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HEALTH STATUS OF POLISH POPULATION AND ITS DETERMINANTS

2025

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TABLE OF CONTENTS

ABBREVIATIONS LIST 5

FROM THE EDITORS 7

FOREWORD 9

THE HEALTH STATUS OF THE POLISH POPULATION: CRISIS, DETERMINANTS AND SYSTEMIC RESPONSE 11
Bernard Waśko, Stefan Bogusławski, Anna Smaga, Bogdan Wojtyniak

1. KEY FACTS 15

2. SELECTED ASPECTS OF THE DEMOGRAPHIC AND SOCIAL SITUATION 45
Bogdan Wojtyniak, Jakub Stokwiszewski, Aneta Trochonowicz, Rafał Halik, Daniel Rabczenko

3. LIFE EXPECTANCY AND MORTALITY OF THE POLISH POPULATION 67
Bogdan Wojtyniak, Jakub Stokwiszewski, Daniel Rabczenko, Aneta Trochonowicz, Tomasz Madej, Tomasz Zdrojewski, Anna Smaga

4. HOSPITAL MORBIDITY IN POLAND 185
Paweł Goryński, Anna Poznańska, Anna Smaga, Paweł Radomski, Anna Tymicka, Bogdan Wojtyniak

5. SELECTED ISSUES OF DISEASES OF THE CIRCULATORY SYSTEM IN POLAND 209
Marek Gierlotka, Mariusz Gąsior, Daniel Rabczenko, Jakub Stokwiszewski, Bogdan Wojtyniak

6. CANCER INCIDENCE TRENDS IN POLAND 227
Joanna Didkowska, Urszula Wojciechowska, Urszula Sulkowska

7. MENTAL AND BEHAVIOURAL DISORDERS 243
Daria Biechowska, Marzena Sowińska

8. EPIDEMIOLOGICAL SITUATION OF SELECTED INFECTIOUS DISEASES IN POLAND 261
Małgorzata Sadkowska-Todys, Iwona Paradowska-Stankiewicz, Magdalena Rosińska, Marta Niedźwiedzka-Stadnik, Ewa Augustynowicz, Małgorzata Stępień, Mirosław P. Czarkowski

9. THE HEALTH CONSEQUENCES OF ACCIDENTS IN POLAND WITH SPECIAL FOCUS ON THE ADULTS AGED 65 AND OVER 323
Rafał Halik, Jakub Stokwiszewski

10. ALZHEIMER'S DISEASE AND RELATED DISORDERS – AN IMPORTANT PUBLIC HEALTH PROBLEM IN POLAND 345
Aleksander Pawlewicz, Beata Koń, Aneta Machnio

11. ANALYSIS OF SICKNESS ABSENCE IN 2022–2023 361
Ewa Karczewicz, Agnieszka Sikora

12. SUBJECTIVE ASSESSMENT OF HEALTH AND THE LEVEL OF SATISFACTION OF HEALTH NEEDS 381
Stefan Bogusławski, Katarzyna Wróbel, Jakub Stokwiszewski, Anna Smaga, Bogdan Wojtyniak

13. THE PREVALENCE OF BEHAVIOURAL HEALTH RISK FACTORS..... 405
Anna Poznańska, Daniel Rabczenko, Bogdan Wojtyniak

14. EATING HABITS OF POLES.....431

14A. EATING HABITS OF CHILDREN AND YOUTH IN POLAND 431
Anna Dzielska, Anna Liber, Anna Fijałkowska

14B. FOOD CONSUMPTION IN HOUSEHOLDS AND EAITING HABITS OF ADULTS.....461
Katarzyna Stoś, Agnieszka Woźniak, Ewa Rychlik, Maciej Ołtarzewski, Katarzyna Wróbel, Jakub Stokwiszewski

15. ASSESSMENT OF CHANGES IN PM2.5 CONCENTRATIONS AND HEALTH EFFECTS RESULTING FROM LONG-TERM EXPOSURE TO THESE CONCENTRATIONS IN POLAND IN THE PERIOD 2019-2023 IN THE LIGHT OF THE REVISION OF EU DIRECTIVES AND WHO GUIDELINES 481
Krzysztof Skotak, Katarzyna Osińska-Skotak

16. PUBLIC HEALTH ACTIVITIES IMPLEMENTED IN POLAND IN 2022–2023, REPORTED IN THE PROFIBAZA SYSTEM, IN RESPONSE TO THE HEALTH NEEDS OF MIGRANTS AND WAR REFUGEES FROM UKRAINE.....493
Katarzyna Lewtak, Małgorzata Gajewska, Maria Piotrowicz, Ewa Urban

17. IDENTIFICATION OF THE MOST SIGNIFICANT HEALTH PROBLEMS AFFECTING THE POPULATION OF POLAND AND ITS VOIVODSHIPS BASED ON CURRENT RESULTS OF THE GLOBAL BURDEN OF DISEASE (GBD) STUDY 515
Roman Topór-Mądry, Anna Weszka, Bogdan Wojtyniak, Kamila Malinowska, Agnieszka Doryńska, Maja Więckiewicz, Sarah Dillard, Johann Manson, Mohsen Naghavi, Christopher J. L. Murray

18. HEALTHCARE EXPENDITURE AND INFRASTRUCTURE OF THE HEALTHCARE SYSTEM IN POLAND.....535
Katarzyna Kwiatkowska, Olga Partyka, Monika Pajewska, Aleksandra Czerw

ABBREVIATIONS LIST

AIDS – the Acquired Immunodeficiency Syndrome
AOTMiT – the Agency for Health Technology Assessment and Tariffication
AOS – specialized care
BAEL – Labour Force Survey
CAPI – Computer Assisted Personal Interviews
BMI – Body Mass Index
CABG – coronary artery bypass graft
COVID-19 – Corona-Virus-Disease-2019
CSIOZ – the Healthcare Information Systems Centre, now e-Health Centre
DAA – Direct-acting antivirals
DALY – Disability Adjusted Life Years
DiLO Card – the Oncology Diagnostics and Treatment Card
DVG – Digitale-Versorgung-Gesetz
ECDC – the European Centre for Disease Prevention and Control
EEA – the European Environment Agency
EHIS – the European Health Interview Survey
EOG – the European Economic Area
ESP2013 – the European Standard Population
EU-SILC – the European Union Statistics on Income and Living Conditions
GBD –the Global Burden of Disease
GUS – the Statistics Poland
HAV – Hepatitis A Virus
HBV – Hepatitis B Virus
HCV – Hepatitis C Virus
HDI – Human Development Index
HIV – Human Immunodeficiency Virus
HLY – Healthy Life Years
ICD-10 – the International Statistical Classification of Diseases and Related Health Problems
IHME – the Institute for Health Metrics and Evaluation
KGP – the National Police Headquarters
KOS zawał – Managed care for acute myocardial infarction survivors – MACAMIS
KRN – the National Cancer Register
LDL – low-density lipoprotein
MDR-TB – multi-drug-resistant tuberculosis
MSM – men who have sex with men
NFZ – the National Health Fund
NIZP PZH – PIB – the National Institute of Public Health the National Institute of Public Health
NIH – National Research Institute (formerly NIPH – NIH)
NOP – adverse event following immunization – AEFI
NSTEMI – non ST segment elevation myocardial infarction

OBSER-CO – the National COVID-19 Seroepidemiological Study
OECD – the Organisation for Economic Cooperation and Development
OOP – out of pocket expenses
PAN – the Polish Academy of Sciences
PCI – percutaneous coronary interventions
PKB – gross domestic product
POZ – primary care
PPS – purchasing power standard
PSSE – the Poviat Sanitary-Epidemiological Station
PSO – preventive vaccination programme
p.p. – percentage point
PTO – the Polish Society of Ophthalmology
PWID – people who inject drugs
PYLL – Potential Years of Life Lost
PYLL75 – Potential Years of Life Lost for the reference age 75
SDI – Social Development Index
SCOP – the Association of Polish Ophthalmic Surgeons
SILICARD – Silesian Cardiovascular Database
UE – the European Union
UE-27 – 27 Member States of the European Union
UE-28 – 28 Member States of the European Union
WHO – the World Health Organization
WHO HFA DB –the WHO European Health for All Database
WSM – women having sex only with men
YLD – Years of Life with Disability
YLL – Years of Life Lost
ZUS – the Social Insurance Institution

FROM THE EDITORS

We are pleased to present to our Readers another edition of the *Report on the Health Status of Polish Population and Its Determinants*. As in previous reports, the picture of the population's health is based on the data available at the time of preparing the report, derived mainly from routine information systems, including datasets functioning within the framework of the Programme of Statistical Surveys of Official Statistics.

The most important data sources used in the report are:

- **Statistics Poland**– data on mortality, births, life expectancy, population size (latest available year: 2023)
- **National Health Fund**– information on medical services financed by the public payer (reporting year: 2024)
- **National Institute of Public Health NIH – National Research Institute** – data on hospitalized morbidity, epidemiological surveillance (reporting year: 2023)
- **Social Insurance Institution** – data on sickness absenteeism (latest available year: 2023)
- **National Cancer Registry** (latest available year: 2022)
- data contained in recognized international databases, in particular those of **Eurostat, OECD and WHO** (latest available years: 2022, 2023; preliminary estimated data)

As in the previous edition, this report also uses important data from other sources. These include, among others, a survey of a representative random sample of adult residents of Poland, carried out by the National Institute of Public Health NIH – NRI in 2025, the results of which have been used in many chapters of the Report.

In presenting selected issues related to the health of the Polish population, this Report discusses in depth – for the fourth time – problems related to nutrition and nutritional status of Poles, using both original studies and GUS data. In the latest edition, special attention has also been given to the nutrition and nutritional status of children and adolescents, using data from the **European Childhood**

Obesity Surveillance Initiative (COSI WHO), conducted in the 2022/2023 school year, as well as the **Health Behaviour in School-aged Children (HBSC)** survey 2021/2022.

In this edition, using approaches to population health derived from the **Global Burden of Disease methodology**, the most important health problems and needs of the Polish population and of individual voivodeships have been identified, based on the current results made available by the Institute for Health Metrics and Evaluation (IHME), from the *Global Burden of Disease 2021* study.

It should also be emphasized that each chapter, apart from updating the data on issues discussed in previous editions of the Report, also addresses new topics not covered before. We hope that our Report will serve well all individuals and organizations working in the field of public health, as well as everyone striving to improve the health status of the Polish population.

We extend our sincere thanks to all authors of the individual chapters, the scientific reviewer, and the technical editors, whose contributions have ensured the high substantive quality of this publication.

FOREWORD

Since 1977, the National Institute of Public Health NIH – National Research Institute has been regularly preparing reports on the health status of the Polish population. This publication remains the only one to offer a comprehensive and synthetic overview of the health situation of the inhabitants of Poland and constitutes an important element in the fulfilment of the Institute's mission.

The 2025 edition, which we are pleased to present to you, contains updates to the previous cross-sectional analyses, as well as new thematic chapters addressing current public health challenges prepared by distinguished experts in their respective fields.

In addition to analyses concerning health status assessment, this report also includes data on its determinants, particularly those related to lifestyle.

The study of the subjective assessment of health status and the extent to which adults' health needs are met remains a constant feature of the publication, although its scope has been expanded this year.

This report is being published towards the end of the implementation period of the National Health Programme 2021–2025, and can therefore be considered a summary of this period. This summary also takes into account the COVID-19 pandemic, which has had both direct and indirect impacts on the health of the population. The conclusions drawn from this year's report should contribute to the preparation of the next edition of the National Health Programme 2026–2030, particularly by identifying areas in which urgent action is required to address the main threats to public health.

The publication is primarily intended for individuals and institutions that influence public health, including those shaping health policy priorities – central and local government bodies, local authorities, research institutions, non-governmental organisations, and, through the media, the wider public.

The authors sincerely hope that the data and analyses presented herein will contribute to a better understanding of the phenomena and changes occurring around us and support actions aimed at improving the health status of the Polish population.

THE HEALTH STATUS OF THE POLISH POPULATION: CRISIS, DETERMINANTS AND SYSTEMIC RESPONSE

Bernard Waśko, Stefan Bogusławski, Anna Smaga, Bogdan Wojtyniak

I

Data illustrating the evolution of life expectancy among the populations of European countries in recent years point to a significant shift in the trends observed over previous decades. The increase in life expectancy has significantly slowed down, and the COVID-19 pandemic, which caused a sharp deterioration in the health status of most societies, most likely did not substantially alter this trend, only temporarily disrupting it. Poland is no exception, and the data presented in this publication confirm this fact. Forecasts predicting a continuous increase in both overall life expectancy and healthy life expectancy in highly developed countries are no longer proving accurate. This raises the question: what is the cause of this slowdown?

We are witnessing a rapid acceleration in the evolution of health determinants. Changes that once occurred over centuries, then over decades in more recent centuries, are now visible within a span of just a few years:

- we are not observing improvement, and in many cases, we are witnessing a deterioration in lifestyle-related determinants: the level of use of various stimulants and psychoactive substances, including alcohol, tobacco products and their substitutes, is rising or at the very least not significantly declining;
- there is widespread recognition of the negative impact of the so-called commercial determinants of health, relating, among other things, to the increasing and excessive consumption of highly and ultra-processed foods, which, supported by strong marketing of this category of products, contribute to the growing epidemic of obesity and overweight;
- despite numerous undertaken efforts, clear health inequalities persist, resulting from a variety of factors, including inequalities in access to healthcare.

The deteriorating geopolitical situation, further intensified by growing concerns over the sense of security and uncertainty about the future, is adversely affecting the mental health of the population, leading to an increasingly frequent occurrence of symptoms of depression and generalised anxiety. New media, driven by algorithms that stimulate social divisions and amplify negative phenomena in the social and political spheres, exacerbate these issues. It is also worth noting the psychological effects of the COVID-19 pandemic, which, seemingly, has almost been forgotten, has left its mark on public consciousness, most notably among children.

Superimposed on these phenomena are the advancing effects of climate change and the worsening state of the global natural environment, including the biodiversity crisis, which contribute to increasing environmental pollution and the spread of new types of infections, including vector-borne diseases. Various forms of antibiotic resistance are being observed more and more frequently, affecting not only bacterial but also fungal infections.

The data, once again cited in our cyclical publication, indicate that not only is the overall health status of the Polish population, as expressed by life expectancy, not improving significantly, but also that the self-assessment of this health status by Poles is deteriorating.

Our publication presents a picture of Polish society's health status as an early warning signal. It is not optimistic, which means we must respond more decisively to the negative developments observed in relation to the determinants of health. Many of the trends described in this Report can be halted or reversed, ultimately leading to long-term improvement in the health and well-being of society and a return to increasing life expectancy and healthy life expectancy.

We are facing a slowly advancing crisis, the early effects of which are already observable as the slowdown in the increase of life expectancy, as described above.

II

Knowledge about the determinants of health has been growing at a remarkable pace in recent years. We are increasingly effective at identifying them and more accurately determining the strength of their impact (despite the exceptional complexity of these phenomena). We know that human health depends on a combination of many factors: behavioural, socio-economic, environmental, and those

related to the human living environment. These factors influence us throughout our lives in different ways and with varying intensity during each life stage. We also know that the more we strengthen positive and weaken negative influences, especially during childhood and early adulthood, the healthier we will be in later adulthood and old age. Furthermore, we know that the health of the Polish population depends primarily on the factors that influence its condition and, to a much lesser extent, on restorative medicine. Despite significant advances in the diagnosis and treatment of diseases, as well as a substantial increase in healthcare spending, our overall well-being is not improving.

An increasing body of scientific evidence points to the high societal and economic value of population health. A healthy population enhances individual well-being, increases social cohesion and the economic efficiency of work, and reduces the social and economic costs of treatment and care for the sick. **We now know all too well that health is not a cost category but a societal and economic asset.** All policies that improve the health of the population in the short term, and especially in the long term, are cost-effective from the perspective of any state.

III

The development of restorative medicine and the improvement of the healthcare system are obvious social needs. However, awareness of these needs and the long-term benefits of actions aimed at improving health is not sufficiently present either in public opinion or among decision-makers. These actions, above all, bring lasting improvements to population well-being, help prevent disease, and contribute to the preservation of health. Poland allocates one of the lowest proportions of its budget in Europe to public health expenditure.

We require swift and intensive action to reduce the impact of factors that cause disease and worsen health. These actions include regulatory measures, educational initiatives, and health interventions in health promotion and disease prevention. We must respond much more rapidly and effectively to developments resulting from the influence of commercial health threats, which are driven by vast investments from industry in the promotion of products that negatively affect health.

Such actions require wise investment. If we speak of security and social protection, if we are building shelters, adapting cities to climate change, and creating reserves for pandemic crises, then all the more should we be investing in the

causes rather than merely addressing the negative consequences of poor public health.

It is already well known that such **interventions are highly cost-effective, both directly and indirectly, although they require perseverance and patience**. The remedial actions undertaken should also be intensified in the face of accelerating negative changes in lifestyle and the human environment. Greater investment is required, along with the measurement and collection of knowledge concerning their effectiveness and efficiency, in order to halt and reverse phenomena detrimental to health.

We are currently preparing the next edition of the National Health Programme 2026–2030. In Poland, this is one of the most important tools, though by no means the only one, we can use to improve the health status of the population.

The actions undertaken must be interdisciplinary, extending beyond the traditional silos of social security management, the healthcare system, education, environmental protection, climate change mitigation and biodiversity conservation. They require systematic planning, evaluation, continuous adjustment of the actions undertaken in order to optimise them, as well as responsiveness to the accelerating changes in the surrounding environment.

Public health is just as important as national security while at the same time requiring incomparably smaller investments.

We owe this not only to our children and grandchildren but also to our seniors.

1. KEY FACTS

Selected aspects of the demographic and social situation

Poland's population has been declining since 2009, falling to 37,637,100 at the end of 2023, which represents 8.2% of the total population of the EU27 and ranks Poland fifth in the EU. In 2023, the natural increase in Poland was negative in both urban and rural areas.

Women account for more than half of the total population (51.7%). The predominance of women over men only becomes apparent in the 50–54 age group and increases rapidly in older age groups. For every 100 men aged 65 and over, there are 148 women, and in the elderly age group of 85 and over, for every 100 men, there are as many as 258 women.

Poland's population is younger on average than that of most European Union (EU27) countries, but according to Eurostat projections, this favourable difference for Poland will gradually disappear, and by the mid-2050s, both the median age and the percentage of people aged 65 and over will be significantly higher in Poland than the EU average.

The percentage of children born outside formal marriage is increasing, and currently, more than one in four children is born outside marriage. In Zachodniopomorskie and Lubuskie voivodships, this proportion exceeds 45%. Poland has a significantly lower proportion of births outside marriage than other European countries; only four EU countries have a lower percentage of such births than Poland.

There is a slight downward trend in the frequency of live births weighing 2,500 g, which occur less frequently than on average in EU countries.

Although the percentage of people with tertiary education has been growing significantly in Poland for a number of years, it is still lower among men aged 25–74 than in most EU countries. In contrast, the percentage of women with tertiary education exceeds the EU-27 average. The proportion of persons with the lowest level of education is significantly lower in Poland than the EU-27 average.

The risk of poverty or social exclusion is currently at a lower level in Poland than the EU-27 average. The most significant improvement after 2015 has been observed among children and young people under 18, while there has been no improvement among the oldest age group (65 and over). However, the percentage of people at risk of poverty in this group is lower than the EU average.

In 2023, there has been a significant increase in the extreme poverty rate in Poland. There is a clear predominance of extreme poverty among rural populations compared to urban populations, even those in small towns. The proportion of persons in households at risk of extreme poverty decreases sharply with the increase in the educational attainment of the head of household.

The total and long-term unemployment rates in Poland are among the lowest in the EU. The voivodships with the worst unemployment rates in recent years are Warmińsko-Mazurskie, Podkarpackie and Świętokrzyskie. The significantly limited opportunities for part-time work in Poland compared to the EU and OECD average, particularly among women, should be considered a disadvantage.

The housing conditions of Poles are, in some respects, worse than the EU average, and this is particularly noticeable in relation to overcrowding. In contrast, Poles are less likely than the EU population as a whole to live in poor-quality dwellings.

The latest Human Development Index (HDI) for 2024, at 0.881 ranks Poland 19th in the European Union and 36th globally.

The above overview of Poland's demographic and social situation shows that it is better than the EU-27 average in many respects. In those areas where the situation is less favourable, the gap is narrowing. Measures aimed at improving it and reducing the gap between Polish society and the more affluent societies of the EU in certain areas should also contribute to beneficial long-term changes in the health of the Polish population.

Life expectancy and mortality of the Polish population

An analysis of data on life expectancy and mortality of the Polish population in 2023 shows that after years of the COVID-19 pandemic, which saw a significant deterioration in the health of Poles, the basic health indicators have largely returned to pre-pandemic levels and often even exceeded them.

In 2023, life expectancy for men was 74.7 years, 0.6 years longer than in 2019 before the pandemic, and for men aged 65, it was 0.1 years longer. Life expectancy

for women was 82.1 years, 0.3 years longer than in 2019 (at the age of 65, it was 0.1 years longer, similar to men).

For many years, Poland has been experiencing an unfavourable trend of high excess mortality among men compared to women, resulting in a significantly shorter life expectancy regardless of age. The authors of the chapter estimate that in 2023, slightly more than half (51.9%) of the difference in life expectancy between men and women, which was 7.3 years, was due to higher mortality among men under the age of 65.

The shortest life expectancy is among inhabitants of towns with a population of less than 10,000, while the longest life expectancy is among inhabitants of the largest cities with a population of over 200,000. The difference in life expectancy related to place of residence is greater for men than for women.

In all voivodships, life expectancy for men and women in 2023 was already higher than in 2019. The ranking of voivodships according to life expectancy before and after the pandemic has changed slightly for men, while it has remained virtually unchanged for women. The differences in life expectancy between voivodships for both men and women before the pandemic in 2019 and after the pandemic in 2023 are very similar.

The differences in life expectancy among inhabitants of powiats are only weakly related to their level of deprivation, especially in the case of women, which should be regarded as favourable.

There is a very clear correlation between life expectancy in Poland and the level of education. Individuals with lower levels of education live significantly shorter than those with tertiary education – this difference amounted to nearly 13 years for men aged 30 during the three-year period of 2020–2022, and nearly 9 years for women.

The life expectancy of Polish men and women is shorter than the EU-27 average by 4.1 and 1.9 years, respectively, and these differences are smaller than in 2019, when these gaps were 4.4 and 2.1 years, respectively. Polish men's shorter life expectancy is mainly due to their higher mortality rate during their working age (25–64 years) compared to other countries, while Polish women's shorter life expectancy is primarily due to higher mortality rates in older age groups (65 and over).

The decline in the overall mortality rate in Poland after 1991 slowed significantly in 2014–2019, and the pandemic years of 2020–2021 caused it to rise sharply by approximately a quarter. However, currently (2023), the death rate is already below that of the pre-pandemic year 2019.

In 2023, the overall population of Poland and persons aged over 45 most frequently died of heart disease, while suicide was the most common cause of death

among persons aged 15–24 and 25–44. The second leading cause of death in Poland in 2023 was cerebrovascular diseases, and the third was cancer of the trachea, bronchi and lungs.

The greatest potential years of life lost (PYLL75), premature mortality, are caused in men by diseases of the circulatory system (DCS) and malignant neoplasms (approx. 21% each), while malignant neoplasms are by far the most common cause of death in women (approx. 38%). In 2023, suicides were responsible for more potential years of life lost among men than lung cancer, cerebrovascular disease or myocardial infarction.

In 2023, diseases of the circulatory system were responsible for 36.9% of all deaths in Poland, which is less than in 2019 (39.4%). They pose almost 50% greater risk to men than women, and urban populations die on average one year younger than rural ones. The life expectancy of individuals with up to lower secondary education is more than two and a half times higher than that of individuals with tertiary education. Higher mortality from diseases of the circulatory system, especially heart disease, is the main factor contributing to shorter life expectancy in Poland compared to wealthier countries. The feasibility of detailed comparative analyses of mortality due to DCS is limited due to significant differences between voivodships and changes over time in the certification and coding of deaths, particularly in this group of causes.

Malignant neoplasms were responsible for 24.4% of all deaths in Poland in 2023, which is practically the same as in 2019 (24.5%). They pose a 70% greater threat to men than to women, and rural populations die on average only about six months younger than urban populations. The mortality rate associated with the level of education is much lower than in the case of DCS. The average female age at death due to malignant neoplasm of breast and malignant neoplasm of cervix uteri in 2023 was 70.8 years and 65.8 years, respectively, and thus women who died from the latter were, on average, 5 years younger. The mortality rate for women due to breast and cervical cancer was higher in urban areas than in rural areas.

Mortality from diseases of the respiratory system and diseases of the digestive system is currently higher than before the pandemic, with significant regional differences. Men die on average at a younger age than women, while the average age at death is similar in urban and rural areas. Education is a factor that strongly influences the risk of death from these diseases.

The level of education strongly differentiates the risk of death due to external causes and the likelihood of an ill-defined cause of death. A similar effect, but practically only for men, is found in urban or rural places of residence.

Although the infant mortality rate in Poland has been steadily declining for years, and until 2015, it was higher than the EU average, the decline slowed down after that year. In 2023, the infant mortality rate in Poland (3.9/1,000 live births) was higher than the EU average (3.3/1,000) by the same amount as in 2014. Of note is the higher early neonatal mortality, i.e. in the first week of life, in Poland than in most EU-27 countries. Infant mortality rates vary significantly between voivodships and fluctuate from year to year, which undoubtedly points to the need to improve and standardise the level of care provided to pregnant women and newborns.

The mortality rate of people under 75 due to avoidable and treatable or preventable causes is an essential element in assessing the performance of a healthcare system. The mortality risk among Polish citizens due to avoidable causes after the increase in 2020 and 2021 (higher for treatable causes) is currently lower than in 2019. The mortality rate from these causes is strongly linked to the level of education in both sexes. Mortality rates among men and women due to alcohol-related causes, i.e. preventable causes, increased between 2014 and 2022, but decreased significantly in both sexes in 2023.

The mortality rate and its dynamics due to avoidable causes in Poland are less favourable than the EU-27 average. In 2022, mortality due to preventable causes in Poland was 45% higher than the EU-27 average, mortality due to treatable causes was 56% higher, and avoidable mortality was 49% higher. For both preventable and treatable diseases, the situation in Poland is more unfavourable than in the EU as a whole for diseases of the circulatory system than for cancer. The mortality rate due to alcohol-related health problems for men in Poland in 2022 was more than twice (114%) higher than the mortality rate in the EU-27 as a whole, and the mortality rate for women was 89% higher.

Hospital morbidity in Poland

In 2023, Poland recorded 7.0 million hospitalisations, marking the first year in which the number exceeded the level registered prior to the COVID-19 pandemic. During the first year of the pandemic (2020), there was a sharp 25% decrease in hospitalisations, followed by smaller reductions of 12% in 2021 and 3% in 2022 compared to 2019.

A similar trend is observed in the standardised hospitalisation rates, which reflect the burden of disease after eliminating differences in the age structure of

the Polish population over successive years. The hospitalisation rate in Poland in 2023 was 1,894.5 cases per 10,000 population, exceeding the 2019 level by 4%. Compared to 2017, it was 1% lower.

Delayed or foregone hospitalisations are a significant component of the so-called health debt, understood as the cumulative delay in the provision of healthcare services resulting from disruptions in the functioning of healthcare systems in the context of the COVID-19 pandemic. The scale of this phenomenon varied across different diagnostic groups, leading to hospital treatment. The largest decrease in hospitalisation rates in 2020 was observed for infectious and parasitic diseases, where the standardised hospitalisation rate declined by 45%, followed by diseases of the respiratory system (35%) and diseases of the nervous system (34%). In the case of infectious diseases, diseases of the circulatory system, diseases of the nervous system and injuries, despite the observed upward trend, the hospitalisation rate in 2023 remains below the 2019 level.

The most common causes of hospitalisation between 2017 and 2023 were diseases of the circulatory system. Since 2020, cancer has ranked second, with a marked upward trend in hospitalisation rates – in 2023, the rate was 46% higher than in 2017.

Clear differences exist in the causes of hospitalisation between women and men. The frequency of hospitalisation due to injuries and poisoning, as well as diseases of the circulatory, respiratory and digestive systems, is significantly higher among men than among women. Additionally, from 2017 to 2023, the male predominance in hospitalisations due to diseases of the circulatory and digestive systems has increased. At the same time, the female predominance in hospitalisations for cancer, eye diseases, and diseases of the musculoskeletal system has decreased. Diseases of the genitourinary system are a notably more frequent cause of hospitalisation among women.

Most common causes of hospitalisation by age group:

Ages 0–4

- Excluding the Z00–Z99 group, which includes normal births (Z38), the leading cause of hospitalisation is conditions originating in the perinatal period – each of these categories accounts for nearly 20% of children's hospital stays;
- Respiratory diseases are a significant reason for hospital treatment in both sexes, responsible for 16.7% of hospitalisations among boys and 14.3% among girls. Other notable causes include infectious diseases (7.6% in boys *vs* 6.2% in girls), congenital malformations (6.6% *vs* 7.7%), and injuries and poisoning (6.1% *vs* 5.6%).

Ages 5–14

- Injuries and poisoning are the leading causes of hospitalisation, slightly more common in boys (20.1%) than in girls (17.4%);
- Respiratory diseases are the second most frequent cause of hospitalisation for both boys (14.5%) and girls (13.4%);
- Other important causes include endocrine, nutritional and metabolic diseases – more common in girls (9.4%) than boys (7.7%) – as well as nervous system diseases, which show similar prevalence in both sexes (5.8% in girls *vs* 5.6% in boys).

Ages 15–39

- Pregnancy, childbirth and the puerperium are by far the dominant cause of hospitalisation among women (O00–O99: 39.3%), followed by diseases of the genitourinary system (10.3%);
- Among men, the most frequent cause of hospitalisation is injuries and poisoning (28.5%), which is also the third most common cause among women (7.6%). Other significant causes for men include diseases of the digestive system (11.4%) and diseases of the musculoskeletal system (7.3%).

Ages 40–59

- Cancer is the most common cause of hospitalisation among women (18.5%), and the third most frequent among men (11.7%);
- Other leading causes among women include diseases of the genitourinary system (17.4%), which are much less common in men (5.2%), and diseases of the musculoskeletal system (9.3%), with a similar rate observed in men (9.2%);
- Injuries and poisoning remain the leading cause of hospitalisation among men (14.0%, compared with 6.6% among women);
- The second most common cause for men is diseases of the circulatory system, accounting for 13.6% and rising rapidly with age (for comparison, DCS cause 5.7% of hospitalisations among women in this age group);
- Diseases of the digestive system are also more prevalent among men (11.6%) than among women (7.3%).

Individuals aged 60 and over accounted for nearly half of all hospitalised patients in 2023 (45.7% among women and 46.7% among men), reflecting the ageing of the population.

As in the general population, the standardised hospitalisation rates for older adults dropped significantly in 2020 and have gradually returned to pre-pandemic levels. In 2023, the rate was 3,255 hospitalisations per 10,000 women and 3,907 per 10,000 men.

For both sexes aged 60 and over, the most common cause of hospitalisation was diseases of the circulatory system, followed by cancer.

Throughout the analysed period, men consistently had a higher hospitalisation rate, with the excess ranging from 18% to 26%, peaking in 2020. The most pronounced differences were observed in diseases of the respiratory system (with a 67% higher rate in men in 2023) and diseases of the circulatory system (68% higher in men in 2023). An increasing trend in hospital treatment rates among men compared to women was also observed for diseases of the digestive and nervous systems.

Only two diagnostic groups had consistently higher hospitalisation rates among women than men throughout the analysed period – endocrine, nutritional and metabolic diseases, and injuries and poisoning. The latter significantly contrasts with the trend observed in the general population, where men are much more frequently hospitalised due to injuries.

Urban residents were hospitalised slightly more often than rural residents, likely due to better access to hospital care. Throughout the analysed period, the difference in hospitalisation rates remained relatively stable – the excess in urban population hospitalisations ranged from 5.3% in 2019 to 8.5% in 2021 and 2022.

For most of the analysed disease groups, hospitalisation rates were higher among urban residents than rural ones, with the greatest differences observed for cancer (an average annual excess of 20%) and endocrine, nutritional and metabolic diseases (18%). Exceptions included pregnancy and childbirth-related conditions (with a 6% average annual excess among rural residents) and diseases of the circulatory system (4%).

In 2023, the hospital mortality rate was 2.2% for men and 1.7% for women; for the first time, these figures were lower than those recorded before the pandemic.

Among all analysed causes of hospitalisation, COVID-19 was associated with the highest hospital mortality; even after the end of the pandemic, its mortality rates remained significantly higher than those for other disease groups – in 2023, they stood at 10.9% for men and 9.7% for women.

Other leading causes of hospitalisation associated with high hospital mortality include diseases of the circulatory and respiratory systems, and infectious diseases. Notably, high mortality was also observed among patients admitted due to ill-defined causes (ICD-10: R00–R99), which may indicate insufficient diagnostic precision.

Throughout the analysed period, men experienced higher in-hospital mortality than women for hospitalisations due to: diseases of the genitourinary system, malignant neoplasms, diseases of the nervous system, endocrine, nutritional and metabolic diseases, ill-defined causes, and COVID-19. Women, in turn, died

more frequently than men when hospitalised for diseases of the circulatory system and skin diseases.

Selected issues of diseases of the circulatory system in Poland

The first year of the COVID-19 pandemic (2020) was marked by a significant deterioration in care for patients with diseases of the circulatory system.

This decline in patient care affected both inpatient and outpatient services.

The considerable deterioration in care for patients with diseases of the circulatory system observed during the first year of the pandemic led to the development of a "health debt", which has been gradually repaid in the subsequent post-pandemic years.

Data from 2022–2023 clearly indicate a trend towards recovery and the "repayment of the health debt" – the number of cardiology services has increased in an effort to make up for the backlog and meet the growing needs of patients.

After a marked increase in mortality due to diseases of the circulatory system in 2020–2021, death rates in 2023 stabilised at levels consistent with pre-pandemic trends. However, persistently high excess mortality remains evident in Dolnośląskie and Lubuskie voivodships and, to a somewhat lesser extent, in Mazowieckie voivodship.

Cancer incidence trends in Poland

The sharp increase in cancer cases and survivors may lead to a public health crisis and strain the healthcare systems in Poland (in 2022, there were 181 thousand new cases and approximately 1.35 million people living with cancer). The main challenge for the Polish healthcare system in the coming decades will be to undertake actions to reduce the number of cases, which appears to be the most urgent and cost-effective way to ensure health. Primary prevention (preventing disease onset) and secondary prevention (preventing deaths) should be the main strategies to reduce the cancer burden on Polish society. Palliative and end-of-life care for the growing number of cancer patients should also be developed. Actions should leverage the potential of evidence-based health policy. A source of reliable information (facts) is the Polish National Cancer Registry (https://onkologia.org.pl/pl). The Polish National Cancer

Registry system enables the integration of hospital systems, automating data transmission to the registry without the need for physician involvement.

Mental and behavioural disorders

Data from 2022 indicate significant changes in the psychiatric care system in Poland, encompassing an increase in the number of patients using outpatient psychiatric care, as well as hospitalisations in inpatient care. The growing incidence of mental disorders, including depression, anxiety disorders, and substance use disorders, necessitates adaptation of the healthcare system to the increasing demand for treatment and psychological support. Of particular concern is the rising number of patients hospitalised following suicide attempts, which underscores the urgent need to intensify both preventive and interventional efforts.

Disparities in access to psychiatric services between urban and rural populations remain a significant issue. Urban residents use services much more frequently, which indicates the necessity to improve psychiatric care accessibility in rural areas. Meanwhile, the predominance of male hospitalisations persists, especially in the context of alcohol and psychoactive substance use disorders.

Conclusions

- Increased demand for psychiatric services: The number of patients using mental health outpatient services and hospitalised due to mental disorders is rising, highlighting the need to expand the psychiatric care system.
- Increase in hospitalisations following suicide attempts: In 2022, there was a noticeable increase in the number of patients hospitalised after a suicide attempt across Poland, indicating the need for more effective preventive and interventional measures.
- Inequalities in access to psychiatric care: Urban residents are more likely to use psychiatric services than rural residents, suggesting limited availability of specialists in rural areas.
- Increase in patients with alcohol and psychoactive substance use disorders: This is especially evident among men, underlining the need to strengthen the addiction treatment system.
- Rising number of hospitalisations due to depression and affective disorders: This may reflect improved diagnosis, but also an actual increase in mood disorder cases.

Health policy recommendations

- Development of outpatient psychiatric care and telemedicine: To improve service accessibility, the number of psychiatric consultation centres should be increased, and telemedicine expanded, particularly in rural areas.
- Strengthening preventive and educational efforts: It is essential to intensify prevention programmes targeting depression, anxiety, and addiction, especially among children, adolescents, and older adults.
- Increasing the number of mental health professionals: Investment is needed in the training of psychiatrists, psychologists, and therapists, as well as in mental health education for primary care physicians.
- Better integration of addiction treatment with psychiatry: The rising number of patients with substance use disorders requires more effective treatment and harm reduction programmes.
- Development of a support system for individuals after suicide attempts: More effective monitoring and support systems should be implemented, including community-based care programmes and post-hospitalisation psychological support.
- Tailoring interventions to demographic differences: Mental health programmes should account for the specific needs of different groups, including women, men, youth, and the elderly.
- Monitoring mental health trends: Regular epidemiological analyses will enable better alignment of health policy with the dynamically changing needs of society.
- Implementing these actions could improve the accessibility and quality of psychiatric care in Poland and reduce the burden on the mental healthcare system.

Epidemiological situation of selected infectious diseases in Poland

Vaccination coverage among individuals aged 0–19 against vaccine-preventable diseases remains above 90% nationwide. However, data from voivodships show variability, ranging from 87% to 91%.

Although the current coverage still ensures population immunity, areas with lower coverage are at risk of outbreaks of certain infectious diseases.

The incidence of vaccine-preventable diseases is influenced by post-pandemic dynamics, variable vaccination rates, and a growing number of individuals refusing vaccination.

Although the incidence of tuberculosis continues to decline gradually, the rising proportion of multidrug-resistant tuberculosis remains a key concern.

Insufficient laboratory confirmation of suspected rubella cases is troubling, as it is necessary for accurate diagnosis and is linked to Poland's participation in the European rubella elimination programme.

The increase in cases of numerous infectious diseases in 2022–2023 largely reflects the accumulation during the pandemic of individuals susceptible to various pathogens due to reduced interpersonal contact and mobility and limited access to healthcare services for conditions other than COVID-19.

The continuous increase in newly diagnosed cases of HIV, syphilis and gonorrhoea among men who have sex with men indicates the limited effectiveness of current interventions targeting this group. Evaluation and intensification of these efforts, e.g. greater access to HIV pre-exposure prophylaxis, are essential.

Marked differences in registered incidence rates of sexually transmitted infections and HIV suggest significant underreporting to the epidemiological surveillance system in most voivodships.

High STI incidence rates in the reproductive-age population, i.e. 20–30 years, highlight the need for action regarding the potential for vertical transmission of these infections.

Rapid diagnosis and treatment are critical elements in the prevention of HIV and STIs, making integration of testing for all indicated infections and prompt treatment of diagnosed individuals essential to reduce transmission risk, including among contacts, partners of infected individuals, and those engaging in high-risk sexual behaviours.

Incidence rates of chronic infectious diseases (HIV, chronic hepatitis B and C) have returned to pre-pandemic levels, indicating that diagnostic efficacy has also returned to pre-pandemic levels, which, however, remains insufficient.

The increased influx of migrants, particularly refugees from Ukraine, has significantly impacted the epidemiology of selected infectious diseases.

Implementation of a sentinel surveillance system would be advisable to improve surveillance of respiratory infections, including COVID-19, influenza and RSV.

Adult vaccination is a key element of preventive healthcare in the face of an ageing population and increasing burden of chronic disease. Its implementation should be based on individual risk assessment, considering age, health status, occupation, and lifestyle.

Personalised adult immunisation schedules are an important public health tool, enabling effective prevention of infectious diseases, improving quality and length of life, and reducing the risk of severe health complications, particularly in high-risk populations.

Health consequences of accidents in Poland, with particular emphasis on the situation of people aged 65 and over

According to the survey conducted in March 2025, 24.8% of respondents experienced at least one accident in the past 12 months. Accidents were more frequently reported by men (27.6%) and less frequently by women (22.0%.

Based on hospital morbidity data, it can be estimated that 1% of Poland's population annually experiences an accident requiring hospital treatment, most of which are falls (56.2% of hospitalisations between 2019 and 2023).

In 2010, mortality due to accidents in Poland was 26% higher than the average in the EU-27; by 2022, this excess had decreased to 9.6%. After 2015, the decline in accident-related mortality slowed down both in Poland and, on average, in the EU-27. During the COVID-19 pandemic in 2021, an increase in mortality from accidents was observed, particularly high among those aged over 65.

The systematic improvement in road traffic safety, combined with the ongoing population ageing, has resulted in falls now being the leading cause of accidental deaths (standardised rate of 14.5 per 100,000 population). The second leading cause is transport accidents (5 per 100,000 population), followed by accidental poisoning (4.5 per 100,000 population – posing more than twice the risk to life compared to the EU-27 average).

Between 2019 and 2023, there was a marked increase in mortality due to falls among people aged 65 and over, particularly during the pandemic. Although the mortality rates declined in 2022 and 2023, they remain higher than in 2019 among the oldest age groups.

Alzheimer's disease and related disorders – an important public health problem in Poland

The chapter presents information on the recorded epidemiology of Alzheimer's disease and related disorders, estimated based on data on health services reported to the National Health Fund. The presented data indicate that Alzheimer's disease and related disorders mainly affect women, with the incidence increasing with age. Due to the population ageing, the number of patients increased in 2023 compared to 2014. The number of patients divided by population remained stable, and in some cases, the rates even decreased.

There are differences between voivodships in the European age-standardised prevalence rates. Differences are also observed depending on the patients' place of residence: the highest recorded prevalence rates of Alzheimer's disease and related disorders are observed in towns with up to 10,000 inhabitants, and the lowest in cities with 100,000 to 200,000 inhabitants and those over 200,000 inhabitants.

Analysis of sickness absence in 2022–2023

Sickness absence affects many aspects of society. It is a measure of the health situation of the population and an important indirect cost of illness.

Spending on sickness absence in 2023 amounted to PLN 26.7 billion, an increase of 4.9% compared to 2022.

There were 23.7 million medical certificates issued due to own illness, for a total of 273.5 million sickness absence days. The number of medical certificates increased by 0.6% compared to 2022, while the number of sickness absence days was 0.3% lower.

Throughout 2023, at least one medical certificate due to own illness was issued to 7,158.6 thousand insured persons. Of this number, 3,859.7 thousand women were on sick leave, accounting for 53.9% of those on sick leave. Men on sick leave at least once in the whole year constitute a group of 3,297.5 thousand insured persons; they accounted for 46.1% of those on sick leave.

An important element in the analysis of sickness absence is the absence of women whose incapacity arises during pregnancy. The share of pregnant women's sickness absence days in women's sickness absence was 25.8% of absence days (28.2% in 2022). This means that every eighth certificate was issued in connection with incapacity during pregnancy, and over a quarter of the number of days of sickness absence among women was due to incapacity during pregnancy.

In 2023, compared to 2022, the number of days spent in hospitals by persons insured with the Social Insurance Institution (ZUS) increased significantly. Hospital stays for those insured with ZUS by 7.5% days, while the number of hospital certificates was 12.9% higher. However, the average duration of incapacity to work per hospital stay was lower than in the previous year, at 4.46 days (4.69 days in 2022).

In recent years, the rate of sickness absence has been disrupted by the SARS-CoV-2 virus pandemic. Fear of contracting the disease has been added to the reasons for COVID-19-related absenteeism.

There was still COVID-19-induced absenteeism and further increases in this absenteeism in March and December of 2023. The incidence of concomitant diseases since the start of the pandemic, primarily mental illnesses, including depressive disorders in both children and adults, is not decreasing.

Subjective assessment of health and the level of satisfaction of health needs

Subjective health status assessment

The results of the 2025 survey indicate a decrease in the average self-assessed health status of women and men in Poland aged over 20 compared to 2018. Currently, 19% of men and 14% of women assess their health status as "very good", compared to 38.2% and 28.5% six years ago. The deterioration in the magnitude of this important indicator may mean an increase in the dynamics of the burden on the healthcare system in the future, beyond the observed trends.

Compared to 2018, the percentage of respondents declaring poor or very poor health increased (up to 10.0% of men and 10.6% of women in the general population), especially among people with higher and secondary education and those with a relatively good economic situation. A significant deterioration in self-assessed health status in the period described was also observed among people aged 60–74 and 75 or over. The percentage of poor and very poor health ratings is highest among people with primary education. A similar situation can be observed among individuals whose households are in a difficult economic situation. The data indicate social groups with potential below-average health status, requiring increased public health and restorative medicine interventions specifically targeted at these groups.

Prevalence of long-term health problems and chronic diseases

Compared to 2018, the number of persons reporting long-term health problems or chronic diseases increased, particularly problems that cause serious limitations in activities of daily living. The trend of worsening self-assessed health compared to 2018 is consistent with a very significant increase in the percentage of people reporting long-term health problems or chronic diseases, particularly problems that cause serious limitations in activities of daily living. This trend affects both sexes to a similar extent.

A significant proportion of the Polish population reports symptoms of moderate to severe depression (16.2% of men, 19.9% of women). This is especially true for people struggling financially and those with lower levels of education. This problem is more common in women than in men. It should be noted that the survey was conducted in September 2018 and February 2025, respectively, which may affect the percentage of people reporting symptoms of depression. However, the observed increases are worrying and require further close monitoring.

A large proportion of respondents declare symptoms of generalised anxiety. Women declare anxiety significantly more often than men (17.8% of men, 20.7% of women). The question about generalised anxiety was included for the first time in the survey. The results indicate high levels of anxiety, especially among younger people. This is worrying and requires further in-depth investigation.

A large percentage of respondents report severe pain. Once again, women declare such symptoms significantly more often than men. Almost 20% of people experiencing pain claim that it interferes with their usual activities, which still represents a high percentage: 13% of men and 17% of women in the general population aged 20 and over in Poland. The high level of reported pain in the surveyed population, requires further investigation. Pain causes increased demand for medical services and reduces economic efficiency, resulting in presenteeism and absenteeism. At the same time, many of these conditions can be prevented by modifying lifestyle and reducing risk factors such as overweight and obesity or insufficient physical activity.

Use of health services within the National Health Fund and private healthcare providers

The share of those largely or exclusively using privately financed services is significant, ranging from 24.6% in men to 22.5% in women. Such individuals relieve the burden on the publicly financed system but are potentially exposed to inefficient health expenditure due to, e.g. the lack of comprehensive and coordinated care.

The highest percentage of people using non-publicly financed services is observed in the younger population, with secondary and higher education, living in large cities (over 200,000 inhabitants) and rural areas. However, almost a third of the population who exclusively or largely use non-publicly financed services struggle to finance their health expenditures. This is indirect evidence of significant difficulties in accessing publicly financed services.

A very large percentage (significantly over 50%) of the population who find it difficult to cover their health expenditures report a high burden of health problems. It can be assumed that such individuals (in their perception) require medical services but do not have sufficient access to free services; hence, they use the

non-publicly financed sector. As a result, their health expenditure exceeds their financial capacity.

Those with a low level of education are more likely than average to report a poor health condition (12.1% of men and 16.5% of women) and are more likely to indicate severe limitations due to chronic health problems (13.1% of men and 16.9% of women). This requires in-depth research into health inequalities.

Those declaring problems with covering health expenditures are far more likely to use only publicly financed services (i.e. 46.7% of men and 52.8% of women). Those reporting a difficult financial situation are also more likely to use only health services financed by the National Health Fund; this applies particularly to women (38.0% of men and 45.0% of women). The remaining respondents from these groups declare that using non-publicly financed services to some extent means an additional burden on their household budgets. Based on the presented data, a significant group of people who are in an unfavourable financial position or are burdened by the costs of services (due to poor economic status and/or poor health status) believe that they do not have satisfactory access to publicly financed services.

A relatively large share of the surveyed population (15.7% of men and 18.2% of women) declare that they use the services of specialists only in the non-publicly financed sector. The above observation may indicate difficulties in accessing services financed by the National Health Fund and/or the prevalence of specialist services in the form of subscriptions or extra insurance. It can be assumed that those declaring the use of services provided by primary care physicians outside the National Health Fund (7.8% of men and 10.2% of women) are covered by subscriptions or additional health insurance.

Unmet health needs

A very high percentage of the surveyed population (over half of those using a given service) declare delays in access to various types of services financed by the National Health Fund due to long waiting times. This is most often the case of access to specialists, diagnostic tests, hospital care and mental health care. A significantly smaller percentage (several per cent) declares such delays due to transport issues or long distances. Delays in accessing services due to long waiting times are a very common issue among the Polish population.

A relatively small percentage of the surveyed population indicated that delays in obtaining medical services contributed to a deterioration in their health condition.

A significant share of the respondents who declared a need for medical services decided not to obtain them. The most frequent reasons were queues/

impossibility to make the appointment, difficulties reaching the healthcare facility via the phone, a potentially high cost of the paid services, and lack of time.

A significant number of the respondents declared resignation from various types of medical services. The most common cases of resignation concerned mental health care and dental services (24.5% of men and 20.0% of women, and 18.5% of men and 15.4% of women, respectively, among those needing a given service). This requires in-depth research. Access to mental health care, even non-publicly financed services, may be difficult due to the limited availability of specialists, but also other factors, such as the feeling of shame. The resignation from dental services is probably due to the low availability of public financing, high costs for the patient, or the limited availability of medicinal products for self-medication.

A relatively large share of the respondents (i.e. approximately 12–14% of those in need of a given service) resigned from a visit to a specialist or did not purchase prescribed medicines, and some of such individuals experienced a deterioration in their health status due to the lack of diagnosis or treatment. This observation indicates the need for thorough research to identify the populations and services most correlated with resignations resulting in deterioration in health.

The prevalence of behavioural health risk factors

The share of male smokers (28.8%) is slightly above the EU average, while the percentage of female smokers (20.3%) is exactly at the EU average. Since 2014, the downward trend in the share of daily smokers in Poland has halted; this trend has also been visible in other countries in recent years.

Daily smoking is reported by a greater number of men than women in all age groups under the age of 75, with the highest rates observed among men and women aged 40–59 (34.5% and 25.0%, respectively).

The highest share of smoking men is observed in the group with basic vocational education and that of women with lower secondary education or below.

For both men and women, the share of smokers in the group of those in a poor financial situation exceeds that in the other groups by approximately 50%.

Electronic substitutes of traditional tobacco products were used daily by 19.8% of men and 12.0% of women aged 20–39. In older age groups, the figures are lower (7.9% and 6.8% for men and women aged 40–59, respectively).

The share of risky drinkers depended significantly on sex and was 27.2% for men and 15.7% for women.

Among both men and women, there was a significant decrease in the percentage of risky drinking individuals with age.

Risky drinking was related to both education level and economic status. Among men, the highest share of risky drinkers was in the groups with tertiary and basic vocational education, whereas among women, it was higher among those with tertiary and secondary/post-secondary education. However, in both men and women, the responses indicating risky drinking were most common in the group of respondents who assessed their economic status as bad.

The results concerning the frequency of use of different types of psychoactive substances are worrying due to the high share of those in the youngest age group (20–39) who have tried drugs and who have used drugs in the past 12 months; for cannabis, 23.7% and 11.9%; for stimulants, 10.4% and 6.3%; for hard drugs, 6.1% and 2.5%.

Men use each type of psychoactive substance 1.4–2.5 times more often than women.

Those with the lowest education and in a poor material situation use each type of such substance significantly more often than the individuals in the other groups of respondents.

In 2025, the prevalence of excess body weight (BMI ≥ 25) among the Polish population aged 20 or over was 64% for men and 48% for women, while in the case of obesity (BMI ≥ 30), it was 15% and 13%, respectively. These problems are much more common among men, half of whom are overweight by the age of 20–39, and in the older age groups (60–84), their share exceeds ¾.

The maximum prevalence of excess body weight is recorded in the 75–84 age group (76% of men and 66% of women), and obesity is noticed in the younger age groups: aged 60–74 for women (18%) and aged 40–59 and 60–74 for men (19% each).

The risk of overweight, and especially obesity, strongly depends on the level of education. For both sexes, the situation is least favourable among those with basic vocational education – excess body weight is the case in 74% of men and 60% of women, and obesity – 19% of both subpopulations. Obesity is recorded for every fourth Polish woman with lower secondary school education or below (27%) and almost every fifth female with basic vocational education (19%), i.e. 2–3 times less often than for women with higher education (9%). The situation among men differs from the above. Those with higher education are characterised by a high prevalence of obesity (18%), while those with lower secondary school education or below have a relatively low prevalence of both excess body weight (54%) and obesity (15%).

Frequently observed severe financial difficulties contribute to obesity in women (19% vs 11% in the case of other Polish women), while it reduces the prevalence

of obesity in men (11% vs 16%), as well as excess body weight (52% vs 69%). This effect is even more noticeable after considering differences in the age structure of the compared groups. Among the materially disadvantaged, obesity is more often recorded among women, while in the case of individuals in a better financial situation, it is more often recorded among men.

The percentage of Poles with excess body weight is higher among the residents of rural areas compared to urban residents, both for men (68% vs 61%) and women (51% vs 46%). However, obesity is slightly more common among men living in urban areas (16% vs 14%).

Compared to 2018, in Poland, the prevalence of excess body weight increased by 7.2 pp among women and 5.3 pp among men, for obesity by 1.7 pp and 4.4 pp. This increase was only partly due to a change in the age structure of the population. During these 7 years, the prevalence of overweight and especially obesity increased significantly in women with tertiary education (1.5 and 2.1 times, respectively), and in the category of 20–39-year-olds (1.9 and 2.1 times, respectively). In men, there is a great decrease in the prevalence of obesity (by over 1/3) among those who constantly or frequently experience serious financial difficulties.

As many as 58% of Poles aged 20 or over do not engage in recreational physical exercises requiring at least moderate effort, and 27% do not exercise or walk at all. Only 29% of Poles follow the WHO recommendations related to the activities necessary to maintain good health.

The percentage of people undertaking physical exercise decreases steadily with age, from 54% at 20–39 to 26% at 75 or over. Moreover, 41% of the youngest and 15% of the oldest Poles declare that they follow the WHO recommendations. At the age of 20–39, men are more active than women; at 60 or over, Polish women exercise more often than their peers (at 60–74, 71% of men and 65% of women are inactive).

The engagement in recreational exercises of both genders increases with the level of education. The percentage of Poles with tertiary education following the WHO recommendations compared to those with primary education is 2.4 times higher for men (37% vs 15%) and as much as 3.6 times higher for women (36% vs 10%). Recreational exercises are not undertaken at all by 79% of men with primary education and 48% with tertiary education. For women, the percentages are 84% and 48%, respectively.

Those experiencing permanent or frequent financial difficulties are much more likely not to engage in recreational physical activity (64% vs 55%). They are also less likely to follow the WHO recommendations (24% vs 31%), even considering only those who exercise (67% vs 70%).

The WHO recommendations regarding physical activity for young people for proper development and health maintenance are met by a small proportion of Polish students, and their percentage decreases with age and amounts to: 29% for boys and 21% for girls aged 11–12, 27% and 17% among 13–14-year-olds, respectively, and 19% and 12% among 14–15-year-olds (data from the Health Behaviour in School-aged Children (HBSC) study from 2022). In all age groups under consideration, boys are more active than girls. Although the level of youth activity has increased compared to 2018, the situation is still less favourable than in 2014.

Overall, behavioural risk factors are responsible for 26% of healthy life years lost in Poland (31% in men and 20% in women) and contribute to 36% of deaths (43% and 29% in the gender groups, respectively).

Eating habits of Poles

Eating habits and nutritional status of infants, children and adolescents

Based on available data on the diet and nutritional status of infants aged 5–36 months, children of early school age (7–9 years), and older children and youth (11–17 years), a set of recommendations was formulated to improve the health of the child population in Poland.

It is advisable to strengthen antenatal education on the benefits of breastfeeding for both mother and child. It is essential to enhance lactation support in maternity wards, particularly among mothers of preterm infants and those who delivered by caesarean section. Education on the benefits of breastfeeding should begin already during pregnancy, as part of antenatal classes led by midwives, and should continue during postnatal home visits, during which the midwife encourages the mother to breastfeed, provides lactation counselling, and helps resolve breastfeeding problems. Care for the mother, including breastfeeding support and lactation counselling, should be continued by the midwife for as long as the mother requires it.

Among parents of infants and children aged 1–3 years, efforts to promote breastfeeding should be continued, along with broad education on the principles of proper nutrition in the early years of life. Shaping healthy eating habits in early childhood significantly reduces the risk of diet-related diseases in later stages of life. It is recommended to develop educational support tools and to introduce dietary consultations within primary health care.

Established but unsatisfactory dietary patterns are observed in the population of children aged 7–9 years. The relatively regular consumption of fruit and

vegetables, especially among girls, contrasts with the significantly low consumption of fish, legumes and fermented milk drinks. High consumption of sweets and sweetened drinks remains a significant problem, which is combined with increasing rates of overweight and obesity, particularly among boys. It is recommended that consistent nutrition standards be introduced in schools and nursery schools, that the availability of highly processed foods be limited, and that educational activities on how to compose a proper diet be developed.

In the group of school children and adolescents aged 11–17, the irregularity of breakfast consumption, which increases with age, becomes a challenge, as well as the persistently high consumption of products with low nutritional value. Gender differences indicate the need for differentiated measures. Girls are more likely to skip breakfast, which may be due to lower levels of appetite in the morning or issues related to self-esteem associated with body weight, while boys are more likely to be overweight and obese, which may be related to higher consumption of high-calorie foods and lower nutritional awareness. It is necessary to strengthen prevention and health education in schools, promote physical activity and other aspects of a healthy lifestyle, as well as to ensure access to individual dietary consultations in cases of identified irregularities.

The conclusions from the analysis clearly indicate the need to implement a comprehensive, nationwide strategy to promote healthy nutrition among children and youth, including health education, family support, environmental measures and systematic monitoring of nutritional status. It is also recommended that the available forms of dietary counselling be further developed, taking into account the individualisation of activities depending on age, gender, and detected irregularities.

Food consumption in households and dietary habits of adults

The data from the household budget surveys show a decrease in the consumption of some products, especially in 2020–2023. The consumption of cereals, vegetables, potatoes, processed meat products, milk, sugar and soft drinks, with the exception of mineral and spring water, decreased. Fluctuations in consumption were recorded for the other analysed product groups.

The decline in consumption of the products mentioned above was associated with a decrease in the energy value of the diet in 2020–2023, and a lower content of macronutrients, most minerals and vitamins.

The eating habits of Poles continued to deviate from the recommendations, as in previous years. Above all, the consumption of vegetables and fruit was insufficient, while the amount of red meat, meat products, and salt consumed was too high.

The diet of Poles was characterised by a relatively high proportion of energy from total fat, with saturated fatty acids providing a particularly large amount of energy. In addition, the intake of fibre, some minerals and vitamins, especially calcium and vitamin D, was too low.

The assessment of the eating habits of adults confirmed irregularities in the diet of Poles. It was observed that Poles did not consume the recommended daily portions of vegetables and fruit, the frequency of consumption of whole-grain products, milk and dairy products was insufficient, and sea fish and legumes were rarely consumed. A large number of the respondents often consumed red meat and meat products, as well as sweets.

More unfavourable dietary habits were observed in men, who consumed fewer recommended daily portions of vegetables and fruit than women, ate more red meat, meat products and fast food products than women, and drank more energy drinks. In contrast, women were slightly more likely to consume sweets. Differences in dietary habits depending on age and place of residence were mostly insignificant.

Based on an earlier study, conducted in 2022, many dietary habits of Poles also deviated from the recommendations: the amount of consumed vegetables, fruit and sea fish was too low, and sweets were consumed too often. The consumption of whole grain cereals, milk and dairy products, red meat and meat products and legumes was not analysed at that time.

On top of the fact that dietary patterns deviated from the recommendations, some Poles did not feel the need or did not want to eat healthily. The positive information is that the percentage of those with such an attitude is currently lower than in 2022.

Given the persistent irregularities in the diet of Poles and the lack of interest of some people in healthy eating, it is extremely important to implement comprehensive actions to change nutritional habits, with the primary purpose of improving eating habits.

Assessment of changes in PM2.5 concentrations and health effects resulting from long-term exposure to these concentrations in Poland in the period 2019–2023 in the light of the revision of EU Directives and WHO guidelines

Actions undertaken over the past five years (2019–2023) to reduce emissions of air pollutants indicate a clear improvement in air quality and a decline in annual average PM2.5 concentrations.

Non-compliance with the currently applicable legal annual average limit value of 10 μg/m3 for PM2.5, established in Poland and the European Union to protect human health, concerns 3.5% of powiats in Poland (13 out of 380). The introduction of a stricter limit by Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe, which sets the first-level limit at 10 μg/m3, will require an intensification of current efforts, as non-compliance with this new standard currently applies to over three-quarters of powiats (299 out of 380).

For every powiat in Poland, with the exception of the city of Legnica, the period 2019–2023 saw negative values of the medium-term rate of change, indicating an improvement in air quality. Unfortunately, a high rate of improvement, exceeding -10% per year, was observed in only one-quarter of powiats (93). This means that in powiats where the rate of change is lower, achieving compliance with the stricter PM2.5 limit by 2030 will be very difficult, if not impossible.

Improvements in air quality have a measurable impact on reducing the health effects resulting from exposure to air pollution. High negative values of the medium-term rate of change in the number of premature deaths, exceeding -10% per year, are observed in nearly 68% of powiats (257). This means that even relatively small reductions in the population's exposure to PM2.5 lead to a significant decline in health impacts, with the rate of change being higher than that of air pollution concentrations, also influenced by population decline.

The most polluted cities in the period 2019–2023 in terms of annual average concentrations of PM2.5 particulate matter were Świętochłowice, Chorzów, Piekary Śląskie, Rybnik, Zabrze, Siemianowice Śląskie, Bytom, Jastrzębie-Zdrój, Żory, Ruda Śląska, and Nowy Sącz. These cities do not comply with the applicable average annual limit value of 20 μg/m3 for PM2.5 concentrations. At present, among the 66 cities with powiat rights, the stricter limit value introduced by Directive (EU) 2024/2881 (10 μg/m3) is met in only five: Gdynia, Gdańsk, Świnoujście, Sopot, and Zielona Góra, while the WHO's recommended value is met only in Gdynia and Gdańsk.

Public health activities implemented in Poland in 2022–2023, reported in the Profibaza system, in response to the health needs of migrants and war refugees from Ukraine

In the years 2022–2023, a total of 3,198 activities were implemented in Poland in support of the health of Ukrainian migrants and war refugees, of which 1,423

(44.5%) took place in 2022, i.e. in the first year after the outbreak of war with Russia The greatest share of measures was implemented in the following voivodships: Śląskie (415 activities), Kujawsko-Pomorskie (342) and Lubuskie (322). One in three activities was implemented throughout the entire calendar year (1,120 activities; 35.0%), while 13.5% (433 activities) were one-day events.

The highest number of measures was targeted at groups of less than 100 people (1,110 activities, 34.4%) and between 101 and 1,000 people (1,131, 35.4%). The activities were mostly targeted at people regardless of age, i.e. adults and children (1,535, 48.0%), regardless of sex (2,743 activities, 85.8%) or regardless of place of residence (2,108 activities, 65.9%).

In response to health challenges – particularly those highlighted by the COVID-19 pandemic – in 2022, the WHO introduced a proposal for a renewed list of Essential Public Health Functions (EPHFs). Among the 12 EPHFs presented were: EPHF1 Monitoring and evaluating the population's health status, health service utilisation and surveillance of risk factors and threats to health (EPHF2 Public health emergency management, EPHF5 Protecting populations against health threats, including environment and occupational hazards, communicable disease threats, food safety, chemical and radiation hazards, EPHF6 Promoting prevention and early detection of diseases, including noncommunicable and communicable diseases, EPHF7 Promoting health and well-being and actions to address the wider determinants of health and inequity) and seven enabling-oriented functions (EPHF3: Assuring effective public health governance, regulation and legislation, EPHF4 Supporting efficient and effective health systems and multisectoral planning, financing and management for population health, EPHF8 Ensuring community engagement, participation and social mobilisation for health and well-being, EPHF9 Ensuring adequate quantity and quality of public health workforce, EPHF10: Assuring quality of and access to health services, EPHF11: Advancing public health research and EPHF12 Ensuring equitable access to and rational use of essential medicines and other health technologies).

All activities targeting migrants and war refugees, reported in the ProfiBaza system, were classified according to the respective Essential Public Health Functions. Each activity, depending on its scope, was associated with more than one EPHF. Among the activities undertaken in support of the health of migrants and war refugees, those relating to services-oriented functions predominated (2,991 activities; 93.5%), in particular: EPHF5 (1701 activities), EPHF6 (2654 activities), EPHF7 (2151 activities).

As part of the monitoring and assessment of population health and surveillance of health risks and threats (EPHF 1), 348 activities (10.9%) were

implemented. These included the collection and analysis of data related to the epidemiological situation, population health status and its determinants (329 activities; 94.5%), primarily in the context of environmental health (111 activities; 31.9%), infectious diseases (100 activities; 28.7%) and behavioural risk factors (24 activities; 6.9%). Monitoring the population's health status aimed to assess the scale of health problems, both those affecting the migrant and refugee population from Ukraine and the native population, their trends, and regional variations. This made it possible to identify areas of priority importance for public health and existing health inequalities.

In the area of health protection (EPHF 5), activities involved the provision of health services in the context of, among others, environmental health (642 activities; 37.7%), health protection in educational and occupational settings (294 activities; 17.3%), food safety (171 activities; 10.1%), road safety (15 activities; 0.9%), and patient safety, including pharmacovigilance, monitoring of adverse vaccine reactions, and control of infectious diseases and healthcare-associated infections (31 activities; 1.8%).

A total of 2,654 activities (83.0%) were carried out in the field of disease prevention (EPHF 6). Within the scope of primary prevention, this mainly included health education (2,312 activities; 87.1%) and, to a lesser extent, vaccination (682 activities; 25.7%, with vaccinations administered in only six programs). These activities targeted both individuals and their living environments in order to reduce the likelihood of disease or health disorders and to build health literacy and trust in vaccinations among Ukrainian migrants and war refugees. These tasks were often multisectoral and involved institutions from the health care, social care and education sectors as well as local government units and NGOs. Secondary prevention (158 tasks; 6.0%) included early detection of diseases and rapid corrective action to stop disease progression. The screening tests included early detection of cancer, hearing and vision impairments, metabolic diseases (including diabetes) and infectious diseases (e.g. hepatitis, COVID-19). Tertiary prevention focused on therapeutic and rehabilitative actions (64 tasks; 2.4%) aimed at reducing the impact of illness and the risk of recurrence, mainly in the area of medical rehabilitation and disability prevention.

Health promotion (EPHF 7) comprised 2,151 activities (67.3%) targeted at communities, including migrants and war refugees, focusing on interventions aimed at changing individual behaviours, lifestyles, and living environments (e.g. environmental and psychosocial factors), in order to enhance control over health and its determinants. The activities were mostly educational (1,653 activities; 76.8%), and one in ten involved building a health-friendly environment or

modifying the surroundings (247 activities; 11.5%). The most common initiatives promoted healthy lifestyles and health behaviours (1,476 activities; 68.6%). One in three health promotion activities addressed mental and social health (789 activities; 36.7%). The most frequently addressed topics included infectious diseases such as HIV/AIDS and vaccine-preventable diseases (533 activities; 24.8%). These activities were carried out in locations frequented by migrants and war refugees, reflecting a so-called community-based approach to health promotion, including educational institutions (766 activities, 35.6%), recreation/sports/leisure facilities (230 activities, 10.7%), public utility institutions such as libraries (224 activities, 10.4%) and the media/virtual space (189 activities, 8.8%).

Within the enabling-oriented functions, the highest number of activities were carried out in the areas of community engagement and social participation (EPHF 8) – 935 activities, ensuring health service quality and equity (EPHF 10) – 336 activities, and supporting health systems and multisectoral planning and financing of public health services (EPHF 4) – 317 activities.

Identification of the most significant health problems affecting the population of Poland and its voivodships based on results of the Blobal Burden of Disease (GBD) study

The overall health situation in Poland, as measured by the DALY disease burden indicator, outside of the COVID-19 pandemic that occurred in 2021–2022, has shown the following trends since 1990: there has been a substantial decrease in the rates for diseases of the circulatory system (DCS) (a 30% actual reduction between 1990 and 2021), and an increase in the burden from neoplasms (+25%; 1990–2021), which have nearly equalled the burden levels of CVD. The leading public health threats in Poland are diseases of the circulatory system and cancer, which together account for the majority of health loss through premature deaths (over 90%) (YLL). Their burden mainly stems from high mortality: for diseases of the circulatory system, the YLL rate is 7,057.0 per 100,000 population with 668.6 YLD per 100,000, and for cancer, it is 6,971.0 YLL per 100,000 with 194.5 YLD per 100,000 population. In 2021, due to the COVID-19 pandemic, respiratory diseases ranked third, with 5,048.3 YLL per 100,000 and 352.5 YLD per 100,000. In contrast, for musculoskeletal disorders, injuries, mental health disorders, and diabetes, the disease burden stems mainly from living with disability (YLD).

The level of health loss in Poland varies by sex and voivodship of residence. In 2021, the value of disability-adjusted life years (DALYs) due to all causes among men was 45,307.2 DALYs per 100,000. The highest regional disease burden was recorded in Łódzkie voivodship (51,515.7 DALYs per 100,000), and the lowest in Małopolskie (39,820.3 DALYs per 100,000).

Among women, the total burden in 2021 was 36,176.4 DALYs per 100,000. The voivodships with the lowest rates from all causes were Małopolskie (32,354.0 DALYs per 100,000) and Podkarpackie (32,636.2 DALYs per 100,000), while the highest rate was noted in Łódzkie voivodship (41,089.1 DALYs per 100,000).

The analysis of COVID-19 data for 2020–2021 reveals significant differences in the rates of healthy life years lost, both among European countries and within Polish voivodships. In 2021, a clear increase in the DALY rate was observed compared to 2020, with the highest values recorded in Hungary (6,886.6 DALYs per 100,000) among countries and in Lubelskie voivodship (5,537.3 DALYs per 100,000) in Poland.

The dynamics of disease burden changes indicate that between 1990 and 2021, there was a substantial decrease in Poland's age-standardised DALYs (-25%). The largest reduction occurred in Pomorskie voivodship (-31%) and the smallest in Świętokrzyskie (-18%). However, in the shorter period of 2010–2021, Poland saw a slight increase in disease burden (+3%), particularly in Mazowieckie (+8%), Podlaskie (+7%), and Podkarpackie (+5%) voivodships, which was the result of the COVID-19 pandemic.

Over the 30-year period (1990–2021), Poland recorded a significant reduction in disease burden (-59%) for diseases of the circulatory system, with the most substantial improvement in Mazowieckie voivodship (-66%) and the least in Świętokrzyskie (-44%). Between 2010 and 2021, the greatest reduction was observed in Łódzkie voivodship (-34%).

The 30-year trend for cancer shows a clearly weaker improvement than for diseases of the circulatory system, with a national decrease of 21%. The best results were achieved in Pomorskie voivodship (-37%) and the weakest in Świętokrzyskie (-6%). Over the 2010–2021 period, the national average reduction was -12%.

In 2021, the main risk factors responsible for the disease burden among men (actual, unstandardised values) in Poland were tobacco use (13.5% of total burden), alcohol use (8.9%), and high systolic blood pressure (9.6%). Among women, the leading risk factors were high BMI (8.9%), high systolic blood pressure (9.2%), and dietary risks (8.5%). For both sexes, the contribution of risk factors showed considerable regional variation.

Healthcare expenditure and infrastructure of the healthcare system

There has been a steady increase in total healthcare expenditures throughout the years, but the percentage of GDP allocated to healthcare remains relatively low compared to other European countries (6.7% in 2022) and the EU average of 9.9%.

The structure of public and private expenditure has remained virtually unchanged for years, with public expenditure accounting for around 70% and private expenditure for 30%. It is worth noting the significant expenditure on non-reimbursable benefits (mainly medicines), which account for over 20% of current healthcare expenditure.

The structure of expenditure has not changed significantly over the years, with medical services consistently accounting for over 50%. The lack of growth in expenditure on prevention and public health is worrying, as it has been hovering around 2–3% for years and has been on a downward trend in recent years.

In the context of healthcare resources, the age structure of nurses and midwives is a significant problem – according to forecasts by the Polish Chamber of Nurses and Midwives, by 2030, as many as 65% of currently employed nurses and 60% of midwives will be of retirement age. The declining number of nurses is also evident in other OECD countries.

Despite seemingly sufficient bed capacity, there is still a problem with their utilisation, which generates additional costs for the healthcare system. Another problem is the uneven distribution of bed capacity across the country.

In view of the ongoing ageing of the Polish population, efficient geriatric care is an essential element of the system. The results of the Supreme Audit Office's audit indicate, among other things, that there are many gaps to be filled in this area, including an insufficient number of geriatric specialists and nurses, an uneven distribution of geriatric facilities and wards across the country, and a complete lack of such centres in some regions.

2. SELECTED ASPECTS OF THE DEMOGRAPHIC AND SOCIAL SITUATION

Bogdan Wojtyniak, Jakub Stokwiszewski, Aneta Trochonowicz, Rafał Halik, Daniel Rabczenko

This chapter aims to compare the demographic and social situation of the Polish population to that of the European Union (EU-27) in areas important for public health. The analysis primarily uses figures from the databases of Statistics Poland and the Statistical Office of the European Union (Eurostat).

The population of Poland has been declining since 2011, standing at 37,637,100 at the end of 2023. The population reported in the National Population and Housing Census 2021 decreased by approximately 476,000, or 1.2%, compared to the National Population and Housing Census 2011. Net international migration was negative until 2015, and since 2016, the difference between the number of immigrants and emigrants has been consistently positive, reaching 6,800 in 2023.[1] The natural increase (the difference between the number of births and deaths) has also been consistently negative in cities since 2012, becoming negative in rural areas in 2015 and again in 2019 (Fig. 2.1). Nationwide, there has been a negative natural increase since 2013. In 2023, 20 of the 27 countries of the European Union and the EU as a whole experienced negative natural increases, with the total population declining in 8 countries.[2] According to Eurostat data, Polish citizens currently make up 8.2% of the total EU population, placing Poland fifth in terms of population size.

[1] Demographic Yearbook of Poland 2024, Statistics Poland Warsaw 2024

[2] https://ec.europa.eu/eurostat/databrowser/view/demo_gind__custom_15826549/default/table?lang=en

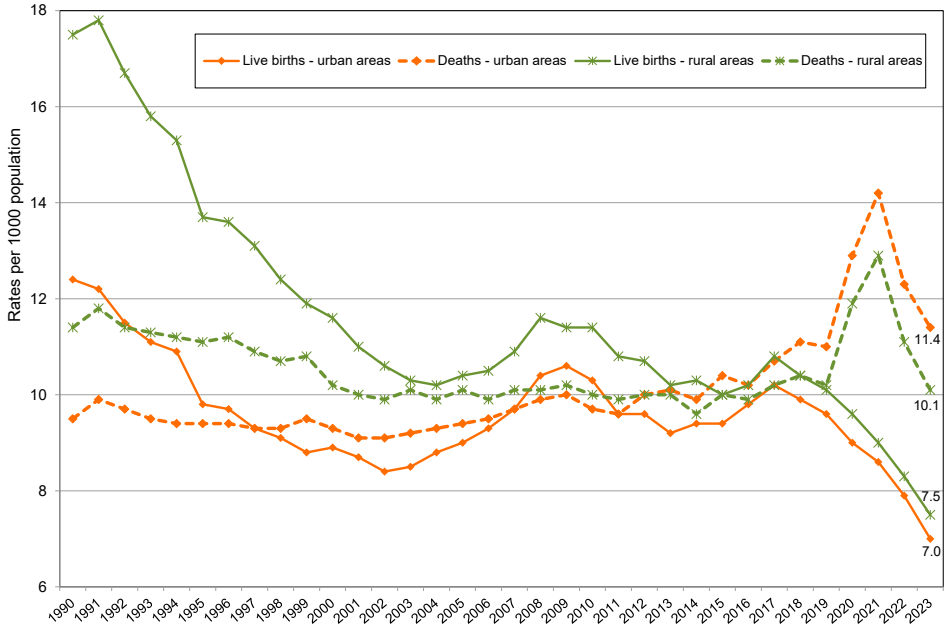


Fig. 2.1. Vital statistics in Polish urban and rural areas in 1990–2023 (Statistics Poland data)

Women make up more than half of the population (51.7%), with 107 women for every 100 men (Table 2.1). This excess of women over men only becomes apparent among persons aged 50–54 (in urban areas, 40–44, and in rural areas, 65–69) and increases rapidly in older age groups. For every 100 men aged 65 and over, there are 148 women, and in the elderly age group of 85 and over, for every 100 men, there are as many as 258 women (they account for 72.1% of the total population of Poland in this age group). In the population aged under 50, there is a consistent predominance of men over women (among newborns, boys account for 51.2% in 2023), which is gradually decreasing, mainly as a result of higher premature mortality among men compared to women.

The percentage of children and young people under 20 has been slowly but steadily declining since the second half of the 1980s. In 2023, this group accounted for one-fifth (20.1%) of the total population, the same as people aged 65 and over, who gradually increased their share of the total population (Table 2.1).

Poland's population is younger on average than that of most European Union countries (EU-27). According to Eurostat data as of 1 January 2024 (preliminary estimates), the median age of the entire EU population was 44.7 years, while in Poland, it was 43.0 years. The proportion of people aged 65 and over was 21.6% and 20.5%, respectively.

Table 2.1. Population of Poland by sex, place of residence and selected age groups in 2013–2023 (as at 31 December)

Year	Total	Men	Women	Urban areas	Rural area	Number of women per 100 men	Population (%)		
	Numbers in thousands						Under 20	65 and over	urban
2013	38,496	18,630	19,866	23,258	15,238	107	20.5	14.7	60.4
2014	38,479	18,620	19,859	23,216	15,262	107	20.3	15.3	60.3
2015	38,437	18,598	19,839	23,166	15,271	107	20.1	15.8	60.3
2016	38,433	18,593	19,840	23,129	15,304	107	20.0	16.4	60.2
2017	38,434	18,593	19,840	23,109	15,324	107	20.0	17.0	60.1
2018	38,411	18,582	19,829	23,067	15,344	107	20.0	17.5	60.1
2019	38,383	18,567	19,816	23,033	15,350	107	20.0	18.1	60.0
2020	38,089	18,417	19,671	22,777	15,311	107	20.2	18.5	59.8
2021	37,908	18,323	19,585	22,624	15,284	107	20.3	18.9	59.7
2022	37,766	18,249	19,517	22,490	15,276	107	20.2	19.5	59.6
2023	37,637	18,182	19,454	22,377	15,260	107	20.1	20.1	59.5

Source: based on Statistics Poland data

According to Eurostat projections, this favourable difference for Poland will gradually diminish, and by the mid-2050s, both the median age and the percentage of people aged 65 and over (but not including the oldest aged 80 and over) will be higher in Poland than the EU-27 average (Table 2.2). It is worth noting that in Poland, the proportion of the oldest people, i.e. those aged 80 and over, will grow most rapidly between 2025 and 2040, while the proportion of those aged 65–79 will only increase significantly between 2040 and 2055.

Important demographic and social indicators reflect the changes in the population's age structure and the problem of population ageing. One of these is the old-age dependency ratio, defined as the proportion of people of an age at which they are usually no longer in the labour force (i.e. aged 65 and over) to the working-age population (in this case, aged 20–64). As shown in Figure 2.2, in the coming decades, we will see a significant increase in this ratio, i.e. faster growth in the elderly population than in the working-age population, both in Poland and across the EU (albeit with differences between countries), with the unfavorable change being greater in Poland.

The ongoing changes in the Polish population's age structure and ageing are well illustrated by the changes shown in the age pyramid and the significant increase in the number of people in the oldest age groups (Fig. 2.3).

Table 2.2. Projected median age and percentage of persons aged 65 and over and 80 and over in Poland, the EU and selected countries in 2025–2055

Country	2025	2035	2045	2055
Population median age				
UE27	44.8	46.6	47.7	48.3
Czech Republic	44.0	46.1	46.4	46.1
Germany	45.1	45.9	47.0	46.9
Poland	42.7	47.0	49.4	49.4
Sweden	40.8	42.5	43.1	44.0
Hungary	44.6	45.7	46.8	47.0
Italy	49.0	51.0	51.4	51.9
Percentage of population aged 65 and over				
UE27	21.8	25.5	28.1	29.6
Czech Republic	20.4	22.2	26.3	28.1
Germany	22.5	26.5	26.8	27.6
Poland	20.2	22.8	26.5	31.2
Sweden	20.5	22.1	22.9	24.4
Hungary	20.8	21.8	25.9	27.5
Italy	24.7	29.8	33.4	33.6
Percentage of population aged 80 and over				
UE27	6.1	7.8	9.9	11.6
Czech Republic	4.7	7.1	7.6	9.5
Germany	7.2	7.4	10.1	10.9
Poland	4.2	7.0	9.0	9.9
Sweden	6.0	7.4	8.0	9.1
Hungary	4.9	6.5	7.2	9.1
Italy	7.8	9.3	11.8	14.9

Source: Eurostat's EUROPOP2023 data

The urban population is on average older than rural population; in 2023, the proportion of people aged 65 and over was 22.0% in urban areas and 17.2% in rural areas, while the median age was 43.8 and 41.3, respectively. The highest proportion of the population aged 65 and over in urban areas is found in Świętokrzyskie and Łódzkie voivodships, while the lowest was recorded in Małopolskie (Fig. 2.4). The largest difference in the age structure of the urban and rural populations was observed in Pomorskie voivodship, where the proportion of older people in urban areas was 7.3 percentage points (ppt) higher than in rural areas, and the average age (median) of urban residents was 4.2 years higher than that of rural residents.

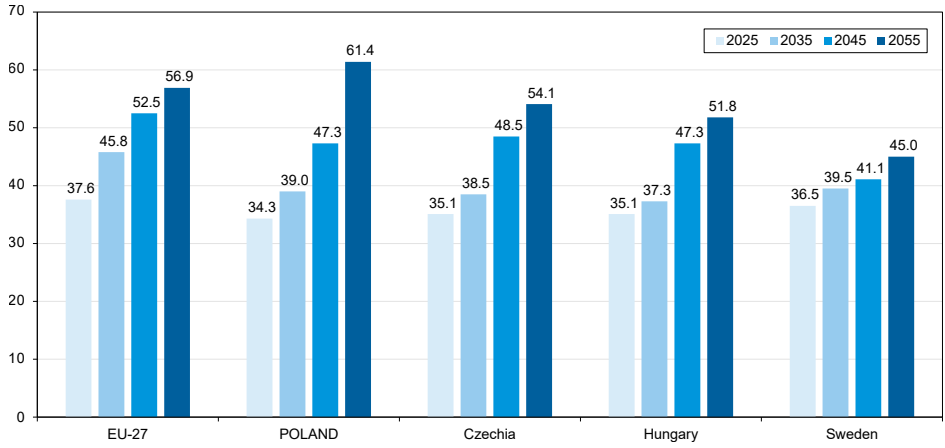


Fig. 2.2. Old-age dependency ratio (number of persons aged 65 and over/number of persons aged 20–64) in Poland and the EU average and selected countries, projected for 2025–2055

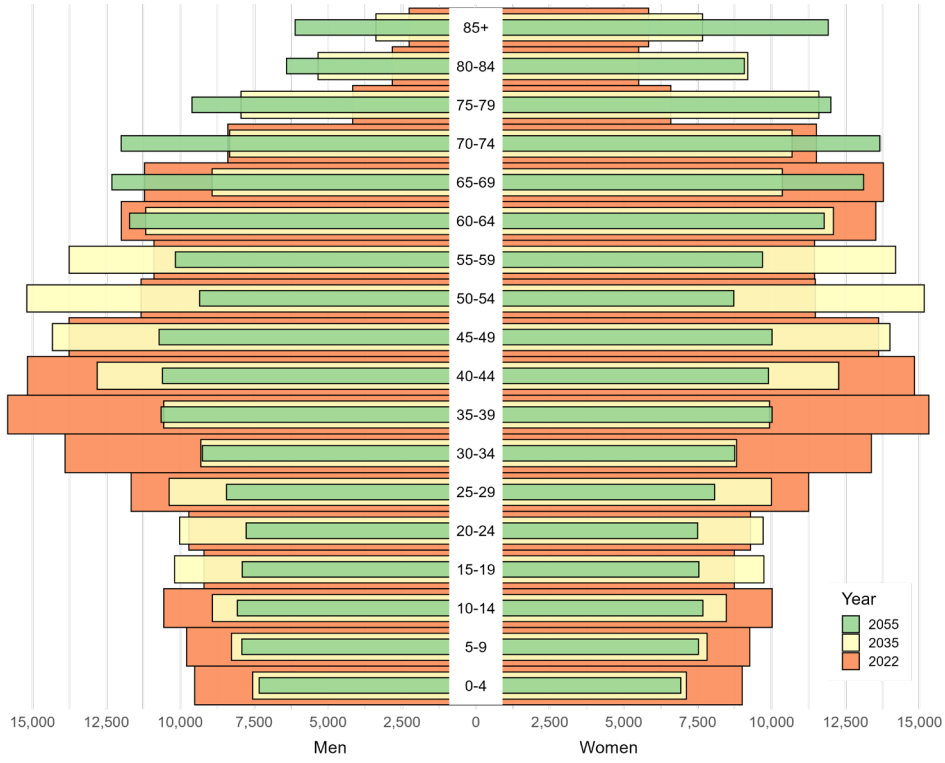


Fig. 2.3. Population of Poland by sex and age in 2019 and projections for 2030 and 2050 (Eurostat's EUROPOP2019 data)

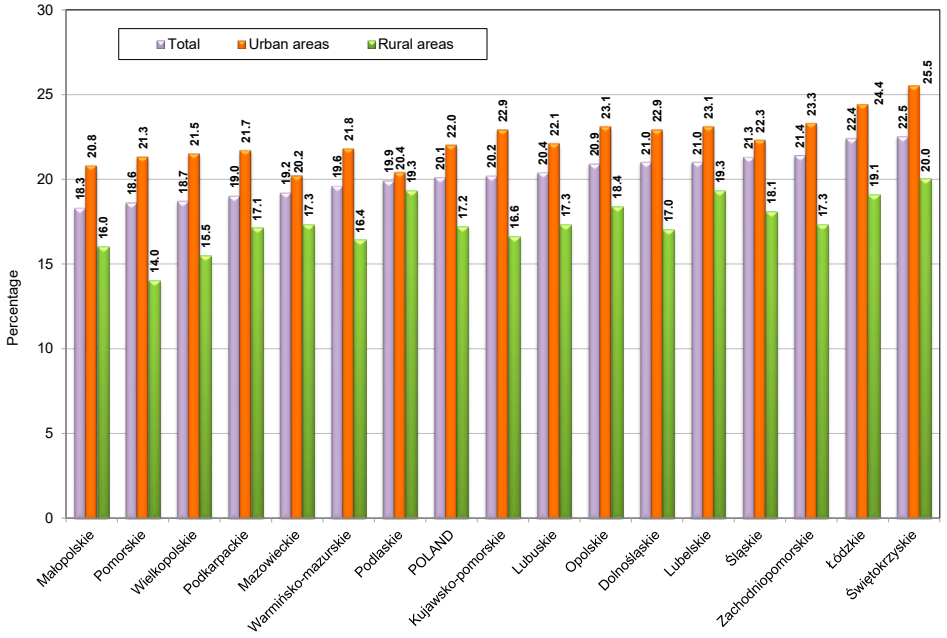


Fig. 2.4. Percentage of people aged 65 and over in the total population, in urban and rural areas by voivodships in 2023 (based on Statistics Poland data)

The proportion of the urban population has been declining since 2000 and stood at 59.5% in 2023. According to projections from Statistics Poland, this figure will continue to decline slowly but steadily. The most urbanised voivodship is Śląskie, where 75.8% of the population lived in urban areas in 2023, while nearly half as many people, 41.0%, lived in urban areas in Podkarpackie voivodship. Furthermore, in three voivodships: Lubelskie, Małopolskie and Świętokrzyskie, urban populations accounted for less than half of the total voivodship population.

The number of live births after 2017 is decreasing both in absolute terms and in relation to the population (Table 2.3). The decline in the number of births affects both urban and rural areas. One of the basic measures indicating the number of births is the total fertility rate. It defines the average number of children a woman would give birth to during her entire reproductive period (15–49 years), assuming that she would give birth in line with the fertility rates for a given age, measured in a given year. In other words, the total fertility rate is calculated based on the sum of the partial fertility rates. It is commonly accepted that if the fertility rate fluctuates between 2.10 and 2.15, replacement-level fertility can be assumed, meaning that the offspring generation replaces the parent generation.

Figure 2.5 shows that Poland ranks among the countries with the lowest rates (1.20 in Eurostat's preliminary estimate and 1.16 according to Statistics Poland). It should also be noted that this figure is well below 2.0 in all EU countries, with the EU average standing at just 1.38.

Table 2.3. Births in Poland in 2011–2023

Rok	Live births			Stillbirths	
	Number (in thousands)	Per 1,000 population	Extramarital as % of live births	Number	% of total births
2011	388.4	10.1	21.2	1,653	0.42
2012	386.3	10.0	22.3	1,601	0.41
2013	369.6	9.6	23.4	1,386	0.37
2014	375.2	9.7	24.2	1,341	0.36
2015	369.3	9.6	24.6	1,075	0.29
2016	382.3	9.9	25.0	1,147	0.30
2017	401.2	10.5	24.1	1,101	0.27
2018	388.2	10.1	26.4	1,277	0.33
2019	375.0	9.8	25.4	1,238	0.33
2020	355.3	9.3	26.4	1,231	0.35
2021	331.5	8.7	26.7	1,220	0.37
2022	305.1	8.1	28.1	1,023	0.34
2023	272.5	7.2	28.7	918	0.34

Source: based on Statistics Poland data

More than one in four children born in Poland today is outside formal marriage (Table 2.3). The proportion of such births has been steadily increasing for several years and increased by more than a third between 2011 and 2023. There is considerable variation between voivodships with regard to the proportion of such births and changes over time. Between 2019 and 2023, the percentage of extramarital births was by far the highest in Zachodniopomorskie and Lubuskie voivodships (Fig. 2.6a). On the other hand, the incidence of extramarital births is three times lower in Podkarpackie voivodship (and only slightly higher in Małopolskie voivodship). The proportion of births outside marriage is higher in urban than rural areas (32.9% vs 22.9% in 2023), with the largest difference in Śląskie (16.3 ppt) and Łódzkie voivodships (16.0 ppt), while this proportion is virtually the same in urban and rural areas in Zachodniopomorskie voivodship (0.0 ppt).

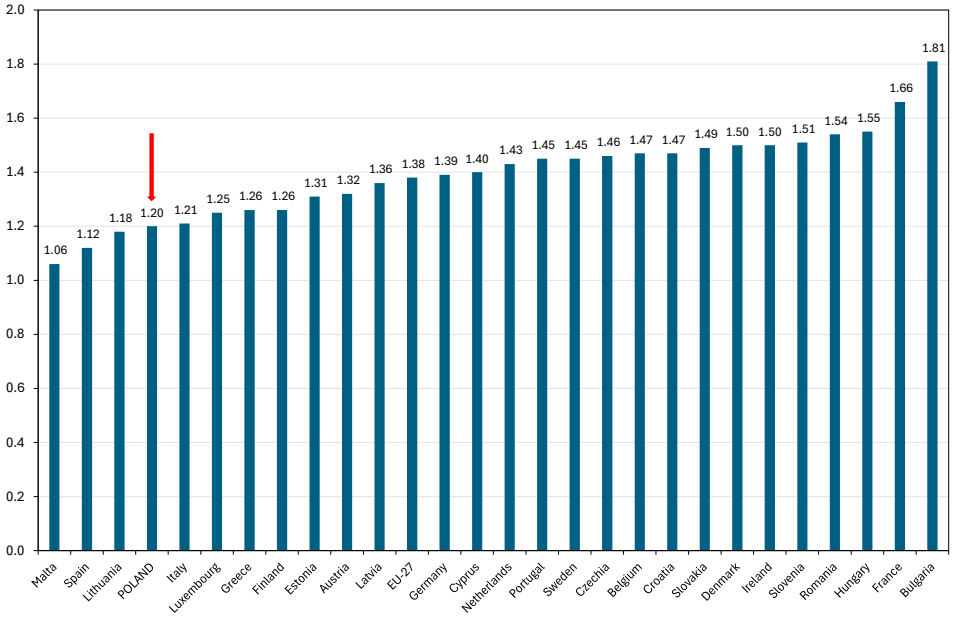


Fig. 2.5. Total fertility rate in the EU-27 in 2023 (Eurostat data)

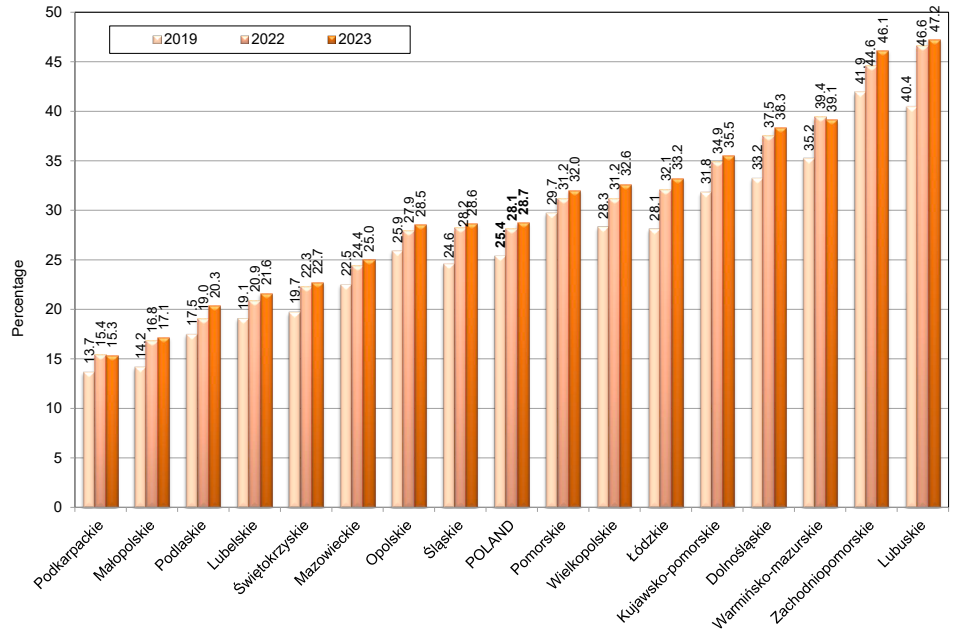


Fig. 2.6a. Percentage of extramarital births among live births by voivodship in 2019, 2022 and 2023 (Statistics Poland data)

According to Eurostat data, the percentage of extramarital births in Poland is low compared to the twenty-seven EU countries; only Greece, Hungary, Croatia and Lithuania have lower rates than Poland (Fig. 2.6b). In six countries, such births account for more than half of all births. In total, across all EU countries, an average of 42.2% of children are born outside formal marriages.

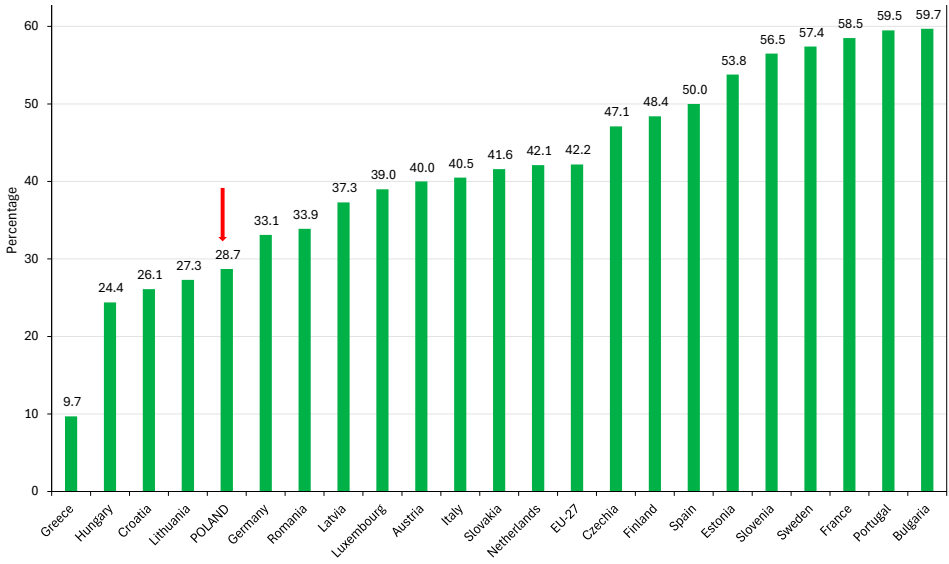


Fig. 2.6b. Percentage of extramarital births among live births in the EU-27 in 2023. (Eurostat data)

In 2023, 5.7% of live births had low birth weights, i.e. newborns whose birth weight was below 2,500 g (Table 2.4). The frequency of such births has remained stable since 2017. Low-birth-weight babies are born less frequently in Poland than in the European Union average; according to WHO estimates, the proportion for the EU-27 was 6.5% in 2022 (WHO HFA DB[3]).

The difference between voivodships in the proportion of newborns with low birth weight has slightly increased in recent years. In 2018–2023, the least favourable situation (the highest percentage of such newborns) was observed in Śląskie voivodship, where this proportion has been steadily increasing recently, in Lubuskie and Lubelskie voivodships, with the most favourable situation in Podlaskie and Pomorskie voivodships (Fig 2.7).

[3] https://gateway.euro.who.int/en/indicators/hfa_600-7100-of-live-births-weighing-2500-g-or-more/#id=19695

Table 2.4. Live births by birth weight in selected years 2013–2023

Year	Live births				
	Total	Under 2,500 g		2500 g or more	
		Number	Per cent1	Number	Per cent[1]
2013	369,576	22,019	6.0	347,553	94.0
2014	375,160	22,211	5.9	352,940	94.1
2015	369,308	21,351	5.8	346,611	94.2
2016	382,257	22,314	5.8	359,929	94.2
2017	401,982	23,062	5.7	378,877	94.3
2018	388,178	21,451	5.5	366,686	94.5
2019	374,954	21,174	5.6	353,724	94.3
2020	356,540	19,991	5.6	336,454	94.4
2021	331,511	18,761	5.7	312,631	94.3
2022	305,132	17,342	5.7	287,696	94.3
2023	272,451	15,330	5.6	257,091	94.4

[1] Only live births with a recorded birth weight were included
Source: based on Statistics Poland data

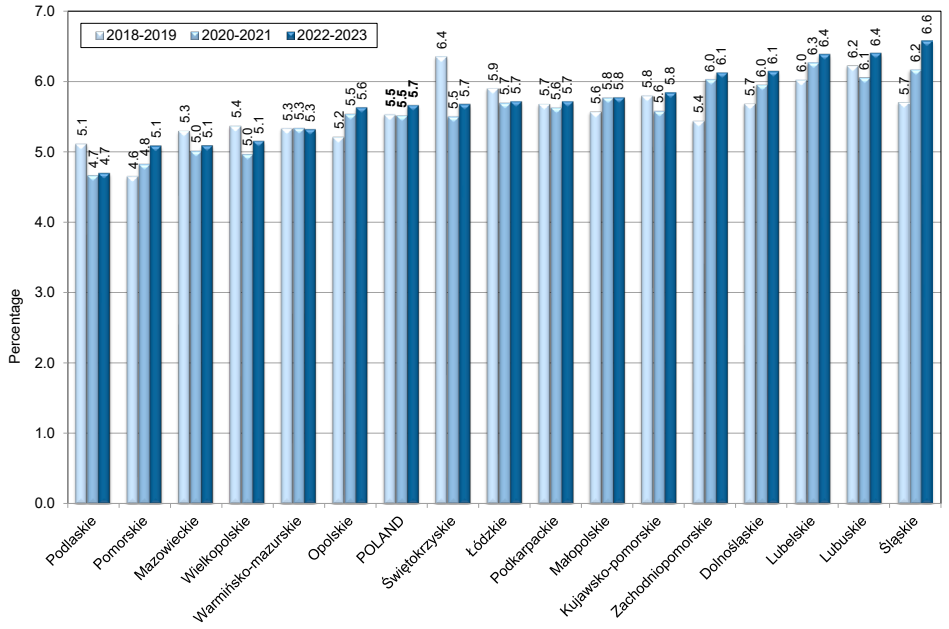


Fig. 2.7. Percentage of low birth weight (below 2500 g) live births by voivodship, 2018–2019, 2020–2021 and 2022–2023 (based on Statistics Poland data)

Socio-economic status has a recognised, highly significant impact on health status. The Polish population's socio-economic structure is less favourable than that of the other EU-27 countries, albeit with some exceptions. The level of education is one of the most important determinants of social status. The presented education groups were created by Eurostat based on the categorisation of education levels in the ISCED-11[4]: levels 0–2 – less than primary, primary or lower secondary level of education; levels 3–4 – upper secondary or post-secondary non-tertiary education; and levels 5–8 – tertiary education. Although the proportion of persons with tertiary education has increased significantly in Poland in recent years, it is still slightly lower among men than the EU average but higher than in the Czechia, Slovakia and Hungary (Fig. 2.8a). The lower proportion of men with the lowest level of education in Poland compared to the EU as a whole should be considered a positive factor. The percentage of women with tertiary education in Poland is higher than the EU-27 average but lower than, for example, in Lithuania, Estonia or Latvia (Fig. 2.8b). As for men, the percentage of women with the lowest level of education in Poland is significantly lower than the EU average.

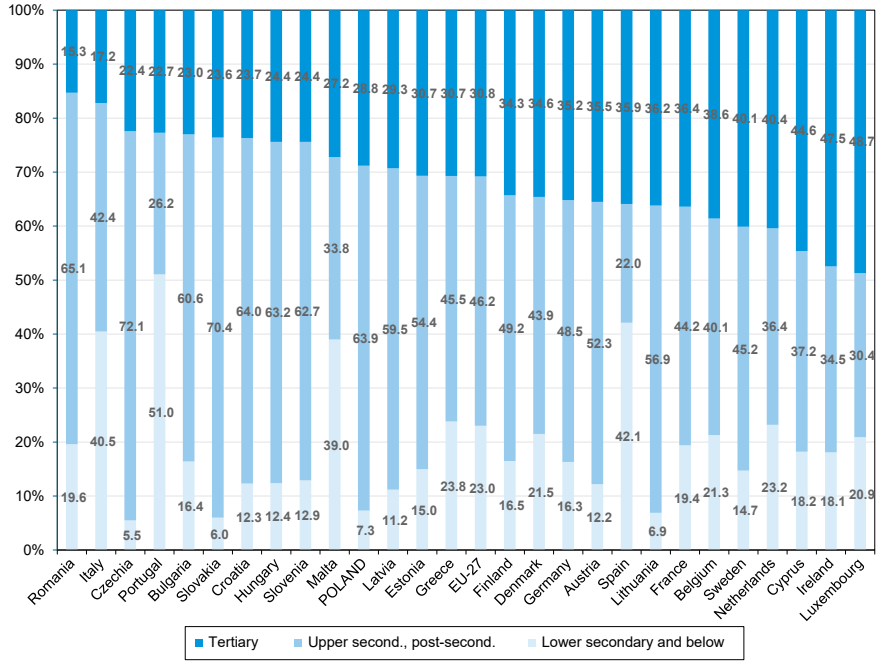


Fig. 2.8a. Structure of education among men aged 25–74 by level of education attained in Poland and other EU-27 countries in 2023 (Eurostat's EU-LFS data).

[4] https://uis.unesco.org/en/topic/international-standard-classification-education-isced

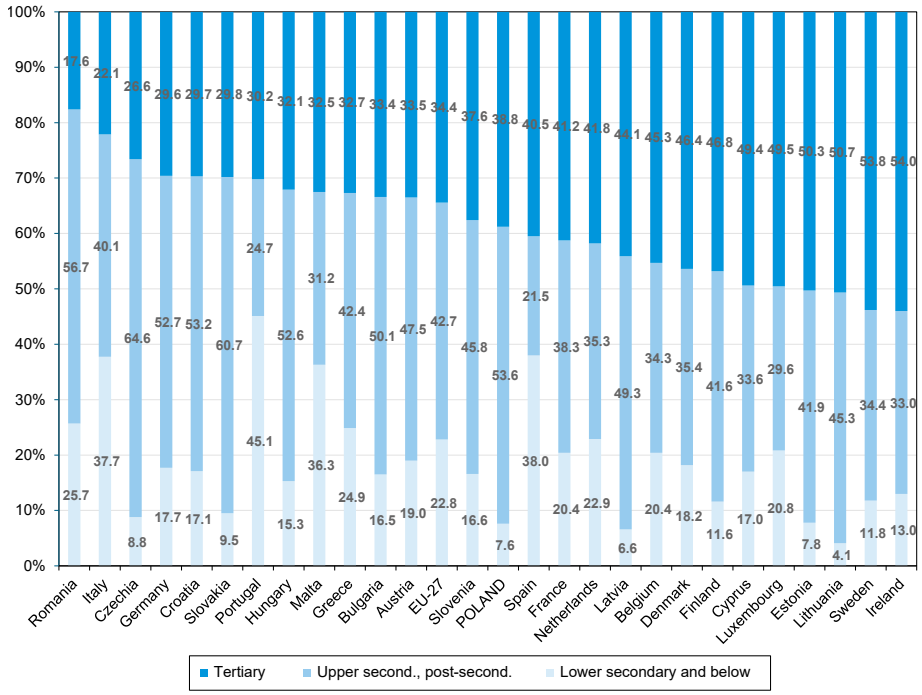


Fig. 2.8b. Structure of education among women aged 25–74 by level of education attained in Poland and other EU countries in 2023 (Eurostat's EU-LFS data).

Although Poland's economic situation is improving, and gross domestic product (GDP) growth is faster than the EU average, thanks to which the gap between Poland and other EU countries is slowly narrowing, GDP per capita (in PPS) remains one of the lowest in the EU; in 2023, it was 21.8% lower than the EU-27 average,[5] ranking Poland in 21st place among EU countries. The situation is worse in Bulgaria, Greece, Latvia, Slovakia, Croatia and Hungary. At the same time, the average (median) equivalised net income in Poland in 2023 was 17.1% lower than the EU-27 average, placing Poland in 19th place in the EU. Ten years earlier, in 2013, net income in Poland was, on average, 39.2% lower than in the EU, and Poland ranked 20th among EU countries.[6]

[5] https://ec.europa.eu/eurostat/databrowser/view/nama_10_pc__custom_15967999/default/table?lang=en

[6] https://ec.europa.eu/eurostat/databrowser/view/ilc_di03__custom_16077825/default/table

The decrease in income inequality and income growth in Poland compared to the EU-27 average should be considered a positive development. This is expressed by the income quintile share ratio – the disposable income of the 20% of people with the highest income in Poland in 2023 was 4.06 times higher than that of the 20% of people with the lowest income, while for the EU-27, this ratio was 4.72 (Eurostat data[7]). This ratio is lower than in Poland in seven countries, including Belgium, Finland, the Netherlands and the Czech Republic.

The decline in economic poverty and social exclusion, estimated based on household income and expenditure, which is expected to continue in Poland until 2022, should be considered highly beneficial from a public health perspective. Unfortunately, this trend slowed down in 2023. According to the definition adopted by EU countries, people living in households whose disposable income is below the poverty threshold set at 60% of the median income in a given country, taking into account the comparability scale and social transfers, are considered at risk of poverty. Social exclusion is a risk for people in households with severe material deprivation (unable to meet at least 4 out of 9 recognised needs for financial reasons) or people in households with very low work intensity.[8] The latest Eurostat data show that in Poland, this rate is currently 5 ppt lower than the EU-27 average (Fig. 2.9a), and only in four EU countries is the risk of poverty or social exclusion less widespread than in Poland: Czechia, Slovenia, Finland and the Netherlands. A positive difference compared to other EU countries can be observed among children and young people under 18 (the situation is worse than in Poland in 20 countries), with no improvement among the oldest population aged 65 and over. However, the proportion of people at risk of poverty or social exclusion in this group is also below the EU average.

The risk of poverty and social exclusion of children is very strongly related to the educational level of parents, both in Poland and in the EU in general. After 2015 (or, more precisely, after 2016), there has been a significant improvement in Poland in this respect, but the disparity is still significant (Fig. 2.9b). However, it is worth noting that while in 2015 children of parents with education other than tertiary were more at risk of poverty or social exclusion than

[7] https://ec.europa.eu/eurostat/databrowser/view/ilc_di11__custom_15986004/default/table?lang=en

[8] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At_risk_of_poverty_or_social_exclusion_(AROPE)

the EU average, this was no longer the case in subsequent years, and the risk has been lower than in Sweden, for example, in recent years.

Data compiled by Eurostat show that the risk of poverty or social exclusion in Poland is clearly regionally differentiated.[9] Not surprisingly, it is least prevalent in the Warsaw region and, in the last two years (2022–2023), in Śląskie voivodship (Fig. 2.9c). The inhabitants of Podlaskie, Warmińsko-mazurskie, Kujawsko-pomorskie and Lubelskie voivodships are most at risk of poverty and social exclusion. An unfavourable development is the significant deterioration of this situation in 2022–2023 in Podlaskie voivodship and in 2023 in Kujawsko-pomorskie and Świętokrzyskie voivodships.

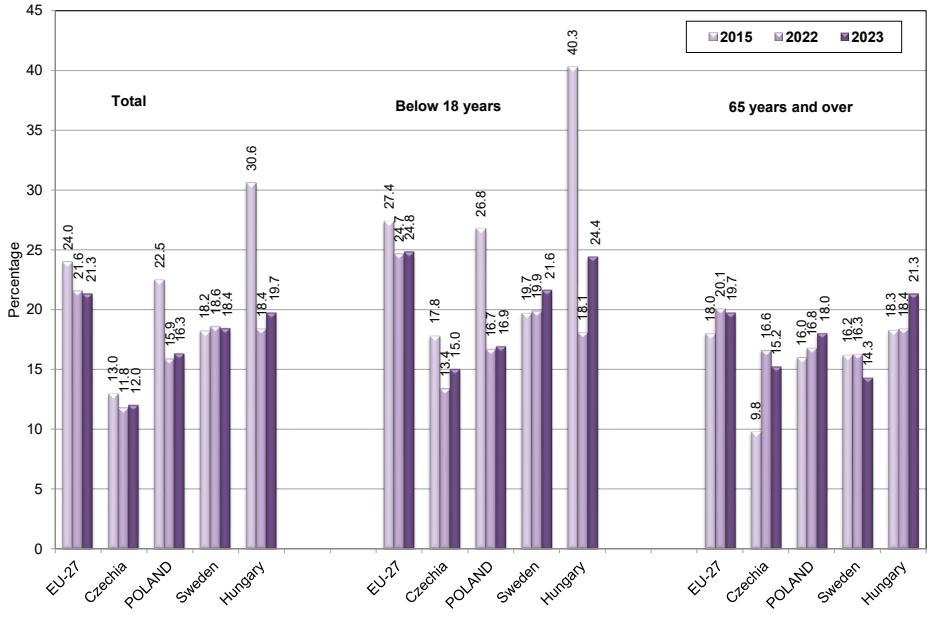


Fig. 2.9a. Percentage of the population at risk of poverty or social exclusion, total and in the age group under 18 and 65 and over in Poland and in the EU-27 as a whole and in selected countries in 2015, 2022 and 2023 (Eurostat's EU-SILC data)

Figures 2.10a and 2.10b show the extent of extreme poverty in Poland in two cross-sections important for analysing differences in the health status of the population, i.e. by place of residence (rural areas, towns and cities of various sizes) and by educational attainment of the head of the household.

[9] https://ec.europa.eu/eurostat/databrowser/view/ilc_peps11n__custom_16041775/default/table?lang=en

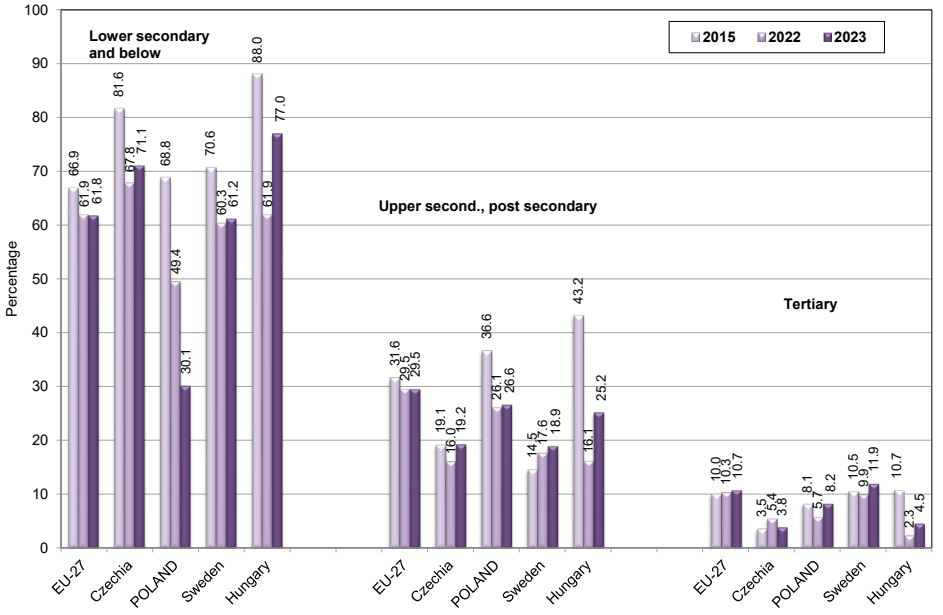


Fig. 2.9b. Percentage of children and young people aged under 18 at risk of poverty or social exclusion by educational attainment of the head of the household in Poland and in the EU-27 in total and selected countries in 2015, 2022 and 2023 (Eurostat's EU-SILC data)

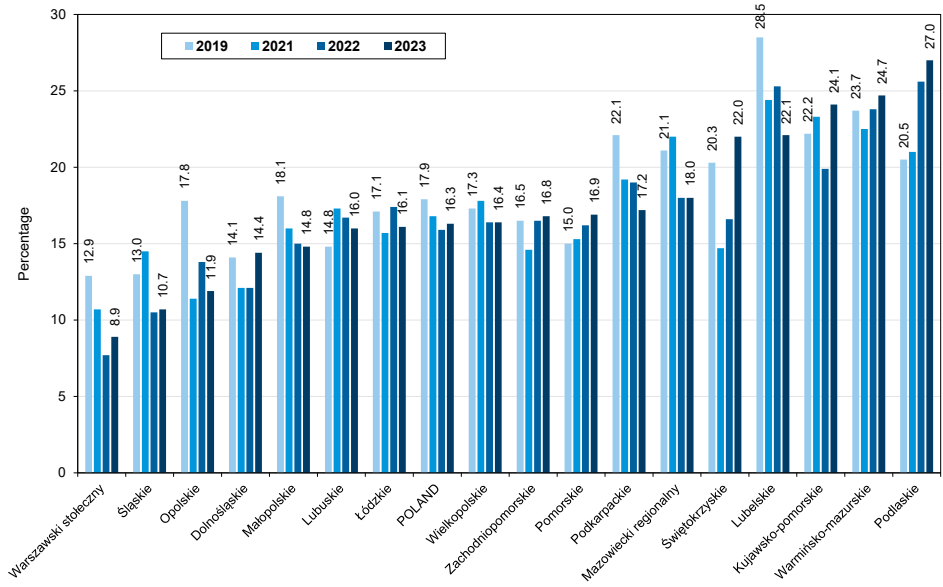


Fig. 2.9c. Percentage of population at risk of poverty or social exclusion by voivodship in 2019, 2021, 2022 and 2023 (Eurostat's EU-SILC data)

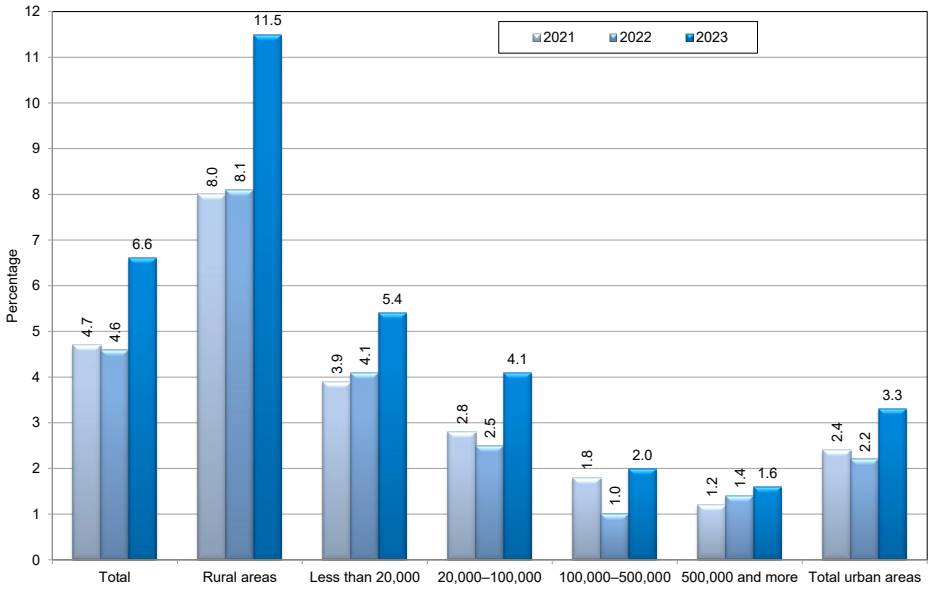


Fig. 2.10a. Extreme poverty rates by class of place of residence in 2021–2023 (Statistics Poland data[10])

The extreme poverty line is established based on the subsistence minimum estimated by the Institute of Labour and Social Studies for a one-person household. The subsistence minimum covers only those needs that cannot be delayed, and consumption below this level makes life difficult and threatens the psychophysical development of the individual.[11]

In 2023, there was a significant increase in the extreme poverty rate, which, as Statistics Poland points out, "took place in a situation of improvement in the average income situation of households (in nominal and real terms).[12] However, a decline in the level of spending in real terms was also observed during this period.[13] In addition, it should be mentioned, which may seem surprising, that the percentage of bad or rather bad subjective assessments of the material situation

[10]Due to the updated generalisation based on the results of the National Population and Housing Census 2021, the results for 2021–2022 differ from those previously published.
[11]Statistics Poland Annex to the report Economic poverty rates in Poland in 2023.
[12] See: News release: https://stat.gov.pl/obszary-tematyczne/warunki-zycia/dochody-wydatki-i-warunki-zycia-ludnosci/sytuacja-gospodarstw-domowych-w-2023-r-w-swietle-badania-budzetow-gospodarstw-domowych,3,23.html
[13] See: News release as above.

among all households has also decreased (year-on-year) in 2023 (from around 6% to around 5% of households)[14]".[15]

There is a clear predominance of extreme poverty among rural populations compared to urban populations, even those in small towns (Fig. 10a). Urban populations have significantly better chances of securing their basic needs than rural populations. Large cities with a population of over 100,000 are the environment most conducive to ensuring living conditions that do not jeopardise psychophysical development.

There is a clear correlation between the educational attainment of the head of household and the risk of extreme poverty in that household (Fig. 2.10b). The proportion of people in households at risk of extreme poverty decreases sharply with increasing level of education. This variation is permanent. It is worth noting that in 2023, the risk of extreme poverty increased compared to 2021 and 2022 in all household groups, regardless of the household head's level of education.

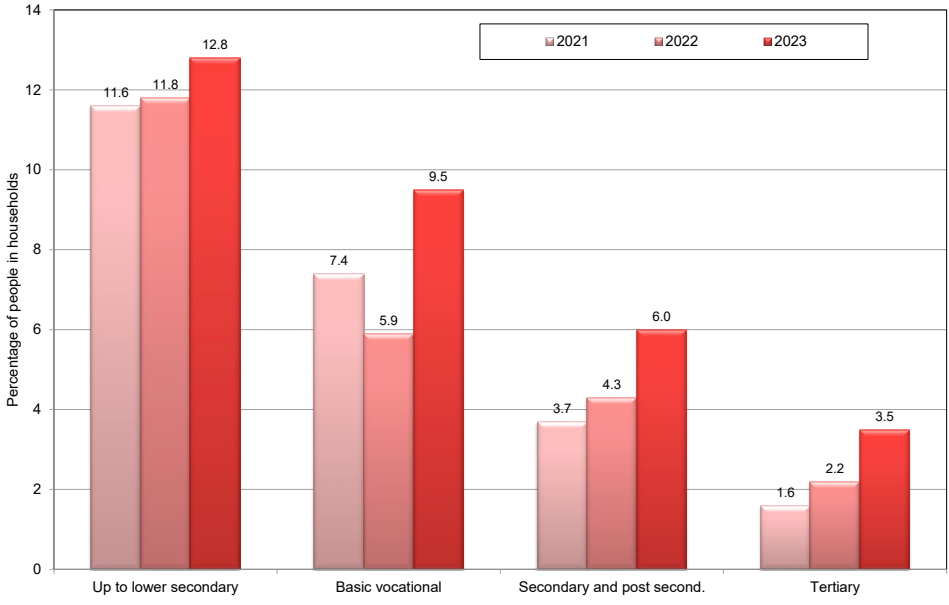


Fig. 2.10b. Extreme poverty rates by education level of the head of household in 2021–2023 (Statistics Poland data[16])

[14] See: https://stat.gov.pl/obszary-tematyczne/warunki-zycia/dochody-wydatki-i-warunki-zycia-ludnosci/sytuacja-gospodarstw-domowych-w-2023-r-w-swietle-badania-budzetow-gospodarstw-domowych,3,23.html

[15] Statistics Poland, Economic poverty rates in Poland in 2023. 28 June 2024.

[16] Due to the updated generalisation based on the results of the National Population and Housing Census 2021, the results for 2021–2022 differ from those previously published.

Poland's unemployment rate has clearly improved compared to previous years. It is not only lower than the EU-27 average but also one of the lowest in the EU. According to the *Labour Force Survey* (LFS) conducted in these countries, in 2023, the unemployment rate in Poland for the population aged 15–74 was 2.8% (lower only in the Czech Republic, at 2.6%), while the EU-27 average was 6.1%. (Fig. 2.11). Furthermore, Poland enjoys a very low long-term unemployment rate, i.e. unemployment lasting longer than 12 months, which in 2023 was only 0.8% of the working population, while the EU28 average was 2.1%. Only in Denmark (0.5%) and the Netherlands (0.5%) was it lower than in Poland.

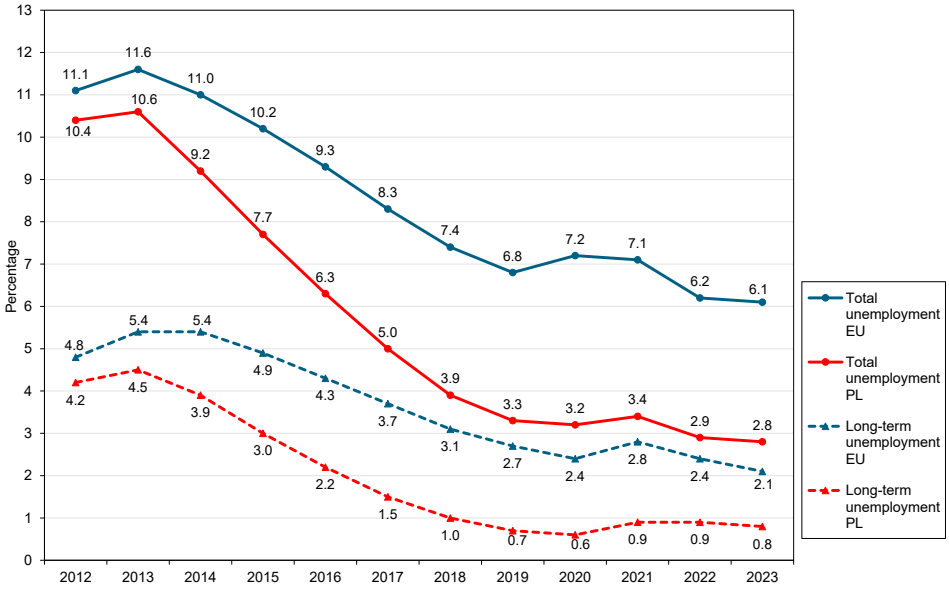


Fig. 2.11. Total unemployment rate and long-term unemployment rate among persons aged 15–74 in Poland and the EU-27 average in 2012-2023 (Eurostat's LFS)

The total risk of unemployment and long-term unemployment varies significantly across voivodships (Fig. 2.12). In 2023, the most favourable situation in terms of total unemployment was in Wielkopolskie voivodship, while long-term unemployment was lowest in the Mazowieckie voivodship. The highest total unemployment rate is observed in Podkarpackie voivodship, while long-term unemployment is highest in Warmińsko-mazurskie voivodship. This challenging situation in Warmińsko-mazurskie and Podkarpackie has persisted for many years.

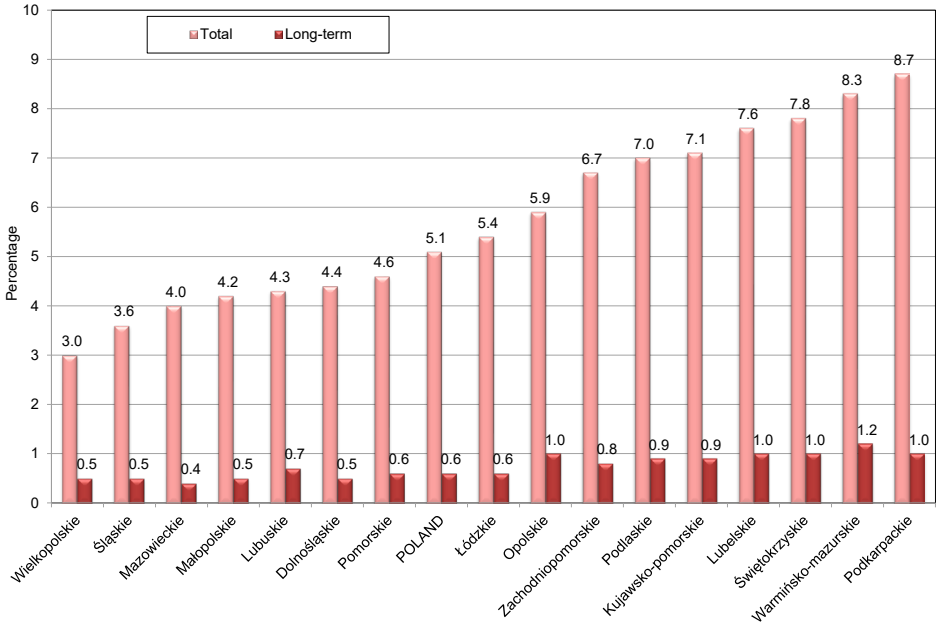


Fig. 2.12. Total and long-term unemployment rate by voivodship in 2023 (Statistics Poland data)

An important aspect of employment from a social and public health perspective is the opportunity to work part-time, which makes it easier to balance family responsibilities, including those related to health, such as caring for children or the elderly. For years, the situation in Poland has been clearly unfavourable compared to the average in OECD and EU countries, both female and male employees, but especially women, are much less likely to be employed part-time. In 2023, in Poland, the percentage of part-time male employees in relation to the total number of employed persons aged 20–64 was 3.2%, while in the EU-27, it was 7.7%. For women, the corresponding figures were 8.3% and 27.9%.[17] However, it is worth noting that while 18.2% of EU women of this age who were employed part-time did not choose this option on their own, the figure was lower for Polish women, at 11.5%.[18]

The housing conditions of Poles are in some respects worse than the average in the European Union. This is particularly evident with regard to overcrowding.

[17] https://ec.europa.eu/eurostat/databrowser/view/lfsa_eppga__custom_16033839/default/table?lang=en

[18] https://ec.europa.eu/eurostat/databrowser/view/lfsa_eppgai__custom_16034272/default/table?lang=en

According to the Eurostat definition, a person is considered as living in an overcrowded household if the household does not meet any of the following conditions: (a) one room for the household, (b) one room per couple in the household, (c) one room for each single person aged 18 or more, (d) one room per pair of single people of the same gender between 12 and 17 years of age, (e) one room for each single person between 12 and 17 years of age and not included in the previous category, (f) one room per pair of children under 12 years of age. As Figure 2.13 shows, according to this definition, 40.3% of the Polish population lives in overcrowded households, while the EU average is only 13.6%. Currently, the situation is worse in only three countries: Bulgaria, Romania and Latvia. The data do not include single-person households. Overcrowding depends heavily on income, so people at risk of poverty, i.e. those living in households with disposable income below 60% of the median income in a given country, taking into account comparability, are much more likely than the general population to live in overcrowded housing (40.3% in Poland). It should be noted that this unfavourable difference is much smaller in Poland than the average for the EU-27 countries (Fig. 2.12).

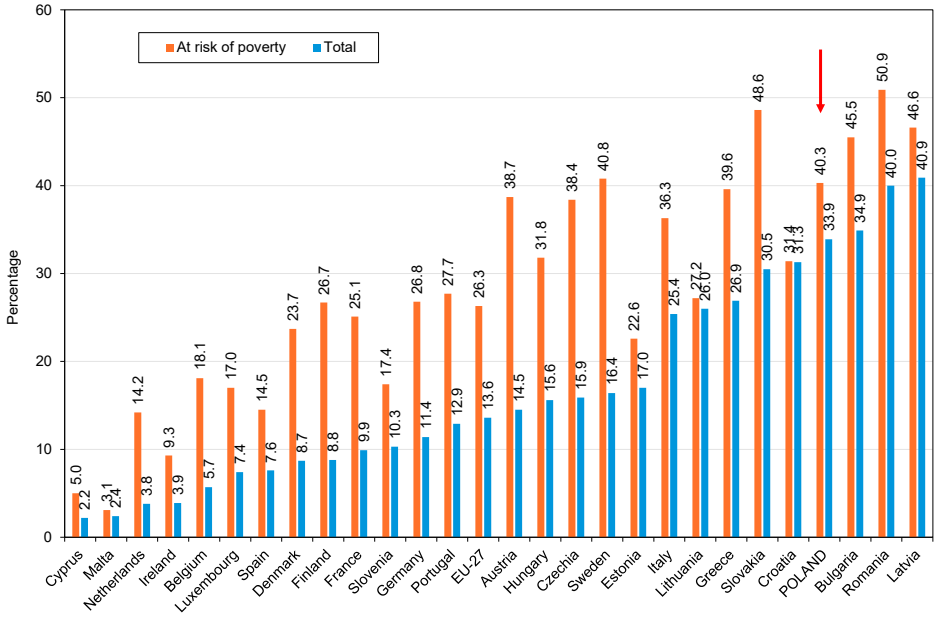


Fig. 2.13. Percentage of the total population and of the population at risk of poverty living in overcrowded households in Poland and other EU countries in 2023 (Eurostat's EU-SILC data)

However, the situation in Poland is better than the EU-27 average when assessing housing conditions in terms of the quality of dwellings and the presence of any of the following indicators of poor quality: leaking roof, damp walls, floors or foundation, or rot in window frames or floor (Fig. 2.13). People at risk of poverty are more likely to live in poor conditions than the general population, but even within this group, the situation in Poland is currently much better than the EU-27 average. Furthermore, the difference between people at risk of poverty and the general population is smaller in Poland than the EU average.

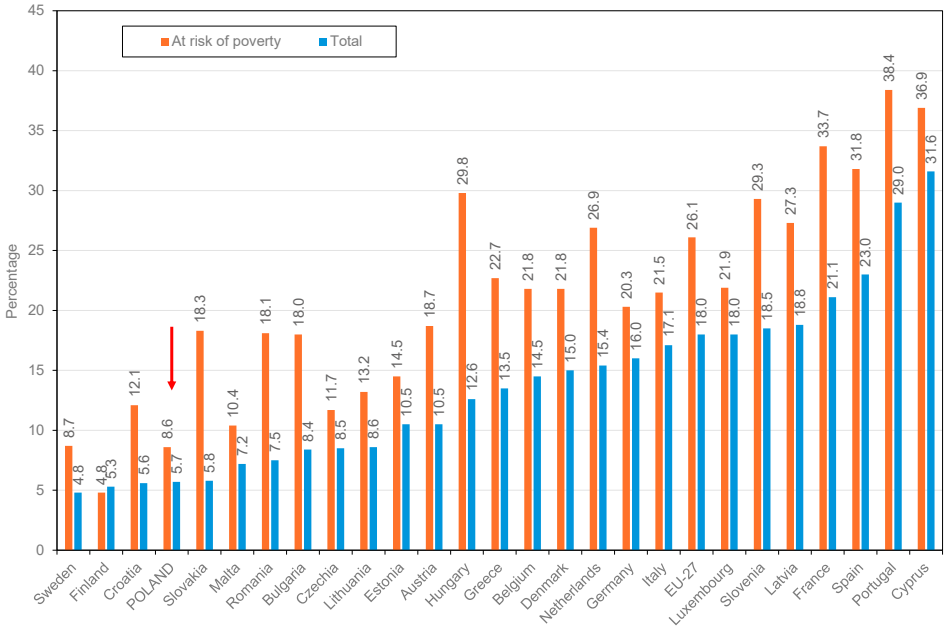


Fig. 2.14. Percentage of the total population and of the population at risk of poverty living in poor-quality dwellings in Poland and other EU countries in 2023 (Eurostat's EU-SILC data)

One summary measure of a country's overall social situation is the synthetic Human Development Index (HDI), which the United Nations proposed for international comparisons. It is based on the average of indicators across three fundamental areas of life. These are health (assessed by the average life expectancy), education (average number of years of schooling for people aged 25 and over, and the expected number of years of schooling for children starting school), and wealth, i.e. income (specifically its logarithm) per capita, taking into account purchasing power parity (PPP) (Gross National Income). The index structure

defines target values in each of the areas listed. According to the latest UN data for 2023, Poland, with an index of 0.906 (the index for all OECD countries is 0.916), is among the countries with the highest HDI and ranks 18th in the European Union and 35th globally[19]. In the years 2010-2022, the average annual increase in the HDI value for Poland was 0.35% and was higher than for all OECD countries (0.26%).[20]

[19] HDR25_Statistical_Annex_HDI_Table.xlsx

[20] https://hdr.undp.org/system/files/documents/global-report-document/hdr2023-24reporten.pdf

3. LIFE EXPECTANCY AND MORTALITY OF THE POLISH POPULATION

Bogdan Wojtyniak, Jakub Stokwiszewski, Daniel Rabczenko,
Aneta Trochonowicz, Tomasz Madej, Tomasz Zdrojewski, Anna Smaga

The pandemic caused by the SARS-CoV-2 virus has caused enormous losses in the health of the population and contributed to a large increase in mortality caused primarily by COVID-19 and, consequently, a shortening of the life expectancy of the Polish population. The state of epidemic threat was introduced in Poland on 16 May 2022. A state of epidemic had previously been in force from 20 March 2020. The World Health Organization (WHO) declared the end of the COVID-19 pandemic on 5 May 2023, and on 1 July 2023, the state of epidemic threat due to SARS-CoV-2 infections was lifted in Poland.[1] This new situation was reflected in a reduction of the overall risk to life among the Polish population and an increase in life expectancy. This chapter analyses these phenomena.

The analysis of mortality among Polish inhabitants is largely based on individual-level data from the register of deaths maintained by Statistics Poland. With certain necessary restrictions, this register is made available to the National Institute of Public Health NIH – National Research Institute to conduct health status analyses of the Polish population per its statutory mandate. Most of the results presented are the authors' own calculations based on data from this register and the WHO Mortality Database.[2] Additionally, indicators published by Statistics Poland and those available in international databases – primarily Eurostat[3] – were also used, with all such cases clearly indicated in the text.

[1] https://www.gov.pl/web/rpp/koniec-stanu-zagrozenia-epidemicznego
[2] https://www.who.int/healthinfo/statistics/mortality_rawdata/en/
[3] http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

The authors' own life expectancy calculations for Poland, its voivodships, and powiats employed the method used by Statistics Poland.[4] Unlike the classic Chiang method[5] previously employed in earlier Reports, the current approach utilises smoothed death rates instead of raw data. For smoothing death rates for age cohorts 85–99 and extrapolation beyond age 100, the Gamma–Gompertz model was used. Additionally, the tools for projecting age-specific rates using linear splines (TOPALS) were applied to calculate life expectancy at the regional level. This method allows for reliable estimation of life expectancy in small geographic areas, where year-to-year fluctuations in death rates are significant, and where zero death counts may occur for certain age groups. Decomposition of life expectancy by cause of death and age was carried out using Arriaga's method.[6] The time trends in death rates and life expectancy in Poland and EU countries were analysed using joinpoint models (linear model) via the Joinpoint Regression Program (*Version 5.3.0.0, November 2024; National Cancer Institute, USA*). In the analysis of death rate trends, joinpoint regression (logarithmic model and estimation of the relative rate of change in mortality) was applied, which allows for better comparison of the dynamics of changes in Poland and other countries, as well as between sex groups.

Changes over time and variation in life expectancy of the Polish population

According to the latest data from Statistics Poland, in 2023 the average life expectancy for men was 74.65 years, while for women it was 7.34 years longer, amounting to 81.99 years. Thus, life expectancy in 2023 had already surpassed the pre-COVID-19 pandemic level, i.e. that of 2019, with this positive difference being more pronounced among men than women. The reasons for this situation will be discussed later in this chapter. The analysis of long-term life expectancy trends reveals a concerning pattern that emerged in the years before the pandemic (Fig. 3.1).

Between 2014 and 2019, there was a marked slowdown in the increase of male life expectancy, while in the case of women, a slight downward trend was observed between 2016 and 2019.

[4] Potyra M, Góral-Radziszewska K, Waśkiewicz K, Kuczyńska K. Life expentancy tables of Poland 2020 Statistics Poland, Warsaw, 2021.

[5] Chiang C. L. "The Life Table and its Applications", Robert E. Krieger Publishing Company, Inc., Malabar, Florida, 1984

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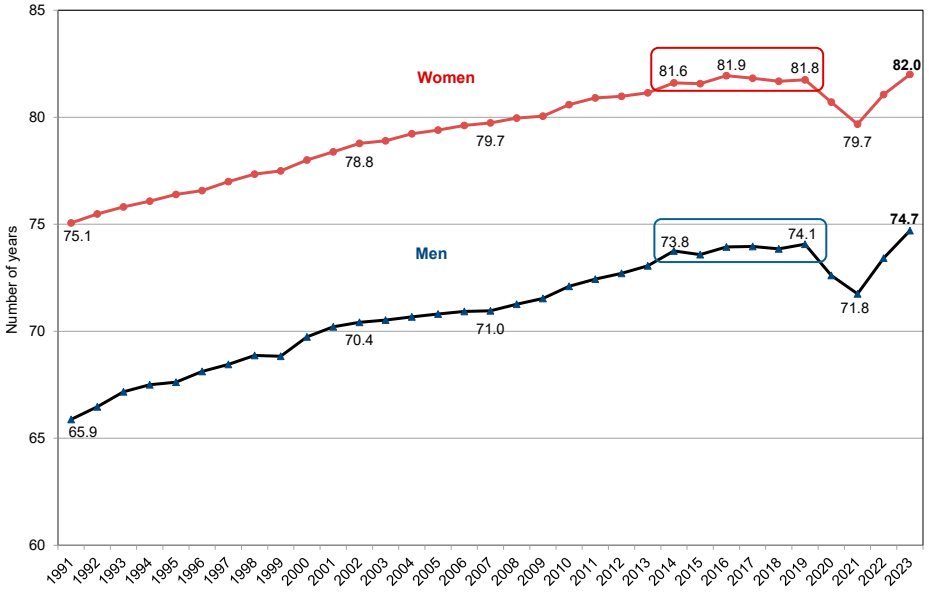


Fig. 3.1. Average life expectancy of men and women at birth in 1991–2023 (Statistics Poland data)

As noted in the previous Report, the pandemic's impact on reducing life expectancy was most significant among older individuals, though it also affected the younger population. To assess changes in life expectancy during and after the pandemic in the younger age group, we calculated the temporary (partial) life expectancy of men and women aged 0–65 (e_{0-65}). The figure represents the average number of years a newborn can expect to live up to age 65, assuming the death rates observed in the year under study remain constant. Theoretically, if there were no premature deaths, i.e. deaths before the age of 65, the partial life expectancy would be 65 years. For persons aged 65, the life expectancy for that age estimated by Statistics Poland (*e65*) was used. Figures 3.2a and 3.2b show the figures for both men and women for 2003–2023. In 2021, life expectancy in the 0–65 age range was 0.4 years shorter for men and 0.2 years shorter for women compared to 2019. Meanwhile, life expectancy at age 65 declined by 1.9 years for men and 1.7 years for women over the same two-year period. By 2023, this reduction in life expectancy had at least levelled out in both the younger and older subpopulations. It should be noted that the slowdown in life expectancy growth, before the pandemic, which we continue to highlight, is occurring in both younger and older age groups.

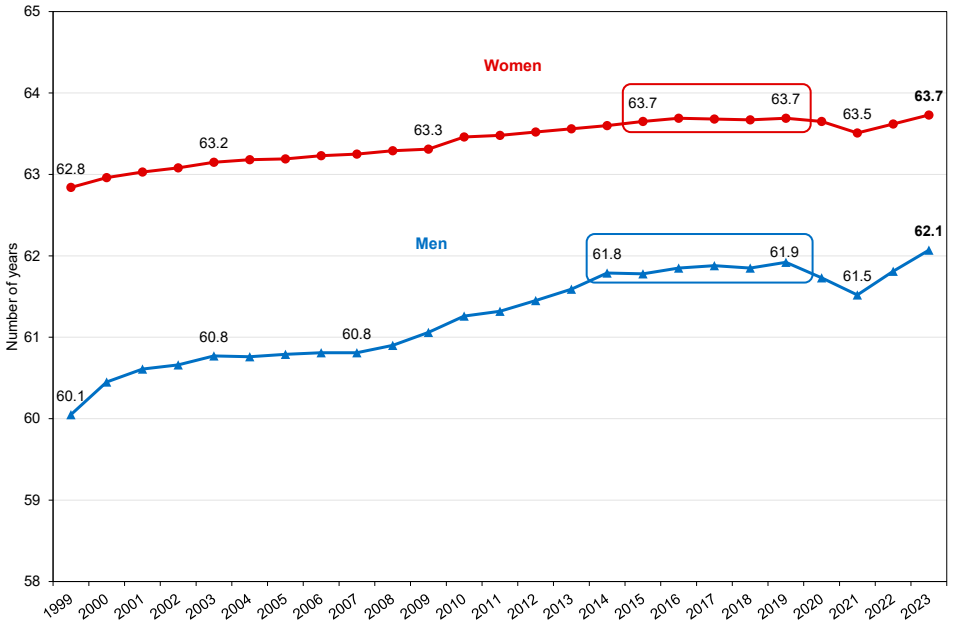


Fig. 3.2a. Average life expectancy of men and women aged 0–65 in 1999–2023 (authors' calculations based on Statistics Poland data)

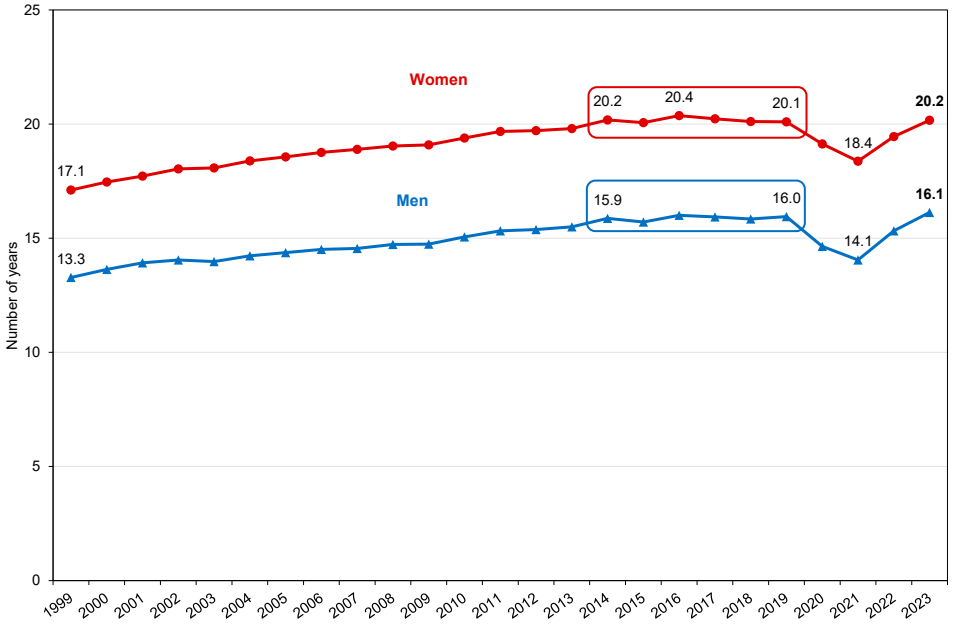


Fig. 3.2b. Average life expectancy of men and women aged 65 in 1999–2023 (Statistics Poland data)

Figures 3.3a and 3.3 b present the impact of increased mortality in individual five-year age groups on the reduction in life expectancy for men and women in Poland in 2021 compared to 2019, as well as the impact of decreased mortality in 2023 compared to 2021 (expressed in months) on the increase in life expectancy. For both men and women, the most significant factor contributing to increased life expectancy after its "pandemic reduction" was the decrease in mortality among persons aged 60–64, followed by men aged 55–59 and 65–69, and women aged 50–54, 55–59 and 65–69. The difference between the increase in life expectancy and the earlier decline was the most significant in these age groups.

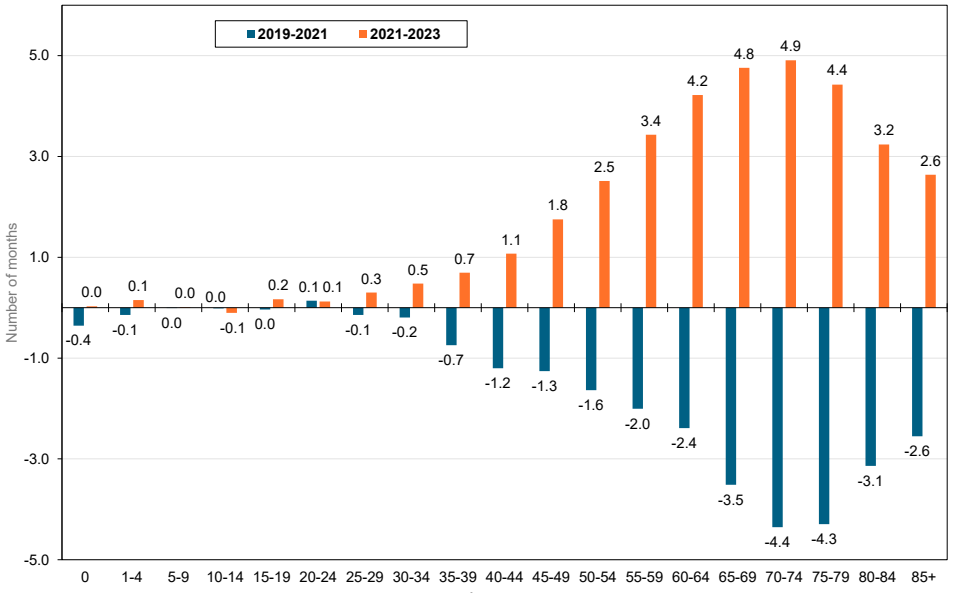


Fig. 3.3a. Number of months of reduction in life expectancy of men in Poland in 2021 compared to 2019 and the increase in 2023 compared to 2021, resulting from increased mortality followed by a decline in individual age groups (authors' calculations using Statistics Poland data)

For many years, Poland has been experiencing an unfavourable trend of high excess mortality among men compared to women, resulting in a significantly shorter life expectancy regardless of age. The situation has not yet returned to the 2019 level in 2023, and this unfavourable trend for men is slightly greater than before the pandemic (Fig. 3.4).

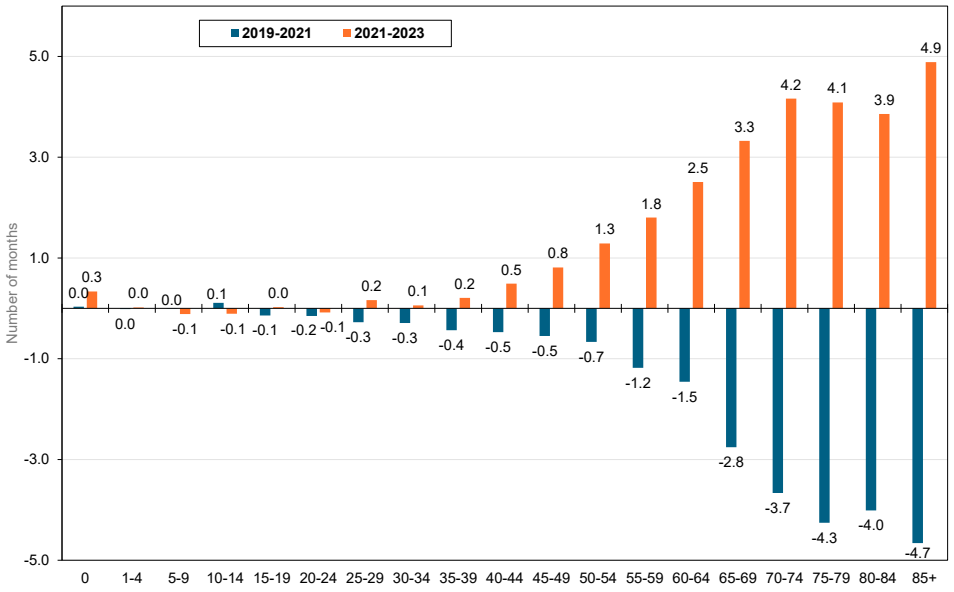


Fig. 3.3b. Number of months of reduction in life expectancy of women in Poland in 2021 compared to 2019 and the increase in 2023 compared to 2021, resulting from increased mortality followed by a decline in individual age groups (authors' calculations based on Statistics Poland data)

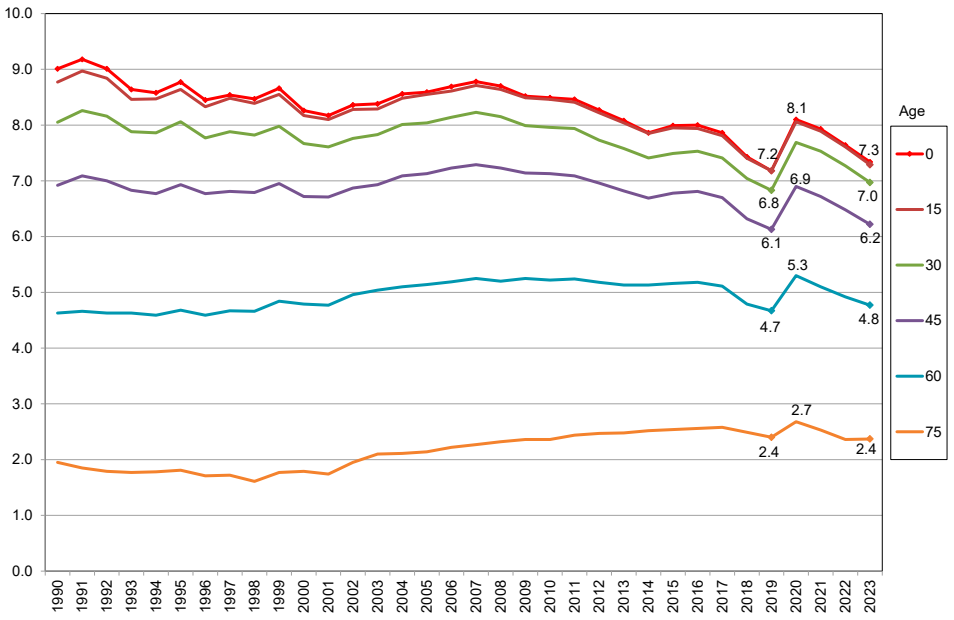


Fig. 3.4. Differences in average life expectancy of women and men by age in 1991–2021 (based on Statistics Poland data)

It is estimated that in 2023, slightly more than half (51.9%) of the difference in life expectancy between men and women was due to higher mortality among men under the age of 65.

The impact of the pandemic on the reduction in life expectancy for men was greater among urban populations than rural populations, while for women it was greater among rural populations. In populations most affected by the pandemic, life expectancy improved more after the pandemic ended, but the largest increase in life expectancy in 2023 compared to 2019 was recorded for men living in rural areas (Fig. 3.5).

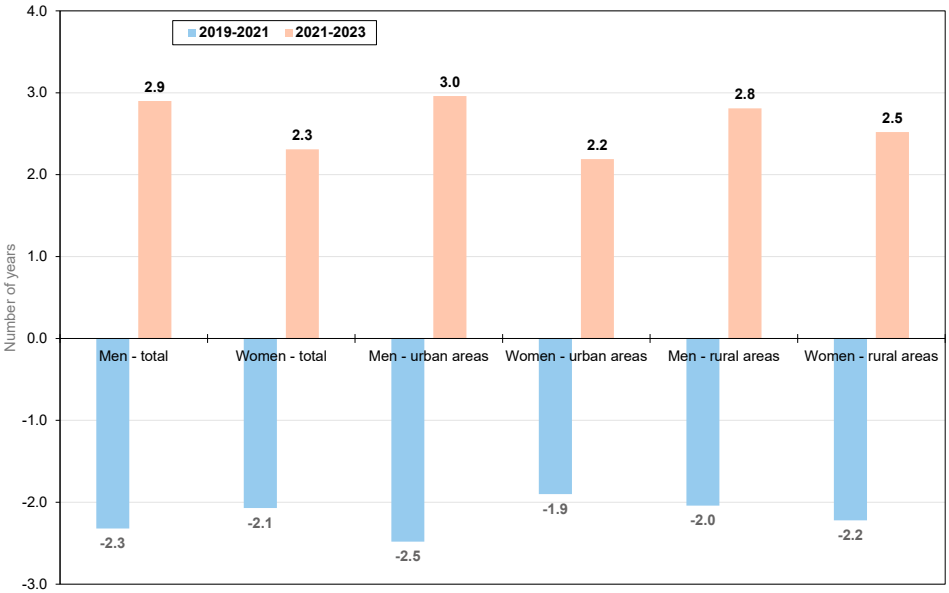


Fig. 3.5. Change in average life expectancy at birth in 2019–2021 and 2021–2023 by sex and place of residence (urban/rural area) (based on Statistics Poland data)

The life expectancy of Polish population varies depending on place of residence (rural areas, towns or cities), and although the differences are not very big, they are quite persistent. **The inhabitants of the smallest towns, with a population of less than 10,000, have the least favourable health situation and the shortest average life expectancy, while the inhabitants of the largest cities, with a population of over 200,000, may expect to live the longest** (Tab. 3.1). The difference in life expectancy related to place of residence is greater for men than for women. It is worth noting that for women, life expectancy in cities with a population of 100,000–200,000 is only slightly higher than in the smallest towns.

The place of residence, i.e. a small town, large city or rural area, did not significantly affect changes in life expectancy related to the pandemic and recovery. While for men, the reduction in life expectancy in 2021 compared to 2019 was lower in towns with fewer than 20,000 inhabitants than in large cities, this association was not as pronounced for women, with the smallest towns and the largest cities seeing the smallest reduction in life expectancy. There was also no clear relationship between the place of residence and increased life expectancy after the pandemic. In all locations, the life expectancy in 2023 was already higher than in 2019.

Table 3.1. Average life expectancy of men and women at birth (Lex) living in rural and urban areas by population in 2017–2023

Place of residence	2017	2018	2019	2020	2021	2022	2023
Men							
Rural area	73.2	73.1	73.3	72.1	71.4	73.0	74.2
Total urban areas	74.2	74.1	74.6	72.7	71.8	73.7	75.0
Towns up to 10,000 inhabitants	72.9	73.1	73.4	71.5	71.0	72.7	74.0
Towns with 10,000 to 20,000 inhabitants	73.6	73.5	73.9	72.1	71.4	73.0	74.3
Towns/cities with 20,000 to 50,000 inhabitants	74.0	73.9	74.3	72.3	71.5	73.5	74.9
Cities with 50,000 to 100,000 inhabitants	73.9	73.7	74.5	72.7	71.4	73.3	74.7
Cities with 100,000 to 200,000 inhabitants	74.3	74.1	74.2	72.5	71.4	73.7	74.9
Cities with 200,000 inhabitants or more	75.1	74.9	75.5	73.8	72.7	74.6	75.8
Women							
Rural area	81.6	81.6	81.7	80.6	79.6	81.1	82.0
Total urban areas	81.5	81.4	81.7	80.6	79.6	81.0	82.1
Towns up to 10,000 inhabitants	81.2	81.2	81.2	80.1	79.2	80.6	81.7
Towns with 10,000 to 20,000 inhabitants	81.4	81.3	81.6	80.4	79.3	80.8	81.8
Towns/cities with 20,000 to 50,000 inhabitants	81.6	81.5	81.6	80.7	79.3	81.1	82.2
Cities with 50,000 to 100,000 inhabitants	81.4	81.3	81.4	80.2	79.3	80.8	81.7
Cities with 100,000 to 200,000 inhabitants	81.2	81.3	81.3	80.2	79.0	80.7	81.5
Cities with 200,000 inhabitants or more	81.9	81.9	82.3	81.1	80.3	81.6	82.4

Source: Authors' calculations based on Statistics Poland data

In all voivodships, life expectancy for men and women in 2023 was already higher than in 2019 (Fig. 3.6a and 3.6b). The differences in life expectancy between voivodships for both men and women before the pandemic in 2019 and after the pandemic in 2023 are very similar. For men, in both years, the shortest life expectancy was recorded in Łódzkie voivodship, while the longest was in Małopolskie and Podkarpackie voivodships, with a similar difference between these two outlying voivodships in both years (2.9–3.0 years). Similarly, both in 2019 and 2023, women in Podkarpackie and Podlaskie voivodships enjoyed the longest life expectancy, while those in Śląskie, Łódzkie and Kujawsko-pomorskie voivodships had the shortest. It is worth noting that the increase in life expectancy in the voivodships in 2021–2023 is quite clearly negatively correlated with its reduction in 2019–2021. Consequently, the ranking of voivodships by life expectancy before and after the pandemic has not changed significantly for men and has remained virtually the same for women.

The variation in life expectancy in powiats and its changes during the pandemic are greater than in the case of voivodships. In general, most powiats where men live the longest are still located in southern and central-western Poland. In contrast, women live the longest in powiats in the south-eastern and eastern parts of Poland, except for powiats in the north-eastern part of Lubelskie voivodship (Fig. 3.7a and 3.7b).

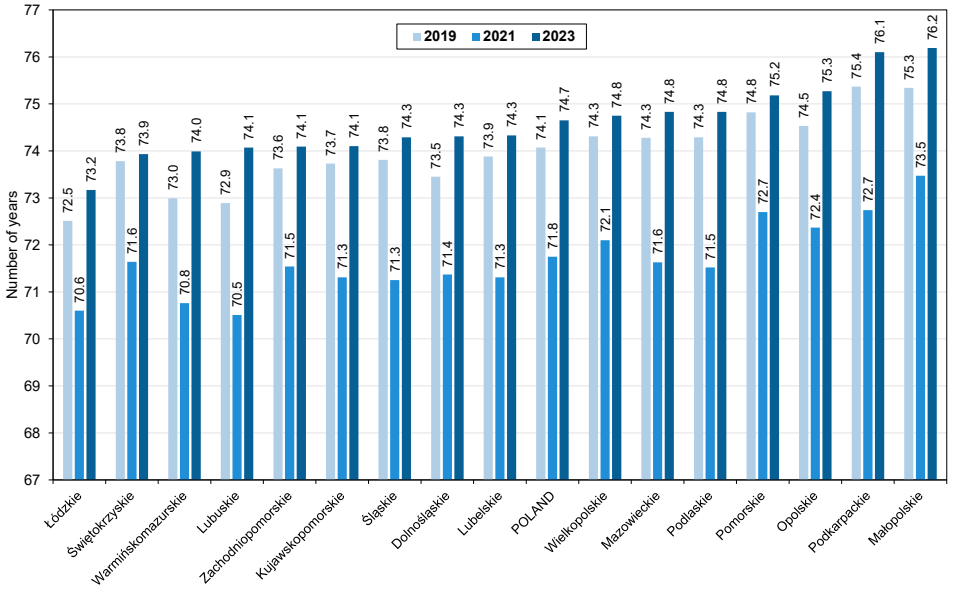


Fig. 3.6a. Life expectancy of men by voivodship in 2019, 2021 and 2023 (Statistics Poland data)

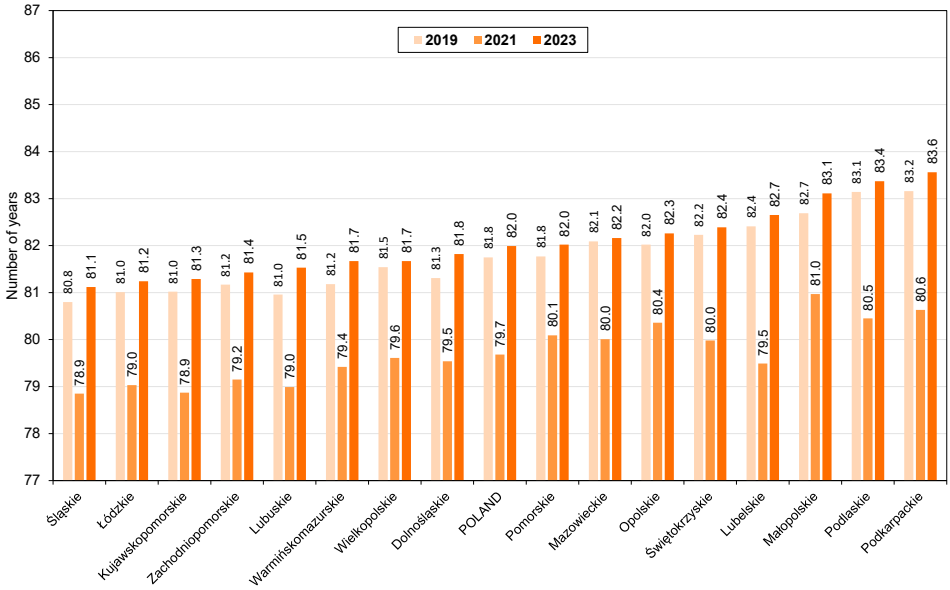


Fig. 3.6b. Life expectancy of women by voivodship in 2019, 2021 and 2023 (Statistics Poland data)

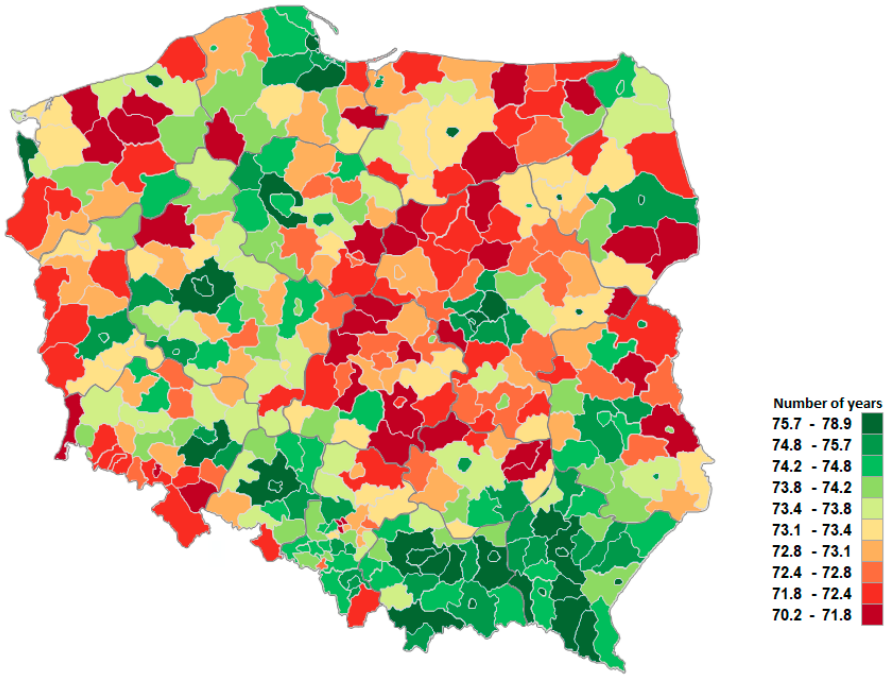


Fig. 3.7a. Life expectancy of men in 2022–2023 by powiat (authors' calculations based on Statistics Poland data)

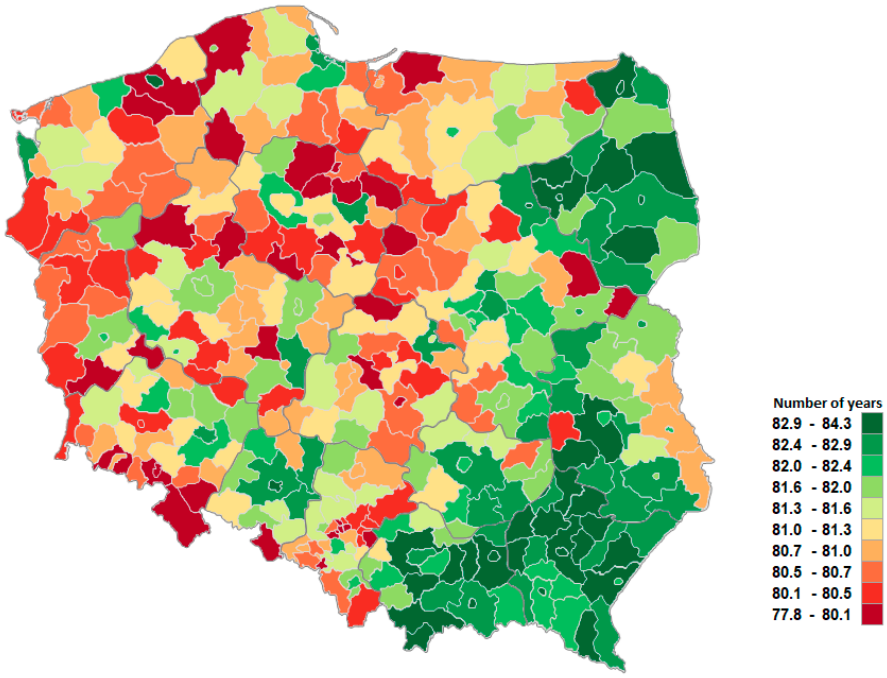


Fig. 3.7b. Life expectancy of women in 2022–2023 by powiat (authors' calculations based on Statistics Poland data)

In the two years (2022–2023) following the pandemic, the longest life expectancy for men was in Sopot (78.9 years), while the shortest was in Olecki powiat (Warmińsko-mazurskie voivodship), 70.2 years. Thus, the difference in life expectancy between these two extremes was approximately 8.7 years (Table 3.2a). This means a greater difference compared to the pre-pandemic period of 2018–2019, when life expectancy for men in Sopot was 7.4 years longer than in Kutnowski powiat. Compared to the pre-pandemic period, life expectancy for men in Sopot increased by 1.1 years, while it decreased by 1.3 years in Olecki powiat.

The difference is slightly smaller for women than for men, with the longest life expectancy in 2022–2023 estimated at 84.3 years for women living in Tatrzański powiat and the shortest at 77.8 years for women living in the city of Chorzów, a difference of approximately 6.5 years (Table 3.2b). Compared to the pre-pandemic period, life expectancy of women in Tatrzański powiat increased by 1.2 years, while it decreased by 0.5 years in Chorzów.

The above differences in life expectancy concern "extreme" powiats, while the difference between the first and tenth deciles, i.e. the average (median) for the

10% of powiats with the shortest life expectancy and the 10% of powiats with the longest life expectancy, is 4.62 years (71.48 vs 76.10) for men and 3.58 years (79.67 vs 83.25) for women. These differences are the same as in 2018–2019, when they stood at 4.63 and 3.59 years, respectively.

Life expectancy varied across powiats in each voivodship but to different degrees. For men, the greatest variation was found in Pomorskie voivodship, where the difference in life expectancy between the extreme powiats was as high as 7.7 years, due to the long life expectancy of men in Sopot. If this powiat is not considered, the gap in Pomorskie voivodship will decrease to 4.8 years. The least variation in male life expectancy is found in the voivodships of Lubuskie, Łódzkie and Podkarpackie, with only 3.2 years (Fig. 3.7c). The variation was smaller for women, ranging from 1.7 years in Podkarpackie voivodship to 4.5 years in Mazowieckie voivodship. There is a sustantial difference in life expectancy of men and women in the voivodships of Pomorskie, Zachodniopomorskie, Podlaskie and Warmińsko-mazurskie.

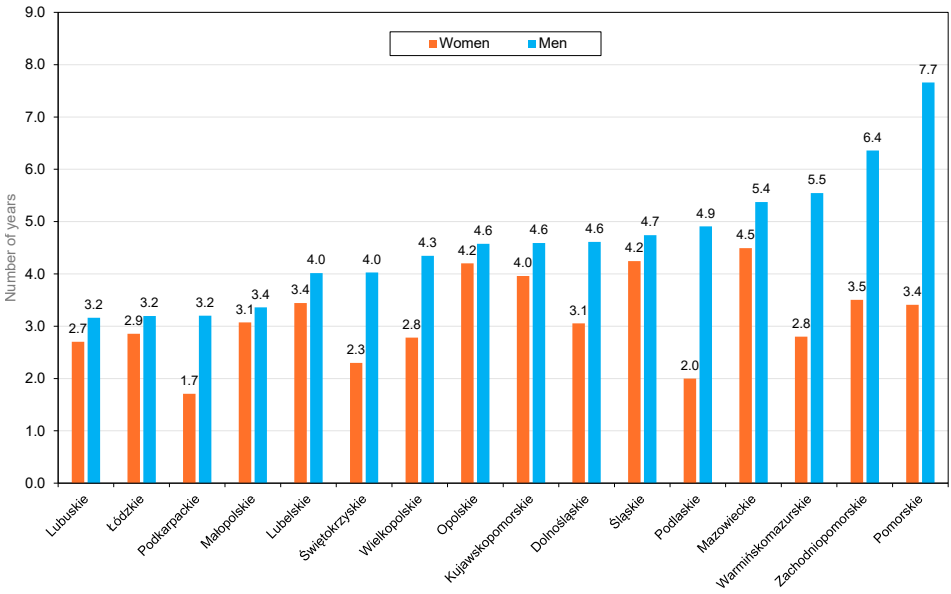


Fig. 3.7c. Difference between the longest and shortest life expectancy for men and women in powiats of a given voivodship in 2022–2023 (authors' calculations based on Statistics Poland data)

Table 3.2a. Thirty powiats with the longest and shortest life expectancy of men in 2022–2023 and the difference in life expectancy in 2022–2023 compared to the pre-pandemic period of 2018–2019

TERYT	Powiats with the longest life expectancy	Life expectancy	Change in life expectancy	TERYT	Powiats with the shortest life expectancy	Life expectancy	Change in life expectancy
2264	city of Sopot	78.9	1.10	2813	Olecki	70.2	-1.28
3211	Policki	77.5	2.14	2462	city of Bytom	70.9	-1.53
1263	city of Tarnów	77.0	0.28	1422	Przasnyski	71.0	-1.35
1863	city of Rzeszów	76.8	-0.53	1427	Sierpecki	71.0	-1.29
1821	Leski	76.7	1.27	1004	Łęczycki	71.1	-0.49
1661	city of Opole	76.7	-0.41	3205	Gryficki	71.2	-1.11
1609	Opolski	76.6	0.52	0265	city of Wałbrzych	71.2	0.17
1206	Krakowski	76.5	1.40	1021	Brzeziński	71.2	0.53
1261	city of Kraków	76.4	-0.12	1437	Żuromiński	71.2	-0.52
1211	Nowotarski	76.4	1.26	0225	Zgorzelecki	71.2	-0.31
2061	city of Białystok	76.4	-0.28	2216	Sztumski	71.2	-4.23
0403	Bydgoski	76.4	1.01	1002	Kutnowski	71.2	0.87
1861	town of Krosno	76.4	-0.94	1012	Radomszczański	71.3	-0.25
1421	Pruszkowski	76.3	1.03	3218	Łobeski	71.3	-1.28
1262	city of Nowy Sącz	76.3	-0.16	1010	Piotrkowski	71.4	-0.26
1465	city of Warsaw	76.2	-0.09	2203	Człuchowski	71.4	-2.24
1817	Sanocki	76.2	-0.12	3201	Białogardzki	71.5	-0.50
1864	city of Tarnobrzeg	76.1	1.02	3216	Świdwiński	71.5	-0.24
2062	city of Łomża	76.1	-0.01	2005	Hajnowski	71.5	0.90
3021	Poznański	76.1	1.04	1438	Żyrardowski	71.5	-0.17
2204	Gdański	76.0	-0.54	0224	Ząbkowicki	71.5	-0.58
2262	city of Gdynia	76.0	-1.29	2606	Opatowski	71.6	0.71
1862	city of Przemyśl	76.0	1.25	0603	Chełmski	71.6	-1.10
3261	city of Koszalin	76.0	-0.56	1410	Łosicki	71.6	-0.25
1216	Tarnowski	75.9	0.34	1424	Pułtuski	71.6	0.08
1802	Brzozowski	75.9	1.13	2607	Ostrowiecki	71.6	-1.54
1219	Wielicki	75.9	0.64	2463	city of Chorzów	71.7	0.79
1464	city of Siedlce	75.9	0.54	2605	Konecki	71.7	-1.64
1806	Kolbuszowski	75.9	0.29	2471	city of Piekary Śląskie	71.7	-2.34
3064	city of Poznań	75.8	-0.16	2817	Szczycieński	71.7	0.11

Source: Authors' calculations based on Statistics Poland data

Table 3.2b. Thirty powiats with the longest and shortest life expectancy of women in 2022–2023 and the difference in life expectancy in 2022–2023 compared to the pre-pandemic period of 2018–2019

TERYT	Powiats with the longest life expectancy	Life expectancy	Change in life expectancy	TERYT	Powiats with the shortest life expectancy	Life expectancy	Change in life expectancy
1217	Tatrzański	84.3	1.22	2463	city of Chorzów	77.8	-0.51
0607	Kraśnicki	83.9	0.87	2462	city of Bytom	78.5	-1.42
1813	Przemyski	83.8	0.14	0417	Wąbrzeski	78.7	-1.94
1461	city of Ostrołęka	83.8	1.56	1602	Głubczycki	78.8	-2.05
2061	city of Białystok	83.7	0.24	2472	city of Ruda Śląska	78.9	-0.74
1812	Niżański	83.7	-0.48	1410	Łosicki	79.3	-2.22
1808	Leżajski	83.6	0.67	2203	Człuchowski	79.3	-1.30
1816	Rzeszowski	83.6	0.36	0221	Wałbrzyski	79.4	-0.13
1202	Brzeski	83.5	0.39	3201	Białogardzki	79.4	-0.70
1863	city of Rzeszów	83.5	-0.20	2802	Braniewski	79.5	-0.68
1864	city of Tarnobrzeg	83.5	0.79	0208	Kłodzki	79.5	-0.62
1821	Leski	83.4	0.34	2474	city of Siemianowice Śląskie	79.5	-0.69
1803	Dębicki	83.4	-0.15	2212	Słupski	79.5	-0.80
1811	Mielecki	83.4	-0.41	0265	city of Wałbrzych	79.5	0.08
1263	city of Tarnów	83.4	0.66	0810	Żagański	79.6	0.10
2008	Moniecki	83.4	-0.20	1008	Pabianicki	79.6	-1.23
2062	city of Łomża	83.3	-0.63	0206	Jeleniogórski	79.6	0.08
2063	city of Suwałki	83.3	0.64	3020	Pleszewski	79.6	-1.95
2003	Bielski	83.3	0.70	0404	Chełmiński	79.7	-1.43
1262	city of Nowy Sącz	83.2	0.79	2468	city of Jaworzno	79.7	-0.77
1211	Nowotarski	83.2	-0.14	0812	Wschowski	79.7	-0.75
1818	Stalowowolski	83.2	-0.10	3209	Koszaliński	79.7	0.12
2011	Sokólski	83.2	1.52	0462	city of Grudziądz	79.7	-0.04
1810	Łańcucki	83.2	-0.41	2476	city of Świętochłowice	79.7	0.86
2012	Suwalski	83.1	-0.36	0224	Ząbkowicki	79.8	-0.63
2006	Kolneński	83.1	0.45	3028	Wągrowiecki	79.8	-0.92
1206	Krakowski	83.1	0.61	0401	Aleksandrowski	79.8	-0.08
1861	city of Krosno	83.1	0.18	1062	city of Piotrków Trybunalski	79.8	0.13
0609	Lubelski	83.1	0.32	1002	Kutnowski	79.8	0.33
1201	Bocheński	83.1	0.06	0409	Mogileński	79.9	-1.89

Source: Authors' calculations based on Statistics Poland data

The difference in life expectancy of men after the pandemic (2022–2023) compared to the period before it (2018–2019) in individual powiats ranged from a decrease of 4.23 years in Sztumski powiat (Pomorskie voivodship) to an increase of 2.77 years in Radzyński powiat (Lubelskie voivodship) (Fig. 3.8a). Differences in the length of life expectancy of men in powiats were observed in every voivodship. In total, life expectancy of men was higher in 222 powiats in 2022–2023 than in 2018–2019, while it was still lower in 158 powiats.

The difference in life expectancy of women after the pandemic (2022–2023) compared to the period before it (2018–2019) in individual powiats ranged from a decrease of 2.28 years in Sokołowski powiat (Mazowieckie voivodship) to an increase of 2.08 years in Strzelecko-Drezdenecki powiat (Lubuskie voivodship) (Fig. 3.8b). Differences in the length of life expectancy of women in powiats before and after pandemic were observed in every voivodship. In total, life expectancy for women was higher in 176 powiats in 2022–2023 than in 2018–2019, while it was still lower in 204 powiats.

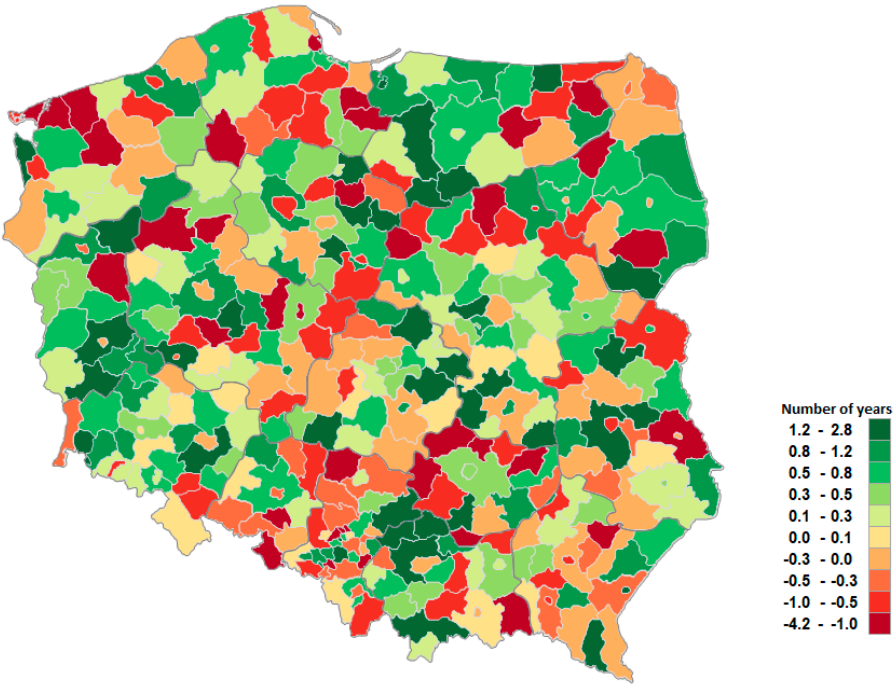


Fig. 3.8a. Difference in life expectancy of men in 2022–2023 compared to 2018–2019 by powiat of residence (authors' calculations based on Statistics Poland data)

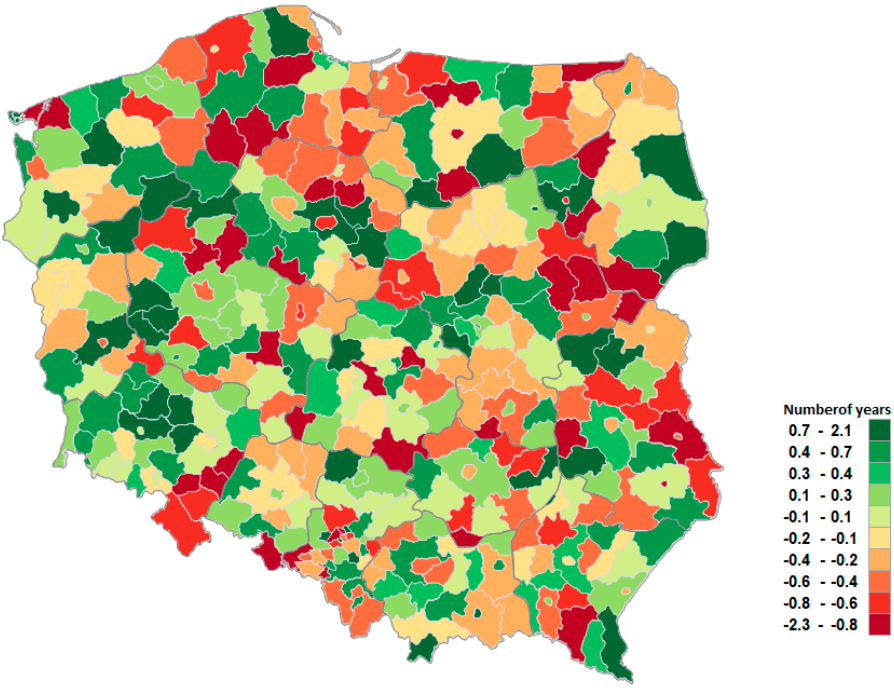


Fig. 3.8b. Difference in life expectancy of women in 2022–2023 compared to 2018–2019 by powiat of residence (authors' calculations based on Statistics Poland data)

An important question is to what extent, if at all, differences in the health status of inhabitants of powiats may result from differences in their socio-economic situation. Figures 3.9a and 3.9b show the relationship between population life expectancy and its changes in recent years, including the pandemic period, and the level of deprivation in the powiats. The relationship between life expectancy and deprivation[7] is more pronounced in men than in women. The average life expectancy of women in powiats depended very little on the deprivation index, but the reduction in life expectancy during the pandemic was most visible in powiats with the highest deprivation index (quintiles 4 and 5). In these powiats, the increase in life expectancy after the pandemic (2021–2023) was also greatest. In contrast, the difference in life expectancy of men is more clearly related to the level of deprivation in powiats than among women, while no such relationship is observed in the case of reduced life expectancy associated with the pandemic. For men, both the decrease in life expectancy in 2021 and its subsequent increase in 2023 were highest in the powiats with the lowest deprivation index (first quintile).

[7] The deprivation index was described in our 2018 Report.

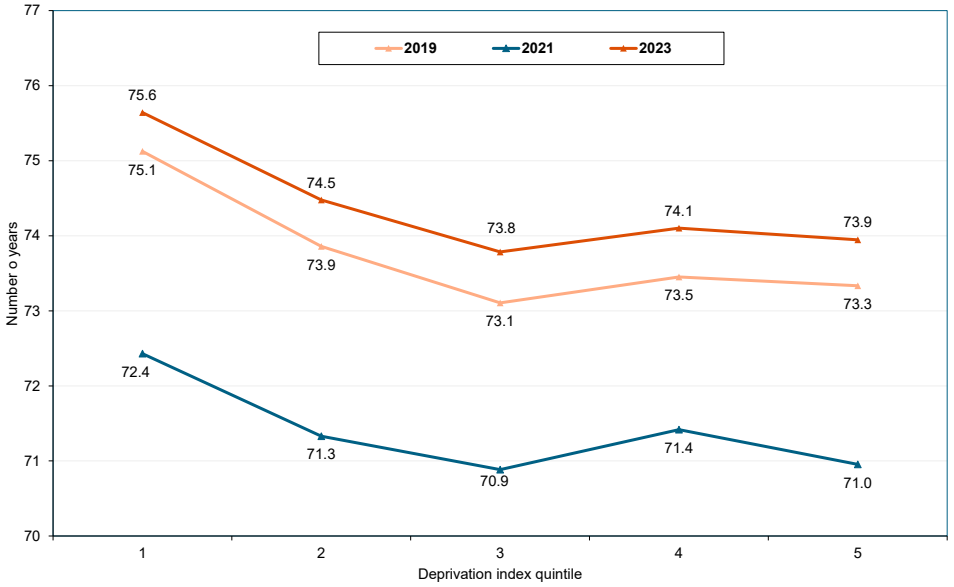


Fig. 3.9a. Life expectancy for men in 2019, 2021 and 2023, depending on the deprivation index quintile (2019) in the powiat (authors' calculations based on Statistics Poland data)

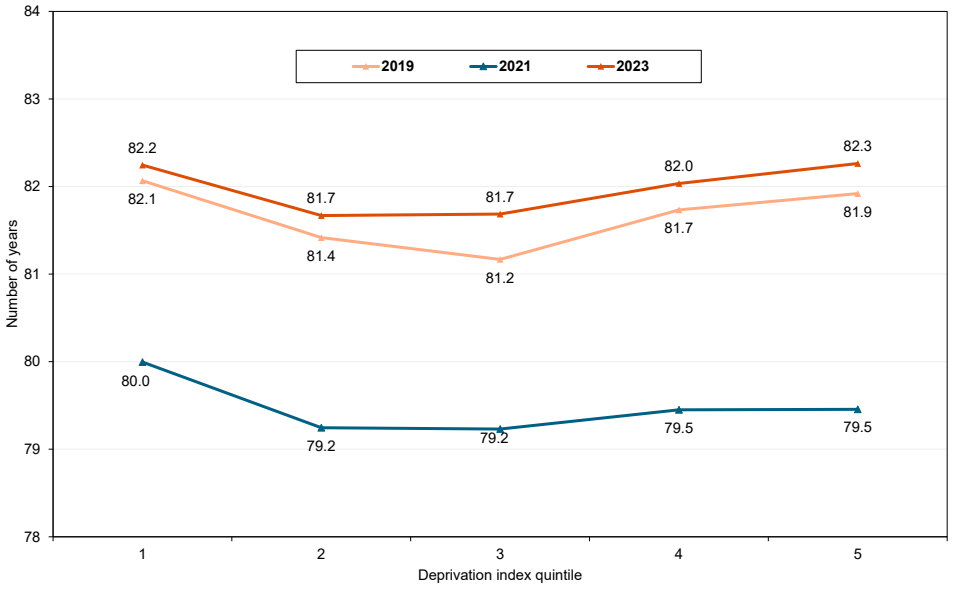


Fig. 3.9b. Life expectancy for women in 2019, 2021 and 2023, depending on the deprivation index quintile (2019) in the powiat (authors' calculations based on Statistics Poland data)

When assessing social inequalities in health of the Polish population, it is crucial to estimate the differences in health status of people with different levels of education. The results of the National Population and Housing Census 2021 (NSP 2021) provided reliable data on the education of the whole Polish population. Combined with mortality data by sex, age and education, this allowed us to estimate life expectancy and mortality from major causes of death for subpopulations with different levels of education. To reduce the impact of random variation, these estimates were made for the three-year period 2020-2022.[8]

A pronounced social gradient observed in mortality from all causes of death, which will be presented later in this chapter, results in **significantly shorter life expectancy among individuals with lower levels of education compared to those with tertiary education.** According to our most recent estimates, this difference amounted to nearly 13 years for men aged 30 during the three-year period of 2020–2022, and nearly 9 years for women (Fig. 3.10).

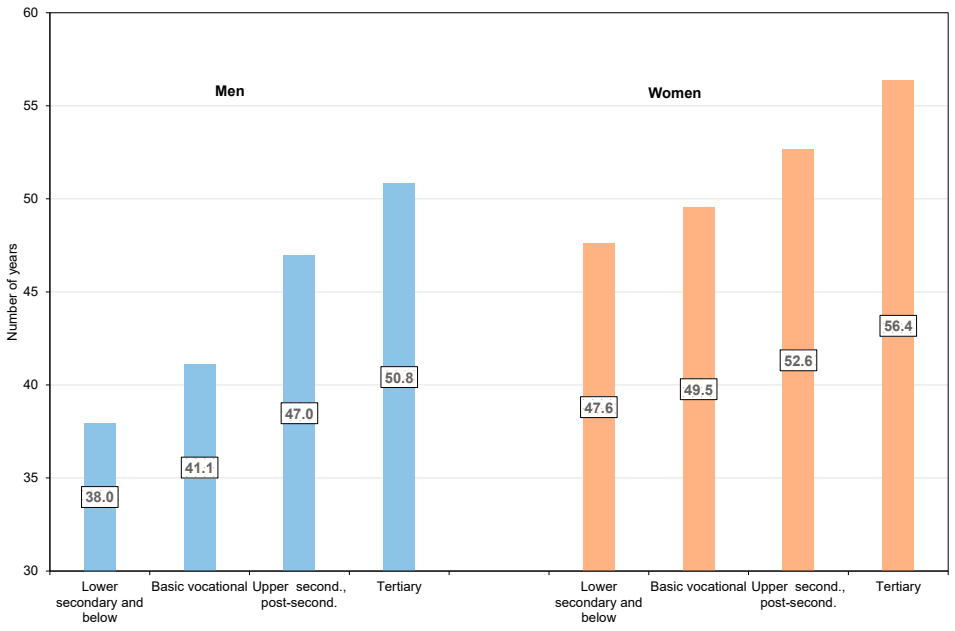


Fig. 3.10. Life expectancy for men and women aged 30 by level of education in 2020–2022 (authors' calculations based on Statistics Poland data)

[8] This part of the analysis was carried out as part of the research task ZC-3/2024, conducted by the Department of Population Health Monitoring and Analysis at the National Institute of Public Health NIH – National Research Institute.

Life expectancy is one of the basic and most commonly used simple synthetic measures for assessing a population's overall health. However, its limitations are evident, as it does not reflect people's health throughout their lives. For this reason, a composite measure known as **health expectancy** or healthy life years (HLY) is also used. This measure divides the entire lifespan into years in good health and years in poor health. Various measures can be used to define poor health, but it is generally accepted that it refers to the long-term health-related limitations, the presence of specific chronic diseases and self-perceived poor health. Eurostat provides estimates of healthy life years for European Union countries based on the Global Activity Limitation Indicator (GALI). The question about limited functional capacity is asked as part of the European Union statistics on income and living conditions (EU-SILC) survey, which Statistics Poland has conducted in Poland since 2005 on a random population sample. However, it should be emphasised that the wording of the question has undergone certain modifications, making it impossible to evaluate the change in the indicator over all these years. Since 2009, the question has been worded: "For at least the last 6 months, have you been limited because of a health problem in activities people usually do?" The current wording is: "Are you limited because of a health problem in activities people usually do?" This is followed by "Have you been limited for at least the past 6 months?"

Statistics Poland annually estimates and publishes the health expectancy indicator (HLY) for the Polish population. However, it should be noted that the estimation method used by Statistics Poland differs slightly (it is more sophisticated) from that used by Eurostat, resulting in some differences in the data presented for Poland later in this chapter (according to Statistics Poland) and in international comparisons (according to Eurostat). When analysing temporal and spatial differences in HLY, it should be kept in mind that it is based on subjective measurements, and it is not advisable to pay attention to minor differences in values.

Not all voivodships had higher healthy life years for men and women in 2023 than in 2019, but the difference was small in three voivodships for men and two for women (Fig. 3.11a and 3.11b). The overall increase in healthy life years in 2023 compared to 2019 was greater than that for total life expectancy. Healthy life years differences in voivodships for both men and women after the pandemic in 2023 are greater than before in 2019. In 2021 and 2023, the HLY indicators for both men and women were highest in Wielkopolskie voivodship, followed by Zachodniopomorskie and Lubuskie voivodships. On the other hand, the lowest indicators were recorded in Lubelskie and Podlaskie voivodships. It is worth noting that the healthy life years of voivodship inhabitants in 2023 are weakly

correlated with overall life expectancy, and in the case of women, this correlation is even negative.

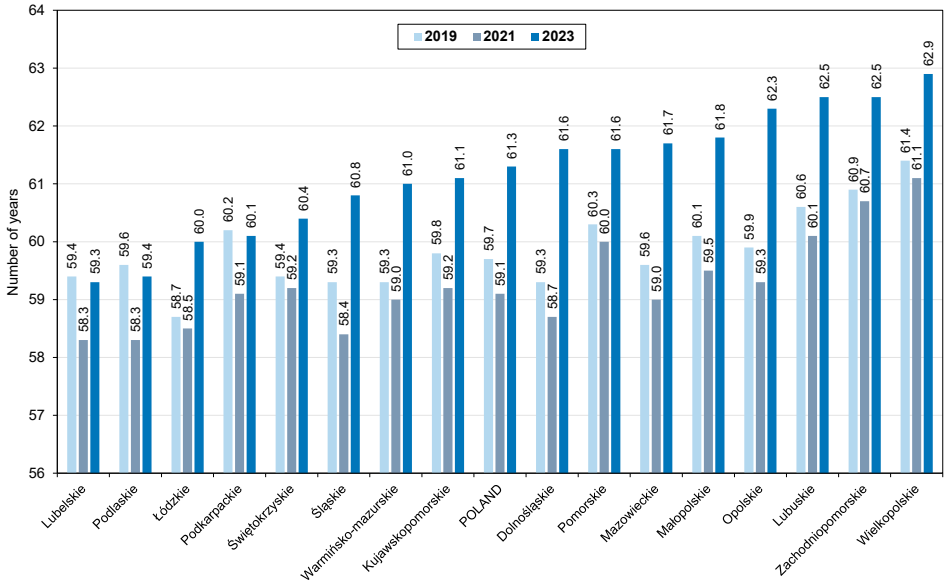


Fig. 3.11a. Healthy life years for men by voivodship in 2019, 2021 and 2023 (Statistics Poland data)

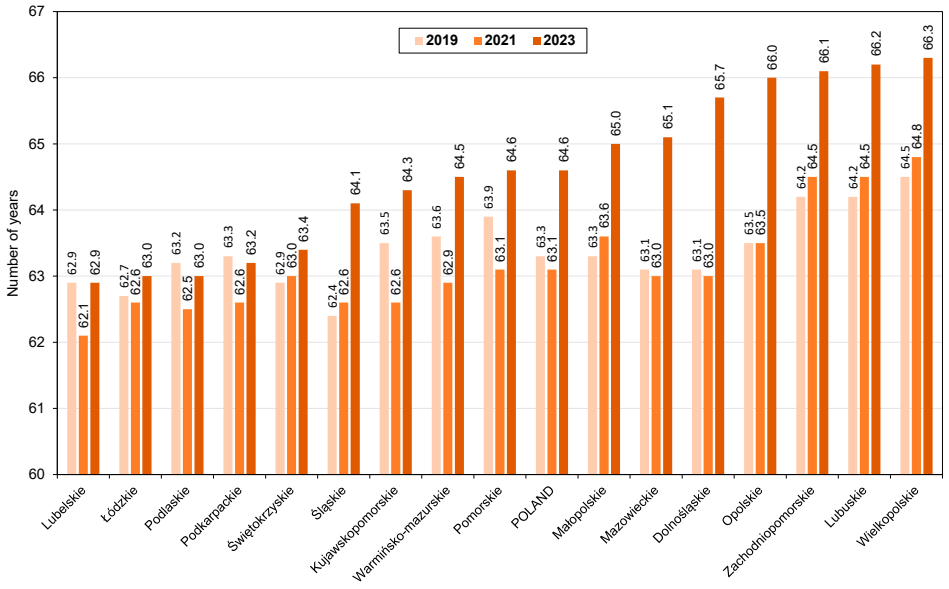


Fig. 3.11b. Healthy life years for women by voivodship in 2019 and 2021 and 2023 (Statistics Poland data)

Life expectancy of the Polish population compared to other EU countries[9]

According to preliminary Eurostat estimates, life expectancy for men in Poland in 2023 is approximately 4.1 years shorter than the average life expectancy in the EU (in 2019, the difference was 4.4 years), with a difference of 7.1 years compared to the longest-living EU citizens in Sweden (Fig. 3.12a). On average, Latvians have the shortest life expectancy in the EU, and the difference in life expectancy between men and women in the EU is as high as 11.2 years (70.5 vs 81.7). Men aged 65 in Poland currently live approximately 2.1 years less than the EU average for this age group, with a difference of 3.7 years compared to the longest-living EU citizens in Luxembourg (Fig. 3.12b). In most countries, life expectancy in 2023 was already higher than in 2019, with exceptions including Germany, Finland, the Netherlands, Austria, and, for women only, Italy and France.

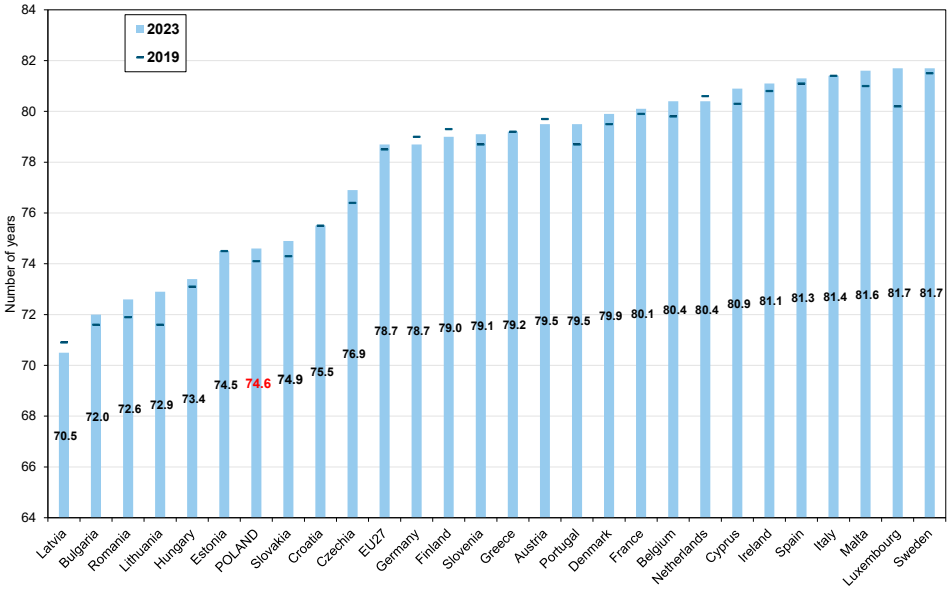


Fig. 3.12a. Life expectancy for MEN in Poland and other EU-27 countries in 2019 and 2023 (Eurostat database, preliminary estimates for Poland and EU-27)

[9] It should be noted that Eurostat's method for calculating life expectancy is slightly different from that used by Statistics Poland, which means that the estimates for Poland provided by these institutions may differ slightly. Any differences are usually between 0.1 and 0.2 years.

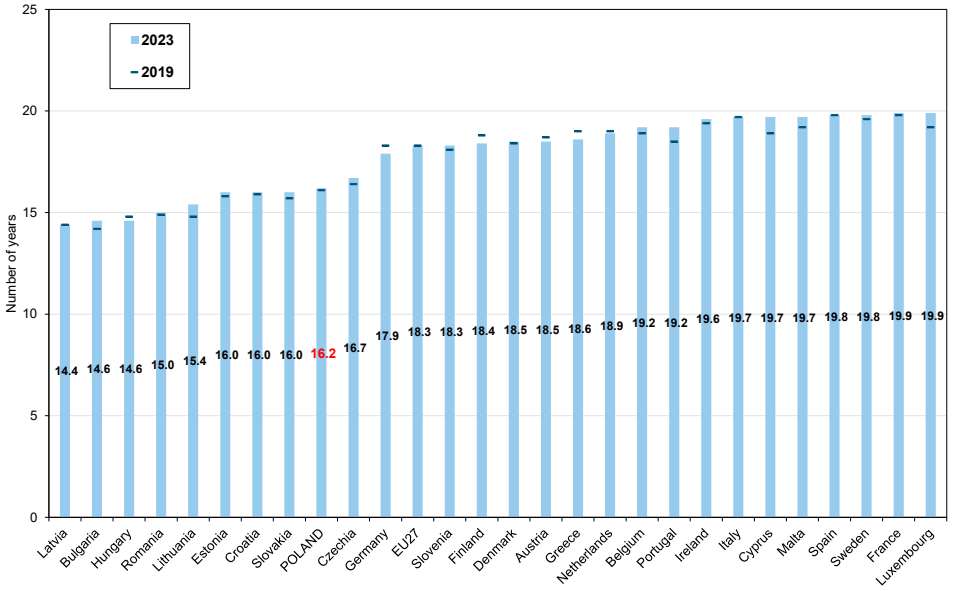


Fig. 3.12b. Life expectancy of MEN aged 65 in Poland and other EU-27 countries in 2019 and 2023 (Eurostat database, preliminary estimates for Poland and EU-27)

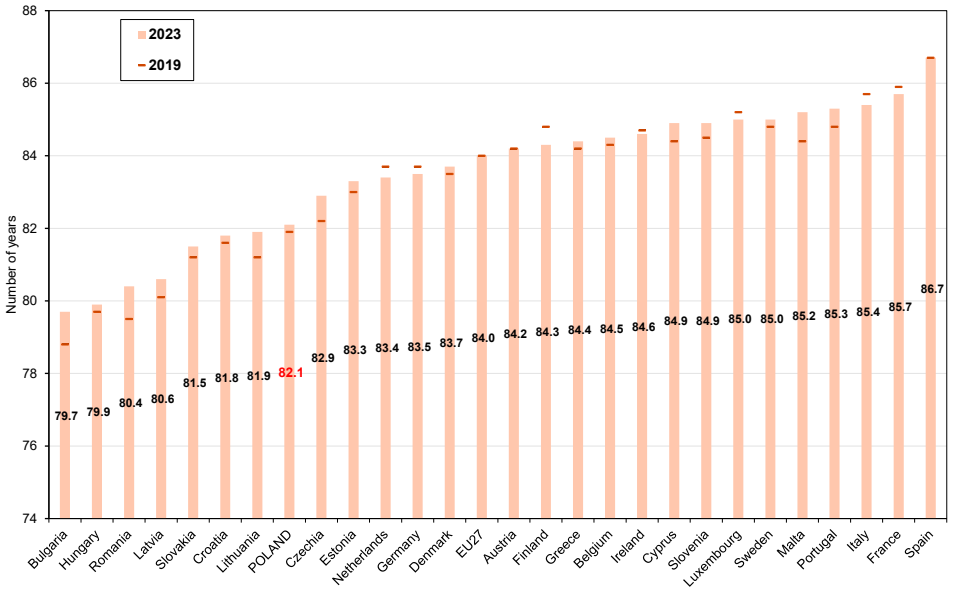


Fig. 3.13a. Life expectancy for WOMEN in Poland and other EU-27 countries in 2019 and 2023 (Eurostat database, preliminary estimates for Poland and EU-27)

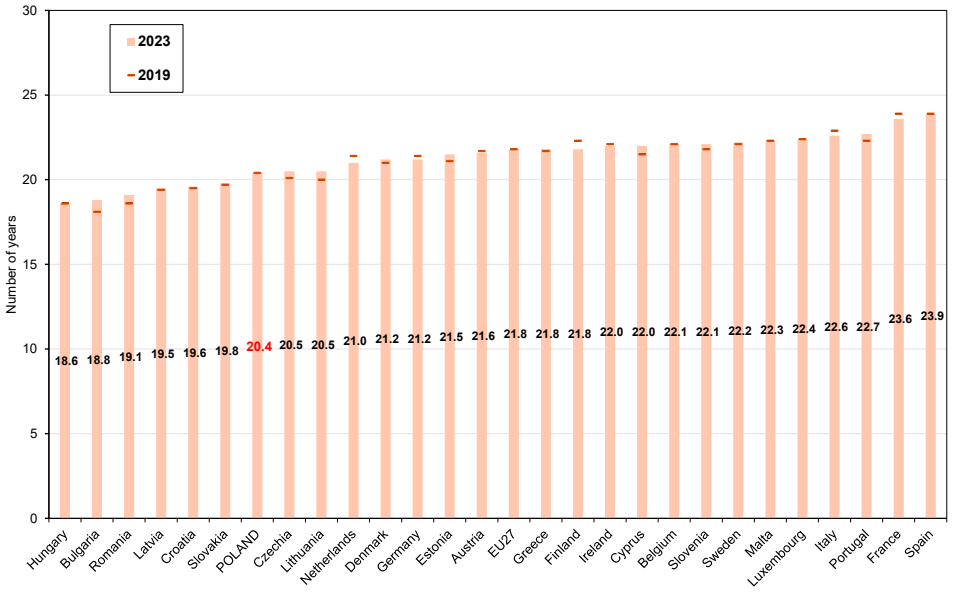


Fig. 3.13b. Life expectancy of WOMEN aged 65 in Poland and other EU-27 countries in 2019 and 2023 (Eurostat database, preliminary estimates for Poland and EU-27)

The differences are less pronounced for women, with **Polish women currently (2023) living on average approximately 1.9 years less than the average life expectancy for all EU women** and approximately 4.6 years less than women in Spain, who live the longest (Fig. 3.13a). On average, women in Bulgaria (79.7 years) and Hungary (79.9 years) have the shortest life expectancy in the EU. Women aged 65 currently live approximately 1.4 years less than EU women of the same age, with a difference of 3.5 years compared to the longest-living women in Europe, who live in Spain (Fig. 3.13b). In most countries, female life expectancy in 2023 was already higher than in 2019, with the exceptions of Germany, Finland, the Netherlands, Austria and, as in the case of men, Italy and France.

It is reasonable to ask to what extent the higher mortality of younger and older people contributes to the shorter life expectancy of Poles compared to the inhabitants of other countries. The decomposition of differences in life expectancy by differences in mortality risk in individual 5-year age groups in Poland and selected Western European countries and the Czech Republic leads to the following conclusions. **The shorter life expectancy of Polish men is still largely due to their higher death rate during working age, i.e. between 25 and 64 years, compared to other countries** (Fig. 3.14a). In contrast, the situation is different for Polish women. The fact that they live shorter lives than women in other European countries is

primarily due to higher death rates in women aged 65 and over (Fig. 3.14b). Nevertheless, in most cases, the higher death rate among Polish women aged 25–64 is still contributes to their shorter average life expectancy compared to women in Western European countries. More effective measures to combat mortality among people of working age, primarily men but also women, will not only bring direct economic benefits but also contribute significantly to reducing the unfavourable difference in life expectancy between Polish citizens and those of other countries.

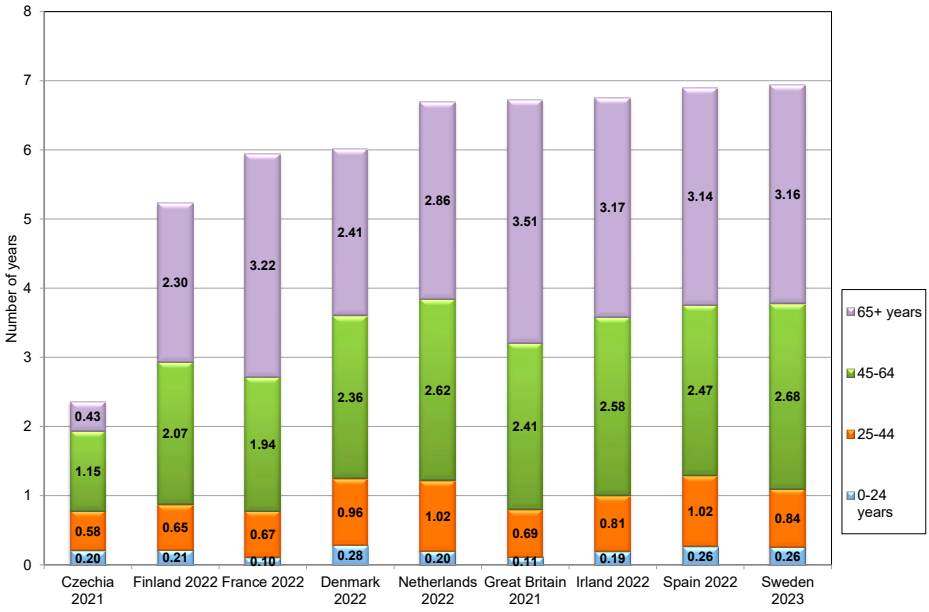


Fig. 3.14a. Number of years of shorter life expectancy of men in Poland compared to men in other countries, resulting from higher death rates among Polish men in specific age groups (authors' calculations based on the WHO Mortality Database)

The overall health situation of the Polish population is slightly less unfavourable than that of the European Union as a whole, if life expectancy is calculated considering that only part of it is spent in good health. According to the latest Eurostat estimates for 2022, the healthy life years (HLY) of Polish women in 2022, at 64.1 years (79.0% of total expected life years), was 1.3 years longer than the EU average, but 6.2 years shorter than that of women in Malta (Fig. 3.15a). In contrast, Polish men could expect to live in good health for an average of 60.8 years (82.8% of total life expectancy), which is 1.6 years less than the EU average and as much as 9.3 years less than the men of Malta. The difference in healthy life years

between women and men in Poland, 3.3 years, is one of the highest in the EU (4.4 years in Bulgaria, 4.1 years in Lithuania, and 3.5 years in Slovenia).

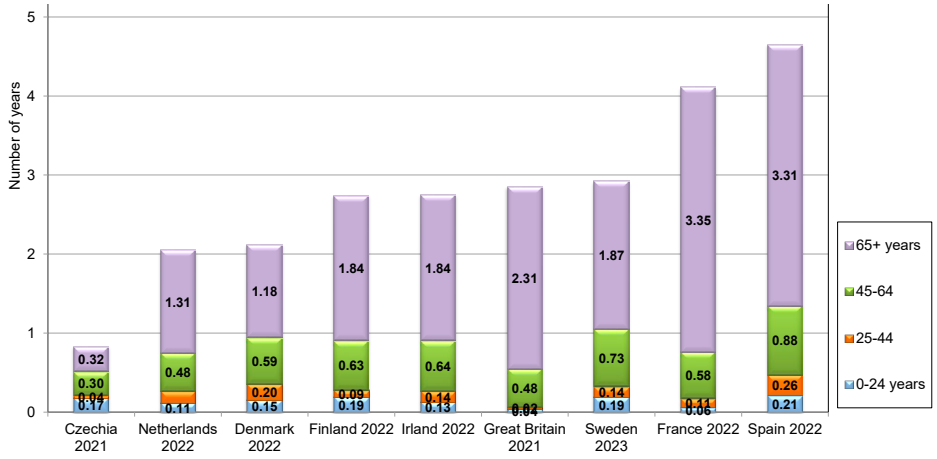


Fig. 3.14b. Number of years of shorter life expectancy of women in Poland compared to women in other countries, resulting from higher death rates among Polish women in specific age groups (authors' calculations based on the WHO Mortality Database)

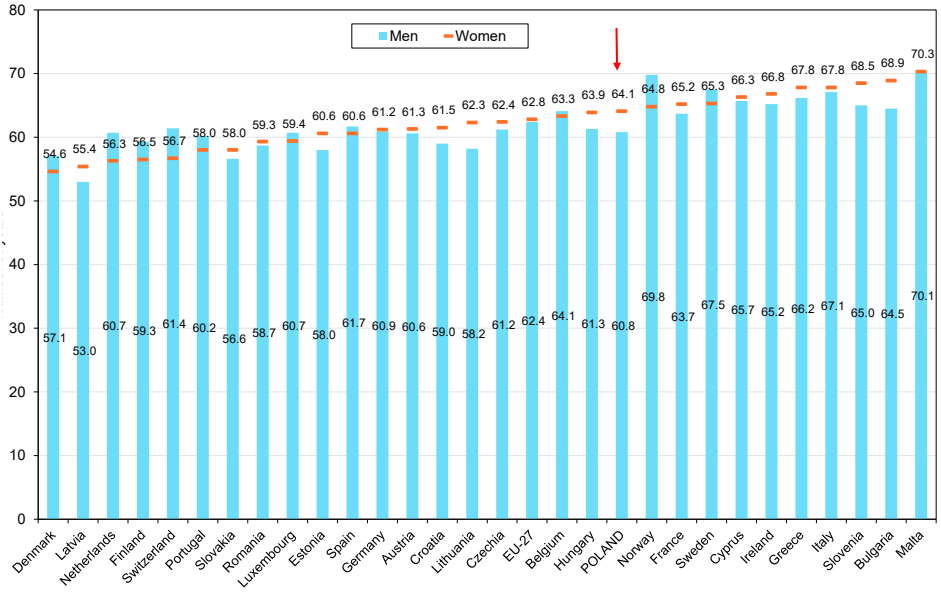


Fig. 3.15a. Average healthy life years (disability-free life expectancy) for men and women at birth in Poland and other EU-27 countries and Norway in 2022 (Eurostat data)

Healthy life years of older people aged 65 (HLY65), for men and women, expressed both in absolute terms (7.8 and 8.6 years, respectively) and as a percentage of total life expectancy (50.4% and 43.7%, respectively), is shorter in Poland than the EU average (8.9 and 9.2 years, respectively, and 50.5% and 43.8%, respectively) (Fig. 3.15b and Eurostat database[10]).

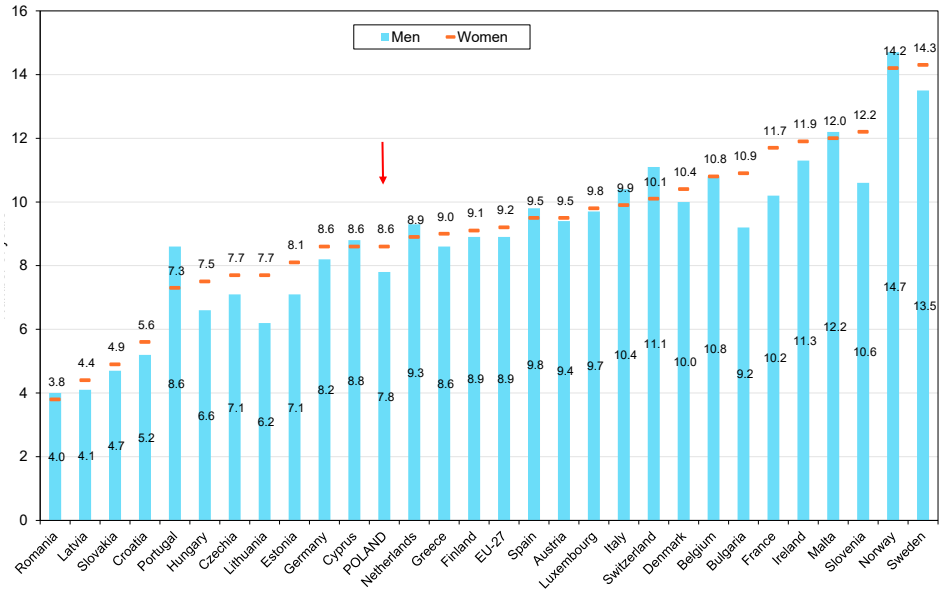


Fig. 3.15b. Average healthy life years (disability-free life expectancy) for men and women aged 65 in Poland and other EU-27 countries and Norway in 2022 (Eurostat data)

All-cause mortality

As mentioned earlier, mortality analysis in Poland was conducted using Statistics Poland database of individual death records, while the WHO Mortality Database was used to compare mortality trends in Poland and selected EU countries. The direct method was used to prepare age-standardised death rates. The European age structure, uniform for men and women, developed and used by Eurostat, has been applied as the standard age structure.[11]

[10] https://ec.europa.eu/eurostat/databrowser/view/hlth_hlye__custom_16206889/default/table?lang=en
[11] Eurostat. Revision of the European Standard Population - Report of Eurostat's task force. 2013 11/07/2013. Report No.: 1977-0375. European Union 2013

The decline in the overall mortality rate in Poland after 1991 slowed significantly in 2014–2019, and the pandemic years of 2020–2021 caused it to rise sharply by approximately a quarter. However, currently (2023), the death rate is already below that of the pre-pandemic year 2019 (Fig. 3.16a).

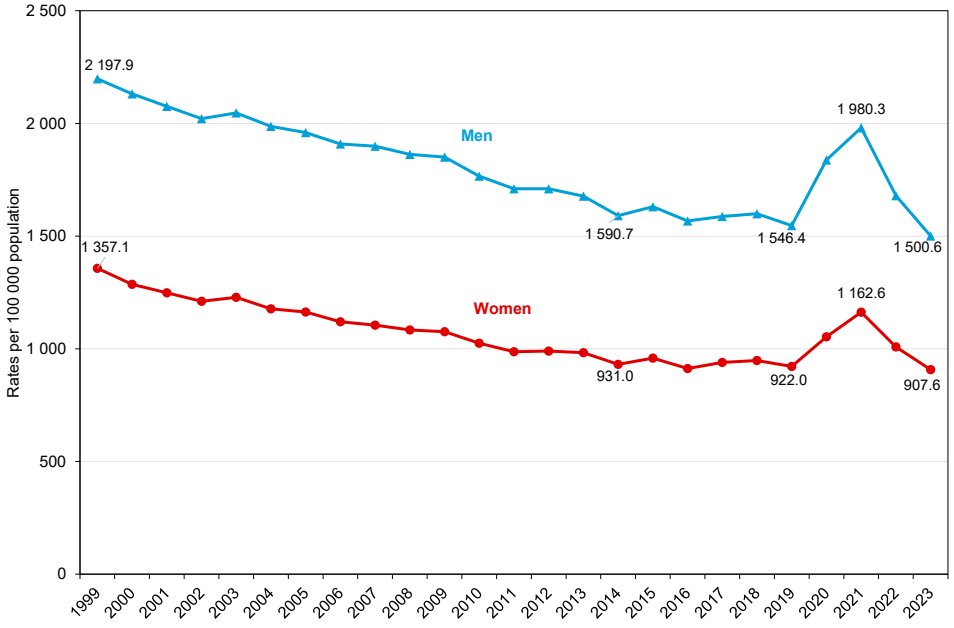


Fig. 3.16a. Age-standardised death rates due to all causes for men and women in Poland, 1999–2023 (own calculations based on Statistics Poland databases)

The mortality trends for older people aged 65 and over are similar to those for the total population, and the current mortality rate is also below that of the pre-pandemic year 2019 (Fig. 3.16b). It should be emphasised that **in the years preceding the pandemic, between 2014 and 2019, there was a complete standstill in the decline in mortality among older people.**

Monthly excess deaths (percentage difference between the number of deaths in a given month and the average number in that month in 2016–2019) during the pandemic in Poland were higher than in most EU countries and significantly deviated from the average for these countries, but after the pandemic, the difference in mortality in Poland compared to the baseline period is lower than in the EU-27 (Fig. 3.17).

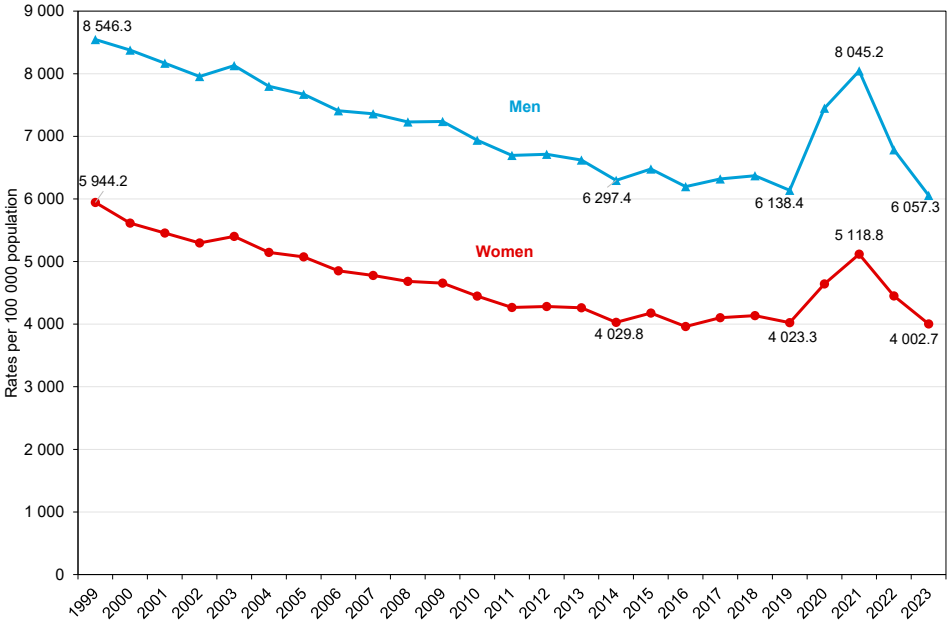


Fig. 3.16b. Age-standardised death rates due to all causes for men and women in Poland aged 65 and over, 1999–2023 (own calculations based on Statistics Poland databases)

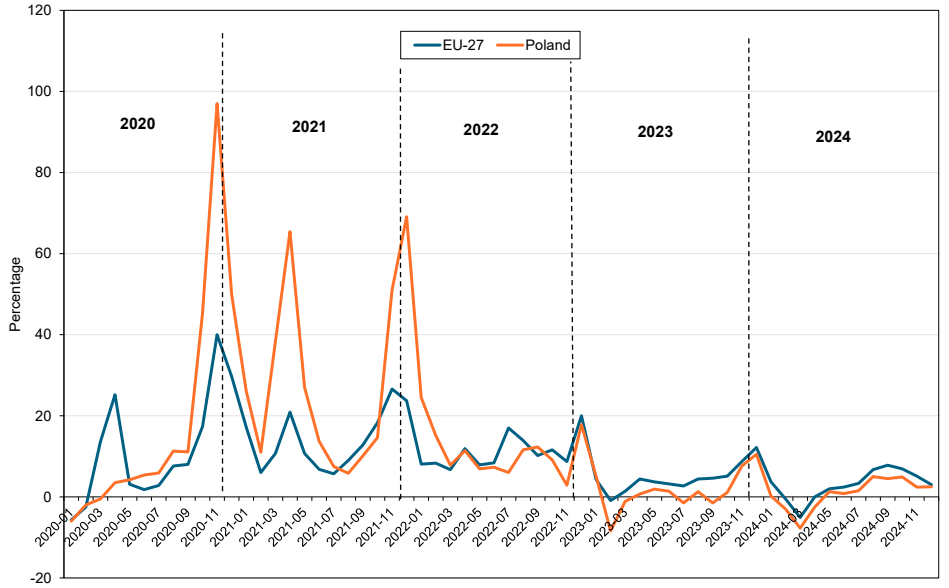


Fig. 3.17. Percentage of additional monthly deaths between January 2020 and December 2024 compared to the average monthly number of deaths in 2016–2019 in Poland and the EU-27 as a whole (Eurostat data)

Mortality by cause

When examining mortality by cause of death, it is essential to consider that the COVID-19 pandemic introduced a degree of disruption in the certification of causes of death. This may have affected, on the one hand, the frequency of deaths certified as due to COVID-19 itself, and on the other, deaths attributed to other causes. It is necessary to remember the WHO guidelines on coding causes of death during this period. According to the WHO guidelines,[12] "A death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID disease (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death.

A death due to COVID-19 may not be attributed to another disease (e.g. cancer) and should be counted independently of preexisting conditions that are suspected of triggering a severe course of COVID-19....

Note: Persons with COVID-19 may die due to other conditions such as myocardial infarction. Such cases are not deaths due to COVID-19 and should not be certified as such."

Undoubtedly, this situation could have reduced the mortality rate from certain chronic diseases, such as cancer, mentioned above. On the other hand, comorbidity with the undiagnosed COVID-19 may have contributed to an increase in the number of deaths attributed to a given chronic disease. This may have been one of the reasons for the significant increase in mortality attributable to diabetes in 2020. For these reasons, interpreting changes in cause-specific mortality rates during the 2020 and 2021 pandemic period requires great caution.[13] It can be assumed that the situation has normalised in this respect with the decline in SARS-CoV-2 infections in 2022 and especially in 2023.

A new indicator relating to mortality in Poland, presented for the first time in this chapter of our Report, is the average age of people who died in 2023 due to

[12] INTERNATIONAL GUIDELINES FOR CERTIFICATION AND CLASSIFICATION (CODING) OF COVID-19 AS CAUSE OF DEATH Based on ICD International Statistical Classification of Diseases (20 April 2020) WHO/HQ/DDI/DNA/CAT https://www.who.int/docs/default-source/classification/icd/covid-19/guidelines-cause-of-death-covid-19-20200420-en.pdf?sfvrsn=35fdd864_2 (Accessed on 8 August 2022)

[13] Wojtyniak B, Stokwiszewski J, Rabchenko D, et.al. "Długość życia i umieralność ludności Polski" in Wojtyniak B, Goryński P. Sytuacja zdrowotna ludności Polski i jej uwarunkowania 2022, NIZP PZH – PIB, Warsaw 2022

the analysed cause of death by sex and voivodship, and for the main categories of causes of death also by place of residence (urban/rural). The actual and age-standardised rates are shown to eliminate the impact of differences in the age structures of the compared subpopulations. This directly affects the age of the decedents, and we do not want to include this impact in the analysis (we want to adjust for it). The standard age structure adopted is that of the total population of Poland, which is the same for all subpopulations analysed. The average age at death provides an important analytical complement to the age-standardised death rate, which reflects differences in overall mortality rates between the subpopulations being compared, whereas the average age at death may reveal disparities in mortality within younger and older segments of the population. This distinction can serve as a point of departure for more detailed public health analyses.

For years, the most common cause of death among Polish citizens has been diseases of the circulatory system, more commonly referred to in clinical nomenclature as cardiovascular disease (CVD), and these two terms will be used interchangeably (Fig. 3.18). In 2023, they accounted for 36.9% of all deaths, which is 2.2 percentage points less than in 2019. The proportion of malignant neoplasms is currently at the same level as in 2019. These two groups of diseases were responsible for 60.3% of all deaths in Poland in 2023.

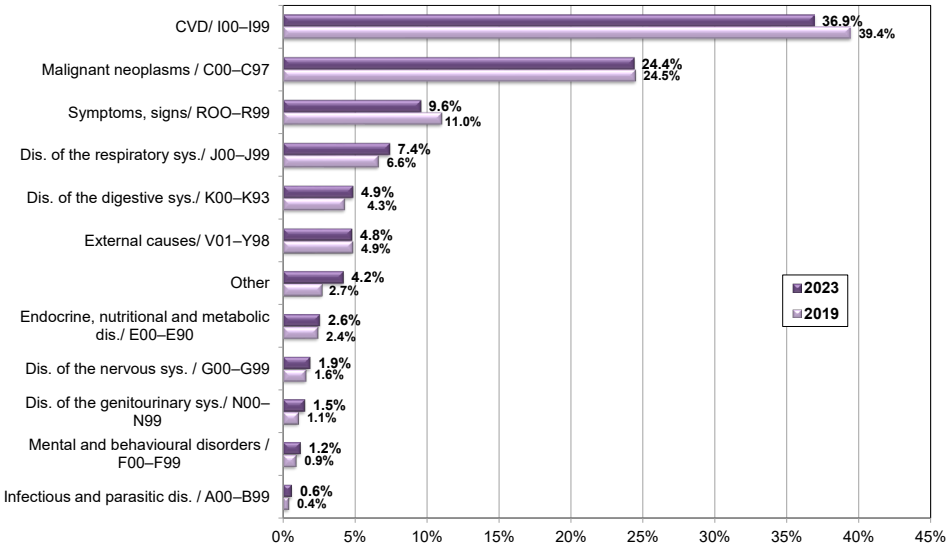


Fig. 3.18. Percentage of the leading causes of death in the total number of deaths in Poland in 2019 and 2023. (based on Statistics Poland data)

To identify the most common causes of death among the Polish population, including more detailed causes, we used a list prepared by the WHO and employed, among others, in England, Wales and Australia.[14] The list includes one modification related to voivodship differences in determining cardiovascular causes of death. A category "heart disease" has been created, which is also used in the English classification. Indeed, **heart disease was the most common cause of death overall in Poland in 2023, as well as among individuals over the age of 45** (Tab. 3.3). The second leading cause of death in Poland in 2023 was cerebrovascular diseases, which were the most common cause of death among the oldest population and the second most common cause of death among persons aged 65–74. Sadly, **suicide is the leading cause of death among young Poles aged 15–24 and 25–44**. Malignant neoplasm of the trachea, bronchus and lung, which is a cause of death that is largely preventable, continues to rank very high, second among people aged 45–74. However, our death statistics paint a very bleak picture, with more than one in ten deaths of people aged 25–64 listed as having an unspecified cause of death.

Table 3.3. Top ten causes of death in Poland by age in 2023

Rang	Total	1-14	15-24	25-44	45-64	65-74	75 y.o.
1	Heart disease (I00-I09, I11, I13, I20-I51) N=100966 (25%)	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) N=90 (14%)	Intentional self-harm [suicide] (X60-X84) N=341 (20%)	Intentional self-harm [suicide] (X60-X84) N=1666 (12%)	Heart disease (I00-I09, I11, I13, I20-I51) N=10209 (15%)	Heart disease (I00-I09, I11, I13, I20-I51) N=20598 (20%)	Heart disease (I00-I09, I11, I13, I20-I51) N=69053 (31%)
2	Cerebrovascular diseases (I60-I69) N=30517 (7%)	Influenza and pneumonia (J10-J18) N=62 (9%)	Land transport accidents (V01-V89) N=298 (18%)	Cirrhosis and other diseases of liver (K70-K76) N=1270 (9%)	Malignant neoplasm of trachea, bronchus and lung (C33, C34) N=4638 (7%)	Malignant neoplasm of trachea, bronchus and lung (C33, C34) N=10438 (10%)	Cerebrovascular diseases (I60-I69) N=19685 (9%)
3	Malignant neoplasm of trachea, bronchus and lung (C33, C34) N=22168 (5%)	Malignant neoplasm of brain (C71) N=51 (8%)	Event of undetermined intent (Y10-Y34) N=78 (5%)	Heart disease (I00-I09, I11, I13, I20-I51) N=1036 (7%)	Cirrhosis and other diseases of liver (K70-K76) N=4075 (6%)	Cerebrovascular diseases (I60-I69) N=6707 (7%)	Influenza and pneumonia (J10-J18) N=13448 (6%)

[14] Becker R, Silvi J, Ma Fat D, L'Hours A & Laurenti R 2006. A method for deriving leading causes of death. Bulletin of the World Health Organization 84:297–304

Rang	Total	1-14	15-24	25-44	45-64	65-74	75 y.o.
4	Influenza and pneumonia (J10-J18) N=20407 (5%)	Land transport accidents (V01--V89) N=50 (8%)	Accidental poisoning by and exposure to noxious substances (X40-X49) N=76 (5%)	Land transport accidents (V01--V89) N=630 (4%)	Cerebrovascular diseases (I60--I69) N=3600 (5%)	Influenza and pneumonia (J10-J18) N=4232 (4%)	Atherosclerosis (I70) N=11190 (5%)
5	Atherosclerosis (I70) N=13844 (3%)	Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue (C81-C96) N=29 (4%)	Influenza and pneumonia (J10-J18) N=54 (3%)	Cerebrovascular diseases (I60--I69) N=496 (3%)	Malignant neoplasm of colon, rectosigmoid junction, rectum, anus and anal canal (C18-C21) N=2320 (4%)	Malignant neoplasm of colon, rectosigmoid junction, rectum, anus and anal canal (C18-C21) N=4144 (4%)	Malignant neoplasm of trachea, bronchus and lung (C33, C34) N=6971 (3%)
6	Malignant neoplasm of colon, rectosigmoid junction, rectum, anus and anal canal (C18-C21) N=12187 (3%)	Heart disease (I00-I09, I11, I13, I20-I51) N=22 (3%)	Heart disease (I00-I09, I11, I13, I20-I51) N=46 (3%)	Influenza and pneumonia (J10-J18) N=494 (3%)	Influenza and pneumonia (J10-J18) N=2082 (3%)	In situ neoplasms, benign and neoplasms of uncertain or unknown behaviour(D00--D48) N=2915 (3%)	Diabetes mellitus (E10-E14) N=5812 (3%)
7	Diabetes mellitus (E10-E14) N=9698 (2%)	Event of undetermined intent (Y10-Y34) N=20 (3%)	Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue (C81-C96) N=40 (2%)	Accidental poisoning by and exposure to noxious substances (X40--X49) N=456 (3%)	Malignant neoplasm of breast (female) (C50) N=1690 (3%)	Diabetes mellitus (E10-E14) N=2454 (2%)	Malignant neoplasm of colon, rectosigmoid junction, rectum, anus and anal canal (C18-C21) N=5550 (2%)
8	In situ neoplasms, benign and neoplasms of uncertain or unknown behaviour(D00--D48) N=9550 (2%)	Epilepsy and status epilepticus (G40, G41) N=20 (3%)	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99) N=35 (2%)	Mental and behavioural disorders due to psychoactive substance use (F10-F19) N=432 (3%)	Intentional self-harm [suicide] (X60-X84) N=1658 (3%)	Cirrhosis and other diseases of liver (K70--K76) N=2361 (2%)	In situ neoplasms, benign and neoplasms of uncertain or unknown behaviour(D00--D48) N=5284 (2%)
9	Cirrhosis and other diseases of liver (K70--K76) N=8593 (2%)	Intentional self-harm [suicide] (X60-X84) N=20 (3%)	Falls (W00--W19) N=33 (2%)	Event of undetermined intent (Y10-Y34) N=348 (2%)	Mental and behavioural disorders due to psychoactive substance use (F10-F19) N=1393 (2%)	Atherosclerosis (I70) N=2169 (2%)	Diseases of urinary system (N00-N39) N=4207 (2%)

Rang	Total	1-14	15-24	25-44	45-64	65-74	75 y.o.
10	Malignant neoplasm of breast (female) (C50) N=6827 (2%)	Accidental drowning and submersion (W65-W74) N=13 (2%)	Malignant neoplasm of brain (C71) N=30 (2%)	Malignant neoplasm of breast (female) (C50) N=322 (2%)	Diabetes mellitus (E10-E14) N=1260 (2%)	Chronic lower respiratory diseases(J40--J47) N=2049 (2%)	Dementia and Alzheimer's disease (F01, F03, G30) N=4089 (2%)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	N=39187 (10%)	N=34 (5%)	N=182 (11%)	N=2232 (16%)	N=7804 (12%)	N=7912 (8%)	N=20983 (9%)

Source: Own study based on Statistics Poland data

Figures 3.19a and 3.19 b present the importance of individual broad disease chapters as causes of death in specific age groups in 2023. The lives of younger people, men aged 10–49 and women aged 10–29, were most at risk from external causes such as accidents (transport accidents, falls, poisoning, drowning), suicide and the effects of crime. In subsequent age groups, men aged 50 to 74 were most at risk of cancer and, to a lesser extent, circulatory diseases, which were the leading cause of death among men aged 75 and over. Compared to the situation before the pandemic, cancer has expanded the age range in which it is the most common cause of death among men to include the group aged 70–74. In contrast, the lives of women aged 30–74 in 2023 were most at risk from malignant neoplasms in general, which only gave way to diseases of the circulatory system at the oldest age.

If death before the age of 75 is considered premature,[15] then it results in potential years of life lost (PYLL) calculated as the difference between the age of death and the age of 75. Therefore, deaths at a younger age are more significant than those at an older age. Taking this into account, the extent to which individual causes of death contribute to the potential years of life lost by Polish citizens can be calculated. The PYLL indicator is one of the basic measures of the burden of premature mortality. As shown by OECD data (the latest and most comprehensive data are from 2020), Poland ranks among developed countries with a significant problem of premature mortality.[16]

[15] The adopted age threshold is a matter of choice; the US and the UK use the same threshold, for example, while the OECD and Eurostat use 70 years.

[16] https://data.oecd.org/healthstat/potential-years-of-life-lost.htm; OECD (2022), Potential years of life lost (indicator). doi: 10.1787/193a2829-en (Accessed on 21 September 2022)

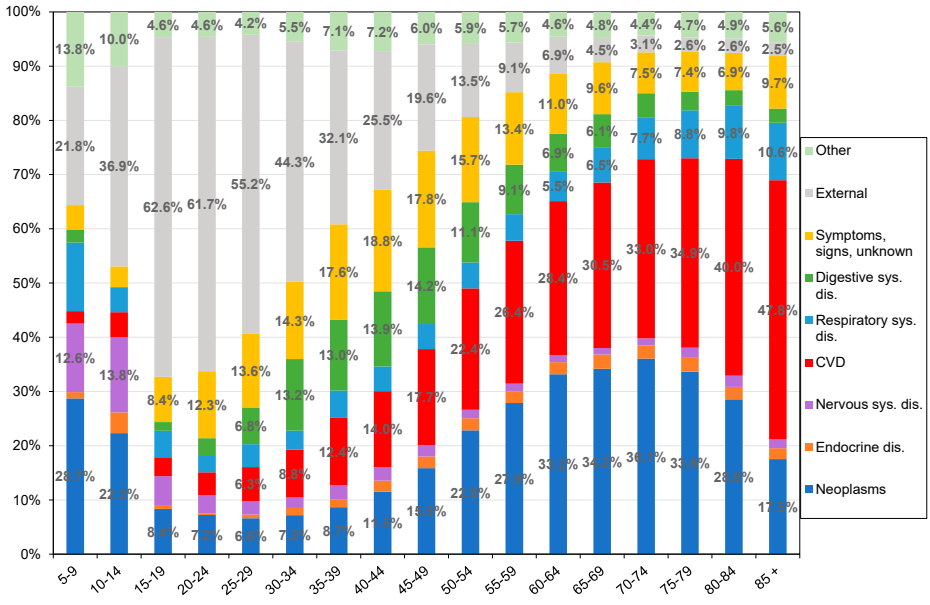


Fig. 3.19a. Percentage of the main causes of death in male mortality in individual five-year age groups in 2023 (own calculations based on Statistics Poland data)

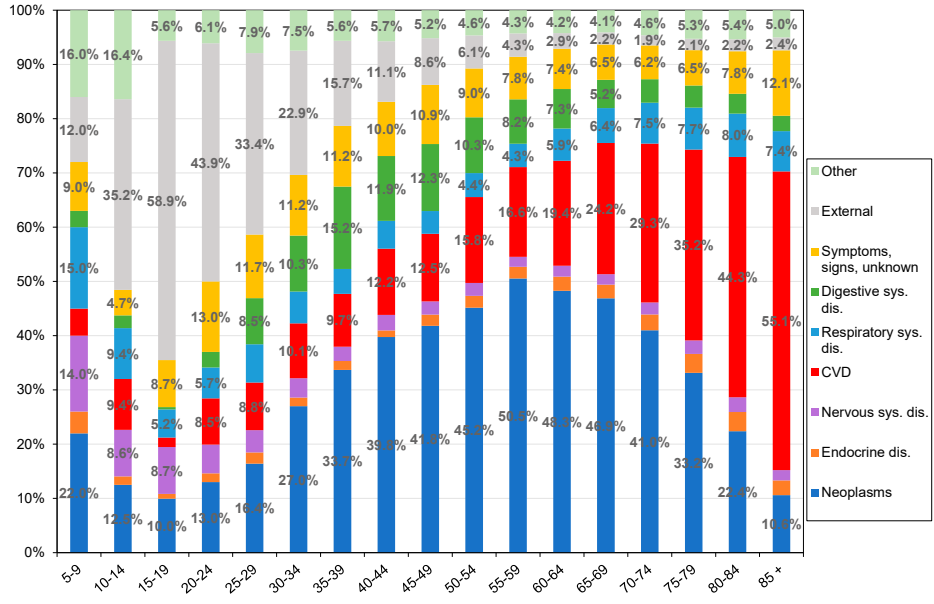


Fig. 3.19 b. Percentage of the main causes of death in female mortality in individual five-year age groups in 2023 (own calculations based on Statistics Poland data)

In 2023, because of deaths before the age of 75, Polish men recorded 1,715,553 (9,957.2 per 100,000) potential years of life lost, and women recorded over half that amount, 748,926 (4,250.9 per 100,000). Figures 3.20a and 3.20b show the percentage of deaths caused by individual diseases or groups of diseases and external causes in the total pool of potential years of life lost for men and women in 2019 and 2023.

For men, diseases of the circulatory system account for almost the same proportion of premature deaths (20.8%) as malignant neoplasms (20.6%), which is a change compared to before the pandemic, when diseases of the circulatory system represented a greater burden (Fig. 3.20a). In the case of DCS, the decrease in PYLL in 2023 compared to 2019 was due to the decline in the share of heart disease and, in the case of cancer, lung cancer. It should be emphasised that in 2023, **suicides were responsible for more potential years of life lost among men than lung cancer, cerebrovascular disease, myocardial infarction, diseases of the respiratory system and chronic liver disease**.

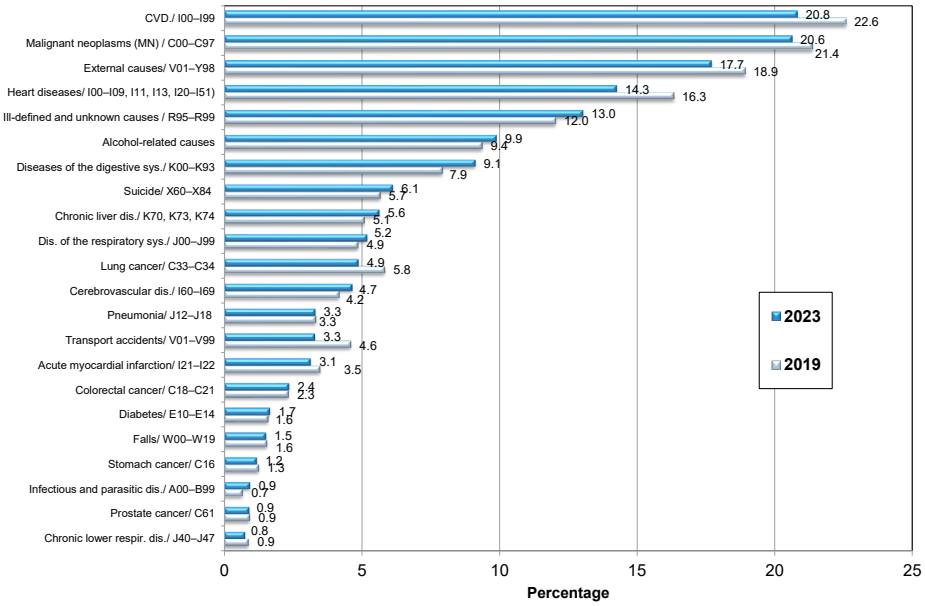


Fig. 3.20a. Share of leading causes of death in potential years of life lost among men in 2019 and 2023 (own calculations based on Statistics Poland data)

For women, the leading cause of potential years of life lost is malignant neoplasms, which accounted for approximately 38% of PYLL75 in 2023, almost the

same as in 2019. The most significant contributors to premature mortality among women in 2023 were malignant neoplasms of the trachea, bronchus and lung, which, it should be emphasised, clearly surpassed malignant neoplasms of the breast, as in 2019, both causes were responsible for the same number of potential years of life lost among women. It is worth noting again that cirrhosis and chronic liver disease now account for more potential years of life lost than cerebrovascular disease, and that malignant neoplasm of the colon, sigmoid, rectum and anus cause more potential years of life lost among women than malignant neoplasm of the cervix uteri.

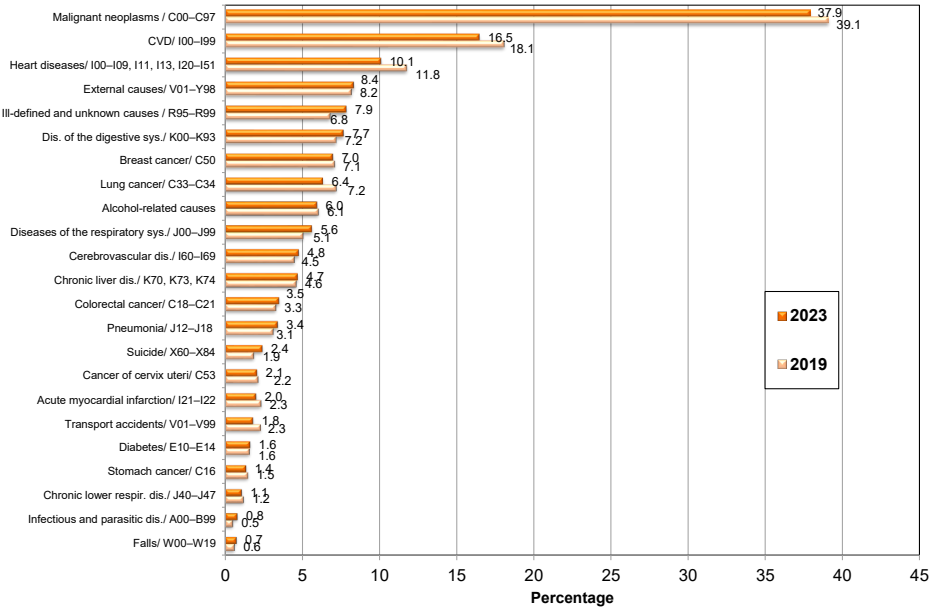


Fig. 3.20b. Share of leading causes of death in potential years of life lost among women in 2019 and 2023 (own calculations based on Statistics Poland data)

After eliminating the effect of age structure differences in subsequent years and between men and women (the European age structure was used as a standard), it can be concluded that the burden of premature mortality for men is currently almost two and a half times higher than for women (Table 3.4). The overall PYLL for men and women after the increase during the pandemic is currently (2023) lower than in 2019. When evaluating the change in potential years of life lost due to specific causes of death in 2023 compared with 2019, attention should be drawn to the currently lower rates observed for the majority of diseases and

health-related events, including avoidable mortality, as well as deaths attributable to all causes directly linked to alcohol consumption.[17] However, it is important to note the increase in potential years of life lost due to infectious and parasitic diseases and female suicides compared to pre-pandemic rates.

Table 3.4. Age-standardised potential years of life lost (PYLL75) for men and women by leading causes of death in 2019, 2021, 2023 (per 100,000 population)

Cause of death (ICD-10)	Men			Women		
	2019	2021	2023	2019	2021	2023
Total	10281.2	12135.8	9567.8	4162.4	4973.2	3934.1
including:						
Certain infectious and parasitic diseases (A00–B99)	68.3	81.5	88.4	20.8	25.3	32.3
Malignant neoplasms (C00–C97)	2231.0	2002.9	1989.2	1600.5	1456.9	1447.8
Malignant neoplasm of stomach (C16)	131.5	116.3	113.7	61.9	47.5	52.6
Malignant neoplasms of colon, sigmoid, rectum and anus (C18–C21)	247.0	224.6	227.5	133.0	131.3	132.3
Malignant neoplasms of trachea, bronchus and lung (C33–C34)	611.1	507.7	473.2	286.1	242.9	232.9
Malignant neoplasm of breast (C50)	-	-	-	297.8	266.6	270.9
Malignant neoplasm of cervix uteri (C53)	-	-	-	90.1	82.1	81.2
Malignant neoplasm of prostate (C61)	99.1	88.5	88.1	-	-	-
Diabetes mellitus (E10–E14)	167.1	182.6	158.2	64.1	74.6	61.1
Diseases of the circulatory system (I00–I99)	2363.2	2444.9	1995.6	726.6	751.7	613.9
Heart diseases (I00–I09, I11, I13, I20–I51)	1710.1	1743.2	1368.8	472.4	479.6	374.3
Acute myocardial infarction (I21–I22)	363.5	436.5	300.8	95.1	95.5	75.5
Cerebrovascular diseases (I60–I69)	435.8	458.9	444.8	182.6	197.0	181.1
Diseases of the respiratory system (J00–J99)	504.2	510.1	495.9	210.1	203.7	217.8
Pneumonia (J12–J18)	344.8	337.4	317.0	131.8	129.4	134.4
Chronic lower respiratory diseases (J40–J47)	94.3	77.2	73.2	46.6	38.5	39.1
Diseases of the digestive system (K00–K93)	806.0	954.5	850.3	299.2	357.6	298.3
Chronic liver disease (K70, K73, K74)	518.1	606.4	524.6	192.7	218.6	184.7
Symptoms, signs and ill-defined conditions (R00–R99)	1234.7	1351.5	1251.0	284.5	328.9	320.8
COVID-19	0.0	1615.8	39.2	0.0	781.9	22.8

[17] OECD, EUROSTAT, Avoidable mortality: OECD/Eurostat lists of preventable and treatable causes of death (November 2019 version), November 2019 http://www.oecd.org/health/health-systems/Avoidable-mortality-2019-Joint-OECD-Eurostat-List-preventable-treatable-causes-of-death.pdf

Cause of death (ICD-10)	Men			Women		
	2019	2021	2023	2019	2021	2023
External causes of death (V01–Y98)	1881.3	1811.5	1668.0	361.2	353.5	352.1
Transport accidents (V01–V99)	461.5	334.7	318.1	104.8	91.2	79.0
Falls (W00–W19)	157.6	170.0	142.8	26.3	25.9	29.9
Intentional self-harm [suicide] (X60–X84)	559.1	572.7	575.9	82.4	89.1	103.6
Alcohol-related	948.8	1094.2	919.0	253.7	286.5	234.5
Avoidable	6943.1	7168.1	6413.7	2766.4	2722.4	2544.7
Preventable	4811.4	4835.1	4342.2	1450.4	1416.4	1315.7
Treatable	2131.7	2333.0	2071.6	1316.0	1306.1	1229.0

Source: Own calculations based on Statistics Poland data

The mortality rates for leading causes of death in Poland are discussed in more detail below, showing differences between men and women, urban and rural areas, and voivodships. Age-standardised death rates were used to facilitate a better comparison across different years and populations, e.g. men and women, urban and rural areas, voivodships and countries.

The years of the COVID-19 pandemic brought significant changes in mortality from various groups of diseases in some voivodeships due to various factors, not necessarily representing the actual reason for an increase or decrease in the risk of death due to a specific group of diseases. A good example is the increase in mortality due to CVDs in 2021 in the voivodships of Dolnośląskie, Kujawsko-pomorskie, Lubelskie, Lubuskie and Mazowieckie. In all these situations, the increase in death rates due to CVDs may be partly an artefact related to differences in the reporting of causes of death and a significant reduction in mortality classified under Ill-defined and unknown causes (ICD-10 R00–R99), including, in particular, "senility" (R54). This peculiar shift in Lubuskie voivodship likely caused the incidence of deaths due to atherosclerosis to increase tenfold (from 37/100,000 to 370/100,000).[18] Therefore, it appears reasonable to focus primarily on comparing the mortality rate of the Polish population in 2023 with that in 2019, i.e. before and after the pandemic.

As mentioned earlier, the results of the National Population and Housing Census 2021, which provided reliable data on the educational attainment of the entire Polish population, enabled us to estimate mortality rates for the leading causes of death in

[18] Wojtyniak B, Stokwiszewski J, Rabchenko D, et.al. "Długość życia i umieralność ludności Polski" in Wojtyniak B, Goryński P. Sytuacja zdrowotna ludności Polski i jej uwarunkowania 2022, NIZP PZH – PIB, Warsaw 2022

subpopulations defined by the level of education. Age-standardised rates were calculated due to differences in the age structure of people with different levels of education. The results of this analysis enabled us to present, for the first time in the Report on the health status of the Polish population, the differences in mortality rates in Polish society related to one of the most important determinants of social status.

Mortality due to diseases of the circulatory system

The mortality rate from diseases of the circulatory system (DCS) and their share in the total number of deaths gradually decreased until 2019, but the pandemic years brought an increase in death rates. However, with the emergence of COVID-19, the share of DSC in total deaths decreased and is now also lower than before the pandemic (Tables 3.5a and 3.5b). The mortality rate due to CVDs is already lower than in 2019 (Fig. 3.21). These diseases continue to pose the greatest threat to the lives of Poles. In 2023, 150,957 people in Poland died from them, i.e. 400.4 per 100,000 population.

Table 3.5a. Mortality rate for MEN by leading causes in 2014–2023

Cause of death (ICD-10)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Age-standardised death rates per 100,000 men										
Malignant neoplasms (C00–C97)	405.1	426.5	414.3	400.6	398.8	382.6	382.4	355.0	360.9	364.5
Dis. of the circulatory sys. (I00–I99)	703.1	723.9	656.3	636.4	624.1	593.7	643.6	660.0	582.6	538.2
Dis. of the respiratory sys. (J00–J99)	106.4	119.9	111.6	122.1	125.3	120.4	129.1	121.5	126.4	124.1
Dis. of the digestive sys. (K00–K93)	60.6	57.3	61.6	62.4	64.2	64.1	68.9	75.1	74.6	71.9
Symptoms, signs (R00–R99)	118.2	105.1	117.8	150.4	163.2	165.1	182.6	142.2	157.0	143.2
COVID-19 (U07)	0.0	0.0	0.0	0.0	0.0	0.0	184.8	365.4	118.0	18.5
External causes (V01–Y98)	96.2	87.5	84.6	83.9	87.6	85.3	87.2	92.4	87.0	83.3
Percentage share in total deaths among men										
Malignant neoplasms (C00–C97)	26.9	27.2	27.3	26.3	25.9	25.7	21.8	18.8	22.5	25.5
Dis. of the circulatory sys. (I00–I99)	40.3	40.7	38.2	36.5	35.9	35.7	32.6	30.8	32.3	33.2
Dis. of the respiratory sys. (J00–J99)	5.9	6.5	6.4	6.9	7.1	7.1	6.5	5.7	7.1	7.6
Dis. of the digestive sys. (K00–K93)	4.5	4.2	4.6	4.6	4.7	4.9	4.5	4.5	5.3	5.5
Symptoms, signs (R00–R99)	7.6	7.0	8.2	10.1	10.5	10.5	10.1	7.7	9.7	9.9
COVID-19 (U07)	0.0	0.0	0.0	0.0	0.0	0.0	9.6	18.0	6.3	1.1
External causes (V01–Y98)	8.3	7.2	7.1	6.9	7.0	7.0	6.0	5.7	6.3	6.7

Source: Authors' calculations based on Statistics Poland data

Table 3.5b. Mortality rate for WOMEN by leading causes in 2014–2023

Cause of death (ICD-10)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Age-standardised death rates per 100,000 women										
Malignant neoplasms (C00–C97)	220.9	227.5	223.1	221.3	222.5	219.3	215.8	203.3	207.4	213.9
Dis. of the circulatory sys. (I00–I99)	468.9	487.3	441.6	434.1	425.9	395.6	424.0	446.7	396.1	365.1
Dis. of the respiratory sys. (J00–J99)	45.2	54.9	49.0	57.6	58.4	56.5	58.0	58.9	63.5	65.1
Dis. of the digestive sys. (K00–K93)	34.1	31.2	33.0	34.4	34.3	34.2	35.9	40.6	39.7	38.8
Symptoms, signs (R00–R99)	67.0	58.1	62.7	80.6	93.8	103.1	110.5	73.5	91.7	82.9
COVID-19 (U07)	0.0	0.0	0.0	0.0	0.0	0.0	82.0	195.4	66.5	9.5
External causes (V01–Y98)	26.4	25.0	24.1	24.1	24.6	24.5	25.2	29.9	27.6	26.8
Percentage share in total deaths among women										
Malignant neoplasms (C00–C97)	23.7	23.6	24.1	23.1	22.9	23.2	20.0	17.2	20.3	23.2
Dis. of the circulatory sys. (I00–I99)	50.3	51.0	48.8	46.7	45.5	43.4	40.9	39.1	39.8	40.8
Dis. of the respiratory sys. (J00–J99)	4.8	5.7	5.4	6.1	6.2	6.1	5.5	5.1	6.3	7.2
Dis. of the digestive sys. (K00–K93)	3.7	3.3	3.6	3.6	3.6	3.7	3.4	3.4	3.9	4.2
Symptoms, signs (R00–R99)	7.2	6.1	7.0	8.7	10.1	11.5	10.7	6.4	9.2	9.2
COVID-19 (U07)	0.0	0.0	0.0	0.0	0.0	0.0	7.7	16.7	6.6	1.1
External causes (V01–Y98)	2.9	2.6	2.6	2.5	2.5	2.6	2.3	2.5	2.7	2.8

Źródło: obliczenia własne autorów na podstawie danych GUS

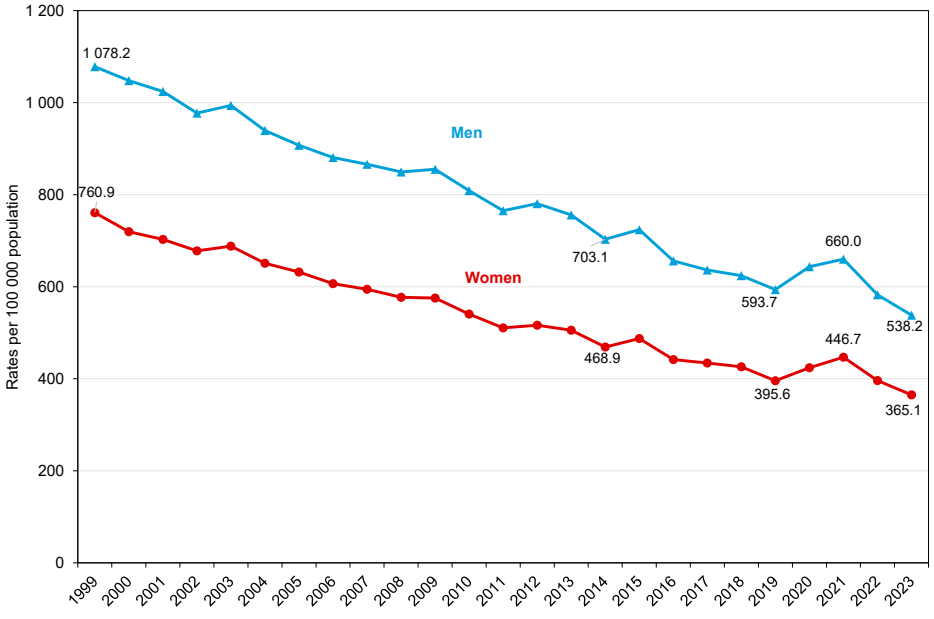


Fig. 3.21. Age-standardised death rates due to all diseases of the circulatory system for men and women in Poland, 1999–2023 (own calculations based on Statistics Poland databases)

Although women die more often than men due to DCS, this is because of their higher average age. After eliminating age differences between the two sexes, it turns out that these diseases pose a much greater threat to men, as the standardised death rate in 2023 for men was 47.4% higher than for women (Tables 3.6a and 3.6b).

Table 3.6a. Crude death rates by sex and cause in 2019, 2022 and 2023 (per 100,000 population)

Causes of death (ICD-10)	Men			Women		
	2019	2022	2023	2019	2022	2023
Total	1138.5	1256.7	1150.1	1000.6	1118.9	1024.2
including:						
Certain infectious and parasitic diseases (A00–B99)	5.0	7.3	7.5	3.8	6.1	6.1
Tuberculosis (A15–A19)	1.9	2.1	2.0	0.5	0.4	0.5
Malignant neoplasms (C00–C97)	292.8	283.1	292.7	231.9	226.6	237.9
Malignant neoplasm of stomach (C16)	16.8	15.3	16.2	8.7	7.9	8.5
Malignant neoplasms of colon, sigmoid, rectum and anus (C18–C21)	37.9	38.0	37.6	27.0	26.7	27.4
Malignant neoplasm of trachea, bronchus and lung (C33–C34)	80.4	71.3	74.4	41.5	40.6	44.2
Malignant neoplasm of breast (C50)	0.4	0.6	0.4	35.1	33.8	34.7
Malignant neoplasm of cervix uteri (C53)	-	-	-	7.9	7.0	7.2
Malignant neoplasm of prostate (C61)	30.3	30.8	32.2	-	-	-
Malignant neoplasm of bladder (C67)	16.9	16.3	16.5	5.1	4.8	5.1
Diabetes mellitus (E10–E14)	22.6	27.2	24.0	25.7	30.3	27.3
Mental and behavioural disorders (F00–F99)	16.2	21.2	17.6	4.1	10.6	9.3
Diseases of the nervous system (G00–G99)	16.1	18.6	18.7	18.2	23.4	22.4
Diseases of the circulatory system (I00–I99)	406.4	406.2	381.8	434.6	444.9	417.8
Heart diseases (I00–I09, I11, I13, I20–I51)	265.7	282.9	259.6	247.7	294.7	275.5
Acute myocardial infarction (I21–I22)	40.7	40.6	37.2	25.5	23.1	23.5
Cerebrovascular diseases (I60–I69)	69.9	78.0	76.2	80.2	90.8	85.4
Diseases of the respiratory system (J00–J99)	81.1	88.9	87.9	61.3	70.6	73.7
Pneumonia (J12–J18)	52.8	56.9	56.5	42.6	47.6	49.7
Chronic lower respiratory diseases (J40–J47)	21.0	19.5	18.3	13.5	13.6	13.5
Diseases of the digestive system (K00–K93)	55.6	66.1	63.5	36.7	43.2	43.0
Chronic liver disease (K70, K73, K74)	28.6	33.4	30.4	11.8	13.2	12.0
Diseases of the genitourinary system (N00–N99)	10.5	16.0	15.5	13.0	18.6	17.5
Symptoms, signs and ill-defined conditions (R00–R99)	120.1	121.5	114.1	115.6	103.2	94.5
COVID (U07, U10)	-	82.9	12.9	-	76.9	11.5
External causes of death (V01–Y98)	79.6	79.2	76.7	26.0	29.7	29.2

Causes of death (ICD-10)	Men			Women		
	2019	2022	2023	2019	2022	2023
Transport accidents (V01–V99)	15.8	10.2	10.5	4.3	2.7	2.8
Falls (W00–W19)	13.5	15.7	14.2	11.0	12.4	12.5
Intentional self-harm [suicide] (X60–X84)	21.3	20.5	21.4	3.1	3.4	3.4
Alcohol-related	50.3	58.8	51.7	14.5	16.5	14.3
Avoidable*	472.6	496.6	471.7	228.8	238.4	234.4
Preventable*	315.4	319.6	305.9	121.2	124.6	121.9
Treatable*	157.2	177.0	165.7	107.6	113.8	112.5

*Refers to the population aged 0–74
Source: Authors' calculations based on Statistics Poland data

Table 3.6b. Age-standardised death rates by sex and cause in 2019, 2022 and 2023 (per 100,000 population)

Causes of death (ICD-10)	Men			Women		
	2019	2022	2023	2019	2022	2023
Total	1546.4	1679.6	1500.6	922.0	1008.2	907.6
including:						
Certain infectious and parasitic diseases (A00–B99)	6.1	9.4	9.3	3.5	5.6	5.4
Tuberculosis (A15–A19)	2.0	2.2	2.1	0.4	0.4	0.4
Malignant neoplasms (C00–C97)	382.6	360.9	364.5	219.3	207.4	213.9
Malignant neoplasm of stomach (C16)	21.7	19.0	20.0	8.2	7.3	7.6
Malignant neoplasm of colon, sigmoid, rectum and anus (C18–C21)	51.9	49.9	48.1	25.5	24.4	24.6
Malignant neoplasm of trachea, bronchus and lung (C33–C34)	99.7	86.0	87.9	38.9	36.8	39.1
Malignant neoplasm of breast (C50)	0.7	0.7	0.5	33.3	31.2	31.5
Malignant neoplasm of cervix uteri (C53)	-	-	-	7.5	6.5	6.6
Malignant neoplasm of prostate (C61)	46.4	46.1	46.7	-	-	-
Malignant neoplasm of bladder (C67)	24.2	22.6	22.1	4.8	4.4	4.5
Diabetes mellitus (E10–E14)	30.9	36.5	31.4	23.8	27.3	24.2
Mental and behavioural disorders (F00–F99)	16.6	23.5	19.2	3.8	9.6	8.3
Diseases of the nervous system (G00–G99)	21.9	25.3	24.8	17.1	21.3	20.1
Diseases of the circulatory system (I00–I99)	593.7	582.6	538.2	395.6	396.1	365.1
Heart diseases (I00–I09, I11, I13, I20–I51)	378.6	405.0	366.7	226.4	261.9	240.2
Acute myocardial infarction (I21–I22)	52.7	49.9	46.0	23.7	20.9	20.8
Cerebrovascular diseases (I60–I69)	99.8	109.1	103.9	73.8	81.5	75.3
Diseases of the respiratory system (J00–J99)	120.4	126.4	124.1	56.5	63.5	65.1

Causes of death (ICD-10)	Men			Women		
	2019	2022	2023	2019	2022	2023
Pneumonia (J12–J18)	79.6	82.5	81.8	38.9	42.7	43.8
Chronic lower respiratory diseases (J40–J47)	30.7	27.3	25.0	12.7	12.2	12.0
Diseases of the digestive system (K00–K93)	64.1	74.6	71.9	34.2	39.7	38.8
Chronic liver disease (K70, K73, K74)	29.2	33.4	30.4	11.2	12.4	11.2
Diseases of the genitourinary system (N00–N99)	16.1	23.7	22.6	11.9	16.8	15.5
Symptoms, signs and ill-defined conditions (R00–R99)	165.1	157.0	143.2	103.1	91.7	82.9
COVID (U07, U10)	-	122.5	19.6	-	69.2	10.1
External causes of death (V01–Y98)	85.3	87.0	83.3	24.5	27.6	26.8
Transport accidents (V01–V99)	16.1	10.5	10.7	4.2	2.7	2.8
Falls (W00–W19)	18.1	20.9	18.9	9.9	11.1	11.0
Intentional self-harm [suicide] (X60–X84)	21.6	20.7	21.4	3.0	3.4	3.4
Alcohol-related	50.5	58.3	51.1	13.8	15.5	13.4
Avoidable*	502.8	507.7	476.8	213.9	210.7	204.4
Preventable*	332.9	325.6	308.3	112.9	110.1	106.3
Treatable*	169.9	182.1	168.5	101.0	100.6	98.2

*Refers to the population aged 0–74
Source: Authors' calculations based on Statistics Poland data

Tabela 3.7a. Rzeczywiste współczynniki zgonów według płci, miejsca zamieszkania oraz przyczyn w 2023 r. (na 100 tysięcy ludności)

Causes of death (ICD-10)	Total		Men		Women	
	Urban area	Rural area	Urban area	Rural area	Urban area	Rural area
Total	1138.4	1006.5	1198.1	1083.1	1084.9	930.2
including:						
Certain infectious and parasitic diseases (A00–B99)	7.7	5.4	8.5	6.0	6.9	4.8
Tuberculosis (A15–A19)	1.4	1.1	2.3	1.7	0.5	0.4
Malignant neoplasms (C00–C97)	287.7	230.2	311.1	267.1	266.6	193.5
Malignant neoplasm of stomach (C16)	13.2	10.7	17.5	14.3	9.4	7.0
Malignant neoplasms of colon, sigmoid, rectum and anus (C18–C21)	34.9	28.6	40.0	34.3	30.3	23.0
Malignant neoplasms of trachea, bronchus and lung (C33–C34)	63.4	52.0	76.5	71.5	51.7	32.6
Malignant neoplasm of breast (C50)	20.8	14.1	0.4	0.4	39.2	27.7
Malignant neoplasm of cervix uteri (C53)	4.3	2.9	-	-	8.1	5.8
Malignant neoplasm of prostate (C61)	16.6	14.1	35.0	28.2	-	-
Malignant neoplasm of bladder (C67)	11.8	8.9	18.1	14.2	6.1	3.6

Causes of death (ICD-10)	Total		Men		Women	
	Urban area	Rural area	Urban area	Rural area	Urban area	Rural area
Diabetes mellitus (E10–E14)	26.6	24.4	25.9	21.4	27.3	27.3
Mental and behavioural disorders (F00–F99)	12.9	13.9	16.3	19.5	9.9	8.3
Diseases of the nervous system (G00–G99)	23.1	16.9	20.6	15.9	25.3	17.9
Diseases of the circulatory system (I00–I99)	407.6	389.8	392.1	367.5	421.6	412.0
Heart diseases (I00–I09, I11, I13, I20–I51)	271.2	262.9	267.0	249.3	275.0	276.3
Acute myocardial infarction (I21–I22)	32.6	26.5	40.4	32.7	25.5	20.3
Cerebrovascular diseases (I60–I69)	84.4	75.9	78.6	72.8	89.6	79.0
Diseases of the respiratory system (J00–J99)	88.1	69.5	95.6	77.3	81.5	61.7
Pneumonia (J12–J18)	59.4	43.6	64.0	46.0	55.2	41.3
Chronic lower respiratory diseases (J40–J47)	15.8	15.8	17.2	19.8	14.6	11.7
Diseases of the digestive system (K00–K93)	57.5	46.1	67.9	57.4	48.3	34.9
Chronic liver disease (K70, K73, K74)	22.7	18.1	32.4	27.6	14.0	8.7
Diseases of the genitourinary system (N00–N99)	18.2	14.0	16.8	13.7	19.5	14.4
Symptoms, signs and ill-defined conditions (R00–R99)	107.6	98.6	118.1	108.5	98.1	88.8
COVID (U07, U10)	14.2	9.2	15.4	9.4	13.1	9.0
External causes of death (V01–Y98)	50.0	55.2	71.4	84.1	30.8	26.6
Transport accidents (V01–V99)	5.4	8.1	8.5	13.3	2.7	3.0
Falls (W00–W19)	13.9	12.5	14.4	13.9	13.4	11.2
Intentional self-harm [suicide] (X60–X84)	10.8	14.0	18.9	24.9	3.5	3.1
Alcohol-related	33.5	30.8	52.3	51.0	16.8	10.6
Avoidable*	363.3	335.1	474.5	467.8	258.7	197.6
Preventable*	217.0	207.0	303.5	309.2	135.7	101.1
Treatable*	146.3	128.1	171.0	158.5	123.0	96.5

*Refers to the population aged 0–74
Source: Authors' calculations based on Statistics Poland data

Tabela 3.7b. Standaryzowane współczynniki zgonów według płci, miejsca zamieszkania oraz wybranych przyczyn w 2023 r. (na 100 tysięcy ludności)

Causes of death (ICD-10)	Total		Men		Women	
	Urban area	Rural area	Urban area	Rural area	Urban area	Rural area
Total	1124.4	1214.5	1456.1	1582.0	896.2	930.5
including:						
Certain infectious and parasitic diseases (A00–B99)	7.6	6.4	10.0	8.1	5.8	4.9
Tuberculosis (A15–A19)	1.3	1.1	2.3	2.0	0.5	0.4

Causes of death (ICD-10)	Total		Men		Women	
	Urban area	Rural area	Urban area	Rural area	Urban area	Rural area
Malignant neoplasms (C00–C97)	274.9	264.6	363.3	365.1	222.8	196.9
Malignant neoplasm of stomach (C16)	12.7	12.2	20.4	19.4	7.9	7.2
Malignant neoplasm of colon, sigmoid, rectum and anus (C18–C21)	33.6	33.5	47.7	48.6	25.2	23.5
Malignant neoplasms of trachea, bronchus and lung (C33–C34)	58.8	58.1	85.0	92.6	42.2	33.0
Malignant neoplasm of breast (C50)	20.2	16.3	0.5	0.6	33.3	28.2
Malignant neoplasm of cervix uteri (C53)	4.1	3.2	-	-	7.1	5.9
Malignant neoplasm of prostate (C61)	16.3	17.4	46.2	47.5	-	-
Malignant neoplasm of bladder (C67)	11.3	10.6	22.4	21.6	5.0	3.7
Diabetes mellitus (E10–E14)	26.4	30.2	31.4	31.5	22.4	27.7
Mental and behavioural disorders (F00–F99)	12.6	15.2	17.3	22.3	8.3	8.2
Diseases of the nervous system (G00–G99)	23.2	20.4	26.0	22.6	21.0	18.2
Diseases of the circulatory system (I00–I99)	410.2	493.0	505.8	599.3	342.5	407.9
Heart diseases (I00–I09, I11, I13, I20–I51)	272.8	332.9	344.6	409.0	223.0	272.9
Acute myocardial infarction (I21–I22)	31.6	31.2	46.9	44.7	21.0	20.5
Cerebrovascular diseases (I60–I69)	84.6	94.6	99.1	112.3	73.4	79.1
Diseases of the respiratory system (J00–J99)	87.8	86.0	123.8	125.0	66.8	61.9
Pneumonia (J12–J18)	59.7	54.7	84.9	76.3	45.2	41.3
Chronic lower respiratory diseases (J40–J47)	15.3	19.3	21.2	32.0	12.0	11.9
Diseases of the digestive system (K00–K93)	55.6	51.6	73.6	69.3	41.0	35.1
Chronic liver disease (K70, K73, K74)	21.4	18.3	32.0	28.1	12.7	8.7
Diseases of the genitourinary system (N00–N99)	18.4	17.8	22.4	23.2	16.0	14.5
Symptoms, signs and ill-defined conditions (R00–R99)	106.8	118.5	138.4	153.1	80.7	87.4
COVID (U07, U10)	14.3	11.7	21.3	16.2	10.7	9.0
External causes of death (V01–Y98)	49.4	59.3	75.8	94.8	27.1	26.5
Transport accidents (V01–V99)	5.4	8.3	8.6	13.7	2.6	3.0
Falls (W00–W19)	14.1	15.3	18.0	20.3	11.1	11.1
Intentional self-harm [suicide] (X60–X84)	10.6	14.0	18.6	25.7	3.5	3.1
Alcohol-related	31.5	30.7	50.9	51.4	15.2	10.5
Avoidable*	323.6	343.5	463.0	498.3	210.4	194.6
Preventable*	194.1	211.2	296.0	326.9	110.4	99.2
Treatable*	129.6	132.3	167.0	171.4	100.0	95.4

*Refers to the population aged 0–74
Source: Authors' calculations based on Statistics Poland data

In most voivodships, the mortality rate due to CVDs in 2023 was lower than in 2019. Only in the voivodships of Dolnośląskie, Lubelskie, Lubuskie and

Podkarpackie was the death rate in 2023 still higher than in 2019, both for the total population and for people aged 65 and over (Fig. 3.22a and 3.22b).

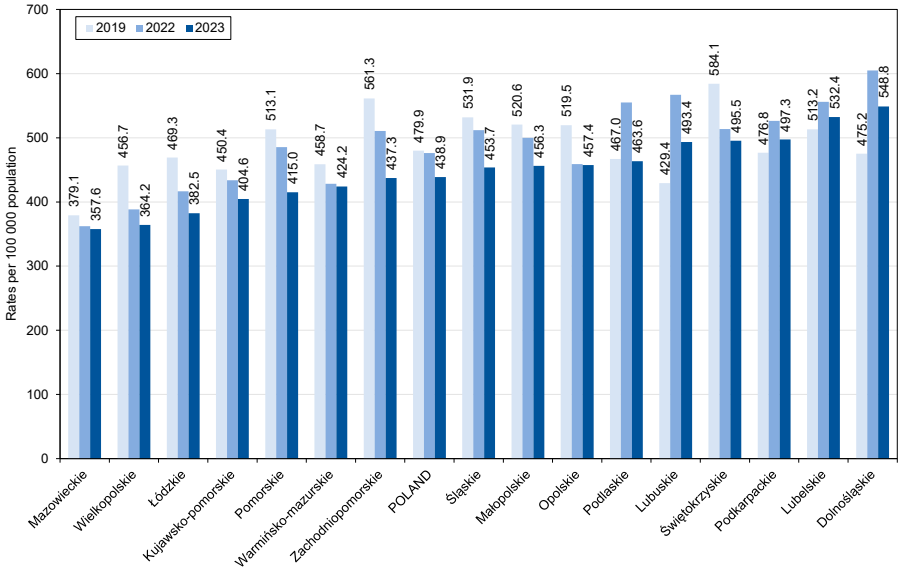


Fig. 3.22a Age-standardised death rates due to diseases of the circulatory system for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

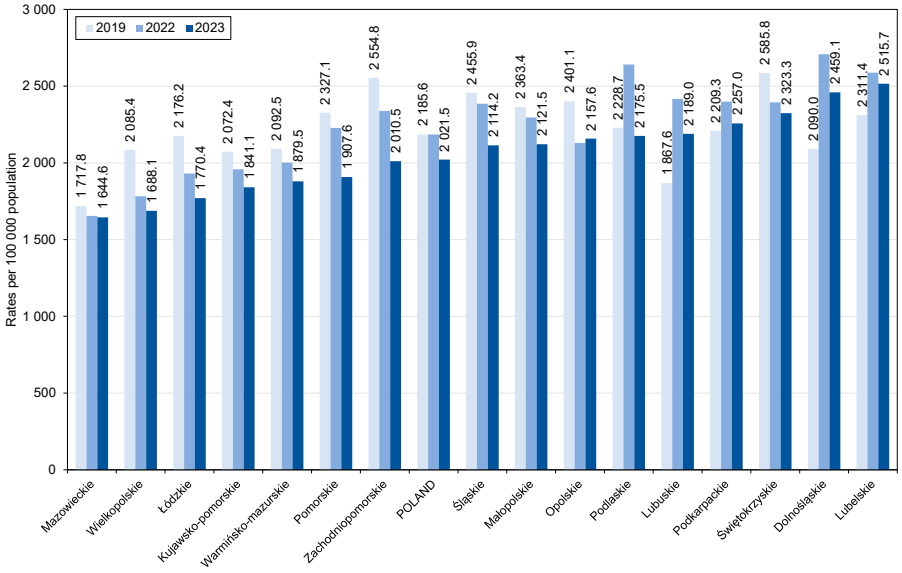


Fig. 3.22b Age-standardised death rates due to diseases of the circulatory system for persons aged 65 and over by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

Table 3.8 presents the percentage differences in the observed standardized death rates due to all CVDs for individual provinces in relation to their expected values based on previous 10-year trends for men and women in 2022 and 2023. In the Łódzkie, Świętokrzyskie, Wielkopolskie and Zachodniopomorskie voivodships, the mortality rate in both 2022 and 2023 was significantly lower than expected, while the previously mentioned excess mortality in the Dolnośląskie, Lubelski, Lubuskie and Podkarpackie voivodships occurs for both men and women.

Table 3.8. Relative (%) difference in observed standardized death rates due to all cardiovascular diseases in men and women compared to their expected values based on previous 10-year trends by province in 2022 and 2023

Voivodship	2022		2023	
	Men	Women	Men	Women
Dolnośląskie	33.5	78.3	22.1	59.3
Kujawsko-pomorskie	2.3	1.5	-1.5	-9.8
Lubelskie	9.6	14.8	3.8	9.4
Lubuskie	43.3	48.7	20.1	32.5
Łódzkie	-2.5	-7.9	-7.1	-17.4
Małopolskie	-4.4	0.6	-13.1	-8.8
Mazowieckie	23.7	5.7	25.8	3.3
Opolskie	-12.7	0.7	-15.5	2.2
Podkarpackie	20.4	15.3	9.4	11.3
Podlaskie	11.3	19.8	-3.6	-5.1
Pomorskie	-4.8	-3.3	-18.5	-18.9
Śląskie	0.4	1.8	-12.8	-10.2
Świętokrzyskie	-4.7	-7.1	-8.1	-11.9
Warmińsko-mazurskie	-6.3	2.1	-8.4	-1.4
Wielkopolskie	-13.9	-13.0	-19.7	-19.2
Zachodniopomorskie	-5.4	-10.5	-20.4	-23.2
Poland	4.7	8.5	-4.2	-1.1

Source: Authors' calculations based on Statistics Poland data

The average age at death due to CVDs in 2023 was 74.8 years for men and 83.6 years for women (Tab. 3.9a). Even after eliminating age differences in both sexes, women die from these diseases on average 4.7 years later than men (Tab. 3.9b). On average, men and women in Lubuskie voivodship die at the youngest

age, while inhabitants of Lubelskie voivodship die at the oldest age. People living in urban areas die on average one year younger than those living in rural areas; however, in Lubuskie and Zachodniopomorskie voivdoships, men living in urban areas die on average 2.5 years younger than those living in rural areas.

Table 3.9a. Average age at death due to CVDs by voivodship, sex and place of residence (urban/rural) in 2023 – actual values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	73.1	73.4	72.1	83.1	83.1	83.3
Kujawsko-pomorskie	73.7	74.3	72.9	82.7	82.4	83.2
Lubelskie	76.7	76.8	76.7	85.1	84.2	85.7
Lubuskie	72.0	72.1	71.7	81.6	81.7	81.4
Łódzkie	74.8	74.7	74.9	83.2	82.8	83.9
Małopolskie	75.9	76.5	75.2	84.2	84.2	84.2
Mazowieckie	75.4	76.2	73.9	83.9	84.0	83.8
Opolskie	76.0	76.1	75.9	83.8	83.4	84.2
Podkarpackie	74.5	75.1	74.1	84.4	83.7	84.8
Podlaskie	76.3	75.8	76.8	85.1	84.0	86.3
Pomorskie	74.5	75.7	72.1	83.2	83.4	82.7
Śląskie	75.3	75.2	75.7	83.0	82.8	83.7
Świętokrzyskie	76.2	76.3	76.2	84.7	83.9	85.4
Warmińsko-mazurskie	72.0	73.2	70.4	82.8	82.5	83.2
Wielkopolskie	74.6	75.1	73.8	82.7	82.7	82.7
Zachodniopomorskie	74.1	74.4	73.5	82.9	82.9	82.9
Poland	74.8	75.1	74.4	83.6	83.3	84.1

Source: Authors' calculations based on Statistics Poland data

Tabela 3.9b. Average age at death due to CVDs by voivodship, sex and place of residence (urban/rural) in 2023 – age-standardised values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	76.3	75.7	77.9	81.6	81.4	82.2
Kujawsko-pomorskie	77.0	76.7	77.4	81.6	81.2	82.4
Lubelskie	79.5	79.2	79.7	83.8	83.3	84.2
Lubuskie	76.0	75.3	77.7	80.8	80.8	80.7

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Łódzkie	77.7	77.2	78.8	82.0	81.6	82.7
Małopolskie	78.2	78.0	78.5	82.8	82.6	83.0
Mazowieckie	77.3	77.4	77.3	82.2	82.1	82.3
Opolskie	78.4	78.4	78.4	82.7	82.4	83.0
Podkarpackie	77.4	77.5	77.3	83.0	82.7	83.1
Podlaskie	78.6	78.4	79.7	83.3	82.7	83.9
Pomorskie	77.4	77.5	77.4	82.1	81.9	82.4
Śląskie	77.8	77.4	79.4	82.4	82.2	83.2
Świętokrzyskie	78.7	78.3	79.2	83.3	82.9	83.6
Warmińsko-mazurskie	76.4	76.7	76.5	81.7	81.2	82.3
Wielkopolskie	77.9	77.7	78.2	82.1	81.8	82.5
Zachodniopomorskie	77.6	77.0	79.5	81.9	81.7	82.3
Poland	77.6	77.2	78.2	82.3	82.0	82.9

Source: Authors' calculations based on Statistics Poland data

The mortality rate of the Polish population due to diseases of the circulatory system is clearly related to the level of education (Fig. 3.23). **The lives of people with up to lower secondary education are more than two and a half times more at risk from these diseases than those with tertiary education**. The lives of people with upper secondary education are twice as vulnerable as those with tertiary education.

When analysing mortality in Poland due to diseases of the circulatory system, it is important to remember, as we unfortunately stress in every Report, that there are significant limitations in comparing mortality rates in Poland with more detailed CVDs subgroups, both at the regional and international level. On the one hand, for many specific cardiovascular diseases, there are significant differences between voivodships in determining and coding causes of death, and on the other hand, diagnoses/codes defined by WHO experts as garbage codes,[19],[20] are assigned

[19] https://stat.gov.pl/obszary-tematyczne/ludnosc/statystyka-przyczyn-zgonow/zgony-wedlug-przyczyn-okreslanych-jako-garbage-codes,3,2.html

[20] *WHO methods and data sources for country-level causes of death 2000-2012*, Global Health Estimates Technical Paper WHO/HIS/HSI/GHE/2014.7, WHO, Geneva, May 2014
Na co umarł pacjent – czyli, co jest wpisywane na kartach zgonów http://stat.gov.pl/obszary-tematyczne/ludnosc/statystyka-przyczyn-zgonow/na-co-umarl-pacjent-czyli-co-jest-wpisywane-na-kartach-zgonow-,1,1.html

as causes of death in Poland. Unfortunately, differences between voivodships remain striking, as the percentage of deaths with such codes in the total number of deaths due to CVDs in 2023 ranged from about 5% in Kujawsko-pomorskie and Pomorskie voivodships to about 50% in the Świętokrzyskie and Małopolskie voivodships (Fig. 3.24). Because of such codes, the analysis presented below includes total heart diseases (ICD-10 I00–I09, I11, I13, I20–I51), myocardial infarction (I21–I22) and cerebrovascular diseases (I60–I69) among CVDs.

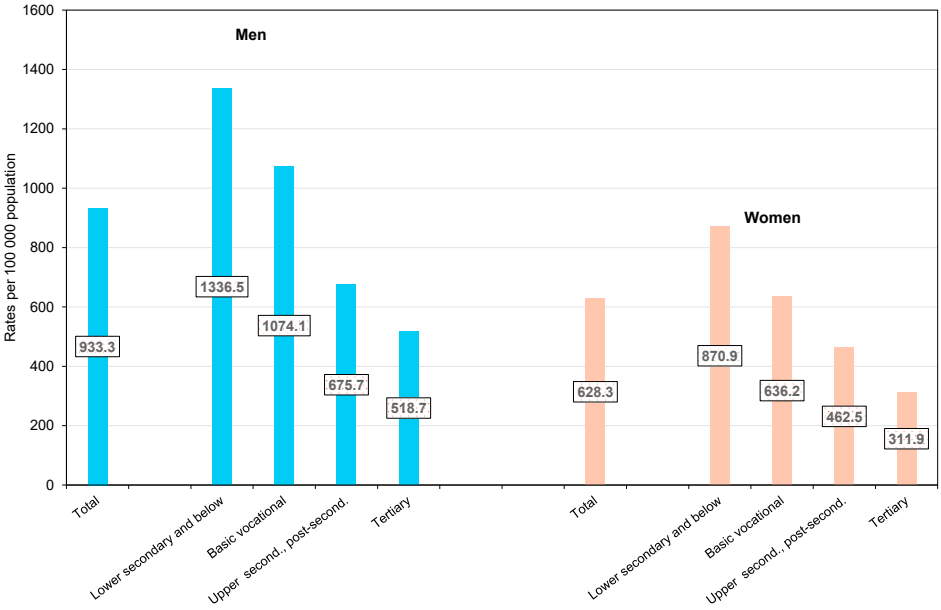


Fig. 3.23. Standardised death rates due to DCS for men and women aged 30 and over by level of education in the three-year period 2020–2022 (own calculations based on Statistics Poland data)

Heart disease is by far the most common cause of death among diseases of the circulatory system (101,000 deaths in 2023, including 11,300 myocardial infarctions, accounting for 66.9% and 7.5% of all deaths from cardiovascular diseases, respectively), followed by **cerebrovascular diseases** (31,500 deaths, 20.2% of the total group). Age-standardised death rates due to heart disease for women and cerebrovascular disease for both sexes in 2023 were still higher than in 2019 (Table 3.6b).

Diseases of the circulatory system pose a greater threat to rural than urban populations, which is clearly evident after age standardisation (the urban

population is, on average, older than the rural population) (Tables 3.7a and 3.7b). Myocardial infarction is an exception, as it is more common among urban than rural populations.

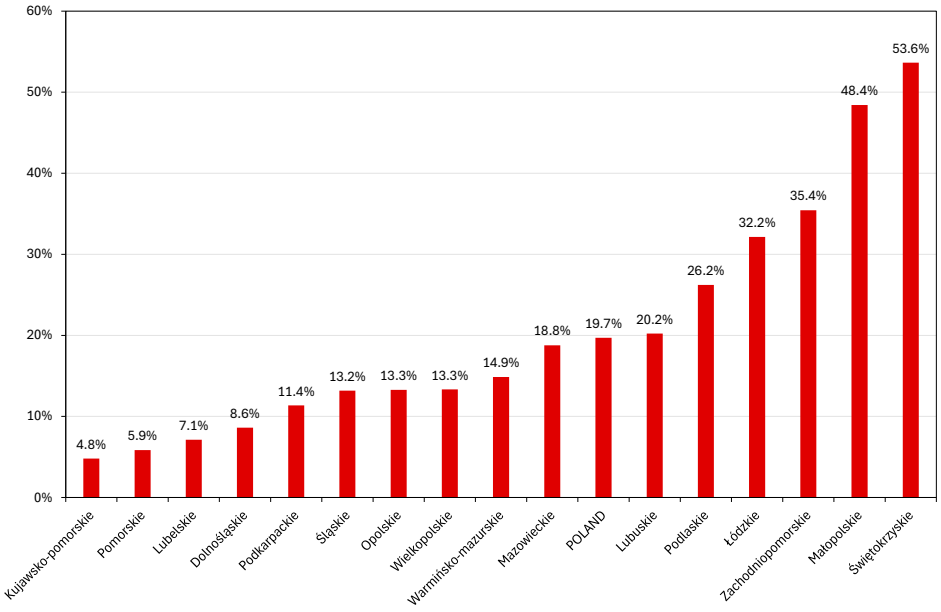


Fig. 3.24. Percentage of garbage-coded deaths in the total number of deaths due to diseases of the circulatory system by voivodship in 2023 (based on Statistics Poland data)

Diseases of the circulatory system pose a greater threat to life in rural areas than in urban areas in all voivodships. Figure 3.25 shows the excess mortality of these subpopulations in each voivodship in relation to the observed mortality for Poland in 2021. The highest excess mortality rate in relation to the national average for both urban and rural areas was in Dolnośląskie voivodship. High excess mortality among urban populations was observed in the voivodships of Lubelskie and Lubuskie, while mortality among rural populations exceeded the national average only slightly.

Mortality due to myocardial infarction is surprisingly high in Lubuskie voivodship (Fig. 3.26). The death rate due to this cause in 2022 and 2023 is twice as high as in 2019. This is undoubtedly an artefact related to determining and coding causes of death in this voivodship. In addition, in almost all voivodships, the death rate in 2023 was lower than in 2019.

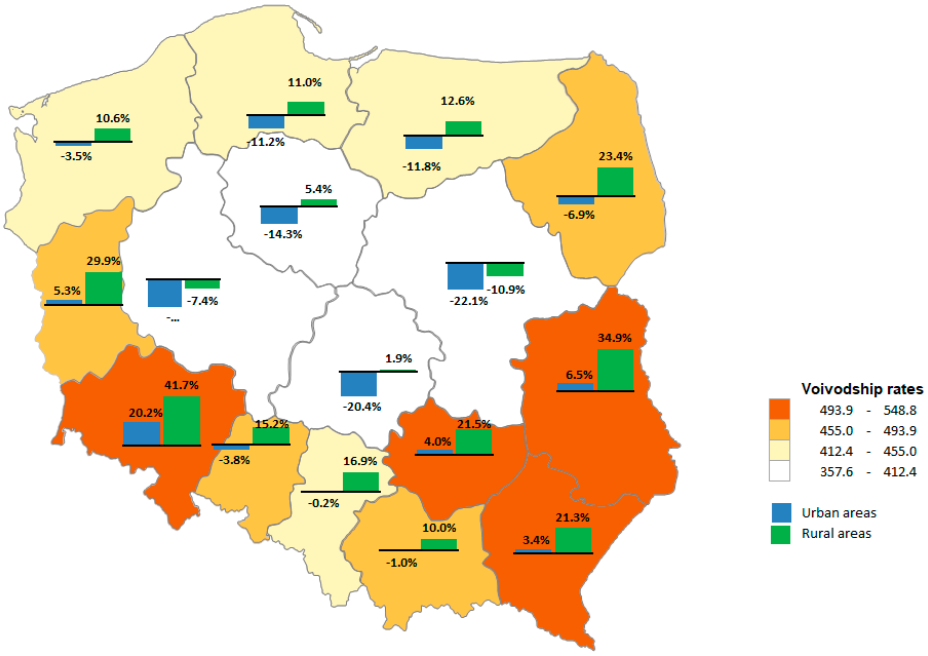


Fig. 3.25. Relative difference (%) in age-standardised death rates due to total diseases of the circulatory system (I00–I99) among urban and rural populations in relation to the national rate by voivodship in 2023

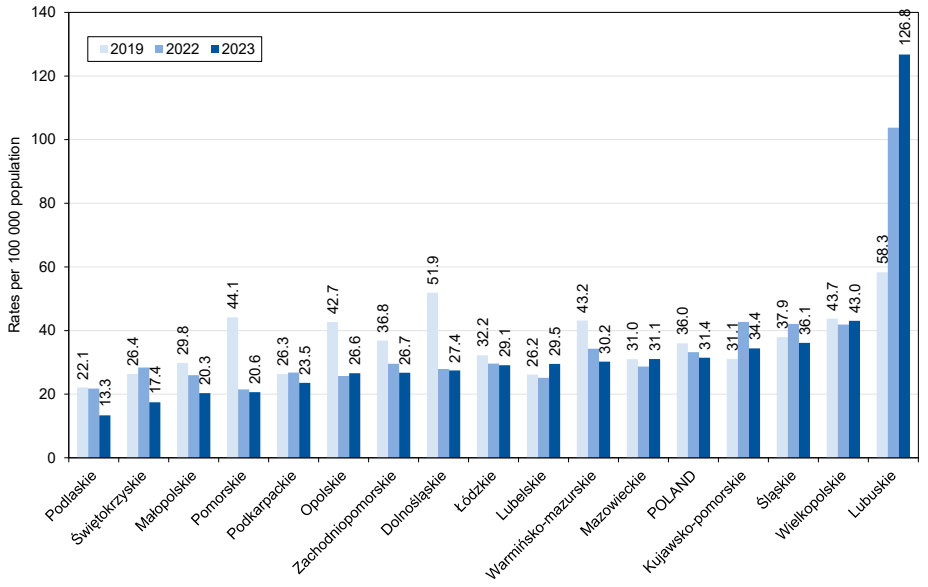


Fig. 3.26. Age-standardised death rates due to myocardial infarction for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

The average age at death due to myocardial infarction in 2023 was 69.7 years for men and 78.4 years for women (Tab. 3.10). Even after eliminating age differences in both sexes, women die from this condition on average 4.9 years later than men. On average, men die at the oldest age in Świętokrzyskie voivodship and women in Małopolskie voivodship. In contrast, men die at the youngest age in Kujawsko-Pomorskie voivodship (on average, as much as 7 years earlier than in Świętokrzyskie voivodship) and women in Opolskie and Mazowieckie voivodships.

Table 3.10. Average age at death due to myocardial infarction by voivodship and sex in 2023 – actual and age-standardised values

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Dolnośląskie	69.7	78.9	72.1	77.4
Kujawsko-pomorskie	65.8	77.7	68.2	76.6
Lubelskie	71.9	78.8	74.2	76.8
Lubuskie	67.2	78.1	70.6	77.1
Łódzkie	71.4	78.3	73.6	76.7
Małopolskie	70.3	81.4	72.3	79.7
Mazowieckie	69.2	77.4	71.1	75.5
Opolskie	72.2	77.0	74.5	75.4
Podkarpackie	70.3	79.6	72.5	78.1
Podlaskie	70.7	78.3	72.7	75.8
Pomorskie	69.3	79.0	71.4	77.8
Śląskie	70.2	77.6	72.0	76.6
Świętokrzyskie	72.7	78.2	75.4	76.7
Warmińsko-mazurskie	71.3	80.3	75.1	79.3
Wielkopolskie	69.6	78.6	72.8	77.8
Zachodniopomorskie	70.2	77.7	73.0	76.7
Poland	69.7	78.4	72.0	76.9

Source: Own calculations based on Statistics Poland data

Mortality due to cerebrovascular diseases in 2023 was lower than in 2019 in half of the voivodships. Of note is the 40% decrease in mortality in Podlaskie voivodship and, on the other hand, the progressive increase in mortality in Lubelskie voivodship – in 2023, the mortality rate was 40% higher than in 2019 (Fig. 3.27).

The average age at death due to cerebrovascular disease in 2023 was 73.4 years for men and 81.7 years for women (Tab. 3.11). Even after eliminating differences in

age structure in both sexes, women die from this condition on average 4.4 years later than men. On average, men and women die at the oldest age in Lubelskie voivodship, while the youngest deaths occur in Podkarpackie voivodship (on average 7.6 years earlier for men and 5.5 years earlier for women than in Lubelskie voivodship).

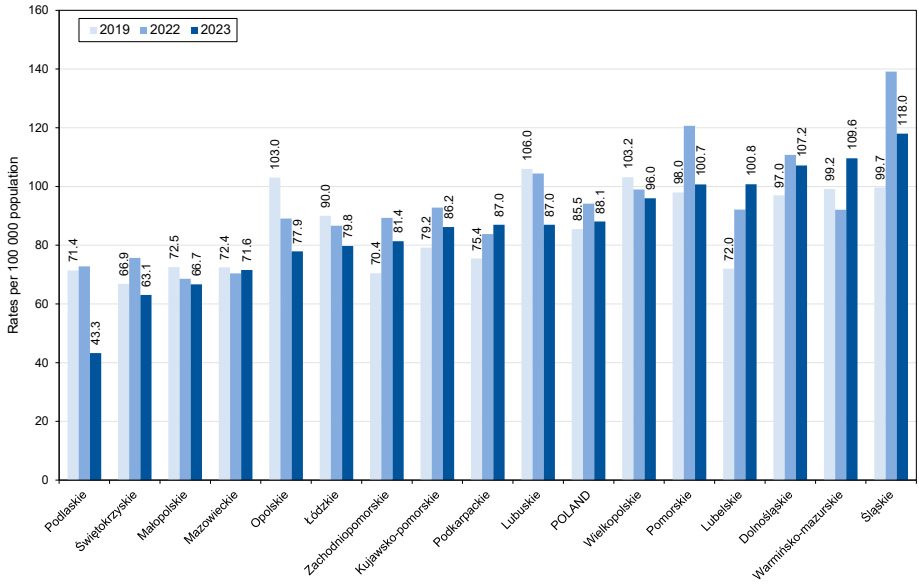


Fig. 3.27. Age-standardised death rates due to cerebrovascular disease for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

Table 3.11. Average age at death due to cerebrovascular disease by voivodship and sex in 2023 – actual and age-standardised values

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Dolnośląskie	72.9	81.7	75.7	80.3
Kujawsko-pomorskie	73.1	80.8	76.1	79.7
Lubelskie	75.6	84.7	78.3	83.2
Lubuskie	71.5	78.8	75.0	77.9
Łódzkie	72.9	81.4	75.3	80.0
Małopolskie	73.5	81.2	75.8	79.6
Mazowieckie	73.2	81.3	75.1	79.5
Opolskie	74.2	81.2	76.8	79.9
Podkarpackie	67.9	79.7	70.7	77.8
Podlaskie	73.6	82.1	76.1	80.0

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Pomorskie	75.6	82.6	78.1	81.5
Śląskie	75.2	82.3	77.6	81.6
Świętokrzyskie	72.9	82.0	75.0	80.2
Warmińsko-mazurskie	70.1	79.9	74.1	78.7
Wielkopolskie	74.4	81.5	77.3	80.8
Zachodniopomorskie	73.5	81.0	76.6	80.1
Poland	73.4	81.7	75.9	80.3

Source: Own calculations based on Statistics Poland data

Cerebrovascular diseases pose a greater threat to life in rural areas than in urban areas in all voivodships. Figure 3.28 shows the excess mortality of these subpopulations in each voivodship in relation to the observed mortality for Poland in 2023. The greatest differences in excess mortality between rural and urban populations (to the detriment of rural areas) were found in the voivodships of Lubelskie and Warmińsko-mazurskie. Both urban and rural areas in Śląskie voivodship have the highest excess mortality rates.

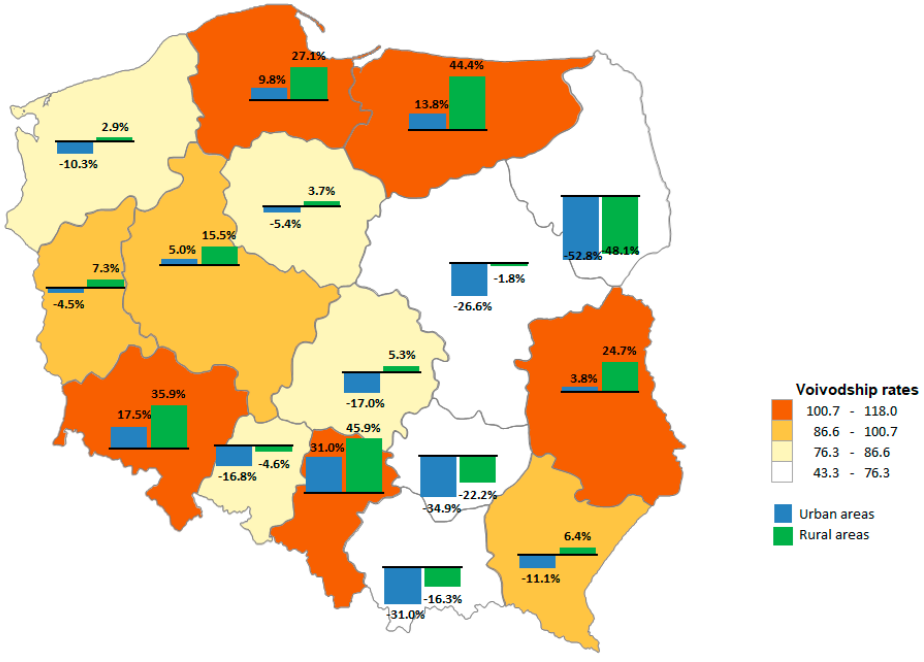


Fig. 3.28. Relative difference (%) in standardised death rates due to cerebrovascular diseases (I60–I69) among urban and rural populations in relation to the national rate by voivodship in 2023.

Mortality due to malignant neoplasms

Malignant neoplasms are the second most common cause of death in the Polish population. In 2023, they caused 99,676 deaths in Poland (53,322 men and 46,354 women), i.e. 264.4 per 100,000 inhabitants.

Malignant neoplasms are a much greater threat to life for men than for women; in 2023, the standardised death rate for men was 70.4% higher than that for women (Tables 3.6a and 3.6b). Thus, **the excess mortality of men relative to women is significantly higher for malignant neoplasms than for cardiovascular diseases.**

Mortality due to malignant neoplasms is slowly declining, with a more pronounced trend among men than women (Fig. 3.29).

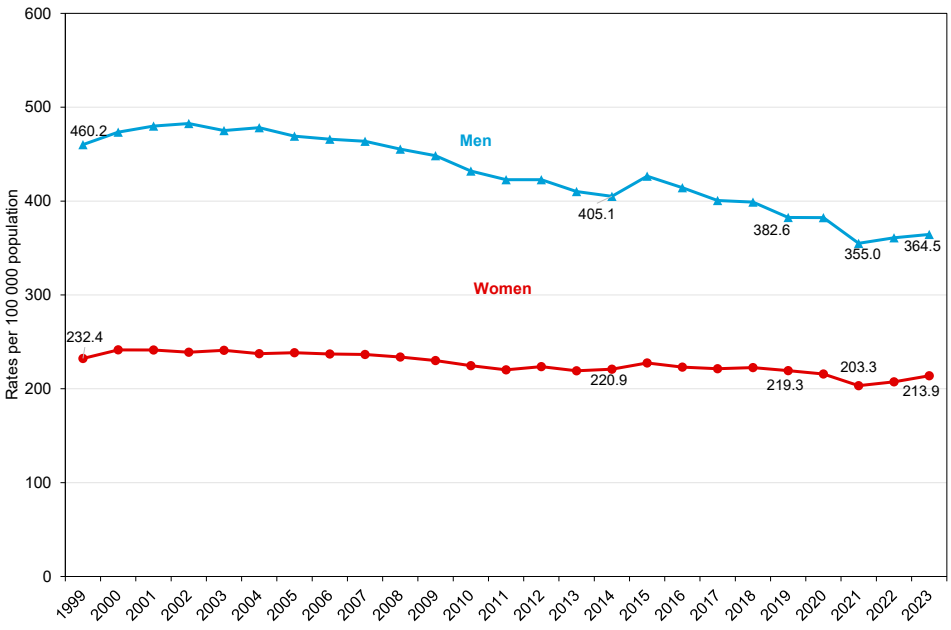


Fig. 3.29. Age-standardised death rates due to all malignant neoplasms for men and women in Poland, 1999–2023 (own calculations based on Statistics Poland databases)

In most voivodships, except for Lubelskie, Małopolskie, Śląskie and Świętokrzyskie, and in the population aged 65 and over also in Mazowieckie and Opolskie, the mortality rate in 2023 was lower than in 2019 (Fig. 3.30a and 3.30b). This favourable difference was highest (over 10%) in Warmińsko-mazurskie and Lubuskie voivodships. In 2019–2023, the lowest risk of death due to malignant neoplasms overall was in Podkarpackie voivodship.

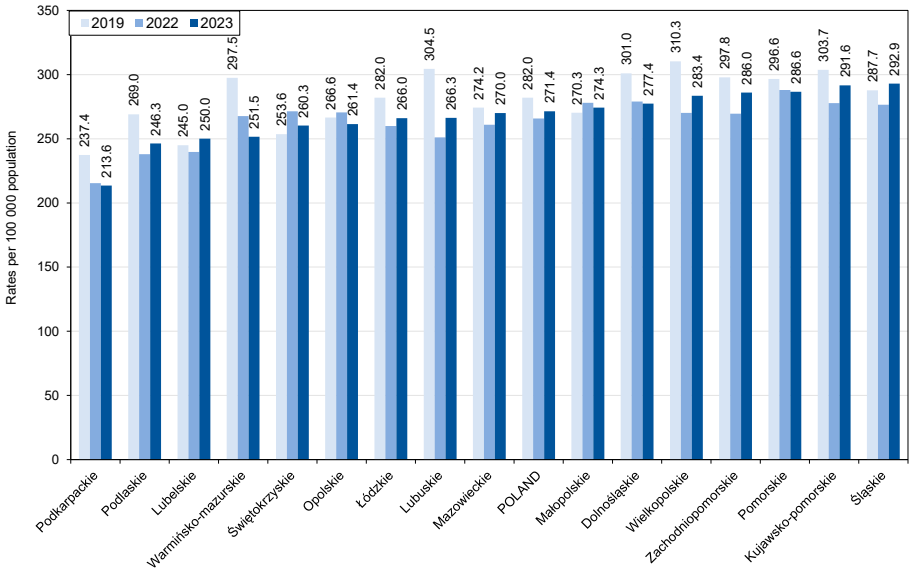


Fig. 3.30a. Age-standardised death rates due to malignant neoplasms (C00–C97) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

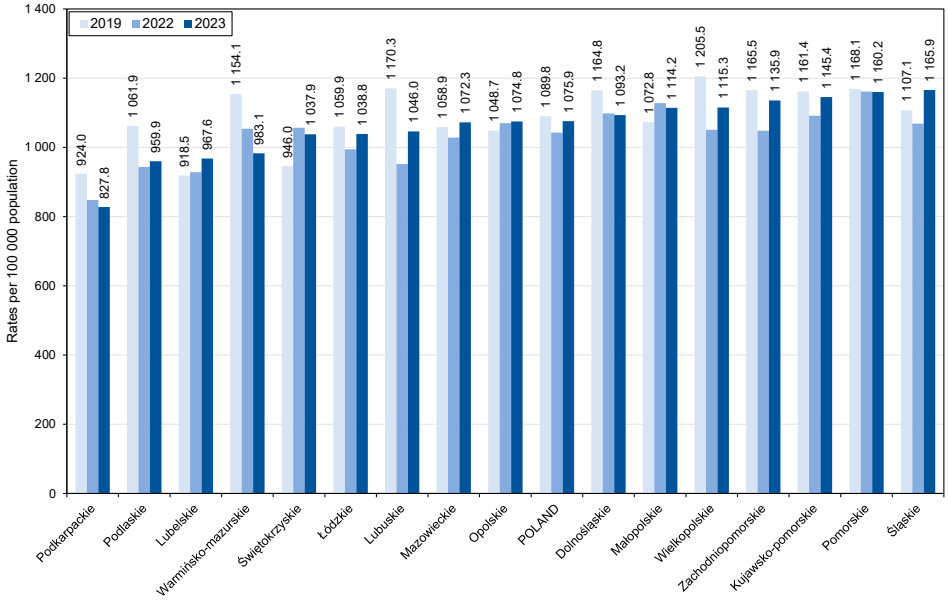


Fig. 3.30b. Age-standardised death rates due to malignant neoplasms (C00–C97) in persons aged 65 and over by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

Table 3.12 presents the percentage differences in the observed standardized death rates due to all malignant neoplasms in men and women in 2022 and 2023 for individual provinces in relation to their expected values based on previous 10-year trends. In the Warmińsko-mazurskie, Wielkopolskie, Podkarpackie, Lubuskie, and Podlaskie voivodships, the mortality rates in both 2022 and 2023 were significantly lower than expected for both men and women, while in the Świętokrzyskie voivodship there is an excess of mortality, especially in women, and in the Pomeranian voivodship in men.

Table 3.12. Relative (%) difference in observed standardized death rates due to malignant neoplasms in men and women compared to their expected values based on previous 10-year trends by province in 2022 and 2023

Voivodship	2022		2023	
	Men	Women	Men	Women
Dolnośląskie	-1.8	-6.3	-4.4	-7.9
Kujawsko-pomorskie	-11.7	-7.0	-7.8	-3.7
Lubelskie	-2.0	-3.4	-0.5	1.4
Lubuskie	-21.9	-12.1	-15.9	-8.9
Łódzkie	-3.6	-7.0	0.3	-7.6
Małopolskie	4.8	2.7	0.7	2.1
Mazowieckie	-3.1	-3.9	-3.8	2.6
Opolskie	10.5	-2.4	2.6	-2.6
Podkarpackie	-12.6	-5.7	-11.5	-10.7
Podlaskie	-12.3	-11.7	-11.1	-6.1
Pomorskie	5.9	-5.0	5.6	-5.5
Śląskie	0.2	-2.1	5.9	3.6
Świętokrzyskie	6.7	11.9	-0.2	8.0
Warmińsko-mazurskie	-4.4	-6.9	-9.7	-15.5
Wielkopolskie	-14.6	-13.1	-11.7	-7.6
Zachodniopomorskie	3.5	-12.7	7.4	-5.3
Poland	-3.7	-4.3	-3.4	-2.0

Źródło: obliczenia własne autorów

The average age at death due to malignant neoplasms in 2023 was 70.8 years for men and 72.3 years for women (Tab. 3.13a). After eliminating differences in age structure in both sex groups, women die from these diseases on average 1.8 years earlier than men (Tab. 3.13b). The average age at death in individual voivodships

is similar, and differences between voivodships do not exceed two years. On average, rural inhabitants die only approximately six months earlier than urban inhabitants; in the case of men in Podkarpackie and Podlaskie voivodships, they die 1.9 and 1.7 years earlier than their urban counterparts, respectively.

Table 3.13a. Average age at death due to malignant neoplasms by voivodship, sex and place of residence (urban/rural) in 2023 – actual values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	70.5	71.2	68.9	72.4	73.0	70.4
Kujawsko-pomorskie	70.5	71.2	69.3	71.5	72.3	70.0
Lubelskie	70.5	71.1	69.9	72.0	72.0	71.9
Lubuskie	70.2	71.0	68.7	71.5	72.0	70.4
Łódzkie	70.8	71.4	69.8	72.1	72.5	71.2
Małopolskie	71.8	72.8	70.7	73.4	73.9	72.7
Mazowieckie	71.1	72.0	69.5	72.7	73.3	71.3
Opolskie	71.7	72.2	71.0	72.9	73.1	72.6
Podkarpackie	70.2	71.7	69.3	71.7	71.8	71.7
Podlaskie	71.0	71.4	70.5	72.8	72.2	73.9
Pomorskie	71.3	72.3	69.1	72.7	73.6	70.4
Śląskie	71.0	71.3	70.1	72.2	72.3	71.7
Świętokrzyskie	71.4	72.4	70.6	72.6	72.0	73.2
Warmińsko-mazurskie	69.7	70.8	68.1	71.3	71.7	70.4
Wielkopolskie	70.3	71.3	69.1	71.2	71.8	70.3
Zachodniopomorskie	70.1	70.8	68.5	71.8	72.1	70.7
Poland	70.8	71.6	69.6	72.3	72.7	71.4

Source: Own calculations based on Statistics Poland data

Table 3.13b. Average age at death due to malignant neoplasms by voivodship, sex and place of residence (urban/rural) in 2023 – age-standardised values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	72.5	72.5	72.7	71.0	71.2	70.5
Kujawsko-pomorskie	72.6	72.7	72.6	70.6	70.9	70.0
Lubelskie	72.2	72.4	72.0	70.2	70.4	70.0

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Lubuskie	72.7	72.9	72.2	70.8	71.0	70.4
Łódzkie	72.5	72.8	72.0	70.3	70.6	69.7
Małopolskie	73.4	73.6	73.2	71.8	71.8	71.7
Mazowieckie	72.6	73.0	72.0	71.1	71.4	70.3
Opolskie	73.3	73.5	73.1	71.5	71.5	71.4
Podkarpackie	72.2	73.4	71.5	70.4	70.3	70.4
Podlaskie	73.0	73.7	71.9	70.6	70.5	70.8
Pomorskie	73.4	73.5	73.1	71.7	71.8	71.2
Śląskie	72.6	72.6	72.5	71.0	71.0	71.0
Świętokrzyskie	72.9	73.4	72.5	70.6	70.0	71.2
Warmińsko-mazurskie	72.4	72.9	71.6	70.5	70.5	70.4
Wielkopolskie	72.6	72.9	72.2	70.5	70.5	70.5
Zachodniopomorskie	72.2	72.3	72.2	70.8	70.8	70.9
Poland	72.7	72.9	72.3	70.9	71.0	70.6

Source: Own calculations based on Statistics Poland data

The mortality rate of the Polish population due to cancer is related to the level of education, but to a lesser extent than in the case of CVDs (Fig. 3.31). There is no significant difference in the risk of death for persons with up to lower secondary and upper secondary education. This risk is over 85% higher for men and approximately 55% higher for women than for individuals with tertiary education. The lives of people with post-secondary non-tertiary education are approximately one quarter more at risk than those with tertiary education.

Fig. 3.32 shows the excess/"deficit" mortality due to malignant neoplasms for the total population of urban and rural areas in each voivodship in relation to the observed mortality for Poland in 2023. The differences between the rates for urban and rural residents in individual voivodships are minor, as are the deviations from the national rate. The most significant difference is observed in Pomorskie voivodship, where the observed death rate in urban areas was only 3.6% higher than expected for Poland, while the death rate in rural areas was 9.6% higher, which is the largest excess mortality of the rural population in relation to the national rate.

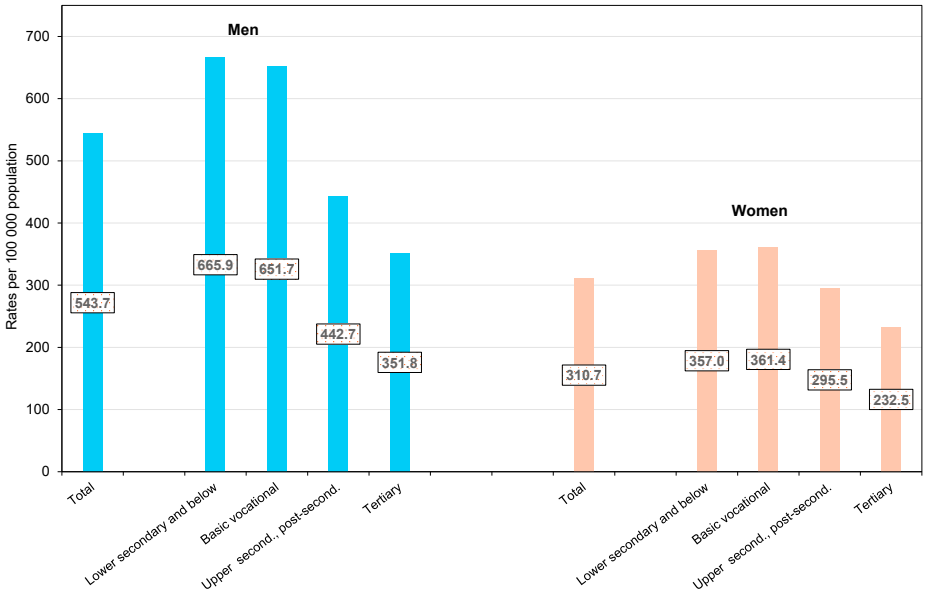


Fig. 3.31. Standardised death rates due to malignant neoplasms for men and women aged 30 and over by level of education in the three-year period 2020–2022 (own calculations based on Statistics Poland data)

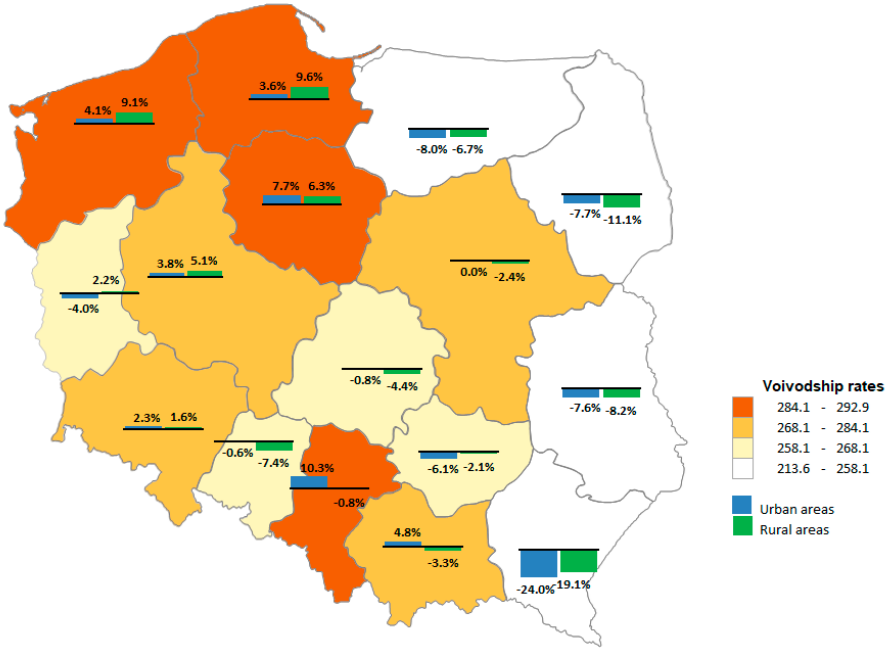


Fig. 3.32. Relative difference (%) in age-standardised death rates due to malignant neoplasms for the total population of urban and rural areas in relation to the observed national rate by voivodship in 2023

For many years, malignant neoplasms of the trachea, bronchus and lung (C33–C34) have posed the greatest threat to the life of Polish citizens, causing 22,168 deaths in 2023 (22.2% of all deaths due to malignant neoplasms). Malignancies affecting other sites are significantly less common. In 2023, there were 12,187 deaths due to malignant neoplasms of colon, sigmoid, rectum and anus (ICD10 C18–C21) (12.2% of cancer-related deaths), 4,591 deaths due to malignant neoplasms of stomach (C16) (4.6%), 6,757 women (and 70 men) died due to malignant neoplasm of breast (C50) (6.8% of all cancer-related deaths and 14.6% of female cancer-related deaths), malignant neoplasm of cervix uteri (C53) caused 1,401 deaths among women (1.4% of all cancer-related deaths and 3.0% of female cancer-related deaths), and 5,859 male deaths due malignant neoplasm of prostate (5.9% of all cancer-related deaths and 11.0% of male cancer-related deaths). Standardised death rates for all analysed cancer groups in 2023, except lung in women and prostate in men, were lower than in 2019 (Table 3.6b).

Malignant neoplasms in general pose a slightly greater threat to men living in rural areas than in urban areas, but due to differences in age structure, the actual death rate is higher in urban areas. This relatively low excess mortality for rural men in 2023 did not apply to malignant neoplasms of the stomach and prostate (Table 3.7b). For women, the mortality rate in rural areas is lower than in urban areas for both malignant neoplasms in general and in selected sites.

In 2023, mortality due to malignant neoplasms of the trachea, bronchus and lung was lower in all voivodships, except Opolskie and Lubelskie, than in 2019. Of note is the 23% decrease in mortality in Podlaskie voivodship and approximately 15% in Lubuskie and Dolnośląskie voivodships (Fig. 3.33). In 2023, mortality in Zachodniopomorskie voivodship was as much as 72% higher than in Podkarpackie voivodship, which has had the lowest mortality rate due to this cancer for years.

The average age at death due to malignant neoplasms of the trachea, bronchus and lung in 2023 was 70.4 years for men and 71.4 years for women (Tab. 3.13). After eliminating differences in age structure in both sexes, women die from this condition on average a year earlier than men. The average age at death in individual voivodships is similar, with differences between voivodships of less than two years for men and less than three years for women.

For lung cancer, the difference between voivodships in urban and rural mortality rates is greater than for all neoplasms (Fig. 3.34). In five voivodships, mortality is higher in urban areas, while it is higher in rural areas in 11 voivodships. The greatest difference to the detriment of rural areas is in the three voivodships of northern Poland: Warmińsko-mazurskie, Pomorskie and Zachodniopomorskie.

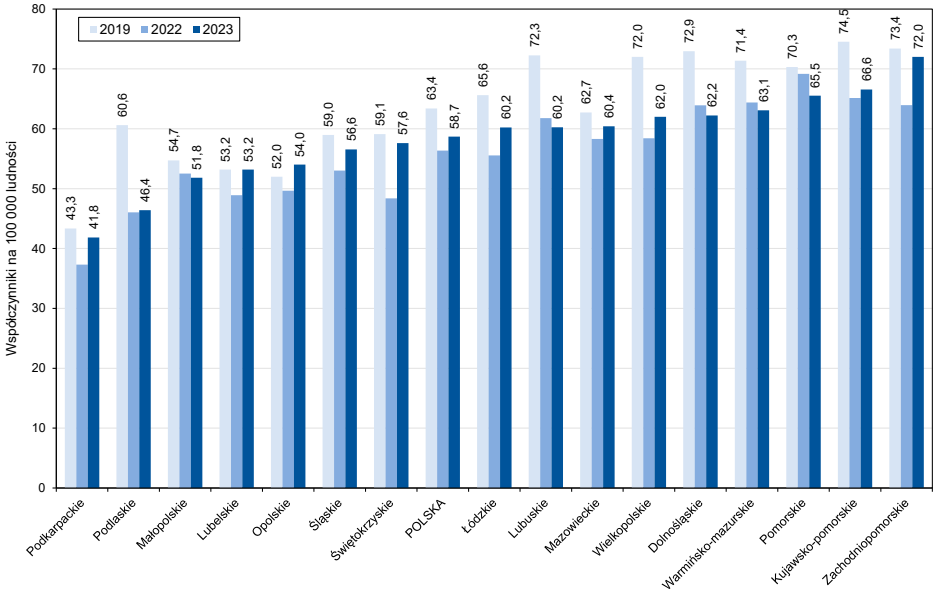


Fig. 3.33. Age-standardised death rates due to lung cancer (C33–C34) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

Table 3.14. Average age at death due to lung cancer by voivodship and sex in 2023 – actual and age-standardised values

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Dolnośląskie	70.4	71.7	71.8	70.9
Kujawsko-pomorskie	69.9	71.0	71.3	70.4
Lubelskie	70.4	70.9	71.4	70.0
Lubuskie	69.9	70.4	71.5	70.0
Łódzkie	70.6	71.5	71.6	70.5
Małopolskie	71.4	71.8	72.4	70.9
Mazowieckie	70.6	72.4	71.5	71.3
Opolskie	70.5	70.6	71.7	69.8
Podkarpackie	71.0	71.5	72.3	70.7
Podlaskie	69.6	71.6	70.8	70.6
Pomorskie	71.1	72.6	72.4	72.0
Śląskie	70.4	70.6	71.3	69.9
Świętokrzyskie	70.7	71.2	71.6	70.2

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Warmińsko-mazurskie	69.3	69.7	71.1	69.4
Wielkopolskie	70.1	70.9	71.6	70.4
Zachodniopomorskie	70.1	71.0	71.6	70.6
Poland	70.4	71.4	71.6	70.6

Source: Own calculations based on Statistics Poland data

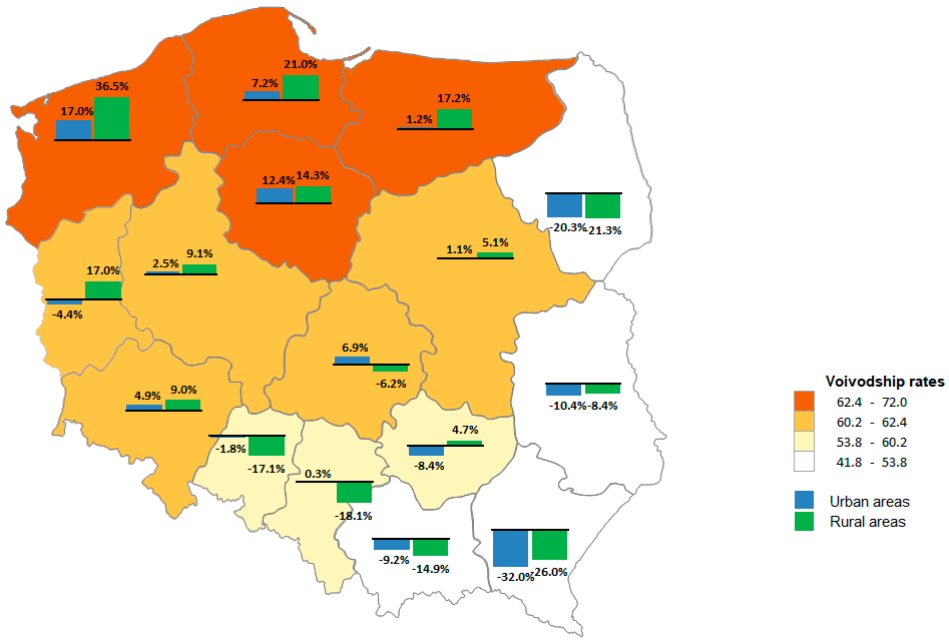


Fig. 3.34. Relative difference (%) of age-standardised death rates due to lung cancer of urban and rural populations in relation to the observed national rate by voivodship in 2023

Female mortality due to the breast cancer in 2023 was lower than in 2019 in most voivodships (Fig. 3.35). Of note is the 35% decrease in mortality in Warmińsko-Mazurskie voivodship and approximately 15% in Dolnośląskie and Kujawsko-pomorskie voivodships. In 2023, mortality in Wielkopolskie voivodship was 62% higher than in Warmińsko-mazurskie voivodship, where mortality has recently decreased significantly, and in Podkarpackie voivodship, which has had low mortality rates due to this cancer for years.

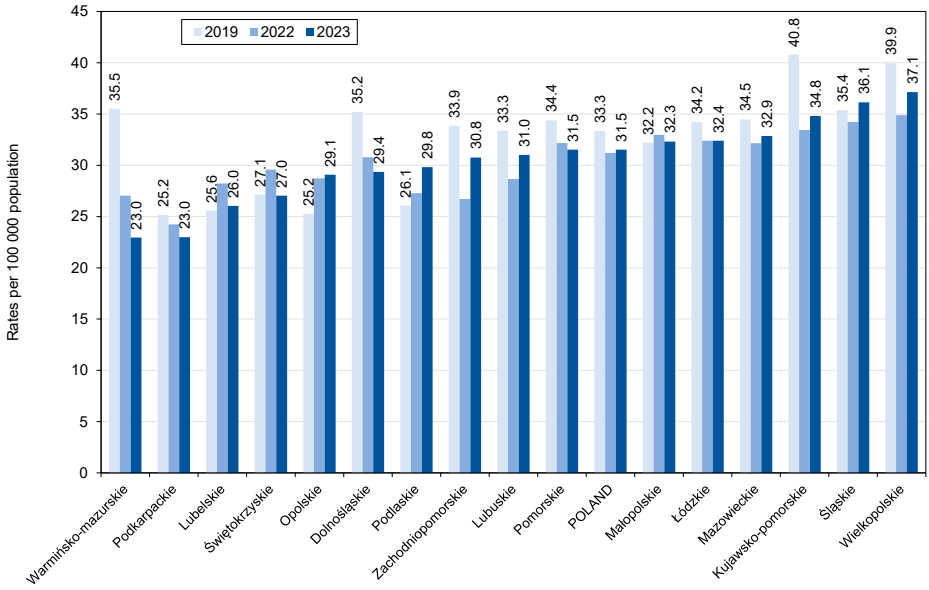


Fig. 3.35. Age-standardised death rates for women due to breast cancer (C50) by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

The average female age at death due to breast cancer and cancer of cervix uteri in 2023 was 70.8 years and 65.8 years, respectively, and thus women who died from the latter were on average 5 years younger (Tab. 3.15). However, there are significant differences between voivodships; for example, in Dolnośląskie, women who died from the cancer of cervix uteri were 8.4 years younger than those who died from the breast cancer, while in Podkarpackie, the age difference was only one and a half years. Women in Dolnośląskie voivodship who died of cervix uteri cancer were more than six years younger than women in Podkarpackie voivodship.

Table 3.15. Average female age at death due to breast cancer and cancer of cervix uteri by voivodship in 2023 – actual and age-standardised values

Voivodship	Actual age		Standardised age	
	Breast cancer	Cervical cancer	Breast cancer	Cervical cancer
Dolnośląskie	71.1	62.7	69.5	61.4
Kujawsko-pomorskie	69.0	66.8	67.7	65.9
Lubelskie	70.2	65.9	67.9	63.5
Lubuskie	71.4	67.0	70.3	65.8
Łódzkie	69.8	67.6	67.5	65.0

Małopolskie	71.9	66.2	70.0	65.0
Mazowieckie	71.0	65.5	69.1	64.2
Opolskie	71.9	67.8	70.4	65.8
Podkarpackie	70.4	68.9	68.6	67.8
Podlaskie	71.2	67.9	68.6	66.4
Pomorskie	69.7	64.8	68.4	64.0
Śląskie	71.9	66.0	70.3	64.4
Świętokrzyskie	70.6	66.5	68.2	64.4
Warmińsko-mazurskie	71.4	64.4	70.1	63.4
Wielkopolskie	70.1	66.0	69.2	65.1
Zachodniopomorskie	70.3	63.0	68.9	61.7
Poland	70.8	65.8	69.1	64.4

Source: Own calculations based on Statistics Poland data

Male mortality due to malignant neoplasms of the prostate in 2023 was higher than in 2019 in most voivodships (Fig. 3.36). On the one hand, there is a noticeable increase in mortality in the Opolskie and Lubelskie voivodships, with a slightly slower increase in Małopolskie, and on the other hand, a decrease in Podkarpackie.

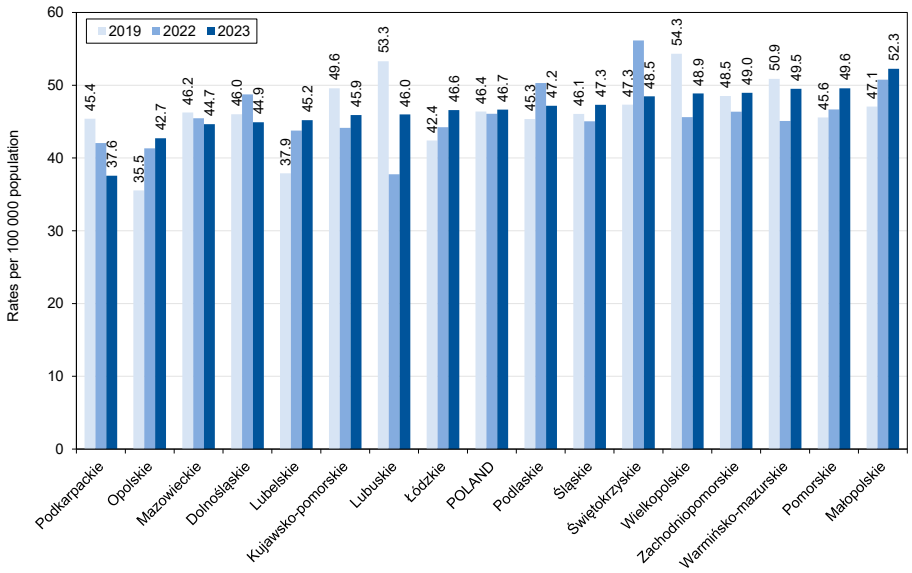


Fig. 3.36. Age-standardised death rates for men due to prostate cancer (C61) by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

The differences between voivodships in prostate cancer mortality are not very large – although mortality in Małopolskie voivodship in 2023 was 39% higher than in Podkarpackie voivodship yet the difference between Pomorskie and Opolskie voivodships was 16% only.

The average age of men who died from prostate cancer was 77.2 years and differed by only 1.5 years between the voivodships with the highest (Kujawsko-pomorskie and Zachodniopomorskie, 79.7 years) and lowest (Podlaskie, 78.2 years) rates.

Mortality due to diseases of the respiratory system

The mortality rate from diseases of the respiratory system after 2014 shows an upward trend, which is more pronounced in women (Fig. 3.37). In 2023, these diseases caused 30,382 deaths (16,019 men and 14,363 women), i.e. 81 deaths per 100,000 population (88 for men and 74 for women, Table 3.6a).

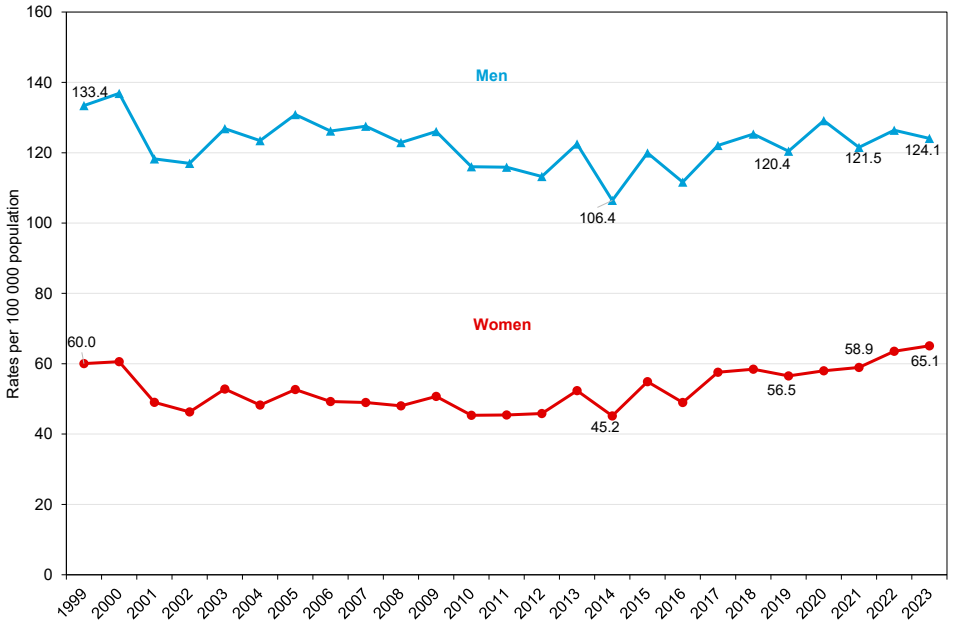


Fig. 3.37. Age-standardised death rates due to diseases of the respiratory system for men and women in Poland, 1999–2023 (own calculations based on Statistics Poland databases)

Diseases of the respiratory system pose a much greater threat to men than women; after eliminating differences in age structure, the mortality rate from these diseases in 2023 was 91% higher for men than for women (Table 3.6b).

In most voivodships, the mortality rate in 2023 was higher than in 2019, with the most significant difference in both the total population and the oldest population in Lubelskie (36% and 42%) and Świętokrzyskie (30% and 31%) voivodships (Fig. 3.38a and 3.38b). These voivodships have the lowest mortality rates due to diseases of the respiratory system. The greatest reduction in mortality was recorded in Podlaskie voivodship (by 17% and 24%). In the last two years, 2022–2023, the greatest threat to life due to diseases of the respiratory system was observed in Łódzkie and Dolnośląskie voivodships.

Table 3.16 presents the percentage differences in the observed standardized mortality rates for all respiratory diseases in men and women in 2022 and 2023 compared to their expected values based on previous 10-year trends for individual provinces. It is worth noting the very high excess mortality in both years in the Świętokrzyskie, Lubelskie and Śląskie voivodships, both among men and women, and among men in the Opolskie voivodship.

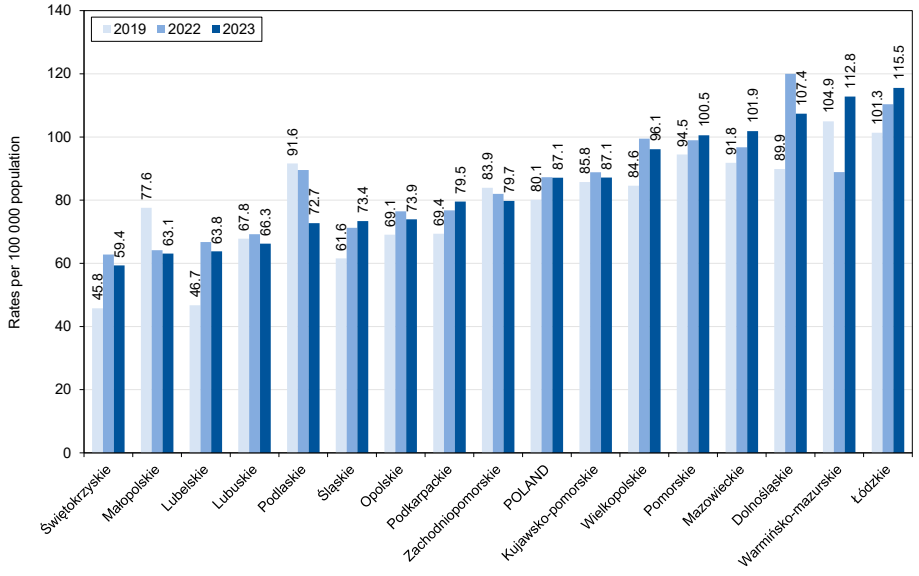


Fig. 3.38a. Age-standardised death rates due to diseases of the respiratory system for the total population by voivodship in 2019, 2020 and 2021 (own calculations based on Statistics Poland data)

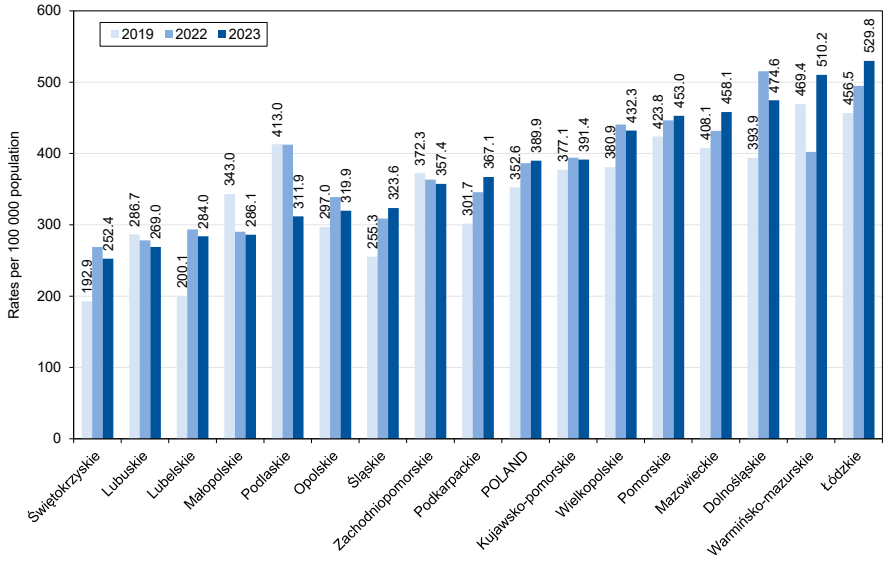


Fig. 3.38b. Age-standardised death rates due to diseases of the respiratory system for persons aged 65 and over by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

Table 3.16. Relative (%) difference in observed standardized death rates due to the respiratory system diseases in men and women compared to their expected values based on previous 10-year trends by province in 2022 and 2023

Voivodship	2022		2023	
	Men	Women	Men	Women
Dolnośląskie	33.0	27.5	9.8	11.9
Kujawsko-pomorskie	2.2	13.3	-5.9	7.7
Lubelskie	60.8	51.1	41.3	35.3
Lubuskie	7.1	-2.6	-4.4	-5.1
Łódzkie	2.5	18.4	0.0	16.9
Małopolskie	-16.8	-5.7	-23.1	-11.4
Mazowieckie	8.5	9.7	7.3	10.5
Opolskie	4.9	71.3	-4.5	54.3
Podkarpackie	13.7	10.3	8.7	19.3
Podlaskie	5.8	6.7	-20.4	-20.2
Pomorskie	-0.9	1.3	-6.1	-1.8
Śląskie	27.8	35.3	29.1	31.7
Świętokrzyskie	60.6	52.3	45.5	39.6
Warmińsko-mazurskie	-14.9	-6.7	5.4	18.8

Voivodship	2022		2023	
	Men	Women	Men	Women
Wielkopolskie	16.3	38.9	4.5	31.3
Zachodniopomorskie	-5.4	-10.4	-16.7	-8.2
Poland	17.0	15.7	9.6	12.0

Źródło: obliczenia własne autorów

The average age at death due to diseases of the respiratory system in 2023 was 74.3 years for men and 80.0 years for women (Tab. 3.17a). After eliminating differences in age structure in both sexes, women die from these diseases on average 1.3 years later than men (Tab. 3.17b). On average, men and women in Lubuskie voivodship die at the youngest age, while inhabitants of Podkarpackie voivodship die at the oldest age. The difference in age at death between these voivodships is pronounced, exceeding 6 years for men and almost 8 years for women. Overall, urban and rural inhabitants die at a similar age, but there are some minor differences between voivodships. For example, in Zachodniopomorskie voivodship, rural inhabitants die on average 1.8 years younger than urban inhabitants, while in Małopolskie voivodship, they die 1.7 years older.

Table 3.17a. Average age at death due to diseases of the respiratory system by voivodship, sex and place of residence (urban/rural) in 2023 – actual values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	73.7	74.4	72.0	80.1	80.6	78.4
Kujawsko-pomorskie	73.5	73.3	73.9	78.8	79.4	77.6
Lubelskie	74.2	74.2	74.1	81.9	81.7	82.2
Lubuskie	69.0	69.2	68.6	73.8	75.0	71.0
Łódzkie	75.3	75.5	74.9	80.9	80.7	81.5
Małopolskie	75.7	76.7	74.7	81.2	80.7	81.7
Mazowieckie	74.9	75.7	73.4	80.8	80.7	80.8
Opolskie	73.6	74.3	72.8	80.0	79.2	81.0
Podkarpackie	76.6	76.8	76.5	81.9	81.1	82.5
Podlaskie	72.7	72.7	72.7	80.1	79.0	81.9
Pomorskie	73.9	74.8	71.8	79.8	80.2	78.9
Śląskie	74.2	74.4	73.4	78.5	78.3	79.6
Świętokrzyskie	71.9	72.0	71.8	80.3	79.3	81.4
Warmińsko-mazurskie	73.7	74.6	72.4	78.8	79.3	77.8

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Wielkopolskie	74.1	75.0	72.7	79.2	79.6	78.5
Zachodniopomorskie	74.4	75.4	72.0	79.3	80.1	76.9
Poland	74.3	74.8	73.4	80.0	80.0	80.0

Source: Own calculations based on Statistics Poland data

Table 3.17b. Average age at death due to diseases of the respiratory system by voivodship, sex and place of residence (urban/rural) in 2023 – age-standardised values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	77.0	76.8	77.5	78.3	78.5	77.7
Kujawsko-pomorskie	76.6	75.7	77.8	77.5	78.0	76.9
Lubelskie	77.0	76.8	77.3	80.0	80.0	79.9
Lubuskie	73.0	72.2	74.9	72.6	73.3	70.9
Łódzkie	78.0	77.9	78.4	79.1	78.8	79.8
Małopolskie	78.2	78.2	78.2	79.5	78.7	80.4
Mazowieckie	77.0	77.0	76.9	78.8	78.7	79.2
Opolskie	76.1	76.4	76.0	78.3	77.1	79.5
Podkarpackie	79.3	79.2	79.4	80.4	79.8	80.8
Podlaskie	75.3	75.7	74.9	77.7	77.3	78.8
Pomorskie	76.7	76.6	77.1	78.7	78.5	79.1
Śląskie	76.6	76.4	77.0	77.3	76.9	78.6
Świętokrzyskie	74.3	73.8	74.8	78.3	77.6	79.0
Warmińsko-mazurskie	78.1	78.1	77.9	77.5	77.6	77.1
Wielkopolskie	77.5	77.7	77.1	78.4	78.3	78.4
Zachodniopomorskie	77.8	77.9	78.2	77.9	78.3	76.6
Poland	77.1	77.0	77.3	78.4	78.3	78.6

Source: Own calculations based on Statistics Poland data

The mortality rate of the Polish population due to diseases of the respiratory system is strongly related to the level of education (Fig. 3.39). The lives of people with up to lower secondary education are approximately two and a half times more at risk from these diseases than those with tertiary education. The mortality rate among people with upper secondary education is approximately 90% higher than among people with tertiary education.

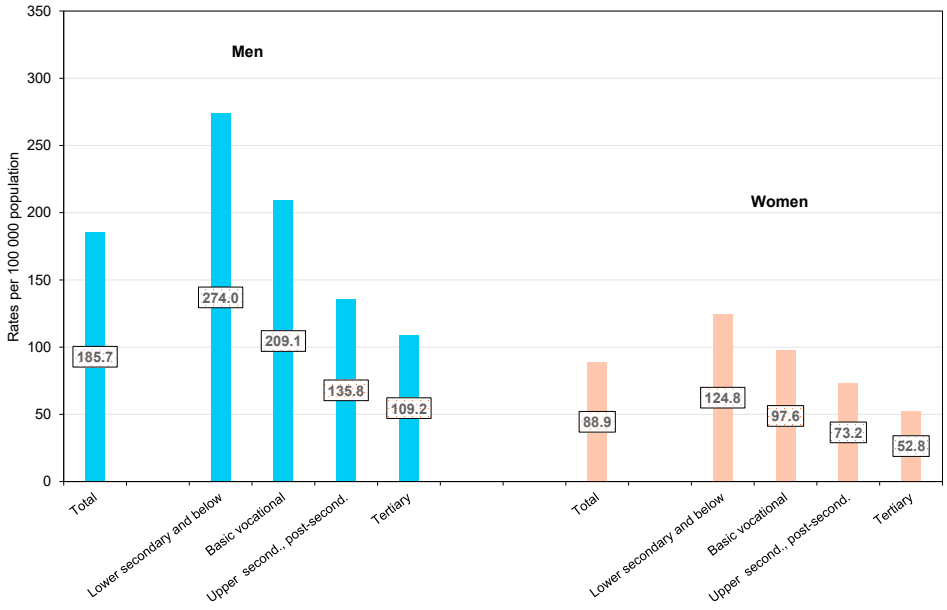


Fig. 3.39. Standardised death rates due to diseases of the respiratory system for men and women aged 30 and over by level of education in the three-year period 2020–2022 (own calculations based on Statistics Poland data)

The leading cause of death among diseases of the respiratory system is pneumonia, which killed 19,976 people (10,292 men and 9,684 women) in 2023 and chronic lower respiratory diseases, which caused 5,961 deaths (3,336 men and 2,625 women).

Diseases of the respiratory system overall pose a similar threat to life; after eliminating differences in age structure and men living in rural and urban areas, the mortality rate among women living in urban areas is 7.9% higher than among women living in rural areas (Tables 3.7a and 3.7b). Mortality due to pneumonia is slightly higher in urban areas than in rural areas, both among men and women, while chronic lower respiratory diseases pose a much greater threat to the lives of men living in rural areas than in urban areas – the excess mortality rate for men in rural areas is as high as 51%. Female mortality rates in urban and rural areas are now virtually the same.

Figure 3.40 shows excess mortality due to diseases of the respiratory system for urban and rural populations in each voivodship in relation to the observed mortality for Poland in 2023. The most unfavourable difference for rural areas was observed in Warmińsko-mazurskie voivodship, where the excess mortality rate in rural areas was 26.9 ppt higher than the national average, and in

Wielkopolskie voivodeship, where the mortality rate in rural areas was higher than the national average, while it was lower in urban areas. In contrast, Łódzkie voivodship was the only region where excess mortality in urban areas was higher than in rural areas (its excess mortality in urban areas is the highest in Poland).

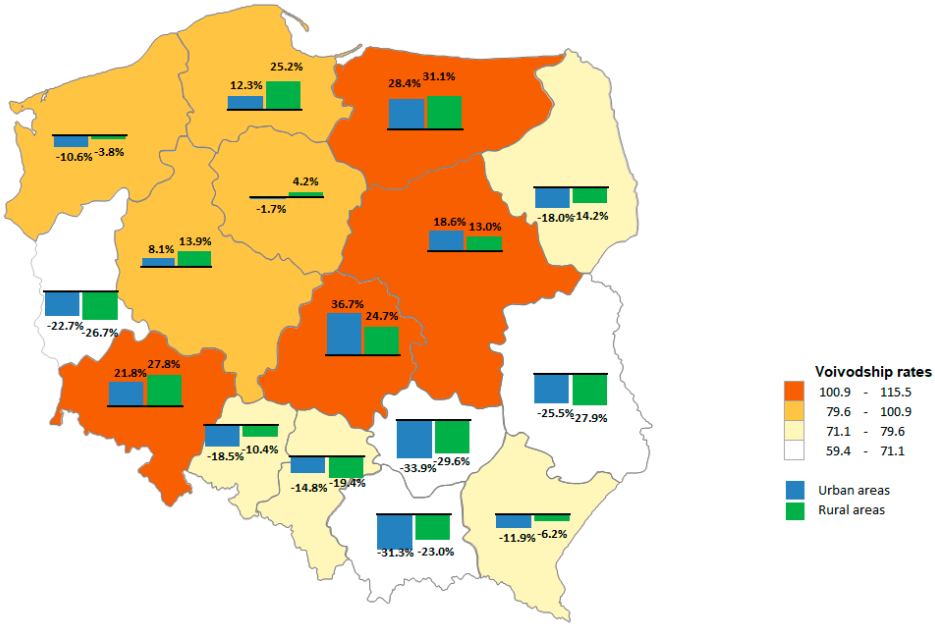


Fig. 3.40. Relative difference (%) in standardised death rates due to diseases of the respiratory system for the total population of urban and rural areas in relation to the observed national rate by voivodship in 2023

There are significant differences in mortality rates due to **pneumonia** between voivodships, and there were also significant differences in mortality rates between 2019 and 2023 in individual voivodships (Fig. 3.41). Of note is the steady increase in mortality in the Łódzkie, Lubelskie and Mazowieckie voivodships, and its gradual, significant decline in Podlaskie and Opolskie. In 2023, the death rate in Łódzkie voivodship was three times higher than in Świętokrzyskie voivodship.

The average age at death due to pneumonia in 2023 was 74.9 years for men and 81.2 years for women (Tab. 3.18). Even after eliminating differences in age structure in both sexes, women die from this condition on average 1.7 years later than men. On average, men die at the oldest age in Podkarpackie voivodship and women in Małopolskie, Opolskie and Łódzkie; on the other hand, the youngest age at death is in Lubuskie voivodship – on average 7.7 years earlier for men and

10.0 years earlier for women than in the aforementioned voivodships, where residents died from this disease at the oldest age.

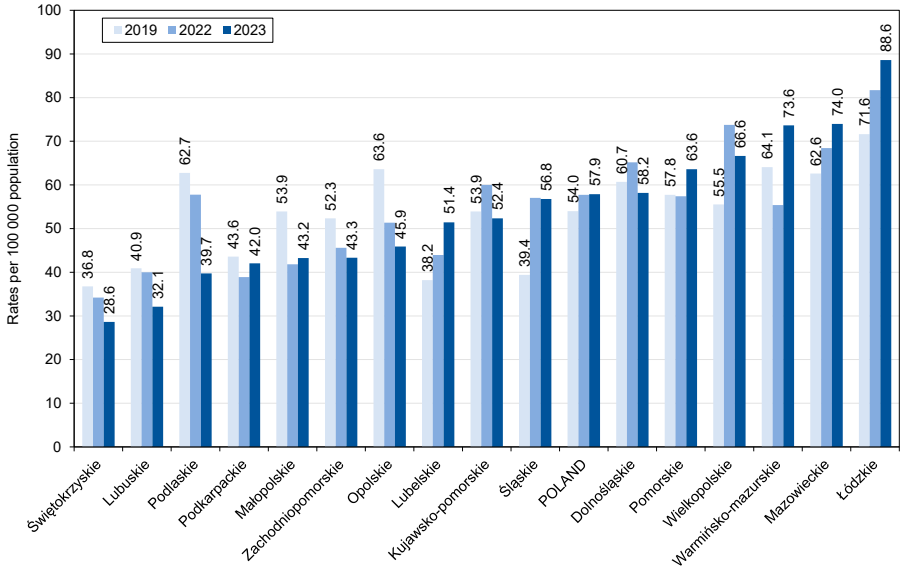


Fig. 3.41. Age-standardised death rates due to pneumonia (J12–J18) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

Table 3.18. Average age at death due to pneumonia by voivodship and sex in 2023 – actual and age-standardised values

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Dolnośląskie	75.2	81.3	78.8	79.4
Kujawsko-pomorskie	73.5	80.3	77.0	78.9
Lubelskie	74.7	82.4	77.5	80.6
Lubuskie	67.7	72.8	72.5	71.0
Łódzkie	76.0	82.5	78.8	80.9
Małopolskie	76.2	82.5	78.8	81.0
Mazowieckie	75.3	81.9	77.6	80.0
Opolskie	74.6	82.4	77.4	81.0
Podkarpackie	77.4	82.2	80.2	80.4
Podlaskie	75.1	82.7	77.4	80.6
Pomorskie	73.8	81.5	77.1	80.3
Śląskie	74.4	79.2	76.9	77.9

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Świętokrzyskie	74.3	81.7	76.8	79.9
Warmińsko-mazurskie	73.8	79.8	78.4	78.4
Wielkopolskie	74.9	80.1	78.5	79.2
Zachodniopomorskie	75.2	81.3	78.7	80.0
Poland	74.9	81.2	77.9	79.6

Source: Own calculations based on Statistics Poland data

Mortality of the general population of Poland due to **chronic lower respiratory diseases**, as in the case of pneumonia, varies greatly between voivodships (Fig. 3.42). The death rates in most voivodships decreased and in 2023 were lower than in 2019. The downward trend was most pronounced in the voivodships of Śląskie, Małopolskie and Lubuskie, where mortality rates in 2023 were lower than in 2019 by 44%, 34% and 33%, respectively. A clear upward trend in the death rate can be observed in Podkarpackie voivodship, with an exceptionally sharp increase in mortality between 2019 and 2022 in Opolskie and Świętokrzyskie. The surprisingly low mortality rate in Opolskie voivodship in 2019 and also in 2020 was undoubtedly an artefact related to a probable distortion in the coding of causes of death.

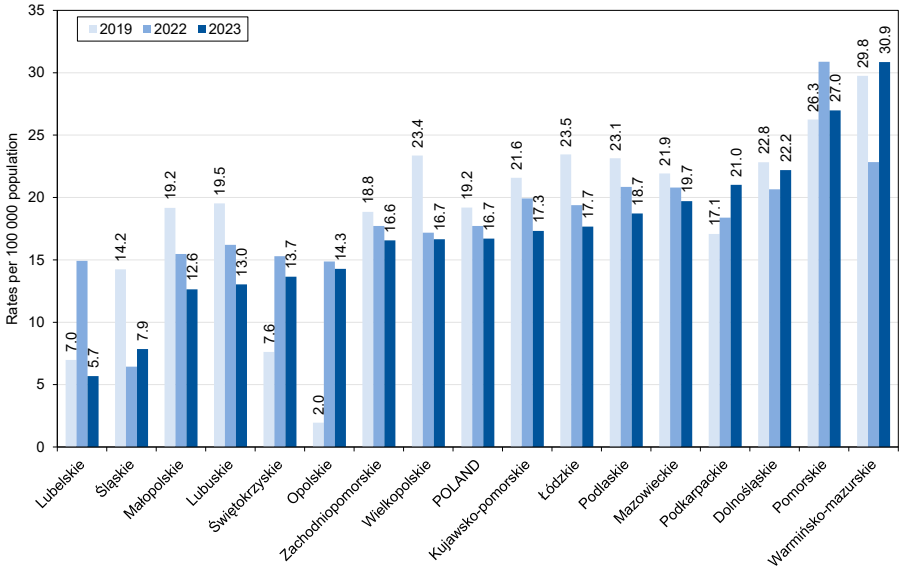


Fig. 3.42. Age-standardised annual death rates due to chronic lower respiratory diseases (J40–J47) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

The average age at death due to chronic lower respiratory diseases in 2023 was 74.9 years for men and 76.8 years for women (Tab. 3.19). Even after eliminating differences in age structure in both sexes, women die from this condition on average 1.1 years earlier than men. On average, men and women die at the oldest age in Podkarpackie voivodship, while the youngest age at death is recorded among inhabitants of Opolskie voivodship and women in Lubuskie and Śląskie voivodships. The age difference between these two extreme voivodships stands at almost 4 years for men and almost 5 years for women.

Table 3.19. Average age at death due to chronic lower respiratory diseases by voivodship and sex in 2023 – actual and age-standardised values

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Dolnośląskie	73.9	76.8	76.2	75.8
Kujawsko-pomorskie	75.4	76.2	77.8	75.5
Lubelskie	76.2	78.3	78.0	75.8
Lubuskie	75.3	74.3	77.6	74.1
Łódzkie	74.4	76.4	76.3	75.2
Małopolskie	77.2	79.1	78.6	77.5
Mazowieckie	74.7	76.7	76.1	75.3
Opolskie	73.1	75.1	74.9	74.2
Podkarpackie	77.1	79.8	78.8	79.0
Podlaskie	76.2	76.9	77.9	75.1
Pomorskie	74.6	76.4	76.2	75.6
Śląskie	75.1	75.1	76.6	74.2
Świętokrzyskie	74.0	78.6	75.8	77.3
Warmińsko-mazurskie	74.7	77.7	78.0	76.9
Wielkopolskie	73.9	76.8	76.1	76.2
Zachodniopomorskie	73.3	75.1	75.6	74.5
Poland	74.9	76.8	76.8	75.7

Source: Own calculations based on Statistics Poland data

Mortality due to diseases of the digestive system

The mortality rate of the general population of Poland due to diseases of the digestive system increased in 2015–2018, with the pandemic years of 2020–2021 bringing a further increase in the death rate, while it has decreased in the last two

years (Fig. 3.43). In 2023, diseases of the digestive system caused 19,943 deaths (11,561 men and 8,382 women), i.e. 53 deaths per 100,000 population (63 for men and 43 for women, Table 3.6a).

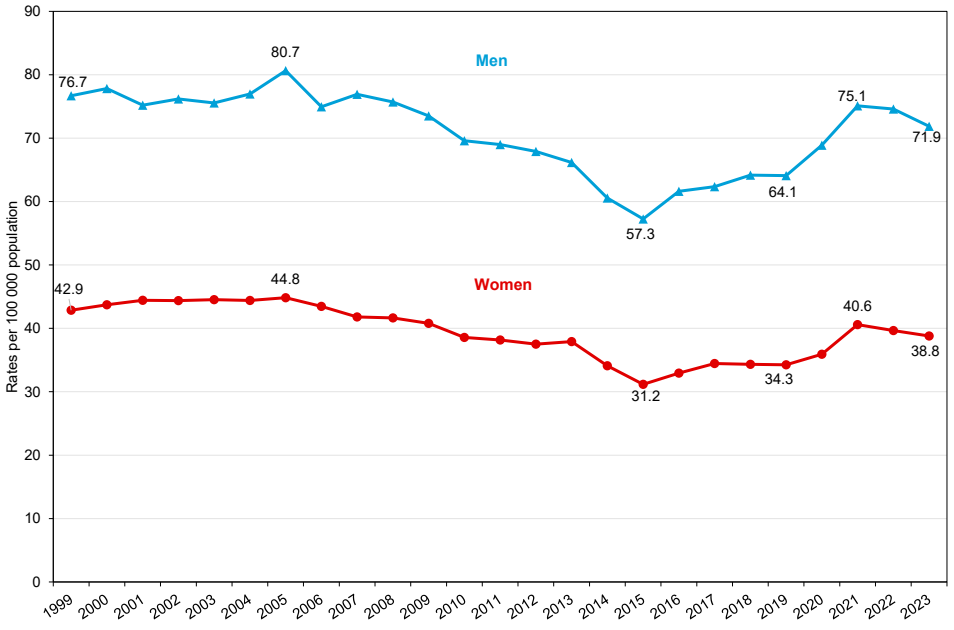


Fig. 3.43. Age-standardised death rates due to diseases of the digestive system for men and women in Poland, 1999–2023 (own calculations based on Statistics Poland databases)

Although the overall mortality rate due to diseases of the digestive system is lower than that due to diseases of the respiratory system, diseases of the digestive system are the most common cause of death among Poles aged 25–64 (Fig. 3.19a and 3.19b).

Diseases of the digestive system pose a much greater threat to men than women; after eliminating differences in age structure, the mortality rate among men is 85% higher than among women (Table 3.6b, Fig. 3.43).

The threat to life from **diseases of the digestive system among the total** population in 2019–2023 was highest in Dolnośląskie (only in the last two years), Śląskie and Łódzkie voivodships (Fig. 3.44). In Świętokrzyskie, Lubelskie and Dolnośląskie voivodships, mortality in 2022 and 2023 was significantly higher than before the pandemic. In contrast, mortality rates declined quite significantly in Podlaskie and Opolskie voivodships.

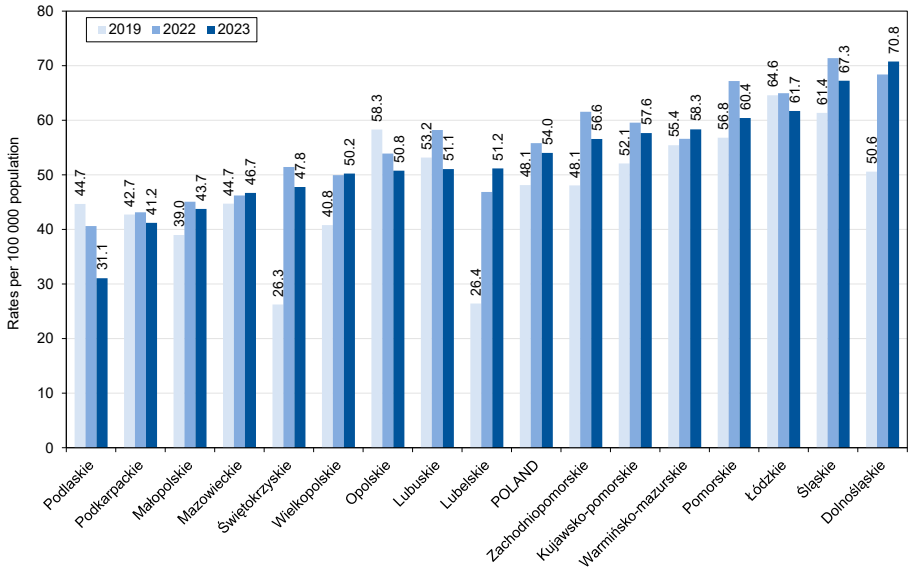


Fig. 3.44. Age-standardised annual death rates due to diseases of the digestive system (K00–K93) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

Table 3.20 presents the percentage differences in the observed standardized death rates due to all digestive system diseases in men and women in 2022 and 2023 for each voivodship compared to their expected values based on previous 10-year trends. The very high excess mortality in both years in the Lubelskie and Świętokrzyskie voivodships is noteworthy, particularly high in women. Such a high excess value in these provinces was caused, on the one hand, by a large increase in mortality due to these causes in 2021 and, on the other hand, by a strong downward trend in death rates in previous years, which is taken into account when estimating the expected death rate.

Table 3.20. Relative (%) difference in observed standardized death rates due to the digestive system diseases in men and women compared to their expected values based on previous 10-year trends by province in 2022 and 2023

Voivodship	2022		2023	
	Men	Women	Men	Women
Dolnośląskie	53.6	26.9	42.2	48.5
Kujawsko-pomorskie	9.8	13.5	0.9	13.6
Lubelskie	54.1	141.2	74.1	158.5
Lubuskie	0.9	19.3	-3.3	-9.8
Łódzkie	3.2	1.5	-0.4	-4.7
Małopolskie	20.0	6.5	15.8	5.5

Voivodship	2022		2023	
	Men	Women	Men	Women
Mazowieckie	0.5	8.6	1.1	7.9
Opolskie	-21.6	2.3	-27.3	-4.4
Podkarpackie	-6.4	14.4	-7.6	2.2
Podlaskie	-3.6	-18.9	-25.8	-41.6
Pomorskie	21.6	12.9	2.2	10.8
Śląskie	18.9	12.9	13.0	3.3
Świętokrzyskie	75.3	168.2	71.4	130.2
Warmińsko-mazurskie	4.0	-4.0	-0.9	8.9
Wielkopolskie	30.6	32.4	33.4	28.3
Zachodniopomorskie	20.2	28.1	13.2	16.4
Poland	15.0	18.9	10.0	15.5

Source: Own calculations based on Statistics Poland data

The average age at death due to diseases of the digestive system in 2023 was 63.2 years for men and 73.4 years for women (Tab. 3.21a). After eliminating differences in age structure in both sexes, women die from these diseases on average 5.7 years later than men (Tab. 3.21b). On average, men die youngest in Podlaskie voivodship and women in Lubuskie, while men die oldest in Kujawsko-Pomorskie, Opolskie and Wielkopolskie and women in Lubelskie. The difference in age at death between these two extreme voivodships is pronounced, standing at 4.7 years for men and 4.5 years for women. Urban and rural populations generally die at a similar age, but there are differences between voivodships. For example, in Świętokrzyskie voivodship, men living in urban areas die on average 3.1 years younger than men living in rural areas, and women living in urban areas die as much as 7.1 years earlier than women living in rural areas. In Opolskie voivodship, women living in urban areas die more than six years earlier than women living in rural areas.

Table 3.21a. Average age at death due to diseases of the digestive system by voivodship, sex and place of residence (urban/rural) in 2023 – actual values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	63.2	63.7	62.0	72.3	72.1	73.2
Kujawsko-Pomorskie	63.6	64.3	62.6	74.8	75.3	73.6
Lubelskie	63.3	64.3	62.4	76.7	76.2	77.3
Lubuskie	63.1	63.6	62.3	71.0	70.1	72.7

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Łódzkie	63.4	64.2	62.0	74.1	73.9	74.6
Małopolskie	63.9	64.6	63.2	74.5	73.7	75.7
Mazowieckie	62.8	63.0	62.5	74.2	73.8	74.9
Opolskie	64.6	65.7	63.5	73.8	71.4	76.8
Podkarpackie	61.4	63.5	59.8	74.4	73.3	75.4
Podlaskie	60.0	61.5	58.4	73.3	72.0	75.5
Pomorskie	63.9	64.5	62.9	73.5	74.0	72.2
Śląskie	63.1	63.2	62.9	72.3	72.3	72.2
Świętokrzyskie	63.1	62.6	63.7	73.6	70.4	76.8
Warmińsko-Mazurskie	61.7	62.1	61.2	72.9	72.7	73.1
Wielkopolskie	63.5	64.8	61.9	72.3	73.4	70.1
Zachodniopomorskie	63.8	64.0	63.3	72.3	72.5	71.7
Poland	63.2	63.7	62.2	73.4	73.2	74.0

Source: Own calculations based on Statistics Poland data

Table 3.21b. Average age at death due to diseases of the digestive system by voivodship, sex and place of residence (urban/rural) in 2023 – standardised values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	65.8	65.6	66.1	70.2	69.2	72.7
Kujawsko-pomorskie	66.7	66.3	67.6	73.2	73.0	73.2
Lubelskie	66.1	66.8	65.5	74.2	74.1	74.4
Lubuskie	65.2	65.2	65.5	69.8	68.5	72.3
Łódzkie	65.9	66.5	64.7	71.2	70.5	72.6
Małopolskie	66.5	66.2	66.8	72.3	70.8	74.1
Mazowieckie	65.3	65.0	66.1	71.7	70.9	73.1
Opolskie	66.7	67.1	66.5	71.8	69.1	75.3
Podkarpackie	64.1	66.0	62.5	72.2	71.2	73.2
Podlaskie	62.0	63.6	60.0	70.1	69.0	71.8
Pomorskie	66.4	65.9	67.5	72.2	71.7	72.9
Śląskie	65.1	64.8	65.9	70.4	70.2	71.2
Świętokrzyskie	64.6	63.1	66.2	70.5	66.8	74.0
Warmińsko-mazurskie	65.3	64.8	66.3	71.6	70.8	72.7
Wielkopolskie	66.7	67.0	66.3	71.2	71.4	70.5
Zachodniopomorskie	66.4	65.8	68.1	70.5	69.9	71.7
Poland	65.7	65.6	65.8	71.4	70.6	72.7

Source: Own calculations based on Statistics Poland data

The mortality rate of the Polish population due to diseases of the digestive system is strongly related to the level of education (Fig. 3.45). The lives of people with up to lower secondary education are approximately three and a half times more at risk from these diseases than those with tertiary education. The mortality rate among people with upper secondary education is more than two times higher than among people with tertiary education.

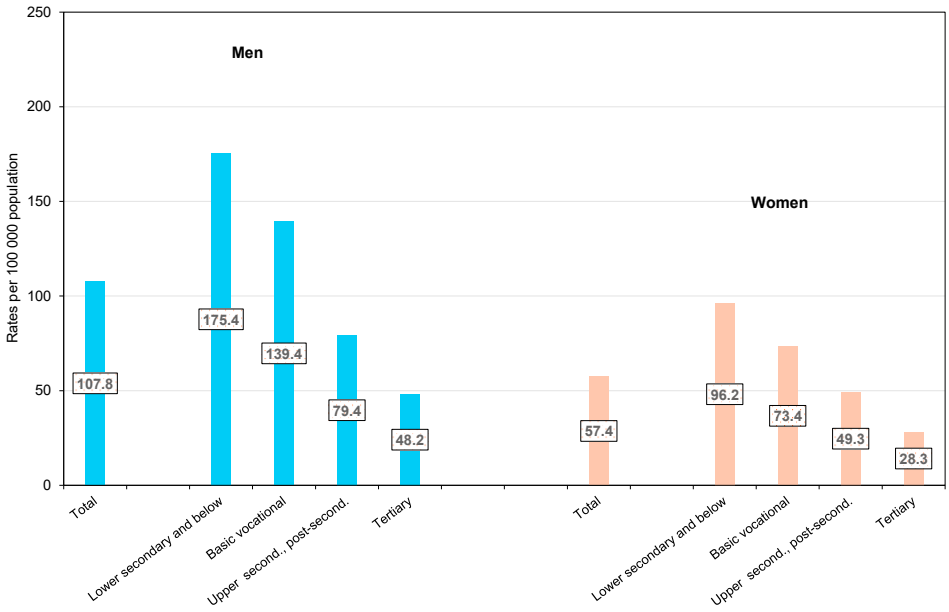


Fig. 3.45. Age-standardised death rates due to diseases of the digestive system for men and women aged 30 and over by level of education in the three-year period 2020–2022 (own calculations based on Statistics Poland data)

Diseases of the digestive system in general pose a greater threat to the lives of urban populations than rural populations, both for men and women (Tables 3.7a and 3.7b). An even greater difference to the detriment of urban populations can be seen in chronic liver disease, particularly among women. Their mortality rate among women in urban areas is 44% higher than in rural areas.

Figure 3.46 shows excess mortality due to diseases of the digestive system for urban and rural populations in each voivodship in relation to the observed mortality for Poland in 2023. The most unfavourable difference for rural areas compared to urban areas was in Warmińsko-mazurskie, Podlaskie and Pomorskie voivodships. In contrast, the most significant difference in excess mortality to the detriment of urban populations was observed in the voivodships of Śląskie and Łódzkie.

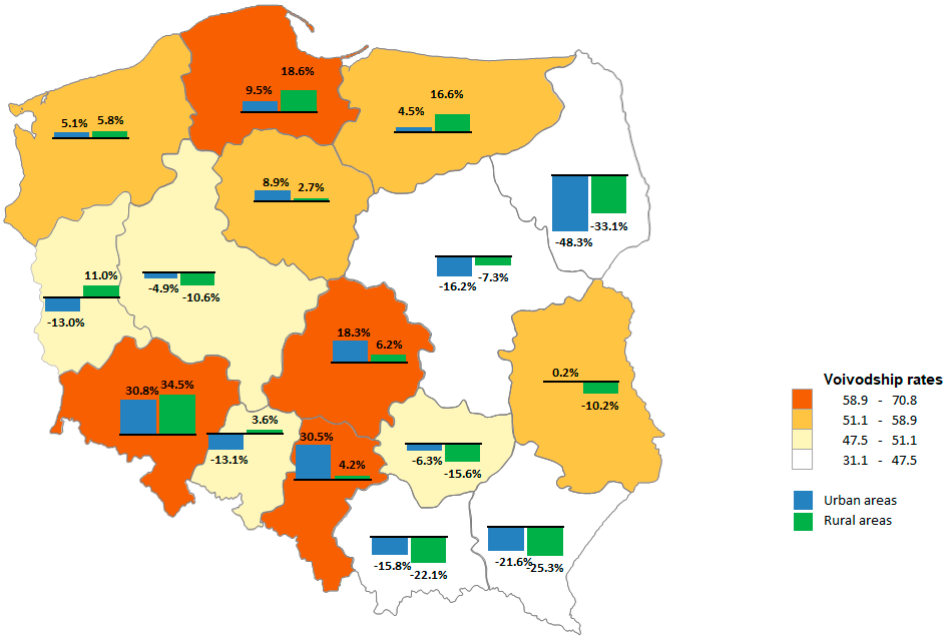


Fig. 3.46. Relative difference (%) in standardised death rates due to diseases of the digestive system for the total population of urban and rural areas in relation to the observed national rate by voivodship in 2023

Chronic liver disease (K70, K73 and K74) (mainly cirrhosis and alcoholic liver disease) is the most important subgroup of diseases of the digestive system in terms of causes of death, with 7,866 deaths (5,537 men and 2,329 women) (39% of all deaths due to diseases of the digestive system) in 2023.

Mortality due to **chronic liver disease** varies greatly between voivodships. This disease poses the greatest threat to life in the voivodships of Dolnośląskie and Śląskie – in 2023, it was 59% and 41% higher than the national average, respectively (Fig. 3.47). In 2023, death rates in almost half of the voivodships were higher than in 2019, with the largest increases observed in Dolnośląskie, Wielkopolskie and Pomorskie voivodships. A marked decrease in mortality rates occurred in the voivodships of Lubuskie, Opolskie and Podlaskie.

The average age at death due to chronic liver disease in 2023 was 57.8 years for men and 60.9 years for women (Tab. 3.21). After eliminating differences in age structure in both sex groups, men die from this condition only slightly earlier than women, on average by 0.8 years. Of note is the situation in Podkarpackie voivodship, where men die on average 7 years younger than women. On average, men die at the oldest age in Lubuskie and Pomorskie voivodships, and women in

Podkarpackie voivodeship, while men die at the youngest age in Podkarpackie and women in Łódzkie. The age difference between these two extreme voivodships is substantial, at 5.8 years for men and 6.7 years for women.

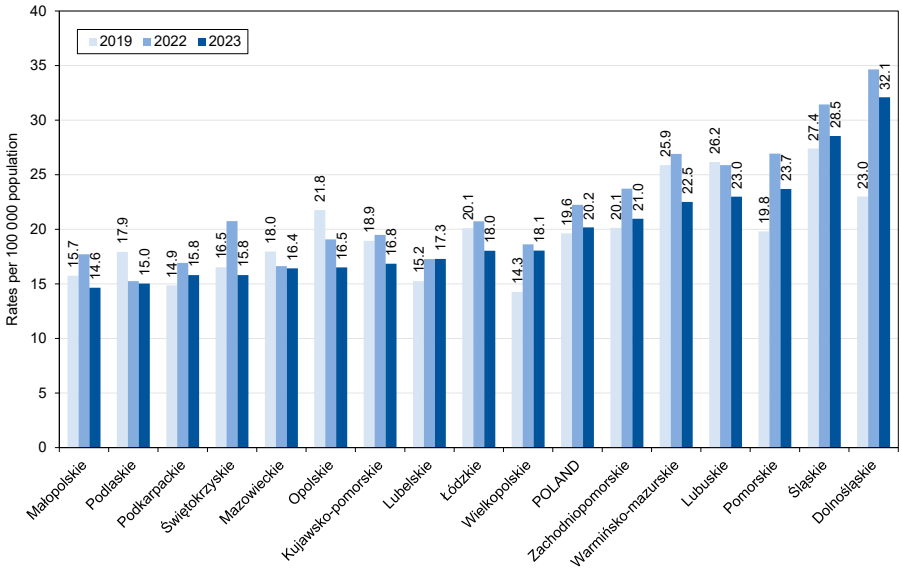


Fig. 3.47. Age-standardised annual death rates due to chronic liver disease and cirrhosis (K70, K73–K74) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

Table 3.22. Average age at death due to chronic liver disease by voivodship and sex in 2023 – actual and age-standardised values

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Dolnośląskie	59.1	61.3	60.0	60.1
Kujawsko-pomorskie	56.8	62.3	57.6	61.0
Lubelskie	56.0	61.7	56.8	60.2
Lubuskie	60.9	62.6	61.8	61.7
Łódzkie	56.4	58.4	56.9	56.4
Małopolskie	57.5	59.7	58.7	59.3
Mazowieckie	57.6	60.2	59.1	59.1
Opolskie	58.3	63.4	59.1	62.1
Podkarpackie	55.2	64.2	56.1	63.2
Podlaskie	57.1	58.8	58.2	58.1

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Pomorskie	60.1	63.3	61.5	62.5
Śląskie	58.2	60.0	59.1	58.7
Świętokrzyskie	57.6	58.9	57.6	57.2
Warmińsko-mazurskie	56.3	61.4	57.4	60.7
Wielkopolskie	57.5	60.4	59.0	59.6
Zachodniopomorskie	58.5	59.9	59.5	58.7
Poland	57.8	60.9	58.9	59.7

Źródło: obliczenia własne na podstawie danych GUS

The mortality rate due to chronic liver disease and cirrhosis is higher among urban populations than rural populations in most voivodships, except for Pomorskie, Lubuskie, Podlaskie and Opolskie. The largest relative difference in mortality rates between urban and rural areas is in Świętokrzyskie (the lowest rural mortality rate in Poland) and Śląskie (the second highest urban mortality rate in Poland after Dolnośląskie) voivodships (Fig. 3.48).

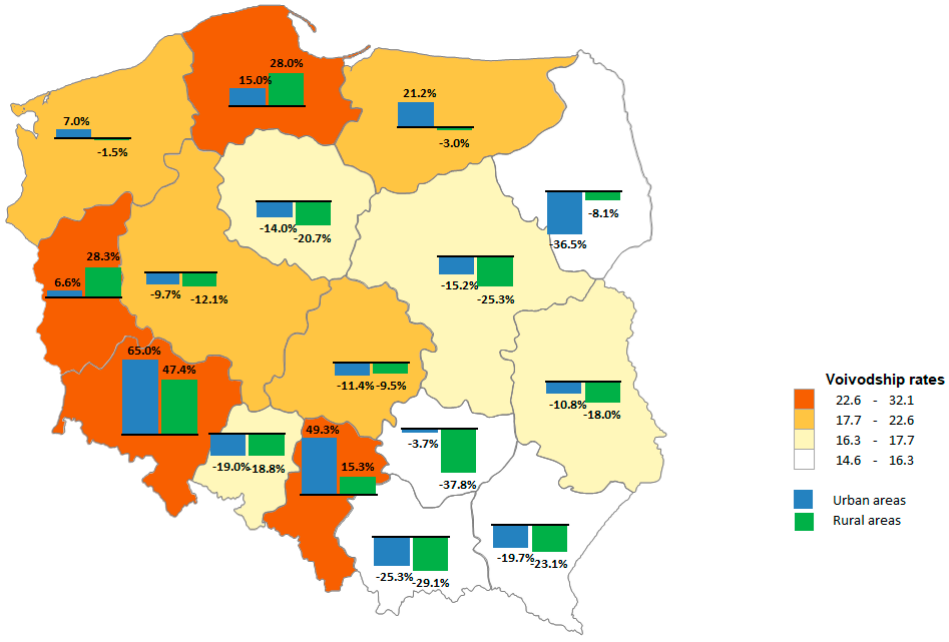


Fig. 3.48. Relative difference (%) in standardised death rates due to chronic liver disease and cirrhosis (K70, K73–K74) among urban and rural populations in relation to the national rate by voivodship in 2023

Mortality due to external causes of death

The significance of this group of health-related events as a cause of death among men and women decreased until 2017, while in subsequent years the death rates slowly increased, especially in 2021, but in the last two years they decreased again (Tables 3.5a and 3.5b, Fig. 3.49). External causes of death are the biggest threat to the lives of males aged 10–49 and females aged 10–29 (Fig. 3.19a and 3.19b). In 2023, there were 19,645 deaths (13,965 men and 5,680 women) due to these causes, i.e. 52.1 per 100,000 population (76.7 for men and 29.2 for women, Table 3.6a).

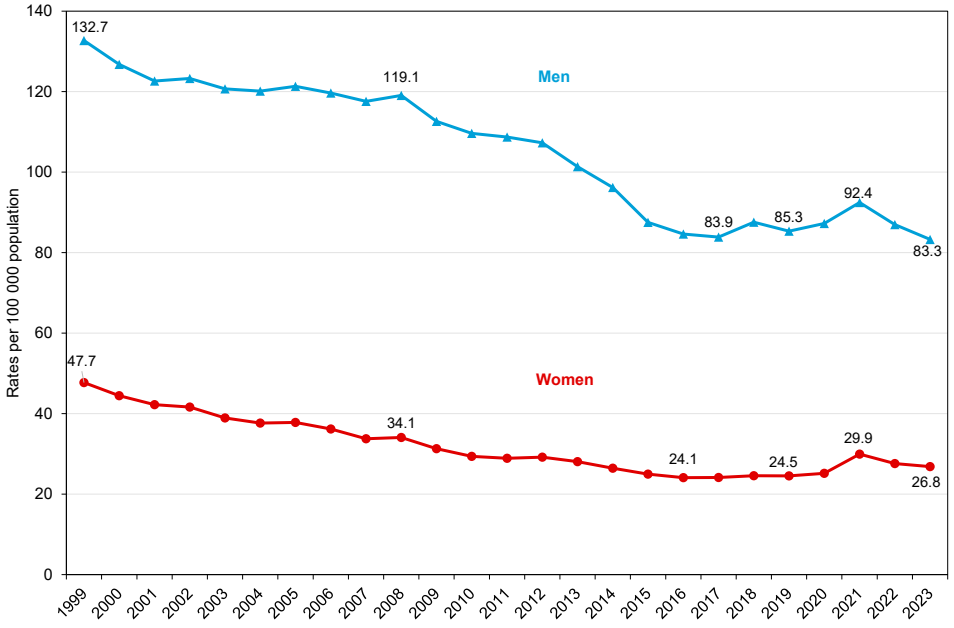


Fig. 3.49. Age-standardised death rates due to external causes for men and women in Poland, 1999–2023 (own calculations based on Statistics Poland databases)

External causes of death pose a much greater threat to life of men than women. In 2023, the standardised death rate for men was 3.1 times higher than that for women (Table 3.6b, Fig. 3.49). Mortality level of men is higher in rural than in urban areas (by 25%), while mortality of women living in rural and urban areas is currently the same (Table 3.7b).

There is considerable variation between voivodships in the death rates due to **external causes of death**. Mortality level is highest in Pomorskie and Łódzkie voivodships – in 2023, death rates were higher than the national average by 59%

and 41% respectively, and more than twice as high as in Małopolskie (Fig. 3.50). In 2023, death rates in half of the voivodships were lower than in 2019, with the largest decreases in mortality observed in Małopolskie, Dolnośląskie and Podlaskie. A marked increase in mortality was recorded in the north of Poland in Pomorskie and Zachodniopomorskie voivodships.

Table 3.23 presents the percentage differences in the observed standardized death rates due to all external causes for men and women in 2022 and 2023 compared to their expected values based on the previous 10-year trends for individual voivodships. The higher excess mortality in women than in men is noteworthy, particularly high in both years in the Lubelskie and Świętokrzyskie voivodships, and also clearly marked in the Mazowieckie province.

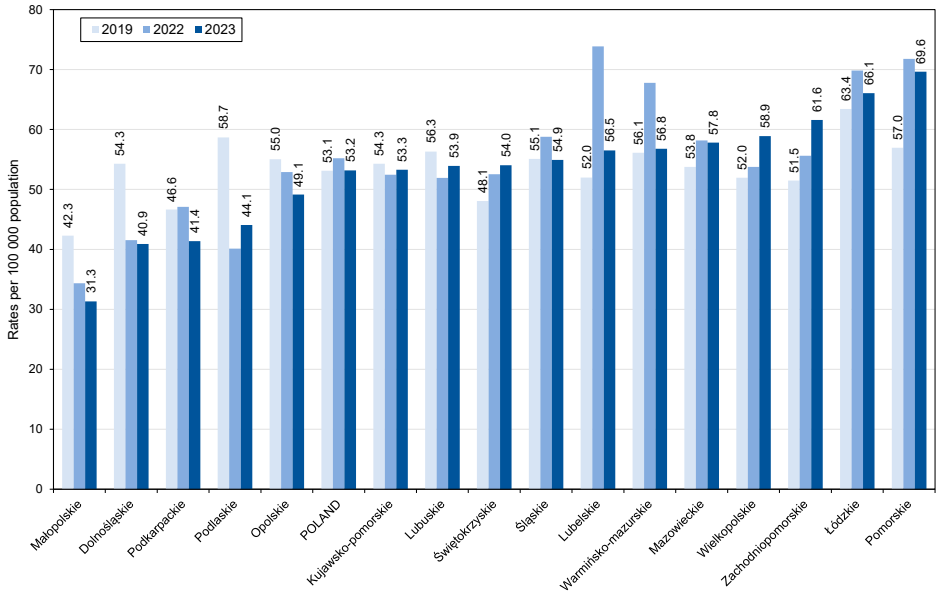


Fig. 3.50. Age-standardised annual death rates due to external causes (V00–Y98) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland databases)

Table 3.23. Relative (%) difference in observed standardized death rates due to the external causes of deaths in men and women compared to their expected values based on previous 10-year trends by province in 2022 and 2023

Voivodship	2022		2023	
	Men	Women	Men	Women
Dolnośląskie	-24.1	-20.2	-29.9	-17.2
Kujawsko-pomorskie	-7.8	26.5	-7.7	23.4
Lubelskie	29.1	130.2	0.5	67.4

Voivodship	2022		2023	
	Men	Women	Men	Women
Lubuskie	-12.6	13.8	-9.4	4.4
Łódzkie	1.4	28.4	-0.1	12.3
Małopolskie	-9.8	-20.2	-18.4	-26.0
Mazowieckie	10.2	44.0	8.4	42.2
Opolskie	-4.5	6.1	-17.9	17.6
Podkarpackie	-0.8	17.8	-13.1	-8.2
Podlaskie	-34.3	-22.8	-25.1	-23.4
Pomorskie	26.6	22.7	14.7	25.0
Śląskie	24.2	0.6	13.6	-4.8
Świętokrzyskie	10.8	53.3	15.9	55.4
Warmińsko-mazurskie	16.2	37.4	-2.2	5.7
Wielkopolskie	-6.0	5.2	-4.6	23.5
Zachodniopomorskie	13.3	13.4	18.0	32.9
Polska	6.7	13.1	1.1	8.5

Source: Own calculations based on Statistics Poland data

The average age at death due to external causes of death in 2023 was 54.6 years for men and 70.4 years for women (Tab. 3.24a). After eliminating differences in age structure in both sex groups, women die from these diseases on average 9.2 years later than men (Tab. 3.24b).

Table 3.24a. Average age at death due to external causes of death by voivodship, sex and place of residence (urban/rural) in 2023 – actual values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	53.0	53.6	51.9	69.3	71.0	64.8
Kujawsko-pomorskie	53.2	54.8	51.4	68.9	69.3	68.1
Lubelskie	56.2	55.9	56.4	73.4	72.9	73.8
Lubuskie	53.1	53.6	52.3	68.3	68.9	66.2
Łódzkie	56.7	57.3	55.9	72.1	72.8	70.9
Małopolskie	53.8	53.4	54.1	70.8	69.9	71.6
Mazowieckie	54.6	55.3	53.7	70.5	69.8	71.7
Opolskie	56.2	58.3	54.0	72.7	74.7	70.4
Podkarpackie	54.4	53.5	54.9	70.2	70.5	70.0
Podlaskie	53.4	53.1	53.6	71.0	70.4	71.8

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Pomorskie	54.4	56.3	51.6	69.2	70.9	65.4
Śląskie	56.5	56.9	55.4	71.8	71.5	72.8
Świętokrzyskie	56.5	56.7	56.4	67.3	65.8	68.5
Warmińsko-mazurskie	52.3	51.6	53.1	66.7	69.1	62.2
Wielkopolskie	53.0	54.4	51.6	69.1	70.8	66.9
Zachodniopomorskie	54.8	55.9	53.0	70.5	71.6	67.0
Poland	54.6	55.4	53.8	70.4	70.8	69.5

Source: Own calculations based on Statistics Poland data

On average, men die youngest in Warmińsko-Mazurskie and women in Świętokrzyskie voivodships, while men die oldest in Łódzkie and Lubelskie and women in Lubelskie. The difference in age at death between these two extreme voivodships is particularly pronounced in the case of women, at 7.4 years, while for men it is 4.0 years. Urban and rural populations generally die at a similar age, but there are differences between voivodships. For example, in Warmińsko-mazurskie voivodship, men living in urban areas die on average 4.7 years younger than men living in rural areas, and women living in urban areas of Świętokrzyskie die as much as 4.5 years earlier than women living in rural areas.

Table 3.24b. Average age at death due to external causes of death by voivodship, sex and place of residence (urban/rural) in 2023 – age-standardised values

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Dolnośląskie	55.9	55.8	56.0	65.3	65.9	63.7
Kujawsko-pomorskie	56.0	56.6	55.7	65.9	64.5	67.8
Lubelskie	59.2	58.4	59.9	69.3	68.3	70.1
Lubuskie	56.3	56.1	56.9	65.7	65.0	65.9
Łódzkie	59.4	59.6	59.0	67.3	67.4	67.5
Małopolskie	57.5	55.9	58.8	67.8	65.8	69.8
Mazowieckie	58.0	58.3	57.8	66.6	65.0	69.3
Opolskie	58.3	59.9	56.6	68.8	70.6	67.2
Podkarpackie	57.3	55.9	58.3	67.2	66.5	67.5
Podlaskie	56.3	56.3	55.9	66.1	66.0	66.0
Pomorskie	58.2	58.6	57.7	67.4	67.6	67.7

Voivodship	Men			Women		
	Total	Urban area	Rural area	Total	Urban area	Rural area
Śląskie	59.1	59.2	58.9	68.7	67.9	71.5
Świętokrzyskie	58.2	57.4	58.8	61.9	59.3	63.7
Warmińsko-mazurskie	55.4	53.6	58.3	63.9	64.7	62.1
Wielkopolskie	57.3	57.3	57.8	67.4	67.5	67.9
Zachodniopomorskie	58.1	58.2	58.4	67.4	67.3	66.7
Poland	57.8	57.8	58.0	67.0	66.4	67.7

Source: Own calculations based on Statistics Poland data

Mortality of the Polish population due to external causes of death is very strongly related to the level of education (Fig. 3.51). The lives of men with up to lower secondary education are approximately four times more at risk due to these causes than the lives of men with tertiary education, while this difference for women is two and a half times. The mortality rate for those with upper secondary education is three times higher for men and twice as high for women as for those with tertiary education.

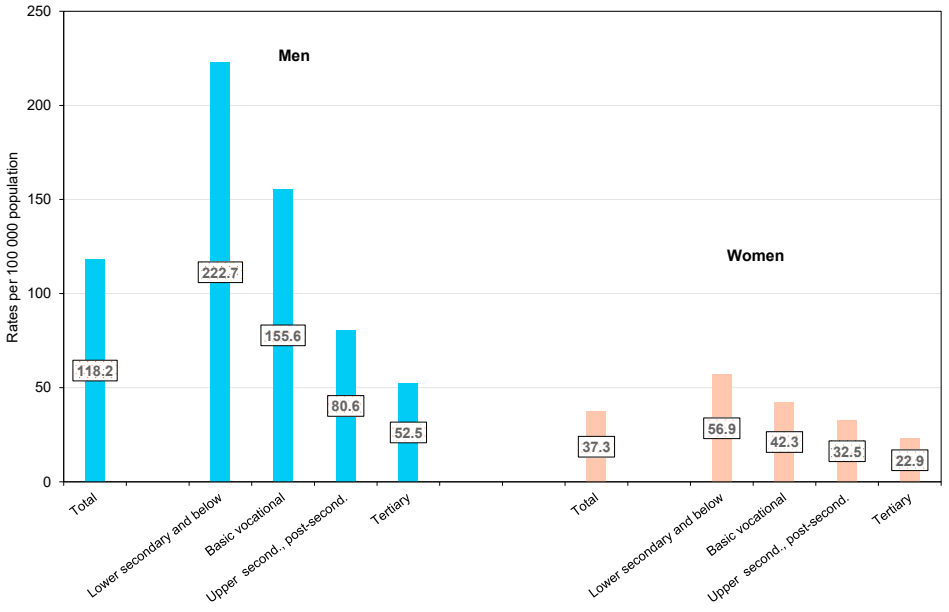


Fig. 3.51. Age-standardised death rates due to external causes for men and women aged 30 and over by level of education in the three-year period 2020–2022 (own calculations based on Statistics Poland data)

Among external causes of death, **falls** were the most common cause for the total population of Poland and for women in 2023, accounting for 5,027 deaths, or 26% of all deaths from external causes (2,582 men and 2,445 women). Of note is that among women, only 7% of deaths from this cause are among those under the age of 65, while among men, the figure is as high as 35%. Falls pose a similar threat to the lives of urban and rural populations.

The second leading cause of death among external causes is **suicide**, which is the leading cause of death among men, resulting in 4,553 deaths in 2023 (as many as 3,895 men and 658 women). Suicides pose a significantly greater threat to the lives of men living in rural areas than in urban areas (38% greater in 2023), and in the last year this cause posed a greater threat (by 13%) to the lives of women living in urban areas than in rural areas (the greater threat to women's lives in urban areas has only been observed since 2021).

The third leading external cause of death among Poles is **transport accidents**, which claimed the lives of 2,458 people (1,908 men and 550 women) in 2023. Mortality level in rural areas is higher than in urban areas – in 2023, excess of 59% among men and 15% among women (Table 3.7b).

The nationwide age-standardised death rate due to **suicide** remained stable in 2019, 2022 and 2023. In contrast, a number of voivodships saw significant changes in this rate (Fig. 3.52). We drew attention to the problems associated with the comparative analysis of suicide death rates in our 2020 Report.[21] Currently, high suicide mortality rates in Kujawsko-pomorskie voivodship in 2022 (the number of deaths increased from 172 in 2019 to 277 in 2021, 267 in 2022 and 247 in 2023) may be partly due to significant decrease in the number of deaths from events of undetermined intent (ICD-10 Y10–Y34) (from 237 in 2019 to 13 and 31 in 2022 and 2023, respectively), which may indicate changes in certification. The opposite trend can be observed in Opolskie voivodship, where the death rate has fallen dramatically. While in 2019, there were 120 deaths due to suicide and 10 due to events of undetermined intent, in 2022 and 2023, the corresponding figures were 41 and 105, and 28 and 101. However, such changes cannot explain all sudden increases and decreases in death rates, for example, changes in mortality in Świętokrzyskie voivodship.

The average age at death due to suicide in 2023 was very similar for men and women, at 48.4 and 48.0 years, respectively (Tab. 3.25). Even after eliminating differences in age structure in both sexes, women die from this cause on average 3.4 years earlier than men. However, in Łódzkie voivodship, women died almost

[21] Wojtyniak B, Stokwiszewski J, Rabchenko D, et.al. "Długość życia i umieralność ludności Polski" in Wojtyniak B, Goryński P. Sytuacja zdrowotna ludności Polski i jej uwarunkowania 2020, NIZP PZH PIB, Warsaw 2020

10 years earlier than men and by almost eight years in Podlaskie voivodship. On average, men died at the oldest age in Świętokrzyskie voivodship and women in Lubuskie and Dolnośląskie, while men died at the youngest age in Pomorskie and women in Łódzkie. The age difference between these two extreme voivodships is significant, at 5.7 years for men and 10 years for women.

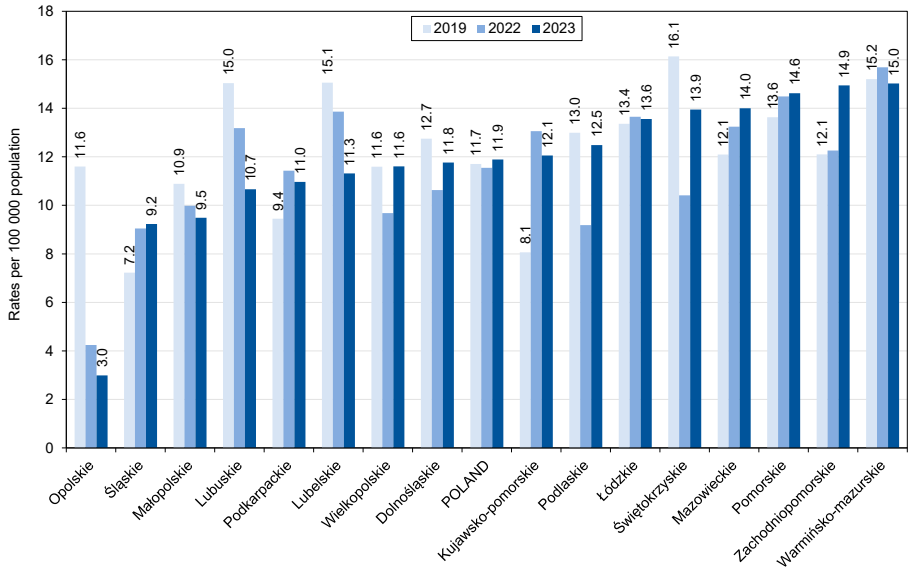


Fig. 3.52. Age-standardised annual death rates due to suicide (X60–X84) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

Table 3.25. Average age at death due to suicide by voivodship and sex in 2023 – actual and age-standardised values

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Dolnośląskie	47.9	54.0	49.4	51.6
Kujawsko-pomorskie	47.2	49.0	48.6	47.7
Lubelskie	48.6	49.3	50.5	47.5
Lubuskie	46.4	53.4	47.3	51.7
Łódzkie	50.3	44.2	51.3	41.7
Małopolskie	48.5	47.6	50.7	47.2
Mazowieckie	49.0	46.2	51.0	45.5
Opolskie	46.8	46.0	47.6	45.7
Podkarpackie	48.2	44.7	49.4	44.4

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Podlaskie	48.0	43.4	49.9	42.2
Pomorskie	44.2	48.0	46.2	47.4
Śląskie	48.8	50.6	49.7	48.8
Świętokrzyskie	51.2	46.5	51.9	45.1
Warmińsko-mazurskie	48.0	44.0	50.2	42.6
Wielkopolskie	49.1	50.4	51.0	50.1
Zachodniopomorskie	49.0	50.2	50.8	48.0
Poland	48.4	48.0	50.0	46.6

Source: Own calculations based on Statistics Poland data

In all voivodeships, the mortality rate due to suicide is higher in rural areas than among the residents of urban areas. The largest relative difference in mortality rates between rural and urban areas is in Warmińsko-mazurskie and Mazowieckie voivodships (Fig. 3.53). The highest risk of suicide among rural residents is currently found in Warmińsko-mazurskie, Podlaskie, Zachodniopomorskie and Mazowieckie voivodships, and in urban areas in Pomorskie and Zachodniopomorskie voivodships.

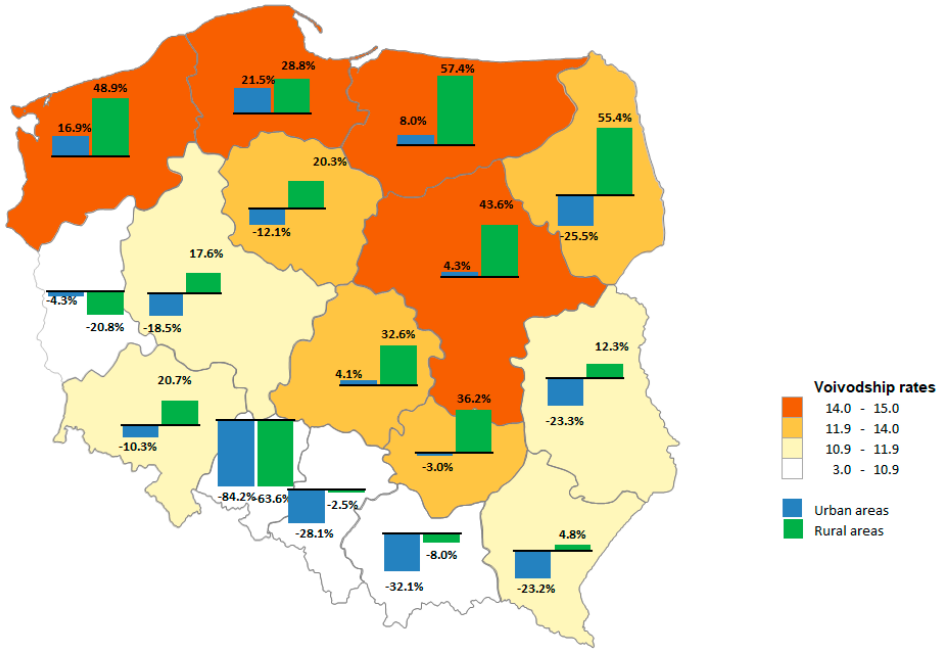


Fig. 3.53. Relative difference (%) in standardised death rates due to suicide (X60–X84) among urban and rural populations in relation to the national rate by voivodship in 2023 (own calculations based on Statistics Poland data)

Mortality due to **transport accidents** in Poland in 2023 was lower than in 2019 in all voivodships (Fig. 3.54). However, of note are Świętokrzyskie, Lubelskie, Dolnośląskie and Podlaskie voivodships, which recorded an exceptional reduction in mortality rates. This is probably an artefact related to the change in coding of the cause of death. The situation in the last two years indicates that Małopolskie voivodship is the region with the lowest risk of death from transport accidents, while Mazowieckie, Wielkopolskie and Łódzkie voivodships have the highest risk of such incidents.

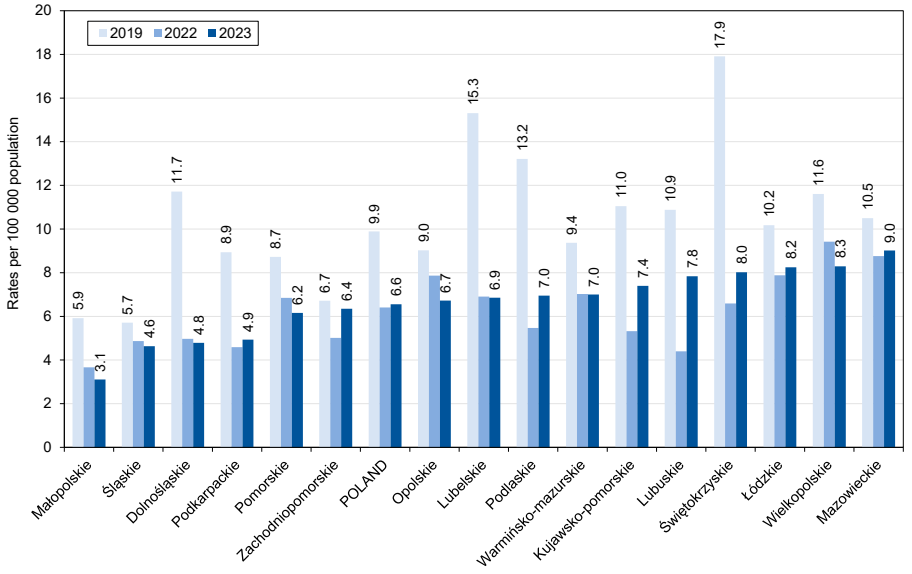


Fig. 3.54. Age-standardised annual death rates due to transport accidents (V00–Y99) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

The average age at death due to transport accidents in 2023 was very similar for men and women, at 45.8 and 51.8 years, respectively (Tab. 3.26). After eliminating differences in age structure in both sexes, men die from this cause on average 1.6 years earlier than women. However, in Pomorskie voivodship, men died almost 14 years earlier than women, and in Małopolskie voivodship, 9 years earlier. On the other hand, in Warmińsko-mazurskie and Opolskie voivodships, women died in transport accidents at an average age 6 years younger than men. The age difference between the voivodships with the highest and lowest average age at death is substantial, standing at 9.5 years for men and 20.7 years for women.

Table 3.26. Average age at death due to transport accidents by voivodship and sex in 2023 – actual and age-standardised values

Voivodship	Actual age		Standardised age	
	Men	Women	Men	Women
Dolnośląskie	44.4	46.2	45.8	43.6
Kujawsko-pomorskie	47.2	49.6	48.7	47.7
Lubelskie	46.9	59.2	49.2	55.8
Lubuskie	45.4	51.0	47.7	49.3
Łódzkie	46.8	55.4	48.1	49.8
Małopolskie	46.7	60.7	49.0	58.0
Mazowieckie	46.1	53.1	49.0	50.6
Opolskie	43.8	39.2	44.0	37.3
Podkarpackie	49.2	54.2	51.9	53.3
Podlaskie	45.3	56.7	47.1	54.0
Pomorskie	40.3	57.3	42.4	56.2
Śląskie	46.8	56.3	47.6	52.6
Świętokrzyskie	46.9	49.9	47.4	46.0
Warmińsko-mazurskie	44.5	43.4	48.1	41.8
Wielkopolskie	45.4	47.1	48.3	46.5
Zachodniopomorskie	45.3	52.4	46.3	49.6
Poland	45.8	51.8	47.8	49.4

Source: Own calculations based on Statistics Poland data

In all voivodships, the mortality rate due to transport accidents in rural areas is significantly higher than in urban areas (Fig. 3.55). The largest relative difference in mortality rates between rural and urban areas is found in Zachodniopomorskie, Łódzkie and Świętokrzyskie voivodships. The mortality level in rural areas in Mazowieckie voivodship is currently the highest in Poland, while the mortality in urban areas is highest in Lubuskie voivodship.

Mortality due to ill-defined causes

When discussing mortality caused by specific causes of death, attention should be paid to the ill-defined causes, i.e. where the cause of death described symptoms, was ill-defined or unknown (ICD-10 R00–R99). In 2023, the ill-defined cause was reported in 39,187 cases (20,781 men and 18,406 women) (104 per 100,000

population). These causes are not limited to the oldest age groups but are found in all ages (Fig. 3.19a and 3.19b). They are significantly more common among men than women and among rural than urban populations (Tables 3.6a, 3.6b, 3.7a, 3.7b).

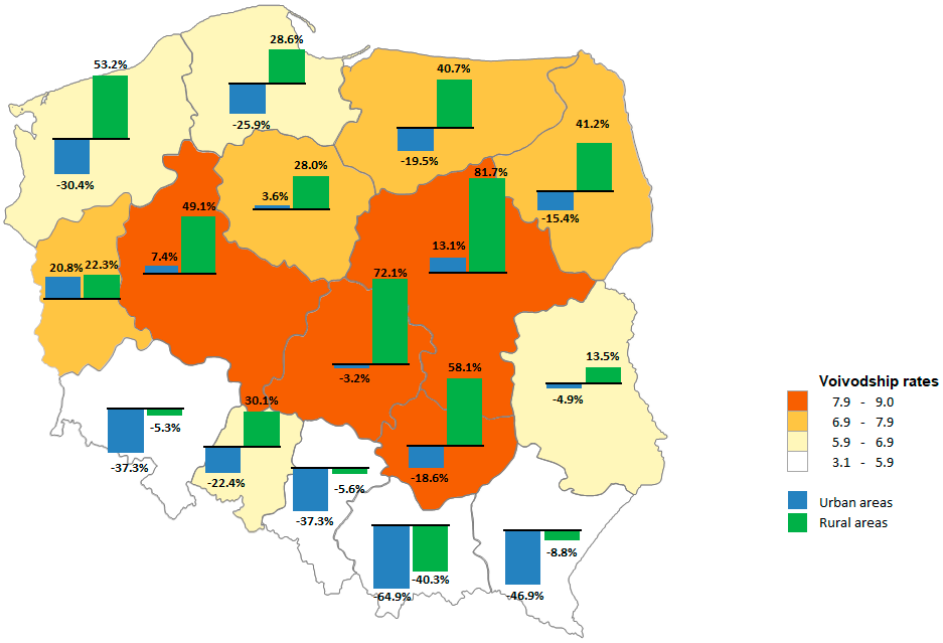


Fig. 3.55. Relative difference (%) of standardised death rates due to transport accidents (V00–V99) among urban and rural populations in relation to the national rate by voivodship in 2023 (own calculations based on Statistics Poland data)

For years, we have been drawing attention to the disappointing situation regarding voivodship and temporal disparities in deaths where the causes are ill-defined or unknown. As shown in Figure 3.56, both mortality rates and changes in mortality rates in recent years show considerable differences between voivodships. Firstly, the differences in rates between the extreme voivodships are very large – recently around twentyfold (in 2019, the difference was almost 70-fold). Secondly, the rates fluctuated significantly over time, which is difficult to understand. As noted earlier in this chapter, these shifts must have affected the changes and magnitude of death rates due to other causes. Only the situation in Pomorskie voivodship and, more recently, in Dolnośląskie and Podkarpackie is commendable.

The mortality of the Polish population due to ill-defined causes is very strongly related to the level of education held (Fig. 3.57).

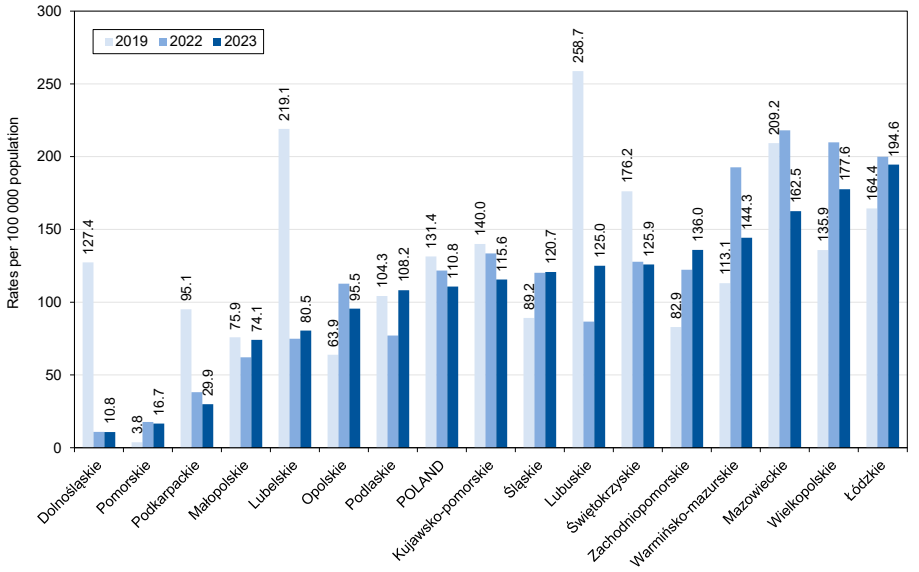


Fig. 3.56. Age-standardised annual death rates due to ill-defined causes (R00–R99) for the total population by voivodship in 2019, 2022 and 2023 (own calculations based on Statistics Poland data)

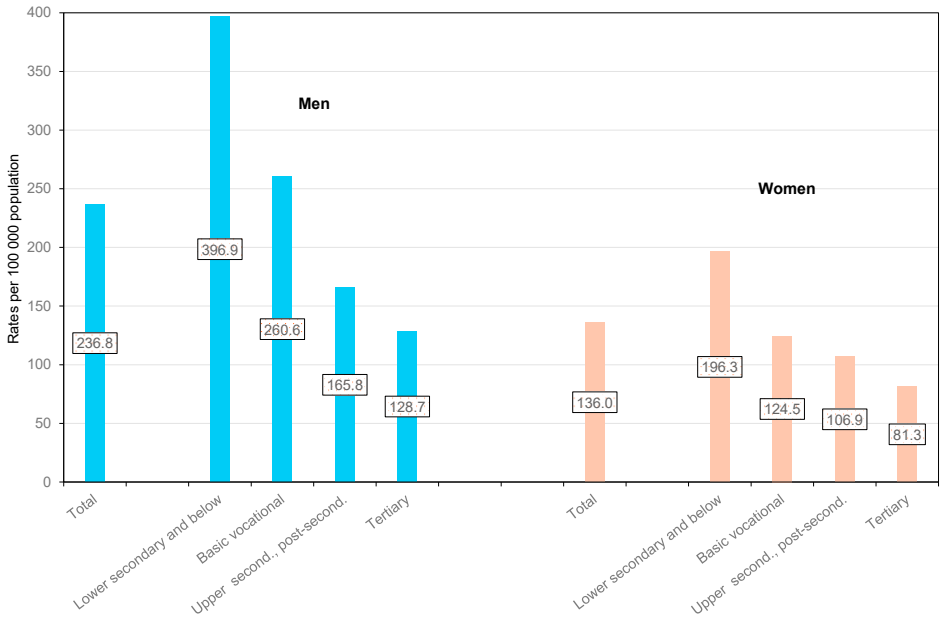


Fig. 3.57. Age-standardised death rates due to ill-defined causes for men and women aged 30 and over by level of education in the three-year period 2020–2022 (own calculations based on Statistics Poland data)

Deaths of men with up to lower secondary education are approximately three times more likely to be attributed to ill-defined causes than deaths of men with tertiary education, while this difference is almost two and a half times higher for women. The mortality rate of persons with such a vague diagnosis and upper secondary education is twice as high for men and 50% higher for women than for persons with tertiary education.

Mortality due to preventable and treatable causes

The concept of avoidable mortality is based on the idea that premature deaths due to certain health problems/events should be rare, and ideally should not occur at all, if timely and effective medical or public health interventions are available. Mortality due to these causes includes preventable causes of death and treatable causes of death. We will now discuss the problem of mortality in the Polish population due to these two groups of causes. Although avoidable mortality is not a precise, unambiguous measure of the performance of a healthcare system, they are considered to be population health indicators that provide a good starting point for assessing the performance of that system and for comparisons in the functioning of public health and medical care, which should lead to a reduction in premature deaths due to preventable or treatable causes.

A preventable cause of death, in the light of the understanding of the determinants of health at the time the death occurred, means that all or most of that cause (subject to age restrictions where appropriate) that could have been avoided by public health interventions in the broadest sense. Conversely, **a treatable cause of death** is one that, based on medical knowledge and available technology at the time of death, could have been avoided by good quality healthcare in all or most cases. The highlighted disease groups were created using the list[22] developed by Eurostat and the OECD, which was published in November 2019 and updated in 2022.[23] Unlike in previous versions, the 2019 list sets a uniform age threshold of 75 years for all selected causes of death. The established guiding

[22] OECD, EUROSTAT, Avoidable mortality: OECD/Eurostat lists of preventable and treatable causes of death (November 2019 version), November 2019. Retrieved 24 April 2020 from http://www.oecd.org/health/health-systems/Avoidable-mortality-2019-Joint-OECD-Eurostat-List-preventable-treatable-causes-of-death.pdf

[23] Avoidable mortality: OECD/Eurostat lists of preventable and treatable causes of death (January 2022 version)

principles include the following three critical points outlined by the authors: "For those causes of death that can be both largely prevented and also treated once they have occurred, these causes of death were attributed to the preventable category on the rationale that if these diseases are prevented, there would be no need for treatment. Causes of death should generally not be fractioned as being partly preventable and treatable given the lack of evidence to do this accurately and systematically, except when there is no strong evidence of predominance, in which case a 50%-50% allocation was used. Any double counting of the same causes of death between the two lists was avoided, so that the two lists can be used together to provide a broad assessment of the relative importance of prevention and health care interventions in reducing avoidable deaths." A 50-50 allocation was applied to cervical cancer, diabetes and most of the selected diseases of the circulatory system (DCS) that can be avoided, including hypertension, ischaemic heart disease and cerebrovascular disease. All these principles mean that the new lists differ slightly from the previous ones.

As the authors emphasis, the lists of causes of death and age limits reflect current health expectations, medical technology and knowledge and health policy development, and are therefore subject to future revision. The latest 2022 version now takes into account COVID-19 and the potential to prevent deaths from it through vaccination. In our analyses of avoidable mortality, due to uncertainties in attributing SARS-CoV-2 infection as the cause of death, these deaths were not considered.

In 2023, there were 122,561 deaths (81,266 men and 41,295 women) due to **avoidable causes** (352 per 100,000 population). The causes included in this category pose a much greater threat to men than women; after eliminating differences in age structure, the mortality rate among men is 2.3 times higher than among women (Table 3.6b). Deaths in this group account for 30.0% of all deaths, 38.8% of men and 20.7% of women, while deaths under the age of 75 account for 65.7%, 66.3% and 64.6%, respectively.

Death rates due to all avoidable causes show **a slowdown in the previous downward trend after 2014,** an increase in mortality during the pandemic, which was more pronounced for treatable causes than for preventable causes, and a decline in mortality below pre-pandemic rates in the last two years (Fig. 3.58).

In six voivodships, the death rates due to avoidable causes in 2023 were higher than in 2019, with the most considerable difference in Lubelskie voivodship (+13.5%), while mortality in Małopolskie decreased by nearly a quarter (Fig. 3.59). The highest mortality rate in the last two years has been in the voivodships of Dolnośląskie, Pomorskie and Lubuskie, which in 2023 was approximately 15% higher than the national average.

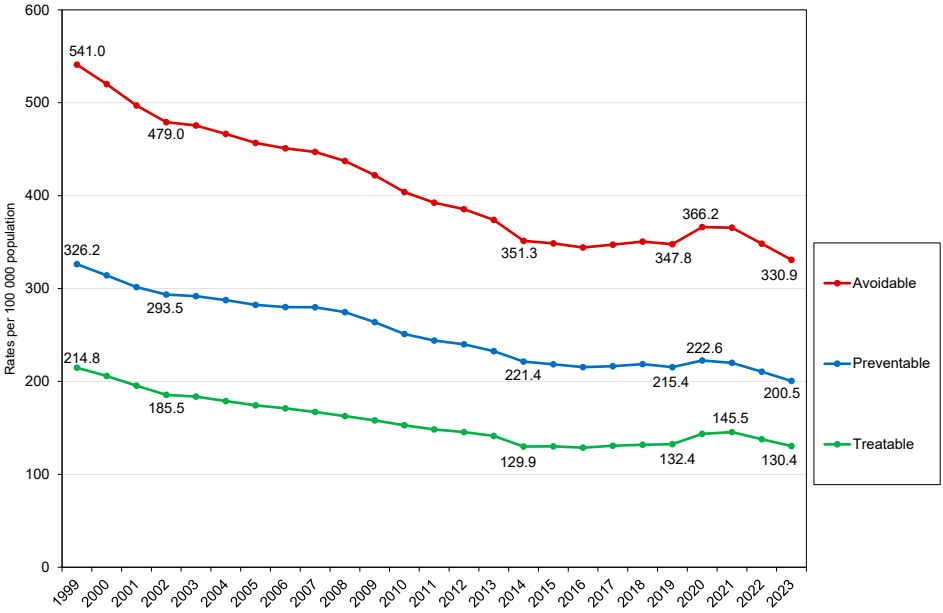


Fig. 3.58. Age-standardised death rates for persons under 75 due to avoidable, preventable and treatable causes in 1999–2023 (authors' calculations based on Statistics Poland data)

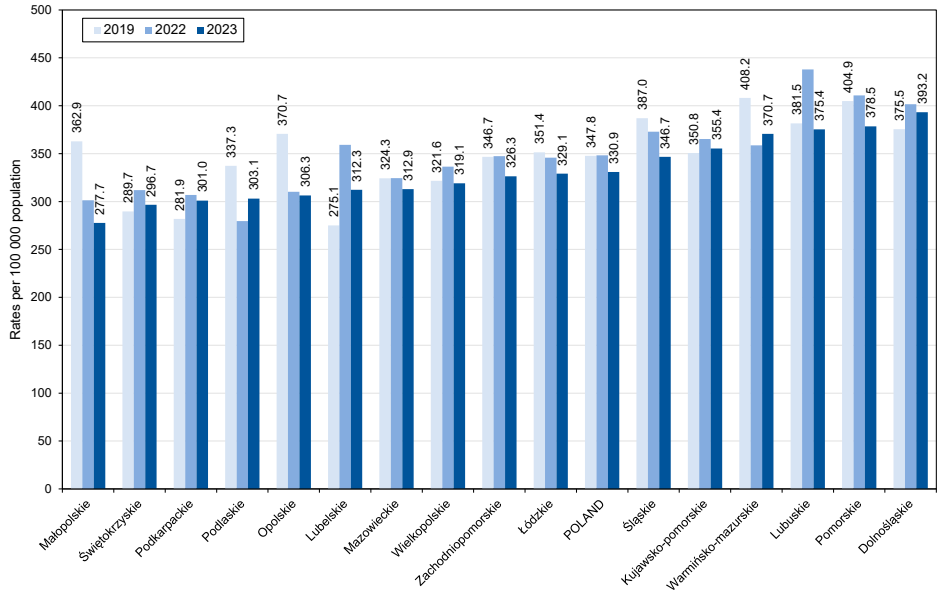


Fig. 3.59. Age-standardised death rates due to avoidable causes for the total population aged under 75 by voivodship in 2019, 2022 and 2023 (authors' calculations based on Statistics Poland data)

The mortality rate of the Polish population due to avoidable causes is strongly correlated with the level of education in both sex groups (Fig. 3.60). The lives of men with up to lower secondary education are approximately four times more at risk due to these causes than the lives of men with tertiary education, while this difference for women is threefold. The mortality rate for those with upper secondary education is three times higher for men and two and a half times as high for women as for those with tertiary education.

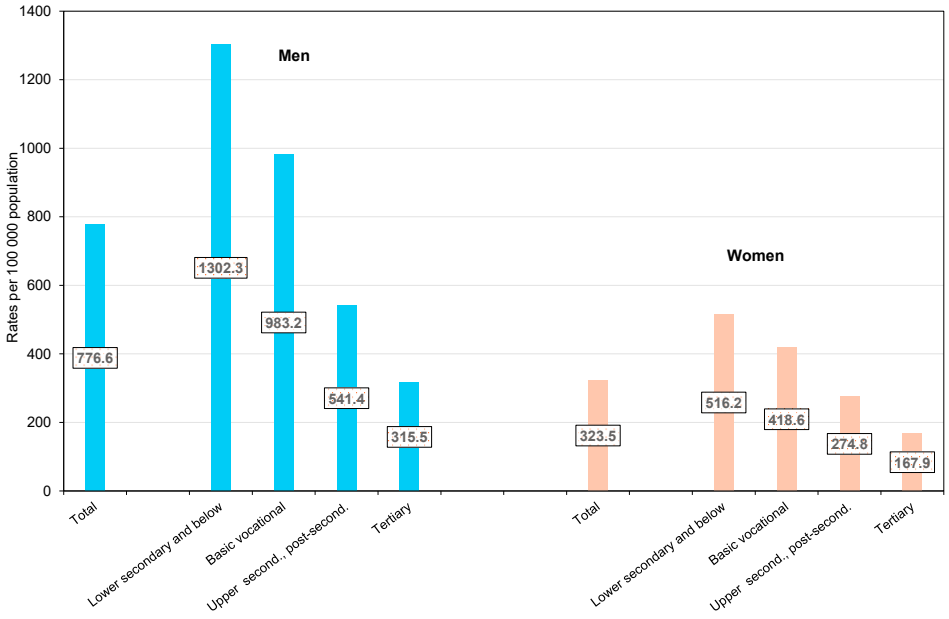


Fig. 3.60. Age-standardised death rates due to avoidable causes for men and women aged 30–74 by level of education in the three-year period 2020–2022 (authors' calculations based on Statistics Poland data)

The most important specific categories of **preventable mortality** include those caused by diseases for which vaccinations are available, HIV/AIDS, malignant neoplasm of the lung, hypertension, half of cases of ischaemic heart disease and cerebrovascular disease, chronic obstructive pulmonary disease, alcohol and substance use disorders, as well as accidental injuries and suicides.

In 2023, there were 74,189 deaths (52,713 men and 21,746 women) due to **preventable causes** (213 per 100,000 population). The causes included in this category pose a much greater threat to men than women; after eliminating differences in age structure, the mortality rate among men is 2.3 times higher than among

women (Table 3.6b). Deaths in this group account for 18.1% of all deaths, 25.2% of male deaths and 10.8% of female deaths.

Age-standardised death rates due to preventable causes for men are 10.4% higher for those living in rural areas than in urban areas; for women, these are 11.3% higher for those living in urban areas (Table 3.7b).

Figures 3.61a and 3.61b show important information on changes in standardised preventable mortality due to diseases of the circulatory system, neoplasms and alcohol-related causes between 1999 and 2023. The following facts are noteworthy. Preventable mortality due to neoplasms was in decline before the pandemic. It decreased even more sharply during the pandemic, which may have been due to the concomitant COVID-19 and the associated assignment of cause of death, as noted at the beginning of this chapter. In 2022 and 2023, death rates stabilised. At the same time, mortality due to CVD slowed down significantly in 2014–2016 and halted completely in 2016–2019. During the pandemic years of 2020 and 2021, mortality from CVD increased, but in 2022 and 2023, the death rate declined and was back to the 2019 rate by 2023. For mortality due to alcohol-related causes, the death rates for men and women increased between 2014 and 2022, reaching higher levels for men during the pandemic, but decreasing significantly for both sexes in 2023.

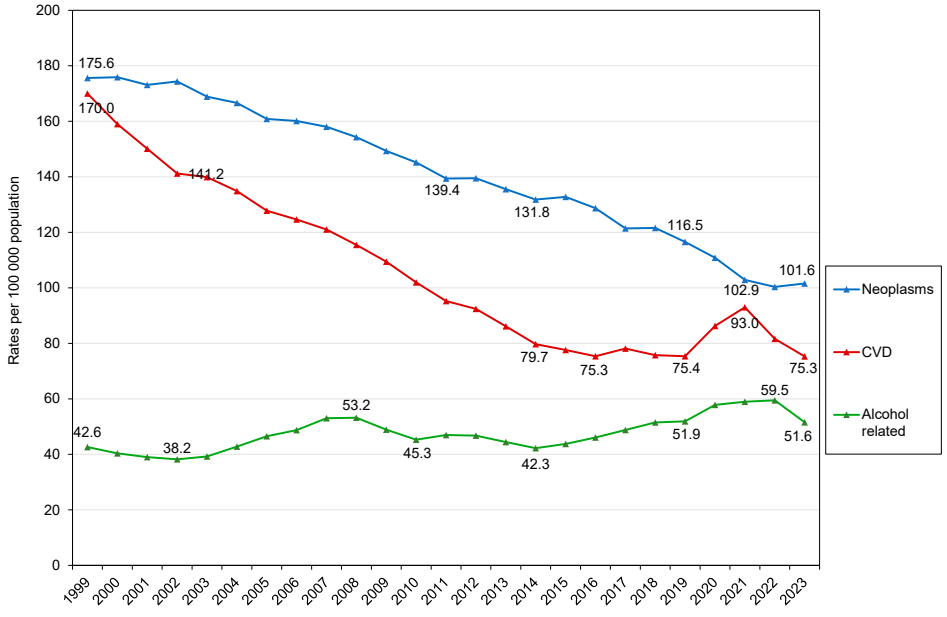


Fig. 3.61a. Age-standardised death rates for MEN under 75 due to preventable DCS, cancer and alcohol-related causes, in 1999–2023 (authors' calculations based on Statistics Poland data)

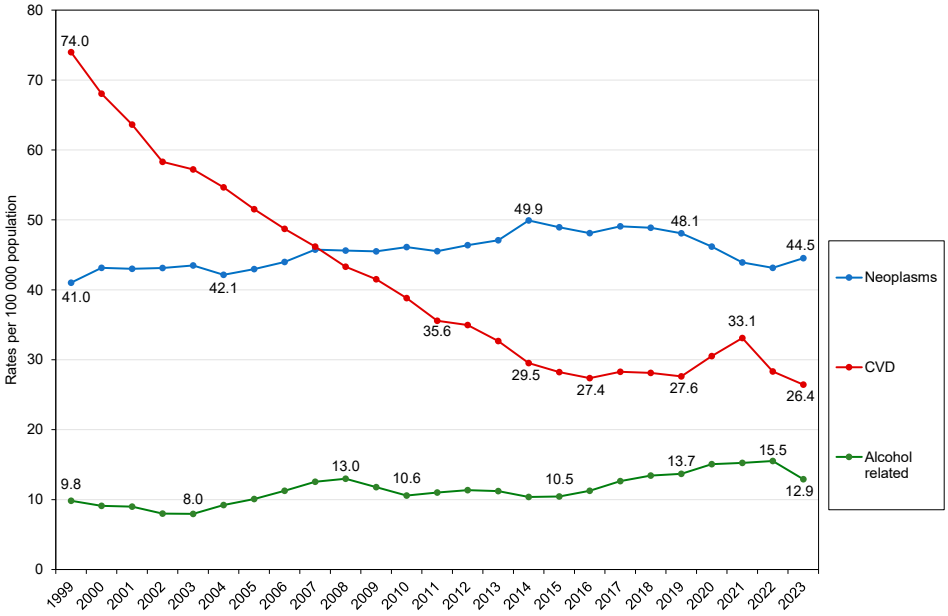


Fig. 3.61b. Age-standardised death rates for WOMEN under 75 due to preventable DCS, cancer and alcohol-related causes, in 1999–2023 (authors' calculations based on Statistics Poland data)

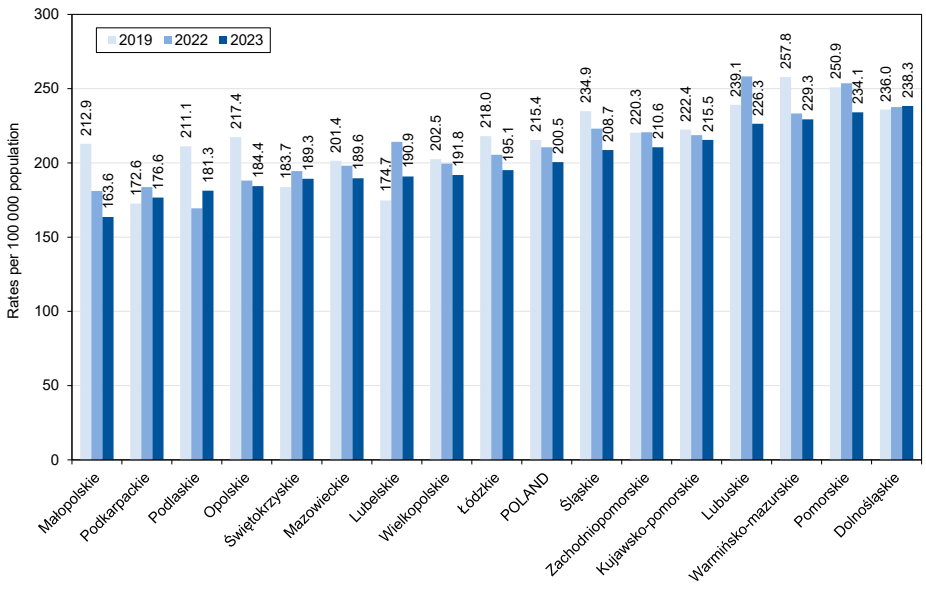


Fig. 3.62. Age-standardised death rates due to preventable causes for the total population aged under 75 by voivodship in 2019, 2022 and 2023 (authors' calculations based on Statistics Poland data)

In four voivodships, the death rates due to preventable causes in 2023 were generally slightly higher than in 2019, while in the remaining voivodships, mortality was lower, in six voivodships by more than 10% and in Małopolskie by as much as 23% (Fig. 3.62). The highest mortality rate in the last two years has been recorded in Dolnośląskie, Pomorskie, Warmińsko-mazurskie and Lubuskie voivodships; it is approximately 35% higher than in the voivodships of Małopolskie, Podkarpackie and Podlaskie.

Specific categories of **treatable (amenable)** causes of death include breast cancer, colorectal cancer, Hodgkin's disease, non-malignant neoplasms, acute and chronic rheumatic heart disease, half of cases of ischaemic heart disease and cerebrovascular disease, pneumonia and acute lower respiratory infections, asthma, stomach and duodenal ulcers, appendicitis, and hernias.

In 2023, there were 48,372 deaths (28,554 men and 19,818 women) (139 per 100,000 population) due to treatable causes. The causes included in this category pose a greater threat to men than women; after eliminating differences in age structure, the mortality rate among men is 71.6% higher than among women (Table 3.6b). Deaths in this group account for 11.8% of all deaths, 13.6% of all male deaths and 9.9% of all female deaths, while in mortality under the age of 75 they account for 22.3%, 20.1% and 26.6% of deaths, respectively.

Age-standardised death rates due to treatable causes are similar for urban and rural populations – mortality is 2.6% higher in rural areas for men and 4.8% higher in urban areas for women (Table 3.7b).

In four voivodships: Lubelskie, Podkarpackie, Dolnośląskie and Kujawsko-pomorskie, death rates due to treatable causes in 2023 were significantly higher than in 2019, while in Małopolskie and Opolskie voivodships, the mortality rate in 2023 was more than 20% lower than in 2019 (Fig. 3.63). The highest mortality rate in the last two years has been recorded in Dolnośląskie and Lubuskie voivodships, approximately 40% higher than in Świętokrzyskie and Małopolskie voivodships.

Figure 3.64 shows changes in standardised death rates due to treatable circulatory system diseases and cancer between 1999 and 2023. Apart from changes related to the pandemic, the most important observation concerns previous years. In the case of CVD, this was between 2014 and 2019, when the decline in mortality initially slowed down and then came to a complete halt between 2016 and 2019. In the case of cancer, practically the entire period from 1999 to 2019 was marked by a very slight decrease in mortality rates.

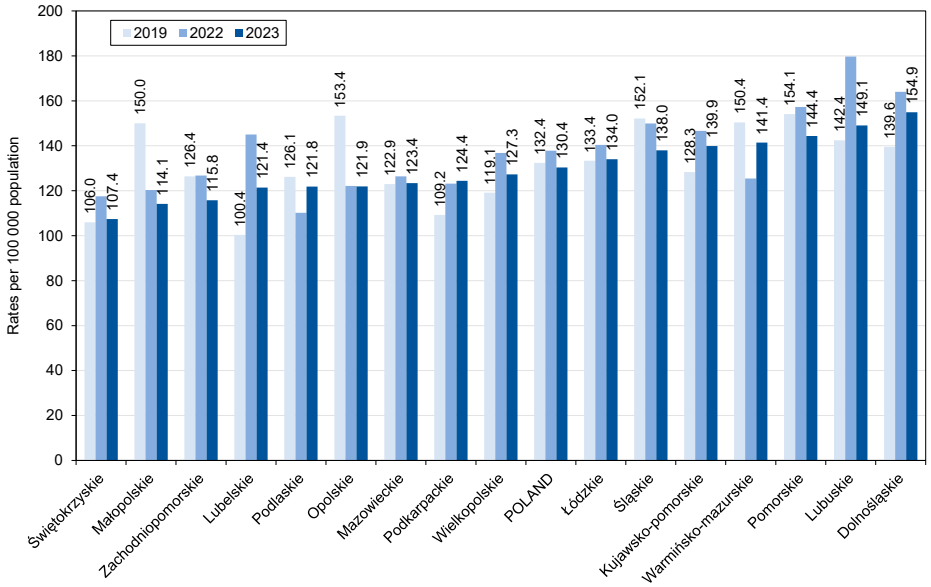


Fig. 3.63. Age-standardised death rates due to treatable causes for the total population aged under 75 by voivodship in 2019, 2022 and 2023 (authors' calculations based on Statistics Poland data)

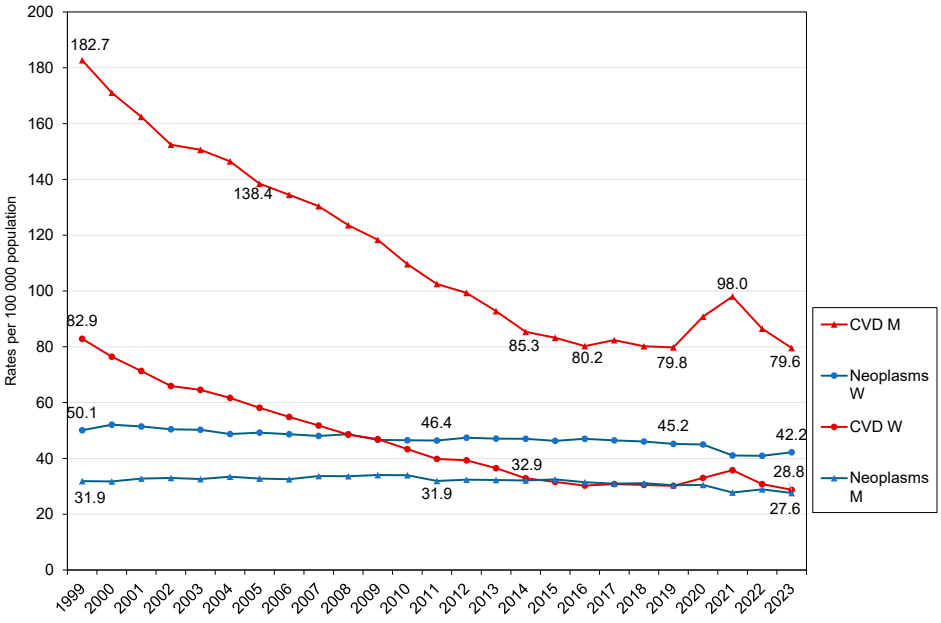


Fig. 3.64. Age-standardised death rates for men (M) and women (W) under 75 due to treatable CVD and neoplasms, 1999–2023 (authors' calculations based on Statistics Poland data)

Infant mortality

Infant mortality, i.e. the death of children under 1 year of age, declined in Poland until 2020, when the downward trend stopped. In 2023, there were 1,051 deaths of children under 1 year of age in Poland, i.e. 3.9 per 1,000 live births (Table 3.27).[24] Half of all infant deaths occur before the end of the first week of life. Compared to 2020, when the death rate was 3.6/1,000 live births, the post-neonatal mortality increased, i.e. among infants over four weeks of age with low birth weight, i.e. less than 2,500 g, and who were born slightly more frequently in 2023 than in 2020 (Tab. 3.28). Low birth weight is one of the main risk factors for infant mortality. In 2023 the mortality rate for infants born weighing less than 2,500 g was 36 times higher than for infants who weighed more.

Table 3.27. Infant deaths by age in 2013–2023

Years	Total	Age in full days				
		0-27				28-365
		Total	0-6		7-27	
			Total	0		
	Number	Percentage				
2013	1,684	69.1	50.2	30.8	18.9	30.9
2014	1,583	68.5	49.3	29.9	19.1	31.5
2015	1,476	72.3	51.6	29.1	20.7	27.7
2016	1,522	71.9	52.2	28.3	19.7	28.1
2017	1,604	70.8	53.4	31.0	17.5	29.2
2018	1,494	71.5	53.7	32.7	17.8	28.5
2019	1,412	72.5	53.4	31.6	19.1	27.5
2020	1,270	71.6	52.4	30.3	19.2	28.4
2021	1,306	73.9	52.6	32.7	21.3	26.1
2022	1,171	68.1	50.3	29.5	17.8	31.9
2023	1,051	66.5	50.1	29.9	16.4	33.5
	Per 1,000 live births					
2013	4.6	3.1	2.3	1.4	0.9	1.4
2014	4.2	2.9	2.1	1.3	0.8	1.3

[24] According to Statistics Poland's Statistical Bulletin No 2/2025, this rate was 3.6/1,000 live births in 2024

Years	Total	Age in full days				
		0-27				28-365
		Total	0-6		7-27	
			Total	0		
	Number	Percentage				
2015	4.0	2.9	2.1	1.2	0.8	1.1
2016	4.0	2.9	2.1	1.1	0.8	1.1
2017	4.0	2.8	2.1	1.2	0.7	1.2
2018	3.8	2.8	2.1	1.3	0.7	1.1
2019	3.8	2.7	2.0	1.2	0.7	1.0
2020	3.6	2.6	1.9	1.1	0.7	1.0
2021	3.9	2.9	2.1	1.3	0.8	1.0
2022	3.8	2.6	1.9	1.1	0.7	1.2
2023	3.9	2.6	1.9	1.2	0.6	1.3

Source: Based on Statistics Poland data

Table 3.28. Infant deaths by birth weight in 2013–2023

Years /	Under 2,500 g		2,500 g and more	
	Percentage of deaths[1]/	Deaths per 1,000 live births /	Percentage of deaths[1]/	Deaths per 1,000 live births /
2013	66.4	50.8	33.4	1.6
2014	66.7	47.5	33.2	1.5
2015	68.8	47.6	31.2	1.3
2016	68.4	46.6	31.6	1.3
2017	67.0	46.6	33.0	1.4
2018	70.8	49.2	29.2	1.2
2019	69.8	46.3	30.2	1.2
2020	66.5	44.2	33.5	1.3
2021	68.1	47.4	31.9	1.3
2022	68.3	46.1	31.1	1.3
2023	69.0	47.3	30.9	1.3

Source: Based on Statistics Poland data

Almost half (49.0%) of infant deaths in 2023 were caused by conditions originating in the perinatal period, primarily disorders related to short gestation and

low birth weight, which account for more than half (54%) of deaths in this group (Table 3.29). Compared to 2019, in 2022 and 2023, respiratory and cardiovascular disorders and bacterial sepsis of newborns became more significant causes of perinatal infant deaths. In the second most common group of causes of death, i.e. congenital malformations, responsible for 38% of all infant deaths, the significance of deaths due to malformations of the circulatory system decreased, while malformations of the nervous system gained slightly in importance. Unfortunately, in 2022 and 2023, the proportion of deaths due to ill-defined and unknown causes increased. The decreasing share of deaths due to external causes in infant mortality should be considered favourable.

Table 3.29. Infant deaths due to selected causes in 2019, 2022 and 2023

Causes of death (ICD-10)	2019			2022			2023		
	Number	Percentage	Per 1,000 live births	Number	Percentage	Per 1,000 live births	Number	Percentage	Per 1,000 live births
Total	1,412	100	3.8	1,171	100	3.8	1,051	100	3.9
including:									
Certain infectious and parasitic diseases (A00–B99)	4	0.3	0.0	4	0.3	0.0	9	0.9	0.0
Septicaemia (A40–A41)	0	-	-	0	-	-	1	0.1	0.0
Pneumonia (J12–J18)	43	3.0	0.1	29	2.5	0.1	35	3.3	0.1
Certain conditions originating in the perinatal period (P00–P96)	749	53.0	2.0	589	50.3	1.9	515	49.0	1.9
Disorders related to short gestation and low birth weight, not elsewhere classified (P07)	474	33.6	1.3	331	28.3	1.1	277	26.4	1.0
Birth trauma (P10–P15)	6	0.4	0.0	0	-	-	1	0.1	0.0
Respiratory and cardiovascular disorders specific to the perinatal period (P20–P29)	60	4.2	0.2	88	7.5	0.3	72	6.9	0.3
Bacterial sepsis of newborn (P36)	21	1.5	0.1	22	1.9	0.1	25	2.4	0.1

Causes of death (ICD-10)	2019			2022			2023		
	Number	Percentage	Per 1,000 live births	Number	Percentage	Per 1,000 live births	Number	Percentage	Per 1,000 live births
Congenital malformations, deformations and chromosomal abnormalities (Q00–Q99)	511	36.2	1.4	449	38.3	1.5	399	38.0	1.5
Congenital malformations of the nervous system (Q00–Q07)	37	2.6	0.1	40	3.4	0.1	39	3.7	0.1
Congenital malformations of the circulatory system (Q20–Q28)	227	16.1	0.6	173	14.8	0.6	138	13.1	0.5
Sudden infant death syndrome (R95)	22	1.6	0.1	19	1.6	0.1	18	1.7	0.1
Ill-defined and unknown causes of mortality (R96–R99)	7	0.5	0.0	19	1.6	0.1	21	2.0	0.1
External causes of death (V01–Y98)	40	2.8	0.1	19	1.6	0.1	13	1.2	0.0

Source: Own calculations based on Statistics Poland data

Infant mortality rates vary significantly between voivodships and fluctuate from year to year (Fig. 3.65). In 2023, the infant mortality rate ranged from 20 deaths per 10,000 live births in Lubuskie voivodship, where 2023 brought a significant decrease in mortality, to 55 in Kujawsko-pomorskie voivodship, where high infant mortality persists. Despite significant annual fluctuations in infant mortality rates in individual voivodships, it is possible to identify the voivodships where the mortality rate in recent years has remained above the national average and those where it is lower than in Poland as a whole. The first group in 2019–2023 included the following voivodships: Kujawsko-pomorskie, Warmińsko-mazurskie, Śląskie, Podkarpackie, and in the last four years (2020–2023) Pomorskie, and Lubelskie in 2019–2022 (significant decrease in mortality in 2023). In contrast, the rates in Mazowieckie, Lubuskie and Małopolskie voivodships remained below the national average throughout the five-year period.

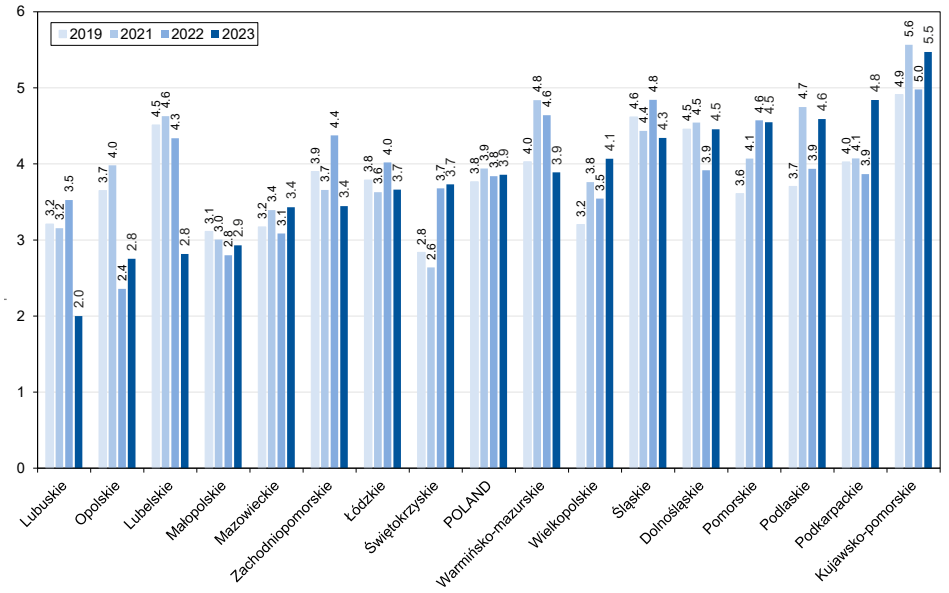


Fig. 3.65. Infant death rates by voivodship in 2019, 2021–2023 (based on Statistics Poland data)

Mortality in Poland compared to other European Union countries

This subsection presents the mortality rate of the Polish population in comparison with that of the EU-27 as a whole and its individual countries in terms of infant mortality and mortality due to avoidable causes, with particular emphasis on alcohol-related deaths.

Although infant mortality rates in Poland have been steadily declining for years, and the rate of decline until 2015 was higher than the EU average, the decline slowed down after that year. In 2023, the infant mortality rate in Poland (3.9/1,000 live births) was higher than the EU average (3.3/1,000) by the same amount as in 2014 (Fig. 3.66). Of note is that infant mortality in Poland has been at the same level as in France since 2017, despite being significantly higher in 2010. Infant mortality rates are declining more slowly in most EU countries, but this trend occurs at different levels, and there is undoubtedly room for improvement in Poland in this area.

Of note is the higher early neonatal mortality, i.e. in the first week of life, in Poland than in most EU-27 countries (Fig. 3.67). On the other hand, this rate is similar to that in the UK, the Netherlands or Germany.

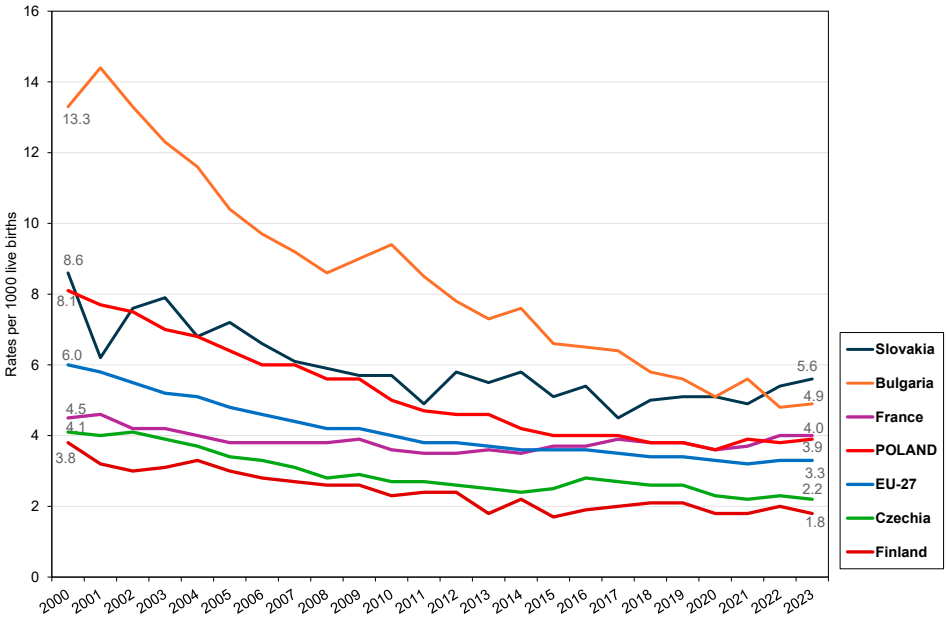


Fig. 3.66. Infant mortality rates in Poland, EU-27 average and selected EU countries in 2000–2023 (based on Eurostat data)

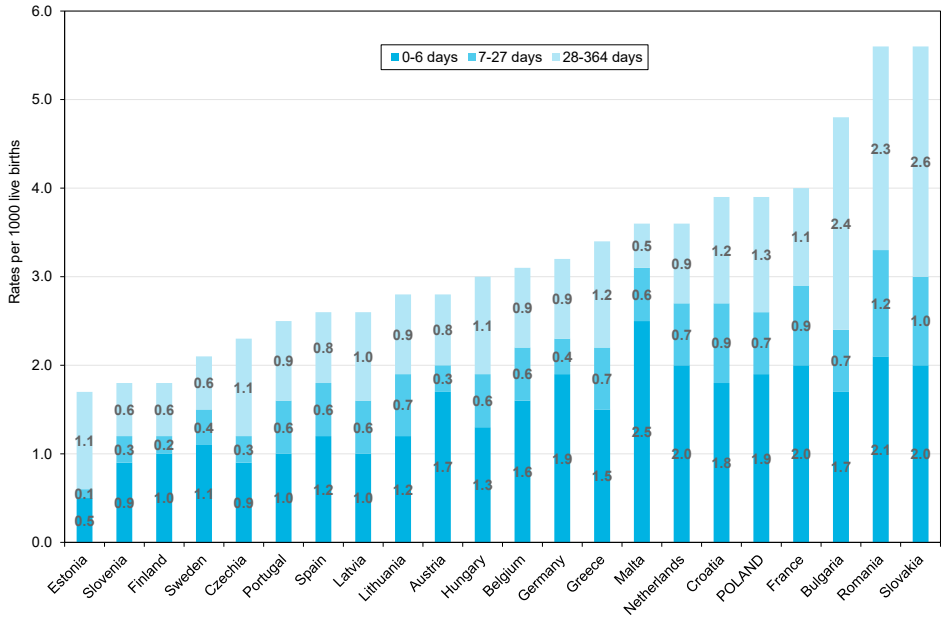


Fig. 3.67. Infant mortality by age in Poland and EU countries in 2023 (based on Eurostat data)

A comparison of the mortality rate and its dynamics in Poland with selected EU countries due to avoidable causes is not very favourable for Poland. Figure 3.68 shows the current (latest available in 2022) mortality rate in EU-27 countries for people under 75 due to preventable and treatable causes. In all countries, mortality due to preventable causes is higher than mortality due to treatable causes, by an average of 87% for the EU-27, ranging from 39% in Malta and Slovakia to 196% in Slovenia. In 2022, mortality due to preventable causes in Poland was 45% higher than the EU-27 average, mortality due to treatable causes was 56% higher, and avoidable mortality was 49% higher.

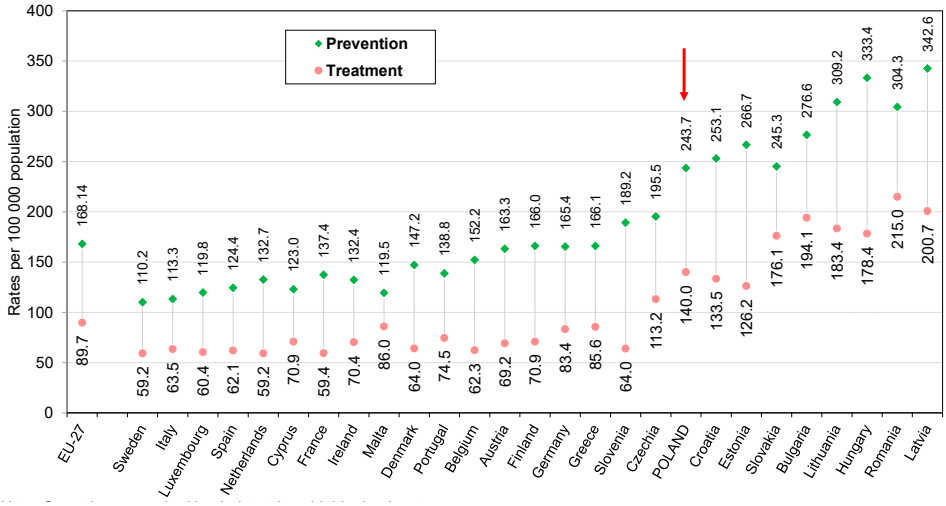


Fig. 3.68. Age-standardised death rates for persons under 75 due to preventable and treatable causes in the EU-27 in 2022 (based on Eurostat data)

As shown in Figures 3.69a and 3.69b, the dynamics in mortality rates for these two groups of causes of death in individual countries have been fairly similar in recent years, which means that the differences between countries tend to remain stable. Of note is the widespread increase in mortality in 2022 due to preventable causes, which may indicate the effect of changes in health behaviour during the pandemic and a weakening of public health measures more broadly, as these were focused on preventing the effects of COVID-19. In the second group of causes of death, i.e. treatable causes, attention is drawn to the deteriorating situation in Poland after 2016, which is particularly evident when compared to the Czech Republic.

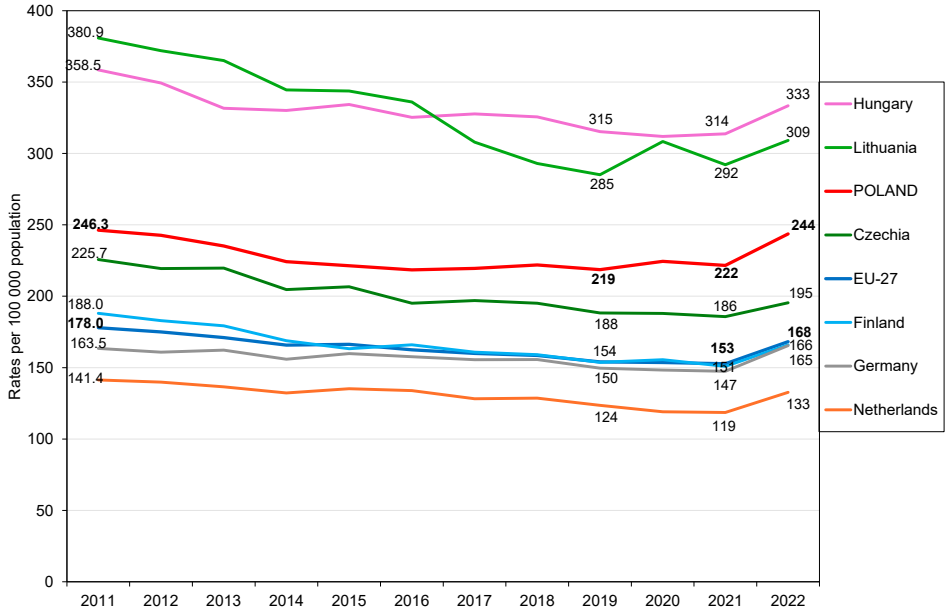


Fig. 3.69a. Age-standardised death rates for people under 75 due to preventable causes in Poland and selected EU countries in 2011–2022 (Eurostat data)

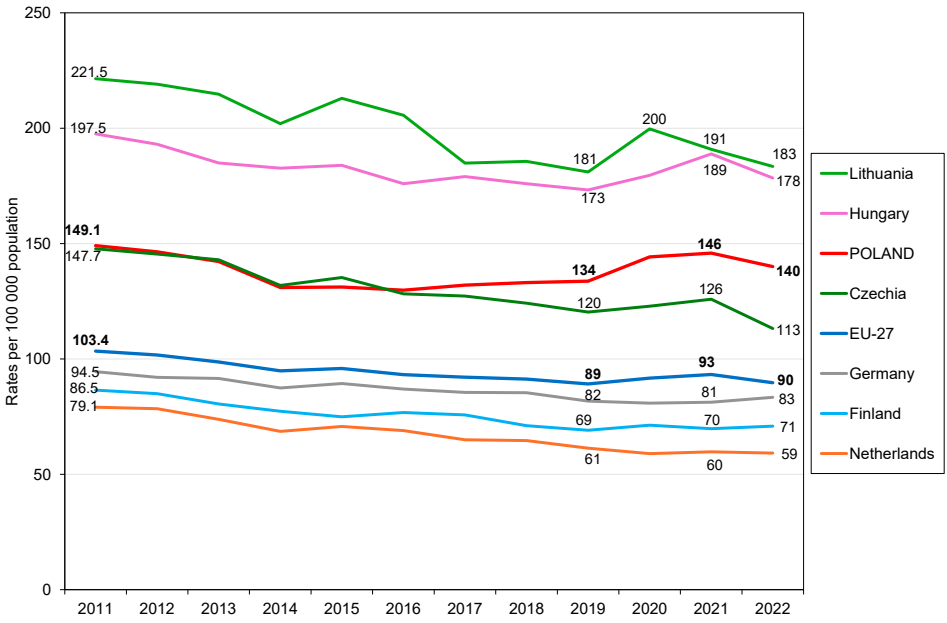


Fig. 3.69b. Standardised death rates for people under 75 due to treatable causes in Poland and selected EU countries in 2011–2022 (Eurostat data)

Figures 3.70a and 3.70b present mortality rates due to preventable, and treatable diseases of the circulatory system and cancer in Poland and the EU-27 as a whole, as well as in selected countries. In the case of preventable diseases, neoplasms pose a greater problem, with mortality rates across the EU 67% higher than those for CVDs in 2022. In contrast, for treatable conditions, diseases of the circulatory system are a greater concern, accounting for 34% more deaths across the EU in 2022 than neoplasms. It should be noted that, for both preventable and treatable diseases, the situation in Poland is more unfavourable than in the EU-27 for diseases of the circulatory system than for cancer.

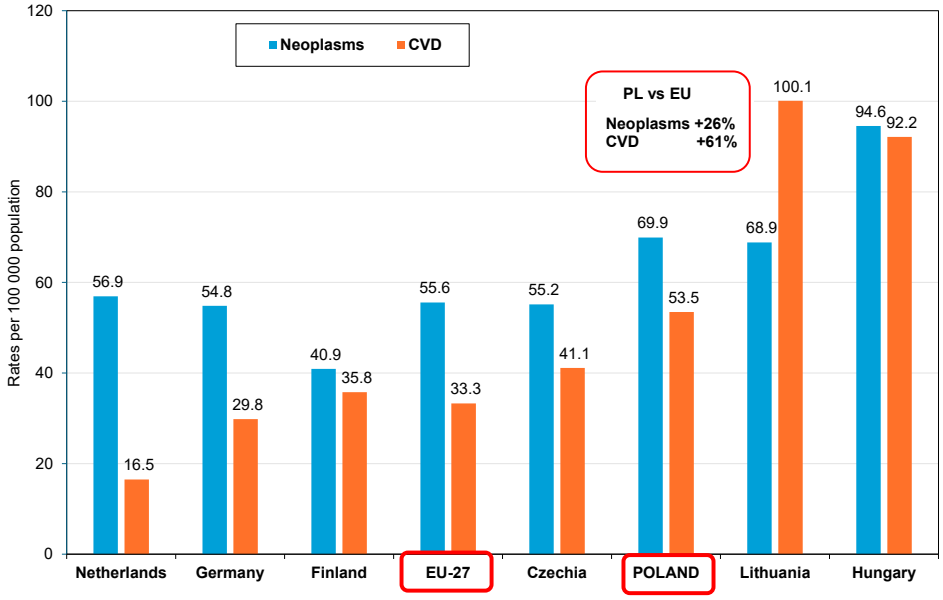


Fig. 3.70a. Age-standardised death rates for persons under 75 due to preventable diseases of the circulatory system (CVDs) and neoplasms in Poland and selected EU-27 countries, 2022 (based on Eurostat data)

Finally, we would like to draw attention to mortality due to preventable alcohol-related health problems, which are also listed in the OECD and Eurostat report mentioned above. The mortality rate for men in Poland in 2022 was more than twice (114%) higher than the average mortality rate in the EU-27 countries (Fig. 3.71a), while the mortality rate for women was 89% higher (Fig. 3.71b).

Figure 3.72 presents changes in male mortality rates from alcohol-related causes in 2011–2022 in Poland, the EU-27 as a whole and selected countries. As mentioned earlier, the mortality rate in Poland has seen a steady increase since 2014, while the mortality rate in the EU as a whole remained stable.

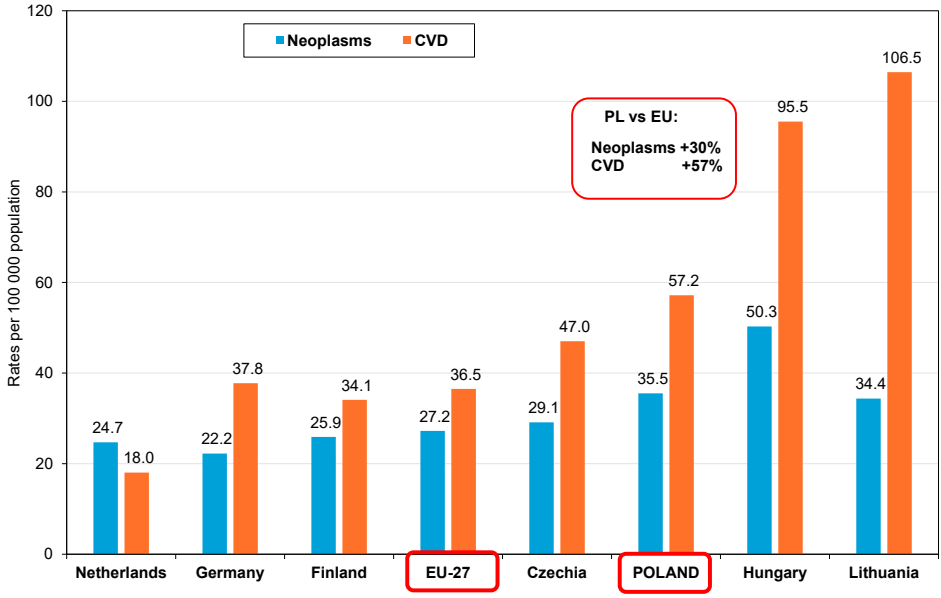


Fig. 3.70b. Age-standardised death rates for persons under 75 due to treatable diseases of the circulatory system (CVDs) and neoplsms in Poland and selected EU-27 countries, 2022 (based on Eurostat data)

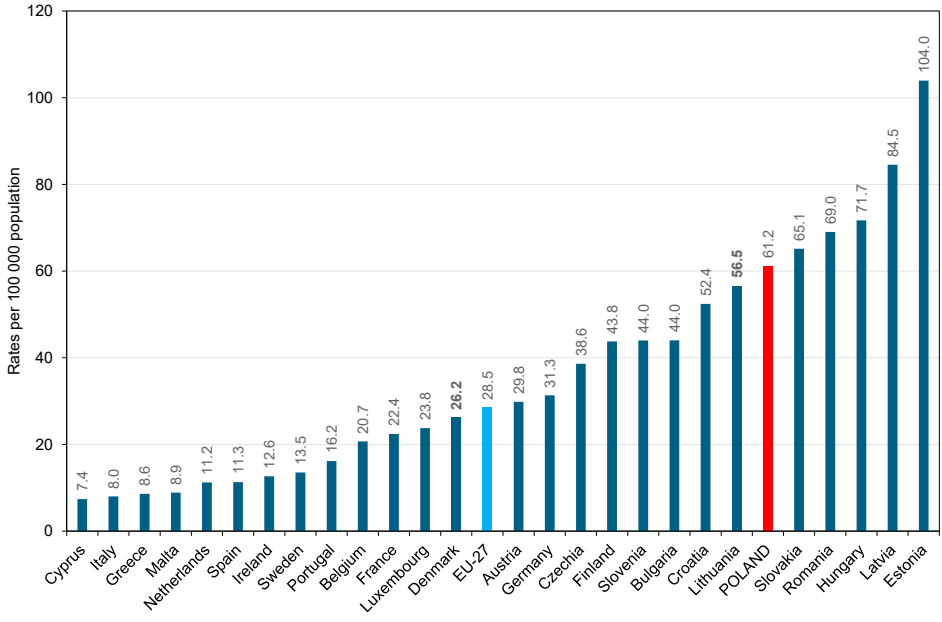


Fig. 3.71a. Age-standardised death rates for men under 75 due to alcohol-related causes in EU-27 countries in 2022 (Eurostat data)

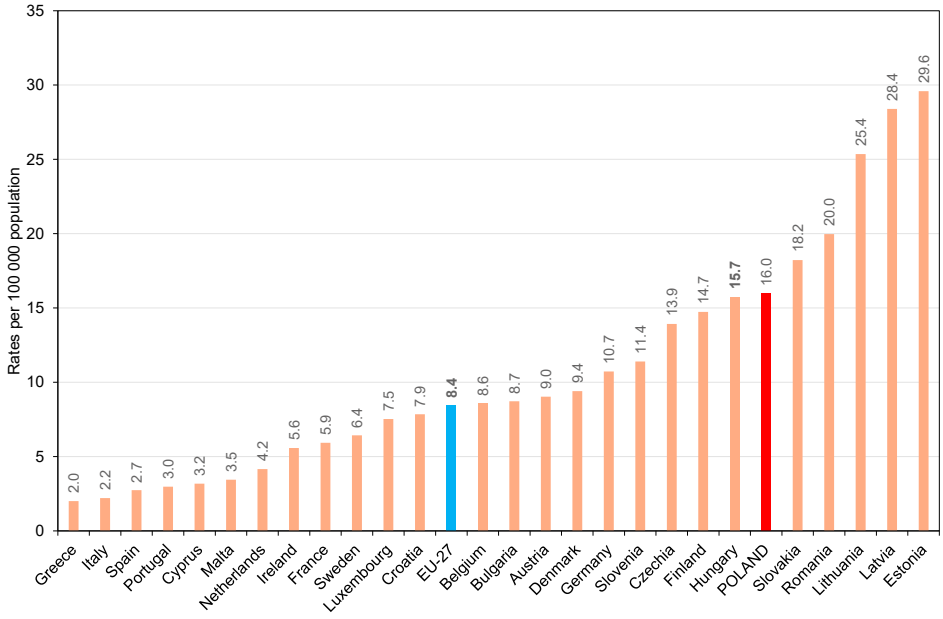


Fig. 3.71b. Age-standardised death rates for women under 75 due to alcohol-related causes in EU-27 countries in 2022 (Eurostat data)

As a result, the excess mortality in Poland compared to the EU-27 increased from 60% in 2014 to the aforementioned 114% in 2022, thus almost doubling. Of note is the situation in Lithuania, where measures taken in the late 2000s in response to the significant health damage caused by alcohol consumption led to a substantial decline in alcohol-related mortality by 2018. However, despite further measures, this trend has failed to continue in recent years, indicating undoubted difficulties in achieving this goal.[25] Considering that the causes of death included are almost entirely direct consequences of alcohol consumption and do not include causes that are only partially alcohol-related, the problem is undoubtedly much greater and requires urgent and effective measures to reduce alcohol consumption.

Since the mortality rate in Poland is higher than in Western European countries for most causes of death, it is worth considering to what extent these differences in mortality due to specific causes contribute to a shorter life expectancy of the Polish population compared to the inhabitants of Western Europe.

[25] Rehm J, Rovira P, Jiang H, Lange S, Shield KD, Tran A, Štelemėkas M. Trends of alcohol-attributable deaths in Lithuania 2001–2021: epidemiology a d policy conclusions. BMC Public Health (2024) 24:774, https://doi.org/10.1186/s12889-024-18237-y.

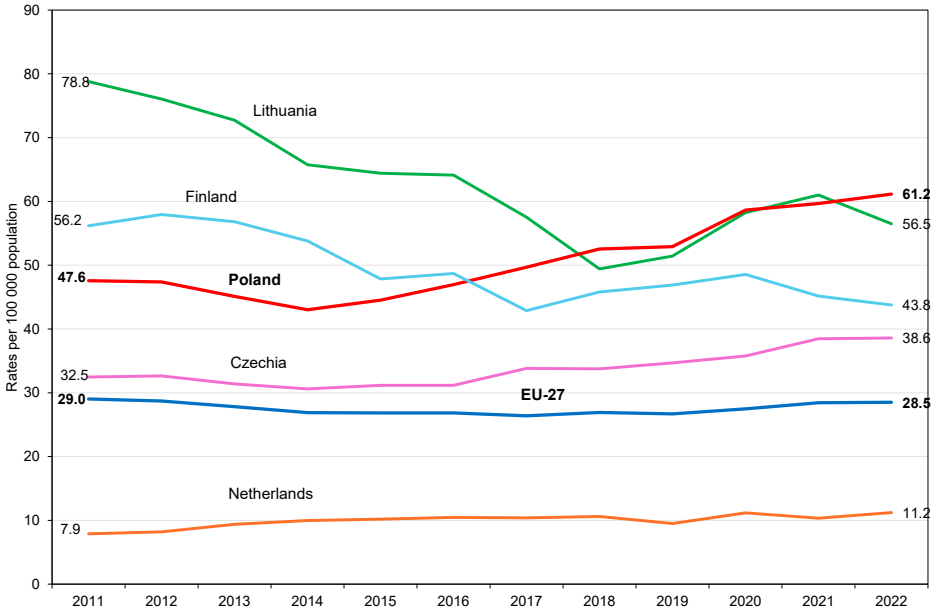


Fig. 3.72. Age-standardised death rates for men under 75 due to alcohol-related causes in EU-27 countries and selected countries in 2011–2022 (based on Eurostat data)

In order to estimate this proportion, the difference in life expectancy for men and women in Poland in relation to the inhabitants of selected countries, was broken down taking into account mortality from the main causes of death according to the previously mentioned Arriaga's method. As shown in Figures 3.73a and 3.73b, the shorter life expectancy of Poland's population is mainly due to higher mortality from diseases of the circulatory system, particularly heart disease, which shortens the lives of Polish men and women by 2.5 and 2.3 years, respectively, compared to the population of France, 2.2 and 1.9 years compared to the population of Spain, 2.3 and 1.4 years compared to the population of the Netherlands, etc. Higher mortality due to malignant neoplasms shortens the life expectancy of Polish men and women in comparison to their counterparts in the Netherlands and Sweden, by 1.5 years for men and 0.8 years for women. However, it should be noted that the imperfections of our system for assigning causes of death mean that deaths coded as due to symptoms and ill-defined causes play a large role in explaining the difference in life expectancy between the populations of Poland and other countries. The WHO considers these garbage codes, which are rarely used in countries with sound death certification systems. This means that heart disease and cerebrovascular disease may play an even greater role in explaining the shorter life expectancy of the Polish population.

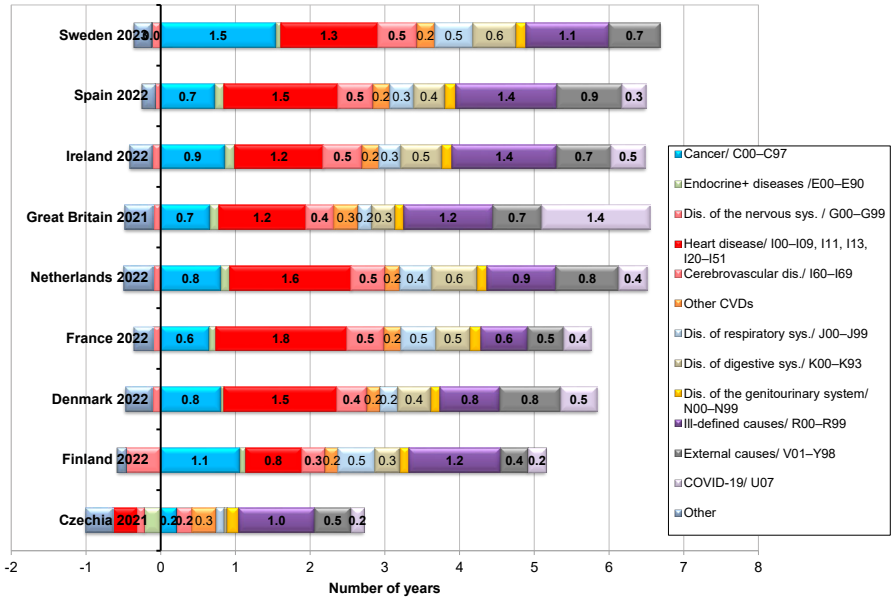


Fig. 3.73a. Number of years of shorter life expectancy for MEN in Poland compared to men in other countries, resulting from higher death rates among Polish men due to specific causes of death (authors' calculations based on the WHO Mortality Database)

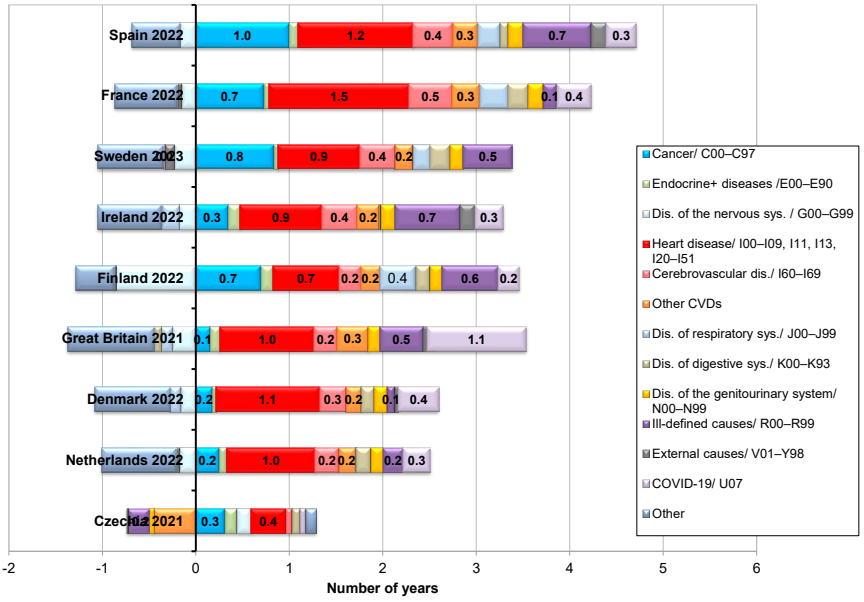


Fig. 3.73b. Number of years of shorter life expectancy for WOMEN in Poland compared to women in other countries, resulting from higher death rates among Polish women due to specific causes of death (authors' calculations based on the WHO Mortality Database)

4. HOSPITAL MORBIDITY IN POLAND

Paweł Goryński, Anna Poznańska, Anna Smaga, Paweł Radomski, Anna Tymicka, Bogdan Wojtyniak

Monitoring the frequency of hospital admissions and their causes constitutes one of the most important tools for analysing and assessing the health status of the population. These data enable the identification of the most severe health problems requiring hospital treatment, as well as the tracking of changes in the burden of chronic and acute diseases over time. Although certain interpretative limitations must be taken into account – hospitalisation depends, among other factors, on the severity of the disease course, availability of hospital beds, organisation of outpatient services, socio-economic factors, and changing external circumstances (e.g. the COVID-19 pandemic) – hospital data remain one of the most reliable sources of diagnostic information. The high quality of clinical diagnoses in hospital records, resulting in part from broad access to diagnostic methods and specialist medical supervision, renders these data more precise when compared with other routine systems for assessing population health.

In Poland, the primary source of data on hospitalisations is the Nationwide General Hospital Morbidity Study (NGHMS), conducted in accordance with the Programme of Statistical Surveys of Official Statistics. This study is carried out by the National Institute of Public Health NIH – National Research Institute (NIPH NIH – NRI), and its scope is defined by the General Hospital Statistical Form (MZ/Szp-11). The study is population-based and includes all cases of hospitalisation in public and non-public hospitals (excluding psychiatric wards, which are covered by a separate system).

The most recent available data pertain to 2023.

Frequency of hospitalisation in Poland in 2017–2023

Table 4.1 presents the absolute numbers of hospitalisations for all causes, excluding physiological childbirths, as well as for selected diseases grouped according to the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10). The frequency of hospitalisations in recent years must be analysed with reference to 2019. In the following year (2020), the COVID-19 pandemic reached Poland, disrupting, as in many countries around the world, long-term trends not only in health phenomena, including hospital morbidity, but also in demographic processes.[1]

Table 4.1. Number of hospitalisations for selected groups of causes in 2017–2023

Diagnosis (ICD-10)	Years						
	2017	2018	2019	2020	2021	2022	2023
All diagnoses (A00–T98 excluding O80 and O84)	6,999,219	6,782,687	6,805,344	5,126,396	6,001,200	6,611,299	7,035,719
Certain infectious and parasitic diseases (A00–B99)	185,637	178,996	183,387	100,410	119,491	169,205	154,038
Neoplasms (C00–D48)	490,650	534,375	573,954	568,434	637,971	698,979	756,151
Endocrine, nutritional and metabolic diseases (E00–E90)	251,255	247,341	252,318	174,624	198,052	232,208	256,631
Diseases of the nervous system (G00–G99)	307,631	304,395	303,477	200,338	217,516	257,743	288,940
Diseases of the circulatory system (I00–I99)	1,085,975	1,036,535	1,011,716	744,976	807,713	892,275	984,396
Diseases of the respiratory system (J00–J99)	538,747	507,304	473,445	307,879	359,536	419,094	466,340
Diseases of the digestive system (K00–K93)	612,560	590,253	584,445	409,689	474,189	556,314	605,285
Diseases of the genitourinary system (N00–N99)	612,464	597,702	610,187	437,359	520,122	588,065	641,784
Pregnancy, childbirth and the puerperium (O00–O99 excluding O80 and O84)	446,683	416,242	399,398	334,063	334,344	321,215	299,904
Injuries (S00–T14)	337,592	321,478	316,955	253,494	283,504	299,878	305,072
COVID-19 (U07–U12)	0	0	0	85,615	256,929	113,066	23,023

Source: Department of Population Health Monitoring and Analysis, National Institute of Public Health NIH – National Research Institute

In Poland, the number of hospitalisations in 2020 dropped sharply compared with previous years, to 5.1 million cases, representing a 25% reduction compared with 2019 (6.8 million hospitalisations). These changes were linked to the

[1] Tilstra A. M. et al. Projecting the long-term effects of the COVID-19 pandemic on U.S. population structure. Nature Communications (2024) 15:2409. https://doi.org/10.1038/s41467-024-46582-4

reorganisation of hospitals in Poland. So-called "dedicated COVID-19 hospitals" were established to treat patients infected with the coronavirus, and patient care priorities shifted. Scheduled hospital admissions for conditions not requiring immediate intervention were postponed, often to much later dates following the acute phase of the pandemic. At the same time, some patients refrained from seeking hospital admission due to concerns about contracting nosocomial infections. Delayed or unrealised hospitalisations constitute one of the significant components of the so-called health debt, understood as the accumulated delay in the provision of healthcare services caused by disruptions in the functioning of healthcare systems in the context of the COVID-19 pandemic.

The atypical period of the epidemic in Poland, both in terms of the intensity and structure of hospitalisations (beginning in March 2020), extended into 2021. That year, 6.0 million patients were hospitalised, 12% fewer than in 2019 but 17% more than in 2020.

In 2022 and 2023, the number of hospitalisations increased further, reaching numbers exceeding 6.6 million and 7.0 million, respectively, representing increases of 29% and 37% compared to 2020. It is worth emphasising that the absolute number of hospitalisations exceeded the 6.8 million recorded in 2019, only in 2023. Hence, the overall number of hospitalisations from the period before the pandemic outbreak was reached again after four years. However, this result does not apply to all diagnostic groups that constitute reasons for hospital treatment. In the case of diseases of the nervous and circulatory systems, infectious and parasitic diseases, and injuries, the number of hospitalisations in 2023 did not surpass the pre-pandemic level.

Similar trends can be observed in the crude hospitalisation rates presented in Table 4.2.

Table 4.3 presents standardised rates, which reflect the burden of disease after eliminating differences in the age structure of the Polish population across the observed years. As is well known, the share of older individuals in Poland's population has been increasing year by year, and among this group, a naturally and biologically justified higher incidence of illnesses and conditions requiring hospital treatment is observed. The overall rise in hospitalisation frequency may result not only from increased disease risk but also from population ageing. This phenomenon has been accounted for in the presented analysis through the standardisation of hospitalisation rates by age (using the direct method, based on the 2013 European Standard Population – ESP 2013).[2]

[2] European Commission, Eurostat, Pace, et al. Revision of the European Standard Population: report of Eurostat's task force: 2013 edition, Publications Office, 2013, https://data.europa.eu/doi/10.2785/11470

Table 4.2. Crude hospitalisation rates for selected groups of causes (per 10,000 population) in 2017–2023

Diagnosis (ICD-10)	Years						
	2017	2018	2019	2020	2021	2022	2023
All diagnoses (A00–T98 excluding O80 and O84)	1,821.1	1,765.2	1,772.3	1,342.4	1,579.1	1,747.3	1,866.3
Certain infectious and parasitic diseases (A00–B99)	48.3	46.6	47.8	26.3	31.4	44.7	40.9
Neoplasms (C00–D48)	127.7	139.1	149.5	148.9	167.9	184.8	200.6
Endocrine, nutritional and metabolic diseases (E00–E90)	65.4	64.4	65.7	45.7	52.1	61.4	68.1
Diseases of the nervous system (G00–G99)	80.0	79.2	79.0	52.5	57.2	68.1	76.6
Diseases of the circulatory system (I00–I99)	282.5	269.7	263.4	195.1	212.5	235.8	261.1
Diseases of the respiratory system (J00–J99)	140.2	132.0	123.3	80.6	94.6	110.8	123.7
Diseases of the digestive system (K00–K93)	159.4	153.7	152.3	107.3	124.8	147.1	160.6
Diseases of the genitourinary system (N00–N99)	159.4	155.6	158.9	114.5	136.9	155.4	170.2
Pregnancy, childbirth and the puerperium (O00–O99 excluding O80 and O84)	116.2	108.3	104.0	87.5	88.0	84.9	79.6
Injuries (S00–T14)	87.8	83.6	82.5	66.3	74.5	79.2	80.9
COVID-19 (U07–U12)	0.0	0.0	0.0	22.4	67.6	29.9	6.1

Source: Department of Population Health Monitoring and Analysis, National Institute of Public Health NIH – National Research Institute

Table 4.3. Age-standardised hospitalisation rates for selected groups of causes (per 10,000 population) in 2017–2023

Diagnosis (ICD-10)	Years						
	2017	2018	2019	2020	2021	2022	2023
All diagnoses (A00–T98 excluding O80 and O84)	1,908.5	1,835.2	1,829.7	1,377.4	1,618.5	1,783.9	1,894.5
Certain infectious and parasitic diseases (A00–B99)	50.1	48.1	49.1	27.0	32.4	46.8	43.4
Neoplasms (C00–D48)	135.0	145.2	153.8	151.2	169.5	183.8	196.9
Endocrine, nutritional and metabolic diseases (E00–E90)	68.9	67.5	68.5	47.4	53.8	62.9	69.4
Diseases of the nervous system (G00–G99)	82.7	81.4	80.6	53.2	57.9	68.6	76.8
Diseases of the circulatory system (I00–I99)	314.9	295.7	284.0	207.7	224.5	244.9	266.4
Diseases of the respiratory system (J00–J99)	147.8	137.9	127.7	82.9	97.3	114.5	128.4
Diseases of the digestive system (K00–K93)	165.9	158.7	155.9	109.2	126.6	147.9	160.3
Diseases of the genitourinary system (N00–N99)	164.3	159.5	161.7	116.0	137.6	155.2	168.8
Pregnancy, childbirth and the puerperium (O00–O99 excluding O80 and O84)	100.6	95.7	93.8	80.7	82.9	82.5	79.2
Injuries (S00–T14)	91.3	86.8	85.3	68.3	76.6	81.2	82.4
COVID-19 (U07–U12)	0.0	0.0	0.0	23.7	70.8	32.0	6.9

Source: Department of Population Health Monitoring and Analysis, National Institute of Public Health NIH – National Research Institute

Figure 4.1 presents the standardised hospitalisation rates for the total population of Poland in the years 2017–2023. As shown, the frequency of hospital treatment, which slightly declined between 2017 and 2019, dropped by 25% in 2020 compared to the previous year. In the following year of the pandemic, the intensity of hospitalisations increased slightly but remained 12% lower than in 2019. By 2022, this difference had narrowed to 2.5%. In 2023, the overall hospitalisation rate in Poland exceeded the 2019 level by 3.5%. However, as shown in the latter part of the chapter, the recovery to pre-pandemic hospitalisation rates did not occur across all diagnostic groups.

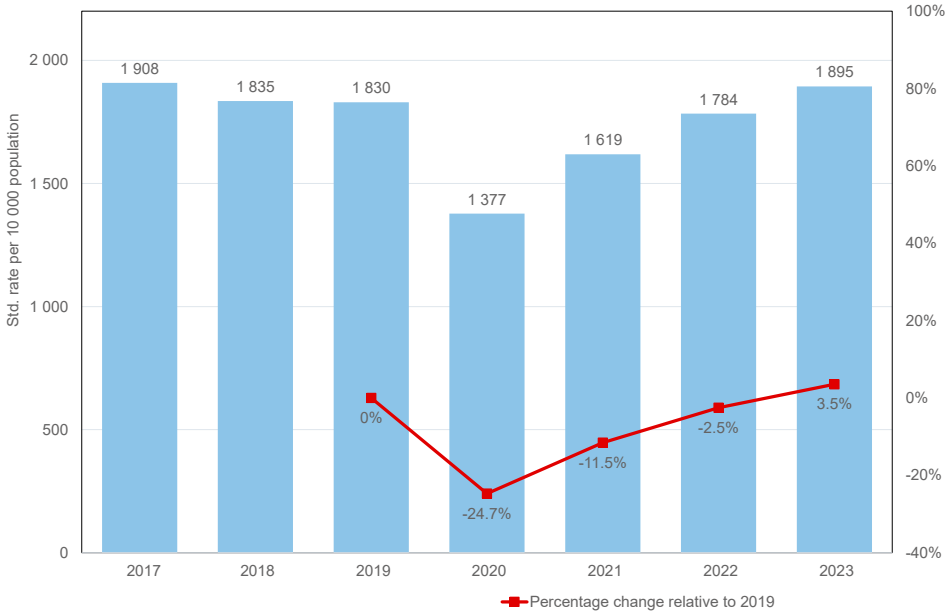


Fig. 4.1. Age-standardised hospitalisation rate for all causes excluding uncomplicated childbirths (per 10,000 population) in 2017–2023 and its percentage change relative to 2019 (data: NIPH NIH – NRI)

Hospitalisation by cause in 2017–2023

The most frequent causes of hospitalisation between 2017 and 2023 were diseases of the circulatory system (Table 4.3, Fig. 4.2). The second most common causes varied by year: in 2017, they were diseases of the digestive system; in 2018 and 2019, diseases of the genitourinary system; and from 2020 onwards,

neoplasms, which in 2017 had ranked only fifth among the leading causes of hospital treatment. The frequency of hospitalisations due to neoplasms has shown a strong upward trend, with only a slight (especially compared to other diseases) slowdown recorded in 2020. This result confirms that during the COVID-19 pandemic, cancer care was treated as a particular priority by the healthcare system despite restrictions imposed on hospitalisation for other causes. For most of the analysed diagnostic categories, a marked decline in hospitalisation frequency was observed in 2020.

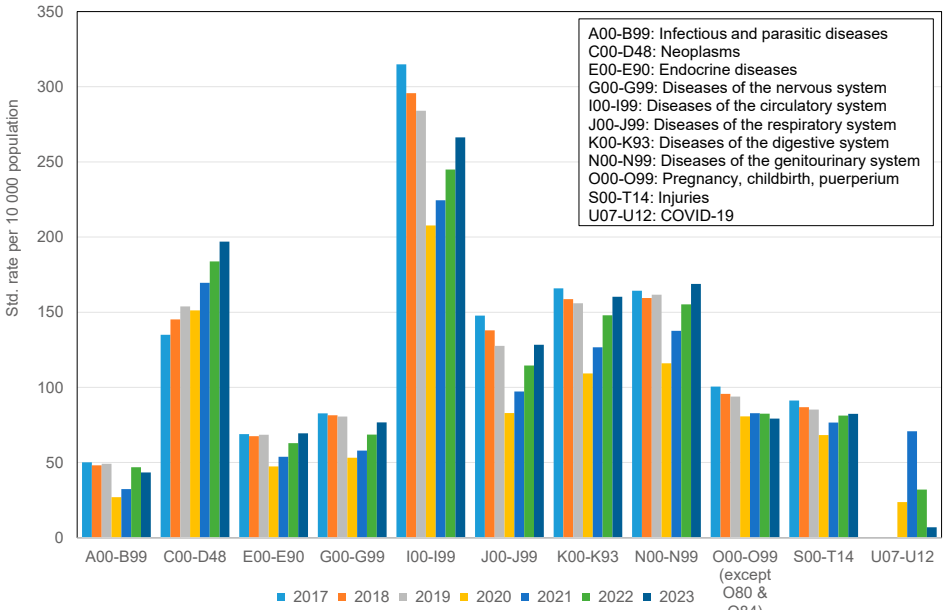


Fig. 4.2. Age-standardised hospitalisation rates for selected groups of causes (per 10,000 population) in 2017–2023 (data: NIPH NIH – NRI)

Table 4.4 compares hospitalisation frequencies in 2020 and 2023 with those in the last year before the COVID-19 pandemic for selected groups of causes.

The greatest decline in hospitalisation frequency in 2020 was observed for infectious and parasitic diseases (A00–B99 according to ICD-10), where the age-standardised hospitalisation rate dropped by 45%, followed by diseases of the respiratory system (down by 35%) and diseases of the nervous system (down by 34%). The smallest reduction was recorded for neoplasms (less than 2%) and pregnancy-related issues (14%). In 2023, the frequency of hospitalisations for

certain causes exceeded the 2019 level, including a substantial 28% increase for neoplasms, a 4% increase for diseases of the genitourinary system, and nearly 3% for diseases of the digestive system. Despite a rising trend for infectious diseases, diseases of the circulatory system, diseases of the nervous system, and injuries, the frequency of hospital treatment remained lower than in 2019. Hospitalisation rates for pregnancy-related conditions decreased not only in comparison to 2019 but also to the pandemic period.

Table 4.4. Percentage changes in the age-standardised hospitalisation rate for selected groups of causes in 2020 and 2023 compared to 2019

Year	Certain infectious and parasitic diseases (A00–B99)	Neoplasms (C00–D48)	Endocrine, nutritional and metabolic diseases (E00–E90)	Diseases of the nervous system (G00–G99)	Diseases of the circulatory system (I00–I99)	Diseases of the respiratory system (J00–J99)	Diseases of the digestive system (K00–K93)	Diseases of the genitourinary system (N00-N99)	Pregnancy, childbirth and the puerperium (000–099 excluding 080 and 084)	Injuries (S00–T14)
2020	-45.0	-1.7	-30.8	-34.0	-26.9	-35.1	-30.0	-28.3	-14.0	-19.9
2023	-11.6	28.0	1.4	-4.8	-6.2	0.6	2.8	4.4	-15.6	-3.3

Source: Department of Population Health Monitoring and Analysis, National Institute of Public Health NIH – National Research Institute

Based on an analysis of the sex structure of hospitalised patients by cause, two groups were identified: "male" diseases (with a higher proportion of hospitalised men) and "female" diseases (with a predominance of women). The results are shown in Figure 4.3. The first group includes, above all, injuries and poisoning (with the share of men in 2017–2023 on average 3.7 percentage points higher than that of women), diseases of the circulatory system (difference: 3.4 pp), diseases of the respiratory system (2.1 pp), and diseases of the digestive system (1.0 pp). The second group includes diseases of the genitourinary system (with women accounting for 4.8 pp more hospitalisations on average), diseases of the musculoskeletal system (1.7 pp), eye diseases (1.3 pp), and neoplasms (1.2 pp). From 2017 to 2023, gender differences increased notably in the case of diseases of the circulatory system (reaching 4.6 pp in 2023) and, to a lesser extent, diseases of the digestive system (up to 2.2 pp). A reduction in the difference in hospitalisation frequency between women and men was observed for neoplasms (to 0.4 pp), eye diseases (to 0.8 pp), and diseases of the musculoskeletal system (to 1.1 pp in 2023).

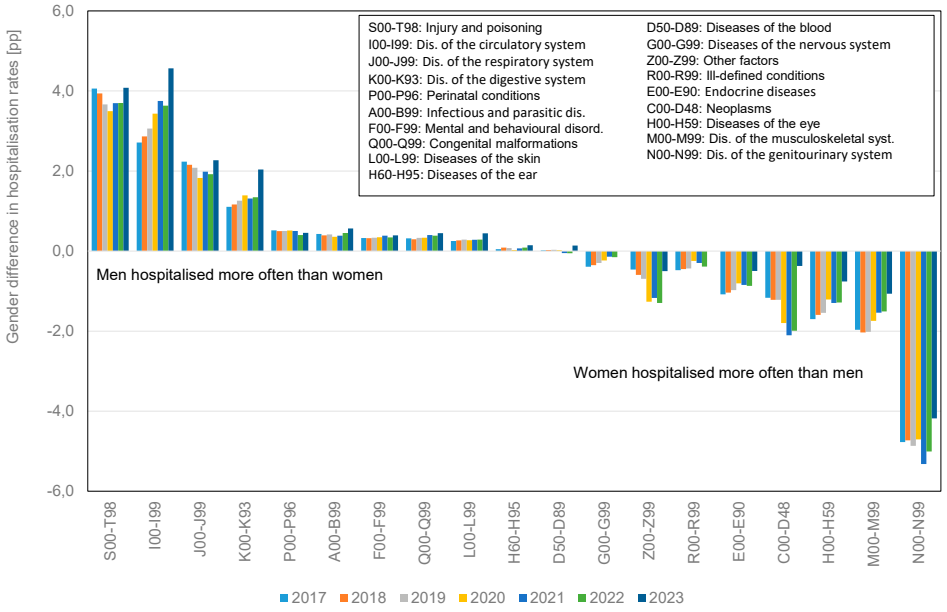


Fig. 4.3. Percentage differences in hospitalisation frequency between men and women in 2017–2023 for major groups of hospitalisation causes according to ICD-10 (data: NIPH NIH – NIR)

Structure of hospitalisation caused by patient age

To deepen the understanding of the causes of hospital treatment in Poland, an analysis was conducted for 2023, broken down into 5-year age groups, separately for women and men.

Among children under the age of 5, a high proportion of hospitalisations (over 20% of all cases) is due to factors influencing health status and contact with health services (Z00–Z99 according to ICD-10) – this category includes normal births (coded Z38 in ICD-10). A significant percentage of the youngest patients (nearly 20%) are hospitalised due to conditions originating in the perinatal period (P00–P96 according to ICD-10).

In addition to the above causes, boys up to 10 are most often treated for diseases of the respiratory system (18%) and infectious diseases (7%), and from the age of 5, also for injuries and poisoning. By ages 5–9, these already account for 15% of hospitalisations, with their share increasing rapidly with age (Fig. 4.4). Until the age of 50, these problems remain the leading cause of hospitalisation for men (accounting for over 30% of hospitalisations among men aged 20–29). At the same time, the

prevalence of diseases of the digestive system increases steadily, reaching 13% in the 35–44 age group. From the age of 50 onwards, diseases of the circulatory system become the predominant cause of hospitalisation for men, with their share rising consistently up to the oldest age group (85 years and over), where they account for 30% of hospital treatment cases. Neoplasms also become more significant, peaking in the 65–69 age group, where they make up 16% of hospitalisation causes, although this never surpasses the frequency of circulatory system disease-related hospitalisations. A relatively high share of eye diseases after age 70 (8%) is linked to the widespread use of cataract surgery with intraocular lens implantation.

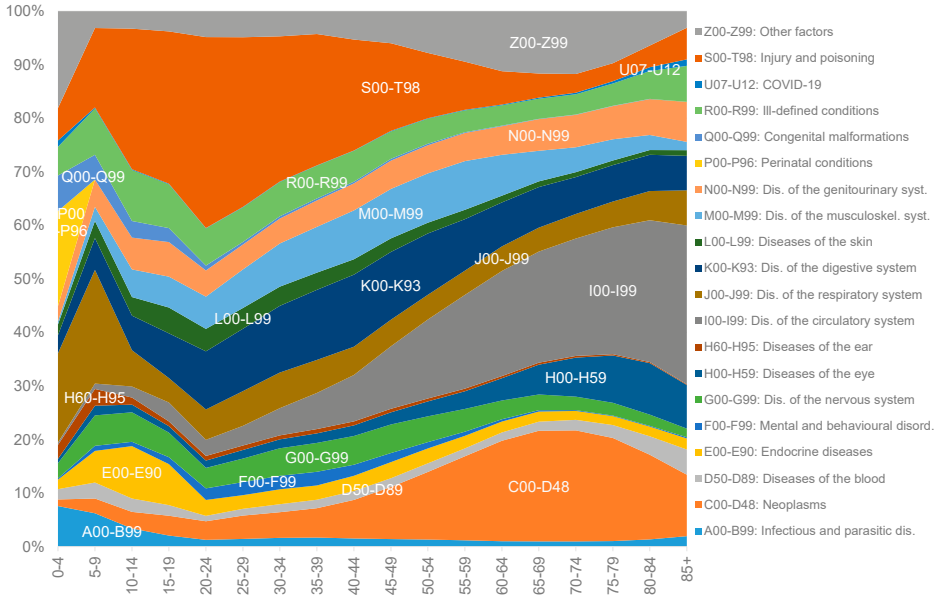


Fig. 4.4. Structure of hospitalisation causes among men in Poland in 2023 by patient age (data: NIPH NIH – NRI)

The structure of hospitalisations for women (Fig. 4.5) looks different. However, for girls under the age of 10, it resembles that observed in boys – alongside births and treatments for perinatal conditions, diseases of the respiratory system (16%) and infectious diseases (7%) dominate. It should be noted that, for the youngest patients (of both sexes), the hospitalisation rate for infectious diseases is significantly higher than in other age groups. As with boys, the share of injuries and poisoning in the hospitalisation structure is already high in the 5–9 age group (14%) and remains the most important cause of hospitalisation among girls over the following 10 years. From the age of 20, events related to pregnancy,

childbirth, and the puerperium become most prevalent (in the 25–34 age group, they account for over half of all hospitalisations), while the frequency of diseases of the genitourinary system steadily increases, reaching 21%, a much higher level than in men. In the 40–49 age group, these diseases are the main cause of hospital treatment among women. After age 40, hospitalisations due to neoplasms increase noticeably, becoming the leading cause of hospital treatment between the ages of 50 and 74. The highest proportion of neoplasms in the structure of hospitalisations among Polish women occurs in the 60–64 age group, thus earlier than in men. Hospitalisation rates for diseases of the circulatory system also rise steadily with age, reaching 10% in the 60–64 age group (i.e. 15 years later than among men). These diseases are the main reason for hospital treatment in women over the age of 75 (in men, over age 50), and in the oldest group (85 years and over), they account for 31% of all hospitalisation cases.

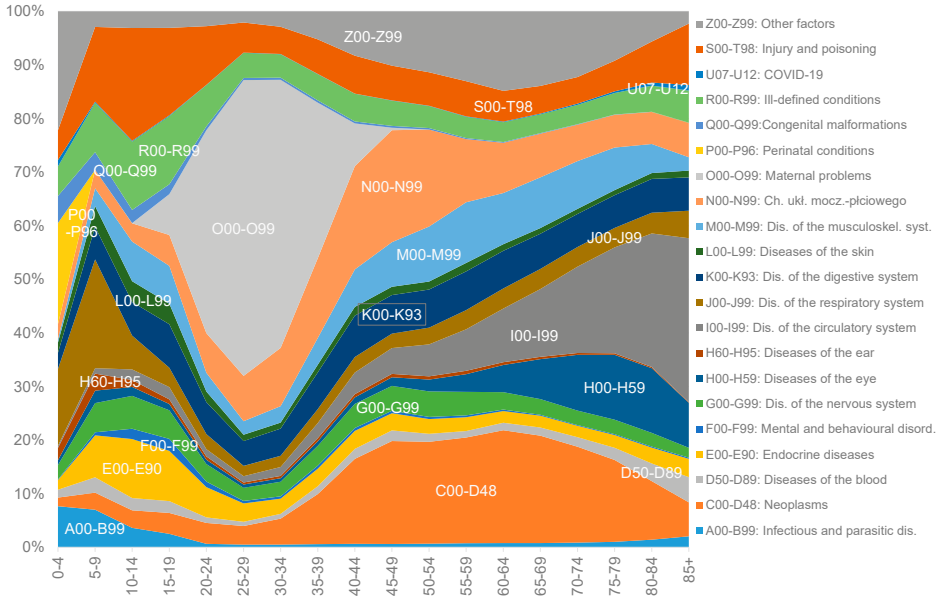


Fig. 4.5. Structure of hospitalisation causes among women in Poland in 2023 by patient age (data: NIPH NIH – NRI)

A significant difference should be noted between men and women in hospitalisation due to injuries and poisoning. Among children up to age 10, the proportion treated for this reason is nearly the same for both sexes. A similar pattern is seen in the 60–69 age group. However, between the ages of 15 and 59, injuries requiring hospital treatment are a much greater issue among men, which is attributed to their greater tendency to engage in risky behaviours. By contrast, among

people aged 70 and older, the proportion of women hospitalised due to injuries is nearly twice that of men, which may indicate higher levels of physical activity among older Polish women.

The percentage of patients hospitalised for ill-defined conditions (R00–R99 according to ICD-10) averages 6% for both sexes, with the highest values observed in children and adolescents aged 5–19. Within this group, the share is significantly higher for girls than for boys (12% *vs* 9%).

Hospital treatment of older adults – aged 60 and over

The number of people using healthcare services naturally increases with the biological ageing of the population, which in Poland has been intensifying due to low fertility and increased life expectancy. The next section of the chapter on hospital morbidity is dedicated to the hospitalisation of older adults.

Figure 4.6 presents the hospitalisation frequency among men and women aged 60 and over from 2017 to 2023. As with the general population, hospitalisation rates dropped significantly in 2020 and gradually returned to pre-pandemic levels. However, they have not reached the values observed in 2017.

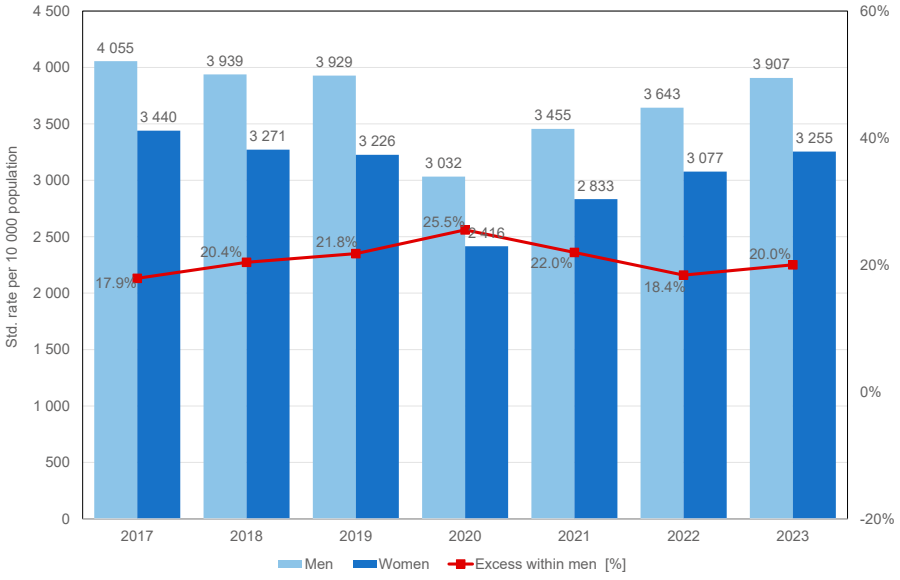


Fig. 4.6. Age-standardised hospitalisation rates (per 10,000 population) of men and women aged 60 and over in 2017–2023 and the percentage excess for men (data: NIPH NIH – NRI)

Throughout the entire period analysed, a considerable excess in male hospitalisation was observed. It ranged from 18% to 26% in individual years and was highest in the first year of the pandemic in Poland (2020). It is worth noting that these differences are significantly greater than those observed in the general population.

Figures 4.7. and 4.8. show the leading causes of hospitalisation among men and women aged 60 and over in 2017–2023. For both sexes, the most common cause of hospital admission was diseases of the circulatory system, followed by neoplasms.

Differences in hospitalisation frequency by sex for specific disease groups (measured by the excess of male over female standardised hospitalisation rates) are presented in Figure 4.9.

In all years, men were hospitalised more frequently than women for most of the analysed causes. The largest differences were related to diseases of the respiratory system, with male hospitalisation surpluses exceeding 95% from 2017 to 2020, although these gradually declined to 67% in 2023. The second group of causes for which men were hospitalised significantly more often than women were diseases of the circulatory system. In this case, the excess increased from 2017 to 2021 (by up to 71%) and declined slightly after the pandemic (to 68% in 2023).

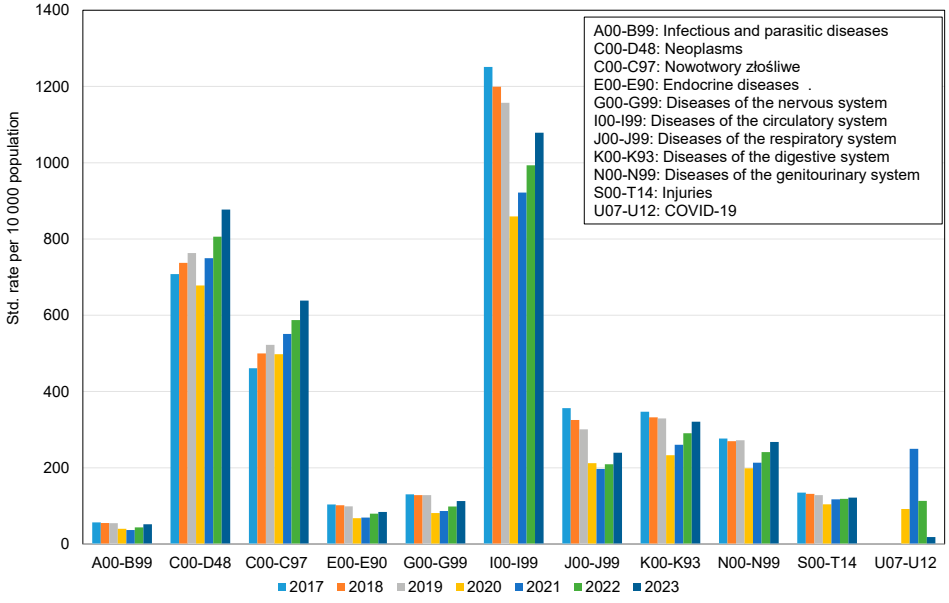


Fig. 4.7. Age-standardised hospitalisation rates of men aged 60 and over (per 10,000 population) in 2017–2023 for the leading causes of hospital treatment (data: NIPH NIH – NRI)

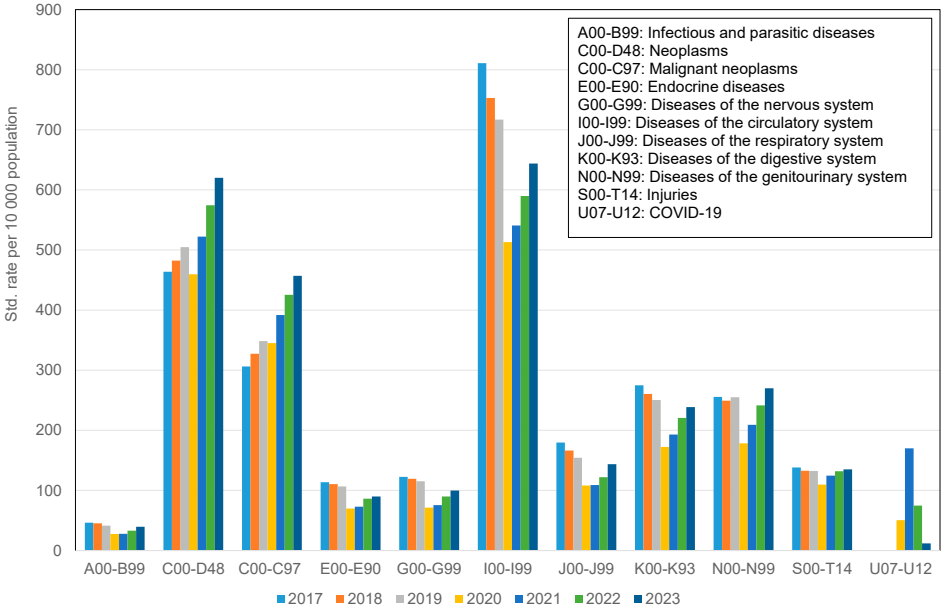


Fig. 4.8. Age-standardised hospitalisation rates of women aged 60 and over (per 10,000 population) in 2017–2023 for the leading causes of hospital treatment (data: NIPH NIH – NRI)

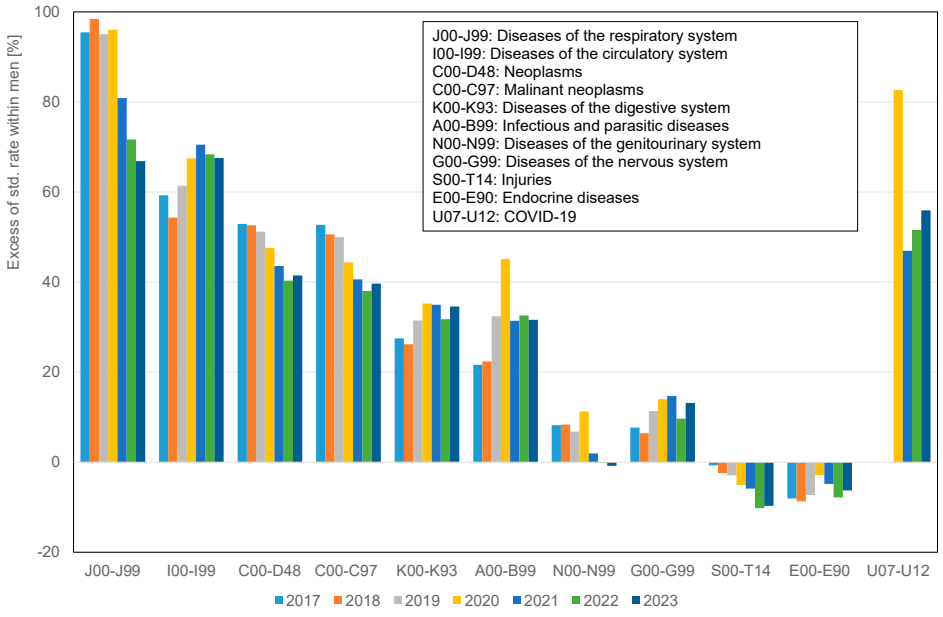


Fig. 4.9. Percentage excess of standardised hospitalisation rates for men compared to women aged 60 and over, by main cause groups, 2017–2023 (data: NIPH NIH – NRI)

An increasing trend in hospital treatment rates among men compared to women was also observed for diseases of the digestive and nervous systems. The opposite trend was noticed for neoplasms (including malignant neoplasms), where the male hospitalisation excess decreased from 53% in 2017 to 42% in 2023 (for malignant neoplasms, from 51% to 40%). A similar trend was observed for diseases of the genitourinary system – after a period of higher male hospitalisation, the rates for both subpopulations practically levelled off (with a slight predominance among women) in 2022–2023. Only two health problem groups had consistently higher hospitalisation rates among women than men throughout the analysed period – endocrine, nutritional, and metabolic diseases and injuries. The latter result significantly differs from findings for the general population, where men are more often hospitalised due to injuries. It is also worth highlighting the high hospitalisation excesses among men in the pandemic year 2020, not only due to COVID-19 (83%) but also other infectious diseases (45%).

The scale of hospital treatment among individuals aged 60 and over is illustrated in Figure 4.10. It shows the excesses of crude hospitalisation rates for those aged 60 and over compared with the entire population in 2017–2023. As expected, due to biological factors, hospitalisation frequency for older adults is significantly higher for almost all causes except infectious and parasitic diseases, where the situation is less clear. The most pressing issue for people aged 60 and over is diseases of the circulatory system, which, during the period analysed, were hospitalised at a rate more than three times that of the general population. Although this surplus has been steadily declining, it still exceeded 200% in 2023, indicating that the rate remained three times higher than the overall population rate. The second most significant issue for older adults was COVID-19, which disproportionately affected this group. From 2020 to 2022, people aged 60 and over were hospitalised for COVID-19 more than 2.5 times as often as the general population (2.1 times in 2023). The third major concern was neoplasms – hospitalisation for these causes among older adults was about 2.5 times more frequent than in the total population. For diseases of the digestive and genitourinary systems, the hospitalisation surplus among older individuals exceeded 50% throughout the entire period analysed. It is worth noting that the differences between most disease groups have narrowed in recent years, with injuries being a notable exception.

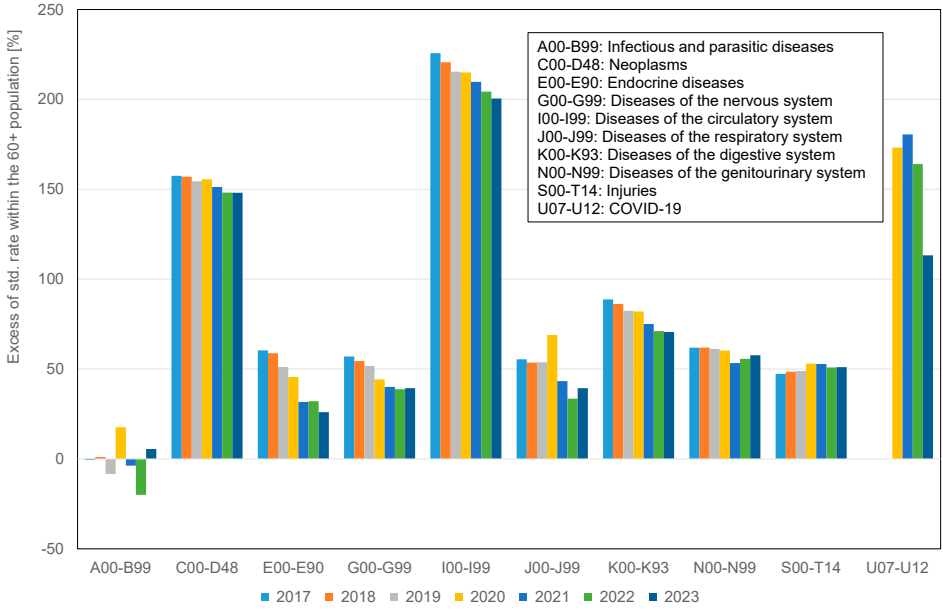


Fig. 4.10. Excesses of hospitalisation rates among people aged 60 and over compared to the total population by main disease groups, 2017–2023 (data: NIPH NIH – NRI)

Hospitalisation of urban and rural residents in 2017–2023

Urban residents were hospitalised slightly more often than rural residents, likely due to easier access to hospital treatment. Throughout the analysed period, the difference in hospitalisation rates remained relatively stable – the excess in urban population hospitalisations ranged from 5.3% in 2019 to 8.5% in 2021 and 2022 (Fig. 4.11).

Hospitalisation frequency for selected causes in the compared subpopulations is shown in Figure 4.12. For most disease groups analysed, urban residents were hospitalised more frequently than rural residents. The largest differences were observed in the case of neoplasms (an average annual excess of 20%) and endocrine, nutritional and metabolic diseases (18%). Exceptions included pregnancy and childbirth-related conditions (with a 6% average annual excess among rural residents) and diseases of the circulatory system (4%). Regarding the former, it is worth noting that the birth rate in rural areas from 2019 to 2023 was, on average, 6.0% higher than in urban areas.

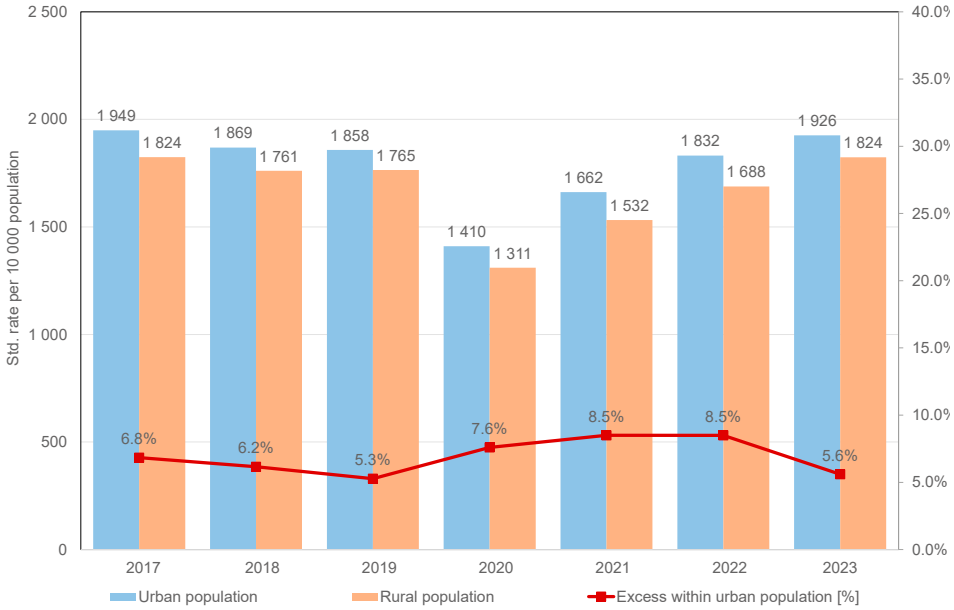


Fig. 4.11. Age-standardised hospitalisation rates for all causes among urban and rural residents (per 10,000 population) in 2017–2023 (data: NIPH NIH – NRI)

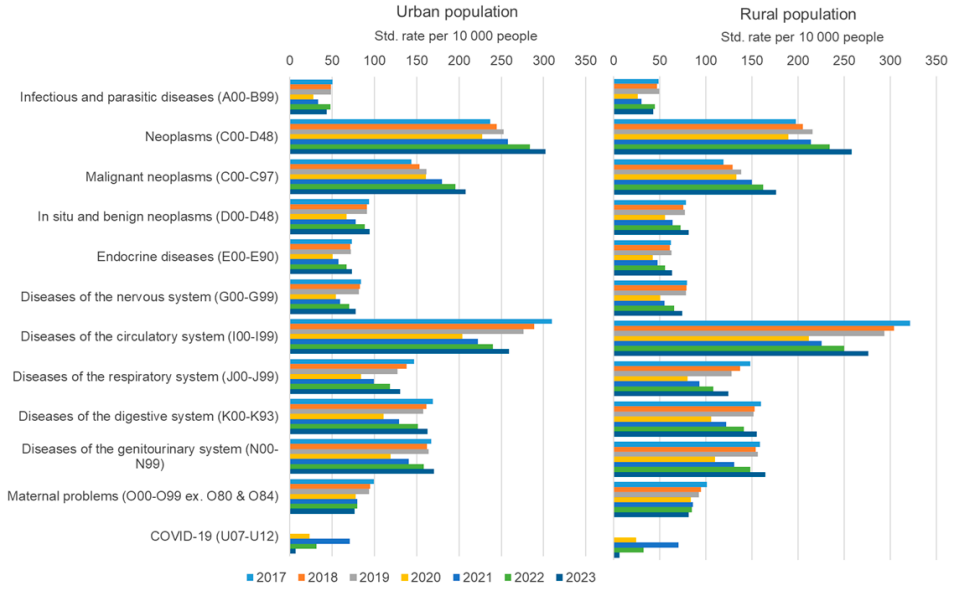


Fig. 4.12. Age-standardised hospitalisation rates among urban and rural residents (per 10,000 population) by cause in 2017–2023 (data: NIPH NIH – NRI)

In-hospital mortality

In-hospital mortality is a highly significant indicator in public health analyses. It provides information on both the severity of the diseases being treated and the quality of hospital care.

The presented analysis covers the period from 2019 to 2023. Table 4.5 presents in-hospital mortality rates (percentages) broken down by sex for each year, both for all patients and for those hospitalised for specific causes corresponding to the main ICD-10 disease groups.

Table 4.5. In-hospital mortality in Poland in 2019–2023 by sex and cause of hospitalisation (percentages)

Diagnosis (ICD-10)	Men					Women				
	2019	2020	2021	2022	2023	2019	2020	2021	2022	2023
Infectious diseases (A00–B99)	3.3	6.3	5.0	4.4	5.3	3.4	6.2	5.6	4.7	5.8
Malignant neoplasms (C00–C97)	3.2	3.1	2.8	2.7	2.5	2.2	2.1	1.8	1.8	1.8
Diseases of the blood (D50–D89)	2.0	2.6	2.8	3.4	3.5	2.1	2.6	2.8	3.3	3.3
Endocrine, nutritional and metabolic diseases (E00–E90)	2.2	2.9	2.5	2.2	1.8	2.0	2.5	2.2	1.8	1.6
Diseases of the nervous system (G00–G99)	0.7	1.0	1.0	0.8	0.7	0.5	0.7	0.7	0.6	0.5
Diseases of the circulatory system (I00–I99)	5.3	6.9	6.3	5.6	4.9	6.4	8.2	7.7	6.8	5.9
Diseases of the respiratory system (J00–J99)	4.0	6.8	5.7	4.1	4.0	4.0	6.3	5.8	4.2	3.9
Diseases of the digestive system (K00–K93)	2.3	3.2	2.9	2.4	2.1	2.2	3.2	2.9	2.3	2.1
Diseases of the skin (L00–L99)	1.2	1.6	1.6	1.3	1.1	1.6	2.5	2.3	1.8	1.5
Diseases of the musculoskeletal system (M00–M99)	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Diseases of the genitourinary system (N00–N99)	2.5	3.3	2.8	2.6	2.5	1.3	1.7	1.4	1.4	1.3
Certain conditions originating in the perinatal period (P00–P96)	0.7	0.8	0.8	0.8	0.9	0.8	0.8	0.7	0.7	0.7
Congenital malformations (Q00–Q99)	0.5	0.6	0.5	0.4	0.3	0.6	0.6	0.6	0.4	0.4
Ill-defined conditions (R00–R99)	2.9	4.3	3.5	3.1	2.9	2.5	3.4	3.0	2.4	2.4
COVID-19 (U07–U12)		24.3	22.9	16.9	10.9		19.1	19.9	15.5	9.7
Injuries and poisoning (S00–T98)	1.0	1.2	1.0	0.8	0.8	1.0	1.2	1.1	0.9	0.8
Other factors (Z00–Z99)	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Total	2.3	3.4	3.5	2.6	2.2	1.8	2.4	2.6	2.0	1.7

Source: Department of Population Health Monitoring and Analysis, National Institute of Public Health NIH – National Research Institute

The data indicate that 2020 saw a sharp increase in mortality. Compared with the previous year (2019), mortality rates rose by 1.1 percentage points for men (a 50% increase in the risk of in-hospital death) and by 0.6 percentage points for women (a one-third increase). The peak in-hospital mortality occurred in 2021 when 3.5% of male patients and 2.6% of female patients died during hospitalisation. This high level of mortality was caused by the COVID-19 epidemic. In 2020 and 2021, nearly one in four men and one in five women hospitalised for COVID-19 died. The high life-threatening nature of this disease is further confirmed by the elevated mortality rates even after the epidemic ended – in 2023, these stood at 10.9% for men and 9.7% for women.

In-hospital mortality decreased in 2022, although it remained slightly above the 2019 level (by 0.3 percentage points among men and 0.2 among women). Only in 2023 did mortality rates drop below pre-pandemic levels, amounting to 2.2% for men and 1.7% for women.

Differences in male and female mortality were related to the cause of hospitalisation. However, it is important to consider differences in the age structure of hospitalised men and women – women tend to be older on average.

Among all the causes of hospitalisation analysed, the highest in-hospital mortality rate was associated with COVID-19; its rates remained significantly higher than those for other disease groups even after the pandemic ended. The decreases in COVID-19 mortality observed in 2022 and 2023 can be attributed to increased population immunity through vaccination, resulting in a milder course of the disease.

Figure 4.13 illustrates the data presented in Table 4.5. Information concerning COVID-19 has been omitted for clarity, allowing for a better presentation of mortality from other causes. Among these, regardless of changes in rates across the years, the highest in-hospital mortality is associated with diseases of the circulatory and respiratory systems and infectious diseases. The relatively high mortality of patients admitted for ill-defined conditions (ICD-10: R00–R99) is also notable, potentially indicating insufficient diagnostic evaluation.

There are distinct groups of diseases for which in-hospital mortality levels differ by sex. Throughout the entire analysed period, men died more often than women during hospitalisations for the following causes: diseases of the genitourinary system (male mortality rate excesses ranged from 86% to 100%), malignant neoplasms (39% to 56%), diseases of the nervous system (33% to 43%), endocrine nutritional and metabolic diseases (10% to 22%), and ill-defined conditions (16% to 29%). As previously noted, men also had higher COVID-19 mortality

rates (9% to 27%). Conversely, women had higher mortality rates than men for hospitalisations due to diseases of the circulatory system (19% to 22%) and skin diseases (36% to 56%).

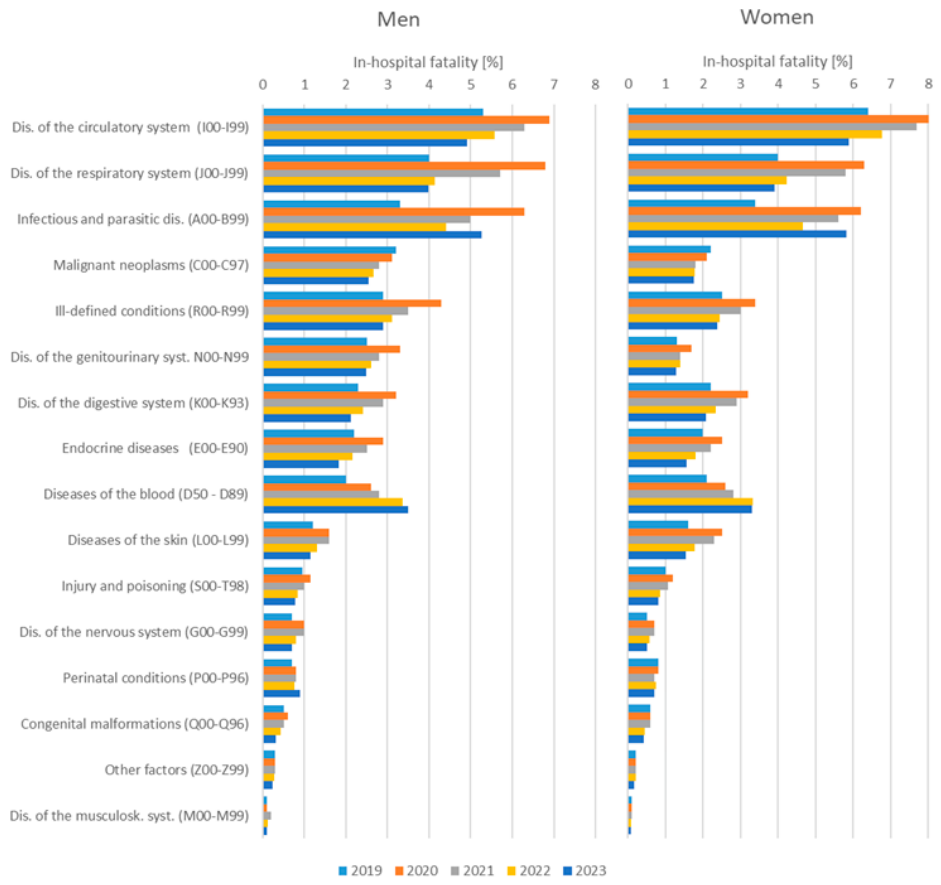


Fig. 4.13. In-hospital mortality in Poland in 2019–2023 by sex and cause of hospitalisation (data: NIPH NIH – NRI)

For almost all causes analysed, in-hospital mortality for both sexes increased significantly in the first year of the pandemic (2020). This phenomenon was due to multiple causes: admission restrictions, hospitalised patients tended to be in more severe condition than in previous years, and the need to organise and provide care for COVID-19 patients negatively affected the quality of care for others. They amplified the overall increased in-hospital mortality, primarily driven by deaths among COVID-19 patients. From 2021 onwards, mortality from causes

other than COVID-19 began to decline. An unfavourable exception is diseases of the blood – mortality related to these conditions increased steadily from 2019 to 2023 for both men and women.

Hospitalisation due to COVID-19

As demonstrated above, the COVID-19 epidemic significantly altered the landscape of hospital morbidity in Poland. The emergence of this disease disrupted long-term trends in observed health phenomena. The specific circumstances of that period (the state of the epidemic in Poland lasted from 20 March 2020[3] to 15 May 2022[4]), including changes in the functioning of the healthcare system, contributed to the accumulation of the so-called health debt, understood as the cumulative delay in the provision of healthcare services. As in other countries, the pandemic also affected the overall health condition of the population. Deaths due to COVID-19 reduced the proportion of elderly individuals in the population, as well as those in poor health, measured at the time in part by the presence of comorbidities. On the other hand, having contracted COVID-19, especially in severe cases or in instances of repeated infection, may have long-term consequences for the health of survivors. In the future, they may require hospital treatment more frequently than their peers in previous years. This issue is particularly relevant given that the long-term health effects of COVID-19 are still not fully understood and remain the subject of extensive research worldwide.[5,6]

As of April 2025, COVID-19 is no longer the most severe health and life threat to the Polish population. Nevertheless, it is still present in the community, continuing to cause hospitalisations and deaths. As shown earlier, it was the disease with the highest in-hospital mortality in 2023. The most important characteristics of hospitalisation due to COVID-19 during the four-year observation period (2020–2023) are discussed below.

[3] Regulation of the Minister of Health of 20 March 2020 on the declaration of an epidemic state in the territory of the Republic of Poland [Journal of Laws 2020, item 491]

[4] Regulation of the Minister of Health of 12 May 2022 on the cancellation of an epidemic state in the territory of the Republic of Poland [Journal of Laws 2022, item 1027]

[5] Lopez-Leon S. et al. More than 50 long-term effects of COVID-19: a systematic review and meta-analysis. Sci Rep (2021) 11, 16144. https://doi.org/10.1038/s41598-021-95565-8

[6] Elneima O et al. Cohort Profile: Post-Hospitalisation COVID-19 (PHOSP-COVID) study. Int. J. Epidemiol., (2024) 53, 1, dyad165, https://doi.org/10.1093/ije/dyad165

The peak of hospitalisation due to COVID-19 in Poland was in 2021 (Tables 4.1, 4.2, 4.3). By 2023, hospitalisation rates had decreased significantly – the crude rate had fallen elevenfold, while the age-standardised rate was ten times lower.

In all years, older individuals were the group most at risk of contracting the disease. However, since 2022, there has been a noticeable increase in hospitalisation rates among children aged 0–4 years (Fig. 4.14). Among adults, the frequency of hospitalisation increased rapidly with age, especially in those over 50. This increase followed a pattern that was nearly exponential. In 2020, the risk of hospitalisation due to COVID-19 for men over the age of 85 was four times higher than for those aged 60–64 and seven times higher than for those aged 50–54. For women, the corresponding figures were four and five times, respectively. In 2023, when the overall population risk had decreased, the hospitalisation rate in the oldest age group was nine times higher than for the 60–64 age group (for both sexes) and more than 20 times higher than for the 50–54 age group. The hospitalisation rate for men was significantly higher than for women.

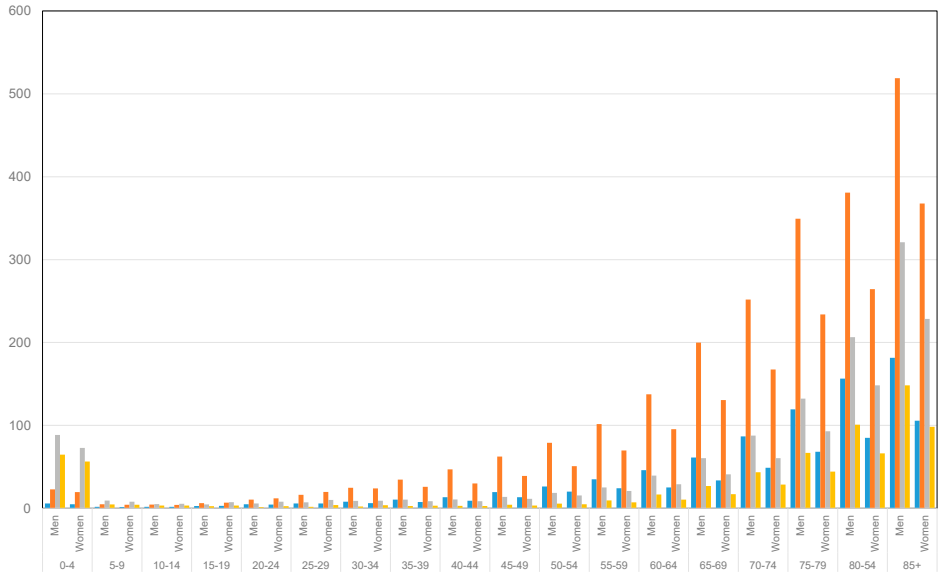


Fig. 4.14. Hospitalisation rates due to COVID-19 in 2020–2023 by sex and age group (data: NIPH NIH – NRI)

The age structure of patients hospitalised for COVID-19 between 2020 and 2023 is shown in Figure 4.15. The distribution in each year followed a similar pattern, though a gradual decrease in the age of treated patients is evident. In 2020,

people over the age of 50 accounted for 80% of hospitalised men and 82% of hospitalised women. Their share gradually declined in the following years, reaching 69% and 72% in 2023, respectively.

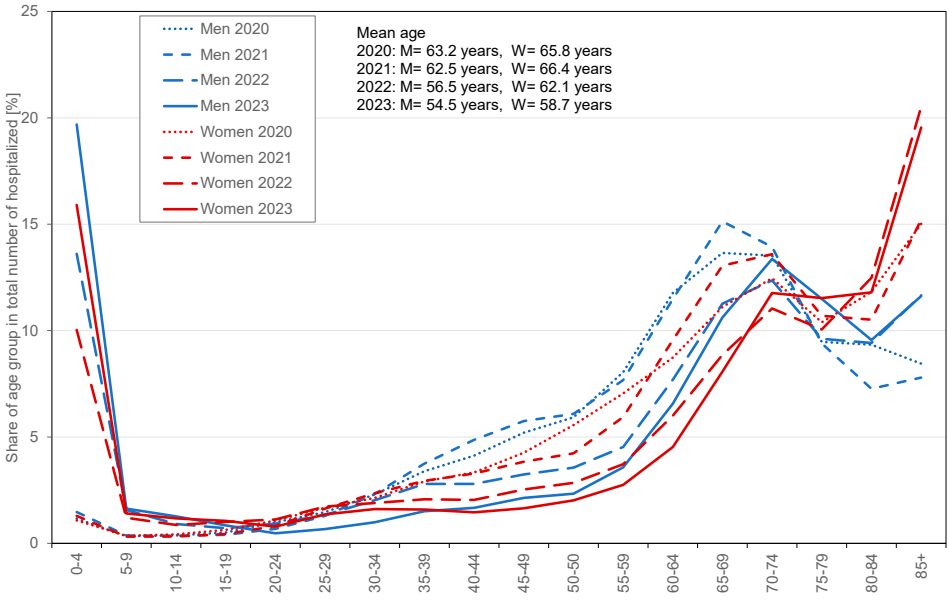


Fig. 4.15. The age structure of patients hospitalised for COVID-19 in 2020–2023 by sex (data: NIPH NIH – NRI)

Throughout the analysed period, men hospitalised with COVID-19 were, on average, younger than women. The average age of patients for both sexes decreased over the years – for men, from 63 in 2020 to 55 in 2023, and for women, from 66 to 59 in the same period. At the same time, the proportion of the youngest patients (aged 0–4) increased. They represented around 1% of COVID-19 patients in 2020 and 2021, rising to over 15% in 2023. Individuals aged 5–30 made up only a small portion of hospitalised patients – the share of any five-year age group within this range did not exceed 2%.

In every year analysed, the proportion of patients aged 40–74 was higher for men than for women, with an average difference of 1.3 percentage points (pp) in each five-year age category. In older age groups, the trend was reversed – the share of the oldest patients among all treated women was higher than among men, and this gap widened with age. The differences were 0.7 pp in the 75–79 age group, 2.8 pp in the 80–84 age group, and 7.7 pp in those aged 85 and over.

The average length of hospital stay for male COVID-19 patients (Fig. 4.16) ranged from 9.7 days in 2023 to 11.3 days in 2021. It was slightly longer each year than for females, whose stays ranged from 9.2 days in 2023 to 10.5 days in 2021. The length of hospital stay was strongly age-dependent, increasing steadily from 4.3 days among children under 10 years to 11.8 days for people aged 60–69. In the oldest age groups, this time slightly decreased to an average of 11.4 days (70–79 years) and 10.6 days (over 80 years).

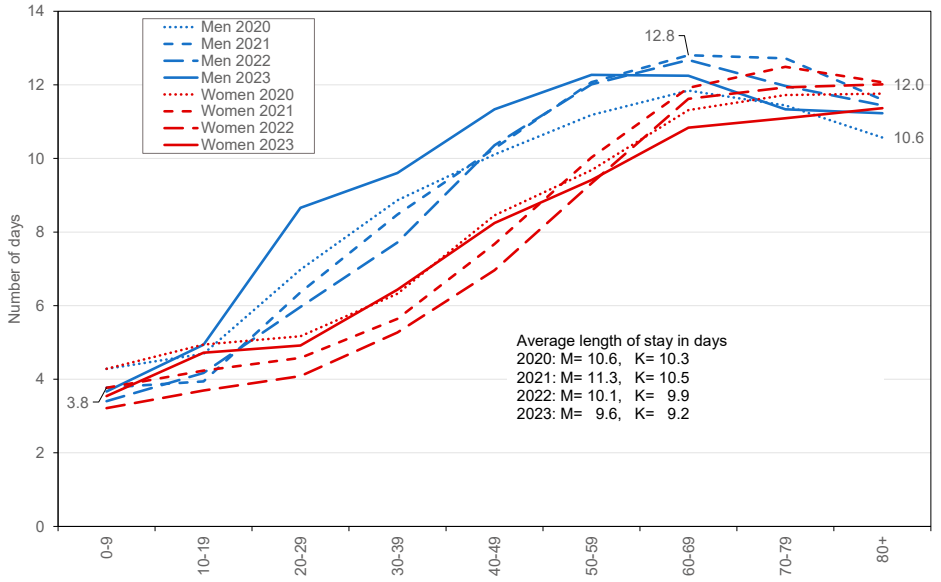


Fig. 4.16. Length of hospital stay for patients hospitalised for COVID-19 by sex and age in 2020–2023 (data: NIPH NIH – NRI)

Hospital mortality due to COVID-19 was very high in the first two years of the epidemic (Fig. 4.17). In 2021 and 2022, nearly one-quarter of hospitalised men died from the disease (24.3% and 22.9%, respectively). Among patients aged 85 and over, more than half died (52.9% and 53.3%). These rates were slightly lower for women – 19.1% and 19.9% overall, and 39.7% and 41.1% in the 85 and over age group. In the following years, mortality declined, likely as a result of increased population immunity through vaccination and improvements in treatment methods. Differences in the risk of death between men and women also narrowed. In 2022, mortality rates were 16.9% (38.1% in those aged 85+) for men and 15.5% (31.4%) for women. In 2023, these figures were 10.9% (28.1%) for men and 9.7% (23.3%) for women.

Across the entire observation period, in-hospital mortality for both sexes was close to zero for patients under 25 years of age. In older age groups, it increased rapidly and steadily, reaching the levels described above for people aged 85 and over. In general, male mortality was higher than female mortality – for people over the age of 25, in-hospital mortality rates were higher for men in every year and every age group analysed.

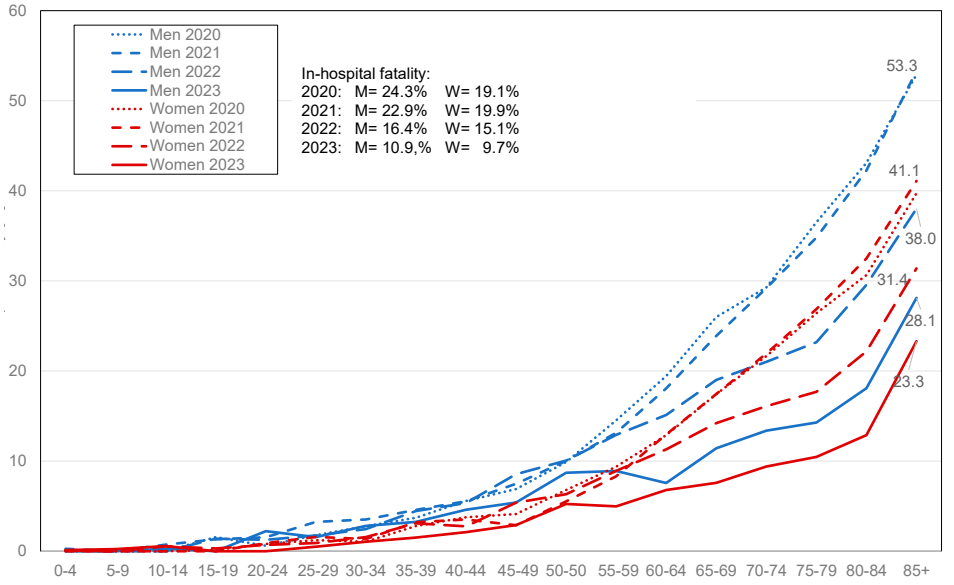


Fig. 4.17. In-hospital mortality due to COVID-19 by sex and age of patients in 2020–2023 (data: NIPH NIH – NRI)

The age structure of urban and rural residents hospitalised for COVID-19 in 2020–2023 was similar. In both subpopulations, a consistent increase in hospitalisation rates with age was observed from age 10 onwards. The average age of patients in both groups was comparable between 2020 and 2022 (differences did not exceed one year). However, in 2023, hospitalised urban residents were, on average, almost five years older than those from rural areas (58.3 versus 53.4 years). In-hospital mortality in both subpopulations decreased more than twofold over the four years, though mortality rates among the urban population were approximately one percentage point higher. Differences in the average length of hospital stay by year did not exceed 0.5 days.

5. SELECTED ISSUES OF DISEASES OF THE CIRCULATORY SYSTEM IN POLAND

Marek Gierlotka (Department and Clinic of Cardiology, University Clinical Hospital in Opole, Institute of Medical Sciences, University of Opole), Mariusz Gąsior (3rd Department of Cardiology, Faculty of Medical Sciences in Zabrze, Medical University of Silesia in Katowice, Silesian Centre for Heart Diseases in Zabrze), Daniel Rabczenko, Jakub Stokwiszewski, Bogdan Wojtyniak

In the previous Report,[1] we presented the impact of the first year of the COVID-19 pandemic on the functioning of healthcare services related to diseases of the circulatory system, as well as changes in mortality and morbidity trends associated with these conditions. The care provided to patients with diseases of the circulatory system deteriorated, with a decrease in the number of hospitalisations, outpatient consultations, and procedures in interventional cardiology, electrophysiology, and cardiac surgery.

Following the pandemic, in 2022 and 2023, there was a gradual rebuilding of cardiological care and an attempt to catch up on the backlog that had accumulated during the pandemic, referred to as the "repayment of the health debt". The number of cardiology services increased in an effort to meet the growing needs of patients. Despite these positive trends, the number of services provided in certain areas still has not reached pre-pandemic levels. The healthcare system now faces new challenges related to the long-term effects of COVID-19 and the necessity of adapting care models.

[1] Feusette P, Gierlotka M, Gąsior M, Rabczenko D, Stokwiszewski J, Wojtyniak B.: "Choroby kardiologiczne w okresie pandemii COVID-19 w Polsce" in: Wojtyniak B, Goryński P. Sytuacja zdrowotna ludności Polski i jej uwarunkowania 2022, NIPH NIH-NRI, Warsaw 2022

Mortality due to diseases of the circulatory system during the post-COVID-19 pandemic period

Diseases of the circulatory system (DCS) have been the primary health concern and the leading cause of death in Poland and the vast majority of EU countries since the second half of the 20th century. According to analyses conducted as part of the Global Burden of Disease 2021 project, DCS were responsible for 22% of all disability-adjusted life years (DALYs) and 33% of years of life lost due to premature death in 2019.[2] Until 2019, the mortality rate from DCS, as measured by the standardised death rate, had been declining (see Chapter 3), but the years of the COVID-19 pandemic disrupted this trend. The time series analysis of death rates and the estimation of deviations in DCS mortality for 2022 and 2023, compared to the expected level based on the previous trend, were carried out using the methodology described in Chapter 3.

Table 5.1. Observed standardised death rates (obs. value) and estimated expected rates (exp. value) with relative difference (%) by voivodship in 2022–2023 (own calculations)

Voivodship	2022			2023		
	Obs. value	Exp. value	%	Obs. value	Exp. value	%
Dolnośląskie	605.9	389.9	56.4	543.9	388.0	41.2
Kujawsko-Pomorskie	436.5	430.6	1.7	400.8	429.1	-6.6
Lubelskie	558.5	501.8	11.5	529.5	501.4	5.6
Lubuskie	568.7	388.8	47.9	489.9	388.6	26.7
Łódzkie	417.6	455.5	-8.1	380.3	454.1	-15.9
Małopolskie	501.1	512.2	-2.0	453.8	512.0	-11.4
Mazowieckie	363.1	309.2	19.3	355.4	299.3	19.6
Opolskie	461.0	473.3	-1.9	454.3	472.0	-3.2
Podkarpackie	528.4	450.1	17.9	494.3	449.8	10.5
Podlaskie	557.1	485.7	14.7	460.9	484.5	-4.8
Pomorskie	487.0	503.9	-3.5	411.3	503.9	-18.4
Śląskie	512.9	500.5	3.1	451.3	500.7	-9.6
Świętokrzyskie	514.9	559.8	-7.4	493.6	559.3	-11.8
Warmińsko-Mazurskie	429.2	420.4	2.8	422.6	419.2	0.5
Wielkopolskie	389.7	445.4	-12.3	361.8	444.2	-18.5
Zachodniopomorskie	510.9	558.7	-8.3	434.5	557.7	-22.2
Poland	477.5	447.8	7.1	436.1	446.8	-2.3

[2] Institute for Health Metrics and Evaluation, GBD Result Tool, http://ghdx.healthdata.org/gbd-results-tool, accessed on 10 October 202

Table 5.1 presents the observed values of the standardised death rate (obs. value), as well as estimates of the expected values (exp. value) and the percentage of excess (or reduction) in DCS death rates in Poland and individual voivodships in 2022 and 2023. While the overall mortality rate in Poland and that of nine voivodships in 2022 were still higher than expected based on the pre-pandemic trend of mortality rates, in 2023, both the nationwide mortality rate and that of ten voivodships were already lower than expected. It is worth noting the persistently high excess mortality in Dolnośląskie and Lubuskie voivodships and, to a somewhat lesser extent, also in Mazowieckie voivodship.

In 2023, mortality was lower than expected in the majority of months, whereas in 2022, this favourable situation occurred only in February and March (Fig. 5.1).

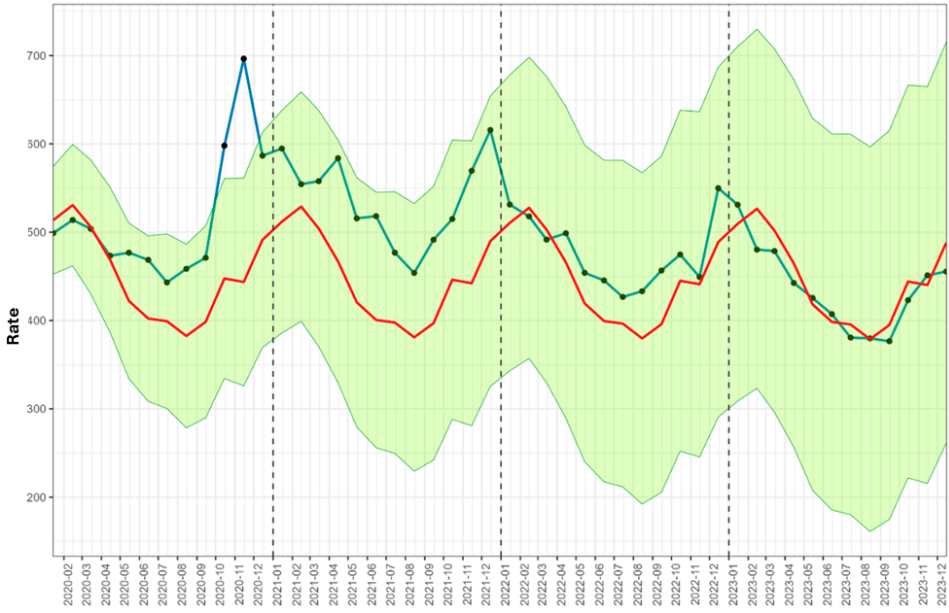


Fig. 5.1. Monthly death rates from diseases of the circulatory system overall (blue line) in 2020–2023 and their expected values (red line) with 95% confidence interval (green area), estimated based on previous 10-year trends (own calculations)

The deviations of the observed death rates from DCS compared to their expected values were relatively similar between men (4.7% in 2022 and -4.2% in 2023) and women (8.5% and -1.1%, respectively). Significant differences are observed in excess mortality depending on the specific DCS subgroup (Table 5.2).

Table 5.2. Observed standardised death rates (obs. value) from selected subgroups of diseases of the circulatory system and estimated expected rates (exp. value) with relative difference (%) for men and women in 2022–2023 (own calculations)

Cause of death	2022			2023		
	Obs. value	Exp. value	%	Obs. value	Exp. value	%
Total						
DCS (I00–I99)	477.5	447.8	7.1	436.1	446.8	-2.3
Hypertensive diseases (I10–I15)	38.1	24.8	53.4	35.7	24.8	43.7
Heart disease (I00–I09, I11, I13, I20–I51)	323.4	261.7	24.2	291.5	261.7	11.7
Ischaemic heart diseases (I20–I25)	189.5	127.7	48.6	178.8	127.4	40.6
Myocardial infarction (I21–I22)	33.2	37.9	-12.0	31.2	37.9	-17.4
Pulmonary embolism (I26)	6.2	5.3	18.3	6.0	5.3	13.1
Cerebrovascular diseases (I60–I69)	94.4	84.9	11.5	87.6	84.9	3.2
Atherosclerosis (I70)	43.0	78.0	-44.6	41.1	77.7	-47.3
Men						
DCS (I00–I99)	584.1	559.8	4.7	534.7	558.8	-4.2
Hypertensive diseases (I10–I15)	42.4	27.6	53.5	38.8	27.6	40.1
Heart disease (I00–I09, I11, I13, I20–I51)	406.0	351.0	16.1	364.3	351.0	4.0
Ischaemic heart diseases (I20–I25)	242.8	176.3	38.0	226.9	175.8	29.3
Myocardial infarction (I21–I22)	50.0	53.0	-5.2	45.7	52.8	-13.1
Pulmonary embolism (I26)	7.4	6.1	21.5	6.9	6.1	14.1
Cerebrovascular diseases (I60–I69)	109.5	98.5	11.4	103.2	98.0	5.3
Atherosclerosis (I70)	46.6	81.9	-42.9	46.4	81.7	-43.2
Women						
DCS (I00–I99)	397.2	368.0	8.5	362.8	367.6	-1.1
Hypertensive diseases (I10–I15)	33.8	23.4	44.5	32.2	23.5	37.0
Heart disease (I00–I09, I11, I13, I20–I51)	262.7	200.1	32.3	238.6	200.1	19.8
Ischaemic heart diseases (I20–I25)	151.4	93.6	62.2	144.7	93.5	55.3
Myocardial infarction (I21–I22)	21.0	24.2	-12.9	20.6	24.1	-13.9
Pulmonary embolism (I26)	5.3	4.7	14.0	5.2	4.7	10.6
Cerebrovascular diseases (I60–I69)	81.7	71.5	14.7	75.0	71.1	5.4
Atherosclerosis (I70)	39.8	73.7	-45.6	37.0	73.3	-49.7

The highest relative excess mortality continues to be recorded for hypertensive diseases and ischaemic heart disease (IHD); however, the excess mortality from IHD does not result from myocardial infarction, for which the mortality rate was lower than expected in both 2022 and 2023 (Fig. 5.2). This may be a partial artefact associated with changes in the coding of causes of death, as indirectly indicated by the markedly less frequent attribution of deaths to atherosclerosis.

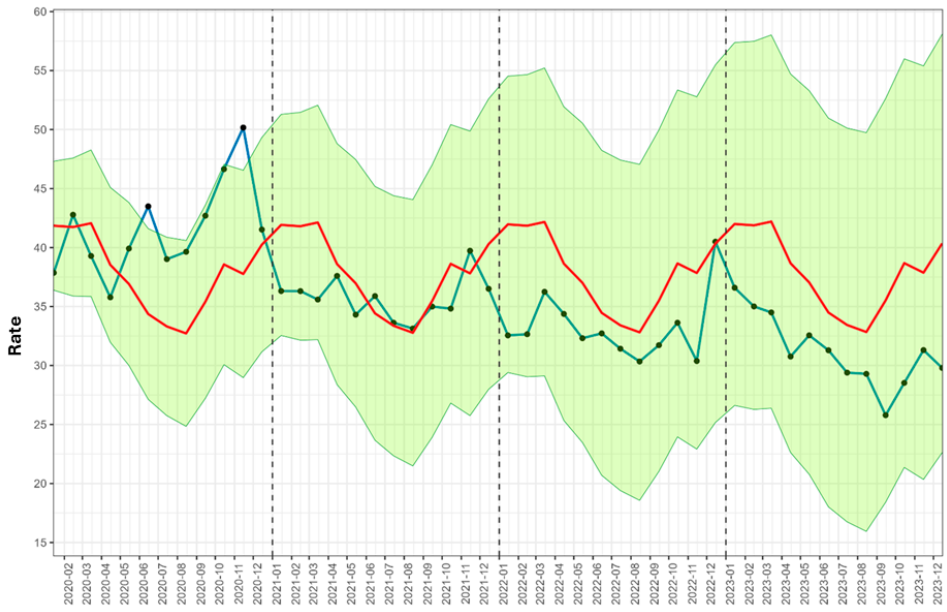


Fig. 5.2. Monthly death rates from myocardial infarction in Poland in 2020–2023 (blue line) and their expected values (red line) with 95% confidence interval (green area) for 2020–2023 (own calculations)

The deviations in observed death rates from DCS overall and in specific subgroups among urban and rural populations were relatively similar (Table 5.3).

Table 5.3. Observed standardised death rates (obs. value) from selected subgroups of diseases of the circulatory system and estimated expected rates (exp. value) with relative difference (%) for urban and rural residents in 2022–2023 (own calculations)

Cause of death	2022			2023		
	Obs. value	Exp. value	%	Obs. value	Exp. value	%
Urban areas						
DCS (I00–I99)	444.8	411.7	8.5	407.4	410.9	-0.6
Hypertensive diseases (I10–I15)	33.4	22.3	49.9	31.5	22.3	40.7
Heart disease (I00–I09, I11, I13, I20–I51)	299.6	239.7	25.8	270.8	239.7	13.4
Ischaemic heart diseases (I20–I25)	176.0	123.0	43.4	168.4	122.9	37.4
Myocardial infarction (I21–I22)	33.4	37.1	-9.6	31.4	37.0	-14.9
Pulmonary embolism (I26)	6.4	5.3	23.7	6.0	5.2	14.6
Cerebrovascular diseases (I60–I69)	89.7	78.9	14.1	84.1	78.5	7.1
Atherosclerosis (I70)	39.3	66.4	-40.4	37.2	65.7	-43.2
Rural areas						
DCS (I00–I99)	538.2	515.9	4.6	490.2	515.4	-4.9
Hypertensive diseases (I10–I15)	46.8	30.5	53.1	43.6	30.5	42.6
Heart disease (I00–I09, I11, I13, I20–I51)	367.5	302.0	22.1	330.9	301.9	9.7
Ischaemic heart diseases (I20–I25)	214.6	138.3	55.2	198.5	138.3	43.7
Myocardial infarction (I21–I22)	33.0	35.9	-7.6	31.0	35.7	-13.0
Pulmonary embolism (I26)	5.9	5.6	6.1	6.0	5.6	8.4
Cerebrovascular diseases (I60–I69)	103.1	92.1	12.2	94.1	91.6	2.7
Atherosclerosis (I70)	49.8	96.5	-48.2	48.3	96.4	-50.2

Hospitalisations due to diseases of the circulatory system during the post-COVID-19 pandemic period

The analysis of hospitalisations due to diseases of the circulatory system presented below pertains to the 2021–2023 period. However, time series of hospitalisation rates from 2010 to 2019 were used to estimate the expected values. These data come from the Nationwide General Hospital Morbidity Study conducted by the NIHP NIH – NRI on behalf of the Ministry of Health as part of the national official statistics research programme.

Figures 5.3a–5.3d show the observed and projected (expected) standardised hospitalisation rates due to diseases of the circulatory system among men and women, as well as urban and rural residents, for individual months in the years 2020–2023.

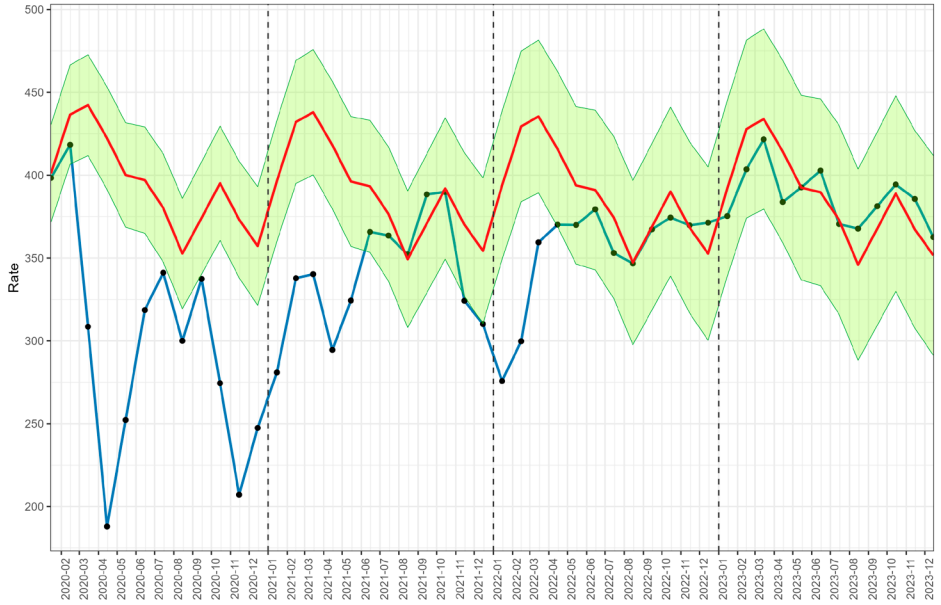


Fig. 5.3a. Monthly standardised hospitalisation rates of men (per 10,000 population) due to diseases of the circulatory system overall (blue line) in 2020–2023 and their expected values (red line) with 95% confidence interval (green area), estimated based on previous 10-year trends (own calculations)

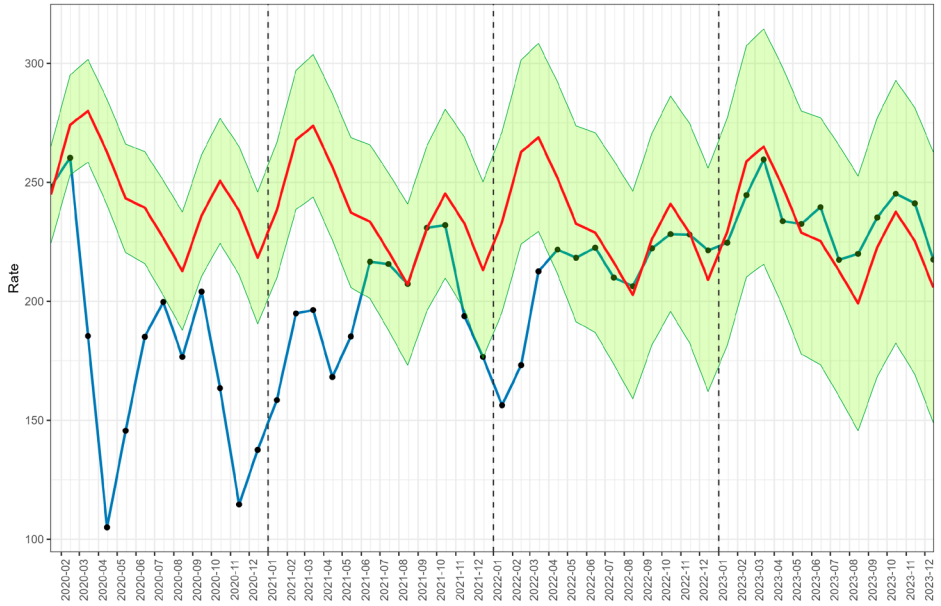


Fig. 5.3b. Monthly standardised hospitalisation rates of women (per 10,000 population) due to diseases of the circulatory system overall (blue line) in 2020–2023 and their expected values (red line) with 95% confidence interval (green area), estimated based on previous 10-year trends (own calculations)

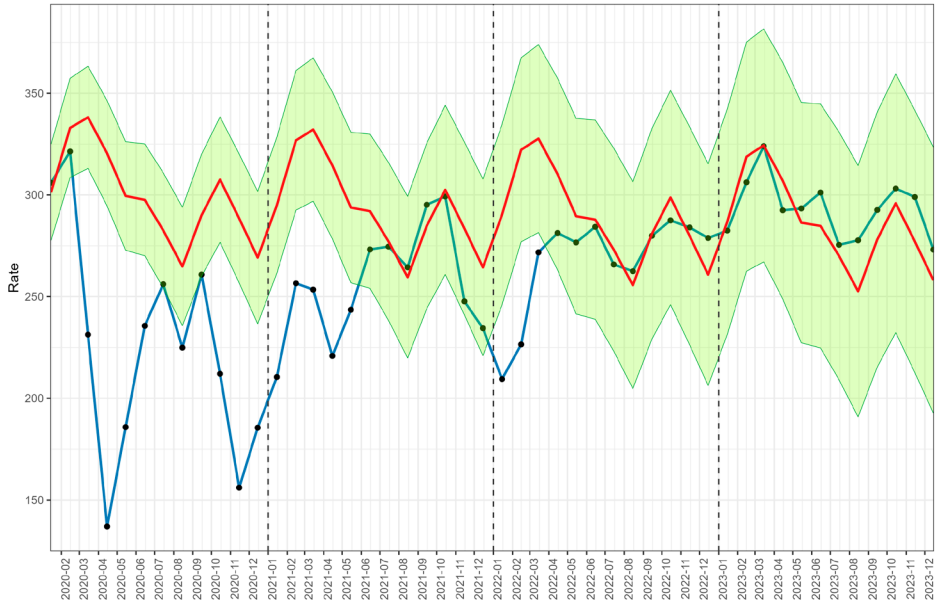


Fig. 5.3c. Monthly standardised hospitalisation rates of urban residents (per 10,000 population) due to diseases of the circulatory system overall (blue line) in 2020–2023 and their expected values (red line) with 95% confidence interval (green area), estimated based on previous 10-year trends (own calculations)

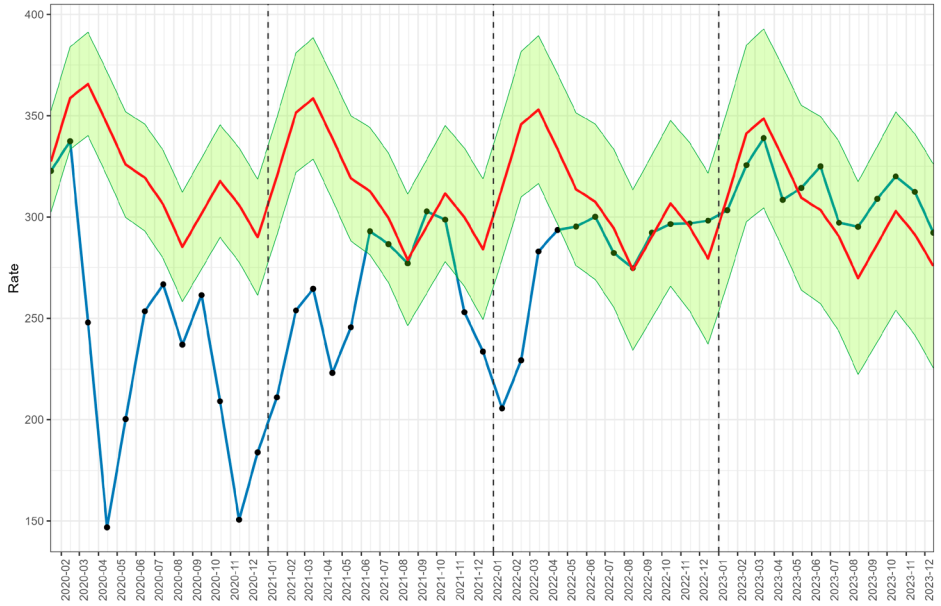


Fig. 5.3d. Monthly standardised hospitalisation rates of rural residents (per 10,000 population) due to diseases of the circulatory system overall (blue line) in 2020–2023 and their expected values (red line) with 95% confidence interval (green area), estimated based on previous 10-year trends (own calculations)

In all subpopulations analysed, the observed hospitalisation rates were lower than expected in every month of 2020 and in the majority of months during 2021–2022. In 2021–2022, the largest (and statistically significant) deviations occurred in the early months of each year. This points to a clear disruption of the seasonal pattern of hospitalisations due to diseases of the circulatory system during those years. Determining the causes and potential consequences of this phenomenon requires further dedicated analysis.

Cardiovascular diseases in the context of the Silesian Cardiovascular Database SILICARD

Below, we present summaries and analyses based on data reported to the National Health Fund from selected voivodships (Śląskie, Opolskie and Podlaskie), including the Silesian Cardiovascular Database SILICARD and the Opole Database of Civilisation Diseases. In particular, the Silesian Cardiovascular Database SILICARD, established on the initiative of Professor Mariusz Gąsior, comprises all medical events related to diseases of the circulatory system reported to the National Health Fund for patients in Śląskie voivodship since 2009. Similarly, the Opole Database of Civilisation Diseases, initiated by Professor Marek Gierlotka, collected comparable data for Opolskie voivodship, although it unfortunately does not include the post-pandemic period.

According to the data from the Silesian Cardiovascular Database – SILICARD, the number of hospitalisations due to cardiovascular diseases in Śląskie voivodship decreased by almost 34% between March and December 2019 and March and December 2020.[3] This decline was most pronounced during months with the highest number of COVID-19 infections. After this marked drop in 2020 (approx. 83 thousand hospitalisations), compared to the preceding years (approx. 116 thousand in 2019), a modest increase was observed in 2021 (approx. 89 thousand), followed by a more dynamic recovery in 2022 (approx. 95 thousand) and 2023 (approx. 103 thousand), as shown in Figure 5.4. Nonetheless, the number of hospitalisations has not yet returned to pre-pandemic levels.

[3] Feusette P, Gierlotka M, Gąsior M, Rabczenko D, Stokwiszewski J, Wojtyniak B.: "Choroby kardiologiczne w okresie pandemii COVID-19 w Polsce" in: Wojtyniak B, Goryński P. Sytuacja zdrowotna ludności Polski i jej uwarunkowania 2022, NIPH NIH-NRI, Warsaw 2022

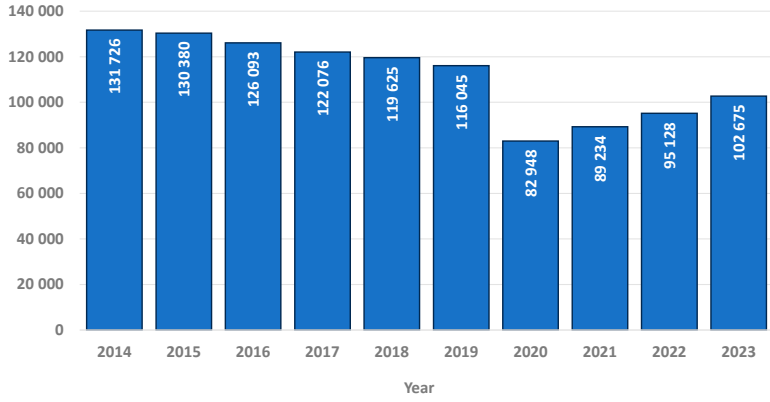


Fig. 5.4. Number of hospitalisations due to cardiovascular diseases in Śląskie voivodship in 2014–2023 (SILICARD data)

The SILICARD data also show a decline in the total number of outpatient visits (both in-person and remote) in 2020 (approx. 380 thousand) compared to 2019 (approx. 420 thousand). Between 2021 and 2022, the number of visits remained relatively stable at a slightly higher level (approx. 397–398 thousand) and increased to around 417 thousand in 2023, approaching pre-pandemic levels. In 2020, teleconsultations accounted for as much as 35% of all visits. In subsequent years, their share gradually declined (14% in 2021, 5% in 2022, and 4% in 2023), with in-person visits returning to normal, pre-pandemic levels. While the role of telemedicine diminished significantly after the peak of the pandemic, it nonetheless remains a permanent feature of the healthcare system (Figures 5.5, 5.6).

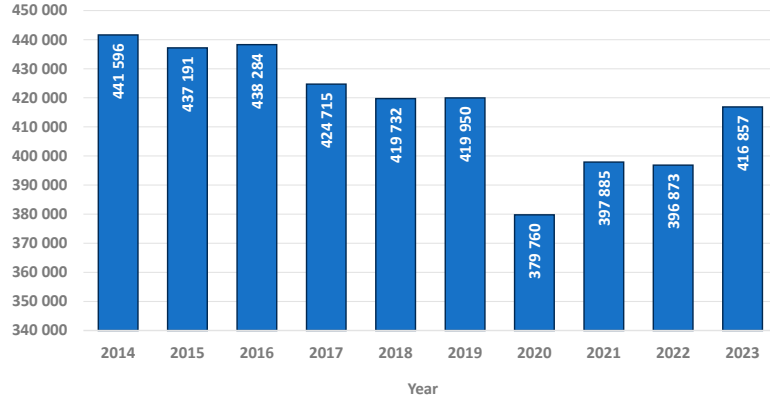


Fig. 5.5. Number of visits to cardiology outpatient clinics (including teleconsultations) in the Śląskie Voivodship in 2014–2023

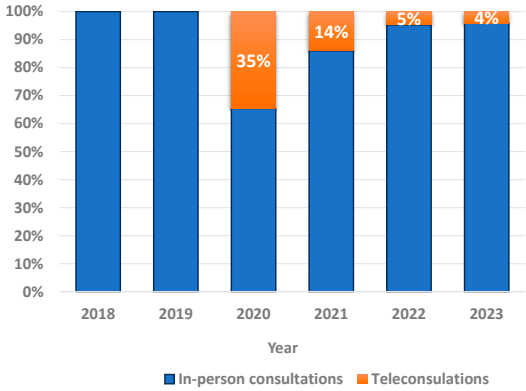


Fig. 5.6. Distribution of types of consultations in cardiology outpatient clinics in Śląskie voivodship in 2018–2023 (SILICARD data)

Situation regarding selected diseases during and after the COVID-19 pandemic

Acute myocardial infarction in the emergency medicine system

According to data from the Silesian Cardiovascular Database, the number of patients and hospitalisations due to myocardial infarction in 2020 was 25% lower than in 2019 (Fig. 5.7). This reduction led to a 26% decline in the number of patients enrolled in the managed care for acute myocardial infarction survivors programme (KOS-zawał).[4] Treatment outcomes for myocardial infarction in 2020 also worsened compared to 2019 – in-hospital mortality was 34% higher in 2020 than in the previous year. Figure 5.7 shows that from 2021 onwards, the number of hospitalisations due to myocardial infarction gradually increased, returning to pre-pandemic levels.

A significant success of Polish cardiology is the managed care for acute myocardial infarction survivors programme – KOS-zawał. This programme has contributed to a marked improvement in the prognosis of myocardial infarction patients. However, during the pandemic, the number of patients enrolled in KOS-zawał was significantly lower than in the pre-pandemic period, which undoubtedly had a negative impact on patient outcomes.

[4] Feusette P, Gierlotka M, Gąsior M, Rabczenko D, Stokwiszewski J, Wojtyniak B.: "Choroby kardiologiczne w okresie pandemii COVID-19 w Polsce" in: Wojtyniak B, Goryński P. Sytuacja zdrowotna ludności Polski i jej uwarunkowania 2022, NIPH NIH-NRI, Warsaw 2022

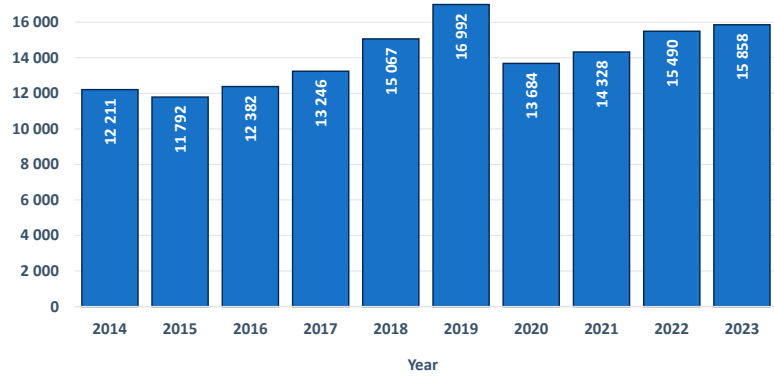


Fig. 5.7. Number of hospitalisations due to myocardial infarction in Śląskie voivodship in 2014–2023 (SILICARD data)

Heart failure

According to the Silesian Cardiovascular Database SILICARD, the number of hospitalisations due to heart failure in 2020 was 33% lower than in 2019 (Fig. 5.8). In-hospital mortality in these patients increased by 16% when comparing 2020 to 2019. As with myocardial infarction, post-pandemic hospitalisation numbers gradually returned to levels observed in 2017–2019.

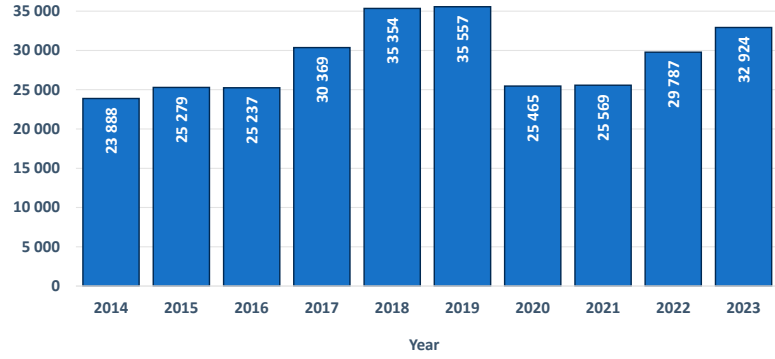


Fig. 5.8. Number of hospitalisations due to heart failure in Śląskie voivodship by month in 2019 and 2020, and annually from 2014 to 2023 (SILICARD data)

The Opole Database of Civilisation Diseases provided similar insights regarding heart failure patients. In 2020, hospitalisations due to heart failure decreased by over 21% compared to 2019. The number of patients with heart failure hospitalised also decreased from 2019 to 2020. Conversely, in 2020, an increased number of deaths was recorded among patients diagnosed with heart failure. The

findings from the Opole Database closely align with those from SILICARD, despite clear demographic differences between the two voivodships.

Atrial fibrillation, aortic stenosis

The SILICARD database also provides data on other diseases of the circulatory system in recent years. In the analysed period in 2020, hospitalisations due to atrial fibrillation dropped by 37% (Fig. 5.9), and due to aortic stenosis by 32% (Fig. 5.10).

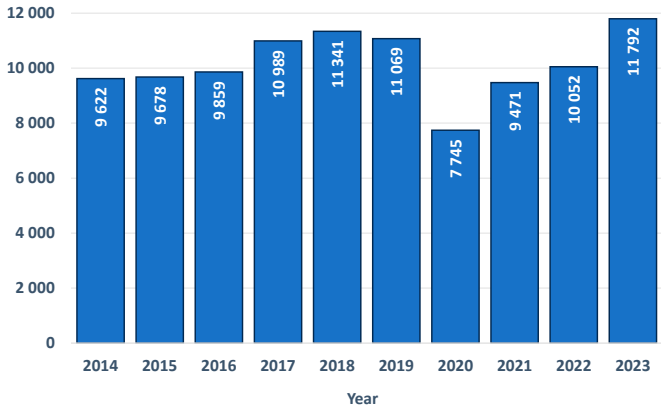


Fig. 5.9. Number of hospitalisations due to atrial fibrillation in Śląskie voivodship in 2014–2023 (SILICARD data)

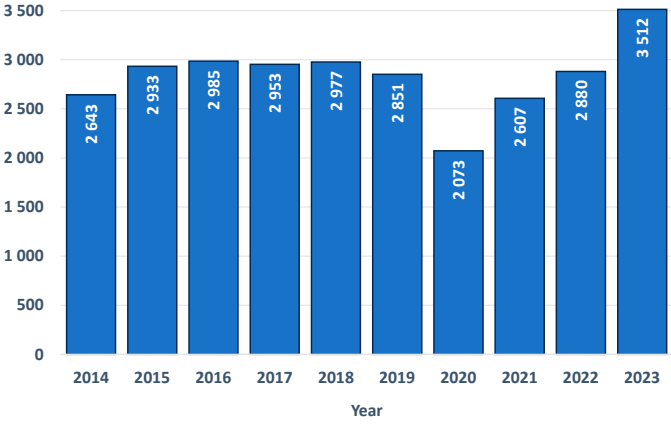


Fig. 5.10. Number of hospitalisations due to aortic stenosis in Śląskie voivodship in 2014–2023 (SILICARD data)

Interestingly, a rapid increase in hospitalisations for both conditions was observed after the pandemic, surpassing pre-pandemic levels. This reflects, on the one hand, the effective "repayment" of the healthcare debt in these disease areas

by cardiologists and, on the other, an increase in the prevalence of atrial fibrillation and aortic stenosis in recent years.

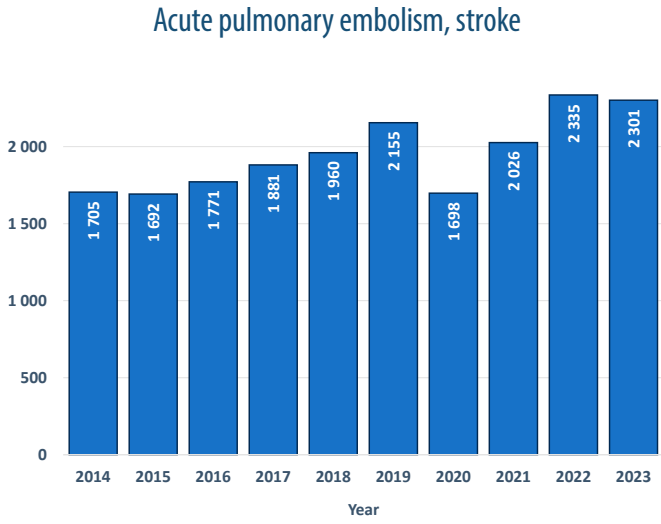


Fig. 5.11. Number of hospitalisations due to pulmonary embolism in Śląskie voivodship in 2014–2023 (SILICARD data)

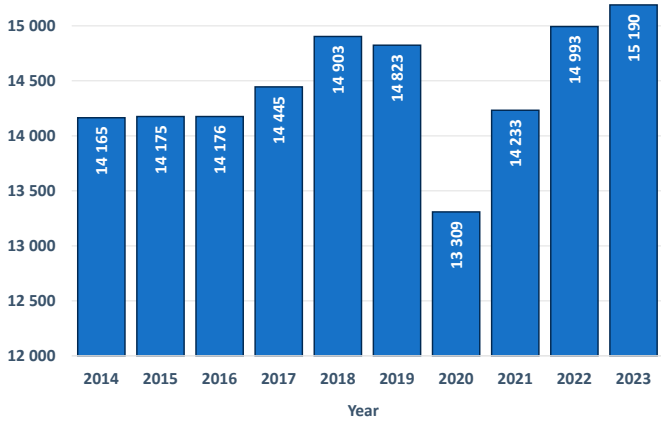


Fig. 5.12. Number of hospitalisations due to stroke (CNS infarction) in Śląskie voivodship in 2014–2023 (SILICARD data)

In 2020, compared to 2019, the number of hospitalisations due to pulmonary embolism decreased by 22% (Fig. 5.11) and due to stroke by 26% (Fig. 5.12). In the following years, these numbers returned to previous levels. Notably, the frequency of hospitalisations for pulmonary embolism was significantly higher in 2022 and 2023 compared to the pre-pandemic period.

Selected procedures performed for diseases of the circulatory system

Figures 5.13 to 5.19 illustrate the changes in the number of selected procedures performed to treat cardiovascular diseases between 2014 and 2023. The first year of the COVID-19 pandemic also saw a decline in the number of cardiological procedures. According to data from the Silesian Cardiovascular Database SILICARD, when comparing 2020 to 2019, the number of coronary angiographies dropped by 29% (Fig. 5.13), and the number of percutaneous coronary interventions fell by 24% (Fig. 5.14). There was an 18% decrease in electrophysiology procedures (Figures 5.15, 5.16, 5.17). The year 2020 also saw a reduction in the number of cardiac surgery procedures. Hospitalisations for coronary artery bypass grafting (CABG) were 28% lower (Fig. 5.25), and valve procedures declined by 19% (Fig. 5.26). In the post-pandemic years 2022–2023, the number of cardiological procedures performed has steadily increased, which is an essential component of "repaying the health debt". In certain areas (e.g. ablations, pacemaker implantations), the numbers exceeded pre-pandemic levels, likely due to both clearing backlogs and technological progress, along with growing population needs. In others (e.g. CABG, PCI), the return to pre-2019 levels has been slower or incomplete.

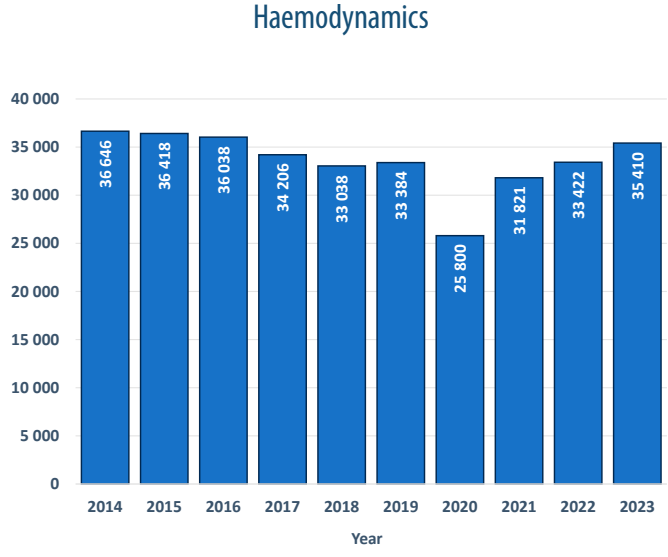


Fig. 5.13. Number of hospitalisations for coronary angiography in Śląskie voivodship, 2014–2023 (SILICARD data)

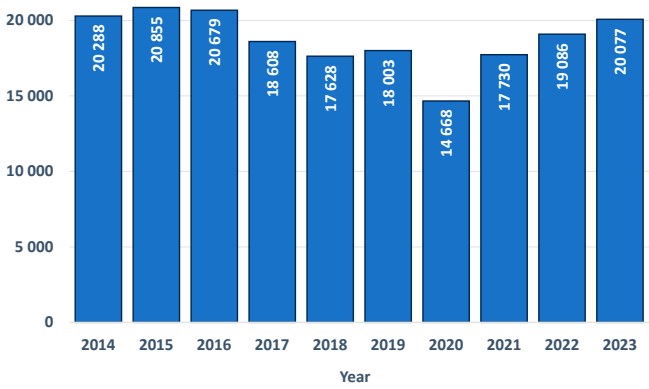


Fig. 5.14. Number of hospitalisations for PCI in Śląskie voivodship, 2014–2023 (SILICARD data)

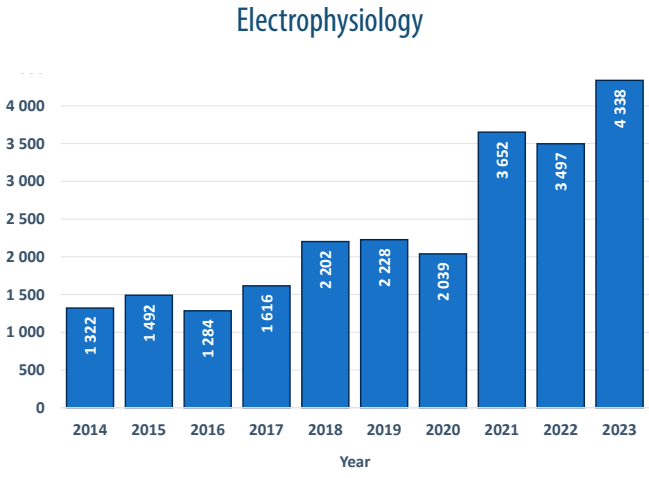


Fig. 5.15. Number of hospitalisations for ablation in Śląskie voivodship, 2014–2023 (SILICARD data)

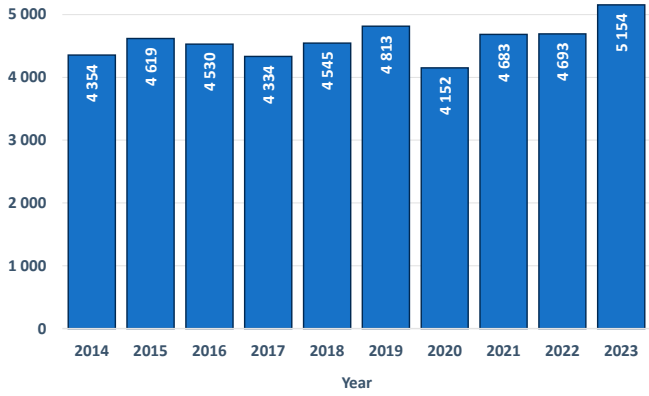


Fig. 5.16. Number of hospitalisations for pacemaker implantation in Śląskie voivodship, 2014–2023 (SILICARD data)

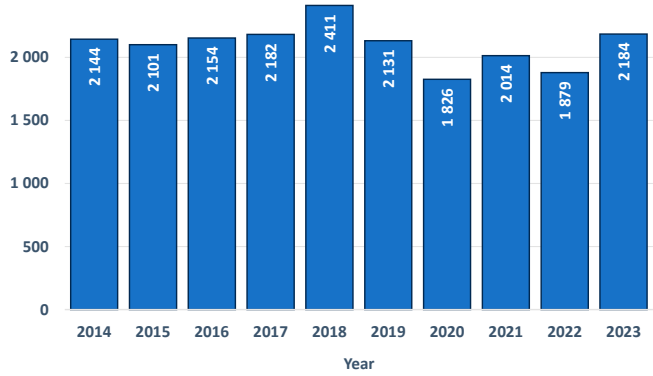


Fig. 5.17. Number of hospitalisations for ICD/BiV implantation procedures in Śląskie voivodship, 2014–2023 (SILICARD data)

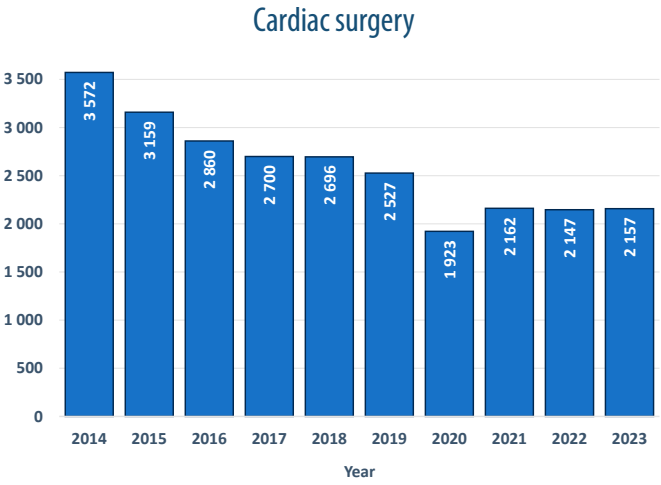


Fig. 5.18. Number of hospitalisations for CABG in Śląskie voivodship, 2014–2023 (SILICARD data)

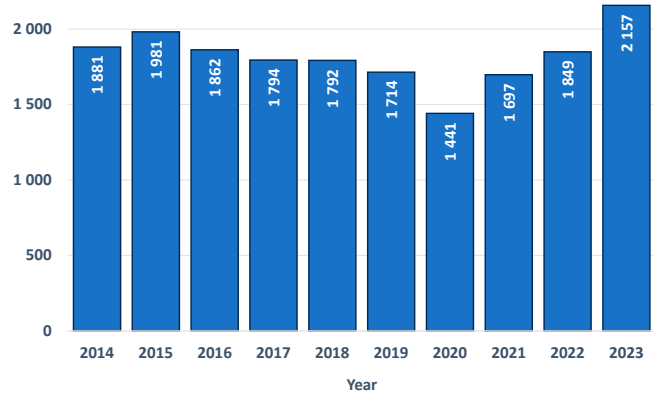


Fig. 5.19. Number of hospitalisations for heart valve surgery in Śląskie voivodship, 2014–2023 (SILICARD data)

Repayment of Health Debt in Cardiology

The health debt in cardiology refers to the cumulative number of delayed or missed consultations, diagnostic tests (e.g. echocardiograms, stress tests), and interventional procedures (e.g. PCI, pacemaker implantations). Repaying this debt is critically important for the health of Polish society. The goal is to prevent the progression of diseases of the circulatory system, reduce the risk of acute cardiovascular events (such as heart attacks and strokes), and improve patients' quality of life. The health debt in cardiology is not only a matter of backlogs but also represents a potential increase in future cardiovascular events and healthcare needs if appropriate preventive measures are not implemented.

Although precisely quantifying this debt is difficult, available data and indicators help estimate its scale. A key marker is the decline in the number of cardiological procedures in 2020–2021 compared to 2019. For instance, according to the National Health Fund data, the number of hospital services in cardiology dropped by 25%. In Poland, the number of procedures for treating acute coronary syndromes (such as PCI) fell by 12%, and certain types of electrophysiological procedures declined by as much as 20%. The number of pacemaker implantations decreased by 20%.

Various initiatives and strategies have been undertaken to address the repayment of health debt in cardiology. One key action is implementing the National Cardiology Network (Pol. Krajowa Sieć Kardiologiczna, KSK), which aims to improve the efficiency, coordination, and quality of cardiac care in Poland. The KSK is designed to ensure that all patients, regardless of their place of residence, receive cardiology care based on the same diagnostic and therapeutic standards, as well as coordinated and continuous care — from the stage of cardiology diagnostics, through treatment and rehabilitation, to further treatment within specialist outpatient care, primary healthcare, or long-term care. Another crucial element of the repayment strategy is utilising funds from the national recovery and resilience plan (RRP). The RRP envisions investments in modernising medical infrastructure and improving access to services, including cardiology.

6. CANCER INCIDENCE TRENDS IN POLAND

Joanna Didkowska, Urszula Wojciechowska, Urszula Sulkowska

In Poland, the source of knowledge about cancer incidence is the data collected in the National Cancer Registry (Krajowy Rejestr Nowotworów, KRN), whose foundations were established in 1952. The KRN operates on the basis of a regulation issued by the Minister of Health (Journal of Laws of 2018, item 1197). Data on cancer incidence has been available since the mid-1960s[1]. Annual reports devoted to the epidemiological situation regarding cancer have been published since 1979, and since 1999, incidence data have also been made available by the National Cancer Registry on its website[2].

Neoplastic diseases have continuously accompanied the human population – the first mentions of cancer cases in humans date back more than 3,000 years BCE, with descriptions of breast tumours found in the Code of Hammurabi (1950 BCE) and in the Ebers Papyrus (circa 1660 BCE)[3]. Today, cancer is a global health, social, and economic challenge, regardless of a country's level of wealth.

The number of malignant neoplasm cases worldwide in 2022 was estimated by an international team of experts at nearly 20 million, with over one-fifth occurring in Europe.[4] The most frequently diagnosed cancer among men in Europe is prostate cancer (20%), and among women, breast cancer (26%)[4].

[1] Koszarowski T., Gadomska H., Wronkowski Z., Romejko M.: Nowotwory złośliwe w Polsce w latach 1952-1982 [Malignant neoplasms in Poland between 1952 and 1982]. Centre of Oncology - Maria Skłodowska-Curie Institute, Warsaw 1987

[2] http://onkologia.org.pl/

[3] Berner J. Breast cancer from antiquity to the present day [Rak piersi od starożytności do współczesności]. CANCERS [NOWOTWORY] Journal of Oncology 2012, 62 (1), 42-48.

[4] Ferlay J, Ervik M, Lam F, Laversanne M, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2024). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available at https://gco.iarc.who.int/today, accessed 12/02/2025.

In the 20th century, Poland underwent a so-called demographic transition, characterised by a gradual change in the age structure of the population resulting from a decline in the female fertility rate, postponement of the age at first and subsequent childbirths, a decrease in natural population growth, and an increase in average life expectancy. In the 21st century, these trends accelerated, leading to a growth in the number of older people (aged 65 and over) in the population (7.5 million in 2023) and an increase in their share in the general population (20.1% in 2023). Demographic and health processes in Poland occurred with a certain delay compared to those observed in developed countries of Western Europe, but now chronic diseases, including cancers, have also become the predominant health issue in Poland.

Over the last half-century, the epidemiology of cancer among men in Poland has been shaped by three primary sites: stomach cancer, which was dominant until the early 1970s; lung cancer, whose incidence increased until the mid-1990s; and prostate cancer, which since 2016 has been the most common cancer among men (Table 6.1). Among women, cervical cancer was the most common until the early 1970s; however, a decrease in its incidence and a rapid increase in breast cancer cases led to a shift. The most common cancers among women became breast, colorectal, and lung cancers (Table 6.1).

Table 6.1. The most common cancer cases in Poland in 1980 and 2022

MEN	1980				2022			
	Number	%	crude rate	age-standardised rate (ESP2013)	Number	%	crude rate	age-standardised rate (ESP2013)
Total	34,074		196.6	380.4	89,794	100.0	491.2	579.2
stomach	4,847	15.8	28.0	58.4	3,008	3.3	16.5	19.7
large intestine	2,288	7.4	13.2	26.9	10,474	11.7	57.3	68.6
lung	9,041	29.4	52.2	49.3	12,286	13.7	67.2	78.3
melanoma	265	0.9	1.5	2.5	1,925	2.1	10.5	12.2
prostate	1,731	5.6	10.0	26.5	20,961	23.3	114.7	134.8
kidney	713	2.3	2.5	3.5	3,298	3.7	18.0	20.0
bladder	268	0.9	8.1	17.4	5,154	5.7	28.2	34.9

WOMEN	1980				2022			
	Number	%	crude rate	age-standardised rate (ESP2013)	Number	%	crude rate	age-standardised rate (ESP2013)
Total	30,746		168.5	242.2	91,506	100.0	468.2	437.2
stomach	2,723	8.9	14.9	23.5	1,908	2.1	9.8	9.1
large intestine	2,432	7.9	13.3	20.4	8,774	9.6	44.9	41.5
lung	1503	4.9	8.2	6.0	8,453	9.2	43.2	39.2
melanoma	346	1.1	1.9	2.5	2,103	2.3	10.8	10.1
breast	5,144	16.7	28.2	38.3	21,554	23.6	110.3	103.9
endometrium	1,827	5.9	10.0	14.1	5,995	6.6	30.7	28.6
cervix	3,532	11.5	19.4	25.3	2,267	2.5	11.6	11.0
ovary	1,728	5.6	9.5	12.4	3,559	3.9	18.2	17.3

Over the last half-century (1980–2022), the number of cancer cases among men increased by more than 55,000 (34,074 vs. 89,794), and among women by nearly 61,000 (30,746 vs. 91,506). This increase affected both crude and age-standardised incidence rates. The rise in malignant neoplasm incidence in the early period, up to the early 1980s, is primarily attributed to improved completeness of cancer registration. In the male population, a rising trend in incidence measured by the crude rate has persisted since the early 1980s, reaching 491/105 in 2022. The standardised5 incidence rates for men rose rapidly between 1980 and 1995. After 1995, the rate of increase slowed significantly, and between 1995 and 2022, the standardised rate rose from 548/105 to 579/105. In the female population, both crude and standardised rates show an upward trend which accelerated significantly since the early 1990s (Fig. 6.1). The noticeable incidence drop in 2020 is a result of the COVID-19 pandemic (delayed diagnosis). Cancer incidence trends show different patterns depending on the age group of patients (Figs. 6.2, 6.3).

Malignant neoplasms in children (0–19 years) are relatively rare (in 2022, the incidence rate for both boys and girls was 15/10[5]). A slight upward trend is visible for both sexes. The structure of cancer incidence in this age group differs significantly from that in adults. Leukaemias, lymphomas and brain tumours were the most common among childhood cancers in Poland (together almost 60% of cases).

[5] The presented age-standardised rates were calculated using the European Standard Population, revision 2013 – ESP2013 https://ec.europa.eu/eurostat/documents/3859598/5926869/KS-RA-13-028-EN.PDF/e713fa79-1add-44e8-b23d-5e8fa09b3f8f

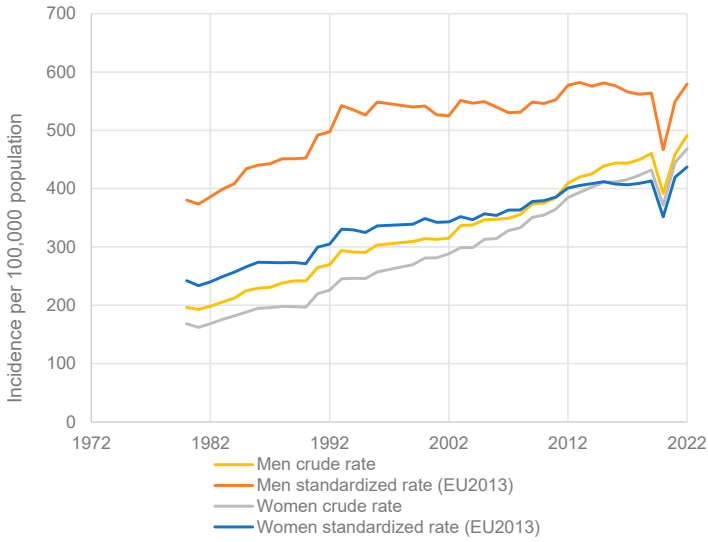


Fig. 6.1. Overall cancer incidence trends in Poland, 1980–2022

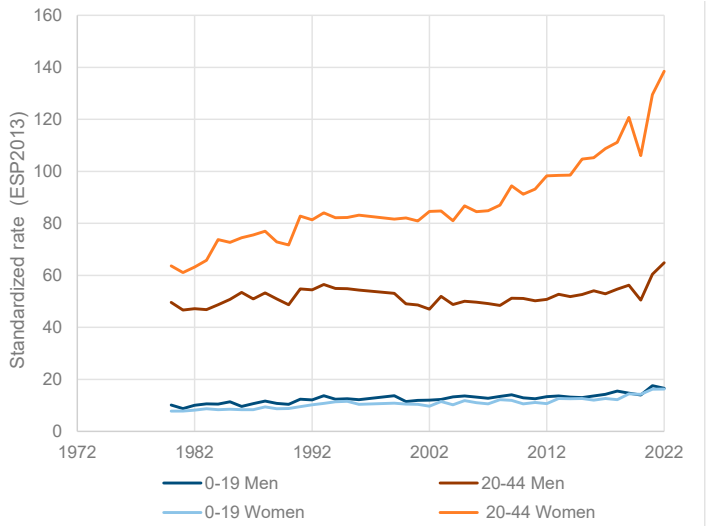


Fig. 6.2. Overall cancer incidence trends in Poland among children and young adults, 1980–2022

Among young adults (20–44 years), age-standardised incidence rates (ESP2013) for women are nearly twice as high as for men (139/105 vs. 65/105 in 2022), and this disparity has been increasing since the early 1980s. Among men, incidence has shown a slight increase over the past two decades. Among women,

incidence rose slightly until the end of the 20th century, but the growth accelerated in the 21st century – a 63% increase in the rate between 2001 and 2022. In 2022, the most common cancers in young men were testicular cancer (24%), colorectal cancer (7%), and melanoma (6%). In young women, the most frequent cancers were breast cancer (28%), cervical cancer (5%), ovarian cancer (4%), and colorectal cancer (4%).

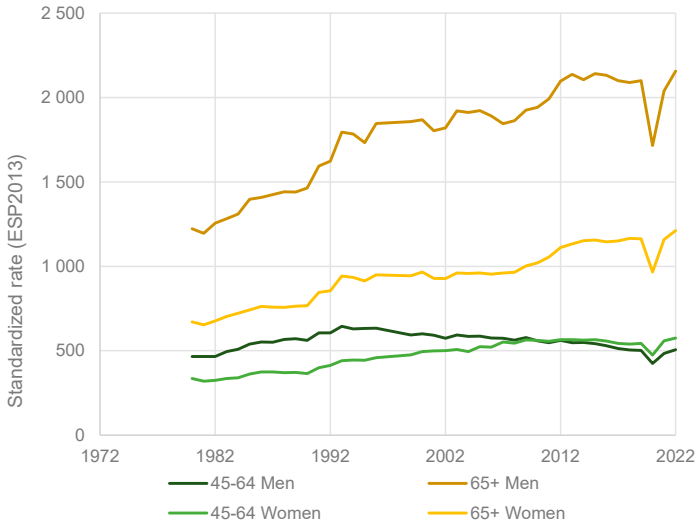


Fig. 6.3. Overall cancer incidence trends in Poland in persons over 45 years of age, 1980-2022

Cancer incidence among middle-aged men (45–64 years) rose rapidly until the early 1990s (629/105 in 1994), followed by a rapid decrease in incidence rates (to 506/105 in 2022). Among women, the early 1990s marked an acceleration in the incidence increase, which has slowed considerably in the last decade. Since the early 1990s, the gap in incidence between men and women has narrowed, and since 2010, middle-aged women have shown higher incidence than men. Among middle-aged men, prostate (20%), lung (13%), and colorectal (12%) cancers were the most common. In women, breast (31%), endometrial (8%), and lung (7%) cancers were the most frequent.

In the oldest age group (65+), incidence increased in both sexes, although the growth has slowed in the last decade. Prostate (27%), lung (15%), and colorectal cancers (12%) were the most frequent among elderly men in 2022. Breast (19%), colorectal (12%), and lung cancers (12%) were the most frequent among elderly women.

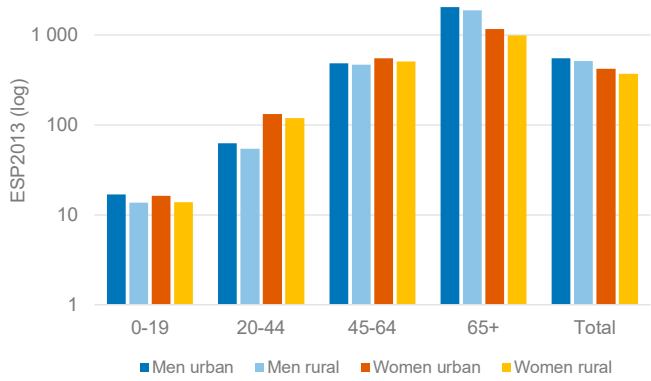


Fig. 6.4. Overall malignant neoplasm incidence by age and place of residence. Poland 2022

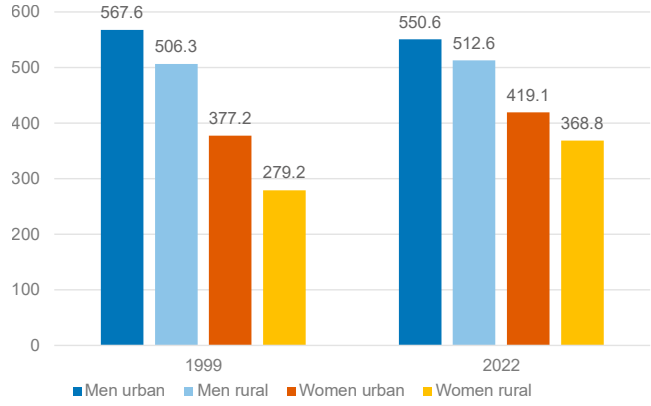


Fig. 6.5. Overall malignant neoplasm incidence by place of residence. Poland 1999 vs. 2022

Place of residence is a differentiating factor in cancer risk for both sexes and all age groups. Incidence among rural residents is lower than among urban residents (Fig. 6.4). The smallest urban-rural difference is observed in the middle-aged group (45–64 years). In both rural and urban areas, cancer risk among young women is higher than among young men. Between 1999 and 2022, incidence increased in both rural and urban populations, with the greatest rise among rural women – by nearly 100/105 (Fig. 6.5).

Cancer incidence trends in Poland from 1980 to 2022 showed different patterns for men and women, with the key distinction being tobacco-related cancers. Among men, incidence has declined (Fig. 6.6), while among women, it has risen significantly (Fig. 6.7).

In men, the largest increase was observed in prostate cancer and melanoma cases. Lung cancer, which was dominant until the end of the 20th century, shows a long-term downward trend in incidence (over 50% decline since 1995). Similarly, in the case of laryngeal cancer, the decline in smoking has contributed to a consistent downward trend in incidence. Another cancer with declining frequency is gastric cancer. The rise in colorectal cancer incidence has slowed significantly since 2016 (Fig. 6.6).

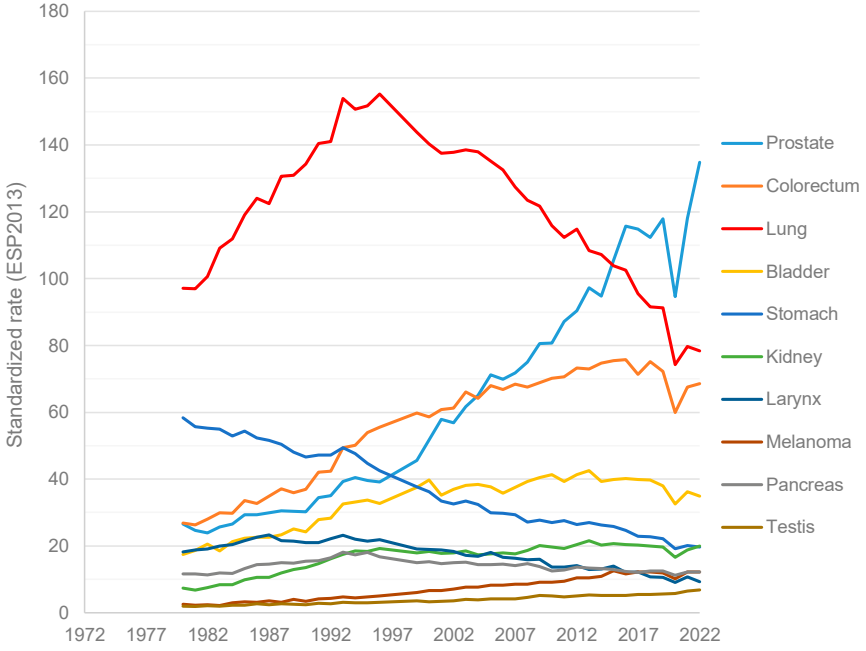


Fig. 6.6. The most common cancer incidence trends, men, Poland, 1980-2022

In the female population, a decreasing trend is observed only in the cases of stomach cancer and cervical cancer. The most significant increase in incidence is noted for breast, lung, endometrial, and thyroid cancers (Fig. 6.7).

The enactment of the Act on the National Oncology Strategy (NOS) has set priorities aimed at reversing epidemiological trends and providing more effective protection for the Polish society against the consequences of cancer. The authors of the strategy identified six cancers amenable to primary prevention (lung cancer, cervical cancer, melanoma), secondary prevention (breast cancer, cervical cancer, colorectal cancer), or representing a significant problem (prostate cancer).

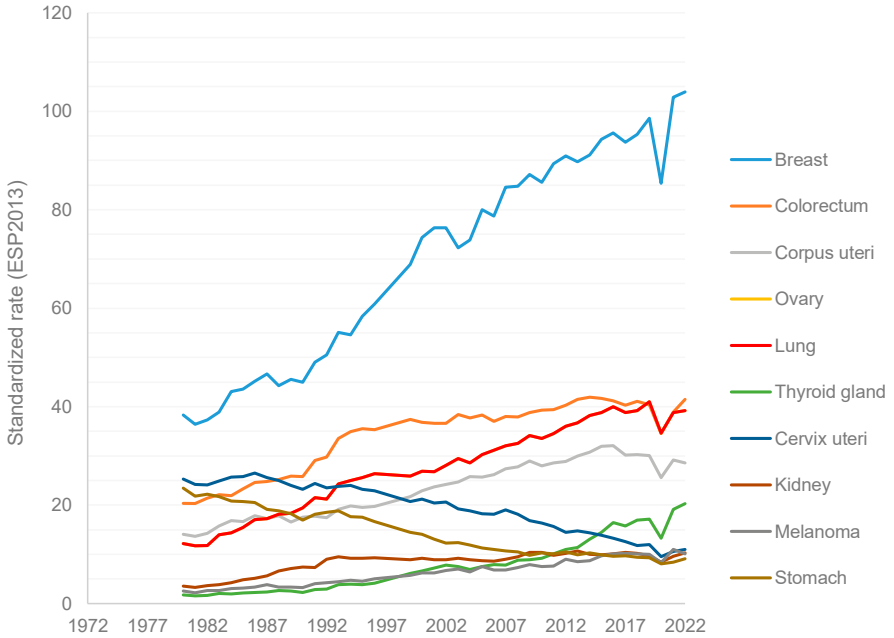


Fig. 6.7. The most common cancer incidence trends, women, Poland, 1980-2022

Colorectal cancers

Colorectal cancers are the third most common cancer among men and the second among women in Poland, occurring more frequently in men (in 2022, the age-standardised incidence rate was 67/105 for men and 42/105 for women). The incidence of colorectal cancer showed an increasing trend in both sexes when considering crude rates, and age-standardised rates increased in men until 2017 and in women until 2014 (Fig. 6.8).

The incidence of colorectal cancer among urban and rural residents remains at a similar level: overall, the difference is 0.3/105 for men and 2.4/105 for women (Fig. 6.9). Among young adults (20–44 years), incidence rates for men are similar to those for women. In other age groups, men have a higher risk. Between 1999 and 2022, the incidence increased primarily among rural residents: by nearly 30% in men and 20% in women. Among urban residents, incidence remained almost unchanged (Fig. 6.10).

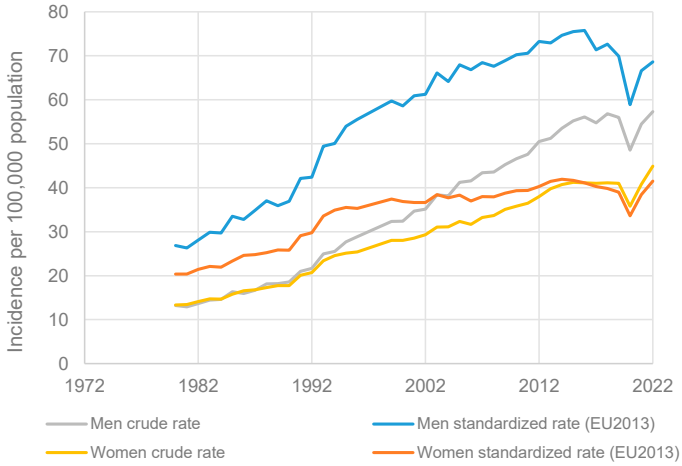


Fig. 6.8. Colorectal cancer incidence trends, Poland, 1980-2022

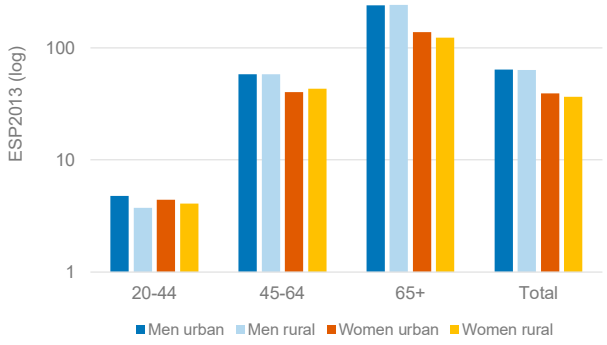


Fig. 6.9. Colorectal cancer incidence, Poland, 2022

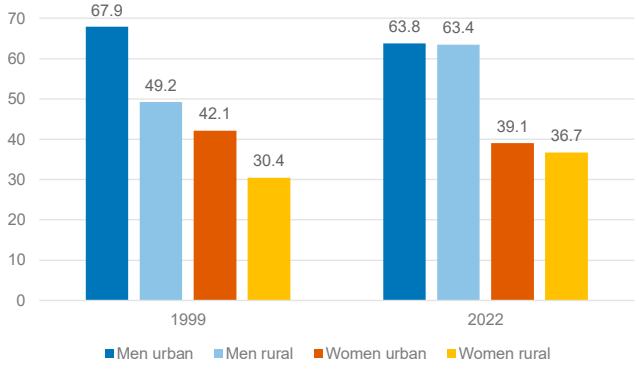


Fig. 6.10. Colorectal cancer incidence by place of residence, Poland, 1999 and 2022

Malignant lung cancer

Lung cancers are the second most common cancer among men and the third among women, but they are the leading cause of cancer-related deaths in both sexes (25.2% of cancer deaths in men and 17.9% in women). Male incidence, expressed in both crude and age-standardised rates, increased until the mid-1990s, followed by a decline. Crude rates decreased more slowly than age-standardised rates. Among women, there is a continuous increase in lung cancer incidence (Fig. 6.11). In 2022, male lung cancer incidence was slightly higher among rural residents, while female incidence was higher among urban residents, especially in the 65+ age group (147/105 vs. 113/105) (Fig. 6.12).

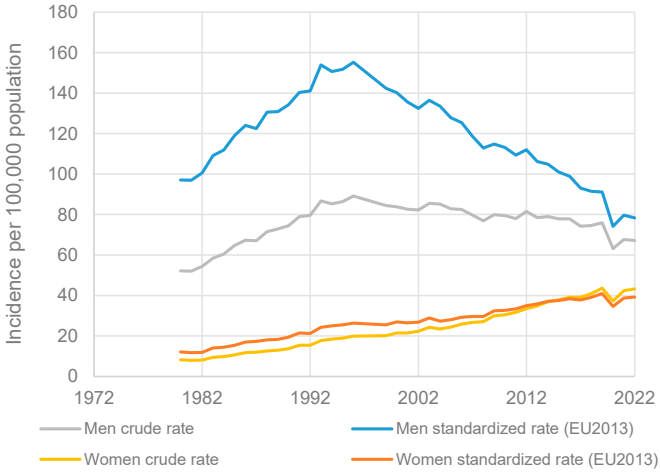


Fig. 6.11. Lung cancer incidence trends, Poland, 1980-2022

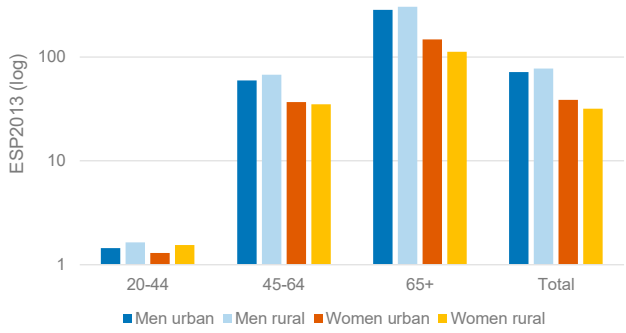


Fig. 6.12. Lung cancer incidence rate, Poland, 2022

Comparing urban and rural incidence in 1999 and 2022 reveals the same trend as in the general population. Male incidence decreased in both urban and rural areas, and the difference between age-standardised rates for both groups narrowed, although male incidence remains higher in rural areas than in urban areas (by 10/105). In the female population, rates were higher in urban areas at both time points and increased by 25% in urban areas and 86% in rural areas over the analysed period (Fig. 6.13).

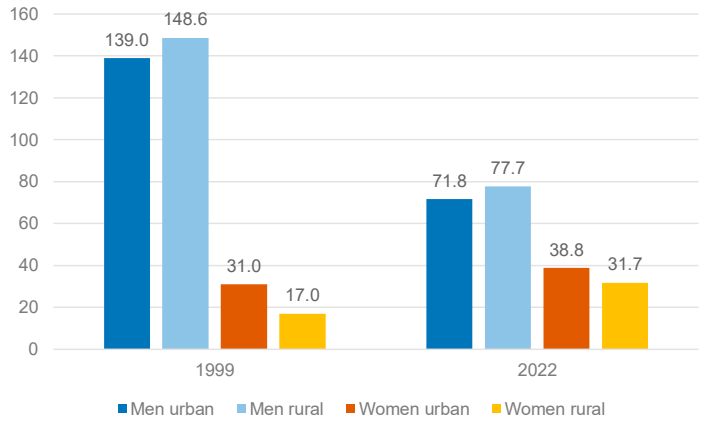


Fig. 6.13. Lung cancer incidence by place of residence, Poland, 1999 and 2022

Melanoma

Melanoma is a cancer whose incidence is rapidly increasing in the Polish population, as expressed in both crude and age-standardised rates. The acceleration of this trend has been evident since the mid-1990s (Fig. 6.14). Melanoma occurs most frequently after the age of 65, with a higher risk in men than in women (Fig. 6.15). Melanoma incidence is higher among urban residents of both sexes.

Over the past two decades, melanoma incidence has approximately doubled among both men and women, regardless of place of residence, with the greatest increase in age-standardised incidence observed among rural men (by 120%). In 2022, the highest age-standardised incidence rate was observed among urban men (13.2/105), and the lowest among rural women (8.4/105) (Fig. 6.16).

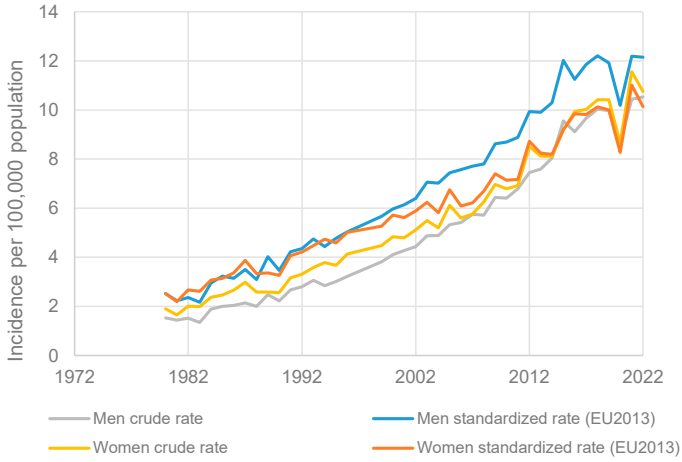


Fig. 6.14. Melanoma incidence trends, Poland, 1980-2022

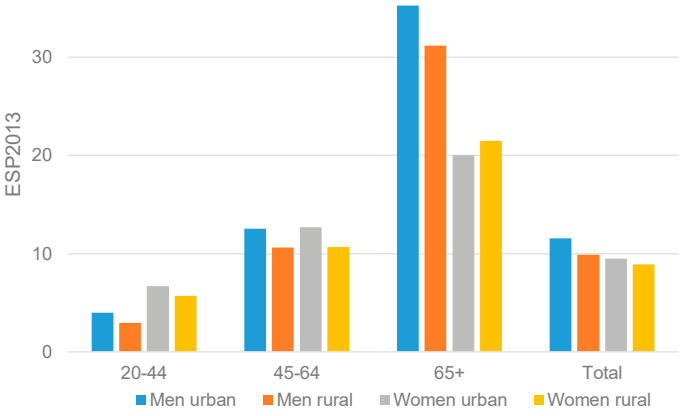


Fig. 6.15. Melanoma incidence, Poland, 2022

Malignant breast cancer

Breast cancer is the most common cancer among women in Poland. Incidence has been increasing since the mid-1960s. Over the past four decades, the age-standardised incidence rate has nearly tripled (from 36/105 to 104/105) (Fig. 6.17). Breast cancer is rare among young women (20–44 years), but the risk increases with age. Incidence is higher among urban women than rural women across all age groups (Fig. 6.18).

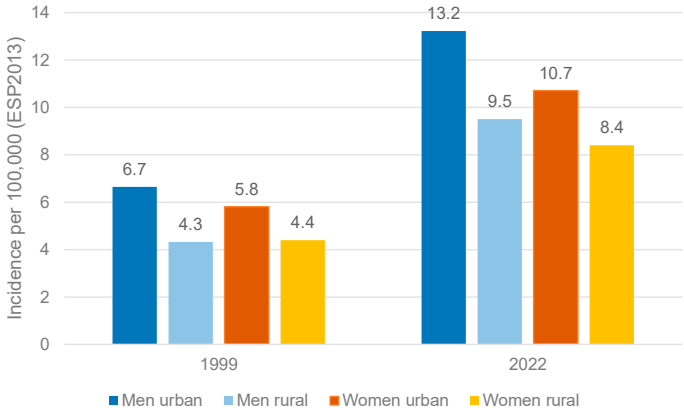


Fig. 6.16. Melanoma incidence by place of residence, Poland, 1999 and 2022

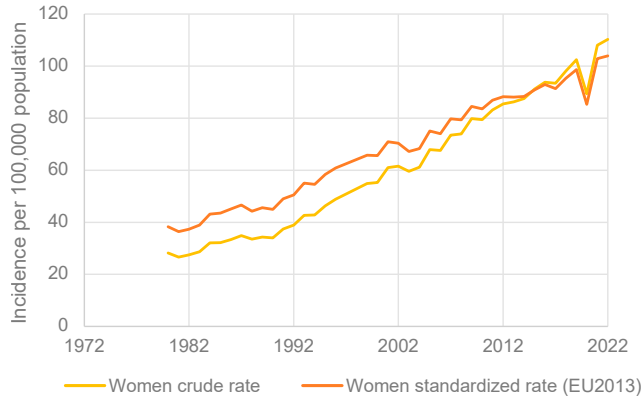


Fig. 6.17. Breast cancer incidence trends, Poland, 1980-2022

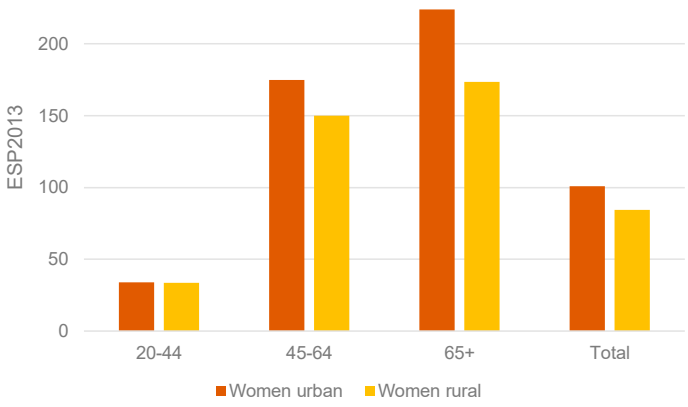


Fig. 6.18. Breast cancer incidence, Poland, 2022

Breast cancer incidence shows an upward trend among both urban and rural women. Between 1999 and 2019, the age-standardised incidence rate increased by approximately 30% among urban women and nearly 77% among rural women, indicating a convergence of risk between the two subpopulations.

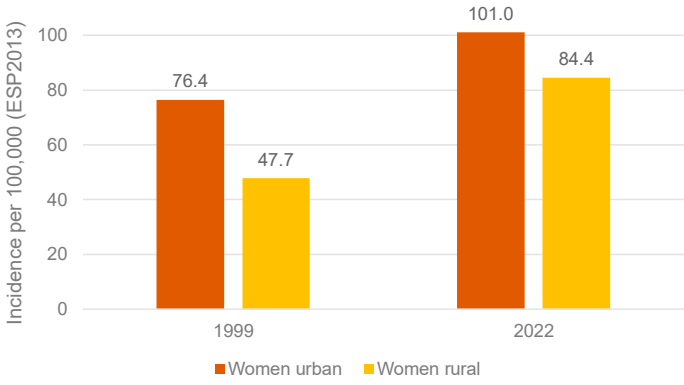


Fig. 6.19. Breast cancer incidence by place of residence, Poland, 1999 and 2022

Cervical cancer

In the 1960s, cervical cancer was the most common cancer among women. Over the past half-century, a decline in incidence, measured by both crude and age-standardised rates, has moved cervical cancer to the eighth position among the most common cancers in women (Fig. 6.20). Incidence is higher among urban women, particularly in the middle age group (45–64 years) (Fig. 6.21).

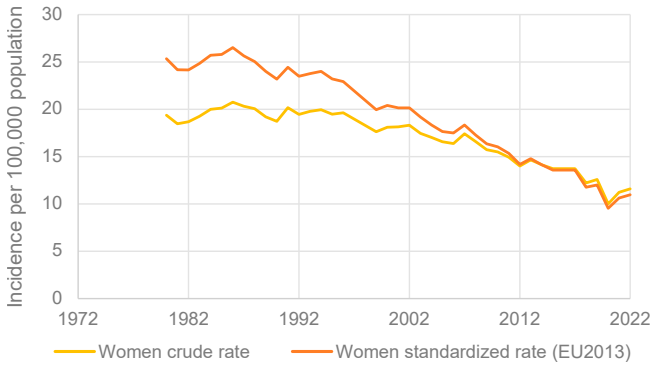


Fig. 6.20. Cervical cancer incidence trends, Poland, 1980-2022

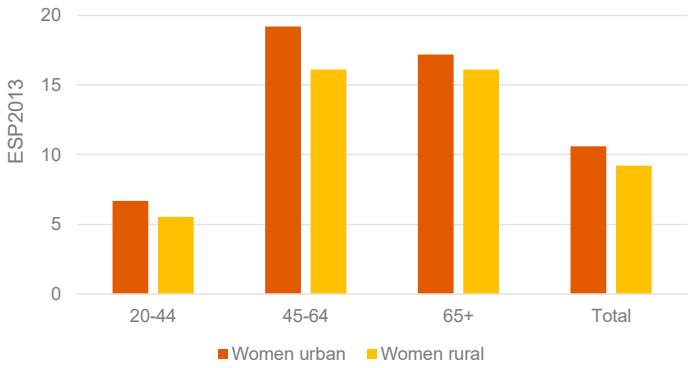


Fig. 6.21. Cervical cancer incidence, Poland, 2022

Between 1999 and 2022, a decline in cervical cancer incidence was observed among both urban women (by 48%) and rural women (by 53%).

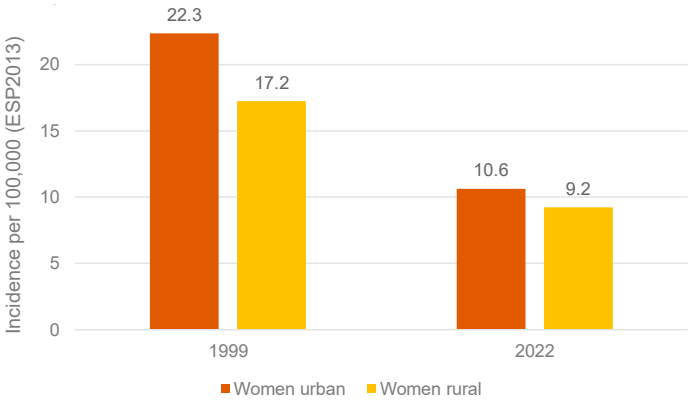


Fig. 6.22. Breast cancer incidence by place of residence, Poland, 1999 and 2022

Prostate cancer

Prostate cancer has been the most common cancer among men in Poland for the past seven years. Since the mid-1990s, there has been a sharp increase in incidence, measured by both crude and age-standardised rates (Fig. 6.23). Prostate cancer is very rare before the age of 45, with incidence not exceeding 0.2–0.3/105. After age 45, the risk increases significantly among both urban and rural men, although rural men have a slightly lower risk (Fig. 6.24).

Over the past two decades, incidence has more than doubled in both urban and rural populations (Fig. 6.25).

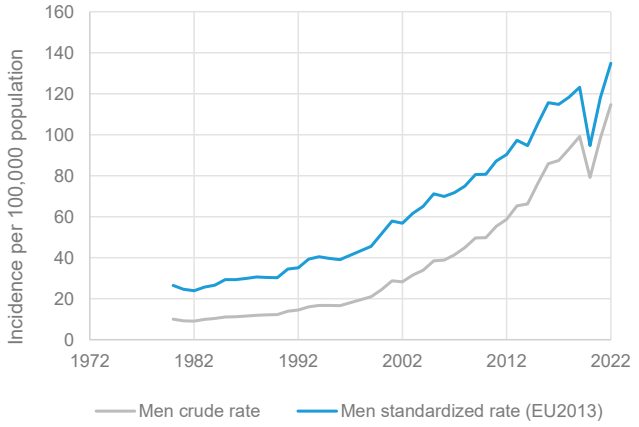


Fig. 6.23. Prostate cancer incidence trends, Poland, 1980-2022

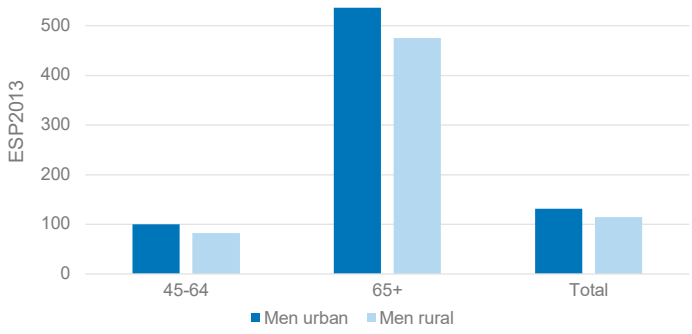


Fig. 6.24. Prostate cancer incidence, Poland, 2022

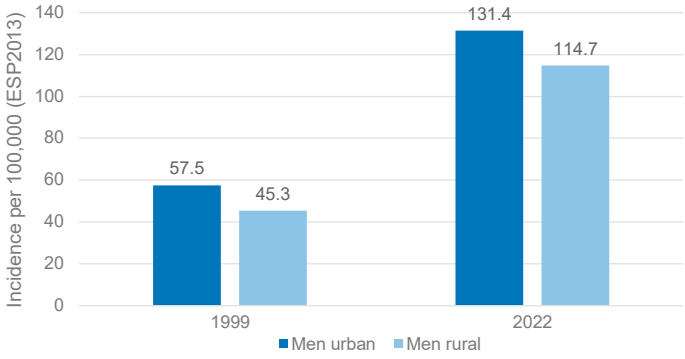


Fig. 6.25. Prostate cancer incidence by place of residence, Poland, 1999 and 2022

7. MENTAL AND BEHAVIOURAL DISORDERS

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Marzena Sowińska (Institute of Psychiatry and Neurology)

Mental health and mental disorders are a crucial area of public health. The WHO defines mental health as a state of well-being in which an individual realises their own potential, can cope with the normal stresses of life, is able to participate in social life, and can work productively.

Available data and forecasts on mental health indicate that mental disorders are a serious and growing problem worldwide. Depression and alcohol use disorders are the two most common mental health conditions globally. Depression ranks among the top 20 leading causes of disability worldwide. The condition affects 120 million people, and this number continues to rise. It is estimated that fewer than 25% of individuals suffering from depression have access to appropriate healthcare and treatment. Mental disorders and illnesses place a considerable burden on individuals and populations, particularly when left untreated. Mental disorders and psychoactive substance use disorders account for as much as 31% of the global burden of disease (GBD). According to WHO projections, by 2030, depression will be the single largest contributor to GBD. In high-income countries, depression is expected to contribute more significantly to the GBD than in low-income countries. Mental disorders cause substantial disability, even though they may not directly contribute to premature mortality. When considering global disease burden measured in DALYs (Disability Adjusted Life Years), which combines years of life lost due to premature death with years lived in disability, depression, violence, and alcohol use disorders rank among the top contributing factors to GBD across all WHO regions. According to WHO data, the global suicide rate has increased by 60% over the past 45 years. Suicide is one of the three leading causes of death among individuals aged 15 to 44, and suicide attempts are estimated to occur 20 times more frequently than completed suicides. The number of suicides among young people is on the rise. Approximately 90% of suicide cases are associated with depression and the use of substances such as alcohol, drugs, and others.

Many countries are undertaking efforts to strengthen mental healthcare systems and to integrate individuals with mental disorders into community life and enable them to participate in meaningful employment.

In Poland, actions to improve the mental health of the population have been initiated by the Council of Ministers, which on 28 December 2010 adopted the Regulation on the National Mental Health Protection Programme (Journal of Laws of 2011, No. 24, item 128). The programme was implemented from 2011 to 2015. A new regulation of the Council of Ministers on the National Mental Health Protection Programme for 2017–2022 (Journal of Laws of 2017, item 458) was published on 2 March 2017. The programme sets out a strategy for: ensuring that persons with mental disorders have access to comprehensive, multidimensional, and universally accessible healthcare and other forms of care and support necessary for living in a family and community setting; promoting appropriate social attitudes towards people with mental disorders, particularly understanding, tolerance, and kindness, as well as preventing discrimination. Mental health issues are also addressed in the National Health Programme for 2021–2025, whose Operational Objective 3 relates to the promotion of mental health, namely the improvement of the population's mental well-being. The Programme highlights, among other things, the need to monitor the epidemiological situation in this field.

Presented below are the scale and dynamics of selected mental health issues in Poland based on existing routine information systems. The specific nature of mental illnesses has meant that, for many years, data on residents of Poland treated for mental disorders in inpatient psychiatric care facilities (hospitals, long-term care facilities, addiction treatment centres, rehabilitation centres for people with addictions) has been collected as part of the National Psychiatric Inpatient Morbidity Survey, conducted by the Institute of Psychiatry and Neurology in Warsaw, which is responsible for data analysis and reporting. The output tables are published in the statistical yearbook issued by the Institute. The reported rates refer to individuals, not to cases, as repeat hospitalisations were linked for statistical analysis purposes using an identifier algorithm established by the Institute. Substantive supervision of these systems is provided by the Institute of Psychiatry and Neurology in Warsaw.

It is worth referring here to mortality data concerning the population of Poland and recalling that one of the most important indicators in the area of mental health, the suicide mortality rate, was significantly higher among men in Poland (21.4/100,000 in 2022) compared to the EU average (17.2/100,000) (age-standardised rates). In contrast, the suicide mortality rate among women in Poland (3.5/100,000) is much lower than that of men and also below the EU-27 average

(4.8/100,000)[1]. No other European Union country records such a persistent and significant gender disparity.

Individuals treated in outpatient psychiatric care facilities

Data on individuals treated in outpatient psychiatric care facilities refer to treatment in mental health clinics (MHC), alcohol addiction therapy clinics (AATC), and psychoactive substance addiction therapy clinics (PSATC). This information is compiled at the Institute of Psychiatry and Neurology in Warsaw and published in the statistical yearbook titled „Psychiatric Healthcare Facilities", issued by the Institute. The yearbook provides figures for the total number of patients and for those receiving treatment for the first time. The total number of treated patients refers to persons registered in outpatient care facilities in a given year. Each patient is counted only once, regardless of the number of visits during the year. First-time patients are individuals registered in a particular type of clinic for the first time in their lives. Although the aggregated form of data collection limits the potential for detailed analysis, it remains a key source of information on the prevalence of mental disorders in Poland.

In 2022, a total of 1.926 million individuals with mental disorders were treated in outpatient settings (1.715 million in MHC, 152,000 in AATC, and 58,000 in PSATC), including 553,000 receiving treatment for the first time. Between 2010 and 2022, both the total number of treated patients and those treated for the first time increased significantly (the only decline occurred in 2020, resulting from the partial closure of healthcare facilities during the first wave of the COVID-19 pandemic) (Fig. 7.1a).

The most common diagnostic group among patients treated in outpatient psychiatric care consists of neurotic, stress-related and somatoform disorders. In 2022, 1,759.2 people per 100,000 population were treated in MHC for these disorders, of which 549.6 per 100,000 were first-time patients (absolute numbers: 675,000 and 211,000 respectively) (Table 7.1). The second largest group comprised individuals treated for mood (affective) disorders – 1,056.5 per 100,000, with 260.0 per 100,000 treated for the first time. Over the past four years, the number of people treated for these two disorder groups has shown a clear upward trend, especially in 2021 and 2022.

[1] https://ec.europa.eu/eurostat/databrowser/view/hlth_cd_asdr2__custom_16133732/default/table?lang=en

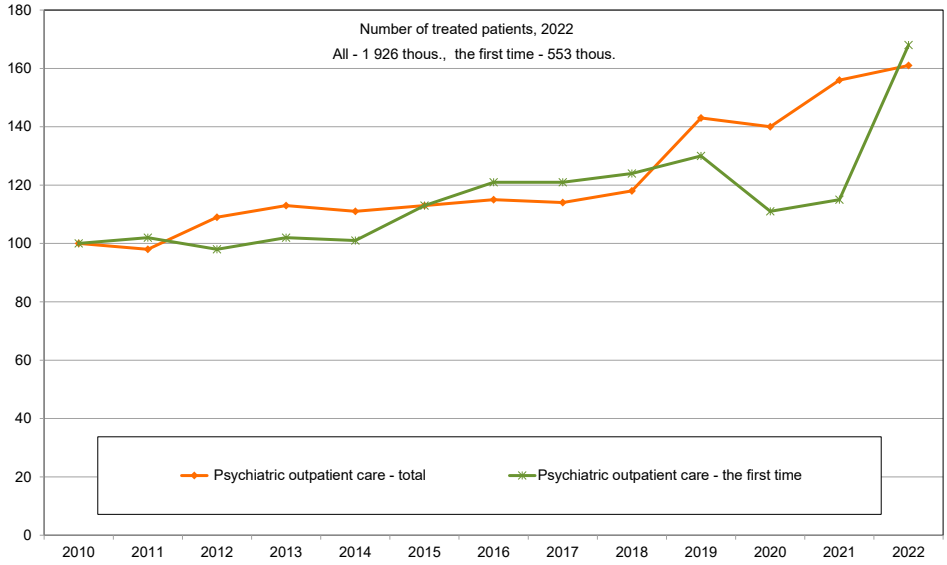


Fig. 7.1a. Outpatient psychiatric care – dynamics of growth in the number of total (T) and first-time (I) patients treated between 2010 and 2022, 2010=100 (based on data from the Institute of Psychiatry and Neurology)

Table 7.1. Outpatient psychiatric care – total and first-time patients by selected diagnoses, 2019–2022 (rates per 100,000 population)

Diagnosis	Total patients treated				First-time treatment			
	2019	2020	2021	2022	2019	2020	2021	2022
Organic mental disorders (F00-F09)[1]	554.5	515.3	507.7	506.0	113.6	89.9	97.4	105.3
Schizophrenia (F20)[1]	359.9	342.2	347.5	347.0	31.2	31.8	29.4	65.0
Mood (affective) disorders (F30-F39)[1]	877.5	885.7	981.8	1056.5	170.4	168.7	178.9	260.0
Neurotic disorders (F40-F48)[1]	1210.7	1215.7	1701.3	1759.2	348.9	298.9	351.7	549.6
Alcohol-related disorders (F10)[2]	425.1	373.9	397.2	403.2	136.9	105.3	112.9	133.0
Psychoactive substance use disorders (F11-F19)[2]	123.2	126.7	144.2	154.4	43.3	37.8	38.8	55.5

[1] treated in mental health clinics
[2] treated in mental health, alcohol and drug and addiction clinics
Source: data from the Institute of Psychiatry and Neurology.

Patients treated for alcohol-related disorders remain the fourth largest diagnostic group among all outpatients, and the third largest among those receiving treatment for the first time. In 2022, a total of 155,000 individuals were treated for

alcohol-related disorders (403.2 per 100,000). A downward trend was observed between 2019 and 2020, followed by a renewed increase in the number of individuals treated for alcohol-related disorders between 2021 and 2022.

It is also worth noting the rising number of patients treated for disorders caused by the use of psychoactive substances. In 2022, this rate stood at 154.4 per 100,000, with 55.5 per 100,000 treated for the first time - an increase compared to 2020 (126.7 per 100,000 and 37.8 per 100,000, respectively). This may indicate a growing demand for addiction treatment services.

To summarise, 2022 saw a significant increase in the number of patients using outpatient psychiatric care, particularly for neurotic and mood disorders. This growth may result both from increased availability of services and greater public awareness of mental health issues.

In 2022, a total of 1.9 million individuals with mental disorders were treated in mental health clinics, equating to 4,534.5 per 100,000 population (Table 7.2). Among this group, 410,000 patients (1,005 per 100,000) were first-time patients.

Women were treated in mental health clinics 98% more often than men. The treatment rate was 5,967.4 per 100,000 for women and 3,002.5 per 100,000 for men. It is important to note that this difference is significantly larger than in 2020, indicating a growing number of women seeking treatment compared to men.

It should also be noted that only a portion of patients with mental disorders related to alcohol and psychoactive substance use are treated in mental health clinics, as these individuals are primarily referred to alcohol and addiction treatment centres.

In outpatient psychiatric care overall, women were also more likely to seek treatment than men, though the difference was smaller - in 2022, women were treated 32% more often than men (men: 4,375.7/100,000; women: 5,762.3/100,000). Compared to 2020, when women were treated 24% more often than men, this represents a continuation of the upward trend in the number of women receiving treatment.

Table 7.2. Outpatient psychiatric care, mental health clinics – patients treated for mental disorders by sex and place of residence, 2013–2022 (rates per 100,000 population)

Year	Total	Men	Women	Urban areas	Rural areas
Outpatient psychiatric care					
2013	4124.1	3781.6	4445.3	5069.5	2676.3
2014	4066.6	3658.3	4449.4	5017.1	2616.7
2015	3809.7	3360.1	4231.2	4694.1	2464.2
2016	3859.7	3385.0	4304.7	4857.8	2347.4

Year	Total	Men	Women	Urban areas	Rural areas
2017	4050.0	3676.4	4400.1	5099.4	2463.5
2018	4213.1	3785.7	4613.6	5280.5	2603.6
2019	4415.1	3976.6	4826.0	5626.6	2597.2
2020	4346.4	3870.2	4792.2	5570.8	2520.5
2021	4886.5	4233.7	5497.3	6494.7	2490.9
2022	5092.2	4375.7	5762.3	6758.2	2629.0
Mental health outpatient clinics					
2013	3364.8	2696.9	3991.3	4132.7	2188.9
2014	3270.3	2562.9	3933.7	4031.7	2109.0
2015	3288.2	2609.9	3924.1	4041.7	2141.9
2016	3347.0	2654.7	3996.0	4212.3	2035.9
2017	3252.1	2579.8	3882.2	4100.1	1969.9
2018	3383.3	2658.2	4062.9	4257.0	2066.0
2019	3569.0	2805.0	4244.1	4526.0	2077.3
2020	3538.4	2790.3	4195.9	4538.8	1991.3
2021	4345.1	2247.2	6308.0	5809.6	2163.5
2022	4534.5	3002.5	5967.4	5929.3	2472.5

Source: data from the Institute of Psychiatry and Neurology

In mental health clinics, urban residents are treated significantly more often than rural residents – in 2022, the difference was 140% (urban: 5,929.3/100,000; rural: 2,472.5/100,000) (Table 7.2). This difference increased from 128% in 2020, suggesting growing disparities in access to psychiatric care between urban and rural populations.

A similar urban–rural disparity (157%) was found in overall outpatient psychiatric care, including mental health clinics, alcohol addiction clinics, and clinics for psychoactive substance addiction. The respective rates were 6,758.2/100,000 for urban residents and 2,629.0/100,000 for rural residents.

It is worth noting that the number of urban residents receiving treatment continues to rise, while only slight changes have been observed in rural areas. These large differences in access to psychiatric care may indicate substantial unmet health needs among the rural population, especially considering the high suicide rates in rural areas compared to urban areas (see chapter on suicide mortality).

In summary, 2022 data indicates a significant increase in the number of individuals using outpatient psychiatric care and mental health clinics, particularly

among women and urban residents. At the same time, inequalities in access to treatment between urban and rural residents are widening, which calls for further analysis and the development of strategies to improve access to care for rural communities.

Patients treated in inpatient psychiatric care facilities

In 2022, a total of 258,000 individuals with mental disorders were treated in inpatient psychiatric care facilities, equating to 683 per 100,000 population, including 92,000 first-time patients (243 per 100,000). Across the relatively stable fluctuation in the number of total and first-time patients treated per 100,000 in inpatient psychiatric care between 2010 and 2022, three distinct periods of growth of around a dozen percent were observed: 2010–2011, 2014–2015, and 2018 (Fig. 7.1b). The decline between 2019 and 2020 resulted from temporary restricted access to inpatient care wards due to the coronavirus pandemic. In the following years (2021-2022), the number of treated individuals stabilised, remaining slightly lower than before the pandemic.

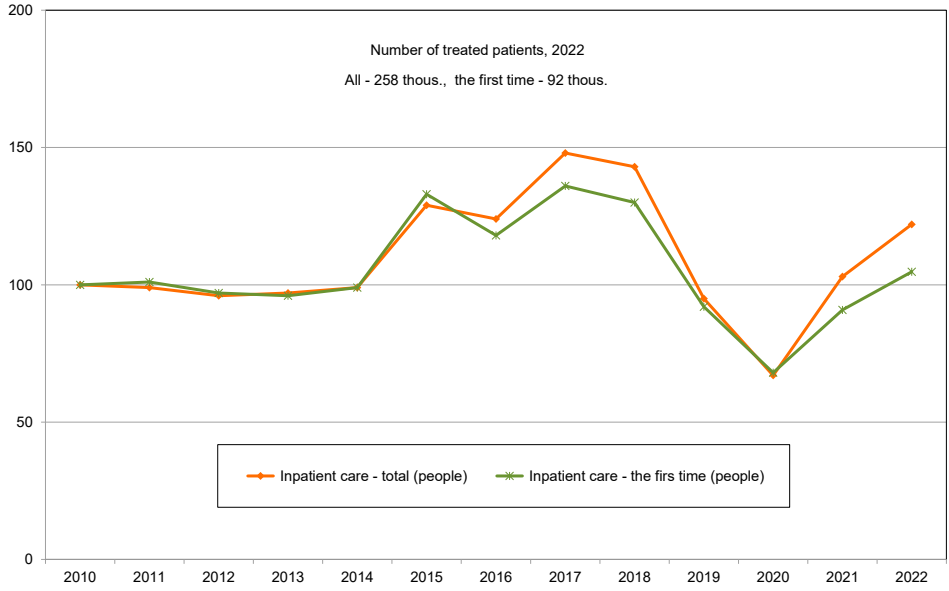


Fig. 7.1b. Inpatient psychiatric care – dynamics of growth in the number of total (T) and first-time (I) patients treated between 2010 and 2022, 2010=100 (based on data from the Institute of Psychiatry and Neurology)

Whereas women made up the majority of patients in outpatient psychiatric care, in inpatient care, men were treated 88% more frequently than women in 2022 (rates: 901.3/100,000 for men and 478.4/100,000 for women). This surplus has remained relatively constant in recent years, although compared to 2020 (103%) there has been a slight decrease in this gap (Table 7.3).

Table 7.3. Inpatient psychiatric care – total inpatients with mental disorders by sex and place of residence, 2013-2022 (rates per 100,000 population)

Year	Total	Men	Women	Urban areas	Rural areas
2013	523.8	695.7	362.6	547.2	444.4
2014	532.0	709.4	365.7	550.3	462.1
2015	614.8	806.0	435.4	680.2	515.2
2016	594.9	784.8	417.0	661.9	493.5
2017	707.7	973.1	459.0	771.3	611.6
2018	683.6	941.1	442.4	729.2	614.9
2019	521.1	705.2	348.6	576.6	437.8
2020	369.8	502.9	247.8	412.9	298.7
2021	571.5	759.3	395.8	641.4	452.1
2022	682.7	901.3	478.4	749.4	584.1

Source: data from the Institute of Psychiatry and Neurology

Urban residents received inpatient psychiatric care 28% more frequently than rural residents, both overall and as first-time patients. Higher hospitalisation rates for urban populations were observed across all diagnostic categories. The greatest disparity, more than twofold, between urban and rural areas in terms of patient place of residence was observed in hospitalisations due to disorders related to the use of psychoactive substances (rural areas – 58.4/100,000, urban areas – 66.8/100,000), personality and behavioural disorders in adults (7.8/100,000 and 17.3/100,000 respectively), and behavioural and emotional disorders usually with onset usually in childhood and adolescence (8.2 and 15.9/100,000).

The largest patient group in psychiatric inpatient wards comprises individuals treated for alcohol use disorders (Table 7.4). In 2022, this group included 95,000 individuals, equating to 232.0/100,000 population (34% of all those treated in psychiatric inpatient wards, including 28% first-time patients). These were predominantly men, who accounted for as much as 83% of patients treated for this condition. In the past three years (2020–2022), the hospitalisation rate for alcohol-related disorders has shown a slight upward trend. In 2022, the

overall hospitalisation rate due to alcohol use disorders among men was more than five times higher than that among women and this pattern also applied to first-time hospitalised patients. Rural residents were hospitalised less frequently than urban residents (rural areas – 203/100,000, urban areas – 209/100,000 population).

Table 7.4. Inpatient psychiatric care – total and first-time patients by selected diagnoses, 2019–2022 (rates per 100,000 population)

Diagnosis	Total patients treated				First-time treatment			
	2019	2020	2021	2022	2019	2020	2021	2022
Organic mental disorders (F00-F09)	83.1	57.0	61.6	71.2	52.4	35.3	22.2	24.8
Schizophrenia (F20)	109.7	86.9	95.2	108.4	94.9	71.9	13.8	15.4
Mood (affective) disorders (F30-F39)	66.0	47.1	59.0	70.3	45.7	31.3	19.8	23.3
Neurotic disorders (F40-F48)	47.3	29.2	45.0	57.8	20.8	12.0	25.2	33.1
Alcohol-related disorders (F10)	269.9	177.2	190.8	232.0	152.6	96.8	80.3	89.8
Psychoactive substance use disorders (F11-F19)	66.6	44.7	56.4	66.8	40.2	25.9	20.9	24.0

Source: data from the Institute of Psychiatry and Neurology.

Patients treated for schizophrenia constituted the second largest group among all hospitalised individuals (20%) and among those treated for the first time (26%). In 2022, the inpatient treatment rate was 108.4/100,000 people (men – 108.4/100,000; women – 84/100,000; urban residents – 107/100,000; rural residents – 84/100,000). For first-time hospitalised patients (4,800 individuals), the rates were as follows: men – 19/100,000; women – 14/100,000; urban residents – 18/100,000; rural residents – 14/100,000. Over the past three years, the overall hospitalisation rate for schizophrenia has remained stable, while the rate for first-time patients has shown a slight increase.

The next largest group consisted of patients with organic mental disorders (11% of all hospitalised individuals). In 2022, the hospitalisation rates were as follows: men – 71.2/100,000; women – 70.3/100,000; urban residents – 84.0/100,000; rural residents – 58.0/100,000. In recent years, the hospitalisation rate for this group of conditions (both total and first-time) has shown an upward trend following a previous decline in 2020.

In 2022, the overall hospitalisation rate in Poland for mood (affective) disorders was 34% higher than for neurotic disorders, while the difference for first-time hospitalisations was 7%. For both diagnostic groups, the hospitalisation rates for

women were higher than for men. However, while the difference for mood disorders was pronounced (women – 70.3/100,000; men – 42/100,000), it was less marked for neurotic disorders (women – 57.8/100,000; men – 55/100,000). This pattern was also observed in first-time hospitalisations.

Both mood and neurotic disorders were more frequently the cause of hospitalisation among urban than rural residents (by 49% and 70% more often, respectively).

There has been a noticeable increase in the number of patients treated for disorders related to the use of psychoactive substances. The overall hospitalisation rate for this group increased from 44.7/100,000 in 2020 to 66.8/100,000 in 2022, while the rate for first-time patients rose by over 20% (from 25.9/100,000 in 2020 to 24.0/100,000 in 2022).

In 2022, nearly 20,000 individuals were treated as inpatients (men – 69/100,000; women – 15/100,000; urban residents – 66.8/100,000; rural residents – 58.4/100,000). For first-time hospitalised patients (4,900 individuals), the rates were as follows: men – 27/100,000; women – 6/100,000; urban residents – 22/100,000; rural residents – 11/100,000.

To summarise, in 2022 there was a continued upward trend in hospitalisations in inpatient psychiatric care for most categories of mental disorders, particularly alcohol and psychoactive substance use disorders, mood disorders, and schizophrenia. This increase applies to both the total number of patients and first-time admissions, which may indicate a growing demand for psychiatric care and a need to expand service availability for people with mental disorders.

As in previous years, there were significant regional differences in the frequency of inpatient psychiatric treatment, both overall and for first-time admissions, depending on voivodeship (Fig. 7.2).

The variation in hospitalisation rates between the highest- and lowest-ranking voivodeships exceeded a threefold difference for both total and first-time patients. In 2022, the overall hospitalisation rate ranged from 833.9/100,000 inhabitants in the Świętokrzyskie Voivodeship to 1,041.4/100,000 in the Podlaskie Voivodeship.

Four voivodeships continued to stand out with higher rates of first-time hospitalisation compared to others: Podlaskie (326.7/100,000), Lubuskie (390.2/100,000), Warmińsko-Mazurskie (305.3/100,000), and Łódzkie.

Compared to 2020, the rate of first-time hospitalisations dropped significantly, most notably in the Łódzkie Voivodeship (by 57%), Lubelskie (by 51%), and Mazowieckie (by 37%), which may reflect changes in access to or approaches to psychiatric treatment in these regions.

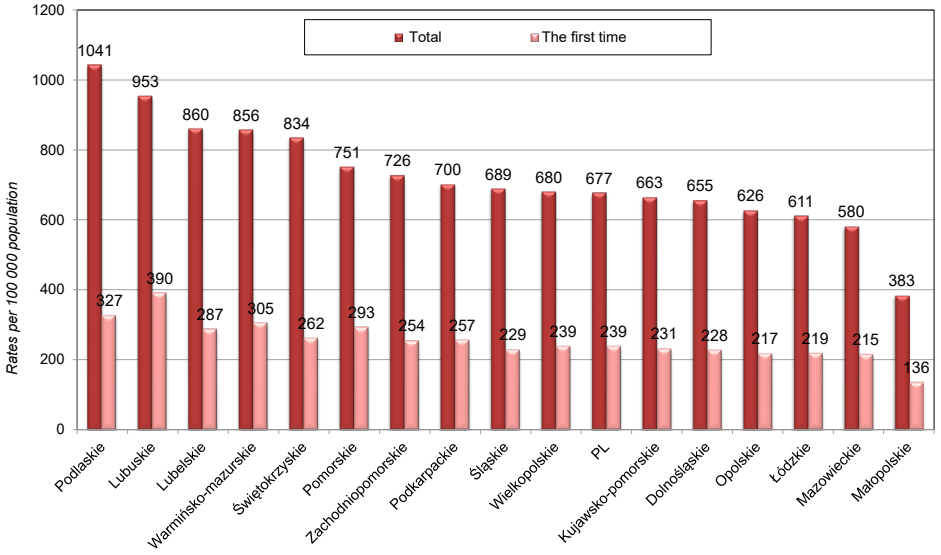


Fig. 7.2. Inpatient psychiatric wards – patients (individuals) treated in total and for the first time by voivodeship of residence, 2022 (data from the Institute of Psychiatry and Neurology)

The differences between voivodeships in the prevalence of mental disorders due to alcohol use requiring inpatient treatment remain significant.

In 2022, the total hospitalisation rate among residents of individual voivodeships ranged from 298.4/100,000 population in the Podkarpackie Voivodeship to 414.9/100,000 in the Podlaskie Voivodeship (Fig. 7.3). The voivodeships at both ends of the spectrum differed from those in 2018, which may result from changes in access to treatment or therapeutic strategies applied in specific regions.

High hospitalisation rates were also observed in the Świętokrzyskie (366.9/100,000), Warmińsko-Mazurskie (353.2/100,000), and Lubuskie (300.6/100,000) voivodeships. This also applied to individuals treated for the first time, with the highest first-time hospitalisation rates recorded in the Lubuskie (132.2/100,000), Warmińsko-Mazurskie (124.8/100,000), and Podlaskie (120.4/100,000) voivodeships.

Compared to 2020, the hospitalisation rates for individuals with alcohol-related disorders remained at a similar level. The changes observed (usually decreases) were below 7%, indicating relative stability in the demand for inpatient treatment of alcohol-related disorders.

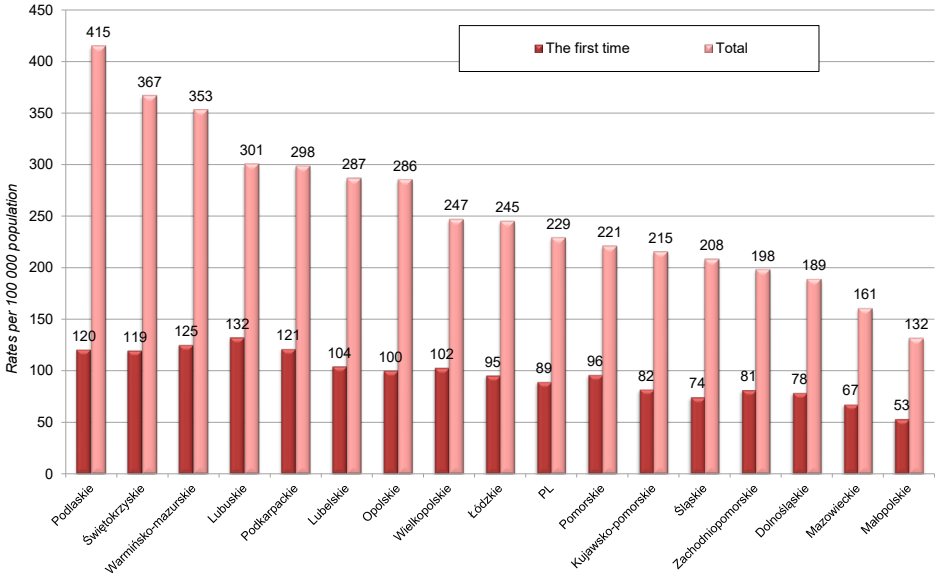


Fig. 7.3. Inpatient psychiatric wards – patients (individuals) treated in total and for the first time for alcohol-related disorders by voivodeship of residence, 2022 (data from the Institute of Psychiatry and Neurology)

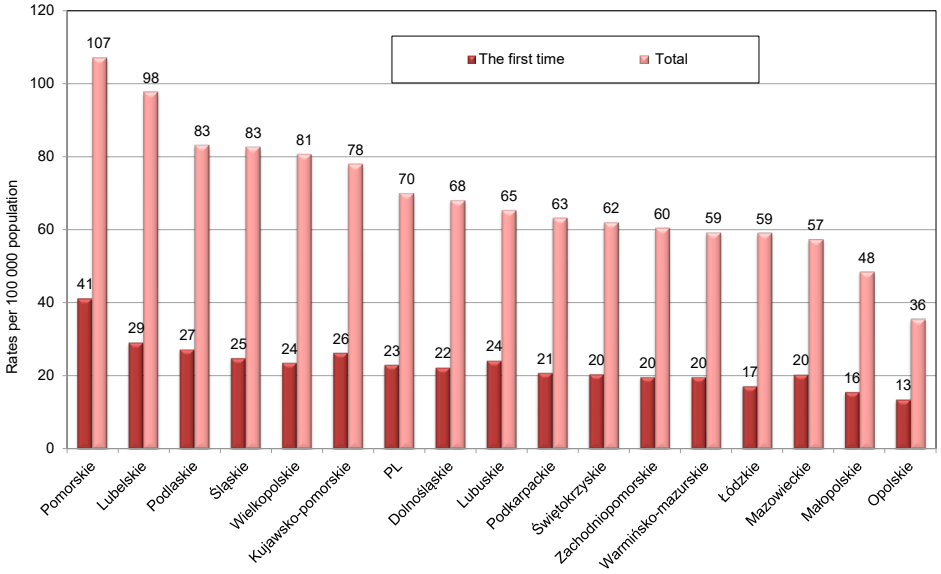


Fig. 7.4. Inpatient psychiatric wards – patients (individuals) treated in total and for the first time for mood disorders by voivodeship of residence, 2022 (data from the Institute of Psychiatry and Neurology)

The World Health Organisation predicts that depression will become the most common health problem within the next 20 years. This disorder is associated with numerous negative social consequences – individuals suffering from severe depression often have to quit their jobs, which leads to long-term unemployment and increased spending on sickness and unemployment benefits.

Depression is one of the mental disorders that prevents normal daily functioning. It mainly manifests as a worsened mood, reduced energy and activity, and loss of interest. Depressive disorders often begin at a young age and tend to be recurrent. Literature emphasises that depression is a systemic illness. If untreated, it increases the risk of somatic diseases, while chronic illnesses increase the likelihood of depression.

According to the World Health Organisation, depression currently accounts for 4.3% of the global burden of disease and is one of the leading causes of disability worldwide, responsible for 11% of all disability-adjusted life years (DALYs). It is particularly common among children, adolescents, and the elderly. Over 350 million people worldwide suffer from this condition.

In statistical terms, the number of people treated for affective disorders in Poland between 2014 and 2022 remained relatively stable, amounting to:

- 325,029 in 2014;
- 321,541 in 2015;
- 318,402 in 2016;
- 318,886 in 2017;
- 326,566 in 2018;
- 327,314 in 2019;
- 204,587 in 2020;
- 207,962 in 2022.

A visible national trend is the increase in the number of treated individuals in the 0–18 and 65+ age groups, as well as a rise in patients diagnosed with bipolar affective disorder (F31) and recurrent depressive disorder (F33). In 2022, the rate of individuals treated and treated for the first time for affective disorders was 840/100,000 and 153/100,000 population, respectively.

Regional differences in hospitalisation rates for patients with mood disorders (including depression) requiring inpatient care remain significant. In 2022, total hospitalisation rates across voivodeships ranged from 80.7/100,000 population in the Wielkopolskie Voivodeship to 107.0/100,000 in the Pomorskie Voivodeship (Fig. 7.4). Compared to 2018, the voivodeships at both ends of the spectrum have changed, which may indicate regional differences in treatment accessibility and diagnostic strategies.

The highest total hospitalisation rates in 2022 were recorded in the following voivodeships:

- Pomorskie (107.0/100,000);
- Lubelskie (97.7/100,000);
- Podlaskie (83.2/100,000).

Similar differences were observed among first-time hospitalised patients, where the highest rates were as follows:

- Pomorskie (41.1/100,000);
- Lubelskie (29.1/100,000);
- Podlaskie (27.2/100,000).

Compared to 2020, hospitalisation rates for individuals with mood disorders show variability. In most voivodeships, a slight increase is observed, which may result from improved treatment availability and the absence of preventive measures.

Suicidal behaviour between 2021 and 2022

Suicide remains a serious public health and social issue. In Poland, more people die by suicide than in road traffic accidents. Suicides typically begin with suicidal thoughts and ideation, which can progress into plans and suicide attempts, some of which result in death. Contemporary suicidology treats suicide as a process or sequence of events that comprises distinct suicidal behaviours. The term „suicidal behaviour" refers to a broad spectrum of actions, including thoughts (ideation), plans, suicide attempts, and completed suicides.

According to Statistics Poland (GUS), the number of suicides in Poland has shown a gradual upward trend over the past 60 years (with a noticeable drop in 1981). The highest rate was recorded in 2009 (17.0 per 100,000 population). Since then, the number of suicides has slowly declined. In 2022, the rate was 11.7.

This report analyses information on suicidal behaviours recorded in official public health statistics related to psychiatric healthcare. Since 2021, two additional questions have been included in patient records to identify whether the hospitalisation was related to a suicide attempt and whether a suicide attempt occurred within 12 months prior to hospitalisation.

In 2022, the number of patients hospitalised in inpatient psychiatric care who had a recorded suicide attempt in the past 12 months was 8,376. This represents an increase from 6,731 patients in 2021.

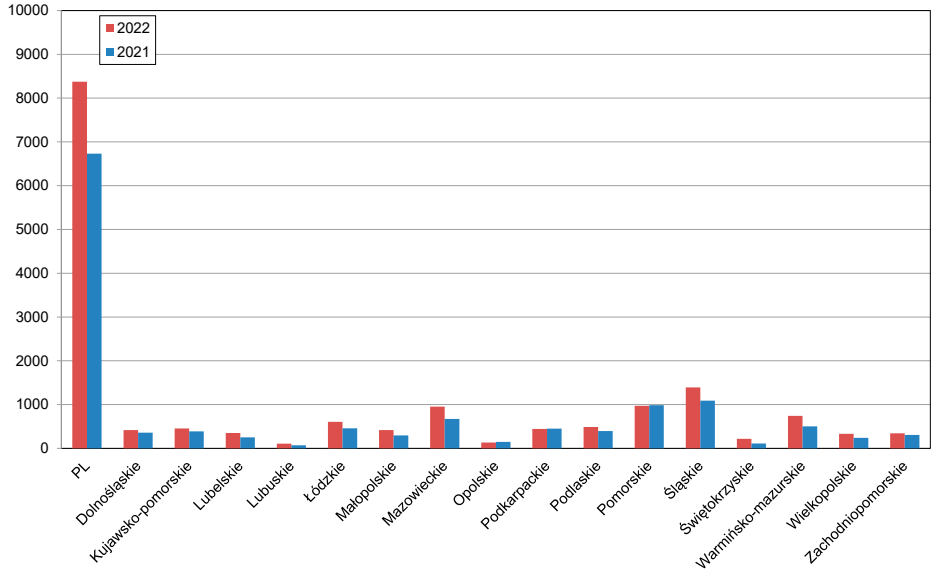


Fig. 7.5. Number of patients hospitalised in inpatient psychiatric care following a suicide attempt in the preceding 12 months (2021–2022)

The highest numbers of patients hospitalised in connection with a suicide attempt were observed in the following voivodeships:

- Mazowieckie – 1,257 individuals (up from 982 in 2021);
- Śląskie – 932 individuals (up from 768 in 2021);
- Wielkopolskie – 722 individuals (up from 553 in 2021);
- Małopolskie – 687 individuals (up from 557 in 2021).

The lowest numbers of hospitalised patients with a history of suicide attempt were recorded in the following voivodeships:

- Opolskie – 120 individuals (up from 94 in 2021);
- Lubuskie – 107 individuals (up from 72 in 2021);
- Podlaskie – 132 individuals (up from 98 in 2021).

An increase in the number of patients hospitalised in inpatient psychiatric care following a previous suicide attempt was recorded in every voivodeship.

The largest increases compared to 2021 occurred in the Mazowieckie (over 27%), Wielkopolskie (over 30%), and Lubelskie (almost 40%) voivodeships.

The rise in hospitalised patients may indicate a growing number of suicide attempts, but also improved detection and referral of patients to psychiatric care.

Data from 2022 indicates a significant increase in the number of patients hospitalised following a suicide attempt across Poland compared to 2021. The highest

numbers of hospitalisations were noted in the most populous regions, but increases were observed in all voivodeships. The growing number of patients requires further analysis of the causes of this trend, as well as the implementation of effective preventive and intervention measures.

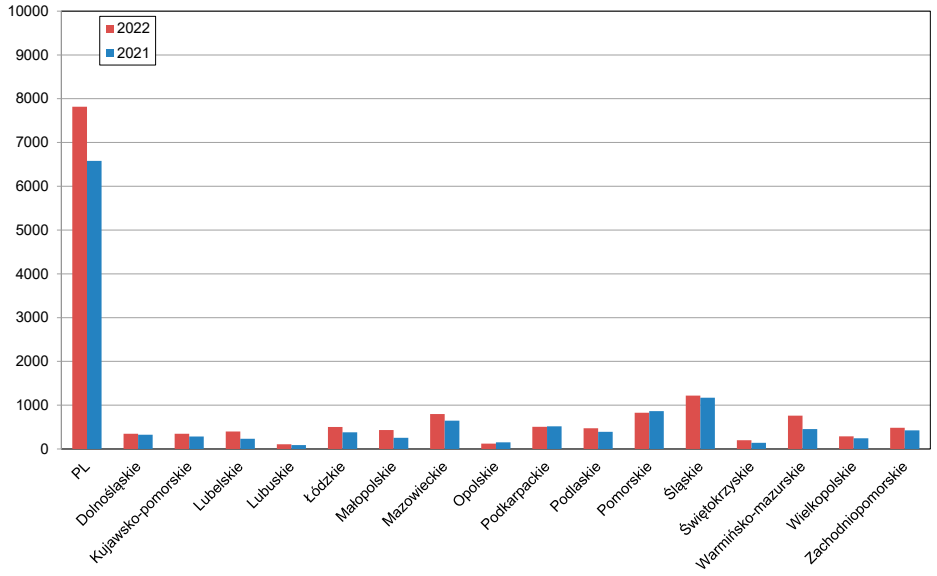


Fig. 7.6. Number of patients hospitalised in inpatient psychiatric care directly due to a suicide attempt (2021–2022)

In 2022, the number of patients hospitalised in inpatient psychiatric care directly due to a suicide attempt was 7,816, representing an 18.7% increase compared to 2021, when 6,581 patients were hospitalised. This increase may indicate a growing problem of suicide attempts requiring psychiatric treatment, or more effective identification of patients in need of intervention.

The highest number of hospitalisations was recorded in the following voivodeships: Mazowieckie (1,213 patients, up from 1,002 in 2021), Śląskie 923 patients, up from 799), Wielkopolskie (765 patients, up from 643) and Małopolskie (684 patients, up from 562). In contrast, the lowest number of hospitalisations was recorded in the following voivodeships: Opolskie (129 patients, up from 104), Lubuskie (108 patients, up from 88) and Podlaskie (142 patients, up from 123).

The largest percentage increases in suicide attempt-related hospitalisations compared to 2021 were observed in the Lubelskie (by 71.7%), Mazowieckie (by 21.1%) and Wielkopolskie (by 18.9%) voivodeships. This increase may indicate a

growing number of suicide attempts but also improvements in diagnostic processes and more effective referral of patients for psychiatric treatment.

Data from 2022 clearly shows an increase in hospitalisations due to suicide attempts across Poland. The highest numbers were recorded in the most populous voivodeships, although increases were observed in all regions. The rising number of patients requiring psychiatric hospitalisation following a suicide attempt highlights the need for continued analysis of this trend's causes and the implementation of more effective prevention and intervention measures in the field of mental health.

8. EPIDEMIOLOGICAL SITUATION OF SELECTED INFECTIOUS DISEASES IN POLAND

Małgorzata Sadkowska-Todys, Iwona Paradowska-Stankiewicz, Magdalena Rosińska, Marta Niedźwiedzka-Stadnik, Ewa Augustynowicz, Małgorzata Stępień, Mirosław P. Czarkowski

Introduction

The COVID-19 pandemic, which broke out in 2020, significantly altered the epidemiological landscape of most infectious diseases and disrupted a number of previously observed trends in their incidence. Efforts to prevent the transmission of SARS-CoV-2 between individuals by reducing interpersonal contact (lockdowns, etc.) and minimising transmission risk during unavoidable interactions (e.g. face masks, widespread availability of disinfectants) not only curbed the spread of COVID-19 but also limited the transmission of other diseases spread via droplets or airborne routes, as well as certain foodborne illnesses. Equally important were extensive media campaigns promoting behaviours aimed at reducing epidemic threats. As a result, in the first year of the pandemic, Poland recorded a decline in the incidence of nearly all notifiable infectious diseases, with reductions often exceeding what might have been expected based on previous long-term downward trends. This decline cannot be fully explained by the fact that the number of reported cases may have been an underestimation of the true incidence, due to the strain placed on the healthcare system and sanitary inspection services by the pandemic. In 2021, partly due to changes in public behaviour resulting from a gradually diminishing sense of threat, the incidence of most infectious diseases increased noticeably compared to 2020, although generally remaining below pre-pandemic levels.

2022 and 2023 were two consecutive years in which incidence rates for most infectious diseases increased significantly, in many cases reaching levels exceeding the median values from 2016–2020. The causes of this increase should be seen in at least two phenomena. The first is the accumulation, in a given area, of individuals susceptible to infection, which occurred during the pandemic as a result of reduced interpersonal contact and mobility. This typically leads, at some point, to a sharp rise in the number of cases and the occurrence of compensatory epidemics, and this applies not only to diseases transmitted via airborne or droplet routes. The second phenomenon is the so-called "health debt" associated with unmet, or not timely met, healthcare needs of the population, created due to (objective and subjective) limitations in access to the healthcare system during the pandemic, and due to disruptions in the functioning of that system caused by the pandemic-imposed prioritisation of its tasks. In the case of infectious diseases, such a "debt" means not only an increase, in the future, in the number of cases diagnosed only at an advanced stage, as is the case with many non-infectious diseases, but may also mean a future increase in the overall number of cases, since individuals with an undiagnosed and untreated infectious disease may become a source of infection for others.

The overall epidemiological situation of infectious diseases in Poland in recent years, as well as the possible consequences of the post-pandemic health debt, are well illustrated by the general mortality connected with these diseases. Between 2020 and 2023, the mortality rate due to infectious and parasitic diseases (excluding COVID-19) in Poland increased by over 60% (from 5.27/100,000 population to 8.67), and the proportion of deaths from these causes in the total number of deaths in Poland rose by over 70% (from 0.42% to 0.73%). Such a sharp increase in this rate has not previously been observed in Poland.

Given that detailed numerical data on all registered cases of infectious and parasitic diseases in Poland that are subject to mandatory registration and epidemiological surveillance are regularly published in the annual „Infectious Diseases and Poisonings in Poland" bulletins[1], and that the epidemiological situation of diseases of particular public health importance is systematically and thoroughly analysed and commented on in the „Epidemiological Chronicle" section of the

[1] Bulletins published by the National Institute of Public Health NIPH – National Research Institute (PZH – PIB) and the Chief Sanitary Inspectorate, available at: https://wwwold.pzh.gov.pl/oldpage/epimeld/index_p.html#04

„Epidemiological Review”[2], this chapter is limited to the discussion of selected diseases only. Nevertheless, Table 8.1 presents basic data characterising the situation of a broader group of infectious diseases under surveillance. The numbers of registered cases and incidence rates presented in the table for the years 2021, 2022, and 2023, along with the median values for 2016–2020, allow for a general assessment of the direction and dynamics of changes occurring in the epidemiological situation of these diseases.

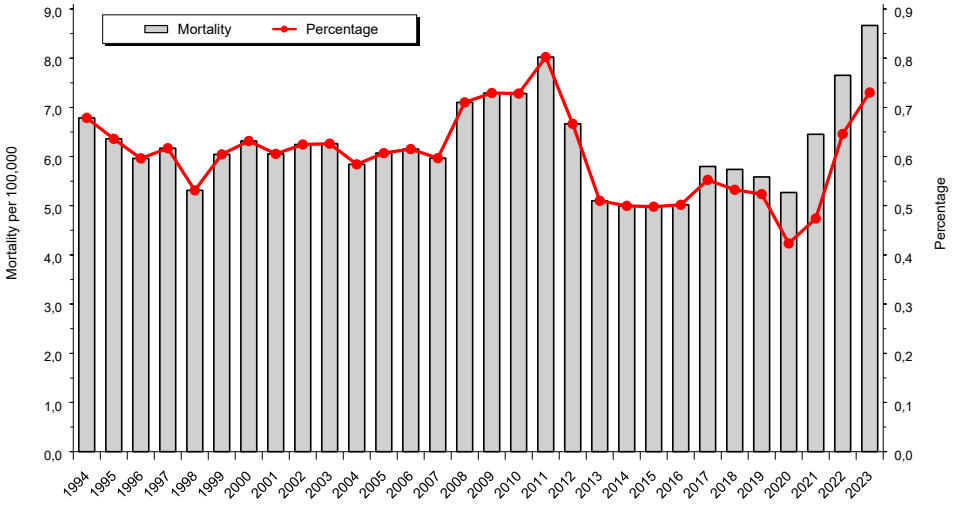


Fig. 8.1. Mortality from infectious diseases (excluding COVID-19) per 100,000 population and the percentage share of deaths from these diseases in the total number of deaths in Poland between 1994 and 2023 (based on data from Statistics Poland – GUS)

The course of the **COVID-19** epidemic in Poland between 2020 and 2023 was characterised by cyclical waves of increased numbers of infections and hospitalisations (Figure 8.2), which were associated with the spread of successive variants of the virus. In 2020, the largest wave of cases occurred between November and December, peaking at the end of the year.

[2] Quarterly journal published by the National Institute of Public Health NIPH – National Research Institute (PZH – PIB) and the Polish Society of Epidemiologists and Infectious Disease Physicians, available at: https://www.przeglepidemiol.pzh.gov.pl/

Table 8.1. Selected notifiable infectious diseases in Poland. Number of cases and incidence per 100,000 population between 2016 and 2023

Diseases (in order by ICD-10)		Median 2016-2020	2021	2022	2023	Median 2016-2020	2021	2022	2023
		number of cases				incidence			
	Cholera	0	0	0	0	0	0	0	0
	Typhoid	2	0	3	6	0.005	0	0.008	0.016
	Paratyphoid A, B, C	2	2	2	4	0.005	0.005	0.005	0.011
	* Salmonellosis	9,957	8,294	6,575	10,348	25.9	21.7	17.4	27.4
including:	foodborne intoxications	9,651	8,014	6,256	9,856	25.1	21.0	16.5	26.1
	* parenteral infections	306	280	319	492	0.80	0.73	0.84	1.31
	Shigellosis	37	18	43	50	0.10	0.05	0.11	0.13
	* Other bacterial intestinal infections	15,047	23,307	23,933	24,544	39.2	61.1	63.3	65.1
including:	* diarrhoeic *E.coli*	285	103	150	208	0.74	0.27	0.40	0.55
	verotoxin-producing *E.coli*	8	9	36	96	0.02	0.02	0.10	0.25
	* other specified and unspecified *E.coli*	281	124	211	330	0.73	0.32	0.56	0.88
	campylobacteriosis	726	631	527	862	1.89	1.65	1.39	2.29
	yersiniosis	170	142	180	313	0.44	0.37	0.48	0.83
	caused by *Clostridioides difficile*	11,310	21,157	21,563	21,268	29.5	55.4	57.0	56.4
	* other specified and unspecified	2,306	1,141	1,266	1,467	6.00	2.99	3.35	3.89
	* Other bacterial foodborne intoxications	504	329	307	285	1.31	0.86	0.81	0.76
including:	* Staphylococcal enterotoxin	37	4	125	108	0.10	0.01	0.33	0.29
	botulism	22	8	14	17	0.057	0.021	0.037	0.045

Diseases (in order by ICD-10)		Median 2016-2020	2021	2022	2023	Median 2016-2020	2021	2022	2023
		number of cases				incidence			
	* *Clostridium perfringens*	1	14	23	20	0.003	0.037	0.061	0.053
	* other specified	9	7	9	9	0.023	0.018	0.024	0.024
	* other unspecified	412	296	136	131	1.07	0.78	0.36	0.35
	Giardiasis	928	559	1,340	1,771	2.42	1.46	3.54	4.70
	Cryptosporidiosis	3	3	18	64	0.01	0.01	0.05	0.17
	* Viral and other specified intestinal infections	48,577	23,365	57,636	27,277	126.5	61.2	152.4	72.4
including:	* rotaviruses	23,263	7,417	34,211	6,119	60.6	19.4	90.4	16,2
	* noroviruses	3,706	7,164	5,938	7,560	9.6	18.8	15.7	20.1
	* other	19,880	8,784	17,487	13,598	51.7	23.0	46.2	36.1
	* Diarrhoea in children under 2 years, unspecified	16,675	9,348	10,515	10,196	2,237.9	1,330.9	1,596.7	1,680.5
	Tuberculosis [1)]	5,487	3,704	4,314	4,436	14.3	9.7	11.4	11.8
including:	respiratory system [1)]	5,244	3,553	4,148	4,265	13.7	9.3	11.0	11.3
	Plague	0	0	0	0	0	0	0	0
	Tularaemia	18	43	35	30	0.047	0.113	0.093	0.080
	Anthrax	0	0	0	0	0	0	0	0
	Brucellosis (new cases)	2	1	1	4	0.005	0.003	0.003	0.011
	Leptospirosis	4	2	6	7	0.010	0.005	0.016	0.019
	Listeriosis	121	121	150	248	0.32	0.32	0.40	0.66
	Tetanus	11	5	5	13	0.029	0.013	0.013	0.034
	Diphtheria	0	0	0	1	0	0	0	0.003

Diseases (in order by ICD-10)		Median 2016-2020	2021	2022	2023	Median 2016-2020	2021	2022	2023
		number of cases				incidence			
	Pertussis	1,629	182	371	922	4.24	0.48	0.98	2.45
	* Scarlet fever	18,781	2,649	12,654	44,784	48.9	6.9	33.5	118.8
	Meningococcal disease	193	107	117	154	0.50	0.28	0.31	0.41
including:	meningitis and/or encephalitis	96	50	65	74	0.25	0.13	0.17	0.20
	sepsis	126	63	52	78	0.33	0.17	0.14	0.21
	* Erysipelas	5,492	2,089	3,161	5,369	14.3	5.5	8.4	14.2
	Legionellosis	47	46	118	424	0.12	0.12	0.31	1.12
	Syphilis (total)	1,602	1,123	1,995	2,989	4.17	2.94	5.27	7.93
	Gonorrhoea	332	287	630	1,322	0.86	0.75	1.67	3.51
	Sexually transmitted chlamydia	258	283	517	977	0.67	0.74	1.37	2.59
	* Lyme disease	20,629	12,500	17,370	25,285	53.7	32.8	45.9	67.1
	Q fever	0	1	2	6	0	0.003	0.005	0.016
	* Typhus fever, spotted fever and other rickettsioses	4	2	8	10	0.010	0.005	0.021	0.027
	Poliomyelitis	0	0	0	0	0	0	0	0
	* Creutzfeldt-Jakob disease	26	18	21	30	0.068	0.047	0.056	0.080
	Variant Creutzfeldt-Jakob disease	0	0	0	0	0	0	0	0
	Rabies	0	0	0	0	0	0	0	0
	* Viral encephalitis	357	258	531	779	0.93	0.68	1.40	2.07
including:	tick-borne	265	210	446	661	0.69	0.55	1.18	1.75
	* other specified	29	17	48	58	0.08	0.04	0.13	0.15

Diseases (in order by ICD-10)		Median 2016-2020	2021	2022	2023	Median 2016-2020	2021	2022	2023
		number of cases				incidence			
	* other unspecified	78	31	37	60	0.20	0.08	0.10	0.16
	* Viral meningitis	943	194	365	775	2.45	0.51	0.96	2.06
including:	* enteroviral	65	5	53	246	0.17	0.01	0.14	0.65
	* other specified and unspecified	809	189	312	529	2.11	0.50	0.82	1.40
	Dengue fever (classical and haemorrhagic)	30	2	23	70	0.08	0.01	0.06	0.19
	Yellow fever	0	0	0	0	0	0	0	0
	Lassa fever	0	0	0	0	0	0	0	0
	Crimean-Congo haemorrhagic fever	0	0	0	0	0	0	0	0
	Disease caused by Marburg or Ebola virus	0	0	0	0	0	0	0	0
	* Varicella	160,707	57,669	171,708	190,825	418.2	151.1	453.9	506.2
	Measles	133	13	27	35	0.346	0.034	0.071	0.093
	Rubella	437	50	147	243	1.14	0.13	0.39	0.64
including:	congenital rubella	0	0	0	0	0	0	0	0
	Hepatitis A	1,067	92	233	206	2.78	0.24	0.62	0.55
	Hepatitis B	3,196	1,547	2,500	3,142	8.32	4.05	6.61	8.33
including:	acute	45	10	29	36	0.117	0.026	0.077	0.095
	Hepatitis C	3,442	1,244	2,528	3,267	8.96	3.26	6.68	8.67
	* Viral hepatitis other and unspecified	12	8	53	55	0.03	0.02	0.14	0.15
	AIDS	102	64	137	156	0.27	0.17	0.36	0.41
	Newly detected HIV infections	1,317	1,461	2,604	2,189	3.43	3.83	6.88	5.81

Diseases (in order by ICD-10)	Median 2016-2020	2021	2022	2023	Median 2016-2020	2021	2022	2023
	number of cases				incidence			
Mumps	1,585	484	922	966	4.13	1.27	2.44	2.56
Malaria	27	15	26	46	0.07	0.04	0.07	0.12
Echinococcosis	64	26	46	66	0.17	0.07	0.12	0.18
Trichinosis	4	2	1	5	0.010	0.005	0.003	0.013
Disease caused by *Streptococcus pneumoniae*	1,192	962	2,216	2,957	3.10	2.52	5.86	7.84
including: meningitis and/or encephalitis	181	123	208	273	0.47	0.32	0.55	0.72
sepsis	815	650	1,459	1,934	2.12	1.70	3.86	5.13
other specified and unspecified	466	323	853	1,271	1.21	0.85	2.25	3.37
Disease caused by *Haemophilus influenzae*	102	52	149	265	0.27	0.14	0.39	0.70
including: meningitis and/or encephalitis	10	3	16	33	0.026	0.008	0.042	0.088
sepsis	54	30	88	129	0.14	0.08	0.23	0.34
* Bacterial meningitis and/or encephalitis – other specified	122	51	78	150	0.32	0.13	0.21	0.40
* Bacterial meningitis and/or encephalitis – other unspecified	216	60	102	150	0.56	0.16	0.27	0.40
* Meningitis other and unspecified	720	311	475	649	1.87	0.81	1.26	1.72
* Encephalitis other and unspecified	100	66	89	146	0.26	0.17	0.24	0.39
Influenza and influenza-like illness	4,790,033	2,973,793	4,703,128	.	12,478.4	7,792.5	12,433.1	.
Congenital toxoplasmosis	18	13	30	25	4.48	3.92	9.83	9.18
COVID-19	x	2,852,789	2,370,351	381,244	x	7,475.4	6,266.2	1,011.3

a) Per 100,000 population overall, children under 2 years of age, and live births (congenital conditions). * Disease entities and syndromes not covered by surveillance within the European communicable disease surveillance network. 1) Data from the National Institute of Tuberculosis and Lung Diseases

Data source: Infectious Diseases and Poisonings in Poland. NIPH NIH-NRI, Chief Sanitary Inspectorate, Warsaw. Annual reports 2016–2023

In 2021, two distinct epidemic waves were observed – the first in March and April, and another, equally intense, in November and December. 2022 began with a wave between March and April, followed by a sharp decline in the number of new cases. This decline was linked to the lifting of the epidemic state in May 2022 and a significant reduction in testing. A summer wave occurred in the second half of the year, but it was considerably smaller than previous ones. In 2023, another increase in cases was observed in March and April and in November and December, though these waves were less intense than in earlier years. Despite the fluctuations in the number of recorded COVID-19 cases, the proportion of hospitalisations in the second half of 2022 and in 2023 remained similar to earlier periods, which may indicate a stabilisation in the clinical course of the disease and the influence of population immunity on the severity of infection. Widespread presence of antibodies against SARS-CoV-2 was observed in the OBSERCO II[3] study conducted in 2023. Depending on the study round, the proportion of individuals with antibodies ranged from 96.5% to 97.4%.

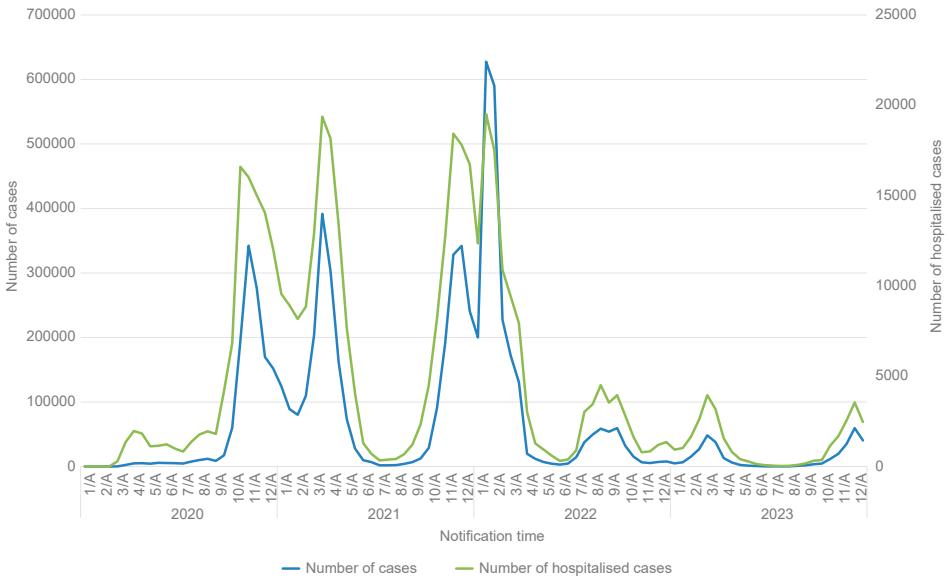


Fig. 8.2. Number of reported COVID-19 cases in Poland between 2020 and 2023, including hospitalised cases. (source: Reports on cases of infectious diseases, infections and poisonings in Poland [biweekly], available at: https://wwwold.pzh.gov.pl/oldpage/epimeld/index_p.html)

[3] https://www.pzh.gov.pl/projekty-i-programy/obserco/

It should also be emphasised that, due to the limitations in testing, the actual number of cases is likely to be significantly higher than the number of officially reported cases, which hinders a comprehensive assessment of the epidemiological situation. Among participants in the aforementioned OBSERCO II study who experienced respiratory symptoms and underwent PCR testing between February and May 2023, COVID-19 was confirmed in 5.6% of cases, influenza in 0.4%, and RSV infection in 0.3%. During the October–December period, these proportions were 11%, 0%, and 0.2%, respectively. These findings indicate continued circulation of the SARS-CoV-2 virus in the population in 2023, despite the small number of recorded cases. Therefore, it is justified to implement a *sentinel* surveillance system, preferably integrated with existing influenza and RSV[4] surveillance, which would enable improved monitoring of SARS-CoV-2 circulation in the population and assessment of its impact on public health.

Diseases covered by mandatory vaccination in Poland

The implementation of the National Immunisation Programme in Poland for over sixty years has had a significant impact on the epidemiological situation in the country regarding vaccine-preventable diseases. Of particular importance are the mandatory vaccinations, which apply to children and adolescents aged 0 to 19 years. As a result of compulsory vaccination, diseases such as diphtheria, tetanus, poliomyelitis, measles, rubella, hepatitis B, and infections caused by *Haemophilus influenzae have been significantly reduced or eliminated.* A reduction in the number of cases and in the occurrence of disease complications requiring hospitalisation has also been observed following the inclusion of Streptococcus pneumoniae vaccination in the Mandatory Vaccination Schedule in 2017. Streptococcus pneumoniae is responsible for severe forms of meningitis, sepsis, pneumonia, otitis media, and deaths among the youngest children as well as among older adults, especially those over the age of 65. For this reason, a 50% reimbursement for the pneumococcal vaccine was introduced for individuals over 65 years of age in designated risk groups from 1/01/2022.

[4] ECDC, WHO Regional Office for Europe. Operational considerations for respiratory virus surveillance in Europe [Internet]. Copenhagen, Denmark and Stockholm, Sweden: European Centre for Disease Prevention and Control and WHO Regional Office for Europe; 2022 [cited 1 December 2024]. Report No.: WHO/EURO:2022-5841-45606-65427. Available at: https://www.ecdc.europa.eu/en/publications-data/operational-considerations-respiratory-virus-surveillance-europe

An important change in the Mandatory Vaccination Schedule was the introduction of rotavirus vaccination from 1/01/2021. Rotaviruses are the most common cause of diarrhoea among infants and young children, often requiring hospital treatment. In 2021, the incidence was 19.5 per 100,000 population, while in 2022 it was more than 4.5 times higher (90.4) compared to the previous year, and more than 5.5 times higher than in 2023, when the incidence was 16.2 per 100,000 population. It is highly likely that the increase in cases observed in 2022 was a post-pandemic effect and may have been related to increased sensitivity of the surveillance system. According to surveillance data, the proportion of hospitalised cases was very high: from over 85% to 91.7% in 2022. More favourable incidence, morbidity and hospitalisation rates are expected in the coming years as rotavirus vaccination becomes more widespread.

The epidemiological situation regarding pertussis in Poland remains complex. Periodic epidemic increases continue to be observed every 3 to 5 years, indicating sustained circulation of the bacteria in the community and continued population susceptibility to infection. Since the second half of the 1990s, there has been a rise in the number of pertussis cases, reaching approximately 2,000–3,000 annually. In 2016, an epidemic peak was recorded with as many as 6,828 reported cases. Since then, a downward trend has been observed: in 2017, 3,067 cases were reported (incidence: 7.98 per 100,000 population), and in 2018 the number further declined to 1,548 cases, i.e. a decrease of 49.4% compared to the previous year (incidence: 4.0 per 100,000). In 2019, 1,630 cases were reported (incidence: 4.25 per 100,000). The pertussis epidemiological situation in 2020 was significantly affected by restrictions on interpersonal contact introduced to limit SARS-CoV-2 transmission. A reduction of more than half in the number of pertussis cases was recorded compared to 2019, with 753 cases reported in 2020. In 2021, the number of cases dropped further to 182 – the lowest level in over 30 years – most likely due to the continued enforcement of social distancing measures and mandatory mask-wearing during the pandemic. 2022 saw an increase in the number of pertussis cases compared to the previous year (371 cases in 2022 versus 182 cases in 2021), which was influenced by the gradual lifting of social distancing restrictions and mandatory mask-wearing. Similarly, there was another increase in pertussis cases in 2023, rising to 922 cases and an incidence of 2.45 per 100,000 population. The increase in the number of individuals susceptible to pertussis may lead to compensatory epidemics in the future. Therefore, it is crucial to maintain high vaccination coverage (above 95%) in the population to prevent new cases of the disease (Fig. 8.3).

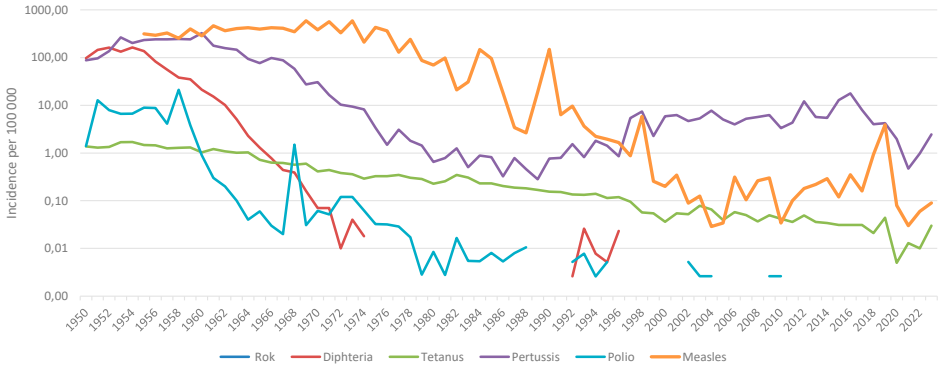


Fig. 8.3. Incidence of selected infectious diseases against which mandatory vaccination programmes are conducted for children and adolescents, 1950–2023 (Source: NIPH NIH-NRI)

It should be emphasised that the implementation of vaccinations against diphtheria, tetanus, pertussis, polio, measles, and rubella has remained at a very high level for most years, ranging between 95% and 100%. The source of information regarding the implementation of mandatory vaccinations in our country is the data on the vaccination coverage of children and adolescents, collected annually by employees of the sanitary and epidemiological stations from all healthcare facilities in Poland. Data on mandatory vaccination coverage indicates that in recent years, approximately 5% of children and adolescents were not vaccinated (Figure 8.4). Regarding most vaccinations, a slight upward trend in vaccination coverage was observed in 2022, which continued into 2023 (Figure 8.5).

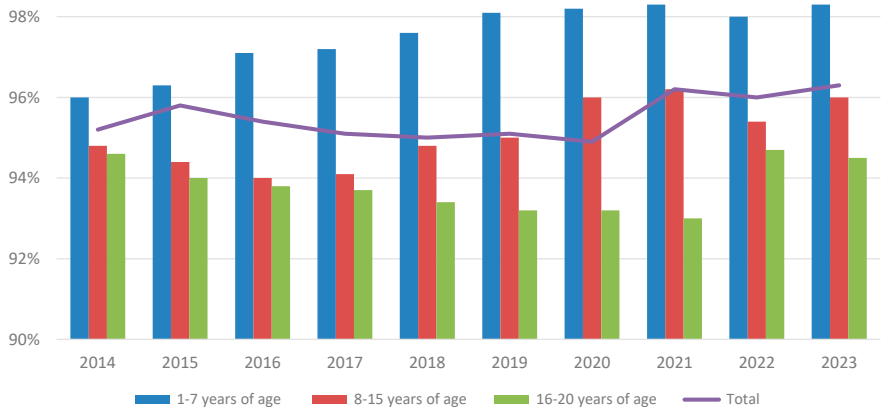


Fig. 8.4. 2006-2023 Immunisation Programme. Percentage of children and adolescents under surveillance, covered by the Programme (source: NIPH NIH-NRI)

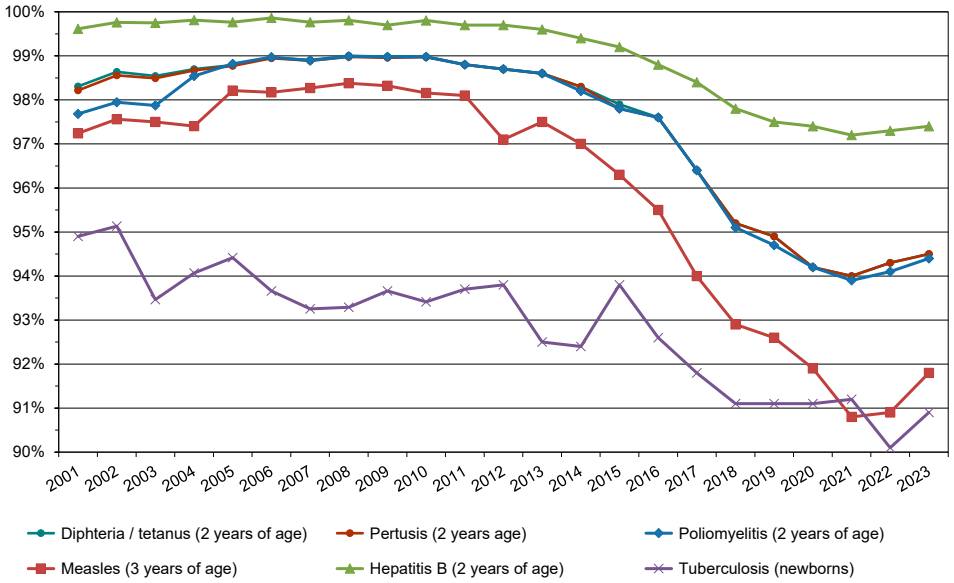


Fig. 8.5. 2001-2023 Immunisation Programme. Percentage of children aged 1-3 years vaccinated against selected diseases (source: NIPH NIH-NRI)

As in previous years, the implementation of vaccinations at the voivodship level varied, with coverage not falling below 87.0%, ranging from 87.3% to 99.1%. Additionally, there remains a trend of lower vaccination rates in the following voivodeships: Podlaskie, Lubelskie, Podkarpackie, Małopolskie, Świętokrzyskie, and Mazowieckie. The vaccination coverage rate for the population subject to mandatory vaccinations, which remains at 90.0%, is still sufficient to achieve herd immunity, preventing the epidemic spread of diseases. An important step in the process of verifying the vaccination status of the population in Poland will be the introduction of an electronic vaccination card, planned to be introduced by the Ministry of Health in the second half of 2025, which will include the registration of all vaccinations covered by the Mandatory Vaccination Schedule. From the perspective of the health security of our society, this measure will allow for an accurate assessment of the vaccination status of children and adolescents in Poland and will help outline educational and promotional actions in this area (Table 8.2).

It is worth emphasising that, as a result of the vaccination programme, the last case of poliomyelitis (Heine-Medin disease) caused by wild poliovirus in Poland was recorded in 1984 (Fig. 8.3). Since then, despite active surveillance for poliovirus infections among individuals under 15 years of age presenting with symptoms of acute flaccid paralysis (which is mandatorily reported to the surveillance system),

only sporadic cases caused by vaccine-derived poliovirus (one each in 2009, 2010, and 2013) have been registered. Following the outbreak of war in Ukraine and the mass migration of Ukrainian citizens to Poland, whose vaccination coverage was lower than that of the Polish population, concerns were raised about the potential emergence of polio cases. However, intensified epidemiological surveillance conducted under the Global Polio Eradication Initiative coordinated by WHO did not detect any cases of poliomyelitis in Poland by the end of 2023. Nevertheless, environmental surveillance identified vaccine-derived polioviruses several times in sewage samples collected in Warsaw and Lublin. This is related to the use of bOPV in Ukraine, which contains attenuated strains of types 1 and 3. The detection of such viruses is an expected outcome and may indicate effective environmental monitoring. In accordance with WHO guidelines and the National Action Plan for response to polio outbreaks or related events, these isolates are not subject to notification.

Table 8.2. Vaccination coverage in Poland in 2023 (source: NIPH NIH-NRI)

Type of vaccine	The average coverage in the country	Min. and max. coverage by voivodship	Age of children in assessment of coverage
Diphteria/tetanus	94.50%	90.7%- 97.6%	second year of life
Pertussis	94.50%	90.7%- 97.6%	second year of life
Poliomyelitis	94.40%	90.7%- 97.5%	second year of life
Measles/mumps/rubella	91.80%	87.3%- 96.6%	third year of life
Rubella	95.70%	91.4%-98.8%	fifteenth years of life
Hemophilus influenzae	94.30%	90.8%- 97.4%	second year of life
Streptococcus pneumoniae	94.70%	90.7%- 97.7%	second year of life
Hepatitis B	97.40%	95.1%- 99.0%	second year of life
Tuberculosis	97.80%	95.2%- 99.1%	second year of life

From the perspective of the Global Polio Eradication Initiative coordinated by the World Health Organisation, Poland has maintained its status as a polio-free country.

Since 1975, cases of diphtheria in Poland have occurred only sporadically (Fig. 8.3) – the last confirmed case was an imported infection from the former Soviet Union in 2000. It is important to remember that there remains a risk of diphtheria re-emergence if there are susceptible individuals and unvaccinated children in the population. One case of diphtheria caused by a non-toxigenic strain of *Corynebacterium ulcerans was registered in 2023.* Accordingly, the diphtheria control strategy must be based on three fundamental components:

- maintaining high vaccination coverage among children and adolescents in accordance with the current immunisation schedule;
- administering booster doses every 10 years with a vaccine containing a reduced dose of diphtheria toxoid (Td vaccine);
- in every suspected case of diphtheria, in addition to microbiological testing for *Corynebacterium diphtheriae*, *Corynebacterium ulcerans, and Corynebacterium pseudotuberculosis*, testing for diphtheria toxin production must be performed, as the toxin is responsible for the severe clinical course of the disease and determines the need for vaccine-based prophylaxis.

Tetanus is an infectious disease caused by *Clostridium tetani*, which produces a neurotoxin (tetanospasmin) leading to spastic paralysis. The disease can only be prevented through vaccination. Tetanus cases are very rare in EU countries, where the disease predominantly affects individuals over the age of 60. Since 1998, the number of tetanus cases in Poland has not exceeded 30 per year, and in recent years a downward trend has been observed, with annual case numbers falling to the low teens. There were 8 cases reported in 2018, while in 2019, 17 individuals contracted tetanus. Between 2020 and 2023, a decline in reported tetanus cases was observed in Poland compared to previous years (2 cases in 2020, and 5 cases each in 2021 and 2022), although 2023 saw an increase to 13 cases (2.5 times higher than in 2022). Sporadic cases of tetanus in Poland are mainly reported among older age groups, although some occur in adults under 60 years of age. These cases can often be linked to the absence of booster vaccinations in adults (Fig. 8.6).

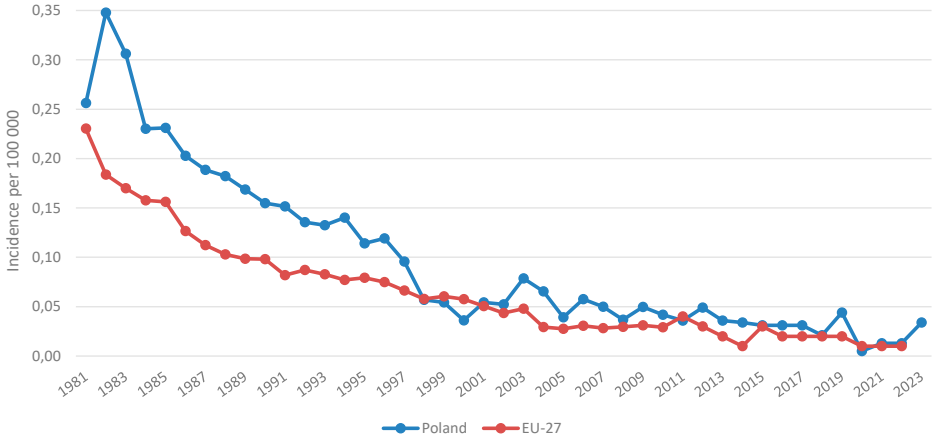


Fig. 8.6. Tetanus incidence in Poland and average in EU/EEA countries between 1981 and 2023 (source: NIPH NIH-NRI, WHO HFA DB, ECDC).

A major success of the tetanus vaccination programme has been the elimination of neonatal tetanus in Poland for several decades. A distinctive feature of tetanus is the widespread presence of *Clostridium tetani* in the environment, with its spores persisting in soil, animal and human faeces, and in human surroundings. This presence is also caused by the lack of herd immunity. In turn, this means that an individual's immunity is solely determined by the society's susceptibility to infection. Since wounds continue to pose a medical problem in both urban and rural environments, maintaining high immunity levels across the population remains the only effective method of disease prevention. Exposure to spores, combined with a high frequency of injuries and low immunity levels, increases the risk of infection. Age also plays a key role in the severity of disease and the likelihood of a fatal outcome.

After years of a steady decline in the incidence of diseases targeted for elimination, such as endemic measles, rubella, and congenital rubella syndrome, the epidemiological situation of these diseases has recently become unstable. Following several years during which approximately 100 measles cases were reported annually (with 133 cases recorded in 2016 and 63 in 2017, and an incidence rate significantly lower than the average across EU countries [Fig. 8.7]), 2018 saw an increase in measles cases to 359, with an incidence rate of 0.93 per 100,000 population – a trend that continued into 2019.

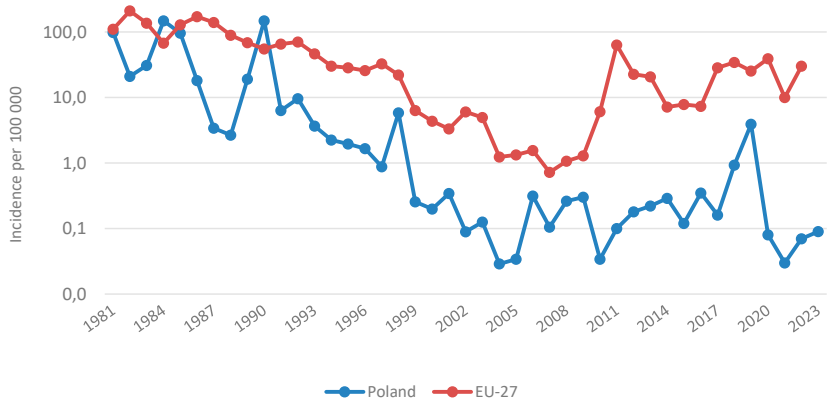


Fig. 8.7. Measles incidence in Poland and average in EU/EEA countries between 1981 and 2023 (source: NIPH NIH-NRI, WHO HFA DB, ECDC)

In total, 1,511 measles cases were reported in Poland in 2019, with an incidence rate of 3.94 per 100,000 population. Most frequently affected were adults

aged 30–44 years. In 2020, only 29 measles cases were reported in Poland (incidence rate: 0.08 per 100,000), with the highest incidence observed among children aged 0–4 years (0.42 per 100,000). Nine patients (31%) were hospitalised, and no deaths due to measles were reported. In 2021, 13 measles cases were registered (incidence rate: 0.03 per 100,000), a 44.8% decrease compared to 2020 and 80% lower than the median between 2014 and 2018. The highest incidence in 2021 was 0.32 per 100,000 among children aged 0–4 years. Six patients (46.2%) were hospitalised with no deaths reported. Vaccination coverage in 2021 for the first dose among 3-year-old children was 90.8%, and for the second dose among 9-year-olds was 84.6% (Fig. 8.15 and Table 8.2). The lower incidence in 2020 and 2021 may have resulted from reduced virus transmission due to acquired immunity following outbreaks between 2017 and 2019, continued vaccination efforts, and, very likely, from public health measures introduced in response to COVID-19, as well as changes in population health-seeking behaviour during the COVID-19 pandemic, and reduced access to healthcare. In 2022, measles cases increased to 27 (incidence: 0.07 per 100,000), followed by 37 cases in 2023 (incidence: 0.09 per 100,000), a trend likely linked to the gradual return to pre-pandemic epidemiological conditions and also to migration from Ukraine. Available data indicates low measles vaccination coverage in Ukraine, and increased population movement into Poland could pose a risk for epidemic outbreaks. A similar rise in measles incidence was observed in other European countries as well. The cause of this unfavourable situation is attributed to several observed social phenomena:

- an increasing number of parents refusing to vaccinate their children against measles, which contributes to declining vaccination coverage and the emergence of outbreaks. Regarding measles, achieving a high vaccination rate, between 90% and 95%, is crucial to establish the so-called herd immunity, which is necessary to halt virus circulation in the population. This is especially important for individuals who cannot be vaccinated, such as infants who are too young, or those with medical contraindications, like people with impaired immune systems; the high level of international and domestic mobility among certain ethnic groups and economic migrants who have not been vaccinated against measles leads to the continuous emergence of small outbreaks in various regions of Poland, regardless of the local level of immunity;
- the inability to predict the location of these outbreaks poses a significant measles risk for unvaccinated individuals, including children with delayed vaccinations. In such situations, infections can also occur among patients and partially immunised medical staff.

From the perspective of the implementation of the measles elimination programme coordinated by the WHO, the observed epidemiological situation of measles in Europe has moved the goal of eliminating the disease further away. However, it still seems achievable in the coming years.

The number of rubella cases, after the compensatory epidemic period, has clearly decreased since 2015 (Fig. 8.8). In 2018, 437 cases of rubella were registered, with an incidence of 1.1/100,000 population. In 2019, there were 285 cases (incidence of 0.7/100,000 population). In 2020 and 2021, 98 and 50 cases occurred, respectively. In the following years, an upward trend became noticeable: 147 cases in 2022 (incidence of 0.39/100,000), and in 2023, 262 cases (incidence of 0.69/100,000).

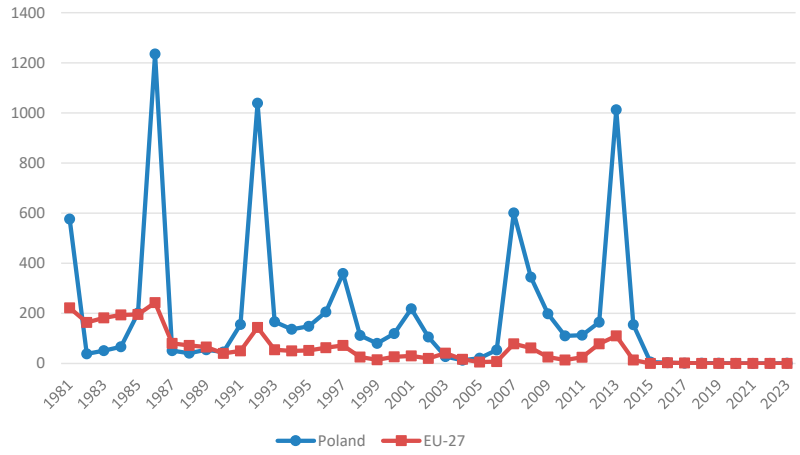


Fig. 8.8. Rubella incidence in Poland and average in EU/EEA countries between 1981 and 2023 (source: NIPH NIH-NRI, WHO HFA DB, ECDC *Atlas*)

The highest incidence of rubella in 2023 occurred in children aged 0-4 years and 5-9 years (Fig. 8.9).

The implementation of mandatory vaccinations against measles, mumps, and rubella in subsequent years will reduce the incidence of rubella and epidemic parotitis. In 2018 and 2019, approximately 1,500 people contracted mumps annually (in 2018, 1,585 people, incidence of 4.1/100,000; and in 2019, 1,338 people, i.e. 3.5/100,000). In the following "pandemic" years, there was a decrease in cases to around 500 cases, with 582 cases in 2020 and 484 cases in 2021. The following years saw an increase in cases, with 922 in 2022 and 969 in 2023, not reaching the numbers from before the pandemic. The incidence of mumps in recent years has

shown a steady, albeit slow, downward trend, less dramatic than for other infectious diseases, due to cyclic epidemics occurring every 3-4 years. However, the incidence of mumps in our country is still higher than the average incidence in EU countries (Fig. 8.10).

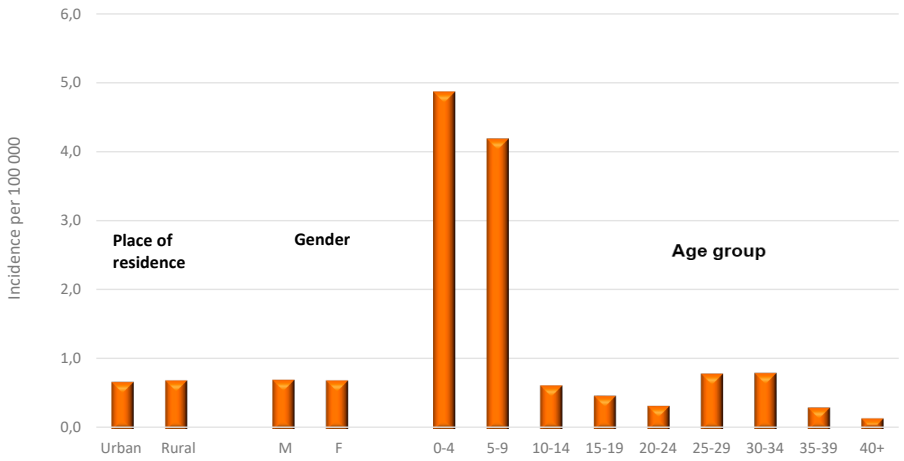


Fig. 8.9. Incidence of rubella in 2023 by place of residence, sex and age (source: NIPH NIH-NRI)

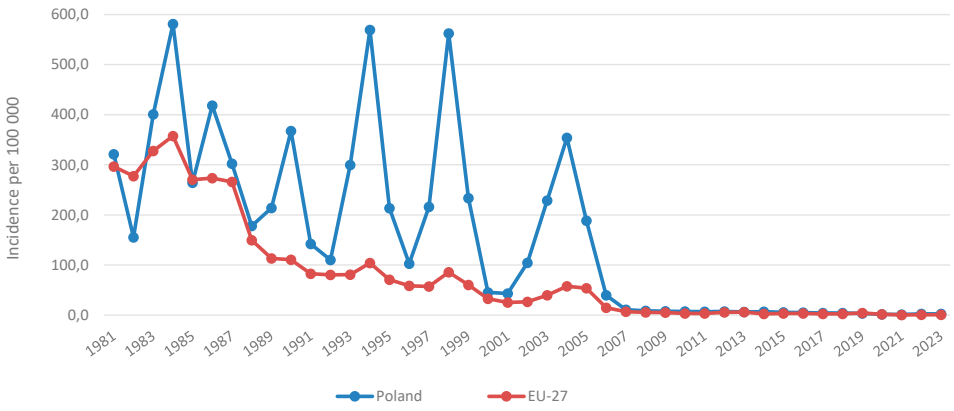


Fig. 8.10. Mumps incidence in Poland and average in EU/EEA countries between 1981 and 2023 (source: NIPH NIH-NRI, WHO HFA DB, ECDC)

The introduction of widespread vaccinations against measles, mumps, and rubella was another key element in improving the epidemiological situation of mumps, for which the decline in incidence reached a pace comparable to rubella. Similarly, the age distribution of cases is comparable to that of rubella (Fig. 8.11).

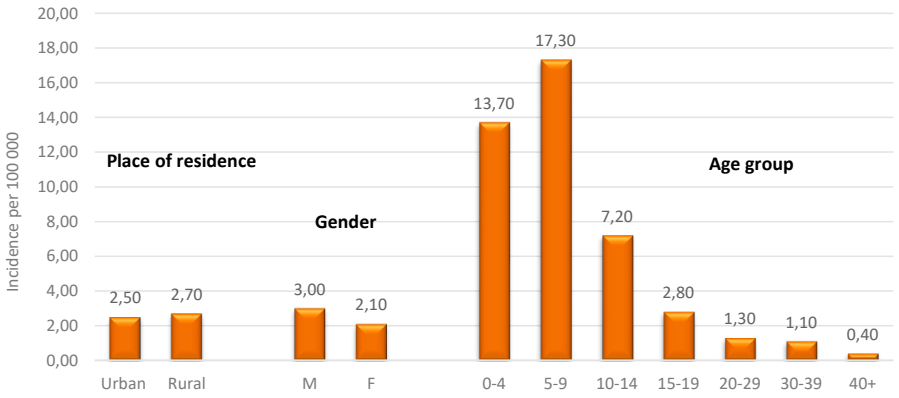


Fig. 8.11. Mumps incidence in 2023 by place of residence, sex and age (source: NIPH NIH-NRI)

However, the insufficient laboratory confirmation of suspected rubella cases remains a concerning issue. This is a necessary element for accurate diagnosis and case confirmation, and it is also a requirement stemming from Poland's participation in the implementation of the rubella elimination programme. The collection of samples for laboratory testing to confirm a clinical diagnosis also applies to cases of measles and the occurrence of acute flaccid paralysis in children under 15 years of age. These programmes are coordinated by the World Health Organisation (WHO).

Until the 1990s, Poland recorded particularly high incidence rates of **hepatitis B (HBV)**, which were more than three times the average incidence observed in other European countries. A key factor contributing to the effective reduction of new infections was the introduction of the mandatory newborn vaccination programme between 1994 and 1996, which was gradually implemented in different voivodeships.

Newborn vaccinations, along with vaccinations for healthcare workers, patients before planned surgical procedures, and improvements in sterilisation procedures in medical facilities, led to a sharp decline in the number of new acute hepatitis B cases. Since 2010, the incidence of acute hepatitis B in Poland has remained below 0.5 per 100,000 residents, representing a small percentage of all diagnosed cases of hepatitis B.

Currently, in the National Immunisation Programme, mandatory vaccinations are provided to the following groups: infants in their first year of life, healthcare workers and individuals training for healthcare professions, persons in contact with an infected individual, individuals with HCV infection, previously unvaccinated women planning pregnancy, patients with renal insufficiency, patients before or after transplantation and those with asplenia or impaired splenic function. It should be emphasised that, at present, hepatitis B vaccination prior to planned

surgical procedures is considered recommended rather than mandatory and the performance of a procedure cannot be conditional upon prior vaccination.

For the past several years, the incidence of hepatitis B (HBV) in Poland has been similar to the levels observed in EU/EFTA countries (Fig. 8.12). Currently, the majority of registered cases are chronic infections detected for the first time, acquired in the past by individuals who were not included in the mandatory newborn vaccination programme.

Similarly to other EU/EFTA countries, the number of new diagnoses significantly dropped during the COVID-19 pandemic, between 2020 and 2021. The return to pre-pandemic levels occurred between 2022 and 2023. However, in the EU/EFTA countries, this return was already observed in 2022 (incidence rate: 8.5 per 100,000 population in 2022 vs. 7.5 in 2019), whereas in Poland, this only happened in 2023, when the incidence reached 8.3 per 100,000, surpassing the 2019 level (7.4 per 100,000).

The decrease in diagnoses during the pandemic is mainly attributed to the limitation of testing due to pandemic restrictions and reduced access to medical care[5]. Therefore, the subsequent increase after the end of the pandemic can partly be explained by the restoration of previous diagnostic capabilities and the increased number of tests being performed.

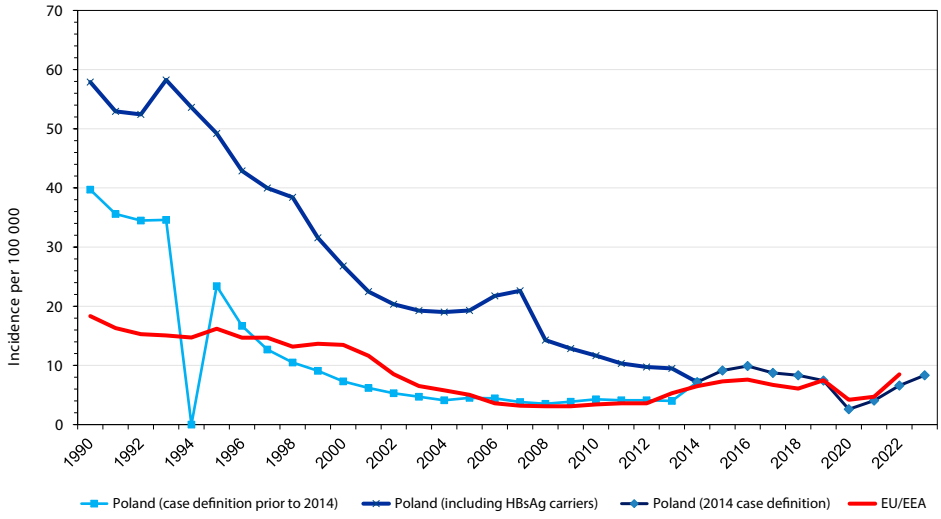


Fig. 8.12. Hepatitis B incidence in Poland and average in EU countries between 1990 and 2023 (source: epidemiological surveillance data and ECDC surveillance atlas. The indicator for EU/EEA excludes countries reporting only acute cases)

[5] Monitoring of responses to the hepatitis B and C epidemics in EU/EEA countries – 2020 data https://www.ecdc.europa.eu/en/publicationsdata/monitoring-responses-hepatitis-b-and-cepidemics-eueea-countries-2020-data

Between 2022 and 2023, the incidence of acute hepatitis B increased again – from 0.03 per 100,000 inhabitants in 2021 to 0.08 in 2022 and 0.10 in 2023. Compared to previous years, cases of acute hepatitis B were recorded in birth cohorts covered by the routine neonatal vaccination programme (Fig. 8.12). In 2023, this mainly concerned individuals under the age of 30.

The change in the epidemiological situation of hepatitis B, especially in younger age groups, may be related to the intensified influx of refugees from Ukraine in 2022–2023. Among all cases of acute hepatitis B during this period, 35% were individuals from Ukraine, and in the group of people under the age of 30, their share exceeded 50%[6]. However, cases of acute hepatitis B still occur among Polish citizens as well. In this context, the declining trend in the vaccination coverage of newborns and infants against hepatitis B, observed since 2015, is concerning. Among children born in 2022, by the end of 2023, only 89.5% nationwide had received the full primary vaccination cycle, including the booster dose, while 2.6% remained completely unvaccinated.

In the case of chronic and unspecified cases, as in previous years, differences between urban and rural residents persisted – a higher incidence rate was recorded in cities (9.9 vs 5.8 per 100,000 inhabitants). Differences were also observed between genders – the incidence rate was higher among men than women (9.9 vs 6.7 per 100,000) (Fig. 8.13).

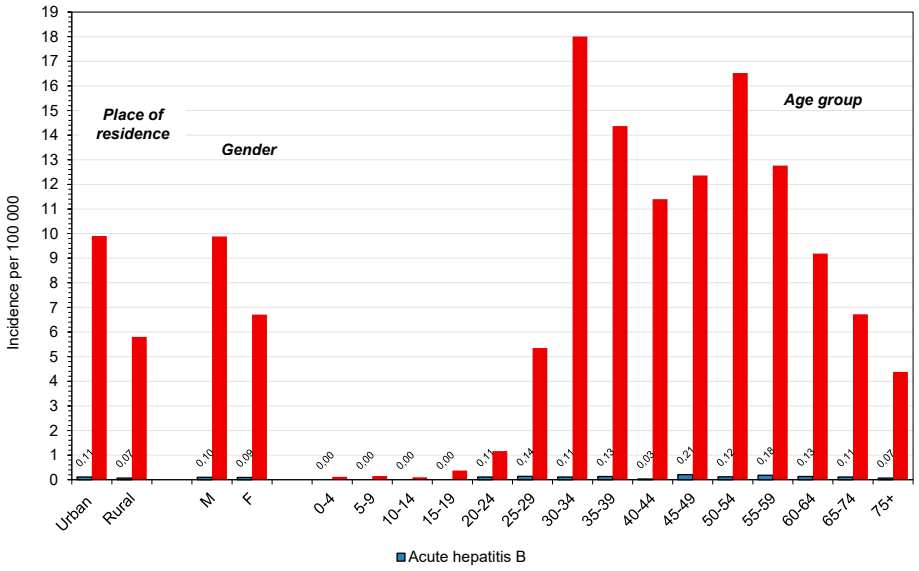


Fig. 8.13. Hepatitis B incidence in 2023 by place of residence, sex and age (source: NIPH NIH-NRI)

[6] Stępień M, Myszka-Szymanowska P. Hepatitis B in Poland in 2022. Epidemiological Review. 2025 Mar 18;78(4):479-495. English, Polish. doi: 10.32394/pe/197864.

The significant geographical variation in the incidence of hepatitis B observed over many years has persisted even after the pandemic period. The rate of return to pre-pandemic incidence levels varied across different voivodeships. In some regions, such as Lubelskie, Podlaskie, Pomorskie, Śląskie, Wielkopolskie, and Zachodniopomorskie voivodeships, the incidence rates returned to pre-pandemic levels as early as 2022. In contrast, in other voivodeships, including Kujawsko-Pomorskie, Łódzkie, and Świętokrzyskie, the incidence rates in 2023 were still at least 10% lower than in 2019 (Fig. 8.14).

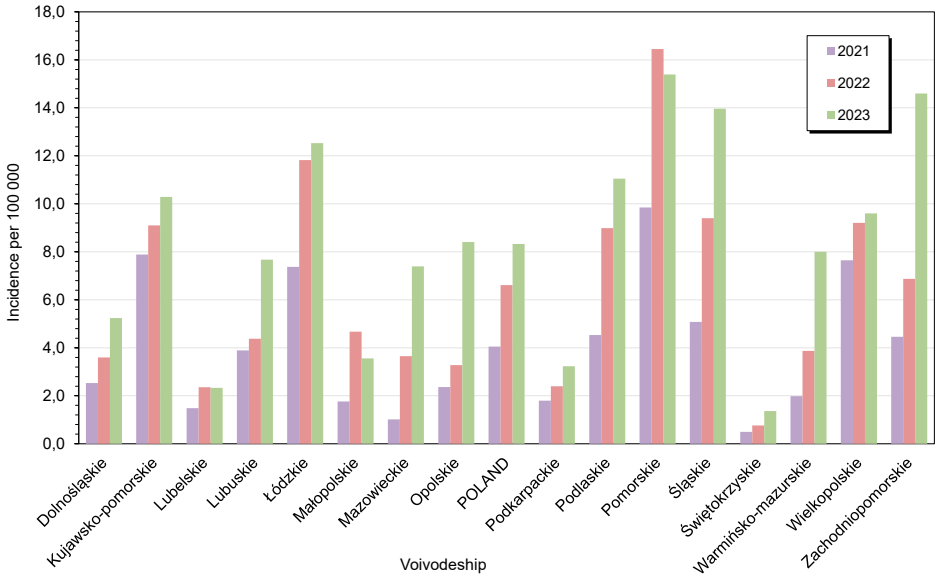


Fig. 8.14. Hepatitis B incidence between 2021 and 2023, by voivodeship (source: NIPH NIH-NRI).

The vaccination against infections caused by ***Haemophilus influenzae*** **type B** was first introduced into the vaccination schedule in 1997 as a recommended vaccination for children from the age of 2 months, aimed at preventing, among other things, meningitis and sepsis. As a mandatory vaccination for children at 1 and 2 years of age, it was introduced in 2004, initially for children from orphanages, then in 2005 for children from large families (with at least three children), and from 2007 onwards for all children at 2 months of age. Already in the same year, a 42.6% decrease in the incidence of invasive disease caused by *H. influenzae* was observed, and the incidence of meningitis and/or encephalitis decreased by 40.6%. The number of cases of meningitis and/or encephalitis caused by *H. influenzae* type B has remained at a low level – 6 cases were reported in 2018.

Despite the decrease in cases, the incidence remained the same as in 2017, i.e., 0.03 per 100,000. In the 0-4 age group, one case was reported (incidence: 0.05 per 100,000), while the others were among individuals over 34 years old. In 2019, a total of 99 people fell ill with invasive *H. influenzae* disease (incidence: 0.26 per 100,000), and in 2020 and 2021, the number of cases dropped to 78 (0.20 per 100,000) and 54 (0.14 per 100,000), respectively. However, in 2022, almost three times as many cases of invasive disease were diagnosed, i.e., 149 cases (0.39 per 100,000) compared to 2021, and 280 cases (0.74 per 100,000) in 2023.

In 2023, the vaccination coverage of 2-year-olds (primary vaccination) against *H. influenzae* in individual voivodeships ranged from 90.8% in the Podlaskie voivodeship to 97.4% in the Kujawsko-Pomorskie voivodeship, with the overall coverage for Poland being 94.3% (Fig. 8.15).

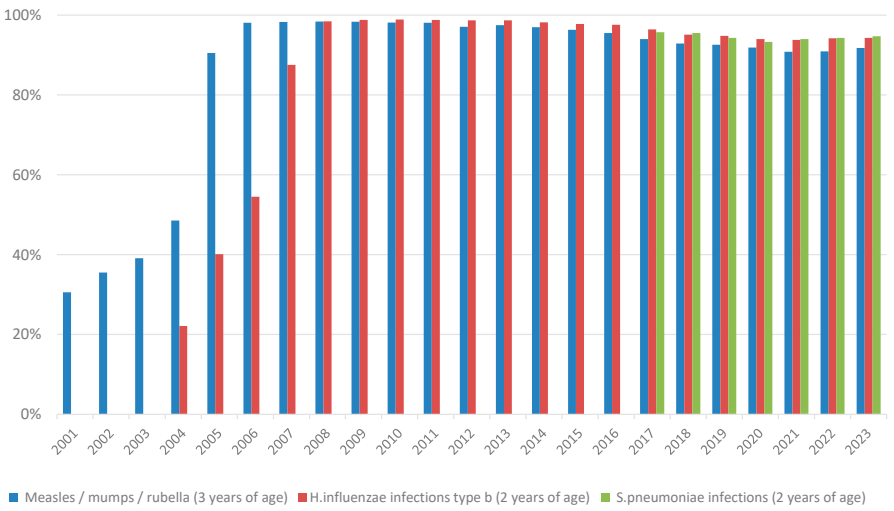


Fig. 8.15. 2001-2023 Immunisation Programme. Percentage of children aged 2–3 years vaccinated against measles, mumps and rubella, and Haemophilus influenzae type B infections (source: NIPH NIH-NRI)

Tuberculosis[7] remains a global public health challenge. The COVID-19 pandemic contributed in many countries to the slowdown, suspension, or even reversal of previously observed progress in combating tuberculosis. A major global consequence of the pandemic was a significant decline in the number

[7] Tuberculosis and Respiratory Diseases in Poland in 2023 [Gruźlica i Choroby Układu Oddechowego w Polsce w 2023 r.]. ed. Maria Korzeniewska-Koseła. Institute of Tuberculosis and Lung Diseases, Warsaw 2024

of people diagnosed with and treated for tuberculosis. The number of TB cases reported to the World Health Organisation (WHO) fell from 7.1 million in 2019 to 5.8 million in 2020 (18% decrease). In 2022, access to healthcare services, disrupted during the COVID-19 pandemic, improved globally, resulting in an increase in the number of people diagnosed and treated for tuberculosis. National registers worldwide recorded 7.5 million new cases. In 2022, two-thirds of the global tuberculosis burden was concentrated in eight countries: India (27%), Indonesia (10%), China (7.1%), the Philippines (7.0%), Pakistan (5.7%), Nigeria (4.5%), Bangladesh (3.6%), and the Democratic Republic of the Congo (3.0%). Between 1.18 and 1.43 million people died from tuberculosis in 2022, including individuals infected with HIV. In the same year, 36,179 cases of tuberculosis were reported in the European Union and European Economic Area, with an incidence rate of 8.0 per 100,000 population, ranging from 2.5 per 100,000 in Liechtenstein to 48.7 per 100,000 in Romania. The majority of tuberculosis patients (66.2%) in EU/EEA countries were aged between 25 and 64 years. Multidrug-resistant tuberculosis (MDR-TB) was confirmed in 933 patients (5.0% of cases with known drug susceptibility results, which was more than in the previous year). The highest proportions of MDR-TB were reported in Estonia (25.0%) and Lithuania (16.7%). HIV infection was identified in 620 patients (4.1% of cases with known HIV status).

The epidemiological situation of tuberculosis in Poland is improving, although the process remains rather slow (Fig. 8.16).

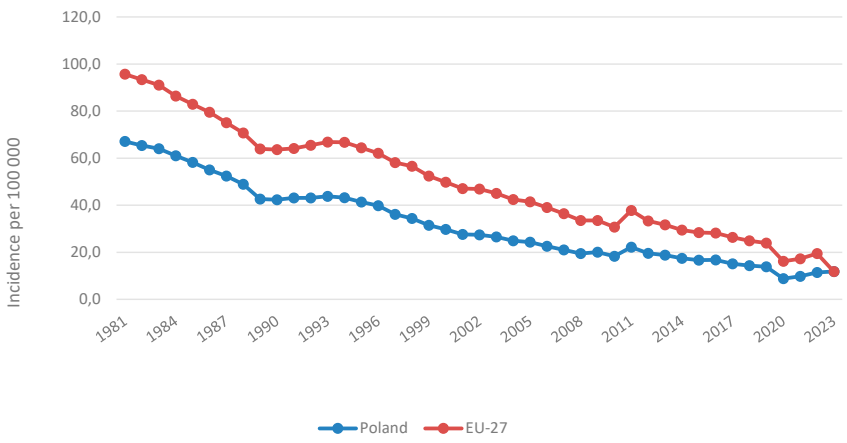


Fig. 8.16. Tuberculosis incidence in Poland and average in EU/EEA countries between 1981 to 2023 (source: IGIChP, WHO HFA DB, ECDC)

Despite a continuing downward trend in tuberculosis incidence, Poland remains among the countries with a higher TB incidence rate than the average for Western European countries. In 2018, the average incidence rate of tuberculosis in the EU/EEA was 14.3 cases per 100,000 population (Fig. 8.16). In 2023, a total of 4,436 tuberculosis cases were registered in Poland, which is 122 more than in the previous year, and 2,262 fewer than in 2014. In 2023, the overall incidence of all forms of tuberculosis was 11.8 per 100,000 population, which represents an increase of 3.5% compared to 2022, and a decrease of 32.2% compared to 2014, when the rate stood at 17.4. New cases of tuberculosis, with no history of previous treatment, accounted for 88.4% of all reported cases in 2023 (3,920 individuals; incidence rate: 10.4). 516 recurrent cases, with an incidence rate of 1.4, accounted for 11.6% of all reported TB cases. Pulmonary tuberculosis was the most common form of the disease, representing 96.1% of all cases in 2023. A total of 4,265 pulmonary TB cases were registered (incidence rate: 11.3). Patients with exclusively extrapulmonary tuberculosis accounted for 3.9% of all cases in 2023 – 171 cases, incidence rate: 0.5. As in previous years, the most common form of extrapulmonary tuberculosis was tuberculous pleuritis – 69 cases, accounting for 40.4% of all extrapulmonary TB cases. Three individuals were diagnosed with tuberculous meningitis and encephalitis. In 2023, no cases of this form of TB were registered among children (aged 0–14 years) and adolescents (15–19 years).

Vaccination against tuberculosis has been carried out for many years, and its implementation remains at a high level, despite a downward trend observed in recent years (Fig. 8.5). The effectiveness of this method of protecting public health is relatively low. The inclusion of tuberculosis vaccination in the schedule is based on its role in preventing tuberculous meningitis and encephalitis, as well as on WHO recommendations for countries with a higher tuberculosis incidence. In 2023, tuberculosis incidence rate increased with age, but only up to 45–64 age group. Rates ranged from 0.9 among children aged 0–14 years to 19.1 among persons aged 45–64 years. People aged 45–64 years accounted for the largest proportion of all tuberculosis cases – 42.5%. In earlier years, the highest incidence rates were observed in the oldest age group, i.e. those aged ≥65 years. In 2023, the incidence rate among persons aged 65 years and older was 15.3. The highest TB incidence rates in children were recorded in the following voivodeships: Pomorskie – 2.6, Lubelskie – 2.4, and Zachodniopomorskie – 2.2 (0.4). As in previous years, tuberculosis incidence was higher among men than among women in 2023. 3,282 cases of tuberculosis were reported in men (incidence rate: 18.0) and 1,154 cases in

women (incidence rate: 5.9). Male cases accounted for 74.0% of all TB cases. Once again in 2023, tuberculosis incidence among urban residents was higher than in rural populations. A total of 2,877 cases were registered in cities, and 1,559 in rural areas. The incidence rate among urban residents was 12.8, and 10.2 among rural residents. Significant differences in tuberculosis incidence rates between voivodeships, observed for many years, were also present in 2023. The highest incidence of all forms of tuberculosis was recorded in the following voivodeships: Lubelskie – 16.2, Śląskie – 15.7, and Świętokrzyskie – 15.5. The lowest incidence rates were observed in Podlaskie – 6.3, Warmińsko-Mazurskie – 6.7, Lubuskie – 7.0, and Wielkopolskie – 7.1 (Fig. 8.16). In 2023, tuberculosis was bacteriologically confirmed in 3,554 patients, including 3,460 cases of pulmonary tuberculosis. The incidence of all bacteriologically confirmed tuberculosis cases was 9.4, and 9.2 for culture-confirmed pulmonary TB. Among the tuberculosis cases registered in 2023, there were 352 foreign nationals, most of whom (235 individuals) were aged 20–44 years. Cases among foreign nationals accounted for 7.9% of all reported TB cases. Among these, 6 cases were recorded in children aged 0–14 years, and 16 cases among adolescents aged 15–19 years. The largest number of foreign nationals with tuberculosis,98, were treated in the Mazowieckie voivodeship. Ukrainians were the largest group (250), followed by significantly smaller groups from Georgia (13) and India (10). Foreign nationals diagnosed with tuberculosis came to Poland from 29 countries. As in previous years, the coexistence of tuberculosis and HIV infection in Poland in 2023 was rare. According to data from the NIPH NIH-NRI, tuberculosis was an AIDS-defining illness in 32 people living with HIV. In 2023, 167 tuberculosis patients were identified as having been held in pre-trial detention centres or prisons (incidence rate: 218.9 per 100,000 inmates). Outpatient treatment in 2023 included 102 cases of tuberculosis with resistance to at least one anti-TB drug. Among these were 56 cases of multidrug-resistant tuberculosis (MDR-TB). MDR-TB cases accounted for 2.8% of all bacteriologically confirmed TB cases and 3.1% of cases with known drug susceptibility (in 2023, drug susceptibility test results were available for 89.7% of culture-positive cases). In 2022, tuberculosis was the cause of death in 472 people. The mortality rate was 1.2 per 100,000 population. As in previous years, pulmonary tuberculosis was the main cause of TB-related deaths – 461 people died from it (mortality rate: 1.2). Extrapulmonary tuberculosis caused 11 deaths. Deaths from tuberculosis accounted for 0.1% of all deaths in Poland in 2022 and 18.7% of deaths caused by infectious and parasitic diseases.

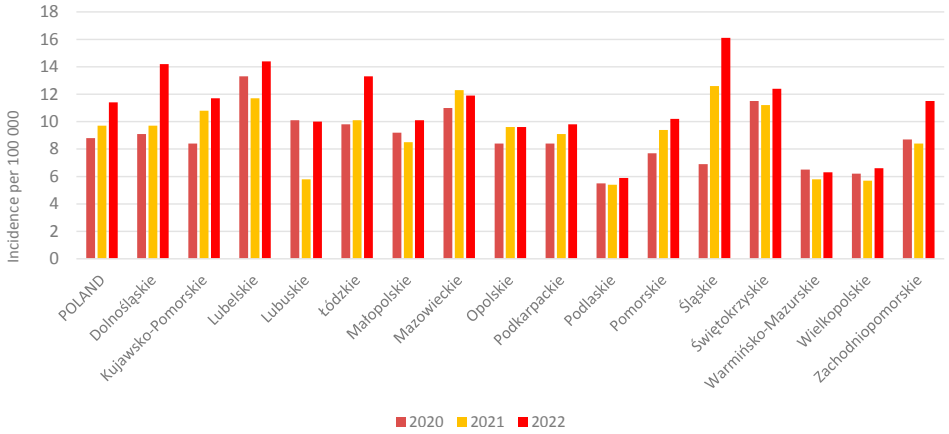


Fig. 8.17. Tuberculosis incidence by voivodeship in 2020, 2021 and 2022 (source: National Institute of Tuberculosis and Lung Diseases)

Among diseases covered by long-term vaccination programmes, only pertussis has shown a deterioration in the epidemiological situation. Pertussis remains a public health concern because vaccine-induced immunity does not last a lifetime – it wanes over time, typically within 4 to 10 years after vaccination. Newborns and infants who are unvaccinated or not fully immunised, particularly during the first six months of life, account for the majority of pertussis-related deaths in EU/EEA countries. Between 2011 and 2022, registered infant deaths due to pertussis involved children under six months of age, with most occurring in infants during their first month of life. This highlights the importance of vaccinating pregnant women during each pregnancy, in order to protect the youngest children from severe disease and death until they receive their primary immunisations. Moreover, a concerning trend is the decreasing vaccination coverage against pertussis among children in their second year of life who are subject to mandatory primary immunisation. An increase in the number of individuals susceptible to pertussis may lead to large compensatory outbreaks in the future. Therefore, under the current epidemiological conditions, it is essential to maintain a population vaccination coverage rate of over 95% to prevent new pertussis cases. In the coming years, the number of pertussis cases is expected to continue rising, which makes it essential to raise awareness, particularly among healthcare professionals, regarding early diagnosis, diagnostic methods, treatment, and notification to the State Sanitary Inspection, which is vital for maintaining surveillance of pertussis. This is not an isolated phenomenon, as many European and non-European countries have also recorded increases in pertussis incidence (Fig. 8.18).

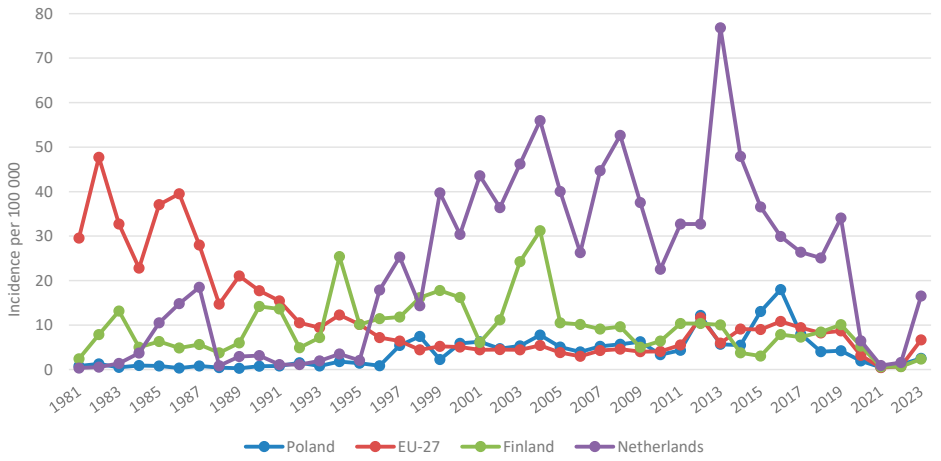


Fig. 8.18. Pertussis incidence in Poland, the Netherlands and Finland and average in the EU/EEA countries between 1981 and 2023 (source: NIPH NIH-NRI, WHO HFA DB, ECDC)

In Poland, an increase in pertussis cases occurred in 1996, and already by 1998, the national incidence rate exceeded the average level observed in EU countries for the first time (Poland: 7.4 per 100,000; EU: 4.3). Since most cases involved children aged 5 to 14 years, a booster dose of pertussis-containing vaccine was introduced into the immunisation schedule at the turn of 2003 and 2004 for children aged 6 years, by replacing the DT vaccine with DTaP. As a result of this vaccination strategy, a decline in pertussis incidence was expected in the following years, ideally to a level comparable with that of the 1980s, i.e. below 1 case per 100,000 population. Unfortunately, the introduction of the DTaP booster dose did not meet those expectations. An increase in pertussis incidence continued to be observed among adolescents and older adults, who serve as a source of infection for the youngest children who have not yet received, or not yet completed, their full vaccination schedule (Fig. 8.19). It must be emphasised, however, that until a new vaccine is developed, the only available preventive measure which remains is maintaining pertussis vaccination in accordance with the current schedule.

A highly concerning and growing problem of vaccine refusal and avoidance could be observed in recent years despite the remarkable success of vaccination programmes and the favourable epidemiological situation they have achieved. An analysis of data from periodic reports submitted by healthcare facilities to the Sanitary Inspection indicates that more than 87,000 children were not vaccinated in 2023 (Fig. 8.20).

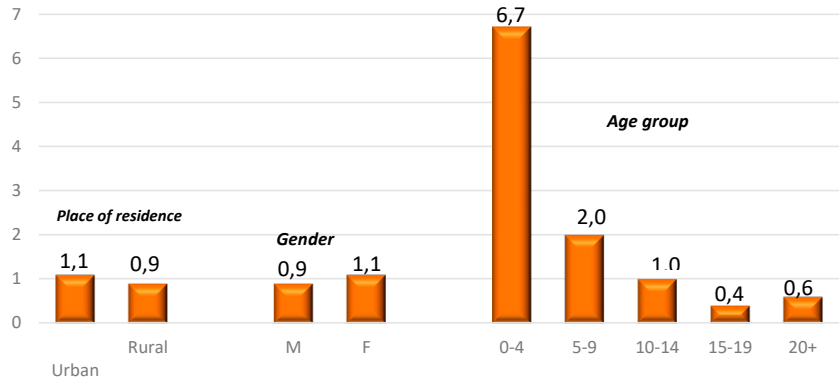


Fig. 8.19. Pertussis incidence in 2022 by place of residence, sex and age (source: NIPH NIH-NRI)

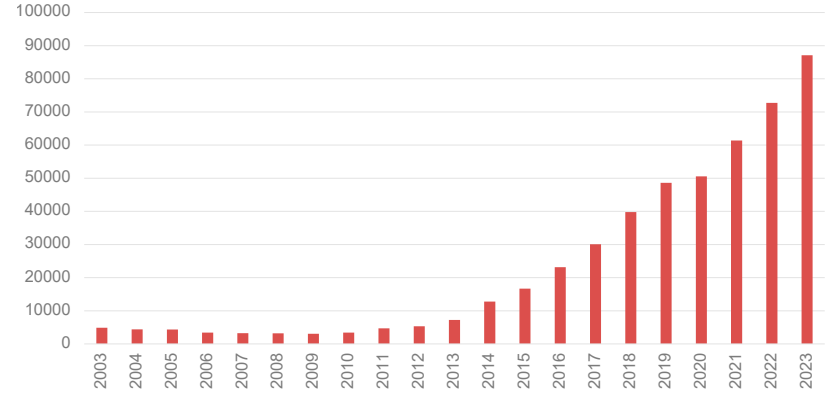


Fig. 8.20. Number of persons evading mandatory vaccinations between 2003 and 2023 (source: NIPH NIH-NRI)

This situation arises, on the one hand, from the growing number of proponents of anthroposophical philosophy, a lifestyle in harmony with nature, religious beliefs, and the strengthening of the anti-vaccination movements, and on the other hand, from the aggressive and often misleading information disseminated by these movements regarding the alleged harmfulness and dangers associated with vaccination. It is important to emphasise that the continued upward trend in the number of people refusing vaccinations poses a risk of the return of epidemics of diseases that have been brought under control through immunisation in the coming years.

Adverse vaccine reactions, known as AEFI (Adverse Events Following Immunisation), which have been subject to mandatory reporting and registration for just under 30 years (the reporting and registration system has been in

operation since 1996), constitute a key tool for assessing vaccine safety in our country. AEFIs are a consequence of vaccinations administered using vaccines registered and marketed in Poland. An increase in the number of reported AEFIs has been observed since the beginning of the registration system until 2023. This should be interpreted as a reflection of the steadily increasing sensitivity of the surveillance system, rather than an actual increase in vaccine reactogenicity. Furthermore, one must consider the several-fold increase in the number of vaccine products used and the types of reactions described over 30 years of surveillance. Equally important from the perspective of surveillance and vaccine safety is the application of a very broad definition of an adverse event following immunisation – one that, under legal regulations, is recognised or suspected by a physician. Reportable reactions include those described in the Summary of Product Characteristics (SmPC), as well as any adverse symptom/reaction occurring within 30 days post-vaccination that may be related to the vaccination. This corresponds to the definition of an Adverse Medical Event. Both AEFIs and Adverse Medical Events are subject to reporting and registration. In 2023, physicians identified and reported a total of 3,857 AEFIs to the State Sanitary Inspection, following vaccinations carried out under the Mandatory Vaccination Schedule and against COVID-19. Of these, 3,371 were classified as mild (87% of all AEFIs), 410 as moderate (11%), and 76 as severe (2.0%). The importance of monitoring adverse events following immunisation is multifaceted. On the one hand, it aims to detect the occurrence of new, atypical and rare reactions, as well as to monitor already known adverse events. On the other hand, it serves to identify risk factors for specific types of reactions, detect vaccine batches with an increased incidence of adverse events, and assess the safety of newly introduced vaccines. It is therefore one of the most essential tools for controlling the post-registration safety of vaccines.

Other infectious diseases

Human immunodeficiency virus (HIV) infections

According to the ECDC report, 24,731 new HIV infections were recorded in 30 EU/EEA countries in 2023 (notification rate of 5.3 per 100,000 population)[8]. The highest rate was reported in Malta (21.0 – 114 HIV infections), and the lowest

[8] European Centre for Disease Prevention and Control/WHO Regional Office for Europe. HIV/AIDS surveillance in Europe 2024 – 2023 data. Stockholm: ECDC; 2024

in Slovenia (2.1 – 44 HIV infections) and Austria (2.1 – 194 HIV infections). A notification rate exceeding 10 per 100,000 population was registered in as many as six countries. In Poland, the rate stood at 6.0, slightly above the average notification rate for the entire European Union. More than 46% of reported infections were among men who have sex with men (MSM). This is the predominant route of transmission in most Western and Central European countries, according to WHO regional classification. In contrast, in countries of Eastern Europe, a region that includes non-EU/EEA member states, the dominant transmission route is heterosexual contact (over 70%), followed by infections among people who inject drugs (18.4%). In 2023, the notification rate of new HIV diagnoses in Western EU/EEA countries increased by over 47% compared with 2021 (from 4.2 to 6.2 per 100,000 population), likely due to the renewed reporting of infections among migrants, primarily from Ukraine, who were received by various countries in connection with the armed conflict in Ukraine. A similar increase was observed in Central European countries – from 3.2 per 100,000 population in 2021 to 4.2 in 2023 (Fig. 8.21). Only Eastern European countries recorded a decrease in the number of infections, by approximately 6% in 2023 compared to 2021, probably due to the onset of migration from Eastern Europe to Central and Western European countries as a result of the armed conflict in Ukraine.

The influx of such a large group of HIV-infected migrants required ensuring access to antiretroviral therapy (ART). At the beginning of 2022, a group of 47 infectious disease experts from 24 countries, affiliated with Euroguidelines in Central and Eastern Europe (ECEE), participated in a survey assessing their respective countries' capacity to provide care for these individuals[9]. Most HIV centres in countries that received refugees from Ukraine (14 countries) were able to organise a rapid response to the needs of migrants, including access to medical consultations and the provision of ART during the first visit (in over 80.0% of centres). Access to treatment continuation was ensured for a period of 30 to 90 days, depending on the policies adopted by the respective country/centre.

Prior to the COVID-19 pandemic, Poland experienced a steady and fairly dynamic increase in the notification rate of newly diagnosed HIV infections, which rose from 2.9 per 100,000 population in 2012 to 3.7 per 100,000 in 2017. In the following

[9] Kowalska J D.; Rukhadze N, Sojak L, Bociaga-Jasik M, Sedlacek D, Matulionyte R, Jilich D, Yancheva N, Papadopoulos A, Rozplochowski B, Patrascu R, Aimla K, Begovac J, Parczewski M, Golovco E, Bielec D, Bartovská Z, Shembri A, Zvirbulis V, Hlebowicz M, Kocbach P, Lakatos B, Preliminary report on the provision of HIV care to war refugees with HIV who are migrating from Ukraine: data from the ECEE Network Group. AIDS 36(13):p 1887-1890, November 1, 2022. Doi. 10.1097/QAD.0000000000003355

years, a slight decrease in the rate was observed. Additionally, in 2020 – the onset of the pandemic – the rate dropped significantly to 2.5 cases per 100,000 population. However, in the subsequent years, a return to pre-pandemic levels became evident, with a rate of 3.8 per 100,000 population in 2021. In 2022, due to the influx of individuals infected with HIV from Ukraine as a result of the armed conflict, the rate of new infections increased to 6.9 per 100,000 population and remained at a similar level in 2023 – 6.4 cases per 100,000 population (Fig. 8.21). The number of infections detected among foreign nationals increased from 72 in 2020 to 136 in 2021, and in 2022, i.e. following the rise in migration, the number of reported HIV cases reached as many as 714, more than half of whom had been diagnosed while still in Ukraine (370 out of 714). However, in the absence of documentation to continue antiretroviral therapy, it was necessary to conduct HIV testing in Poland. On this basis, the individual was included in epidemiological surveillance as a newly diagnosed case of HIV infection.

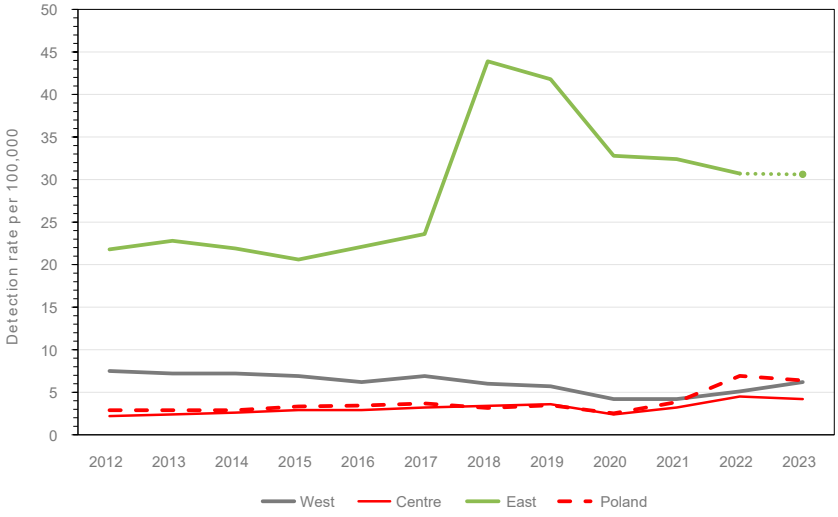


Fig. 8.21. HIV incidence rate per 100 000 inhabitants between 2012 and 2023 in Poland and WHO European subregions (source: ECDC HIV surveillance report 2023 and individual data from Epibaza, NIPH NIH-NRI)

A marked variation in the trends of detection and registration of new HIV infections is evident, with the vast majority of diagnoses made among men (Fig. 8.22). However, it is also important to note the growing number of infections among women – largely due to the registration of infections in women who arrived from Ukraine. In 2022, infections among Ukrainian women accounted for 51.1% of all infections in women (428 out of 838 cases), and in 2023 – 48.3% (290 out of 601 cases). Nevertheless, excluding infections among Ukrainian women and considering only those cases

where the stated nationality was Polish, the number of infections in women increased from 79 cases in 2020 to 105 in 2023. It is also important to bear in mind the rising number of cases where no nationality was reported, suggesting that, due to these reporting gaps, the actual increase in diagnoses among Polish women was likely even greater. Between 2021 and 2023, women accounted for 26% of all newly diagnosed HIV cases, with regional variation ranging from 17.5% in the Małopolskie Voivodeship to 38.3% in the Lubuskie Voivodeship (Table 8.3).

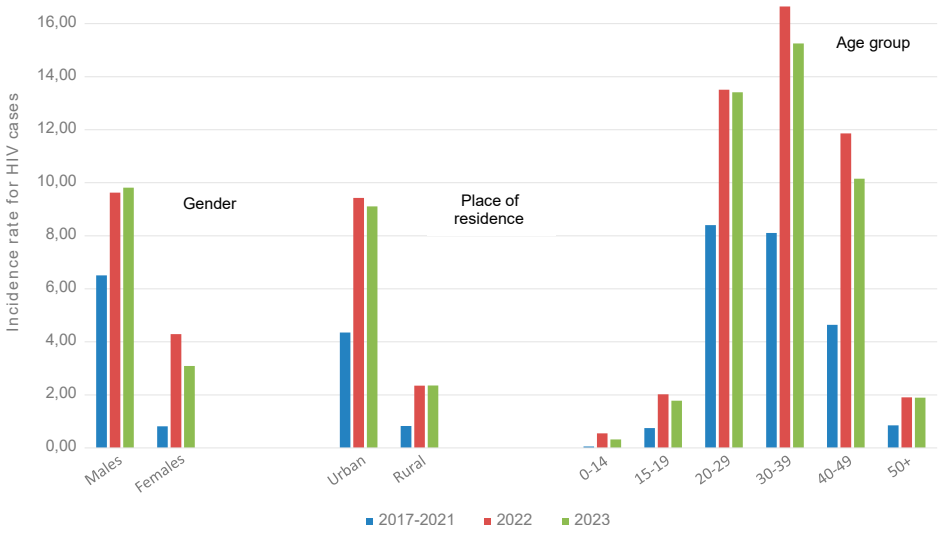


Fig. 8.22. Notification rate of newly diagnosed HIV infections in Poland between 2017 and 2023 by sex, age group, and place of residence (source: individual data from Epibaza, NIPH NIH–NRI)

The trend in infections across different age groups has not changed over time, with the highest number of cases still being reported among individuals aged 30–39 years. However, a notable increase in infections among older individuals should be highlighted – a 54.3% rise in the 40–49 age group and a 122.4% increase among those aged 50 and over (Fig. 8.22). Although the majority of these infections concern people migrating to Poland, this is still a significant group representing a population at risk of transmission. Similarly, the increase in infections among children aged 0–14 years is linked to the registration of vertically transmitted infections that had already been diagnosed in Ukraine. These cases were included in Poland's epidemiological surveillance system as individuals who had been diagnosed previously and are now residing in Poland. However, they do not represent new mother-to-child transmissions.

In 2023, the highest notification rates of new infections, exceeding 6 cases per 100,000 population, were recorded in the following voivodeships: Dolnośląskie, Łódzkie, Małopolskie, Mazowieckie, Pomorskie, and Zachodniopomorskie.

Among individuals with a known route of transmission, infections were most frequently reported among men who have sex with men (MSM), accounting for 55.1% of all cases between 2021 and 2023. Infections acquired through heterosexual contact constituted 34.8% of all reported cases. The distribution of infections among MSM varies geographically: in the Małopolskie, Mazowieckie, and Wielkopolskie voivodeships, infections in this group accounted for more than 70% of all cases with a known route of transmission. Conversely, infections among MSM were least frequently reported in the Warmińsko-Mazurskie voivodeship – 14.8% of male cases. Infections transmitted through heterosexual contact accounted for half of all reported cases in the Opolskie, Warmińsko-Mazurskie, and Zachodniopomorskie voivodeships (Table 8.3).

Table 8.3 Rates of newly detected HIV infections per 100 000 inhabitants between 2017 and 2023 and characteristics of infections detected in 2021-2023, by voivodeship (source: unit data from Epibaza, NIPH NIH-NRI)

Voivodeship	2017-2021	2022	2023	Cases diagnosed in 2021-2023			
				%female	%MSM*	%PWID*	%MSW,WSM*
DOLNOŚLĄSKIE	5.14	12.19	10.07	33.8%	50.9%	7.9%	28.1%
KUJAWSKO-POMORSKIE	2.51	6.28	4.71	25.4%	57.1%	2.0%	38.8%
LUBELSKIE	1.56	2.67	2.64	24.8%	53.6%	7.1%	35.7%
LUBUSKIE	4.05	6.84	5.03	38.3%	28.6%	19.0%	47.6%
ŁÓDZKIE	3.56	7.32	6.35	29.1%	50.9%	4.5%	32.7%
MAŁOPOLSKIE	4.33	11.02	8.95	17.5%	80.6%	2.4%	15.8%
MAZOWIECKIE	5.77	10.85	8.98	20.2%	71.1%	3.9%	19.7%
OPOLSKIE	2.12	4.46	5.66	34.4%	21.3%	6.4%	63.8%
PODKARPACKIE	1.36	2.50	2.85	18.1%	67.9%	7.1%	21.4%
PODLASKIE	1.73	3.50	2.28	34.1%	44.7%	14.9%	38.3%
POMORSKIE	4.24	7.38	9.28	29.2%	48.6%	6.0%	42.1%
ŚLĄSKIE	4.51	1.59	5.37	21.7%	51.1%	8.7%	38.0%
ŚWIĘTOKRZYSKIE	0.80	0.85	0.60	20.0%	54.5%	0.0%	45.5%
WARMIŃSKO-MAZURSKIE	1.81	2.49	3.17	29.3%	14.8%	22.2%	63.0%
WIELKOPOLSKIE	3.71	6.24	5.73	26.6%	79.2%	5.7%	15.1%
ZACHODNIOPOMORSKIE	3.29	13.84	7.91	38.2%	25.3%	5.5%	66.4%
POLAND	3.88	6.92	6.39	25.9%	55.1%	6.0%	34.8%

*percentages relative to cases with a known route of transmission (21.7% of notifications);
MSM – men who have sex with men; PWID – people who inject drugs; MSW, WSM – heterosexuals

In response to the rising number of newly diagnosed HIV infections, the Ministry of Health introduced, as of 5 May 2025, changes to the guaranteed services package within primary healthcare (PHC, Polish: POZ). These changes allow PHC physicians to order HIV testing without requiring patients to visit a Consultation and Diagnostic Centre or to undergo testing privately at other medical laboratories. The initiative is intended to expand access to HIV diagnostics and increase the HIV testing rate in Poland.

Hepatitis C

The achievement of the global strategy for the elimination of hepatitis C virus (HCV) infection as a public health problem, particularly regarding the detection of chronic infections, was significantly hampered during the COVID-19 pandemic. The HCV detection rate in EU countries in 2020 fell by more than half and in Poland it declined 3.5-fold, remaining at a low level throughout 2021.

In 2022, the number of newly diagnosed cases in EU/EEA countries returned to pre-pandemic levels (6.2 per 100,000 population, compared with 5.7 in 2019). In Poland, the HCV detection rate increased significantly in 2022 but remained below pre-pandemic values. It was only in 2023 that the rate reached a level comparable to 2019 (Figure 8.23 A). As of July 2022, primary healthcare facilities were authorised to perform anti-HCV testing within their allocated diagnostic budget.

Despite this, improvements in HCV detection remain insufficient, reflecting persistent barriers to testing. In particular, following the introduction of this mechanism, the patterns of detection did not change significantly: cases identified in primary healthcare continued to account for the largest proportion, approximately one-third, with a slight upward trend observed in 2023, reaching 41% (Figure 8.23 B). The lack of significant change is partly due to the still relatively short observation period and the incomplete utilisation of this instrument by PHC facilities. It should also be noted, however, that the diagnostic budget allocation applies to tests performed on medical indications (i.e. non-screening tests) and is subject to a predetermined limit. In 2022, this amounted to 60 tests per 10,000 individuals under care within a six-month accounting period.

Estimated analyses conducted in 2019 indicate that the number of chronic HCV cases in EU/EEA countries reaches nearly 1.8 million, while in Poland it is approximately 108,000. Given the wide availability of effective treatment, the main barrier to HCV elimination remains insufficient diagnosis. As infection prevalence declines, increasing detection will require a radical expansion of testing, including screening directed at the general population.

Limitations in access to screening for the general population, the lack of targeted diagnostic programmes for people who use or are dependent on psychoactive substances and difficulties in accessing treatment within this group may constitute the main barriers to achieving HCV elimination targets in Poland.

It is also worth noting the significant decline in the number of acute HCV cases during the pandemic. Although an increase has been observed post-pandemic, the number of new cases remains below pre-2020 levels.

Similar to HBV, the epidemiology of HCV in 2022-2023 was influenced to some extent by increased migration. Overall, individuals of Ukrainian nationality accounted for approximately 10% of registered HCV cases.

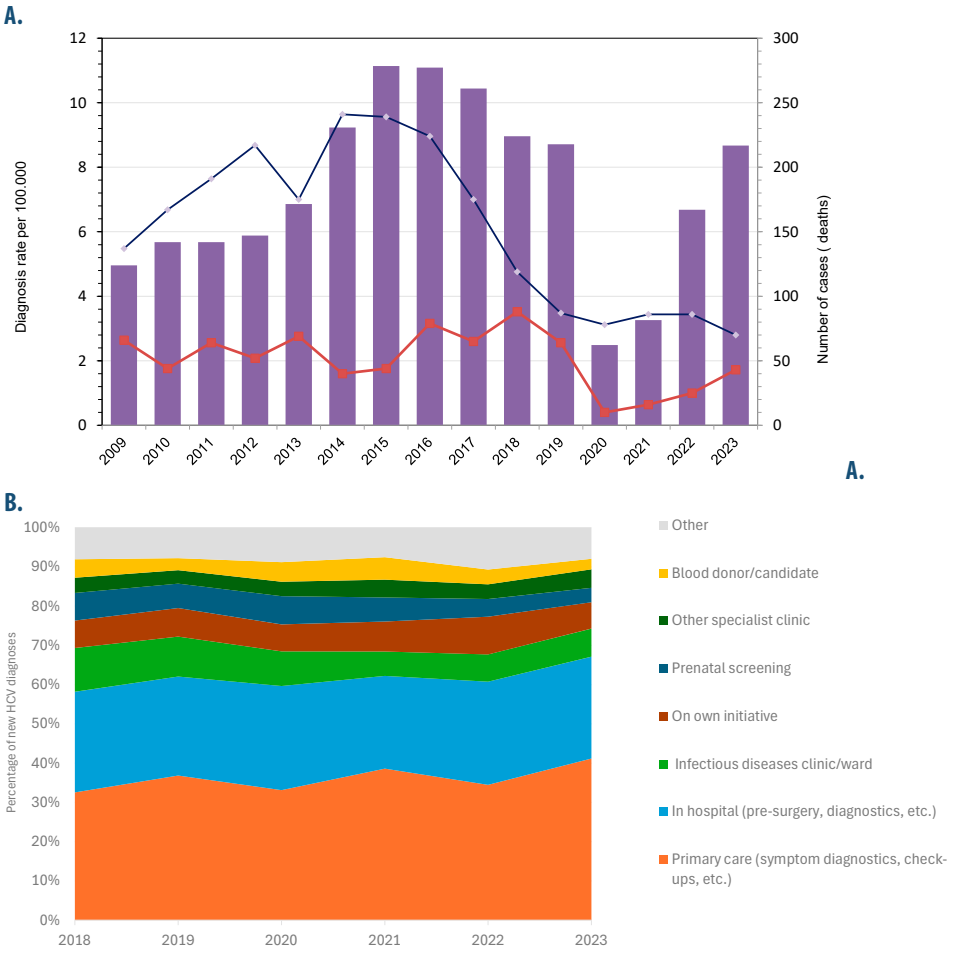


Fig. 8.23. The incidence of HCV infection per 100,000 population and the number of acute cases and deaths due to hepatitis C, ICD-10 codes B17.1, B18.2 (source: epidemiological surveillance data and Statistics Poland – GUS)

Food poisoning and foodborne infections

Foodborne diseases constitute a broad group of disease entities that vary in terms of the pathogens causing them and their clinical manifestations, with the common characteristic being the route of infection. They represent a significant public health problem, serving as a key indicator of food safety and the level of sanitary and hygienic conditions in households, food preparation and serving places within collective catering, as well as in food production facilities, including primary production. The dynamics of incidence of bacterial infections and food poisoning since 1981 is shown in Figure 8.24.

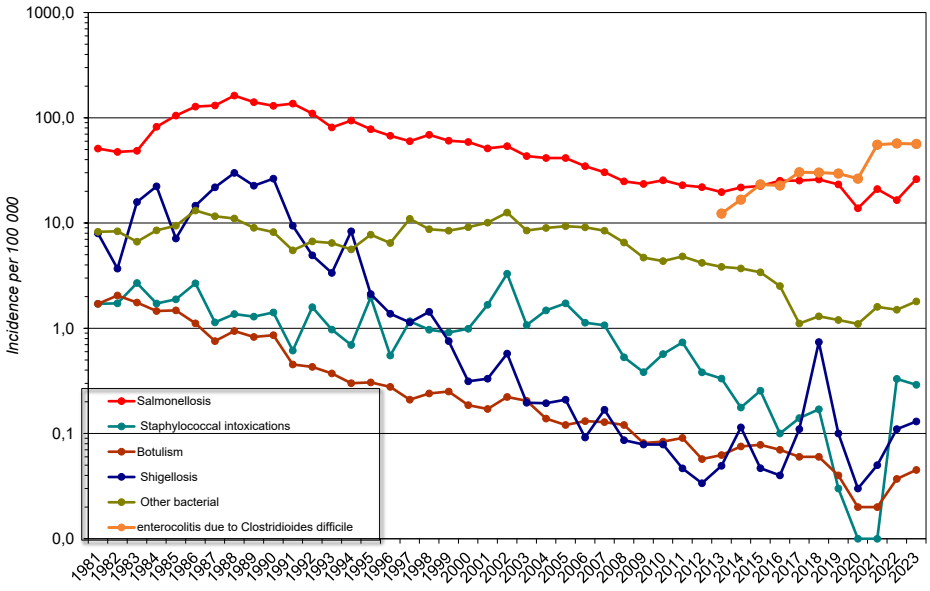


Fig. 8.24. Incidence of salmonellosis and other bacterial food poisoning and foodborne infections between 1981 and 2023 (source: NIPH NIH-NRI)

The logarithmic scale curves reveal significant differences in incidence between individual diseases, illustrating the declining trends in the incidence of salmonellosis, bacterial dysentery, botulism, and staphylococcal toxin poisoning up to 2020. However, in 2021, the second year of the pandemic, and in the following years, the values for most diseases began to rise, surpassing in 2023 the levels recorded in 2019. One disease entity in this group that has shown a very strong upward trend is intestinal infections caused by *Clostridioides difficile*. In 2013, when the registration of infections caused by these bacteria was first separated as a distinct category,

4,738 cases were reported. In subsequent years, there was a steady increase in the number of recorded cases, which more than doubled by 2017, reaching over 11,000 cases, and since then, it has stabilised at this level, amounting to 11,310 cases in 2019 (incidence rate: 29.5/100,000 population). In 2020, a slight decline in the number of registered *Clostridioides difficile* infections was observed, with a total of 10,139 cases (incidence rate: 26.4/100,000 population). However, in 2021, these figures more than doubled, reaching 21,174 cases, which corresponded to an incidence rate of 55.5/100,000. In the following two years, the numbers of cases remained very similar, with incidence rates of 57 and 56.4/100,000 in 2022 and 2023, respectively.

In Poland, *Salmonella* bacteria have been the dominant cause of foodborne infections for many decades. Among them, *S.* Enteritidis is the most commonly encountered serotype. In 1991, the percentage of all foodborne outbreaks/infections caused by this pathogen exceeded 90% (Fig. 8.25).

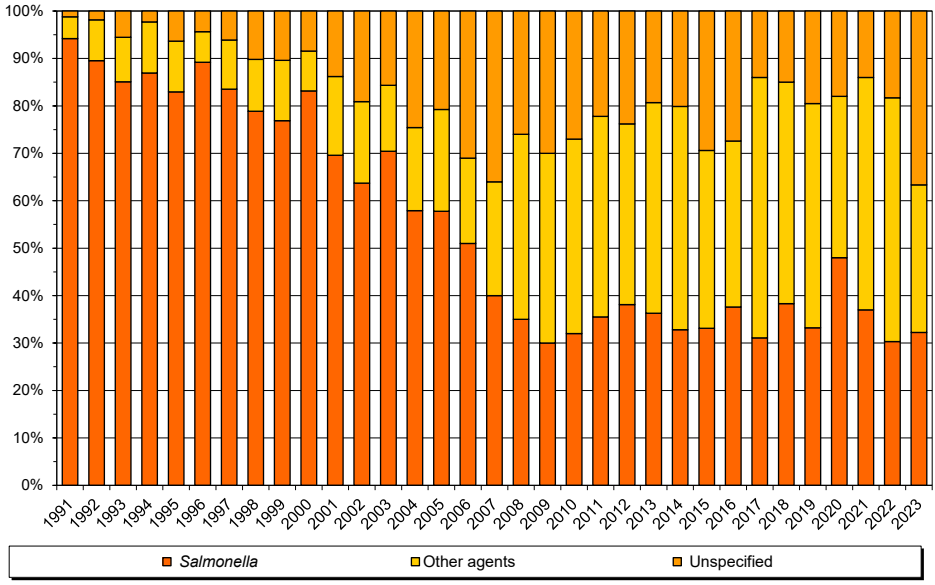


Fig. 8.25. Outbreaks of food poisoning and foodborne infections in Poland between 1991 and 2023 by aetiological agent (source: NIPH NIH–NRI)

However, the share of these pathogens among the factors responsible for outbreaks has steadily decreased, and in the years leading up to the pandemic, it did not exceed 40%. At the same time, the proportion of foodborne infections caused by other identified factors has increased, with a growing trend of infections caused by viruses. This

situation changed in 2020, when outbreaks caused by *Salmonella* species accounted for almost 48% of all reported outbreaks, although their numbers were still significantly lower than in the years prior to the pandemic. In subsequent years, the share of salmonellosis outbreaks decreased, making up 31.1% of all outbreaks in 2023. From 2011 to 2021, the percentage of foodborne outbreaks and infections in Poland where the aetiological agent was not identified steadily decreased, although in some years it still reached nearly 30%, and in 2023, it even rose to 36.6%, despite the rapidly expanding availability of molecular testing for intestinal pathogens.

Aetiological agents of foodborne diseases other than *Salmonella* are identified much less frequently, which is also a consequence of less frequent testing for these pathogens. A period of significant increase in the incidence of salmonellosis occurred in the second half of the 1980s. The 1990s saw a clear decrease in the incidence of foodborne infections caused by *Salmonella* bacteria, and since the second half of that decade, the incidence in Poland has not significantly differed from the average for EU countries (Fig. 8.26). However, since 2016, there has been an increase in both the number and incidence of salmonellosis, which was primarily the result of the introduction of *Salmonella-contaminated eggs from Poland into domestic and international markets.* This led to the emergence of an international outbreak that persisted from 2016 to 2019, with an increase in cases during the summer season in each of the subsequent years.

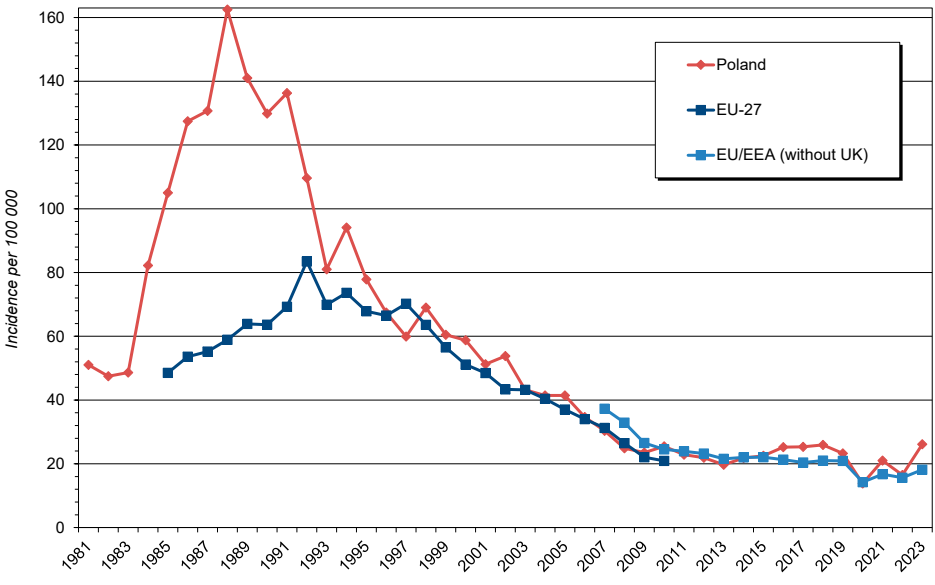


Fig. 8.26. Salmonellosis incidence in Poland and average in EU countries between 1981 and 2023 (source: WHO HFA DB, ECDC Atlas)

In 2020, the incidence of salmonellosis in Poland was even slightly lower than the average incidence in EU/EEA countries, but in 2021, it was again higher by more than 4 percentage points, and in 2023, by almost 8.

The incidence of salmonellosis, similarly to other foodborne diseases, is highest and most frequently reported in the youngest age groups. Among children aged 0–4 years, it reached 221.2 per 100,000 population in 2023, exceeding the levels recorded in the pre-pandemic year 2019. The highest incidence was observed among children aged 2, 3, and 4 years – 275.5, 251.3, and 224.9 per 100,000, respectively. Subsequently, the incidence declined, reaching its lowest level of 5.9 in the 40–44 age group, before gradually increasing in the older age groups, peaking at 14.9 per 100,000 among persons aged 75 and over. Incidence rates among men and women, as well as between rural and urban populations, did not differ significantly (Fig. 8.27).

There are significant territorial differences in the incidence of salmonellosis. In 2023, the incidence across individual voivodeships ranged from 11.3 per 100,000 population in the Zachodniopomorskie voivodeship to 51.1 in the Podkarpackie voivodeship (Fig. 8.28). The Podkarpackie voivodeship has consistently recorded the highest incidence rates of salmonellosis for many years.

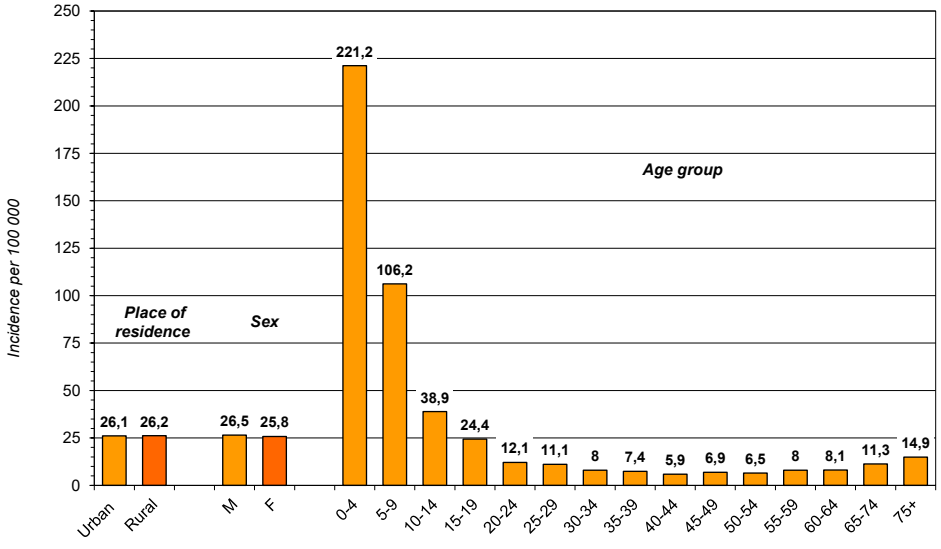


Fig. 8.27. Salmonellosis incidence by place of residence, sex and age in 2023 (source: NIPH NIH-NRI)

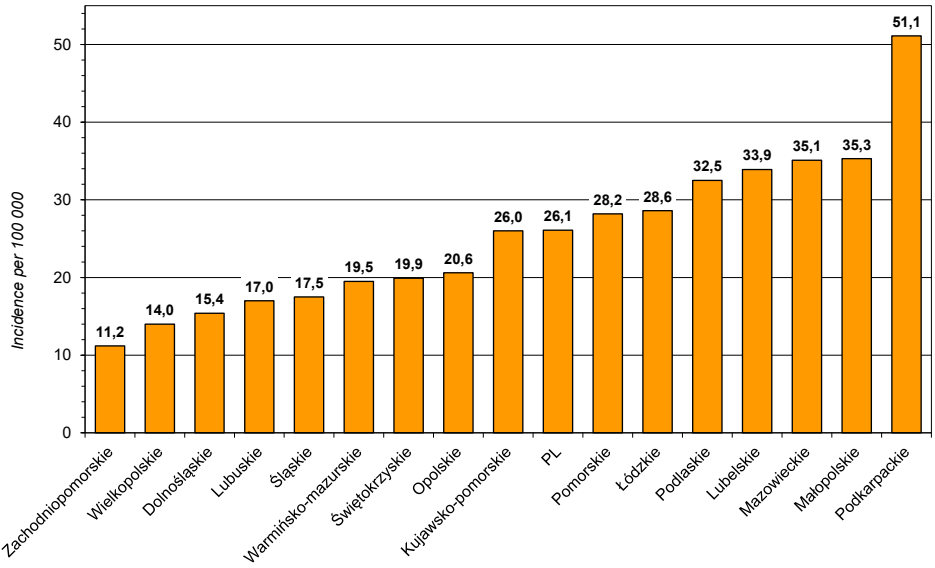


Fig. 8.28. Incidence of salmonellosis in 2023 by voivodeship (source: NIPH NIH-NRI)

Two very important types of bacteria responsible for foodborne infections, *Campylobacter* and *Yersinia*, are being diagnosed with increasing frequency in Poland, although still much less often than in other European Union countries. Since 2002, infections caused by *Campylobacter spp.* have been reported as a distinct entity within the infectious disease surveillance system. The number of diagnosed and reported cases of campylobacteriosis has increased year by year, along with the geographic areas in which the disease has been recognised and registered. In 2003 and 2004, reports came only from the Małopolskie and Mazowieckie voivodeships. In the following years, more voivodeships joined, as laboratories gradually implemented methods for detecting *Campylobacter* bacteria in clinical specimens. In 2017, the highest number of campylobacteriosis cases to date, 877, was reported from all 16 voivodeships (though in two of them only isolated cases were recorded). In the next two years, the number of reported cases declined to 726 and 715 in 2018 and 2019, respectively. In the first year of the pandemic, the number of recorded cases did not exceed 500. In contrast, in 2021, the number rose to 632, and by 2023 it had reached 862 cases. The slow yet steady increase in the number of reported cases is likely a result of several factors: the growing number of laboratories conducting diagnostic testing in this area, the wider adoption of molecular diagnostic methods, increased awareness among physicians regarding the possibility of intestinal infections caused by this

pathogen, and the introduction of mandatory reporting by laboratories of positive diagnostic results for these pathogens. In 2003, nearly 87% of individuals diagnosed with campylobacteriosis were hospitalised. In subsequent years, this proportion declined, reaching 54.1% in 2010. However, from 2013 onwards, it began to rise again, reaching 81.4% in 2019. In the following two years, it began to slowly decline reaching 76.8% in 2020 and 78.2% in 2021, but between 2022 and 2023 it again exceeded 80%. Such high hospitalisation rates indicate significant underdiagnosis and underreporting of campylobacteriosis, with testing primarily conducted among patients requiring hospital care.

Infections caused by *Yersinia* species are also being reported with increasing frequency. In the first two years of reporting this disease (2003 and 2004), the number of reported cases was 71 and 84, respectively. In 2005, 136 cases were reported to the surveillance system. A similar number of cases, 140, was recorded in 2006, and 206 in 2010. From that year until 2019, the number of yersiniosis cases remained relatively stable. In 2020, there was a marked decline in reported cases, with a total of 117 registered, and 142 in 2021. In 2022 and 2023, the number of cases increased to 180 and 313, respectively. Since the beginning of yersiniosis reporting, the percentage of patients hospitalised due to the disease has varied, ranging from 59.2% in 2003 to 83.1% in 2005. In 2022 and 2023, the hospitalisation rates were 58.3% and 53.4%, respectively. Significant regional variation in hospitalisation rates has also been observed in recent years.

Other bacterial foodborne diseases recorded in Poland, such as botulism, staphylococcal toxin poisoning, and bacillary dysentery, currently occur in small numbers and play a lesser role as public health threats. In the case of dysentery, a significant increase in the number of cases occurred in 2018, with a total of 284 cases registered. This number mainly resulted from two outbreaks: one within the country, although affecting an international community, and the other linked to holiday travel by Polish citizens to Albania. Following a decline in 2020 and 2021 to 12 and 18 cases, respectively, the number of cases began to rise again in 2022 and 2023, reaching 43 and 50 cases.

There was a notable increase in the number of infections caused by verotoxigenic *Escherichia coli* in 2022 and 2023, reaching 36 and 96 cases, respectively.

In the case of hepatitis A, following an epidemic increase between 2017 and 2019, linked to an outbreak in Western European countries among men who have sex with men, the number of cases declined significantly in 2020 and 2021, with 111 and 92 cases reported, respectively. These figures correspond to the levels recorded in Poland prior to 2017. In 2022 and 2023, the number of cases increased again, reaching 233 and 206, respectively.

Sexually transmitted infections

According to the World Health Organisation (WHO), sexually transmitted infections should be treated as a priority due to the continuously increasing number of new cases. According to CDC[10] surveillance data, in 2023 over 2.4 million new STI cases were reported in the United States. The most common infections were caused by *Chlamydia trachomatis* (1,648,568 cases of chlamydia), *Neisseria gonorrhoeae* (601,319 cases of gonorrhoea), and *Treponema pallidum* (209,253 cases of syphilis). Chlamydia infections are most frequently recorded among young people aged 15–29 years – accounting for 73.7% of all cases. Available data on Neisseria gonorrhoeae infections indicate a decrease of more than 7% compared to 2022. Infections caused by Treponema pallidum have declined by approximately 13% among men who have sex with men (MSM); however, this population group still represents the majority of *Treponema pallidum* infections.

In most countries, surveillance of sexually transmitted infections is mandatory, and case reporting is required from all medical institutions. In some countries, a sentinel surveillance system has been introduced, whereby more detailed information on infections is reported only by selected healthcare centres. In some countries, e.g. the United Kingdom, a high number of detected cases results from population-wide screening programmes[11].

Syphilis incidence in Europe showed an upward trend between 2012 and 2019, increasing from 4.67 per 100,000 population in 2012 to 7.53 in 2019. In subsequent years, the incidence declined to 5.63 in 2020, but then rose again, reaching 9.97 per 100,000 in 2023. The observed decrease in reported cases was likely related to the exclusion of data from the United Kingdom following its departure from the EU. The significant increase in cases already observed in 2022 primarily concerned men, with the highest number of cases reported among men who have sex with men (MSM). Among those with a known route of transmission, MSM accounted for nearly 72% of syphilis infections in 2023[12].

In 2023, a total of 41,051 confirmed syphilis cases were reported in 29 EU/EEA countries. The incidence rate was 9.97 per 100,000 population, with the lowest rate recorded in Latvia, 0.8 per 100,000 (15 cases), and the highest in Luxembourg, 24.8 per 100,000 (164 cases).

[10] Sexually Transmitted Infection Surveillance, 2023, CDC, (available at: https://www.cdc.gov/sti-statistics/annual/index.html)

[11] European Centre for Disease Prevention and Control. Annual epidemiological report for 2017. Surveillance systems overview for 2017 [Internet; Excel workbook]. Stockholm: ECDC; 2018

[12] European Centre for Disease Prevention and Control. Syphilis. In: ECDC. Annual epidemiological report for 2023. Stockholm: ECDC; 2025

Poland, with an incidence rate of 8.1 (calculated based solely on laboratory-confirmed cases), was among 14 countries with an incidence rate below 10 per 100,000 population.

The incidence recorded in Poland, including cases classified according to the national case definition used for infectious disease surveillance (which includes possible, probable, and confirmed cases[13]), was 6.95 per 100,000 in 2023, which remains below the European average. However, Poland has also experienced a marked increase in reported cases in recent years – from 3.44 per 100,000 in 2013, to 4.45 in 2017, and up to 6.95 per 100,000 in 2023 (Fig. 8.29).

There is a notable variation in syphilis treatment rates between voivodeships. For example, the treatment rate ranged from 1.16 per 100,000 in the Podkarpackie voivodeship to 16.25 in the Mazowieckie voivodeship, which accounted for 34.2% of all reported infections (Fig. 8.30). In 2023, the majority of syphilis cases were treated[14] at the clinical stage of early syphilis – almost 60%, with the majority being symptomatic cases in the most infectious stage (over 70% of early syphilis cases in 2023).

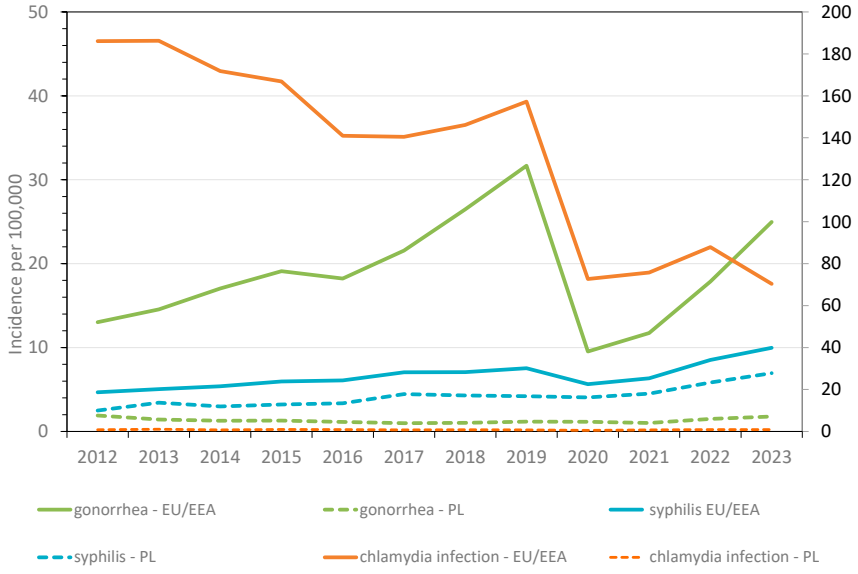


Fig. 8.29. Average incidence of syphilis, gonorrhoea and chlamydia per 100,000 population in EU/EEA countries and in Poland between 2012 and 2023 (source: e-Health Centre: MZ-14 and ECDC surveillance atlas)

[13] Case definitions for infectious diseases for the purpose of epidemiological surveillance, draft version (6c), January 2025, Department of Epidemiology and Surveillance of Infectious Diseases, NIPH NIH-NRI (available at: https://wwwold.pzh.gov.pl/oldpage/epimeld/inne/Def_PL2_6c.pdf)

[14] Bulletin: Infectious Diseases and Poisonings in Poland in 2023, NIPH NIH-NRI; https://wwwold.pzh.gov.pl/oldpage/epimeld/2023/Ch_2023.pdf.

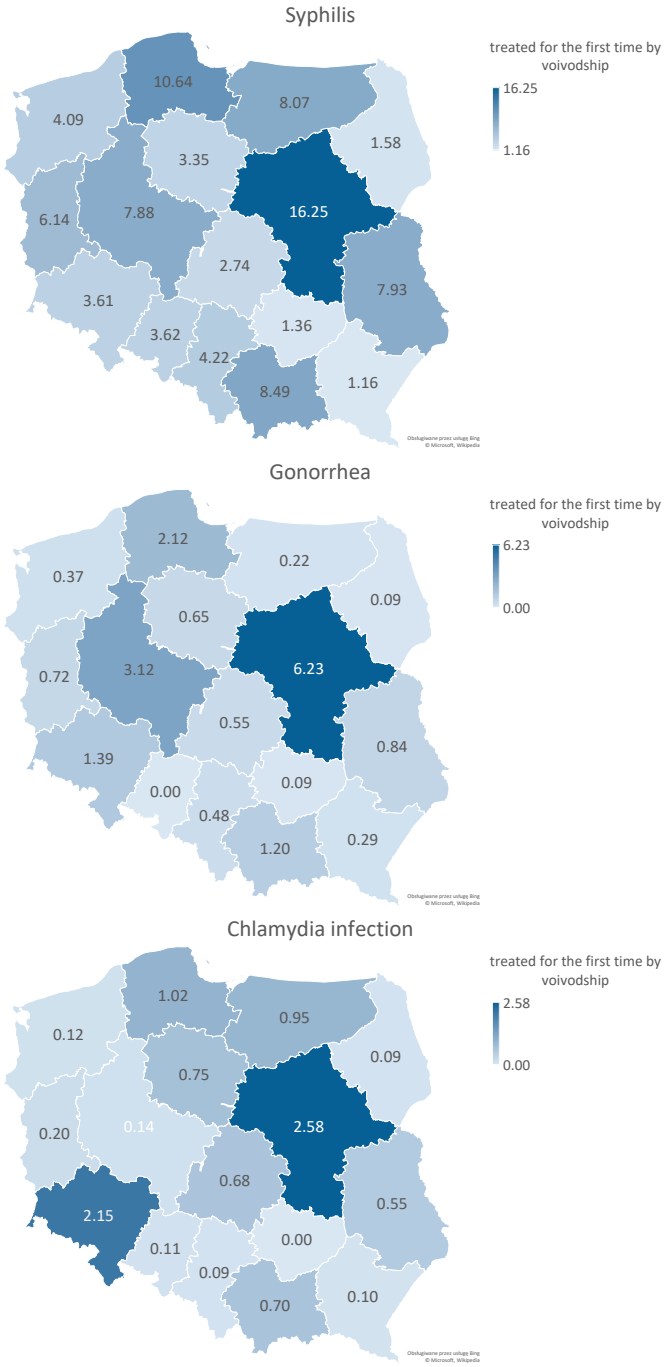


Fig. 8.30. Number of individuals treated for syphilis, gonorrhoea and chlamydia in individual voivodeships in Poland per 100,000 population in 2023 (Source: NIPH NIH-NRI Bulletin based on data from the e-Health Centre: MZ-14)

The incidence of gonorrhoea, similarly to syphilis, has also shown an upward trend across European Union countries[15]. Between 2012 and 2019, incidence rates ranged from 13.02 to 31.67 per 100,000 population. The turning point, as with syphilis, was 2019, when the incidence dropped significantly to 9.53 per 100,000. This was likely linked to the exclusion of UK cases from EU statistics. Nevertheless, the incidence rate more than doubled in the following years, reaching 24.96 per 100,000 in 2023.

In 2023, 96,969 confirmed cases of gonorrhoea were reported from 28 EU/EEA countries, with an overall incidence of 25.0 per 100,000 population. The rates ranged from 0.2 in Romania (30 cases) to 122.2 in Ireland (6,440 cases). Among women, the highest incidence was recorded in the 20–24 age group (72 cases per 100,000), while among men, the dominant group was aged 25–34 years (131 cases per 100,000). Infections among men who have sex with men (MSM) accounted for over 58% of all reported gonorrhoea cases in 2023. Poland, with an incidence rate of 3.3 (cases reported to ECDC based on the year of notification), was among the 10 countries with an incidence rate below 10 per 100,000 population.

Although the incidence of gonorrhoea in Poland is also increasing, from 1.01 in 2021 to 1.78 per 100,000 in 2023, it remains disproportionately low compared to other EU countries (Fig. 8.29). This is most likely due to a low number of diagnostic tests being performed, underreporting by infected individuals, and/or failure to report cases to epidemiological surveillance systems. This is suggested by the highly uneven geographic distribution of cases across voivodeships. In the Mazowieckie voivodeship, the treatment rate in 2023 was 6.23 per 100,000 population, 343 cases in total, while in other voivodeships the number of treated cases ranged from 1 in Podlaskie and Świętokrzyskie to 109 in Wielkopolskie (Fig. 8.30).

In EU countries, the most common sexually transmitted infection remains *Chlamydia trachomatis*, which particularly affects young individuals shortly after sexual initiation[16]. Between 2012 and 2019, the incidence of chlamydia in European countries ranged from 146.10 to 186.25 cases per 100,000 population. In the following four years (2020–2023), after excluding data from the United Kingdom, the average incidence rate was 76.7 per 100,000.

In 2023, 230,199 confirmed cases of chlamydia were reported by 27 EU/EEA countries, with an incidence rate of 70.4 per 100,000 population. The lowest rate was recorded in Romania, 0.1 per 100,000 (24 cases), and the highest in

[15] European Centre for Disease Prevention and Control. Gonorrhoea. In: ECDC. Annual epidemiological report for 2023. Stockholm: ECDC; 2025.

[16] European Centre for Disease Prevention and Control. Chlamydia infection. In: ECDC. Annual epidemiological report for 2023. Stockholm: ECDC; 2025

Denmark, 625.5 per 100,000 (37,111 cases). The highest incidence was observed among women aged 20–24 years. Infections among MSM accounted for 20% of all cases and increased by 4% compared to 2022, ranking among the 9 countries with the lowest incidence – below 10 per 100,000 population with a rate of 2.7.

In comparison with these figures, it is clear that *Chlamydia trachomatis* infections are significantly underreported in Poland, with the incidence rate not exceeding 1 per 100,000 population (Fig. 8.29). As with gonorrhoea, this is most likely due to limited diagnostics and underreporting of new infections, particularly by private medical providers. In some voivodeships, only isolated cases of individuals treated for chlamydia infections are recorded annually, fewer than 10 per year, for example, in the Lubuskie, Opolskie, Podkarpackie, Podlaskie, Wielkopolskie and Zachodniopomorskie voivodeships. The highest numbers of cases treated in 2023 were recorded in the Dolnośląskie and Mazowieckie voivodeships, with 62 and 142 cases respectively – treatment rates were 2.15 in Dolnośląskie and 2.58 in Mazowieckie per 100,000 population (Fig. 8.30).

According to ECDC reports, gonorrhoea in EU countries occurs more frequently among men who have sex with men (MSM). In 2023, they accounted for over 58% of all infections. The highest incidence of new cases was observed in individuals aged 20–34 years.

For chlamydia, a growing proportion of infections has been recorded among MSM. Between 2019 and 2023, this increase reached 48% in the group of countries that consistently reported transmission routes for *Chlamydia trachomatis*. Nevertheless, the highest incidence of new infections continues to be observed among women aged 20–24 years (more than 700 cases per 100,000 women).

The incidence rate of new syphilis infections in EU countries is highest among men aged 25–34 years (40 cases per 100,000 population), and infections among men are eight times more common than among women. The majority of cases with a known route of transmission are also reported in the MSM population.

In Poland, according to individual case data reported to epidemiological surveillance in 2023, among persons with a known route of transmission, most infections with *Neisseria gonorrhoeae* and *Treponema pallidum* were transmitted in the MSM group, accounting for 55.9% and 55.1% of all infections, respectively. Gonorrhoea cases among heterosexual individuals constituted 25.5% of all infections, and syphilis cases in this group accounted for 26.9%. The remaining infections were reported as unspecified sexual contacts. In the case of *Chlamydia trachomatis* infections, the highest number of cases was recorded among MSM, 36.0%, as well as among individuals with an unspecified type of sexual contact that could have been the source of infection – 35.2%. Infections among heterosexual individuals accounted for 28.8% of cases.

In 2023, the incidence of syphilis and gonorrhoea was six times and eleven times higher, respectively, among men than among women, which confirms the spread of syphilis and gonorrhoea in the MSM population in Poland, also considering information on the transmission route among those with known exposure. In contrast, in the case of chlamydia, the incidence rate is comparable in both male and female populations.

Syphilis incidence is highest among individuals aged 25–29 and 20–24 years, amounting to 21.88 and 21.19 cases per 100,000 population, respectively. Similarly, the incidence of gonorrhoea and chlamydia is also highest in these same age groups, although the rates are lower – approximately 9 cases per 100,000 population in each of these age groups (Fig. 8.31).

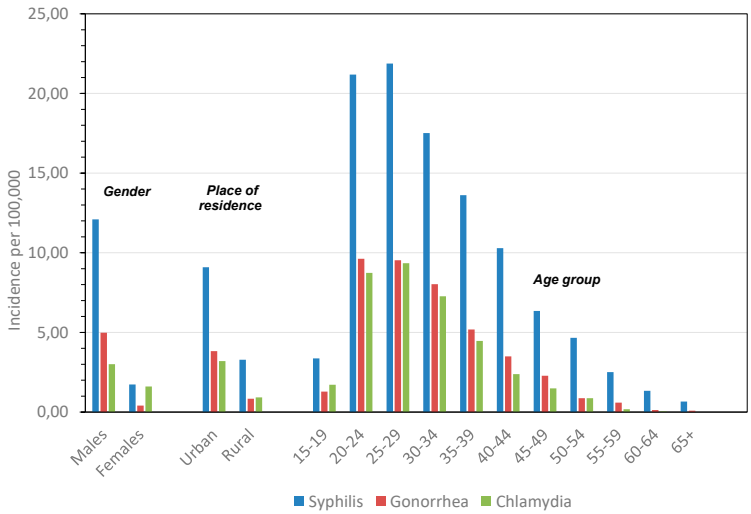


Fig. 8.31. Incidence of syphilis, gonorrhoea and chlamydiosis in 2023 by place of residence, sex and age (source: individual data from Epibaza, NIPH NIH-NRI)

Adult vaccination

Importance of adult vaccination

Vaccinations are important not only for children. The risk of illness and complications from many infectious diseases is significantly higher among unvaccinated adults compared to children. Most severe cases, hospitalisations, cases of disability, and deaths from vaccine-preventable infectious diseases occur in

adults[17]. Vaccinations administered to adults reduce the severity of illness in the event of infection and protect against complications. The COVID-19 pandemic demonstrated how dangerous infectious diseases can be, despite advances in medical knowledge. It became a powerful lesson in the importance of vaccination across various adult populations in the modern world.

Not all adults acquired immunity during childhood to infectious diseases commonly affecting children, such as chickenpox, measles, or rubella. These diseases may have a more severe course in adults, lead to complications, or pose additional risks, e.g., to pregnant women. Not all childhood vaccinations provide lifelong protection. Therefore, booster doses are necessary for some vaccines (e.g. against diphtheria, tetanus, and pertussis). Some infectious diseases are caused by pathogens that undergo changes and mutations, which is why regular vaccination is required (e.g. against influenza or COVID-19). Chronic diseases are more commonly observed in adults, which can increase susceptibility to infectious diseases. These diseases may have a more severe course and lead to complications that are dangerous to health or even life-threatening. In Poland, according to epidemiological data, people over the age of 50 have on average four chronic conditions. Respiratory diseases, cardiovascular diseases, or commonly occurring diabetes increase the risk of complications and severe outcomes from respiratory infections. Vaccination also reduces the risk of exacerbation of chronic conditions. Factors increasing the risk of severe infection include reduced immune function in cancer patients, transplant recipients, or individuals who have had their spleen removed. Research data does not confirm any adverse effects of vaccination on the course of chronic diseases. On the contrary, the opposite effect is often observed. For example, it has been shown that patients vaccinated against influenza have a significantly lower risk of heart attack or stroke in the months following vaccination, compared to unvaccinated patients. On the other hand, there is a large body of evidence confirming the risk of severe infectious disease in patients with chronic conditions, as well as data confirming the adverse impact of infection on the course of these diseases. Many scientific societies around the world explicitly list the presence of chronic diseases as an indication for vaccination in their recommendations and guidelines. Ageing is a universal risk factor for more frequent and more severe infectious disease, with increased risk of serious complications to health or life. After the age of 60, immunity declines, the immune system ages, and changes occur in the activity of

[17] „Infectious Diseases and Poisonings in Poland" bulletins. NIPH NIH-NRI. Department of Epidemiology of Infectious Diseases and Surveillance. https://wwwold.pzh.gov.pl/oldpage/epimeld/index_p.html#04

immune cells. As society ages, the number of people at increased risk of severe illness from bacterial and viral infections grows. Immunosenescence refers to the gradual deterioration of immune system function caused by biological ageing. Both innate and acquired immunity decline, resulting in greater susceptibility to disease. Changes occur that weaken immune responses, and a state of chronic inflammation arises, caused by increased release of proinflammatory cytokines. Adult vaccination is also recommended to protect close contacts who cannot be vaccinated, e.g., due to age or medical contraindications. This is known as the cocoon strategy. Through vaccination, we minimise the risk of falling ill and, as a result, avoid becoming a source of infection for those around us. The need for adult vaccination may also arise from lifestyle factors, such as certain activities or travel. Occupational exposure may also be an indication for vaccination. Healthcare workers are the best example, as through vaccination they protect not only themselves but also their patients.

The benefits of adult vaccination are particularly significant in the context of increasing life expectancy and improving quality of life. Especially when considering, on the one hand, an increasingly ageing population, and on the other, the growing proportion of individuals with chronic illnesses who are effectively treated with therapies that impair immune function. By improving quality of life, adult vaccination represents an important component of the healthy lifestyle paradigm, alongside proper nutrition, physical activity, sleep hygiene, and stress management.

Basic principles of adult vaccination

An adult should verify their immune status. Vaccination history recorded in a vaccination booklet and/or immunisation card allows assessment of which vaccines have been received, whether all required doses were administered and, if necessary, to complete any missing vaccinations. In situations where documentation or knowledge of previous vaccination or disease is lacking, immunity for certain vaccines can be assessed through serological testing to measure antibody levels.

The number of doses required depends on the specific vaccine. In some cases, a single dose is sufficient, while in others the full vaccination schedule must be administered, typically consisting of two or three doses. Certain vaccines may require booster doses at intervals of several years. The most detailed information on each vaccine can be found in its Summary of Product Characteristics (SmPC).

Recommendations for adult vaccinations are listed in the National Immunisation Programme (Polish: Program Szczepień Ochronnych, PSO) under the section for recommended vaccinations, indicating the appropriate age or specific

health indications for administration. Some vaccinations are provided free of charge through dedicated programmes (e.g., COVID-19 vaccination under the National COVID-19 Vaccination Programme), while others, such as influenza, pneumococcal, RSV or shingles vaccines, may be partially or fully reimbursed for certain patient groups. In these cases, the patient may either bear no cost or cover only part of the cost, with the level of reimbursement determined by the healthcare professional during vaccination assessment and prescription. Mandatory adult vaccinations occur in travel medicine, in accordance with international regulations - for example, yellow fever vaccination is required for travel to certain countries. Post-exposure vaccinations are also mandatory, such as those for tetanus or rabies. Selected groups of adult patients with immunodeficiencies (e.g., following haematopoietic stem cell or organ transplantation, post-splenectomy, asplenia or impaired splenic function) are entitled to receive certain vaccines against specific infectious diseases free of charge. Hepatitis B vaccination is also mandatory for individuals at particular risk due to epidemiological or clinical indications. Qualification for vaccination in adults involves a brief medical interview. This covers the individual's current health status, aiming to exclude acute infections, exacerbations of chronic conditions and to assess any medications taken as well as history of severe allergic reactions. When qualifying for subsequent doses of the same vaccine, the interview also addresses any severe adverse reactions experienced after previous doses. A physical examination may be conducted based on individual indications, although it is generally not necessary if the patient reports no symptoms. During the vaccination assessment, the patient should be informed about the potential risk of adverse reactions associated with the vaccine. Vaccines available in Poland are administered to adults as injections at designated vaccination points, including pharmacies that offer vaccination services. Most vaccines are given intramuscularly, with the preferred anatomical site being the posterolateral aspect of the upper arm. Some vaccines recommended for travellers are administered orally. A common and recommended practice in adult vaccination is the administration of multiple vaccines during a single visit. Research evidence indicates that this approach does not increase the risk of adverse reactions. Two vaccines can be administered in the same anatomical area, provided a minimum distance of 2.5 cm is maintained between injection sites.

Qualification for adult vaccination involves taking a brief medical history. This includes assessing the current health status in order to rule out acute infection, exacerbation of a chronic illness, current medications, and a history of severe allergic reactions. When qualifying a patient for subsequent doses of the same vaccine, the interview also covers any serious adverse events following previous

doses. A physical examination may be conducted based on individual indications, although it is usually not required if the patient does not report any symptoms. During the qualification process, the patient should be informed about the potential risk of adverse post-vaccination reactions that may occur in connection with the vaccination. Vaccines available in Poland are administered to adults as injections, delivered at designated vaccination points, including pharmacies authorised to carry out vaccinations. Most vaccines are given intramuscularly, with the preferred anatomical site being the posterolateral area of the upper arm. Some vaccines recommended for travelling individuals are administered orally. A common and recommended practice in adult vaccination is administering several vaccines during a single visit. Scientific studies show that this approach does not increase the risk of adverse post-vaccination reactions. Two vaccines can be administered in the same anatomical region, provided that an injection site spacing of at least 2.5 cm is maintained.

Adult vaccination schedules

The adult vaccination schedule includes recommended vaccinations based on age (Table 8.4) or health-related factors, including the presence of specific chronic diseases or other indications related to lifestyle.

Table 8.4. Adult vaccination schedule (all adults by age group). The schedule includes vaccinations recommended for all non-immune individuals of a given age, as well as those with additional risk factors (e.g. medical, occupational, or lifestyle-related)

Vaccine against	Age (years)				
	19-26	27-49	50-59	60-64	>65
Influenza (IIV)	1 dose annually, during the infection season (preferably at its onset)*				
Diphtheria, tetanus, pertussis (Tdap)	1 dose every 10 years				
Chickenpox (VZV)	2 doses (for individuals who have neither had chickenpox nor been vaccinated)				
Measles, mumps, rubella (MMR)	2 doses (for individuals who have neither had measles or rubella nor been vaccinated)				
COVID-19	vaccinations according to current recommendations				
Hepatitis B virus (HBV)	3 doses (for individuals who have not been previously vaccinated)				
Human papillomavirus (HPV)	3 doses	3 doses (vaccination decision to be made after a consultation with a physician regarding the benefits)			

Vaccine against	Age (years)				
	19-26	27-49	50-59	60-64	>65
Pneumococcal disease (PCV, PPSV)			1 dose PCV-13 or PCV-20	1 dose PCV-13 or PCV-20	1 dose PCV-13 + PPSV-23 or 1 dose PCV-20
Herpes zoster (RZV)			2 doses, 2-6 months apart		
Respiratory Syncytial Virus (RSV)				1 dose	
Tick-borne encephalitis (TBE)	3 doses + booster doses every 3-5 years				
Hepatitis A virus (HAV)	2 doses (for individuals who have not been previously vaccinated)				
Meningococcal disease (MenB, MCV-4)	1 or 2 doses				

*a high-dose vaccine is recommended for individuals aged ≥60 years; if it is unavailable or not accepted by the patient, the standard-dose vaccine should be used instead.
IIV – inactivated influenza vaccine; Tdap – tetanus, diphtheria and pertussis vaccine; VZV – varicella (chickenpox) vaccine; MMR – measles, mumps and rubella vaccine; COVID-19 – COVID-19 vaccine; HBV – hepatitis B vaccine; HPV – human papillomavirus vaccine; PCV – pneumococcal conjugate vaccine; PPSV – pneumococcal polysaccharide vaccine; RZV – recombinant zoster vaccine (against herpes zoster); RSV – respiratory syncytial virus vaccine; TBE – tick-borne encephalitis vaccine; HAV - hepatitis A vaccine; MenB – meningococcal group B vaccine; MCV-4 – meningococcal conjugate vaccine against groups A, C, W, and Y.

Personalised vaccination schedules for adults, tailored to age, health condition, profession, and lifestyle, are available on the NIPH NIH-NRI website[18]. These schedules are an important tool in public health promotion and health protection. They have been developed in collaboration with experts from the Polish Society of Vaccinology, based on the recommendations for adult vaccinations outlined in the Polish Immunisation Programme and international vaccination advisory groups, including the US Advisory Committee on Immunisation Practices (ACIP). The calendars form part of the 'My Health – Adult Health Check' service, introduced into primary healthcare from the 5th of May. During the summarising visit, PHC personnel use identified risk factors to establish an individual health plan (IHP) with recommended preventive interventions for the patient, including, among other measures, the recommended vaccinations.[19, 20, 21]

[18] National Institute of Public Health NIH-NRI. Adult vaccination schedules. https://szczepienia.pzh.gov.pl/kalendarze-szczepien-doroslych/
[19] Polish Society of Vaccinology. Adult vaccination schedules. https://ptwakc.org.pl/szczepienia-doroslych/
[20] Centers for Disease Control and Prevention. Vaccines in the Adult Immunization Schedule. https://www.cdc.gov/vaccines/hcp/imz-schedules/adult-age.html.
[21] Bridges C.B., Woods L., Coyne-Beasley T. et al: Advisory Committee on Immunization Practices (ACIP). Recommended immunization schedule for adults aged 19 years and older – United States, 2013. MMWR, 2013; 62: 9-18.

Adult vaccination schedules include[4]:

- Adult vaccination schedule – all adults by age (Table 8.4).
- Vaccination schedules for elderly (Table 8.5).
- Vaccination schedule for women planning pregnancy and pregnant women (Table 8.6).
- Vaccination schedule for patients with diabetes[4].
- Vaccination schedule for patients with respiratory diseases[4].
- Vaccination schedule for patients with cardiovascular diseases[4].
- Vaccination schedule for patients with chronic kidney disease[4].
- Vaccination schedule for patients with chronic liver disease[4].
- Vaccination schedule for patients with asplenia or splenic dysfunction[4].
- Vaccination schedule for patients with rheumatic and musculoskeletal diseases[4].
- Vaccination schedule for patients with immune disorders[4].
- Vaccination schedule for patients with HIV infection[4].
- Vaccination schedule for healthcare workers[4].
- Vaccination schedule for travel medicine[4].

Table 8.5. Vaccination schedule for the elderly. The schedule takes into account the recommended vaccinations for all unimmunised individuals of a specified age, as well as the presence of additional risk factors (e.g., medical, occupational, lifestyle-related)

Vaccine against	Age (years)		
	50-59	60-64	>65
Influenza (IIV)	1 annually, during the infection season (preferably at its onset)*		
Diphtheria, tetanus, pertussis (Tdap)	1 dose every 10 years		
COVID-19	Vaccination according to current recommendations		
Hepatitis B virus (HBV)	3 doses (for individuals who have not been previously vaccinated)		
Pneumococcal disease (PCV, PPSV)	1 dose PCV-13 or PCV-20	1 dose PCV-13 or PCV-20	1 dose PCV-13 + PPSV-23 or 1 dose PCV-20
Herpes zoster (RZV)	2 doses, 2-6 months apart		
Respiratory Syncytial Virus (RSV)	-	1 dose	
Tick-borne encephalitis (TBE)	3 doses + booster doses every 3-5 years		
Meningococcal disease (MenB, MCV-4)	1 or 2 doses		

*a high-dose vaccine is recommended for individuals aged ≥60 years; if it is unavailable or not accepted by the patient, the standard-dose vaccine should be used instead.
IIV – inactivated influenza vaccine; Tdap – tetanus, diphtheria and pertussis vaccine with reduced diphtheria and pertussis antigen content; COVID-19 – COVID-19 vaccine; HBV – hepatitis B vaccine; PCV – pneumococcal conjugate vaccine; PPSV – pneumococcal polysaccharide vaccine; RZV – recombinant zoster vaccine (against herpes zoster); RSV – respiratory syncytial virus vaccine; TBE – tick-borne encephalitis vaccine; MenB – meningococcal group B vaccine; MCV-4 – meningococcal conjugate vaccine against groups A, C, W, and Y.

Table 8.6. Vaccination schedule for women planning pregnancy and pregnant women

Vaccination schedule for women planning pregnancy	
Vaccine against	**Pre-conception period**
Hepatitis B virus (HBV)	3 doses (for women who have not been previously vaccinated)
Chickenpox (VZV)*	2 doses (for women who have neither had chickenpox nor been vaccinated)
Measles, mumps, rubella (MMR)*	1 or 2 doses (for women who have neither had rubella nor been vaccinated)
Influenza (IIV)	1 dose during the infection season (preferably at its onset)
Vaccination schedule for pregnant women	
Vaccine against	**Pregnancy period**
Influenza (IIV)	1 dose, can be administered at any stage of pregnancy
Diphtheria, tetanus, pertussis (Tdap)	1 dose during each pregnancy, can be given between 27th and 36th gestation week (ideally between 28th and 32nd week)
COVID-19	vaccination according to current recommendations
Respiratory Syncytial Virus (RSV)	1 dose, can be given between 24th and 36th gestation week (ideally between 32nd and 36th week)

*vaccination should be completed no later than one month before conception
IIV – influenza vaccine, inactivated; Tdap – tetanus, diphtheria and pertussis vaccine with reduced diphtheria and pertussis antigen content; COVID-19 – COVID-19 vaccine; RSV – respiratory syncytial virus vaccine; HBV – hepatitis B vaccine; VZV – varicella (chickenpox) vaccine; MMR – measles, mumps and rubella vaccine.

Key vaccines recommended for adults

Influenza vaccines

Influenza vaccines for adults are inactivated vaccines administered by injection. They contain inactivated fragments of influenza viruses and are available as split-virion vaccines or subunit vaccines containing surface proteins of the influenza virus. Vaccines are either trivalent or quadrivalent. The composition of the vaccines is updated each season. Influenza vaccination is recommended for individuals at increased risk of influenza-related complications, as well as for those who may be a source of infection to these individuals, including: 1/ all persons aged ≥55 years; 2/ residents of nursing homes and other long-term care or medical facilities (regardless of age); 3/ people with chronic conditions: cardiovascular diseases, kidney disease, liver disease (including liver failure and nephrotic syndrome), respiratory diseases (including asthma and COPD), metabolic disorders (including diabetes, obesity with BMI ≥40), immune deficiency (including that caused by immunosuppressive treatment or HIV), cancer patients (especially haematologic malignancies), organ or tissue transplant recipients; 4/ patients with impaired respiratory function or difficulty clearing airway secretions, and

those at increased risk of aspiration (e.g. due to impaired consciousness, dementia, spinal cord injury, seizure disorders, or other neuromuscular diseases); 5/ pregnant women and women who will be pregnant during the upcoming influenza season; 6/ people who may transmit influenza to the above groups (epidemiological indications), such as staff of nursing homes or facilities for chronically ill patients, individuals providing in-home care or living with people at risk, healthcare personnel, caregivers, parents and household contacts of children under 5 years of age; 7/ workers in education, retail, transport, and other sectors involving frequent contact with the public[22]. Influenza vaccination should be offered to any individual who wishes to reduce their risk of contracting influenza. Annual vaccination during the autumn–winter season builds immunity. Vaccines are available free of charge to selected groups (e.g. older adults, pregnant women) or with partial reimbursement (e.g. people with comorbidities/all adults). One dose per season is recommended. The optimal time for influenza vaccination is before the onset of the period of increased influenza activity. Ideally, vaccination should precede the peak incidence, which in Poland typically occurs from January to March, although this may vary slightly each season. If vaccination cannot be done early, it may still be administered at any time during the influenza season. For adults aged ≥60 years, the high-dose vaccine is recommended, and if it is unavailable or not accepted by the patient, the standard-dose vaccine may be used instead[23].

Hepatitis B vaccines

Hepatitis B (HBV) vaccines are inactivated vaccines that contain the genetically engineered HBs antigen and an adjuvant to enhance the immune response. They are available as monovalent vaccines or in combination with the hepatitis A vaccine. Hepatitis B vaccination is mandatory for individuals at particularly high risk of infection due to epidemiological or clinical factors, including: 1/ individuals who have not previously been vaccinated against hepatitis B; 2/ students enrolled in medical or health sciences programmes; 3/ individuals at particular risk due to contact with a person infected with hepatitis B (household members or residents of

[22] Seremak-Mrozikiewicz A., Nitsch-Osuch A., Czajkowski K. et al. Guidelines of the Polish Society of Gynecologists and Obstetricians, the Polish Society for Vaccinology, and the Polish Society for Family Medicine on vaccinating women with reproductive plans and pregnant or breastfeeding women. Ginekol Pol 2023, Aug 21.

[23] Nitsch-Osuch A., Jankowski P., Kokoszka-Paszkot J., Kuchar E., Mastalerz-Migas A., Mitkowski P., Wysocki J., Zmysłowska A., Antczak A. Towards better protection of older people against influenza and its complications. Polish recommendations for HD influenza vaccine. Family Medicine & Primary Care Review. 1/2024, vol. 26.

care homes, educational institutions, and closed facilities); 4/ healthcare workers at risk of exposure; 5/ individuals infected with the hepatitis C virus; 6/ women planning pregnancy. Mandatory HBV vaccinations for high-risk individuals include: 1/ patients in advanced stages of kidney disease with glomerular filtration rates (GFR) below 30 ml/min and dialysis patients; 2/ individuals after haematopoietic cell transplantation, organ transplantation, splenectomy, or with asplenia or splenic dysfunction; 3/ individuals in the advanced stage of kidney disease with a glomerular filtration rate below 30 ml/min, and dialysis patients (booster doses should be administered if the concentration of anti-HBs antibodies is below the protective level (10 IU/l); it is recommended to test antibody levels every 6–12 months; for organ transplant recipients, it is recommended to maintain an antibody level of ≥100 IU/l; antibody levels should be monitored every 6 months; if the concentration falls below <100 IU/l, a double dose of the vaccine should be administered). Determining the level of anti-HBs antibodies in chronically ill individuals, as part of the medical qualification examination for vaccination, is free of charge for these patients. Hepatitis B vaccination is recommended for individuals susceptible to infection, including: 1/ persons who, due to their lifestyle or occupation, are at risk of infection through tissue injury or sexual contact (e.g. those travelling to regions with endemic hepatitis B, engaging in high-risk sexual behaviours, or using intravenous drugs); 2/ chronically ill patients at high risk of HBV infection (e.g. those with immunodeficiency, including that caused by immunosuppressive treatment, chronic liver disease, or diabetes), who have not been vaccinated under the mandatory vaccination programme; 3/ patients preparing for surgical procedures and invasive medical interventions; 4/ patients with haematological malignancies; 5/ all previously unvaccinated adults, particularly older individuals. The standard hepatitis B vaccination schedule for adults consists of three doses administered at 0, 1, and 6 months. Booster vaccinations are not recommended for healthy individuals. In exceptional cases (e.g. before surgery or travel to an HBV-endemic region), an accelerated primary vaccination schedule may be used: 4 doses administered on days 0, 7, 21, and at 12 months. Special procedures include post-exposure prophylaxis and chronically ill individuals.

Diphtheria, tetanus and pertussis vaccine

The diphtheria, tetanus, and pertussis vaccine is available as the inactivated Tdap vaccine, which protects against diphtheria, tetanus, and pertussis. It contains a reduced dose of diphtheria toxoid (d), tetanus toxoid (T), and a reduced-dose acellular pertussis component (ap), containing 3–5 proteins. Toxoids are inactivated toxins produced by the diphtheria and tetanus bacteria. The vaccine is available in

combined forms (Td), also in formulations including pertussis antigens (Tdap) and polio antigens (Tdap-IPV), or as monovalent vaccines (d or T).

Vaccination with a pertussis-containing vaccine is recommended for: 1/ adults who have, or will soon have, close contact with infants under 12 months of age (parents, grandparents, caregivers), healthcare personnel (especially those working in neonatal and paediatric wards), and nursery staff — to reduce the risk of severe pertussis in infants as part of the cocoon strategy; 2/ pregnant women; 3/ healthcare workers in direct contact with patients in hospitals or outpatient settings, and staff of long-term care facilities, nurseries, and schools (for epidemiological reasons); 4/ adults who wish to reduce their own risk of contracting pertussis. The vaccine containing diphtheria and tetanus toxoids is recommended for adults who were previously properly vaccinated with the primary series (as booster doses), and for those who have never been vaccinated (as a primary series), especially older adults or those whose occupation puts them at risk of tetanus (e.g. farmers, horse and cattle breeders, gardeners). Vaccination is also recommended for individuals travelling to areas with diphtheria outbreaks or in the event of an outbreak within the country.

An adult who has previously received a complete primary vaccination series should receive a booster dose of Tdap, repeated every 10 years. An adult who has never been vaccinated or has no knowledge of their vaccination history should receive three doses of the primary vaccination series, following a 0, 1, 6–12 month schedule. One dose of Tdap should be given, followed by two doses of Td. Ideally, Tdap should be given first, followed by Td for the remaining doses. Neither a past pertussis infection nor vaccination provides long-lasting immunity. To maintain protection, booster doses are necessary and are recommended every 10 years. Pertussis vaccination is recommended during pregnancy, between 27th and 36th gestation week. Pregnant women at risk of preterm delivery should be vaccinated after the end of 20 weeks of gestation. The Tdap vaccine should be administered during every pregnancy. Pregnant women may receive Tdap vaccines or their derivatives that also include the polio component. Post-exposure management for injuries posing a risk of tetanus includes: 1/ vaccination in justified cases; 2/ if the risk is high – the first vaccine dose should be administered together with human tetanus immunoglobulin at a different injection site. If the wound is infected, contains a foreign body, is treated more than 24 hours after injury, or the patient presents with hypovolaemic shock or weighs more than 90 kg – the immunoglobulin dose should be doubled (to 500 IU); 3/ for immunocompromised individuals (primary or acquired, including those undergoing immunosuppressive therapy) or those with contraindications to vaccination, a second dose of human tetanus immunoglobulin is recommended 3–4 weeks after the first.

Vaccination against Covid-19

COVID-19 vaccines represent a new class of vaccine technologies. These include mRNA vaccines, which contain genetic information (a template for the production of a protein/antigen) enclosed in a lipid nanoparticle capsule, and vector vaccines, which use an adenovirus containing embedded genetic information as a template for protein (antigen) production. The adenovirus does not cause infection as it serves solely as a delivery platform. Traditional vaccines are also available: protein-based vaccines produced via recombinant methods and containing an adjuvant to enhance the immune response. The inventors of the mRNA vaccine technology were awarded the Nobel Prize. The SARS-CoV-2 virus mutates (new variants emerge), and therefore the vaccine composition is regularly updated. COVID-19 vaccination is recommended for individuals at risk of severe disease, including people aged 60 and over, persons with obesity (BMI ≥ 25), diabetes, chronic lung disease, chronic kidney disease, cardiovascular disease, neurodevelopmental disorders, active cancer, or immunosuppressive disease or treatment, healthcare workers, especially those in direct contact with patients or infectious material. Vaccination is also recommended for pregnant women. The primary vaccination schedule for adults includes 2 or 3 doses, depending on individual health status. The number of booster doses depends on current recommendations. Immunocompromised patients require an additional dose in the primary series and more frequent booster doses.

Pneumococcal vaccines

Pneumococcal vaccines are inactivated vaccines. Conjugate vaccines contain pneumococcal capsule polysaccharides linked to a carrier protein that ensures a stronger and longer-lasting immune response. Vaccines available for adults include PCV-13 (covers 13 serotypes) and PCV-20 (covers 20 serotypes). Polysaccharide vaccines contain only capsule polysaccharides. For adults, the available vaccine is PPSV-23 (covers 23 serotypes). Conjugate and polysaccharide vaccines function differently; they are not interchangeable and should not be substituted for one another. Pneumococcal vaccination is recommended for adults: 1/ aged >50 years; 2/ who smoke tobacco; 3/ with chronic conditions: cardiovascular, respiratory (e.g. asthma, COPD, emphysema), liver, kidney, metabolic diseases (including diabetes); 4/ with alcohol dependence; 5/ with congenital or acquired immunodeficiency, including those on immunosuppressive therapy, with complement deficiencies, or phagocytic disorders (excluding chronic granulomatous disease); 6/ after splenectomy, with functional asplenia, spherocytosis, or haemoglobinopathies; 7/ with Hodgkin's lymphoma, non-Hodgkin lymphoma,

leukaemia, myeloma, or other malignant neoplasms; 8/ with cerebrospinal fluid leaks; 9/ with cochlear implants, or before planned cochlear implantation; 10/ after solid organ transplantation[24,25].

Vaccination for adults aged ≥65 years includes one dose of PCV-13 and one dose of PPSV-23, spaced 1 year apart, or one dose of PCV-20. Vaccination of adults at risk of pneumococcal disease includes one dose of PCV-13 and one dose of PPSV-23 at an interval of ≥8 weeks, or a single dose of PCV-20. For adults ≥65 years of age or aged 19–64 in risk groups who have previously received a single dose of PCV-13, one dose of PPSV-23 should be given after 1 year (≥65 years) or after ≥8 weeks (individuals from pneumococcal disease risk groups). An alternative approach is the administration of a single dose of PCV-20. For adults ≥65 years or aged 19–64 years in risk groups who have previously received one dose of PPSV-23, one dose of PCV-20 should be administered 1 year later. An exception applies to a specific risk group, i.e. patients after haematopoietic stem cell transplantation for whom a different vaccination schedule is recommended. In such cases, medical consultation is necessary. In the case of limited availability of PPSV-23, adult vaccination should be carried out using a single dose of PCV-13 or PCV-20. Vaccination of adults aged 50–64 years includes administration of one dose of PCV-13 or one dose of PCV-20.

Herpes zoster vaccine

The herpes zoster vaccine is an inactivated vaccine. It contains the varicella-zoster virus glycoprotein, produced using recombinant methods. The vaccine prevents herpes zoster and postherpetic neuralgia (persistent pain following herpes zoster). Vaccination is recommended for adults aged 50 years and over at increased risk of herpes zoster due to: 1/ chronic pulmonary or cardiac disease, chronic kidney failure, diabetes; 2/ immunocompromised status: iatrogenic immunosuppression, solid organ transplant, congenital or acquired immunodeficiency, HIV infection; 3/ cancer: leukaemia, Hodgkin's disease, multiple myeloma, disseminated malignancy; 4/ autoimmune disease: psoriasis, psoriatic arthritis, inflammatory bowel disease, rheumatoid arthritis, multiple sclerosis, systemic lupus erythematosus,

[24] Kuchar E., Antczak A., Skoczyńska A. et al. Pneumococcal vaccination among adults – updated Polish recommendations. Family Medicine & Primary Care Review 2022; 24(3): 285–291.

[25] Mamcarz A., Wełnicki M., Drożdż J., Grabowski M., Jankowski P., Kuchar E., Leszek P., Mitkowski P., Wysocki J. The role of pneumococcal vaccination in reducing the cardiovascular risk of cardiac patients: opinion of experts of the Prevention Committee of the Polish Cardiac Society supported by the Polish Vaccinology Society. Kardiol Pol 2023, Sep 3.

ankylosing spondylitis[26]. The vaccine is reimbursed as follows: 100% reimbursement for individuals aged 65+ at increased risk of shingles and 50% reimbursement for individuals aged 18+ at increased risk. The herpes zoster vaccination schedule includes 2 doses, given 2 to 6 months apart. The vaccine prevents herpes zoster in individuals who have previously had chickenpox. The herpes zoster vaccine is not intended for use in the prevention of chickenpox.

Respiratory syncytial virus (RSV) vaccines

RSV vaccines are inactivated vaccines. They contain one or two glycoproteins produced using recombinant genetic methods. The vaccine may include an adjuvant (a substance that enhances the immune response). The monovalent adjuvanted vaccine is used to prevent lower respiratory tract disease caused by RSV in adults aged 60 years and older and adults aged 50–59 years at increased risk of RSV-related illness. The bivalent vaccine is recommended for administration to adults aged 60 years and older. RSV vaccination is recommended for older adults, especially those with chronic conditions (bronchial asthma, chronic obstructive pulmonary disease, other chronic respiratory diseases, coronary artery disease, heart failure, arrhythmia, diabetes, chronic kidney disease), immunocompromised individuals and residents of care homes[27]. Additionally, the bivalent vaccine is recommended for pregnant women between 24th and 36th gestation week, preferably between the 32nd and 36th week. Vaccinating a woman in the third trimester of pregnancy enables transplacental transfer of neutralising antibodies to the infant, providing protection against RSV in the first six months of life.

Tick-borne encephalitis (TBE) vaccination

TBE vaccines are inactivated vaccines. Vaccination is recommended for individuals living in or travelling to endemic areas, either for tourism or work purposes, especially: 1/ forest workers, soldiers, firefighters and border guards; 2/ hunters, farmers; 3/ tourists and youth camping or spending time in forested areas, participants of camps and summer colonies. The primary vaccination schedule consists of three doses administered at 0, 1–3, and 5–12 months. After two doses, 90% of vaccinated individuals develop specific antibodies. An accelerated primary schedule includes doses at 0, 14 days, and 5–12 months. A booster dose should be given after 3 years, followed by subsequent boosters every 3–5 years.

[26] Kuchar E., Rudnicka L., Kocot-Kępska M. et al. Vaccination against herpes zoster. Recommendations of the expert group of the Polish Society of Vaccinology, Polish Society of Family Medicine, Polish Dermatological Society, Polish Association for the Study of Pain, and Polish Neurological Society. Med. Prakt. 2023, 5, 64-72.

[27] Nitsch-Osuch A., Antczak A., Barczyk A. et al. Expert group recommendations on respiratory syncytial virus (RSV) vaccination in adults. Lekarz POZ 6/2023, vol. 9.

9. THE HEALTH CONSEQUENCES OF ACCIDENTS IN POLAND WITH SPECIAL FOCUS ON THE ADULTS AGED 65 AND OVER

Rafał Halik, Jakub Stokwiszewski

Methodological introduction

Accidents can be defined as sudden and unintended events that pose a threat to human health as a result of physical forces or chemical substances. According to the current ICD-10 classification system in force in Poland, accidents are covered within the category of codes ranging from V01 to X59. From the perspective of public health, the most significant categories of accidents include transport accidents (codes V01 to V99), falls (codes W00 to W19), poisoning (codes X40 to X49), and drowning (codes W65 to W74). It is worth noting that the ICD-10 classification does not include conditions resulting from intentional acts, such as suicides, violence, , within the category of accidents. Health problems arising from iatrogenic or medical errors are likewise excluded from the definition of accidents.

Accidents present a serious challenge for public health due to the high social and economic costs they incur, as well as their impact on long-term disability and premature mortality. According to the 2019 GBD (Global Burden of Disease) study conducted prior to the COVID-19 pandemic, accidents accounted for 8.6% of all years of life lost in Poland due to disability and premature death (DALY). EUROSTAT and the OECD have categorised deaths resulting from accidents as deaths that could be avoided through preventive measures (preventable mortality), meaning that effective public health interventions can significantly reduce their incidence. It is commonly believed that accidents pose the greatest threat to the health and lives of young people. However, population-based studies and medical registers show that accidents occur with similar frequency both among young people and those aged 65 and over. Injuries

sustained in accidents among older individuals are, however, significantly more severe and more often fatal than those in younger people. In the past two decades, due to the ageing of populations across Europe, there has been an increase in the number of accidents typical of older age groups, alongside improvements in road safety and a reduction in transport accidents, which tend to occur more frequently among younger and middle-aged individuals. Since 2006, Poland has also been undergoing similar changes, and a significant increase can now be observed in the proportion of deaths caused by falls, which are accidents most characteristic of older age groups. Since 2012, falls have been the leading cause of fatal accidents in Poland, accounting for over 39% of deaths caused by accident-related injuries. This fact highlights that accidents among the elderly are becoming an increasingly important public health issue, necessitating new approaches to preventing them.

Frequency of accidents in Poland – results of a population survey conducted in 2025 on a sample of the adult population (20 and over)

A survey conducted in 2025 as part of the National Health Programme (NHP), carried out on a sample of 3,000 adult Poles aged 20 and over (further details on the study and its methodology are provided in Chapter 12), revealed that 24.8% of respondents had experienced at least one accident in the past 12 months. Men reported accidents more frequently (27.6%) than women (22.0%) (Fig. 9.1). This means that in the past year, more than one in four men and one in five women over 20 years old suffered an injury – ranging in severity from minor to life-threatening. After adjusting for age structure differences (standardisation), the rates were 26.6% for men and 21.3% for women, suggesting that the observed difference persisted,. The age distribution of reported accidents showed that the highest percentages of injured individuals were found in the middle-aged group of 40–49 years and among the oldest respondents (over 85)- 30.3% and 37.0%, respectively. An exceptionally high percentage of injuries was observed in the social group with the lowest level of education, i.e. those with up to lower secondary education, among whom 41% reported sustaining an injury in the past year. The standardised percentages also showed a clear decline in the reported frequency of injuries with increasing education level. The lowest rate was among individuals with tertiary education (21.3%), slightly higher

among those with secondary or post-secondary education (22.5%), and highest among those with vocational education (28.6%).This indicates substantial socio-economic inequalities in the occurrence of accidents. However, the study did not show statistically significant differences in the reported frequency of accidents depending on the type of place of residence. The highest percentage of residents reporting injuries was in medium-sized towns with populations between 50,000 and 200,000 (27.5%), while the lowest was in rural areas (22.6%).

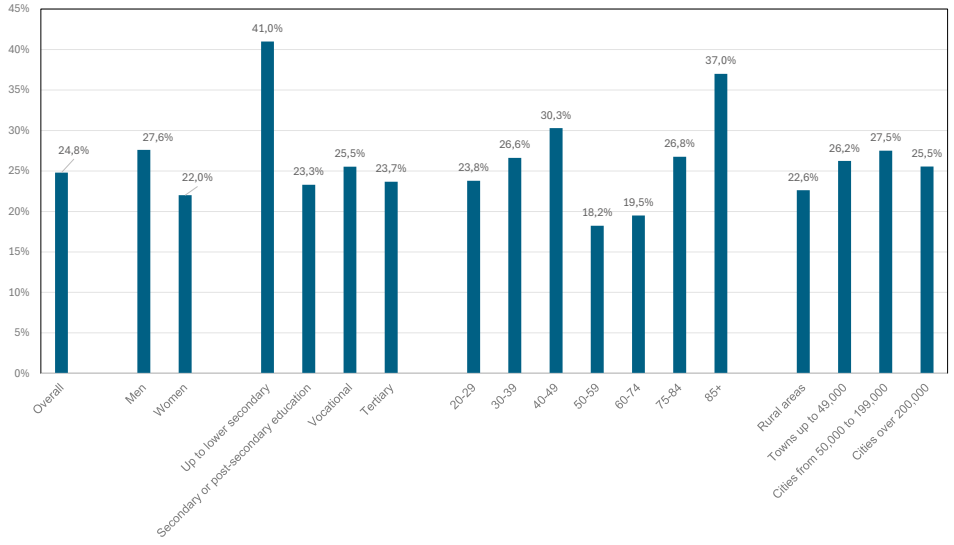


Fig. 9.1. Percentage of people reporting an accident in the last 12 months by selected social groups and place of residence (own estimationsn based on the NIPH NIH – NRI risk factor study)

The most common setting in which accidents occurred was the home environment, accounting for 34.5% of reported injuries. Slightly less frequent were pedestrian accidents, which made up 26.5%, followed by accidents occurring inside a means of transport at 19.4%, and those at school or work at 11.7%. No statistically significant differences were observed between men and women regarding the place where injuries were sustained; the distribution of accident locations was similar for both sexes. The study showed that people aged 65 and over were the most likely of all age groups to sustain injuries inside their homes and outdoors, with respective shares of 36.2% and 39.9%. The frequency of pedestrian accidents in public spaces also clearly increased with age. This finding may raise

concerns about the safety of public areas for older people in Poland and should prompt a more in-depth analysis of accident rates in public spaces and their consequences (Fig. 9.2).

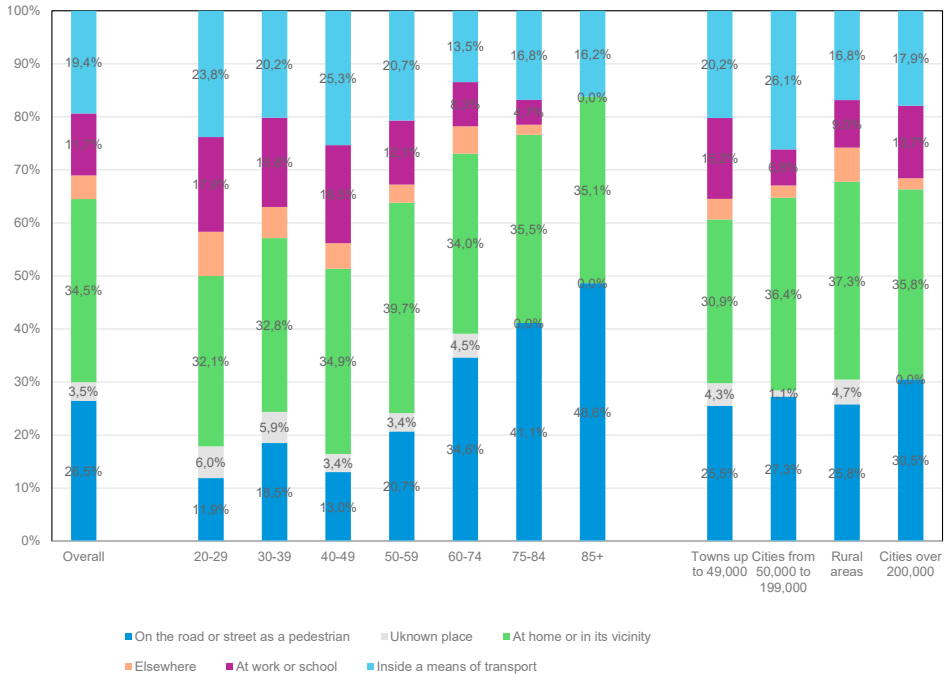


Fig. 9.2. The most frequently reported location/environment of accidents overall, and by age group and place of residence (own estimations based on the NIPH NIH – NRI risk factor study)

Over a year, 10.7% of adult residents of Poland experienced two or more injuries. Distinct differences were observed between sexes: men sustained multiple injuries more than 1.5 times as often as women,- 13.2% and 8.5%, respectively. After standardisation for age, the difference between men and women remained similar , with 12.8% of men and 8.6% of women reporting repeated injuries. Although the age group of 65 and over is typically associated with a higher accident rate, it showed the lowest proportion of people reporting more than two injuries in a year (5.7%). The group most frequently affected by multiple accidents was those aged 20 to 44, with a rate of 13.3%.

The results of survey indicate a much higher frequency of reported accidents compared with the edition of the NHP study conducted in 2018, when 13.8%

of men and 11.5% of women reported having experienced an accident within the past 12 months. However, given certain methodological factors related to the measurement, caution should be exercised when interpreting the high figure recorded in 2025.The first of these is the formulation of the question in the 2025 questionnaire, which does not define any criteria regarding the severity of the accident. This allowed respondents to report even minor injuries or sudden, unexpected events that could cause harm (for example, a minor car collision). Following the COVID-19 pandemic, in some of survey-based studies was experienced an increase in reported health problems, attributable both to objective factors, such as the negative impact of the pandemic on overall health, and to subjective factors, such as greater sensitivity among respondents to reporting concerning signs and symptoms.[1] Even taking into account the above methodological limitations, the reported accident rate should be considered high, particularly among people with lower levels of education and those in the oldest age groups. It is also worth noting that the structure of accident environments or locations in 2025 was similar to that observed in 2018.

Frequency of accidents requiring hospital treatment in Poland

The Nationwide General Hospital Morbidity Study (NGHMS) has a major importance for assessing the actual accident rate.. , ICD-10 classification requires that an external-cause code has to be provided alongside the diagnosis describing the health consequences, such as wounds, fractures, or poisoning. In the case of the NGHMS, there is still a percentage of reporting units that do not attribute an external cause to the injury, although a systematic improvement in this area are experienced. Between 2021 and 2023, the proportion of hospitalisations due to injuries and poisoning without specified external cause can be estimated at 26.8%. The crude hospitalisation rate due to accident-due to injuries resulting from accidents, as an indicator, shows the actual scale of the frequency of more serious accidents in the population. . This indicator remained at a similar level between 2019 and 2023, apart from a slight decrease

[1] Vabba A, Porciello G, Monti A, Panasiti MS, Aglioti SM. A longitudinal study of interoception changes in the times of COVID-19: Effects on psychophysiological health and well-being. Heliyon. 2023;9(4):e14951. doi:10.1016/j.heliyon.2023.e14951

during the COVID-19 pandemic. The lowest hospitalisation rate due to accidents was recorded in 2020, at 83.3 per 10,000 population, and by 2023, it had returned to the 2019 level, reaching 114.6 per 10,000. (Fig. 9.3)



Fig. 9.3. Crude hospitalisation rates due to accidents by their main categories (NGHMS, NIPH NIH)

Hospital morbidity rates allow to make estimates, though subject to a certain margin of error due to the aforementioned issues with incomplete diagnosis coding and occasional repeat hospitalisations, that approximately 1% of Polish population experiences an accident each year that requires hospital treatment. The structure of hospital discharges due to accidents contrasts with the widespread stereotype that transport accidents are the predominant cause of hospital admissions. Between 2019 and 2023, falls were the leading cause of hospitalisation, accounting for 56.2% of all admissions resulting from accidents. It is worth noting that these hospital morbidity figures are consistent with the results of the 2025 survey. According to epidemiological observations, falls are the most common cause of accidents both in the home environment and in public spaces. These were also the locations most frequently reported in the survey as the site of the accident. The second most common cause of accident-related hospitalisation was exposure to mechanical forces, making up 17.1% of all hospital admissions due to

accidents. Transport accidents ranked third, accounting for 7.8% of accident-related hospitalisations.

High hospital morbidity rates due to falls are observed both among the youngest age groups and individuals over 65. Among the oldest populations, there are sharp increases in the overall hospitalisation rate for accident-related injuries, along with a growing predominance of falls as the primary cause of hospital stays, which is most characteristic in the case of women. Furthermore, women aged 85 and over show the highest hospital morbidity due to falls. These rising morbidity rates reflect the increasing risk of falls with age. The pattern is most notably observed in women . From the age of 60 and over, women are more likely than men to be affected by injuries caused by falls (Fig. 9.4).

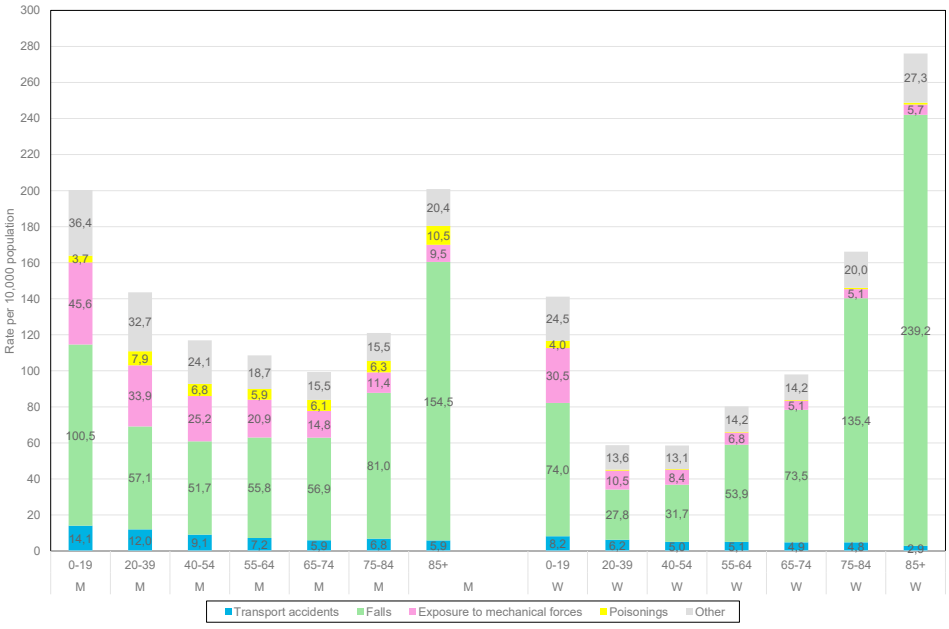


Fig. 9.4. Crude l hospitalisation rates due to accidents by main categories and key age groups from the perspective of injury epidemiology, among men (M) and women (W) (NGHMS, NIPH NIH)

Mortality due to accidents in Poland

At the beginning of the 21st century, Poland was characterised by significantly higher mortality due to accidents compared to the average in EU-27 (Fig. 9.5).

In 2010, the standardised mortality rate for these causes in Polish population was nearly 26% higher than in the EU-27. The risk of death due to accidents had been steadily declining until 2015, when the standardised rate in Poland was 9.1% higher than in the EU-27. By 2022, this difference had slightly increased to 9.6%. After 2015, the decline in mortality due to accidents slowed down both in Poland and in the EU-27, and mortality levels have shown little change. In 2021, during the COVID-19 pandemic, an increase in mortality due to injuries due to accidents was observed both in Poland and, in the EU-27. However, in Poland, this increase was sharper by 11%, whereas in the EU-27, the year-on-year increase was 5.9%.

The decrease of mortality due to accidents in Poland between 2010 and 2022 was particularly dynamic among men, who also represent a group at especially high risk of sustaining injuries and facing an increased threat to life from accidents. This improvement was primarily driven by the long-term improvement of road traffic safety in Poland, where male casualties overwhelmingly dominate transport accident statistics. The mortality rate among women due to accidents in Poland has remained close to the EU-27 average since 2010. In this group as well, the downward trend slowed after 2015, followed by a sudden increase in mortality after 2021.

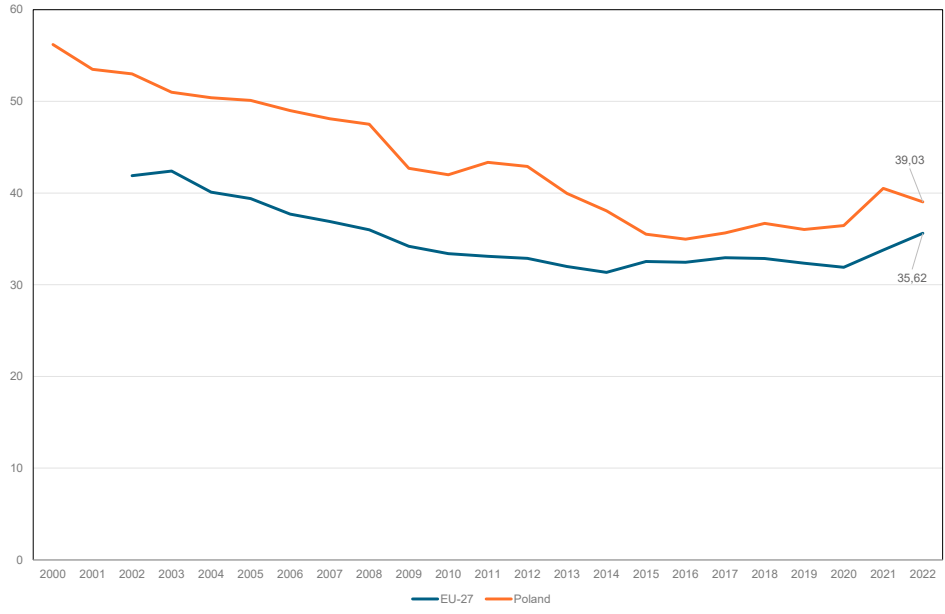


Fig. 9.5. Standardised mortality rates per 100,000 population due to accidents (V01–X59, Y85, Y86) in Poland and the EU-27 average (EUROSTAT)

Among individuals aged 65 and older—the demographic group most vulnerable to fatal accidents—mortality trends followed a distinct trends. . In Poland, the risk of death among older people due to accidents remained for a long time at the same level as in the EU-27 (Fig. 9.6). Between 2010 and 2019, this age group experienced a steady but gradual decline in mortality rates. By 2019, the risk of death from injuries due to accidents among Poland's oldest age groups was 8.4% lower than the EU-27 average. However, 2021 marked a sharp reversal: accident-related mortality increased significantly year-on-year in both Poland and EU-27 countries, rising by 23.7% in Poland compared to nearly 7% across the EU-27. Some observational studies suggest that the most important factors potentially contributing to the sharp rise in accident-related mortality among older people during the COVID-19 pandemic were changes in lifestyle, such as reduced mobility and isolation, which led to an increase in the frequency of falls. Other contributing factors include limitations of the capacity of healthcare system and emergency assistance services.

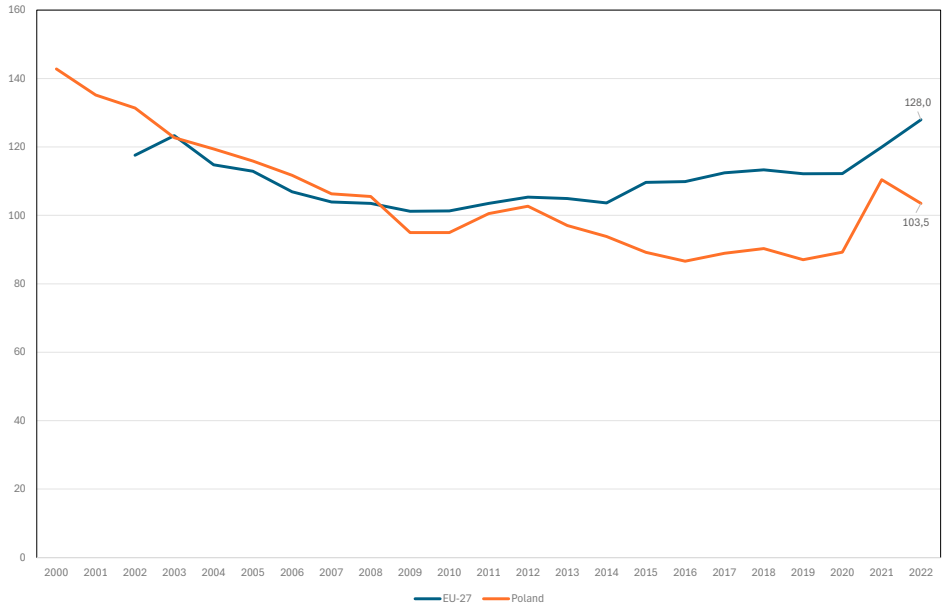


Fig. 9.6 Standardised mortality rates per 100,000 population among people aged over 65 due to accidents (V01–X59, Y85, Y86) in Poland and the EU-27 average (EUROSTAT)

As noted above, recent years have brought significant changes in the types of accidents posing the greatest threat to life in Poland. In 2023, the highest mortality rate was recorded for falls, at 13.3 per 100,000 population, followed by transport

accidents (6.5) and poisonings (4.5). Together, these three categories accounted for over 74% of all accidental deaths in Poland. According to the most recent EUROSTAT estimates available for 2022, the risk of fatal accidents in Poland exceeds the EU-27 average across all major categories. Particularly alarming is the rise in mortality due to accidental poisonings, with the associated risk of death more than twice as high as the EU-27 average (Fig. 9.7).

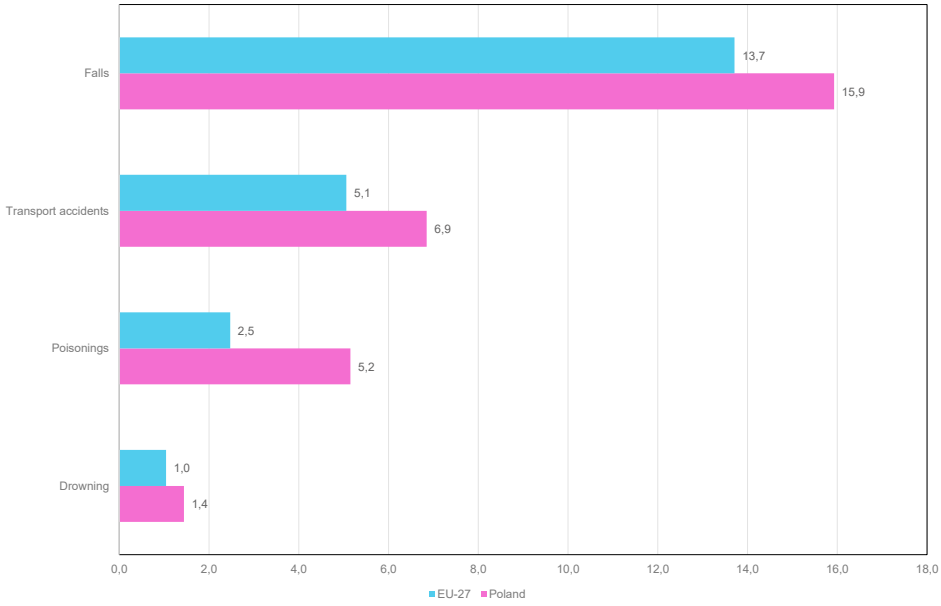


Fig. 9.7. Standardised mortality rates per 100,000 population by major types of accidents in Poland and the EU-27 in 2022 (EUROSTAT)

In Poland, the disparities in the risk of death due to accidents is both substantial and increasingly pronounced. Recent data indicate a marked gender disparity, with men facing a more than 2.5-fold higher risk of death from accidents compared to women. In 2023, the standardised mortality rate was 51.0 per 100,000 population for men, in contrast to 19.6 for women. A similarly significant divergence is observed between urban and rural populations. In 2023, the standardised mortality rate in rural areas reached 38.0, compared to 31.6 in urban areas. It is noteworthy that, since 2019, the excess mortality associated with accidents in rural areas has exhibited a gradual downward trend. Concurrently, the period between 2019 and 2023 was characterised by fluctuations in accident-related mortality across Poland's voivodships, accompanied by a widening of regional disparities in mortality rates (Fig. 9.8).

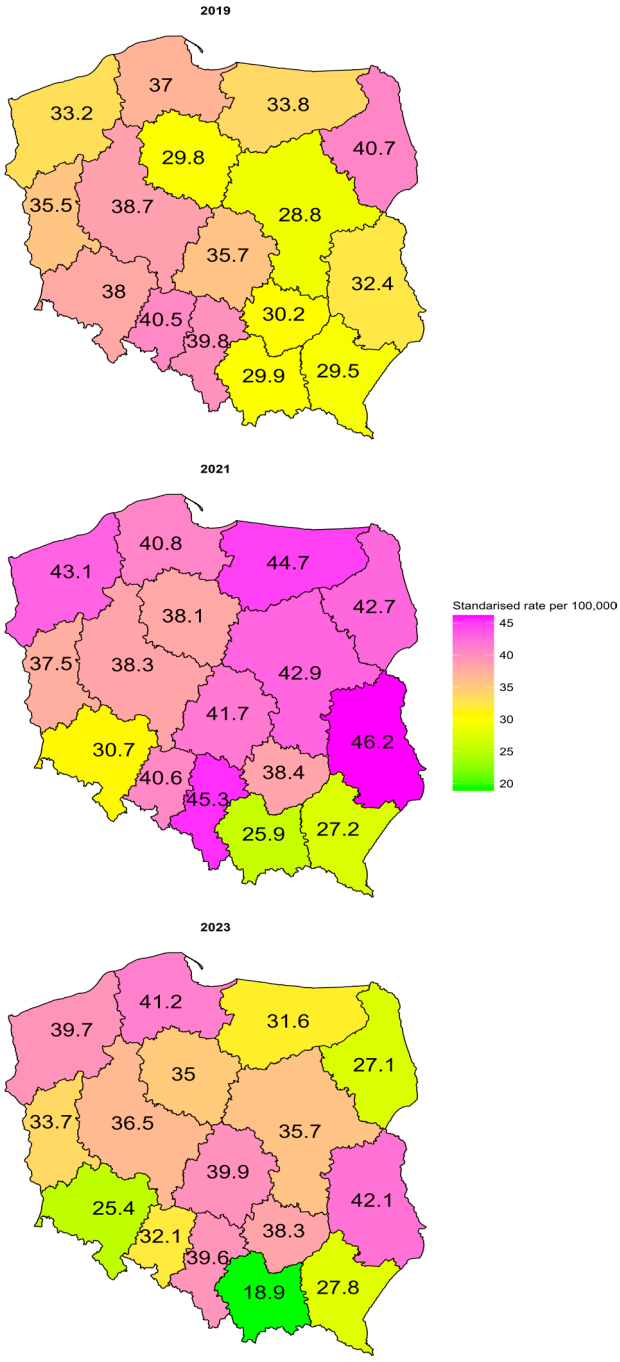


Fig. 9.8. Standardised mortality rates due to accidents per 100,000 population (V01–X59) by voivodship in 2019, 2021, and 2023

Mentioned above phenomena may be related to the impact of the pandemic and the so-called "health debt effect" following the pandemic in some regions of Poland. During the years 2019-2023 , the situation especially worsened in Lubelskie and Świętokrzyskie voivodships, while the most pronounced improvements were observed in Dolnośląskie and Podlaskie voivodships. Lubelskie voivodship has recorded the highest mortality rates due to accidents since the beginning of the 21st century.

Situation regarding categories of accidents posing the greatest threat to public health – falls and transport accidents

Falls

Falls are not only the most common cause of accidental deaths in Poland, but they also represent one of the most complex challenges for modern public health . As mentioned above, falls are particularly frequent among the oldest age groups, and the frequency of serious falls resulting in injury increases significantly with age, especially among women. The risk factors for falls are highly complex and include, multimorbidity, polypharmacy (the concurrent use of multiple medications), malnutrition (issues relating to nutritional status are addressed in Chapter 14), and low level of physical activity (discussed in Chapter 13). Falls are also related to physiological processes associated with advanced age, such as loss of muscle mass, osteoporosis, and sensory impairments. Therefore, fall prevention efforts cannot be focused solely on short-term interventions targeting individual risk factors. To be effective, they must address broader processes, be continuous and systematic, and extend over generations. Public health initiatives aimed at reducing morbidity, particularly the prevalence of chronic diseases, play a significant role in this area. Additional measures with well-documented effectiveness include improving the treatment of chronic conditions and ensuring effective organisation and coordination of health care. The problem of fall-related injuries will likely worsen due to the ageing of the Polish population. There has been a marked and sustained upward trend in mortality rates due to falls since 2006. Despite the alarming situation, the current level of understanding regarding the processes contributing to the higher incidence of fatal falls in Poland compared to the EU-27 average remains incomplete. Some insights into the frequency and determinants

of falls are provided by two cross-sectional studies: PolSenior1,[2] conducted between 2007 and 2012, and PolSenior2,[3] carried out between 2018 and 2019 (with results published in 2021). The PolSenior1 study estimated that annually, 23.1% of individuals aged 65 years and older experience a fall (19.7% of men and 26.8% of women), with nearly 41% resulting in injuries. The subsequent PolSenior2 study indicated a certain improvement in the situation, estimating the age-standardised annual incidence of falls among individuals over 60 years old at 16.0% (11% of men and 19.6% of women). This means that 1.5 million people aged 60 and over in Poland experience a fall each year. It is worth noting that PolSenior2 found a higher fall frequency than PolSenior1 among the oldest groups , those aged 80 and over (Fig. 9.9). A concerning phenomenon observed in PolSenior2 was the significant disparities in reported fall frequency by education level, particularly among women. The percentage of women reporting a fall in the past 12 months was 28.7% for those with primary or incomplete primary education, compared to 12.7% for women with tertiary education. When interpreting the findings of both studies, it is important to exercise caution because PolSenior1 results were published using observed values. In contrast, the results of PolSenior2 were reported using age-standardised values.

The severity of health consequences resulting from falls in the PolSenior2 study was comparable to that observed in PolSenior1. According to the PolSenior2 study, 39.2% of falls resulted in an accident, and it is estimated that over 588 thousand people aged 60 and over in Poland experience various types of fall-related injuries each year. Contusions and cuts were the most frequently recorded injuries among older individuals in the PolSenior2 study, reported in 62.2% of cases. Head injuries were the second most common, accounting for 15.8% of incidents. The frequency of these injuries was similar among both men and women. In contrast, fractures of the upper limbs and femoral neck occurred significantly more often in women. Upper limb fractures were reported in 13.9% of women compared to 2.9% of men, while femoral neck fractures occurred in 6.4% of

[2] Skalska A, Wizner B, Klich-Rączka A, Piotrowicz K, Grodzicki T. Upadki i ich następstwa w populacji osób starszych w Polsce. Złamania bliższego końca kości udowej i endoprotezoplastyka stawów biodrowych. In: Mossakowska M, Błędowski P, Więcek A., ed. Aspekty medyczne, psychologiczne, socjologiczne i ekonomiczne starzenia się ludzi w Polsce (pp. 295–306), Termedia Poznań 2012

[3] Skalska, A., Hajduk, A., Mossakowska, M., Wizner, B., Wierzba, K., & Grodzicki, T. (2021). Upadki i ich następstwa. W P. Błędowski, T. Grodzicki, & M. Mossakowska (Ed.), PolSenior2: badanie poszczególnych obszarów stanu zdrowia osób starszych, w tym jakości życia związanej ze zdrowiem (pp. 235–251). Gdański Uniwersytet Medyczny 2021

women and only 0.8% of men. It is important to emphasise that, alongside head injuries, femoral neck fractures are among the most serious injuries in the elderly population, often leading to a significant decline in quality of life or even death.

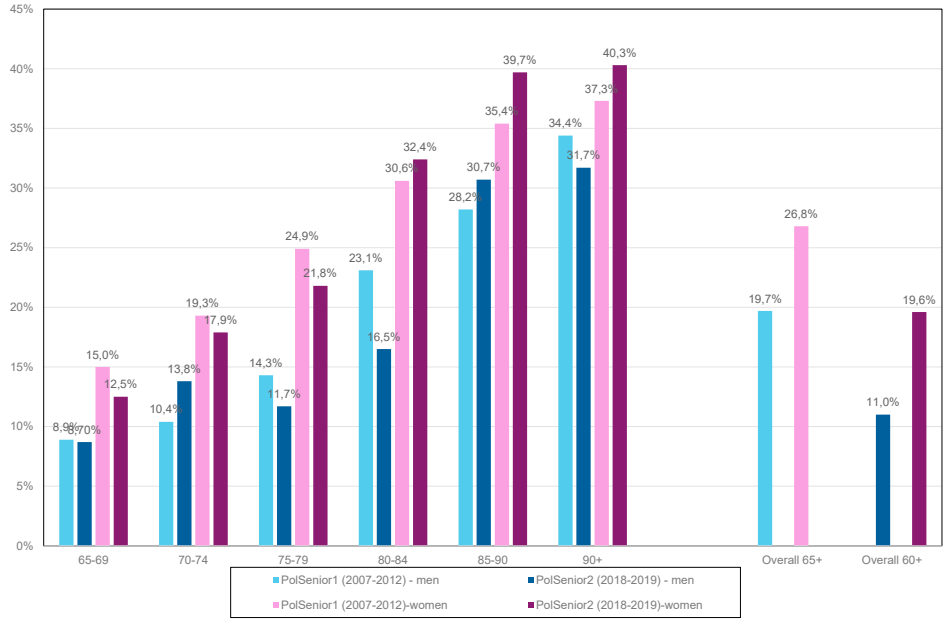


Fig. 9.9. Frequency of falls in demographic groups in the PolSenior1 and PolSenior2 studies. Comparisons between the two studies should be approached with caution due to the age-standardisation of published results in the case of PolSenior2 (PolSenior1 and PolSenior2)

Secondary data collected within public statistics is characterised by variable quality over the years; nevertheless, it presents insight into the prevalence of fall-related injuries and their determinants within certain narrow scopes. In 2023, a total of 5,027 individuals died as a result of fall-induced injuries, the vast majority of whom (3,951) were aged 65 or over (78.6%). Although falls occur more frequently among women, the risk of death among men is slightly higher – standardised mortality rates in 2023 were 14.2 per 100,000 for men and 12.5 per 100,000 for women. In terms of underlying causes of death, the most common fatal falls were classified under the category of "unspecified falls" (W19), accounting for 2,694 deaths or 53.6% of all fatalities due falls. The second most frequently registered category by certifying physicians was "falls on the same level from slipping, tripping and stumbling", resulting in 1,434 deaths (28.5%). The third most common cause was "falls on and from stairs and steps", leading to 338 deaths (6.7%). This pattern of

classifications for fall-related mortality has persisted for many years. The high proportion of cases coded as "unspecified falls" may indicate issues with the precision of the descriptions provided by physicians certifying deaths resulting from falls. International analyses concerning the registration of deaths due to falls suggest that public statistical data in this area may be underestimated.[4]

Mortality data from the period 2019–2023 indicate a clear increase in fall-related deaths during the COVID-19 pandemic, particularly among age groups over 65, in which the highest mortality rates due to falls are observed. In 2022 and 2023, mortality rates in these groups declined, although they remained higher than pre-pandemic levels (Fig. 9.10). Possible contributing factors include the direct impact of the COVID-19 pandemic, such as isolation and reduced mobility among older adults, as lower physical activity level increase the risk of falls. Another factor may have been the so-called "health debt" n and a decline in the management of multimorbidity in the elderly by the healthcare system. However, mentioned above hypotheses require further epidemiological studies..

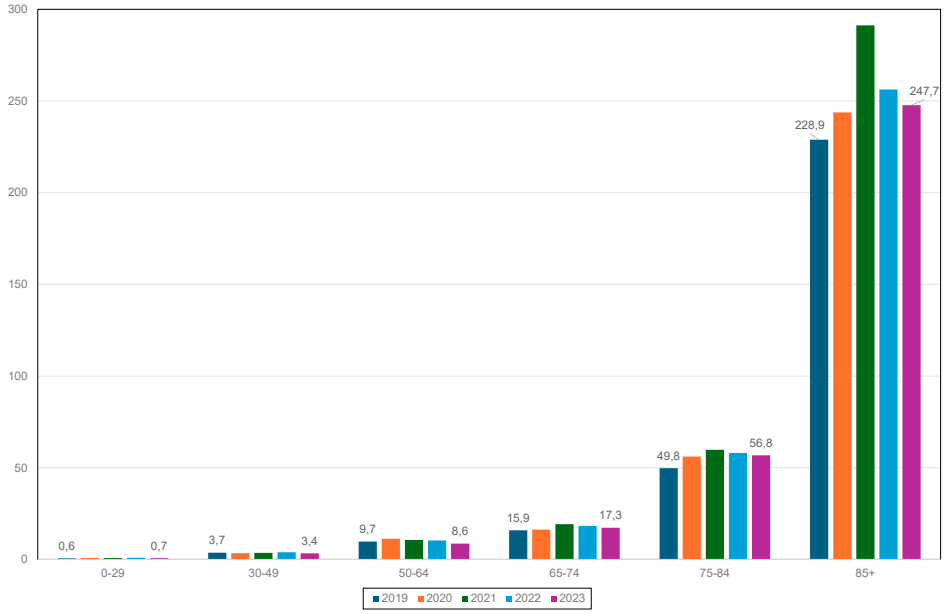


Fig. 9.10 Mortality rates due to falls (W00–W19) per 100,000 population in Poland between 2019 and 2023 by age group (Statistics Poland)

[4] Hua J, Ning P, Cheng P, et al. Coding quality of deaths and its impact on elderly unintentional fall mortality data from 1990 to 2019: a retrospective analysis of the WHO Mortality Database. BMC Geriatr. 2022;22(1):72

Transport accidents

Transport accidents are the second leading cause of accident-related mortality after falls. According to Global Burden of Disease (GBD) estimates, they rank as the seventh cause of lost life years in Poland due to disability and premature mortality . This category of accidents is characterised by an epidemiological profile somewhat contrary to falls. The group at particular risk, which most frequently experiences transport accidents, consists of men from younger and middle-aged groups, and they are also the primary casualities of such accidents. Nevertheless, individuals aged 65 years and over are overrepresented among fatalities in road transport accidents due to the more severe injuries they sustain and generally poorer prognoses for recovery from those injuries. Compared to falls, the scope of preventive measures in relation to road transport accidents is better understood in terms of effective interventions, such as the "Vision Zero" paradigm. The "Vision Zero" approach holds that no level of road traffic fatalities or serious injuries is acceptable; responsibility for safety rests primarily with the road system rather than with individual users alone. It is therefore essential to develop infrastructure and regulations that minimize the impact of human error[5].

Nevertheless, the underlying conditions and characteristics of transport accidents are evolving in response to broader socio-economic changes . One such change is the ageing of populations across Europe, which has led to an increasing proportion of road users being aged 65 and over.

Despite gradual improvements, Poland is still regarded as one of the countries with the lowest road safety level in the the EU-27. Between 2010 and 2023, the number of fatalities in Poland was reduced by 51.5% (from 3,907 to 1,893 deaths). The fatality rate resulting from road transport accidents in Poland was 5.2 per 100,000 population, compared with 4.6 per 100,000 in EU-27 countries (Fig. 9.11).

It is worth noting that in 2024, the number of road fatalities remained nearly unchanged from 2023, amounting to 1,881, according to preliminary data available from National Police Headquarters. The rate of decline across the entire EU was lower, at 31% (a reduction from 29,576 to 20,400 fatalities in 2023). It is also worth noting that after 2020, the pace of decline in EU-27 countries generally slowed and fell off the trajectory outlined in the European Commission's Road Safety Strategy, which had set a target of a 50% reduction in road fatalities between 2018 and 2030.

[5] Tingvall C, Haworth N. Vision Zero – An ethical approach to safety and mobility. Presented at: 6th ITE International Conference Road Safety & Traffic Enforcement: Beyond 2000; 1999; Melbourne, Australia

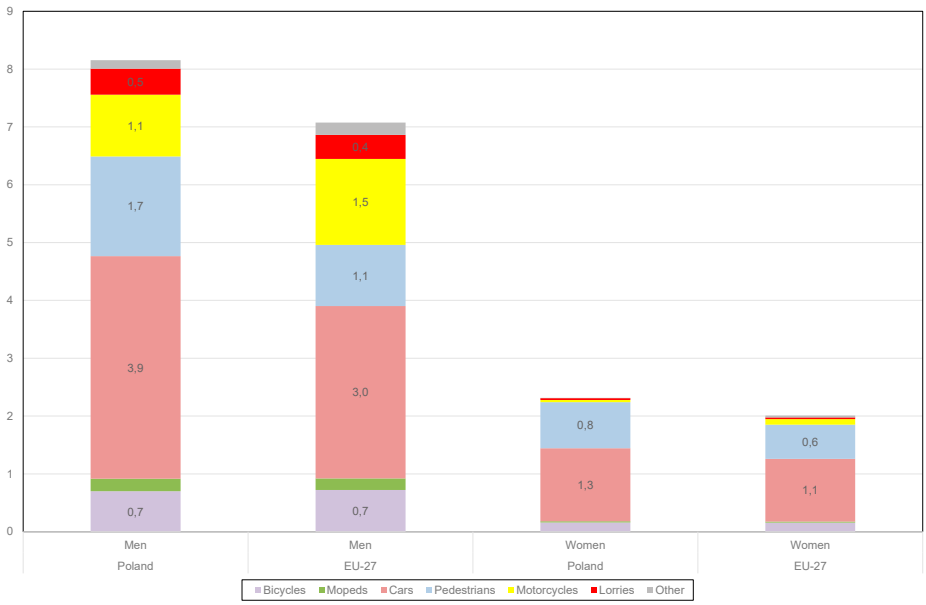


Fig. 9.11. Mortality rates due to road transport accidents per 100,000 population by category of road user in Poland and EU-27, among men and women (EU CARE database and EUROSTAT)

In 2023, male drivers caused 71.9% of all road accidents and accounted for 76.6% of all accident casualties (data from the National Police Headquarters). A particularly high accident rate was observed among individuals aged 18–24, with 115.4 accidents per 100,000 people in this age group. Contrary to widespread stereotypes suggesting that the oldest road users are particularly dangerous for traffic safety, the age group with the lowest accident rate was individuals over 60 years of age, with 36 accidents per 100,000 people. A positive trend was the decline in this rate between 2019 and 2023 across the a demographic groups (Fig. 9.12).

It is also worth noting that individuals aged over 65 account for 25% of all road fatalities in Poland, compared with the EU-27 average of 30.5% (data from the EU-27 CARE database). The trends described above concerning road transport accidents have persisted in Poland for many years. The two main causes responsible for half of all accidents are failure to yield the right of way and inappropriate speed.

For over a decade, Poland has been grappling with a particularly high proportion of so-called vulnerable road users among causalities of accidents . These include pedestrians, cyclists, motorcyclists, and users of various transport aids such as power chairs and electric bicycles. The incidence of such accidents is higher than the EU-27 average. A survey conducted as part of this Report also

highlighted the frequent problem of accidents in public spaces, particularly among pedestrians, reported mainly by age groups over 65. Currently, vulnerable road users represent 44.8% of all road fatalities. A positive trend observed since 2010 has been the improvement in pedestrian safety (Table 9.1), with a marked 63% reduction in pedestrian fatalities compared to other road user groups.

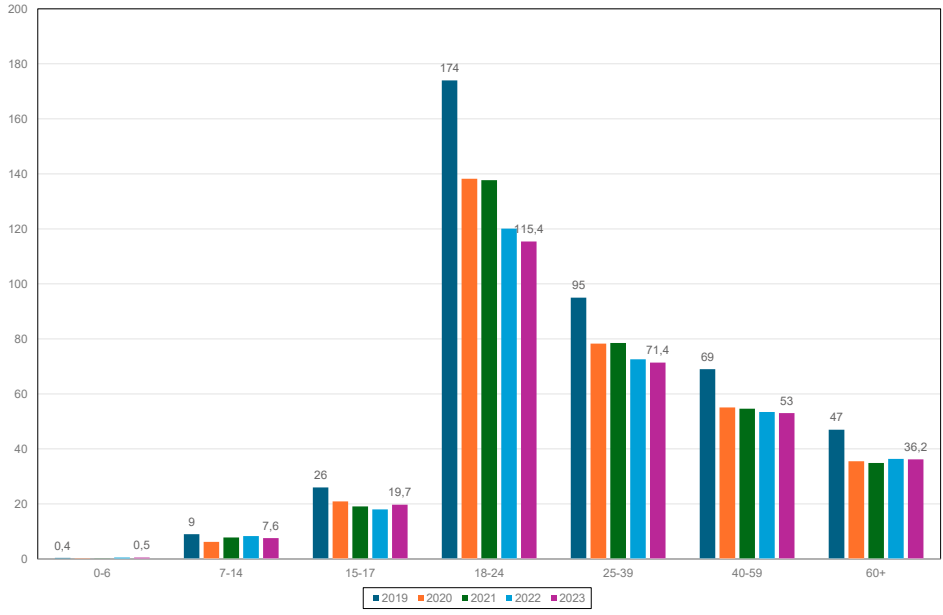


Fig. 9.12. Road transport accident rates per 100,000 population by age group in Poland, 2019–2023 (National Police Headquarters)

Table 9.1. Fatalities in road transport accidents by mode of transport in Poland in 2010, 2020, and 2023 (Polish Road Safety Observatory and National Police Headquarters)

Road users	2010		2020		2023		Change 2023/2010
	%	of total	%	of total	%	of total	
Pedestrians	1,236	31.6%	631	25.3%	457	24.1%	-63.0%
Passengers of cars	1,853	47.4%	1,162	46.6%	962	50.8%	-48.1%
Bicycles	280	7.2%	249	10%	154	8.1%	-45.0%
Motorcycles	259	6.6%	244	9.8%	196	10.4%	-24.3%
Mopeds	83	2.1%	71	2.9%	42	2.2%	-49.4%
Lorries	142	3.6%	104	4.2%	86	4.5%	-39.4%
Buses	14	0.4%	9	0.4%	8	0.4%	-42.9%
Total	3,907 100%		2,491 100%		1,893 100%		-51.5%

The ageing population, particularly noticeable in Europe leads to increasing proportion of road users aged over 65. Age-related health problems , such as multimorbidity and sensory impairments, contribute to a decline in driving ability and are commonly perceived as a particular source of danger posed by older adults on the roads due to their health status. However, survey findings published in 2024 under the acronym ESRA3, comparing the behaviour of older and younger road users, indicate that older individuals report more cautious attitudes and behaviours than younger drivers. In Europe, only 1.3% of people over 65 declared that they accepted talking on the phone while driving, compared with 9.6% among those aged 18–24. Older adults also displayed greater caution regarding speeding – only 4.5% of seniors reported exceeding the speed limit outside built-up areas, compared with 17.6% in the 18–24 age group. The conclusions of the ESRA3[6] clearly indicate that the youngest drivers tend to exhibit more risk-prone behaviour. Nonetheless, the report recommends introducing a regulation requiring periodic medical examinations for drivers over 65. As the population ages, additional road safety challenges are beginning to emerge. Among them is polypharmacy and the adverse effects of certain medications used to treat chronic conditions, which can impair psychomotor performance. The ESRA2[7] (an earlier wave of the survey preceding ESRA3), published in 2019, showed that in Europe, 15% of surveyed drivers admitted to driving a vehicle while under the influence of a medication with a clear warning about its negative impact on psychomotor ability. Another trend observed in recent years is the increasing presence of new forms of transport assistance with higher kinetic energy in pedestrian and cycling traffic, such as e-scooters and electric bicycles. It is important to note that individuals with reduced mobility or sensory impairments are more vulnerable to collisions with such vehicles. The survey also revealed that the frequency of pedestrian and street-related accidents increases with age. This finding may suggest the need for monitoring systems to track accident rates in public spaces.

[6] Delavary, M., Lyon, C., Vanlaar, W.G.M., Robertson, R.D. (2024). Young and Aging Drivers. ESRA3 Thematic report No. 5. ESRA project (E-Survey of Road users' Attitudes). (2024-R-22-EN). Traffic Injury Research Foundation.

[7] Achermann Stürmer, Y., Meesmann, U. & Berbatovci, H. (2019) Driving under the influence of alcohol and drugs. ESRA2 Thematic report No. 5. ESRA project (E-Survey of Road users' Attitudes). Bern, Switzerland: Swiss Council for Accident Prevention.

Accidents among children and young people (age group 0-19 years)

According to the most up-to-date data from the HBSC survey on the health and health behaviours of school children, conducted by the Institute of Mother and Child in collaboration with the WHO, 38.2% of adolescents in Poland – i.e., more than one in three pupils – had suffered at least one injury requiring medical attention in the past 12 months, and 15.9% reported repeated injuries during the same period (2017/2018 school year). The percentage of injuries was higher among boys (40.0%) than among girls (36.6%).It is worth noting that, compared to results from the previous round of the survey in 2013/2014, the frequency of injuries has remained unchanged. However, a rising trend has been observed in the reported frequency of injuries among pupils since the HBSC survey began in Poland in 1994.

Mortality among children and adolescents due to accidents has been steadily declining since 2000. Despite positive trends, the risk of death among children and adolescents due to accidents is 39% higher in Poland than average mortality in the EU-27. According to WHO Global Health Estimates, in 2021 the mortality rate was 5.2 per 100,000 population in Poland, compared to 3.7 in EU countries. Between 2019 and 2023, a total of 1,669 people under the age of 19 died as a result of accidents (about 3% of all deaths due to accidents). Among the causes of mortality among children and young people, traffic accidents were by far the dominant cause – 61.6% of all fatalities, followed by poisoning (9.5%), the third cause being falls responsible for 7% of fatal accidents. It is worth mentioning that the structure of the causes of fatal traffic accidents among children and young people was similar to that of the adult population. Passenger and car driver fatalities accounted for 46.5% of all traffic accident fatalities, and pedestrians for 22.9%. The mortality rate due to traffic accidents among the youngest children aged 0-4 years fell from 1.3 to 1.0 per 100 and in the age group 5-14 years from 1.4 to 1.3 per 100,000 between 2019 and 2023.

For many years, setting with a particularly high accident risk among the youngest age groups have been rural areas in Poland. The changes observed between 2019 and 2023 indicated a substantial improvement in rural areas, particularly among boys. This was largely the result of improvements of road traffic safety (Fig. 9.13). However there is growing concern regarding the lack of a marked reduction in overall mortality among children and adolescents living in urban areas.This situation highlights the need to initiate and intensify preventive measures in other areas of unintentional injuries affecting children and adolescents,

particularly those related to poisoning as well as the safety of public spaces and educational institutions.

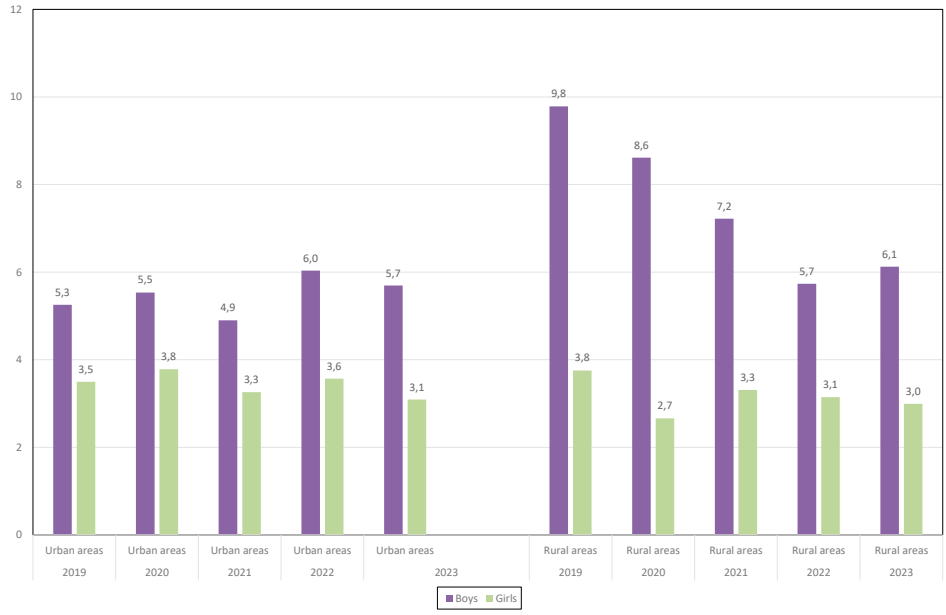


Fig. 9.13. Mortality rates due to accidents among children and adolescents (0-19 years old) per 100,000 population in Poland between 2019 and 2023 by sex and place of residence (Statistics Poland)

10. ALZHEIMER'S DISEASE AND RELATED DISORDERS – AN IMPORTANT PUBLIC HEALTH PROBLEM IN POLAND

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Introduction to the problem of Alzheimer's disease in Poland

Alzheimer's disease is the most common neurodegenerative disease associated with dementia; it is estimated to account for 60–70% of dementia cases.[1] It involves progressive memory loss and other cognitive problems. After several years, it leads to a complete loss of cognitive and physical independence. Alzheimer's disease is treated with symptomatic pro-cognitive drugs and various forms of supportive therapy for patients and carers.[2]

Alzheimer's disease has been studied for many years, but its causes are not fully understood. Its development is influenced by many factors, including genetics, demographics (age is one of the most important factors in the development of Alzheimer's disease and related disorders), health status (cerebrovascular dysfunction resulting from coexisting vascular risk factors such as high blood pressure, hyperlipidaemia, ischaemic heart disease or type 2 diabetes),

[1] https://www.who.int/news-room/fact-sheets/detail/dementia
[2] NFZ o zdrowiu. Choroba Alzheimera i choroby pokrewne [National Health Fund on health. Alzheimer's disease and related disorders], commentary on the report by Prof. Agnieszka Słowik, National Consultant for Neurology, https://ezdrowie.gov.pl/portal/home/badania-i-dane/zdrowe-dane/raporty/nfz-o-zdrowiu-choroba-alzheimera-i-choroby-pokrewne.

psychological and social factors (living alone, lack of social and family relationships promotes the development of dementia).[3]

This chapter presents the epidemiological situation concerning Alzheimer's disease and related disorders, estimated using data on health services reported to the National Health Fund. The analyses presented here expand the data contained in the *National Health Fund on health. Alzheimer's disease and related disorders.*[3]

Data reported to the National Health Fund via SWIAD (data on outpatient and inpatient services) was used. This means that the analysis does not include data concerning health resort treatment or certain preventive programmes.

The **recorded prevalence** of Alzheimer's disease and related disorders in year *t* was defined as the number of persons who were alive at the end of year *t* and who, in the years from *t–3* to *t* (inclusive), received at least one health service with a primary or secondary diagnosis classified under ICD-10 codes F00–F01 (all diagnoses, including those without specified expanded codes), F02.1–F02.3, G30 (all diagnoses, including 3-digit ones) and diagnoses G31.0, G31.1, G31.8, G31.9. The patient population was restricted to individuals aged 55 and over (based on year of birth). Information on the recorded prevalence from 2014 to 2023 is presented, which can be interpreted as the number of diagnosed cases in those years. The second indicator used to describe the recorded epidemiology is the recorded incidence. As in the case of recorded prevalence, this indicator was estimated based on health services reported to the National Health Fund.

Recorded incidence was defined as the number of patients who, in a given year (*t*), received a health service with a primary or secondary diagnosis of F00–F01 (all diagnoses, including those without reported expanded code), F02.1–F02.3, G30 (all diagnoses, those without reported expanded code) and diagnoses G31.0, G31.1, G31.8, G31.9 according to ICD-10 and did not receive such a service in the years from *t–3* to *t–1*. As with recorded prevalence, this information refers to persons aged 55 or over in year *t*.

It should be noted that the information presented has been estimated based on the National Health Fund reporting data and does not include information on persons who received services financed exclusively from sources other than the National Health Fund or who did not use services in connection with Alzheimer's disease and related disorders.

[3] https://ezdrowie.gov.pl/portal/home/badania-i-dane/zdrowe-dane/raporty/nfz-o-zdrowiu-choroba-alzheimera-i-choroby-pokrewne

Scale of the health problem and characteristics of the patient population

This section provides information on the epidemiological situation concerning Alzheimer's disease and related disorders. Information on the recorded prevalence from 2014 to 2023 is presented, which can be interpreted as the number of diagnosed cases in those years. This subsection also contains information on the recorded incidence of new cases of Alzheimer's disease and related disorders in the state-funded healthcare system.

The prevalence of Alzheimer's disease and related disorders per 1,000 persons, for both males and females, was stable between 2014 and 2023 (Fig. *10.1*). For men, it was approximately 20 cases per 1,000 of the population aged 55 and over, while for women, it ranged from approximately 37 to 39 cases.

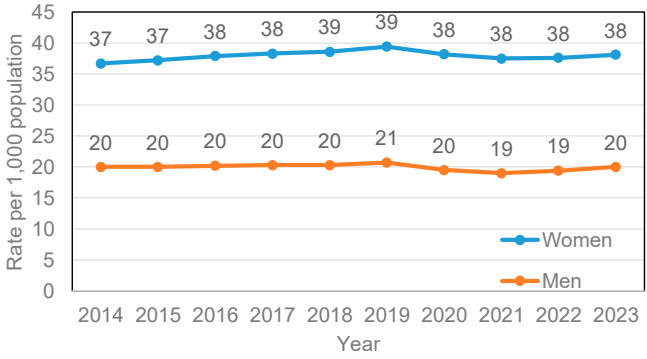


Fig. 10.1. Estimated prevalence of Alzheimer's disease and related disorders in Poland per 1,000 people aged 55 and over (Statistics Poland and National Health Fund data)

Between 2014 and 2023, more women than men had Alzheimer's disease and related disorders in Poland (approximately 250.0 thousand women annually, reaching 261.3 thousand in 2023) (Fig. 10.2). In the analysed period, the highest number of female patients, 270.8 thousand, was recorded in 2019. The number of male patients fluctuated around 100.0 thousands. In 2023, there were 104.2 thousand male patients aged 55 and over.

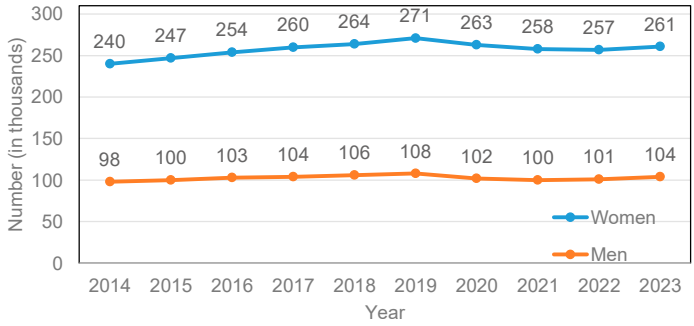


Fig. 10.2. Estimated number of patients with Alzheimer's disease and related disorders in Poland (2014–2023) aged 55 and over as an absolute value (National Health Fund data)

Between 2014 and 2023, the recorded incidence rate (per 1,000 population aged 55 and over) of Alzheimer's disease or related disorders was approximately 7 among men (Fig. 10.3). In women, the incidence rate was 11. There was a noticeable decrease in the incidence rate for both sexes in 2020, which is most likely due to the reduced number of services provided during the COVID-19 pandemic.

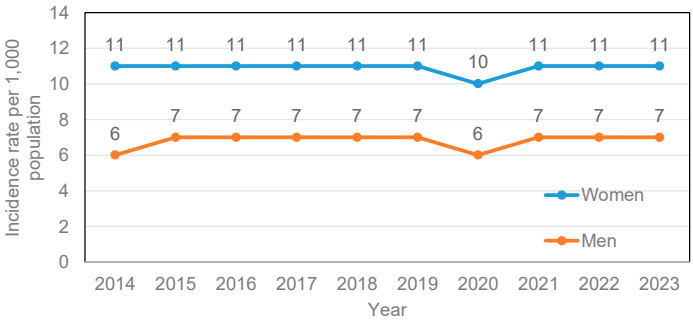


Fig. 10.3. Estimated incidence rate of Alzheimer's disease and related disorders in Poland per 1,000 population aged 55 and over (2014–2023) (Statistics Poland and National Health Fund data)

Fig. 10.4 shows the recorded incidence of Alzheimer's disease and related disorders in the population aged 55 and over. Between 2014 and 2023, approximately 35.0 thousand new male cases were reported annually. The figures for women fluctuated between 71.1 thousand and 76.8 thousand new cases per year during this period.

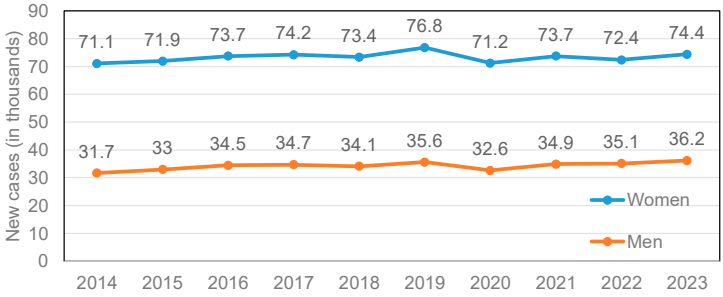


Fig. 10.4. Estimated number of new cases of Alzheimer's disease and related disorders in Poland (2014–2023) (National Health Fund data)

Fig. 10.5 presents information on the number of patients with Alzheimer's disease or related disorders in 2023 by age group. In the youngest group analysed, patients aged 55–64, there were 8.3 thousand male and 8.0 thousand female patients. The older the age group, the more female patients. In 2023, the highest number of patients was aged 85 and over (approximately 117.9 thousand). In men, the highest number of cases, 40.5 thousand, was observed in the group aged 75–84.

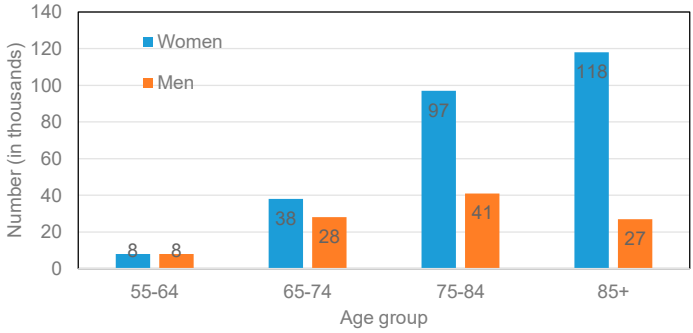


Fig. 10.5. Number of people with Alzheimer's disease or related disorders by gender and age group in 2023 (National Health Fund data)

Data from 2023 indicate that the percentage of patients with Alzheimer's disease and related disorders increases with age (Fig. 10.6). In the 55–64 age group, approximately 0.3% of women were affected, which translates to approximately

7.99 thousand patients. In turn, in the group aged 85 and over, the percentage of women affected by Alzheimer's disease or related disorders was 20% in 2023.

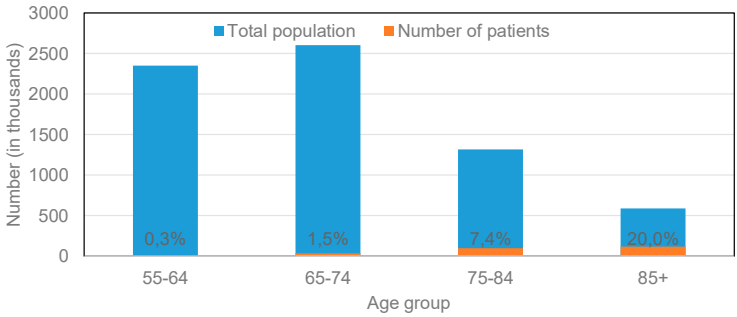


Fig. 10.6. Number and percentage of the population with Alzheimer's disease or related disorders by age group – women, 2023 (Statistics Poland and National Health Fund data)

The data presented in Figure 10.7 indicate that in 2023, the highest percentage of men with Alzheimer's disease and related disorders was found in the oldest age groups. Among individuals aged 55–64, approximately 0.4% of men (approximately 8.3 thousand) had this disease. The highest number of male patients was in the 75–84 age group, with 40.5 thousand cases, representing 5.1% of men in this age group. In turn, the percentage of male patients aged 85 and over was 12%, but the absolute number of patients was lower than in the 75–84 age group, standing at 27.4 thousand men.

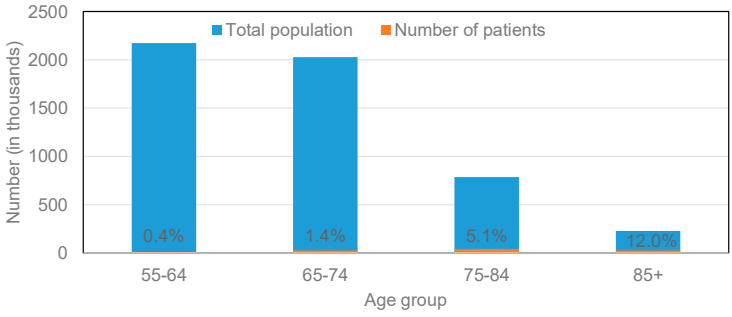


Fig. 10.7. Number and percentage of the population with Alzheimer's disease or related disorders by age group – men, 2023 (Statistics Poland and National Health Fund data)

Dynamics – changes in prevalence and incidence over time

Table 10.1 presents the recorded prevalence of Alzheimer's disease and related disorders in Poland in 2014–2023. The table shows data for the population aged 55 and over. The number of patients during this period increased by approximately 7.9%, from 338.7 thousand to 365.5 thousand. This represented an increase of 8.7% for women and 6.0% for men. The recorded prevalence per 1,000 persons aged 55 and over increased slightly over time, from 29.5 in 2014 to 30.3 in 2023, while the age-standardised rate fell slightly. In 2023, the incidence rate was higher in women by 90.2% than in men. This difference is mostly related to the older age structure of women – the age-standardised prevalence rate for women was 40.2% higher than for men.

Table 10.2 presents the recorded incidence of Alzheimer's disease and related disorders in Poland in 2014–2023 among persons aged 55 and over. The number of new cases increased between 2014 and 2023, from 102.8 thousand in 2014 to 110.7 thousand in 2023 (an increase of 7.7%). The number of new cases for women increased by 4.6% in 2023 compared to 2014, while this figure rose by 14.2% for men. The incidence rate per 1,000 persons aged 55 and over increased from 9.0 in 2014 to 9.2 in 2023 (an increase of 2%). The age-standardised incidence rate per 1,000 persons aged 55 and over decreased in the analysed years from 11.2 to 10.5 for women and remained stable for men (approximately 9.5). The excess of the standardised incidence rate for women compared to men remains at approximately 10%, reaching 11.7% in 2023.

Prevalence differences and changes over time by voivodship of residence

Table 10.3 shows information on the European age-standardised prevalence rate of Alzheimer's disease and related disorders in 2023 by the patients' voivodship of residence. The figures ranged from 25.1 to 36.3, with the lowest value recorded in Podlaskie voivodship and the highest in Podkarpackie voivodship.

Table 10.1 Recorded prevalence and recorded prevalence rate of Alzheimer's disease and related disorders in Poland, 2014–2023 (Statistics Poland and National Health Fund data)

Year	Total number of patients (in thousands)	Number of female patients (in thousands)	Number of male patients (in thousands)	Total prevalence rate per 1,000 persons aged 55 and over	Female prevalence rate per 1,000 persons aged 55 and over	Male prevalence rate per 1000 persons aged 55 and over	Age-standardised prevalence rate per 1,000 persons aged 55 and over (total)	Age-standardised prevalence rate per 1000 persons aged 55 and over (women)	Age-standardised prevalence rate per 1,000 persons aged 55 and over (men)
2014	338.7	240.4	98.3	29.5	36.7	20.0	32.8	37.9	27.6
2015	346.6	246.6	100.1	29.8	37.2	20.0	32.9	38.1	27.6
2016	357.1	254.3	102.8	30.3	37.9	20.2	33.0	38.2	27.8
2017	364.1	259.7	104.3	30.6	38.3	20.3	33.0	38.3	27.7
2018	369.0	263.5	105.5	30.7	38.6	20.3	33.0	38.3	27.7
2019	379.0	270.8	108.2	31.3	39.4	20.7	33.3	38.8	27.8
2020	365.3	263.0	102.3	30.1	38.2	19.5	31.9	37.5	26.3
2021	357.2	257.8	99.5	29.5	37.5	19.0	31.1	36.6	25.6
2022	357.1	256.5	100.6	29.7	37.6	19.4	31.2	36.6	25.9
2023	365.5	261.3	104.2	30.3	38.1	20.0	31.4	36.6	26.1

Table 10.2 Recorded incidence and incidence rate of Alzheimer's disease and related disorders in Poland, 2014–2023 (Statistics Poland and National Health Fund data)

Year	Total number of new cases (in thousands)	Number of new female cases (in thousands)	Number of new male cases (in thousands)	Total incidence rate per 1,000 persons aged 55 and over	Female incidence rate per 1,000 persons aged 55 and over	Male incidence rate ratio per 1,000 persons aged 55 and over	Age-standardised incidence rate per 1,000 persons aged 55 and over (total)	Age-standardised incidence rate per 1,000 persons aged 55 and over (women)	Age-standardised incidence rate per 1,000 persons aged 55 and over (men)
2014	102.8	71.1	31.7	9.0	10.9	6.5	10.3	11.2	9.5
2015	104.9	71.9	33.0	9.0	10.8	6.6	10.3	11.1	9.6
2016	108.2	73.7	34.5	9.2	11.0	6.8	10.4	11.0	9.8
2017	108.9	74.2	34.7	9.1	11.0	6.8	10.3	10.9	9.7
2018	107.5	73.4	34.1	8.9	10.7	6.6	10.0	10.7	9.3
2019	112.4	76.8	35.6	9.3	11.2	6.8	10.2	11.0	9.5
2020	103.8	71.2	32.6	8.6	10.3	6.2	9.5	10.2	8.8
2021	108.7	73.7	34.9	9.0	10.7	6.7	10.0	10.5	9.5
2022	107.5	72.4	35.1	9.0	10.6	6.8	9.8	10.4	9.3
2023	110.7	74.4	36.2	9.2	10.9	6.9	9.9	10.5	9.4

Table 10.3. European age-standardised prevalence rate of Alzheimer's disease and related disorders per 1,000 population by the patients' voivodship of residence, 2023. (National Health Fund data)

Voivodship	European age-standardised prevalence rate
Dolnośląskie	31.21
Kujawsko-Pomorskie	29.40
Lubelskie	32.34
Lubuskie	32.66
Łódzkie	34.52
Małopolskie	35.43
Mazowieckie	31.51
Opolskie	29.19
Podkarpackie	36.27
Podlaskie	25.11
Pomorskie	27.60
Śląskie	29.71
Świętokrzyskie	35.43
Warmińsko-Mazurskie	30.35
Wielkopolskie	31.59
Zachodniopomorskie	29.71

In each voivodship, both in 2018 and in 2023, the prevalence of Alzheimer's disease and related disorders was higher in women than in men (Fig. 10.8, Fig. 10.9).

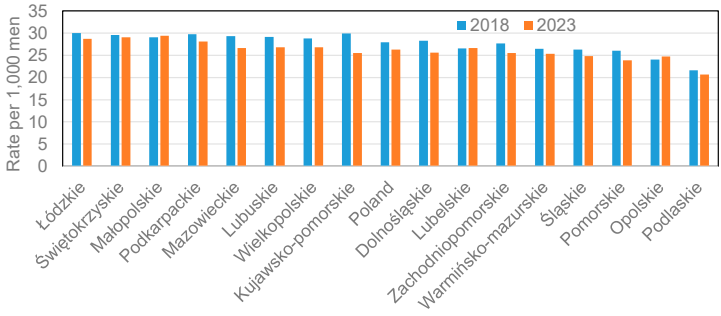


Fig. 10.8. Standardised prevalence of Alzheimer's disease and related disorders among men aged 55 and over per 1,000 men by voivodship of residence in 2018 and 2023 (National Health Fund data)

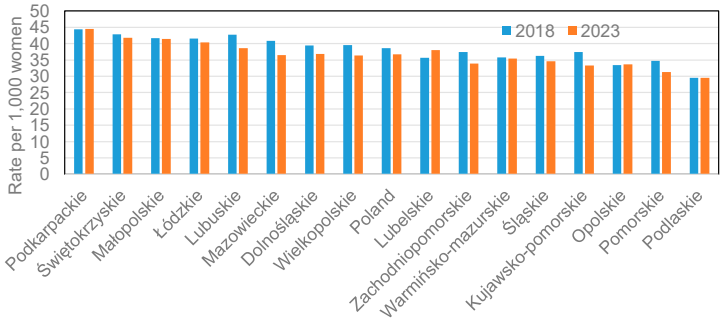


Fig. 10.9. Standardised prevalence of Alzheimer's disease and related disorders among women aged 55 and over per 1,000 women by voivodship of residence in 2018 and 2023 (National Health Fund data)

In 2023, the highest rate for men was observed in Małopolskie voivodship (29.4), and for women in Podkarpackie voivodship (44.47). The lowest rates in 2023 for both men and women were recorded in Podlaskie voivodship (20.65 for men and 29.58 for women). In most voivodships, prevalence was lower in 2023 than in 2018. In 2023, higher rates for men were observed in three voivodships: Małopolskie, Lubelskie and Opolskie, and for women in four voivodships: Podkarpackie, Lubelskie, Opolskie and Podlaskie.

Prevalence differences and changes over time (comparison of 2023/2018) by size of place of residence

Table 10.4 presents the European age-standardised prevalence of recorded Alzheimer's disease and related disorders by size of place of residence in 2018 and 2023. Both in 2018 and 2023, the highest prevalence was observed in towns with a population of up to 10,000 and gradually decreased with increasing population size – the lowest prevalence rates were observed in cities with a population of 100,000–200,000, while in the largest cities, the rate increased slightly. In 2023, the prevalence rate among residents of rural areas and the smallest towns with fewer than 10,000 inhabitants increased compared to 2018, while it decreased among residents of other urban areas. The excess prevalence of women compared to men was highest among rural residents and lowest among residents of the largest cities.

Table 10.4. Standardised recorded prevalence rates of Alzheimer's disease and related disorders per 1,000 population in Poland by sex and size of place of residence of persons aged 55 and over in 2018 and 2023 (Statistics Poland and National Health Fund data)

Year	Sex	Rural area	Towns up to 10,000 inhabitants	Towns with 10,000 to 20,000 inhabitants	Towns/ cities with 20,000 to 50,000 inhabitants	Cities with 50,000 to 100,000 inhabitants	Cities with 100,000 to 200,000 inhabitants	Cities with 200,000 inhabitants
2018	Women	49.7	60.5	44.7	39.3	38.1	36.8	39.2
2018	Men	35.3	47.4	32.6	28.7	27.4	27.2	29.9
2018	Total	42.7	54.3	38.7	34.0	32.8	32.0	34.5
2023	Women	53.8	64.7	43.8	37.4	35.6	34.8	34.5
2023	Men	36.9	47.8	31.3	27.3	26.1	25.7	26.1
2023	Total	45.4	56.6	37.6	32.4	30.8	30.3	30.3

Table 10.5 shows the recorded incidence rates for Alzheimer's disease and related disorders in 2018 and 2023 by place of residence size and sex. Similarly to the recorded prevalence, the highest rates were observed in towns with up to 10,000 inhabitants – this applies to both 2018 and 2023. The lowest rates were recorded in cities with a population of 100,000–200,000 and over 200,000. Unlike the prevalence rate, the figures for women were not higher than those for men in all places of residence by size, with lower rates recorded in 2018 in rural areas, towns with up to 10,000 inhabitants and towns with 10,000–20,000 inhabitants. In 2023, lower rates for women were observed only in rural areas and towns with up to 10,000 inhabitants.

The differences in the prevalence of Alzheimer's disease and related disorders in Poland by the size of the place of residence may be due to a number of factors. These include limitations related to the data set used – in line with the methodology, the estimate does not take into account data on services financed from non-public sources. Therefore, it is likely that in larger cities, where a higher percentage of such services can be expected, the number of patients or newly diagnosed cases may be underestimated.

Table 10.5. European age-standardised incidence rate of recorded Alzheimer's disease and related disorders per 1,000 population in Poland by sex and size of place of residence for persons aged 55 and over, 2018 and 2023 (Statistics Poland and National Health Fund data)

Year	Sex	Rural area	Towns up to 10,000 inhabitants	Towns with 10,000 to 20,000 inhabitants	Towns/ cities with 20,000 to 50,000 inhabitants	Cities with 50,000 to 100,000 inhabitants	Cities with 100,000 to 200,000 inhabitants	Cities with 200,000 inhabitants
2018	Women	23.0	30.2	15.8	12.5	10.8	10.0	10.9
	Men	24.1	36.3	14.6	11.2	9.6	8.8	9.5
	Total	23.5	32.9	15.2	11.8	10.2	9.4	10.2
2023	Women	23.3	29.7	15.8	12.4	11.0	10.6	10.0
	Men	22.9	33.4	14.6	11.5	10.1	9.2	8.8
	Total	23.1	31.4	15.2	11.9	10.5	9.9	9.4

Other possible causes may lie in risk factors for Alzheimer's disease and related diseases. The literature indicates that the risk of dementia depends on the level of formal education – people with a lower education level have a higher risk of developing Alzheimer's disease.[4] Other risk factors that may explain the differences between individual categories of place of residence include other lifestyle-related diseases (such as type 2 diabetes, dyslipidaemia, hypertension, obesity and underweight).[5,6,7]

[4] Hersi, M., Irvine, B., Gupta, P., Gomes, J., Birkett, N., Krewski, D., 2017. Risk factors associated with the onset and progression of Alzheimer's disease: A systematic review of the evidence. Neurotoxicology 61, 43–187.

[5] Li, X., Song, D., Leng, S.X., 2015. Link between type 2 diabetes and Alzheimer's disease: from epidemiology to mechanism and treatment. Clinical Interventions in Aging 10, 549

[6] Silva, M.V.F., Loures, C.d.M.G., Alves, L.C.V., de Souza, L.C., Borges, K.B.G., das Graças Carvalho, M., 2019. Alzheimer's disease: risk factors and potentially protective measures. Journal of biomedical science 26, 33

[7] Qu, Y., Hu, H.Y., Ou, Y.N., Shen, X.N., Xu, W., Wang, Z.T., Dong, Q., Tan, L., Yu, J.T., 2020. Association of body mass index with risk of cognitive impairment and dementia: a systematic review and meta-analysis of prospective studies. Neuroscience & Biobehavioral Reviews.

Prevalence differences and changes over time (comparison of 2014/2018/2023) by sex and age

According to the recorded prevalence data presented in Table 10.6, the number of patients in 2018 was higher than in 2014, and in 2023, it was higher than in 2018, regardless of age group. The differences are due to changes in the population – the prevalence rate per 1,000 people, regardless of sex or age group (with a few exceptions), showed an inverse relationship – the rate in 2018 was lower than in 2014, and the rate in 2018 was lower than in 2023. The exception to this trend is the group aged 85 and over – the total population and women.

Table 10.6. Recorded prevalence of Alzheimer's disease and related disorders in Poland by age group, 2014, 2018 and 2023 (Statistics Poland and National Health Fund data)

Age group	Year	Total number of patients (in thousands)	Number of female patients (in thousands)	Number of male patients (in thousands)	Total prevalence rate per 1,000 persons in a given age group	Female prevalence rate per 1,000 persons in a given age group	Male prevalence rate per 1,000 persons in a given age group
55–64	2014	34.0	17.3	16.8	6.1	5.9	6.3
	2018	26.4	13.5	12.9	5.0	4.9	5.1
	2023	16.3	8.0	8.3	3.6	3.4	3.8
65–74	2014	56.4	33.6	22.8	17.6	18.5	16.5
	2018	63.8	37.4	26.4	15.9	16.6	15.1
	2023	66.1	38.1	28.0	14.3	14.7	13.8
75–84	2014	138.7	100.2	38.4	68.9	77.4	53.7
	2018	139.5	100.0	39.5	72.1	80.9	56.6
	2023	137.8	97.3	40.5	65.5	73.9	51.4
85 and over	2014	109.6	89.3	20.3	164.9	183.8	113.6
	2018	139.2	112.5	26.7	176.4	197.8	121.0
	2023	145.3	117.9	27.4	177.8	200.1	120.2

For recorded incidence, both in absolute terms and per 1,000 population, considering age groups, there is no clear trend in 2014, 2018 and 2023, with incidence rates clearly decreasing in the youngest age group of 55–64 (Table 10.7).

Table 10.7. Recorded incidence of Alzheimer's disease and related disorders in Poland by age group, 2014, 2018 and 2023 (Statistics Poland and National Health Fund data)

Age group	Year	Total number of new cases (in thousands)	Number of new female cases (in thousands)	Number of new male cases (in thousands)	Total incidence rate per 1,000 persons in a given age group	Female incidence rate per 1,000 persons in a given age group	Male incidence rate per 1,000 persons in a given age group
55–64	2014	8.3	4.2	4.1	1.5	1.4	1.6
	2018	6.4	3.2	3.2	1.2	1.2	1.3
	2023	4.6	2.2	2.4	1.0	0.9	1.1
65–74	2014	15.9	9.3	6.6	5.0	5.1	4.8
	2018	18.0	10.3	7.7	4.5	4.6	4.4
	2023	21.3	11.9	9.4	4.6	4.6	4.7
75–84	2014	41.7	28.9	12.8	20.7	22.3	17.8
	2018	40.9	27.9	13.0	21.2	22.6	18.6
	2023	42.0	28.0	14.0	20.0	21.3	17.8
85 and over	2014	37.0	28.7	8.3	55.7	59.1	46.4
	2018	42.1	31.9	10.2	53.4	56.1	46.3
	2023	42.7	32.4	10.3	52.3	54.9	45.4

11. ANALYSIS OF SICKNESS ABSENCE IN 2022–2023

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In 2023, recorded sickness absence exceeded 287 million days, including own illness and care for children or other family members. Sickness absence is a significant financial challenge. Total expenditure on sickness absence in 2023 amounted to PLN 26.7 billion (an increase of 4.9% compared to 2022), of which PLN 15.7 billion was spent on sickness allowances financed from the Social Insurance Fund (an increase of 7.7%), while PLN 11.0 billion was spent on sick pay financed from the funds of employers and the Fund of Guaranteed Employee Benefit Fund (an increase of 1.2%). The Social Insurance Fund covered 58.7% of sickness absence expenditure, with the remainder covered by employers and the Fund of Guaranteed Employee Benefit Fund.

Compared to 2022, the share of benefits financed from the Social Insurance Fund in total expenditure on absenteeism (for sick pay financed from employers' funds) increased by 1.5 percentage points.

The *Medical Certificate Register* recorded 27.0 million medical certificates for temporary incapacity to work. Compared to 2022, the number of days of sick absence decreased by 0.6%, and the number of medical certificates increased slightly by 0.2% (i.e. by 50.5 thousand certificates).

Table 11.1. Sickness absence in 2022–2023

Specification	Number of days of sickness absence		Number of medical leave certificates	
	Total	including: insured with the Social Insurance Institution	Total	including: insured with the Social Insurance Institution
	w mln			
2022	288.8	253.2	27.0	25.2
2023	287.2	250.7	27.0	25.2
Dynamics				
2022 = 100	99.4	99.0	100.2	99.9

Medical certificates issued in 2023 by circumstance of absence:

- due to own illness – 23.7 million medical certificates for a total of 273.5 million days of sickness absence. The number of medical certificates increased by 0.6% compared to 2022, while the number of days of sickness absence decreased by 0.3%;
- with 2.9 million medical certificates issued for a total of 11.2 million days. Compared to 2022, the number of certificates decreased by 4.6% and the number of days of sickness absence by 7.3%.

due to care for another family member – 0.4 million certificates were issued, and the number of days of sickness absence amounted to 2.4 million days. This represented an increase in both the number of days on this account by 2.2% and the number of certificates by 9.4% compared with 2022.

Table 11.2. Sickness absence in 2022–2023 by circumstance

Wyszczególnienie	Number of days of sickness absence		Number of medical leave certificates		Average duration of medical leave	
	2022	2023	2022	2023	2022	2023
	in millions				in days	
TOTAL	288.8	287.2	27.0	27.0	10.70	10.62
of which on account of:						
own illness	274.3	273.5	23.6	23.7	11.64	11.54
childcare	12.1	11.2	3.0	2.9	4.02	3.90
care of another family member	2.4	2.4	0.4	0.4	5.73	5.36

As in previous years, seasonal patterns in sickness absence were observed. The highest number of medical certificates issued due to own illness was recorded in March 2023 – 2.5 million certificates, i.e. 10.4% of all certificates issued due to own illness in 2023. Compared to the previous month, this represents an increase of 17.4%. There is also a significant increase in the number of medical certificates in January, October and November, with 2.3 million certificates issued due to own illness in each of these months.

Table 11.3. Sickness absence due to own illness by month in 2023

Specification	Number of days of sickness absence		Number of medical leave certificates	
	Total	including: insured with the Social Insurance Institution	Total	including: insured with the Social Insurance Institution
	in millions			
I – XII 2023	273.5	237.3	23.7	21.9

Specification	Number of days of sickness absence		Number of medical leave certificates	
	Total	including: insured with the Social Insurance Institution	Total	including: insured with the Social Insurance Institution
	in millions			
I	26.2	22.7	2.3	2.2
II	22.7	19.7	2.1	1.9
III	26.5	23.0	2.5	2.3
IV	21.2	18.2	1.8	1.6
V	21.6	18.6	1.8	1.6
VI	20.7	17.8	1.6	1.5
VII	20.2	17.4	1.5	1.4
VIII	20.5	17.6	1.5	1.4
IX	20.8	18.1	1.8	1.7
X	25.0	21.9	2.3	2.1
XI	24.1	21.0	2.3	2.1
XII	24.1	21.0	2.2	2.1

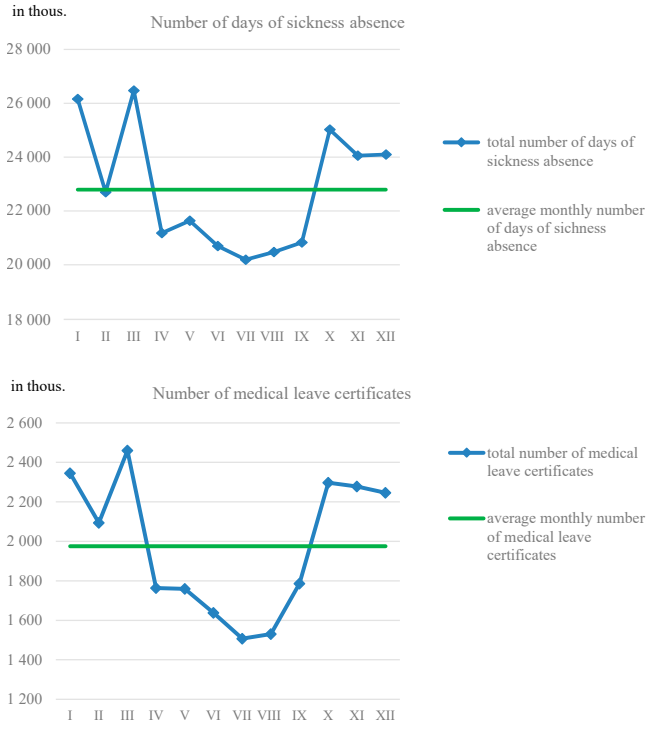


Fig. 11.1. Sickness absence due to own illness by month in 2023

In 2023, persons insured with the Social Insurance Institution (ZUS) constituted a population that received over 92% of all medical certificates issued for own illness, accounting for nearly 87% of all days of absence for this reason.

Table 11.4. Sickness absence in 2022–2023 of persons insured with ZUS

Specification	Number of days of sickness absence		Number of medical leave certificates		Average duration of medical leave	
	2022	2023	2022	2023	2022	2023
	in millions				in days	
In total	253.2	250.7	25.2	25.2	10.05	9.96
including:						
own illness	239.0	237.3	21.8	21.9	10.95	10.83
Males	103.2	103.5	9.7	9.7	10.63	10.66
Females	135.8	133.8	12.1	12.2	11.20	10.96

In 2023, the sickness absence rate among persons insured with ZUS was as follows:

- 25.2 million medical certificates in total,
- 250.7 million days of sickness absence,

including:

- 21.9 million certificates due to own illness,
- 237.3 million days of sickness absence resulting from these certificates,
- average absence as per medical certificate – 10.83 days.

The cumulative average duration of sickness absence of persons insured with the Social Insurance Institution (ZUS) in 2023 (from the beginning of the year) was 33.14 days. The cumulative absence of women was more than 3 days longer than that of men (31.38 days for men and 34.65 days for women).

In 2023, at least one medical certificate due to own illness was issued to 7,158.6 thousand insured persons. Of this number, 3,859.7 thousand women were on sick leave, accounting for 53.9% of those on sick leave. There were 3,297.5 thousand men on sick leave at least once, accounting for 46.1% of those on sick leave.

In 2023, changes in the duration of sickness absence were observed. Medical certificates issued for 1 to 5 days predominated. Certificates issued for 11 to 30 days of incapacity also represented a high percentage. Compared to 2022, the share of certificates issued for 1 to 5 days increased from 40.6% to 42.2%,

including one-day certificates from 5.8% to 6.6%. However, the percentage of sick leave lasting between 6 and 10 days decreased from 24.3% to 23.1%, as did the percentage of certificates for absences between 11 and 30 days, from 30.2% to 29.6%. This means that in 2023, the proportion of medical certificates for up to 5 days increased by 1.6 percentage points, while the proportion of certificates for 6 to 10 days decreased by 1.2 percentage points.

Table 11.5. Number of medical certificates issued in 2023 due to own illness to persons insured with ZUS by duration of sickness absence and gender

Specification	Number of medical leave certificates	number of medical leave by duration leave in days:					
		1-5	including: 1 day	6-10	11-20	21-30	31 days and more
	in millions						
In total	21.9	9.3	1.4	5.1	3.8	2.7	1.1
Males	9.7	3.9	0.5	2.5	1.9	0.9	0.5
Females	12.2	5.4	0.9	2.6	1.9	1.8	0.6

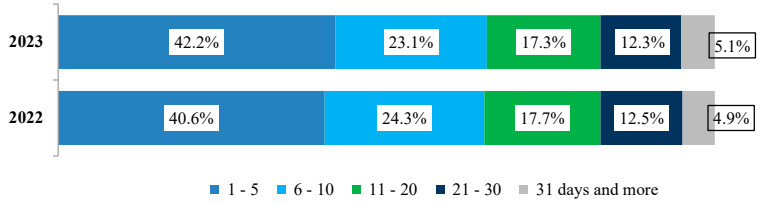


Fig. 11.2. Structure of the number of medical certificates by specified duration of sickness absence in 2022–2023

When analysing the number of days of sickness absence in correlation with the sex and age of insured persons, a clear difference between age groups can be seen. The insured between the ages of 30 and 34 were on sick leave for the longest period of time, with the proportion of days absent amounting to 14.0%. In the case of male absences, 12.8% concerned insured persons aged between 60 and 64, and 12.4% concerned men aged between 40 and 44. In the female population, those aged 30–34 were on sick leave for the longest period of time, with the proportion of days taken by insured persons amounting to 17.0%.

Table 11.6. Structure of sickness absence days due to own illness of persons insured with ZUS by age and gender in 2022–2023

Age	2022			2023		
	Total	males	females	Total	males	females
	in percentages					
In total	100.0	100.0	100.0	100.0	100.0	100.0
19 years and under	0.9	1.2	0.7	1.0	1.4	0.8
20-24	5.4	5.2	5.5	4.9	4.8	5.0
25-29	12.3	8.6	15.1	11.4	8.1	14.1
30-34	14.5	10.5	17.5	14.0	10.1	17.0
35-39	13.0	11.9	13.9	12.9	11.7	13.8
40-44	11.5	12.0	11.0	12.0	12.4	11.6
45-49	11.2	11.7	10.8	11.6	12.0	11.3
50-54	10.5	10.7	10.3	11.0	11.2	10.8
55-59	10.6	11.4	10.0	10.7	11.4	10.2
60-64	7.7	12.9	3.7	7.7	12.8	3.7
65 years and over	2.6	4.0	1.5	2.8	4.2	1.7

When analysing the number of sickness absence days by sex, the largest difference was observed in the 60–64 age group, where the number of sickness absence days for men was more than double that of women. In the age groups 25–29 (69.2% of the number of days), 30–34 (68.4% of the number of days) and 35–39 (60.4% of the number of days), the duration of sickness absence among women significantly exceeded that among men.

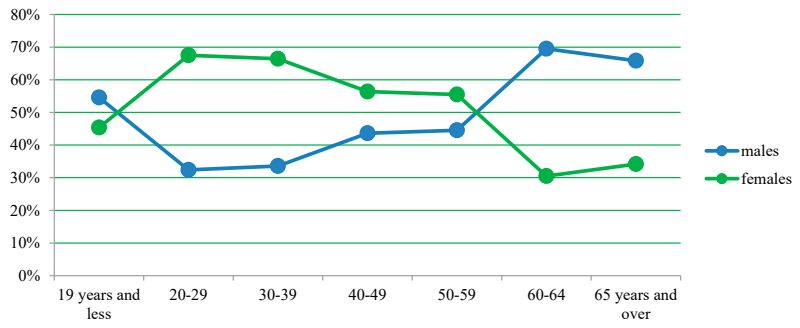


Fig. 11.3. Medical certificates issued due to own illness to persons insured with ZUS by age and gender in 2023

In 2023, the insured also stayed longer in hospitals. The number of sickness absence days related to hospitalisation of persons insured with ZUS accounted for 2.6% of total sickness absence and amounted to 6,180.0 thousand days. In total, 1,385.5 thousand medical certificates related to hospital stays were issued, accounting for 6.3% of all certificates.

Hospitalisation-related absenteeism increased by 7.5% days compared to 2022, while the number of hospital certificates was 12.9% higher. However, the average duration of incapacity to work per hospital stay was lower than in the previous year, at 4.46 days (4.69 days in 2022).

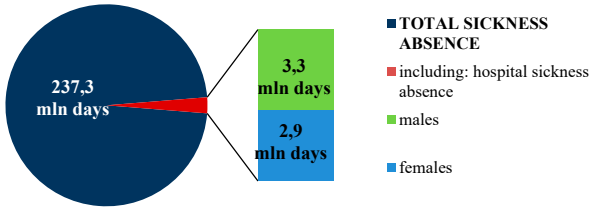


Fig. 11.4. Hospital stay due to own illness of persons insured with ZUS in 2023

For years, there has been a clear prevalence of certificates issued to women. In 2022, 55.5% of medical certificates were issued to women, compared to 55.7% in 2023.

When analysing sickness absence, it is difficult to overlook the significant impact of incapacity to work during pregnancy on overall absence and on the absence of the female population. The share of sickness absence days of pregnant women in the total number of absence days (i.e. absence of men and women) was 14.5% in 2023 (16.0% in 2022), while the share of sickness absence days of pregnant women in the number of sickness absence days of women was 25.8% in 2023 (28.2% in 2022). Every eighth certificate was issued in connection with incapacity during pregnancy, and over a quarter of the number of days of sickness absence among women was due to incapacity during pregnancy.

The letter B indicates incapacity during pregnancy on the medical certificate. However, at the insured person's request, the doctor does not include the code B on the medical certificate. Under the Act on cash benefits under social insurance in the case of sickness and maternity, indicating this code on a medical certificate affects eligibility for sickness allowance and its amount.

In 2023, 304 thousand women were on sick leave with the letter code "B" for at least one day (336.2 thousand in 2022).

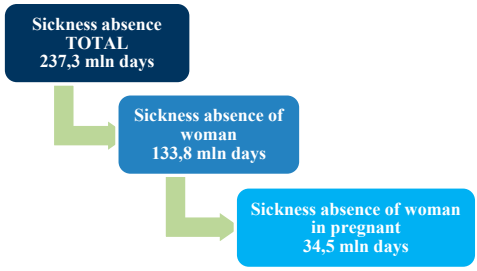


Fig. 11.5. Sickness absence of women insured with ZUS due to own illness in 2023

Due to incapacity for work falling during pregnancy, women insured with ZUS were issued with 1.5 million medical certificates, while sickness absence amounted to 34.5 million days. Compared to 2022, the number of certificates issued for this reason was lower by 9.4%, and the number of sickness absence days by 10.0%. Absence during pregnancy accounted for 25.8% of sickness absence among women and 12.1% of medical certificates issued to women. In 2022, these figures were 28.2% and 13.5%, respectively.

Table 11.7. Number of days of absence due to own illness among women insured with ZUS by age in 2022–2023

Age	Sickness absence of woman in total		Sickness absence of pregnant woman	
	2022	2023	2022	2023
	in percentages			
In total	100.0	100.0	100.0	100.0
19 years and under	0.7	0.8	0.4	0.5
20-24	5.5	5.0	8.1	7.5
25-29	15.1	14.1	32.7	31.9
30-34	17.5	17.0	36.7	37.3
35-39	13.9	13.8	17.9	18.3
40-44	11.0	11.6	3.9	4.2
45-49	10.8	11.3	0.2	0.3
50 years and over	25.5	26.4	0.0	0.0

When analysing sickness absence among women by age, it can be seen that those over 50 were on sick leave for the longest period of time, at 26.4% of the total number of days taken by women. In the women population whose incapacity occurred during pregnancy, the highest percentage of sickness absence (37.3%) was recorded for women between 30 and 34, and those aged 25–29 accounted for 31.9% of total sickness absence during pregnancy.

Absences due to incapacity to work during pregnancy (certificates with code "B") in 2023 were most often due to:

- maternal care for other conditions predominantly related to pregnancy (O26) – 82.2% of the total number of sickness absence days of women unable to work during pregnancy (28.4 million days of absence); in 2022, it was 81.6%, i.e. 31.3 million days of absence,
- haemorrhage in early pregnancy (O20) – 4.9% (1.7 million days); in 2022 – 5.4%, i.e. 2.1 million days,
- supervision of high-risk pregnancy (Z35) – 2.4% (0.8 million days),
- diabetes mellitus in pregnancy (O24) – 1.7% (0.6 million days),
- preterm labour (O60) – 1.1% (0.4 million days).

What were the causes of illness-related incapacity to work, and which diseases caused the longest absences among the entire population on sick leave in 2023?

Analysis of the number of days of absence in correlation with disease groups indicates that the longest periods of incapacity to work were caused by the following:

- diseases of the musculoskeletal system and connective tissue – 17.0% (16.4% in 2022), 40.4 million days,
- diseases of the respiratory system – 14.5% (14.2% in 2022), 34.3 million days,
- pregnancy, childbirth and the puerperium – 14.2% of the total number of days of absence (15.7% in 2022), 33.7 million days of sickness absence,
- Injury, poisoning and certain other consequences of external causes – 13.4% (13.3% in 2022), 31.8 million days,
- mental and behavioural disorders – 11.0% (10.0% in 2022), 26.1 million days,
- COVID-19-related disease entities – 1.1% (2.1% in 2022), 2.6 million days of absence.

Depending on sex, temporary incapacity to work was caused by different diseases.

In the **male** population, the longest absences were caused by the following:

- acute upper respiratory infections of multiple and unspecified sites (J06) – 5.6% of the total number of sickness absences among men (this was 5.6% in 2022),

- nerve root and plexus disorders (G54) – 5.0% (5.6% in 2022),
- dorsalgia (M54) – 4.8% (also 4.8% in 2022),
- other intervertebral disc disorders (M51) – 3.0% (also 3.0% in 2022),
- acute nasopharyngitis (common cold) (J00) – 2.9% (3.0% in 2022).

COVID-19 (U07.1) ranked 26th, accounting for 0.9% of the total number of days of sickness absence for men (in 2022, it was 1.4%). In contrast, influenza (J10, J11) ranked 41st, accounting for 0.5% of the total number of sickness absence days for men (0.3% in 2022). This represents a more than 1.5-fold increase in the number of days of absence compared to 2022, with the number of days of absence caused by *influenza due to identified seasonal influenza virus (J10)* increasing nearly fourfold.

In the **female population**, **for years**, the longest sickness absence has been due to *maternal care for other conditions predominantly related to pregnancy (O26)* – 21.4% of the total number of women's sickness absence days (in 2022, it was 23.2%).

These are followed by:

- acute upper respiratory infections of multiple and unspecified sites (J06) – 5.6% (5.5% in 2022),
- reaction to severe stress, and adjustment disorders (F43) – 4.4% (3.8% in 2022),
- nerve root and plexus disorders (G54) – 3.0% (3.2% in 2022),
- dorsalgia (M54) – 2.8% (2.7% in 2022).

*COVID-19 (U07.1)*ranked 15th among diseases causing the longest absence, accounting for 1.1% of the total number of days of sickness absence for women (in 2022, it was 1.4%). In contrast, influenza (J10, J11) was ranked 40th, accounting for 0.4% of the total number of female sickness absence days (0.2% in 2022). This represents nearly a twofold increase in the number of days of absence compared to 2022, with the number of days of absence caused by *influenza due to identified seasonal influenza virus (J10)* increasing 4.5 times.

In 2023, *COVID-19* was no longer the leading cause of incapacity to work. Sickness absence due to *COVID-19* decreased, while absence due to *Diseases of the respiratory system (J00-J99) increased.* This cause accounted for 6.8 million medical certificates involving a total of 34.3 million days of sickness absence. This represented 30.8% of the total number of certificates issued and 14.5% of the total number of days of sickness absence. This represented an increase of 4.3% in the number of certificates issued and 0.9% in the number of days of sickness absence compared to 2022.

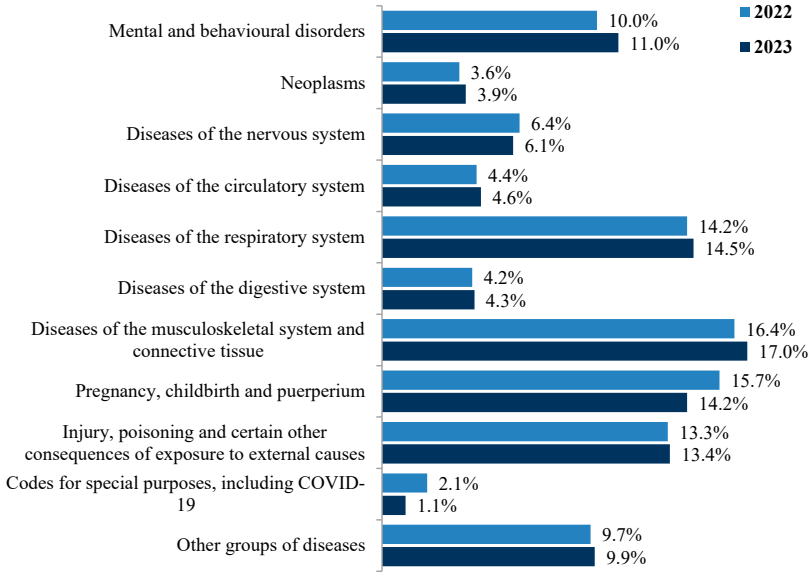


Fig. 11.6. Structure of sickness absence days in 2022–2023 due to own illness of persons insured with ZUS by disease group

In 2023, more than half (i.e. 57.2%) of these certificates were issued to women. A large proportion of certificates issued for disease entities in this group related to *Acute upper respiratory infections of multiple and unspecified sites (J06)*, with 2.7 million issued in 2023 for a total of 13.2 million days. This accounted for 40.0% of medical certificates issued in this disease group and 38.6% of sickness absence days. It is also worth noting that in 2023, every eighth medical certificate due to own illness related to *Acute upper respiratory infections of multiple and unspecified sites (J06)*.

Compared to 2022, the number of certificates for *Acute upper respiratory infections of multiple and unspecified sites (J06)* increased by 4.8%, and the number of days of absence increased by 0.1%. Most often, certificates concerning this condition were short-period, from 1 to 5 days (67.5% of all certificates for this condition), including 4.5% for one-day certificates. In 2022, these were 63.9% and 3.8%, respectively.

Men were most often issued **medical certificates** for the following reasons:

- acute upper respiratory infections of multiple and unspecified sites (J06) – 11.8% of the total certificates issued to men (11.3% in 2022),
- acute nasopharyngitis (common cold) (J00) – 7.4% (7.5% in 2022),

- dorsalgia (M54) – 5.6% (5.5% in 2022),
- *COVID-19 (U07.1)* ranked 10th, accounting for 1.5% of the total number of medical certificates issued for men (in 2022, it was 2.4%).

Among men, the dominant cause of one-day medical certificates issued in 2023 was *Acute nasopharyngitis (common cold)* – 9.9% of certificates (10.1% in 2022). This was followed by:

- acute upper respiratory infections of multiple and unspecified sites (J06) – 8.7% (8.0% in 2022),
- other noninfective gastroenteritis and colitis (K52) – 5.7% (4.6% in 2022),
- functional dyspepsia (K30) – 2.6% (3.0% in 2022),
- dorsalgia (M54) – 2.6% (2.7% in 2022),
- abdominal and pelvic pain (R10) – 2.5% (2.4% in 2022),
- acute pharyngitis (J02) – 2.1% (2.2% in 2022).

The most common disease entities leading to the issuance of medical certificates to women were:

- acute upper respiratory infections of multiple and unspecified sites (J06) – 12.8% (12.2% in 2022),
- maternal care for other conditions predominantly related to pregnancy (O26) – 9.8% of the total certificates issued to women (10.8% in 2022),
- acute nasopharyngitis (common cold) (J00) – 7.4% (7.5% in 2022).

COVID-19 (U07.1) ranked ninth in the number of medical certificates issued to women, accounting for 2.0% of the total certificates issued to them in 2023 (in 2022, it was 2.7%).

Among women, the dominant cause of one-day medical certificates issued in 2023 was *Acute nasopharyngitis (common cold) (J00)* – 8.3% of certificates (in 2022, it was 8.7%). Other significant disease entities were as follows:

- acute upper respiratory infections of multiple and unspecified sites (J06) – 8.1% (7.7% in 2022),
- other noninfective gastroenteritis and colitis (K52) – 4.6% (3.8% in 2022),
- abdominal and pelvic pain (R10) – 3.2% (3.0% in 2022),
- functional dyspepsia (K30) – 2.4% (2.7% in 2022),
- acute pharyngitis (J02) – 2.1% (2.2 in 2022%),
- migraine (G43) – 2.0% (1.8% in 2022).

The most common illness in pregnant women should also be mentioned here. The ranking of disease entities was dominated by:

- maternal care for other conditions predominantly related to pregnancy (O26) – 82.2% of the total number of sickness absence days of women unable to work

during pregnancy (28.4 million days of absence); in 2022, it was 81.6%, i.e. 31.3 million days of absence,
- haemorrhage in early pregnancy (O20) – 4.9% (1.7 million days); in 2022 – 5.4%, i.e. 2.1 million days,
- supervision of high-risk pregnancy (Z35) – 2.4% (0.8 million days),
- diabetes mellitus in pregnancy (O24) – 1.7% (0.6 million days),
- preterm labour (O60) – 1.1% (0.4 million days).

On 1 July 2023, the epidemic threat introduced in connection with SARS-CoV-2 infections was revoked. Things returned to pre-pandemic standards.

In 2023, 396.2 thousand medical certificates were issued due to *COVID-19 (U07.1)*, accounting for a total of 2,495.6 thousand days of sickness absence. The number of medical certificates issued for this reason was 32.0% lower than in the previous year, while the number of sickness absence days decreased by 31.6%.

The highest number of medical certificates due to *COVID-19 (U07.1)* was issued in December 2023. It was 116.6 thousand certificates, representing 29.4% of all certificates issued in 2023 due to *COVID-19*. Another wave of increased sickness absence was recorded in March, with 22.3% of medical certificates and 22.7% of absence days.

Table 11.8. Sickness absence due to own illness with COVID-19 in 2022–2023

Specification	Number of days of sickness absence				Number of medical leave certificates			
	Total	including: insured with the Social Insurance Institution	Total	including: insured with the Social Insurance Institution	Total	including: insured with the Social Insurance Institution	Total	including: insured with the Social Insurance Institution
	2022		2023		2022		2023	
	in thousands							
I-XII 2023	3 650.9	3 438.2	2 495.6	2 426.5	582.5	559.5	396.2	387.5
I	504.0	448.8	90.1	87.2	81.4	76.2	13.8	13.5
II	422.2	376.3	345.6	336.8	74.5	69.4	52.3	51.3
III	238.6	220.8	567.7	553.2	43.4	41.4	88.3	86.5
IV	163.1	155.9	100.3	96.8	25.7	24.9	16.4	16.0
V	54.3	52.0	18.3	17.7	8.4	8.2	3.0	2.9
VI	47.3	45.4	6.7	6.5	7.4	7.2	1.1	1.1
VII	324.5	312.3	4.1	3.9	49.8	48.4	0.6	0.6

Specification	Number of days of sickness absence				Number of medical leave certificates			
	Total	including: insured with the Social Insurance Institution	Total	including: insured with the Social Insurance Institution	Total	including: insured with the Social Insurance Institution	Total	including: insured with the Social Insurance Institution
	2022		2023		2022		2023	
	in thousands							
VIII	658.3	632.1	12.1	11.5	99.9	96.8	1.9	1.9
IX	756.9	731.3	51.2	49.7	116.1	113.1	8.3	8.1
X	304.8	293.7	143.1	139.7	48.3	47.0	23.0	22.6
XI	77.9	74.7	446.0	433.8	12.3	11.9	70.7	69.2
XII	98.9	94.9	710.4	689.7	15.3	14.9	116.6	113.9

More than half (i.e. 60.8%) of the *COVID-19 (U07.1)* certificates were issued to women (in 2022, it was 57.2%). The number of sickness absence days represented 59.5% (55.8% in 2022).

The most common medical certificates due to *COVID-19 (U07.1)* were issued for 1 to 5 days of incapacity. These accounted for 43.3% of all certificates, including 1.8% of one-day certificates. *COVID-19* medical certificates for 6 to 10 days were issued in 51.9% of cases. Certificates issued for 11 to 20 days accounted for 4.6% of certificates. Only 0.2% of medical certificates were issued for more than 20 days. The number of certificates for 6 to 10 days of incapacity to work increased by 4.8 percentage points compared to 2022. On the other hand, the number of certificates issued for up to 5 days decreased by 3.0 percentage points.

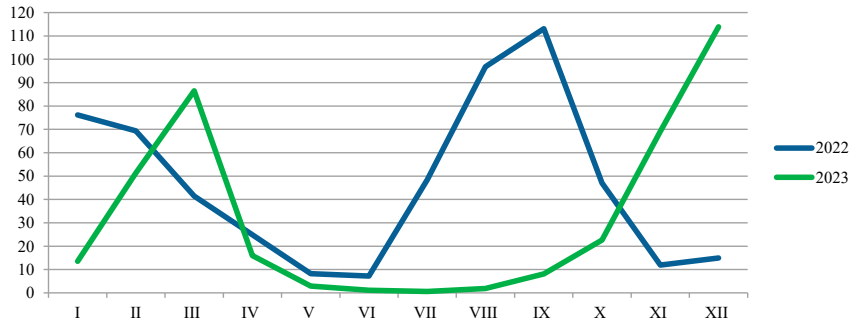


Fig. 11.7. Number of medical certificates (in thousands) of persons insured with ZUS due to own illness with COVID-19 in each month of 2022 and 2023

The lifting of the epidemic threat caused by SARS-CoV-2 infections does not mean that the conditions accompanying the underlying COVID-19 have disappeared. There is still an increase in the incidence of mental illness, including depressive disorders, in both children and adults.

In 2023, 1.4 million medical certificates were issued due to mental and behavioural disorders for a total of 26.1 million days of sickness absence. This represented 6.4% of the total medical certificates and 11.0% of the total number of days of absence. Compared to 2022, 8.7% more medical certificates were issued, and 9.5% more days of incapacity to work were recorded. Over the year, the highest number of medical certificates – 128.3 thousand – was issued in October 2023, accounting for 9.1% of all certificates issued for this reason, for a total of 2,372.0 thousand days.

Medical certificates for mental and behavioural disorders were most often issued in connection with *Reaction to severe stress, and adjustment disorders (F43)* – 33.9%, *Depressive episode (F32)* – 17.9%, *Recurrent depressive disorder (F33)* – 8.7% and *Other anxiety disorders (F41)* – 17.5%. It should be noted that *Reaction to severe stress, and adjustment disorders (F43)* accounted for an increase of 12.0% in the number of medical certificates issued for this reason and 13.5% in the number of days of sickness absence.

In addition to disease entities related to *Mental and behavioural disorders (F00-F99)*, sickness absence due to psychosomatic disorders was influenced by *Malaise and fatigue (R53).*

In 2023, 84.6 thousand medical certificates were issued for this reason, for a total of 416.7 thousand days. Over the past five years, the number of certificates issued for this reason has increased more than fourfold: from 61.8 thousand in 2019 to 261.0 thousand in 2021; in the following two years, it decreased by 53.4% in 2022 and by 69.6% in 2023 to pre-pandemic levels.

The level and spatial variation of sickness absence depend on a number of factors. Sickness absence is mainly correlated with the health status of the population and the level and efficiency of healthcare. Health is influenced by urbanisation and pollution, as well as by the working environment, the sustainability of companies and jobs, the closure of companies and the resulting unemployment, the availability of childcare, and the development of social service care infrastructures.

In recent years, the spread of pandemics has influenced the spatial variation in sickness absence.

In 2023, the longest sickness absences due to own illness of people insured with ZUS were recorded in the voivodships of Mazowieckie (13.5% of the total number of days of sickness absence), Śląskie (12.5%), and Wielkopolskie (10.4%).

The growth in the number of days and the number of medical certificates issued in 2023 shows that most voivodships experienced a decrease in both indicators. Only Małopolskie, Opolskie and Świętokrzyskie voivodships showed sickness absence levels at similar levels to 2022.

The average duration of the medical certificate in these voivodships was 10.34 days, 10.28 days and 10.82 days, respectively. Inhabitants of Łódzkie and Świętokrzyskie voivodships were on sick leave longer than the overall average (10.83 days), while inhabitants of Kujawsko-Pomorskie, Lubelskie, Lubuskie, Podkarpackie, Podlaskie and Warmińsko-Mazurskie voivodships were on sick leave for more than 11 days.

Table 11.9. Sickness absence due to own illness in 2023 by voivodship

Voivodeships	Number of days of sickness absence		Number of medical leave certificates		Dynamic	
					days sickness absence	medical leave
	in thous.	in %	in thous.	in %	previous year = 100	
In total	237 309.7	100.0	21 912.2	100.0	99.3	100.4
including:						
Dolnośląskie	18 050.2	7.6	1 780.2	8.1	99.6	100.7
Kujawsko-pomorskie	12 495.8	5.3	1 079.2	4.9	98.3	98.6
Lubelskie	11 047.6	4.7	989.7	4.5	99.9	99.7
Lubuskie	6 067.2	2.6	541.8	2.5	99.8	101.4
Łódzkie	17931.0	7.6	1 469.5	6.7	98.1	98.6
Małopolskie	19 390.5	8.2	1 869.1	8.5	100.3	102.6
Mazowieckie	32106.0	13.5	3 103.8	14.2	99.2	101.2
Opolskie	5 687.9	2.4	541.1	2.5	101.3	101.1
Podkarpackie	12 257.5	5.2	1 038.9	4.7	99.8	100.9
Podlaskie	5 696.9	2.4	517.8	2.4	98.4	97.8
Pomorskie	14 426.8	6.1	1 331.4	6.1	99.5	101.3
Śląskie	29 675.4	12.5	2 888.0	13.2	99.4	100.3
Świętokrzyskie	7 414.7	3.1	615.4	2.8	100.2	102.2
Warmińsko-mazurskie	7 841.8	3.3	670.4	3.1	98.3	98.9
Wielkopolskie	24659.0	10.4	2 278.3	10.4	99.1	99.5
Zachodniopomorskie	9930.1	4.2	932.6	4.3	99.8	100.8

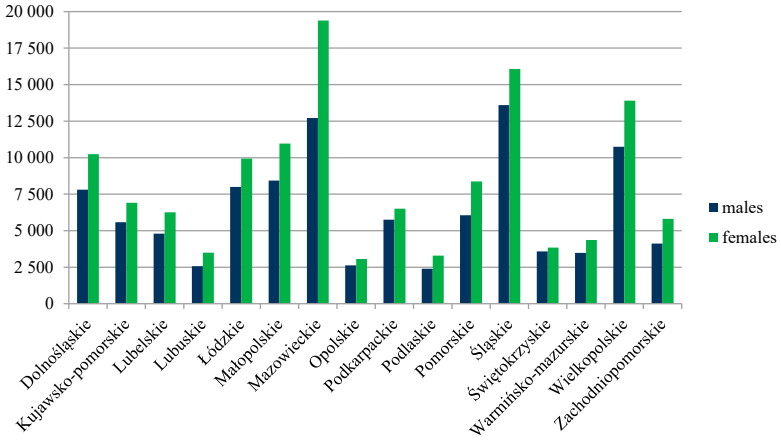


Fig. 11.8. Number of days of sickness absence (in thousands) in 2023 due to own illness of persons insured with ZUS by gender and voivodship

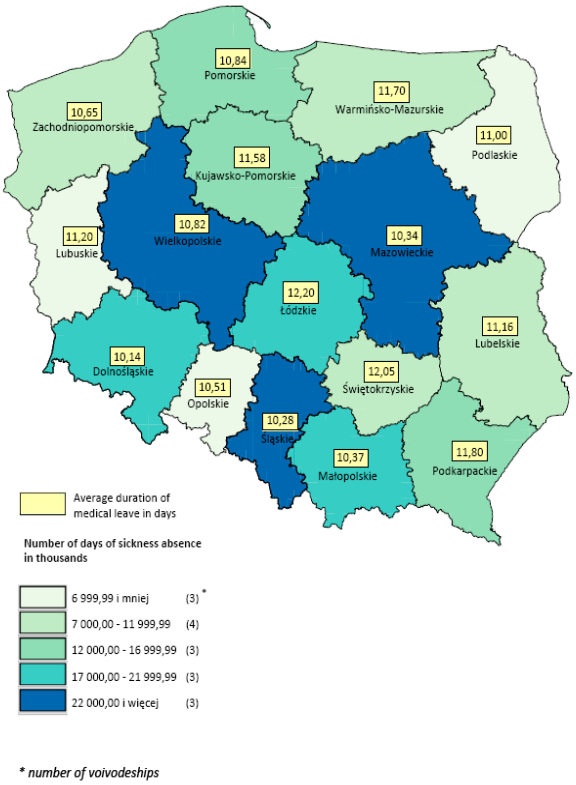


Fig. 11.9. Number of days of sickness absence in 2023 due to own illness of persons insured with ZUS by voivodship, together with the average duration of the medical certificate

Table 11.10 and Fig. 11.10 illustrate the distribution of the number of days of sickness absence due to inability to work caused by selected disease groups in each voivodship. These selected sickness groups generated 84.7% of total sickness absence days in 2023.

In 2023, the highest proportion of sickness absence days in most voivodships was recorded in relation to diseases of the musculoskeletal system and connective tissue. The voivodships with the longest absenteeism were Warmińsko-Mazurskie (19.1% of absence days in this voivodship), Małopolskie (18.5%), Opolskie (18.4%), Podkarpackie (18.4%), Świętokrzyskie (18.5%) and Zachodniopomorskie (18.2%). Long sickness absence was caused by illnesses related to pregnancy, childbirth and the puerperium. Women in Lubelskie (16.2% of the number of days in the voivodeship), Małopolskie (16.9%) and Podlaskie (17.5%) voivodships were on sick leave the longest on this account.

The proportion of sickness absence days due to diseases of the respiratory system in each voivodship ranged from 12.3% to 15.8%. The highest percentage was recorded in Dolnośląskie (15.8%) and Mazowieckie (15.7%) voivodships for the number of days of absenteeism in each of these voivodships. For mental and behavioural disorders, the highest number of days of sickness absence was recorded in Kujawsko-Pomorskie voivodship (14.2% of sickness absence days in this voivodship) and in Wielkopolskie voivodship (13.4%).

Table 11.10. Structure of sickness absence days due to own illness of persons insured with ZUS in selected disease groups by voivodship in 2023

Voivodeships	Number of days of sickness absence	including:							
		neoplasms	mental and behavioural disorders	diseases of the nervous system	diseases of the circulatory system	diseases of the respiratory system	diseases of the musculoskeletal system and connective tissue	pregnancy, childbirth and puerperium	injury, poisoning and certain other consequences of exposure to external causes
	in percentages								
In total	100.0	3.9	11.0	6.1	4.6	14.5	17.0	14.2	13.4
including:									
Dolnośląskie	100.0	3.9	11.3	5.5	4.4	15.8	16.9	12.8	14.1
Kujawsko-pomorskie	100.0	4.1	14.2	6.0	4.7	12.6	17.5	13.7	12.6
Lubelskie	100.0	3.6	7.6	8.4	4.5	13.5	15.7	16.2	15.6
Lubuskie	100.0	4.1	11.0	7.2	4.9	14.3	16.2	13.6	12.9
Łódzkie	100.0	3.6	12.5	6.9	5.2	14.1	17.2	13.0	13.1

Voivodeships	Number of days of sickness absence	including:							
		neoplasms	mental and behavioural disorders	diseases of the nervous system	diseases of the circulatory system	diseases of the respiratory system	diseases of the musculoskeletal system and connective tissue	pregnancy, childbirth and puerperium	injury, poisoning and certain other consequences of exposure to external causes
	in percentages								
Małopolskie	100.0	3.7	8.4	5.3	4.3	15.1	18.5	16.9	12.7
Mazowieckie	100.0	3.8	12.9	4.8	3.9	15.7	15.6	15.7	12.2
Opolskie	100.0	4.0	7.8	5.0	5.0	15.3	18.4	13.7	14.2
Podkarpackie	100.0	3.7	7.8	7.6	4.9	12.9	18.4	15.3	14.6
Podlaskie	100.0	4.2	8.0	5.5	3.9	12.9	17.0	17.5	16.2
Pomorskie	100.0	3.9	12.8	6.6	3.8	14.0	16.2	15.3	12.3
Śląskie	100.0	3.7	9.5	6.0	4.9	15.4	17.8	11.8	14.3
Świętokrzyskie	100.0	3.6	10.0	7.7	5.1	12.5	18.5	12.4	14.5
Warmińsko--mazurskie	100.0	3.9	10.5	6.0	4.4	12.3	19.1	13.6	15.0
Wielkopolskie	100.0	4.1	13.4	6.2	4.9	14.1	15.2	14.6	12.3
Zachodniopomorskie	100.0	4.3	12.5	5.8	4.3	14.5	18.2	12.4	12.5

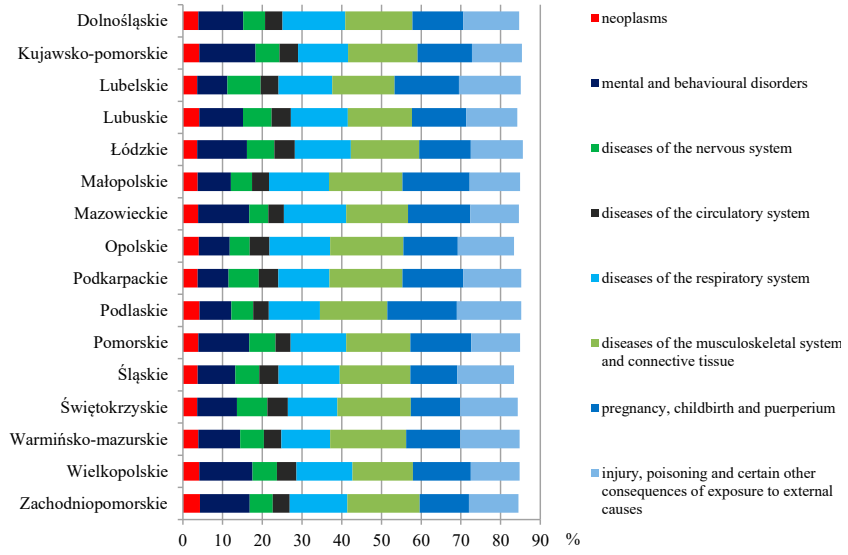


Fig. 11.10. Structure of sickness absence days of persons insured with ZUS due to their own illness by selected disease groups and voivodships in 2023

12. SUBJECTIVE ASSESSMENT OF HEALTH AND THE LEVEL OF SATISFACTION OF HEALTH NEEDS

Stefan Bogusławski, Katarzyna Wróbel, Jakub Stokwiszewski, Anna Smaga, Bogdan Wojtyniak

The National Institute of Public Health NIH – National Research Institute conducts cyclical studies on the subjective and unmet health needs of the Polish population.

The purpose of the data analysis is to assess the subjective evaluation of health status and the level of satisfaction of health needs, based on social surveys carried out on representative samples of adult residents of Poland.

The data presented below come from a study conducted by the NIPH–NIH in 2025. In selected areas, comparisons are made with the results of an analogous study conducted in 2018, i.e., before the COVID-19 pandemic.

The study was carried out using the Computer Assisted Personal Interview (CAPI) method on a representative, random–quota sample of the Polish population aged 20 years and older.

In 2025, the survey included 3,000 respondents. The sample was divided into five age groups: 20–39 years (N=800), 40–59 years (N=800), 60–74 years (N=800), 75–84 years (N=400), 85 years and older (N=200). The sample was representative in terms of demographic variables (age, sex, place of residence – region and size of locality).

In 2018, 3,000 respondents also participated. The sample was stratified according to the size of the locality, proportionally to the number of inhabitants. Within each voivodeship, proportions by sex and age (20–39, 40–59, 60+) were maintained. At the national level, the proportions of urban and rural residents by sex and age were also preserved.

During the data analysis phase, the results were weighted according to the age structure of the adult population of Poland. Comparisons with the previous study take into account changes in the structure of sex, age, and place of residence between 2018 and 2025.

Between consecutive study editions, efforts were made to maintain maximum consistency of the questionnaire, to allow for analysis of changes over time in perceived health status, health behaviors, and health needs. The questionnaire is updated only to the extent necessary and relevant to current research needs.

The tool includes both proprietary questions and standardized items used in European health surveys such as EHIS and EU-SILC (e.g., regarding self-assessed health, chronic diseases, pain, physical activity, social support, and exclusion). It also incorporates validated instruments for assessing:anxiety symptoms (GAD-2),depression (PHQ-9),sleep quality (Single-Item Sleep Quality Scale), attitudes toward vaccination.

This chapter discusses the following selected topics included in the survey questionnaires:

- general self-assessment of health status,
- assessment of unmet health needs,
- use of health services financed publicly by the National Health Fund (NFZ) and privately – through direct out-of-pocket payments or via medical subscriptions and health insurance.

Subjective health status assessment

As explained in the previous edition of the "Report on the health status of the Polish population and its determinants",[1] one of the most important measures describing quality of life in terms of health is its subjective assessment. Respondents perform a self-assessment using a five-point scale ranging from "very good" to "very poor". This assessment is not based on any reference (e.g. other populations of the same age or expectations) and is not objective; it is based on the respondent's impressions and is made in relation to their opinions and attitudes. By default, it covers various dimensions of health – physical, emotional and social – and refers to the status at the time of assessment, but in the long term (it is not affected by short-term deterioration in health, e.g. due to an active infection). It

[1] Sytuacja zdrowotna ludności Polski i jej uwarunkowania, National Institute of Public Health NIH – National Research Institute, Warsaw 2022. https://www.pzh.gov.pl/raport-sytuacja-zdrowotna-ludnosci-polski-i-jej-uwarunkowania/

is recognised that subjective health status assessment is an accurate predictor of current or future health needs and mortality (in the elderly).[2]

The results of the 2025 survey indicate a decrease in the average self-assessed health status of women and men in Poland aged over 20 compared to 2018. The deterioration of this important indicator may suggest an increase in future pressure on the healthcare system, beyond the observed trends.

Compared to 2018, the number of respondents declaring very good health in all socio-demographic groups analysed decreased significantly, with an increase in the number of respondents rating their health as "good". Currently, only 19% of men and 14% of women say their health is "very good", compared to 38.2% and 28.5% six years ago. The percentage of people describing their health as "poor" increased significantly (Fig. 12.1 and Fig. 12.2).

Subjective assessment of health status depends on socio-demographic factors such as age and education.

The younger the subgroup, the higher the proportion of individuals who rate their health as good. Similarly, higher health ratings are more frequently observed among respondents with secondary or higher education (72.1% and 75.0% among men, and 64.8% and 77.4% among women in 2025, respectively), compared to approximately 60.0% among men with primary or vocational education and 42.0% and 55.4% among women in these groups. As for income level, no clear relationship is observed between respondents' income and their self-assessed health status.

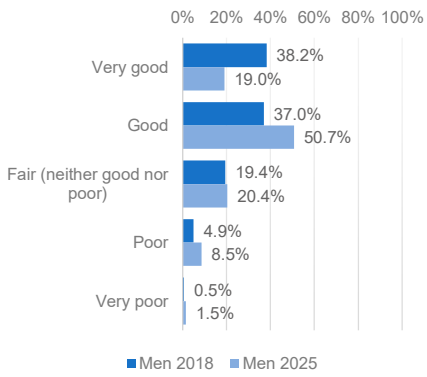


Fig. 12.1. Subjective health status assessment, men (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025)

[2] Palladino, R. et al. (2016), "Associations between multimorbidity, healthcare utilisation and health status: Evidence from 16 European countries", Age and Ageing, Vol. 45/3, http://dx.doi.org/10.1093/ageing/afw044

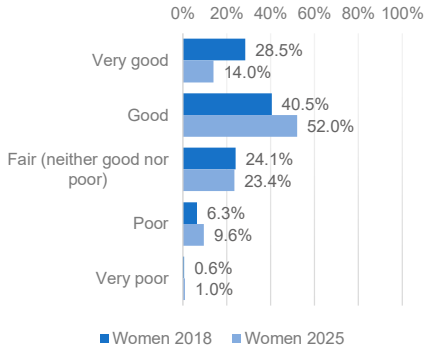


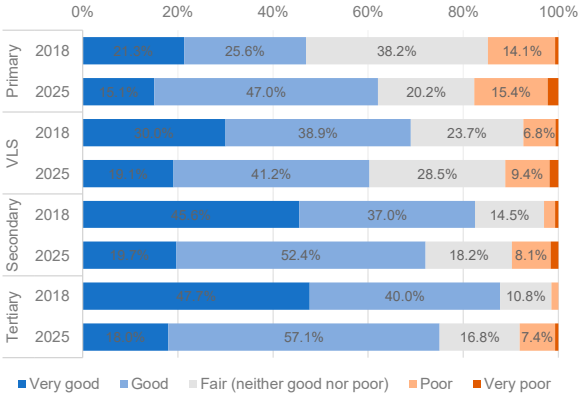
Fig. 12.2. Subjective health status assessment, women (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025)

Subjective health status assessment is lowest among the oldest respondents and those with lower levels of education. Poor or very poor health is reported by 36.0% of men and 31.8% of women aged 75 or over, and by 17.7% of men and 27.7% of women with primary education (Tab. 12.1 and 12.2).

Compared to 2018, the percentage of respondents declaring poor or very poor health increased, especially among people with tertiary and secondary education and those with a relatively good economic situation. A significant deterioration in self-assessed health status in the period described was also observed among people aged 60–74 and 75 or over. The percentage of poor and very poor health ratings is highest among people with primary education. A similar situation can be observed among individuals whose households are in a difficult economic situation.

The data indicate social groups with potential below-average health status, requiring increased public health and restorative medicine interventions specifically targeted at these groups.

A negative trend can be observed in the overall analysis of positive health assessments: good and very good. Since 2018, particularly marked declines have been observed among persons in a relatively good economic situation (a decline of approx. 11 percentage points among men and 8 percentage points among women), in the group of men with tertiary education (-13 percentage points), and among women aged up to 39 (6 percentage points). The declines persist after applying weights to adjust for changes in the socio-demographic structure of the population between the surveys (Fig. 12.3 to Fig. 12.6).



*VLS: Vocational lower secondary

Fig. 12.3. Overall health status assessment by education group, men (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025)

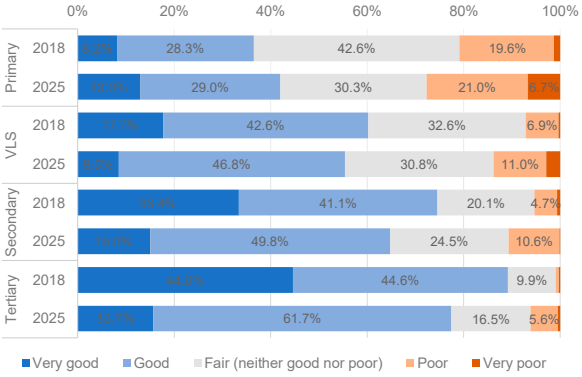


Fig. 12.4. Overall health status assessment by education group, women (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025)

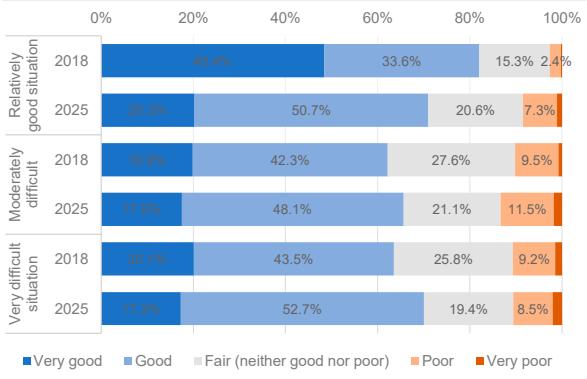


Fig. 12.5. Overall health status assessment in relation to economic situation, men (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025)

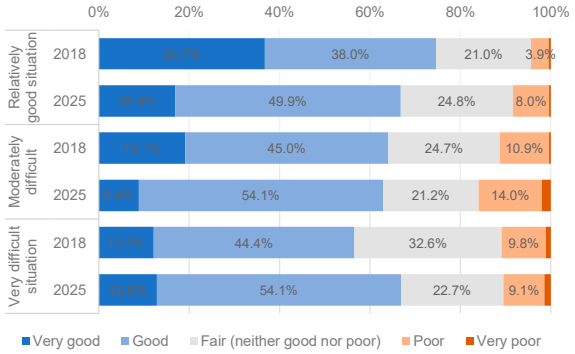


Fig. 12.6. Overall health status assessment in relation to economic situation, women (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025)

The economic situation is assessed based on three questions about the household's difficulties paying bills, and buying food and clothing. Respondents who indicated that they experienced at least one of these difficulties "always", "often" or "sometimes" were classified as having a very difficult economic situation, while those who never experienced such difficulties were classified as enjoying the best economic conditions.

Table 12.1. Overall health status assessment in relation to socio-demographic characteristics, men (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025)

		Men			
		2018		2025	
		Very good/ Good	Very poor/ Poor	Very good/ Good	Very poor/ Poor
Age (years)	20–39	94.7%	1.2%	92.5%	2.8%
	40–59	80.6%	3.0%	77.1%	4.2%
	60–74	46.5%	9.1%	41.5%	21.6%
	75 and over	13.8%	33.2%	16.0%	36.0%
Education	Primary	46.9%	14.8%	62.1%	17.7%
	VLS	68.9%	7.4%	60.3%	11.2%
	Secondary	82.5%	3.0%	72.1%	9.7%
	Tertiary	87.7%	1.4%	75.0%	8.1%
Place of residence size	Rural area	76.9%	4.7%	71.9%	8.8%
	Up to 10,000	79.8%	2.4%	65.8%	10.6%
	10,000–20,000	76.4%	5.7%	64.3%	10.7%

		Men			
		2018		2025	
		Very good/ Good	Very poor/ Poor	Very good/ Good	Very poor/ Poor
Place of residence size	20,000–50,000	74.1%	4.6%	64.8%	8.5%
	50,000–100,000	76.4%	8.0%	55.0%	14.2%
	100,000–200,000	73.9%	6.9%	69.9%	12.6%
	200,000 or more	70.6%	6.7%	73.5%	10.8%
Economic situation of the household	Very difficult	63.5%	10.7%	70.0%	10.6%
	Moderately difficult	62.2%	10.2%	65.6%	13.3%
	Relatively good	82.0%	2.6%	71.0%	8.5%

Table 12.2. Overall assessment of health status in relation to socio-demographic characteristics, women (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025)

		Women			
		2018		2025	
		Very good/ Good	Very poor/ Poor	Very good/ Good	Very poor/ Poor
Age (years)	20–39	93.1%	0.7%	86.8%	3.4%
	40–59	75.2%	4.2%	80.6%	5.5%
	60–74	45.2%	10.3%	41.2%	16.6%
	75 and over	22.3%	28.8%	23.3%	31.8%
Education	Primary	36.5%	20.9%	42.0%	27.7%
	VLS	60.3%	7.2%	55.4%	13.8%
	Secondary	74.6%	5.3%	64.8%	10.7%
	Tertiary	89.2%	0.9%	77.4%	6.1%
Place of residence size	Rural area	71.3%	5.8%	66.0%	10.0%
	Up to 10,000	68.4%	8.7%	71.8%	10.2%
	10,000–20,000	71.0%	4.6%	70.8%	5.8%
	20,000–50,000	66.4%	10.6%	65.1%	9.9%
	50,000–100,000	74.8%	4.0%	71.3%	11.6%
	100,000–200,000	60.4%	12.3%	60.7%	12.5%
	200,000 or more	67.4%	6.0%	62.9%	12.6%
Economic situation of the household	Very difficult	56.6%	10.9%	66.9%	10.5%
	Moderately difficult	64.1%	11.3%	62.9%	15.9%
	Relatively good	74.7%	4.4%	66.8%	8.4%

It is worth noting that the health assessment structure observed in the National Institute of Public Health NIH – National Research Institute survey is broadly consistent with the results of the European Union statistics on income and living conditions (EU-SILC), which cover the population aged 16 and over. In 2023, 66.1% of men and 60.0% of women described their health as good or very good.

Prevalence of long-term health problems and chronic diseases

Compared to 2018, the number of persons reporting long-term health problems or chronic diseases increased, particularly problems that cause serious limitations in activities of daily living.

The trend of worsening self-assessed health compared to 2018 is consistent with a very significant increase in the percentage of people reporting long-term health problems or chronic diseases, particularly problems that cause serious limitations in activities of daily living. This trend affects both sexes to a similar extent.

In 2025, 39.8% of men and 46.5% of women report health problems lasting at least 6 months (an increase of approximately 16 and 13 percentage points compared to 2018). The difference between the sexes is related to the different age structure in these groups. It decreases after appropriate data standardisation (44.9% of men and 41.9% of women after standardisation by age) (Fig. 12.7).

In turn, approximately 9% of men and women struggle with conditions that seriously limit their activities of daily living, which is 4 and 3 percentage points more than in 2018, respectively. The increases persist after standardisation of the socio-demographic structure of the data compared to the previous edition of the survey.

A demographic analysis of the data revealed a significant increase in the percentage of people experiencing long-term health problems among those aged 40–59 (from 25.6% to 45.8% for women and from 17.2% to 38.8% for men) and among people in a relatively good financial situation (from 18.3% to 35.6% for men and from 28.9% to 43.9% for women). These percentages are even higher among older and less affluent groups, but the increase was not as significant.

When it comes to the prevalence of health problems that seriously limit activites of daily living, the group that has seen the most significant change is men with primary education, with a twofold increase from 14.1% to 28.2%, and young women (aged 20–39), with a surge from 1.1% to 8.6%.

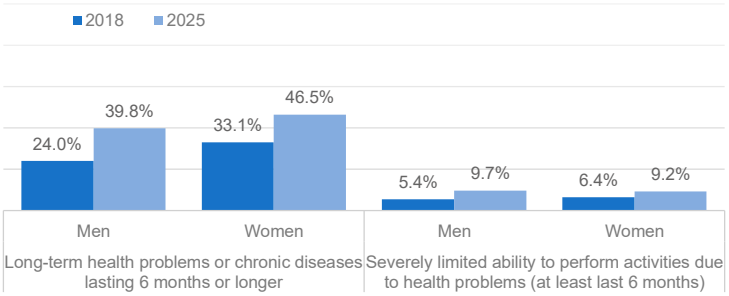


Fig. 12.7. Burden of health problems, as reported in a survey, by sex (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025)

A significant proportion of the Polish population reports symptoms of moderate to severe depression. This is especially true for people struggling financially and those with lower levels of education. This problem is more common in women than in men.

It should be noted that the survey was conducted in September 2018 and February 2025, respectively, which may affect the percentage of people reporting symptoms of depression. However, the observed increases are worrying and require further close monitoring.

The 2025 survey included questions about mental well-being, including depressive symptoms in the last 2 weeks (Patient Health Questionnaire-9, PHQ-9), generalised anxiety symptoms (Generalised Anxiety Disorder 2-item, GAD-2) and sleep quality in the past 7 days, using the 11-item Sleep Quality Scale (SQS).

Symptoms of moderate to severe depression are currently reported by 16.2% of men and 19.9% of women, compared to 8.4% and 10.7% in 2018 (Fig. 12.8).

A significant increase in the prevalence of depressive symptoms was observed in working-age groups, i.e. those aged up to 59, and among people with primary/lower secondary education. However, it should be noted that the age group with the highest incidence of depressive symptoms is still the elderly, aged 75 and over (25.2–26.9% of men and women), and when considering the economic status of households, people in a very difficult financial situation (approximately 36% of men and women in this group).

In the 20–39 age group, the problem affects 13.0% of men and 23.1% of women (an increase of 8 and 17 percentage points, respectively), while in the 40–59 age group, it affects 17.7% of men and 20.8% of women (an increase of 10 and 13 percentage points, respectively). In turn, among people with primary education, moderate to severe depressive symptoms were reported by 36.2% of men

and 42.8% of women (an increase of approximately 18 percentage points), which is significantly higher than among people with higher levels of education. After standardising the results by age and sex in different groups of educational attainment, the prevalence of depressive symptoms increases further (to 50.5%) among women with primary education.

A large proportion of respondents declare symptoms of generalised anxiety. Women report anxiety significantly more often than men.

The question about generalised anxiety was included for the first time in the survey. The results indicate high levels of anxiety, especially among younger people. This is worrying and requires further in-depth investigation.

As with depression, symptoms of generalised anxiety are reported more frequently by women (20.7% vs 17.8% of men), especially those of working age [Fig. 12.8]. An estimated 25.0% and 23.1% of women aged 20–39 and 40–59 experienced anxiety symptoms in the past two weeks, compared to 17.3–19.5% of men in the same age groups.

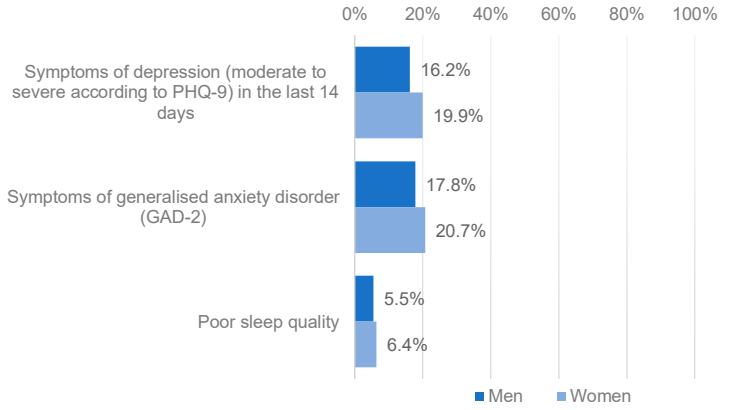


Fig. 12.8. Burden of mental health problems, by sex (National Institute of Public Health NIH – National Research Institute survey, 2025)

Anxiety symptoms are reported by a very high percentage of people in difficult economic situations and with primary education; in particular, this applies to 37.8% of men and 33.3% of women in very difficult economic situations and 31.9% of men and 37.7% of women with primary education. In other groups defined by economic status or education, this proportion does not exceed 20%. These proportions do not change significantly after standardisation by sex and age in the analysed subgroups.

A relatively small percentage of respondents report poor sleep quality. Poor sleep quality (scores ranging from 0 to 3 on a scale of 0 to 10) is more often

reported by people with vocational education (7.9% of men) or primary education (12.8% of women), as well as by less affluent men (9.3%) and women (8.5%).

A large percentage of respondents report severe pain. Once again, women declare such symptoms significantly more often than men. Almost 20% of people experiencing pain claim that it interferes with their usual activities, which still represents a high percentage: 13% of men and 17% of women in the general population aged 20 and over in Poland.

The high level of reported pain in the surveyed population, which hinders normal daily activities, requires further investigation. Pain causes increased demand for medical services and reduces economic efficiency, resulting in presenteeism and absenteeism. At the same time, many of these conditions can be prevented by modifying lifestyle and reducing risk factors such as overweight and obesity, or insufficient physical activity.

In the current edition of the survey, respondents were asked about any physical pain they had experienced in the last four weeks, including its intensity and any impact on their everyday work, daily activities such as studying, professional duties and household chores.

Severe or very severe pain was reported by 13.3% of men and 15.6% of women (Fig. 12.9). Among people experiencing any level of pain, as many as 16.9% of men and 20.5% of women reported that the pain interfered with their everyday activities (including studying, professional duties or household chores) (Fig. 12.10). After standardising the age structure, the differences between the sexes disappear, approaching 14% of severe/very severe pain in both groups and 18.0%–19.7% (men and women experiencing pain, respectively) reporting difficulties in performing work.

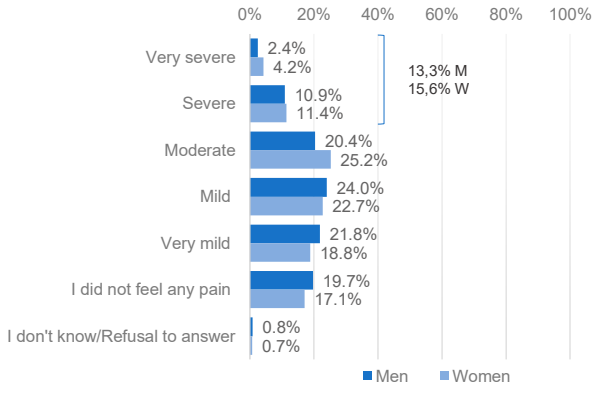


Fig. 12.9. Pain experienced in the last 4 weeks, by sex (National Institute of Public Health NIH – National Research Institute survey, 2025)

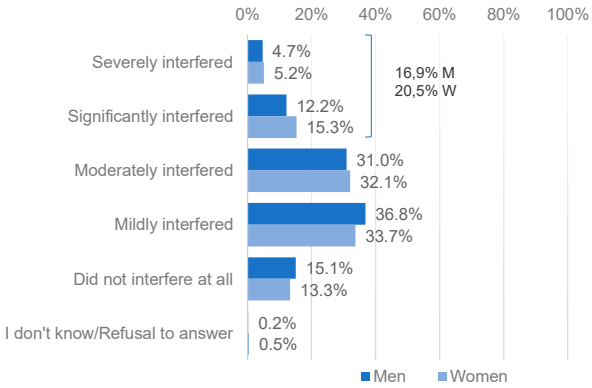


Fig. 12.10. Assessment of pain interfering with everyday work in the last 4 weeks, by sex, n=1,256 men, 1,260 women reporting pain (National Institute of Public Health NIH – National Research Institute, 2025)

No significant differences in the prevalence of pain were observed in subgroups defined by demographic factors, except for women with primary education, among whom severe or very severe physical pain was significantly more common (29.6%) compared to individuals in groups with higher levels of education (below 20%). When considering pain that interferes with daily activities, it is clearly more common not only among women but also among men with primary education (23.6% of men and 28.0% of women in this group reported any pain).

Use of health services within the National Health Fund and private health care providers

The share of those largely or exclusively using privately financed services is significant, ranging from 24.6% in men to 22.5% in women.

Such individuals relieve the burden on the publicly financed system, but are potentially exposed to inefficient health expenditure due to, e.g., the lack of comprehensive and coordinated care.

In order to determine the extent to which respondents use private health services, the survey asked them to select one statement from a predefined list that best describes how they usually use health care in typical everyday situations (i.e. excluding hospital stays or emergencies).

Some 36.8% of men and 36.3% of women stated they only use public healthcare services. A similar percentage – 38.0% of men and 41.0% of women – sometimes

use private healthcare, but the National Health Fund remains their primary provider of health services. Some 22.5% of men and 24.9% of women rely more on private healthcare, with 9.5% of men and 7.1% of women claiming it is their only provider of health services (Fig. 12.11).

The highest percentage of people using non-publicly financed services is observed in the younger population, with secondary and higher education, living in large cities (over 200,000 residents) and rural areas. However, almost a third of the population who exclusively or to a large extent use non-publicly financed services struggle to finance their health expenditure. This is indirect evidence of significant difficulties in accessing publicly financed services.

The survey results permit an analysis of the socio-demographic profile of individuals based on their use of publicly and privately funded services.

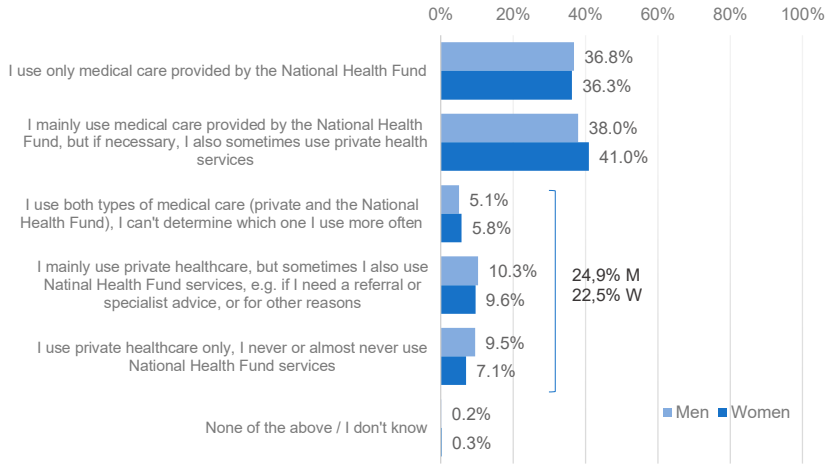


Fig. 12.11. Profile of medical services usage – private and within the National Health Fund, by sex (National Institute of Public Health NIH – National Research Institute survey, 2025)

Three subgroups were analysed: 1. persons declaring that they use only health services provided by the National Health Fund; 2. persons who occasionally use private services when necessary, but still rely mainly on care financed by the National Health Fund; 3. a group that uses non-publicly financed health services to an extent comparable to or greater than that provided by the National Health Fund.

People who use non-publicly financed healthcare more intensively (or exclusively) are often young (people aged 20–39 account for about 43% of the total, while in other subgroups this figure is no higher than 32%) and women with tertiary education (43% of women vs 18.6%–33.3% in other subgroups by type of

service use), as well as women in large cities (26.3% vs 16.3–17% of women who use services financed by the National Health Fund more often) (Tab. 12.3).

Table 12.3. Characteristics of persons by profile of use of publicly and non-publicly financed healthcare (National Institute of Public Health NIH – National Research Institute survey, 2025)

		Men			Women		
		National Health Fund only	Mainly National Health Fund	Private health services*	National Health Fund only	Mainly National Health Fund	Private health services*
Age (years)	20–39	31.8%	27.9%	42.6%	24.8%	24.9%	43.3%
	40–59	37.8%	35.1%	36.5%	34.8%	33.6%	33.5%
	60–74	24.7%	28.9%	15.8%	31.0%	29.0%	14.9%
	75 and over	5.7%	8.2%	5.2%	9.5%	12.6%	8.3%
Education	Primary	3.8%	2.2%	6.7%	6.4%	2.6%	3.6%
	VLS	23.4%	23.1%	23.5%	24.6%	13.4%	13.3%
	Secondary	51.6%	50.%	43.9%	50.%	50.7%	40.1%
	Tertiary	21.2%	24.2%	25.9%	18.6%	33.3%	43.0%
Place of residence size	Rural area	46.0%	45.2%	47.5%	46.1%	43.0%	42.1%
	Up to 10,000	7.9%	9.6%	6.5%	7.6%	8.8%	8.2%
	10,000–20,000	4.9%	4.8%	6.4%	5.6%	6.1%	5.1%
	20,000–50,000	8.8%	6.5%	8.3%	8.2%	8.8%	9.8%
	50,000–100,000	5.1%	6.2%	5.3%	6.9%	7.3%	4.4%
	100,000–200,000	8.3%	8.0%	6.8%	9.2%	9.0%	4.0%
	200,000 or more	18.9%	19.7%	19.2%	16.3%	17.0%	26.3%
Economic situation of the household	Very difficult	26.8%	15.2%	41.2%	35.4%	20.3%	31.9%
	Moderately difficult	20.6%	22.7%	16.8%	21.8%	21.8%	19.9%
	Relatively good	52.7%	62.2%	42.0%	42.8%	57.9%	48.2%
Assessment of financial capacity in relation to health expenditure	Very good	5.1%	3.5%	5.7%	3.5%	4.6%	8.2%
	Good	22.3%	21.6%	27.9%	14.2%	19.1%	21.8%
	Average	41.9%	44.7%	37.0%	45.9%	42.5%	40.2%
	Barely sufficient	18.7%	23.3%	20.0%	20.1%	25.2%	22.1%
	Insufficient	12.0%	7.0%	9.4%	16.3%	8.6%	7.6%

*persons using non-publicly financed health services equally often or more frequently than those financed by the National Health Fund

It is worth noting that a relatively large percentage, i.e. 41.2% of men and 31.9% of women, who use non-publicly funded health services, were classified,

based on their responses, into the subgroup with the very difficult economic situation of the household. Among individuals who use only the National Health Fund services, this figure is 26.8% for men and 35.4% for women.

The population of those who find it difficult to cover their health expenditures, a very large percentage (significantly over 50%), reports a high burden of health problems. It can be assumed that such individuals (in their perception) require medical services, but do not have sufficient access to free services, hence they make use of the non-publicly financed sector. As a result, their health expenditure exceeds their financial capacity.

When discussing the way and possibilities of meeting health needs, it is necessary to look at those experiencing an average worse situation due to socio-economic conditions. For the analysis, individuals in a bad financial situation in a household were selected, who constituted 25.9% of men and 28.5% of women in the entire population under study, as well as the group who assessed their financial status as not good enough to cover health-related expenses, i.e. 9.4% of men and 11.2%.

In addition, attention was given to those with a low level of education, i.e. with basic vocational education or lower. This is 27.2% of men and 21.7% of women in the adult population of Poland.

In the economically disadvantaged group, the structure of responses related to health assessment was similar to the surveyed general population of men and women. Nonetheless, this group is much more likely to have a health burden – 21.7% of men and 17.5% of women report having a severely limited ability to perform daily activities due to chronic health problems, compared with 9.7% and 9.2% of men and women in the general population. [Tab. 12.4].

Similarly, those who cannot afford to cover their health expenses are much more likely to indicate serious limitations resulting from chronic conditions (27.8% of men and 20.8% of women) (Fig. 12.12).

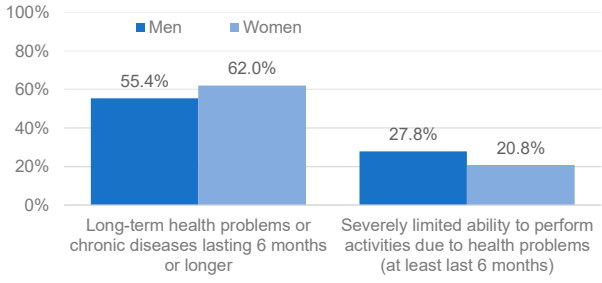


Fig. 12.12. Burden with health problems declared by the group of respondents with insufficient financial resources to cover health expenses, n=150 men and n=160 women (National Institute of Public Health NIH – National Research Institute surveys, 2025)

Table 12.4. Characteristics of persons whose financial capabilities are insufficient (according to declarations) to cover health expenses, n=150 men and n=160 women, and n=1,500 men and n=1,500 women in the general adult population under study (National Institute of Public Health NIH – National Research Institute survey, 2025)

		Selected subgroup		Total population	
		Men	Women	Men	Women
	Share in population	9.4%	11.2%	100.0%	100.0%
Age (years)	20–39	33.1%	30.9%	33.0%	29.1%
	40–59	30.1%	34.8%	36.5%	33.9%
	60–74	30.5%	26.8%	24.0%	26.5%
	75 and over	6.4%	7.5%	6.5%	10.4%
Education	Primary	4.9%	6.7%	3.9%	4.2%
	VLS	26.9%	20.3%	23.3%	17.5%
	Secondary	39.4%	45.8%	49.3%	48.3%
	Tertiary	28.9%	27.2%	23.6%	30.1%
Place of residence size	Rural area	32.8%	36.4%	46.1%	44.0%
	Up to 10,000	10.2%	8.9%	8.2%	8.3%
	10,000–20,000	5.5%	3.8%	5.3%	5.7%
	20,000–50,000	11.5%	11.4%	7.8%	8.8%
	50,000–100,000	9.2%	8.5%	5.6%	6.5%
	100,000–200,000	13.8%	9.6%	7.8%	7.9%
	200,000 or more	17.0%	21.5%	19.2%	18.8%
Economic situation of the household	Very difficult	49.1%	60.0%	25.9%	28.5%
	Moderately difficult	21.4%	14.1%	20.4%	21.3%
	Relatively good	29.5%	25.9%	53.6%	50.2%
Use of health care services	National Health Fund only	46.7%	52.8%	36.8%	36.3%
	Mainly National Health Fund	28.0%	31.5%	38.0%	41.0%
	Private care (as often as or more often than under the National Health Fund)	24.8%	15.3%	24.9%	22.5%
	Other	0.5%	0.4%	0.2%	0.3%

Those with a low level of education are more likely than average to report a poor health condition and are more likely to indicate severe limitations due to chronic health problems. This phenomenon requires in-depth research into health inequalities.

Lower education does not seem to be strongly correlated with health inequalities, which is the case with a worse economic status, although this phenomenon is also observed. People with lower education stand out from the general population due to

their lower health assessment (60.6% of men and 52.8% of women assess their health condition as good or very good, while it is 69.7% of men and 66% of women in the general population) and are more likely to indicate serious limitations resulting from chronic health problems – 13.1% of men and 16.9% of women, while it is 9.7% and 9.2% of men and women in the general population (Tab. 12.6).

Those declaring problems with financing health care expenses are much more likely to use publicly financed services. Those reporting a difficult financial situation are also more likely to use only services financed by the National Health Fund; this applies particularly to women. The remaining respondents from these groups declare using non-publicly financed services to some extent, which means an additional burden on their household budgets.

Based on the presented data, a significant group of people who are in an unfavourable financial position or are burdened by the costs of services (due to poor economic status and/or poor health condition) believe that they do not have satisfactory access to publicly financed services.

Individuals who find it difficult to finance their health expenses, compared to the rest of the population, use only publicly financed services: 46.7% of men and 52.8 % of women use only such services. For comparison, in the general population, this is 36.8% and 36.3% of men and women. In the group of those in a difficult financial situation (based on 3 questions regarding household expenses), this phenomenon is not observed to a large extent and is noticeable mainly in women: 45% of women use exclusively services under the National Health Fund (8.7 pp more than in the entire population under study) (Tab. 12.4).

A large share of those using only the services available under the National Health Fund is also noticeable among women with vocational education or lower, it is 51.7%, i.e., 15.4 pp more than in the general population (for men, it remains at a level similar to the general population) (Tab. 12.6).

To sum up the situation from the perspective of using non-publicly financed services, it can be assumed that a very large part of the society, including those with a worse economic status, choose medical care services outside the National Health Fund. In the adult population under study, 63.5% of men and 63.0% of women use private medical care to some extent (at least occasionally or more often). In the groups considered vulnerable due to socio-economic status, the percentage is also high:

- 52.8% of men and 46.8% of women, among those assessing their financial capacity as insufficient to cover health expenses
- 61.9% of men and 54.3% of women in the group of people who are in the most difficult economic situation
- 63.1% of men and 47.7% of women with vocational or primary education.

Table 12.5. Characteristics of the economically disadvantaged in the household, in terms of health status and use of services, n=345 men and 395 women (National Institute of Public Health NIH – National Research Institute survey, 2025)

		Men	Women
	N	345	395
Health status assessment	Very good	17.3%	12.8%
	Good	52.7%	54.1%
	Fair (neither good nor poor)	19.4%	22.7%
	Poor	8.5%	9.1%
	Very poor	2.1%	1.4%
Long-term health problems/chronic diseases lasting six months or longer		47.8%	51.0%
Severely limited ability to perform usual activities due to health problems lasting at least 6 months		21.7%	17.5%
Use of private and public healthcare	National Health Fund only	38.0%	45.0%
	Mainly National Health Fund	22.2%	29.2%
	Private care (as often as or more often than under the National Health Fund)	39.7%	25.1%
	I don't know	0.1%	0.7%
Assessment of financial capacity in relation to health expenditure	Very good	1.5%	1.9%
	Good	12.0%	9.2%
	Average	46.4%	33.9%
	Barely sufficient	22.2%	31.5%
	Insufficient	17.9%	23.6%

Table 12.6. Characteristics of people with vocational education or lower, in terms of health status and use of services, 437 men and 343 women (National Institute of Public Health NIH – National Research Institute survey, 2025)

		Men	Women
	N	437	343
Health status assessment	Very good	18.5%	9.4%
	Good	42.1%	43.4%
	Fair (neither good nor poor)	27.3%	30.7%
	Poor	10.2%	12.9%
	Very poor	1.9%	3.6%
Long-term health problems/chronic diseases lasting six months or longer		43.9%	55.8%
Severely limited ability to perform usual activities due to health problems lasting at least 6 months		13.1%	16.,9%
Use of private and public healthcare	National Health Fund only	36.9%	51.7%
	Mainly National Health Fund	35.4%	30.2%
	Private care (as often as or more often than under the National Health Fund)	27.7%	17.6%

		Men	Women
Use of private and public healthcare	I don't know	0.1%	0.5%
Assessment of financial capacity in relation to health expenditure	Very good	3.0%	4.0%
	Good	16.3%	13.4%
	Average	43.9%	41.7%
	Barely sufficient	25.8%	26.8%
	Insufficient	11.0%	14.0%

A relatively large share of the surveyed population (15.7% of men and 18.2% of women) declare that they use the services of specialists only in the publicly financed sector.

The above observation may indicate difficulties in accessing services financed by the National Health Fund and/or the prevalence of specialist services in the form of subscriptions or extra insurance. It can be assumed that those declaring the use of services provided by primary care physicians outside the National Health Fund (7.8% of men and 10.2% of women) are covered by subscriptions or additional health insurance.

Almost all respondents (97.5% of men and 98.1% of women) visited a GP or a primary care physician in the last 12 months. Specialist services were used by 72.5% of men and 76.1% of women and 70.6% of the respondents in both groups underwent diagnostic tests (Fig. 12.13).

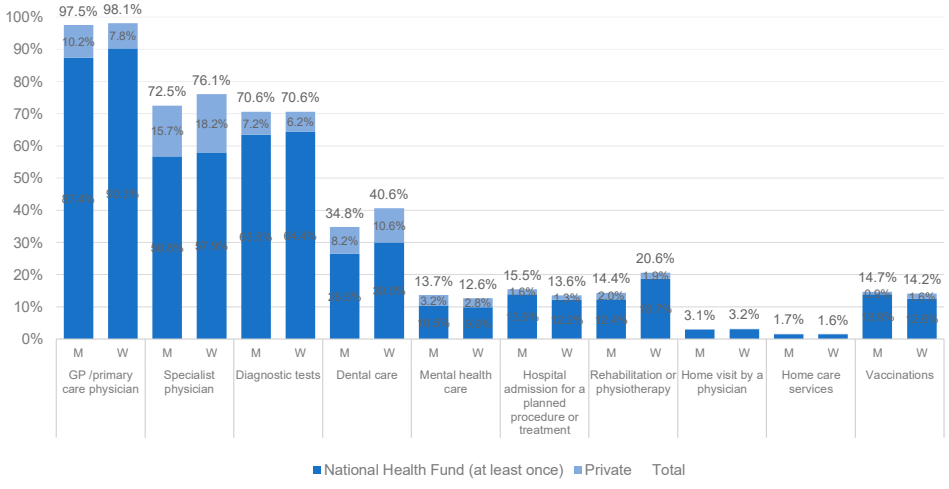


Fig. 12.13. Use of different types of services in the last 12 months. At least once under the National Health Fund vs privately (National Institute of Public Health NIH – National Research Institute survey, 2025)

Women benefited from dental care and rehabilitation/physiotherapy significantly more often than men – 40.6% and 20.6%, respectively (men: 34.8% and 14.4%). The differences are not due to different age-sex structures and are still noticed after considering age standardisation.

The services most often financed exclusively privately were specialist consultations: 15.7% of men and 18.2% of women visited a specialist in the private health care system in the last 12 months. A relatively high percentage of people used GP services outside the National Health Fund (10.2% of men and 7.8% of women) (Fig. 12.13).

Unmet health needs

A very high percentage of the surveyed population (over half of those using a given service) declare delays in access to various types of services financed by the National Health Fund due to long waiting times. This is most often the case of access to specialists, diagnostic tests, hospital care and mental health care. A significantly smaller percentage (several per cent) declares such delays due to transport issues or long distances.

Delays in accessing services due to long waiting times are a very common issue among the Polish population.

People who used various types of services in the last 12 months were asked whether they had experienced a delay in accessing a given service provided under the National Health Fund at least once during that time. Separate questions concerned the issue of long waiting times for the appointment and delays due to long distances or transport.

For a large percentage of the respondents, using health care services financed by the National Health Fund involved long waiting times for the appointments. Most often, this concerned visits to specialists (experienced at least once by 79.6% of men and 82.7% of women using such services). The problem of long waiting times was also reported by a very high proportion of those receiving mental health care (72.6% of men and 65.7% of women), the respondents scheduled for a planned procedure or hospital treatment (69.1% of men and 76.4% of women), diagnostic tests (68.3% of men and 74.2% of women in this group) or vaccinations (65.3% of men and 70.2% of women) (Fig. 12.14).

Delays related to transport or long distances were no longer as common as long waiting times. It is noteworthy that this issue is more often indicated by

women than men, and this is clearly the case for rehabilitation or physiotherapy and visits to specialists (26.0%–26.6% of women using the service in question). Men, in turn, are more likely to declare problems with transport/long distance when it comes to visiting a psychologist or psychiatrist (26.0% of men vs 18.9% of women). The differences remain clear after standardising the data based on different age structures for women and men (Fig. 12.15).

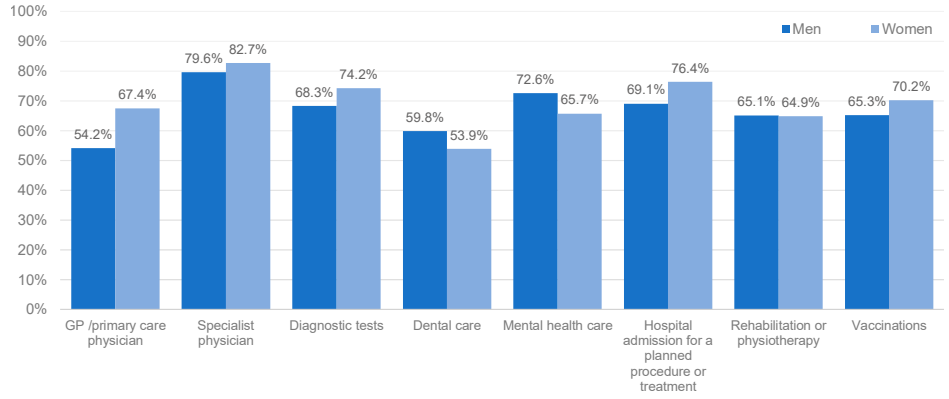


Fig. 12.14. Delays in access to particular types of health services offered under the National Health Fund in the last 12 months due to LONG WAITING TIMES. 100% – persons using a given service (National Institute of Public Health NIH – National Research Institute survey, 2025). Services indicated by n<50 persons were excluded

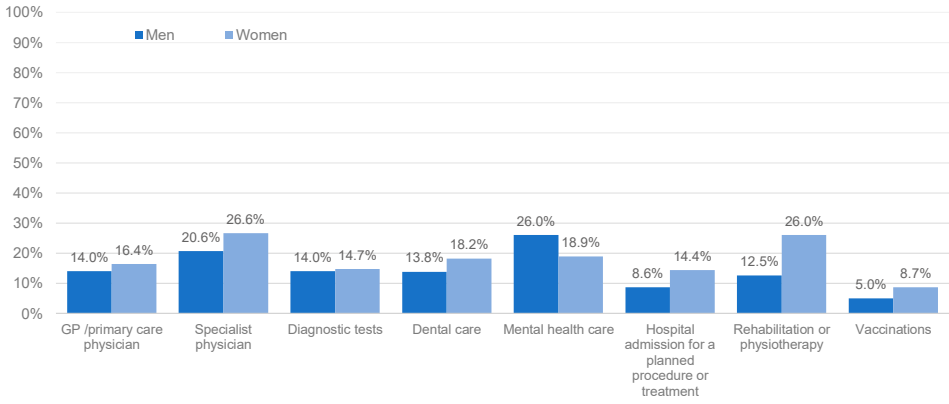


Fig. 12.15. Delays in access to particular types of health services offered under the National Health Fund in the last 12 months due to long waiting times. 100% – persons using a given service (National Institute of Public Health NIH – National Research Institute survey, 2025). Services indicated by n<50 persons were excluded

A relatively small percentage of the surveyed population indicated that delays in obtaining medical services contributed to a deterioration in their health condition.

Although the largest number of people reported delays concerning specialist appointments, hospital admissions and mental health care, a small proportion reported that the delay caused a significant deterioration in their health condition. Health deterioration was more often experienced by the group of those who reported problems with access to primary care physicians and, which is probably more difficult to explain, vaccinations. 6.2% of men and 7.2% of women who had a delayed primary care physician visit, and 11.9% of men and 6.0% of women who waited a long time for vaccination, assessed that this contributed to a significant deterioration in their health condition (Fig. 12.16).

A significant share of the respondents who declared a need for medical services decided not to obtain them. The most frequent reasons were queues/impossibility to make the appointment, difficulties in reaching the health care facility via the phone, but also a potentially high cost of the paid services and lack of time.

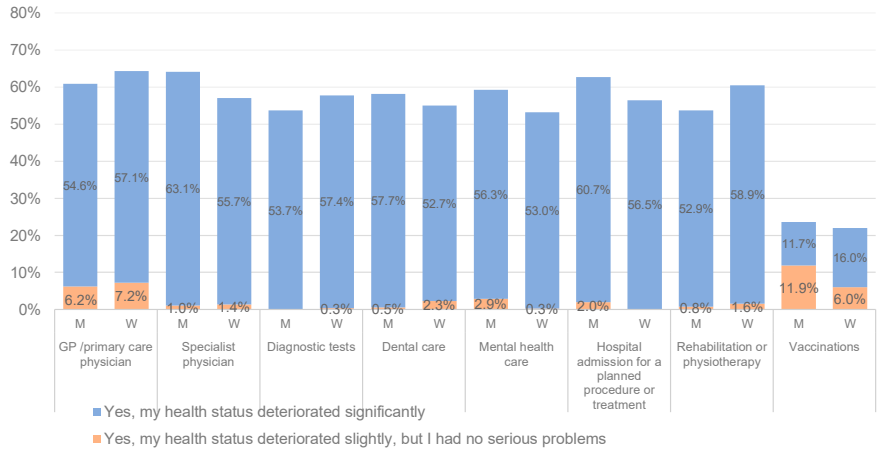


Fig. 12.16. Experienced deterioration in health due to delay in accessing a particular service as a result of long waiting times for the appointments or transport problems, long distances. 100% – people who experienced a delay (National Institute of Public Health NIH – National Research Institute survey, 2025). Services indicated by n<50 persons were excluded

Table 12.7. Reasons for opting out of a particular type of medical care, 100% – persons who opted out of the health service in the last 12 months. Men (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025). Services indicated by n<50 persons were excluded

	Men				
	GP/ primary care physician	Specialist physician	Diagnostic tests	Dental care	Prescription drugs
No appointments available/too long waiting list/queue	24.4%	33.5%	18.7%	14.0%	22.3%
Difficulties to reach the facility via the phone to book the visit	20.7%	14.9%	21.5%	10.1%	16.0%
Could not afford (the visit was too expensive or not covered by health insurance)	16.7%	12.0%	10.6%	36.5%	19.7%
Did not have time due to work, childcare or other reasons	15.9%	17.6%	9.8%	16.,9%	8.8%
Too large distance/no means of transport	8.1%	6.4%	9.8%	2.5%	10.9%
I don't know any good doctors	6.8%	5.9%	2.7%		1.8%
Fear of physicians/hospitals/tests/treatment	4.2%	3.1%	15.4%	4.0%	8.8%
Waited for the problem to go away	3.3%	6.6%	11.5%	16.1%	11.6%

Table 12.8. Reasons for opting out of a particular type of medical care, 100% – persons who opted out of the health service in the last 12 months. Women (National Institute of Public Health NIH – National Research Institute surveys, 2018, 2025). Services indicated by n<50 persons were excluded

	Women				
	GP/ primary care physician	Specialist physician	Diagnostic tests	Dental care	Prescription drugs
No appointments available/too long waiting list/ queue	31.6%	28.8%	30.9%	32.7%	15.0%
Difficulties to reach the facility via the phone to book the visit	20.1%	15.7%	5.6%	4.1%	5.4%
Could not afford (the visit was too expensive or not covered by health insurance)	28.7%	35.1%	40.3%	36.7%	39.8%
Did not have time due to work, childcare or other reasons	7.6%	6.9%	8.1%	11.7%	7.9%
Too large distance/no means of transport	1.6%	3.8%	5.8%	6.3%	11.5%
I don't know any good doctors	4.0%	2.3%	1.9%		6.8%
Fear of physicians/hospitals/tests/treatment	2.9%	4.7%	5.2%	5.9%	6.1%
Waited for the problem to go away	3.6%	2.7%	2.2%	2.6%	7.6%

A significant number of the respondents declared resignation from various types of medical services. The most common resignations concerned mental health care and dental services.

This phenomenon requires in-depth research. Access to mental health care, even non-publicly financed services, may be difficult due to limited availability of specialists, but also other factors, such as the feeling of shame. The resignation from dental services is probably due to the low availability of public financing and high costs for the patient or the limited availability of medicinal products for self-medication.

The fact of resignation from various types of medical services was declared by approximately 10% and 24% of men and women, among those who claimed that they needed a particular service. It should be noted that 24.5% of men and 20.0% of women declared that they refrained from visiting a psychologist or psychiatrist in the last 12 months, despite the fact that they needed mental health care. Women were more likely than men to resign from rehabilitation/physiotherapy (17.0% vs 11.3%), while men were more likely to resign from dental care (18.5% vs 15.4%) (Fig. 12.17).

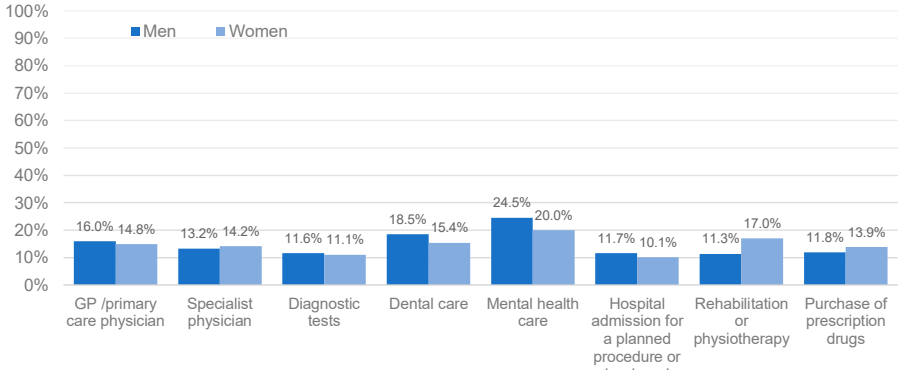


Fig. 12.17. Resignation from particular types of services (despite the need to use the service) in the last 12 months. 100% – persons declaring that they needed a particular service. (National Institute of Public Health NIH – National Research Institute survey, 2025). Services indicated by n<50 persons were excluded

A relatively large proportion of respondents resigned from visits to specialists or did not purchase prescribed medicines, and some of those experienced a deterioration in their health condition as a result of the lack of diagnosis or treatment. This observation indicates the need for thorough research to identify the populations and services most correlated with resignations resulting in deterioration in health. The services often resigned from, which is usually associated

with health consequences, include visiting a specialist and purchasing prescribed drugs: 13.2–14.2% of men and women decided not to visit a specialist despite the need. Of these, 15.9% of men and 23.6% of women experienced a clear deterioration in their health condition as a result (Fig. 12.18).

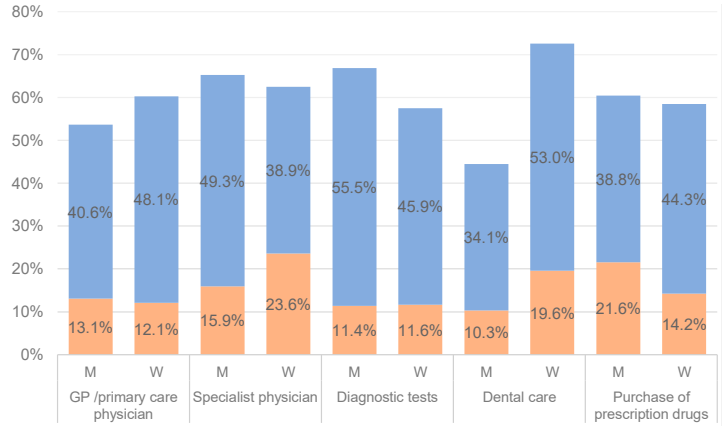


Fig. 12.18. Experienced deterioration in health due to resignation from a given service in the last 12 months. 100% – persons who decided not to use a given service (National Institute of Public Health NIH – National Research Institute survey, 2025). Services indicated by n<50 persons were excluded

Similarly, approximately 11.8–13.9% of men and women did not always purchase prescribed medication. In this group, 21.6% of men and 14.2% of women claim that their health condition has deteriorated as a result.

The most frequently given reasons for the resignation were queues, lack of available dates, difficulties in getting through to the facility to make an appointment and financial issues – more often mentioned by women than men. Men, in turn, are more likely to explain their resignation from a visit to a physician or diagnostic tests by lack of time due to work, childcare or looking after other persons (Tab. 12.7 and 12.8).

13. THE PREVALENCE OF BEHAVIOURAL HEALTH RISK FACTORS

Anna Poznańska, Daniel Rabczenko, Bogdan Wojtyniak

Many lifestyle elements are essential for health and, consequently, the quality and length of life. The importance of diet and exercise was already emphasised by ancient physicians such as Herodicus (5th century BC), Hippocrates (5th-4th century BC), and Galen (2nd century AD). Much later, in the 1950s, the adverse effect of smoking on life expectancy was demonstrated when the results of the *British Doctors' Study showed that it increased the risk of death from lung cancer and coronary thrombosis*[1]. It is also worth highlighting the significance of the *Framingham Heart Study, initiated in 1948 and still ongoing, in identifying behavioural risk factors for cardiovascular diseases*[2].

Attempts to quantify the impact of lifestyle on population health have been undertaken at least since the publication of Lalonde's (1974) concept of health fields[3]. In the 1990s, for example, the contribution of lifestyle to all-cause mortality was estimated at 50%, while biological and environmental/social factors were attributed 20% each, and the health care system – 10%[4].

The most recent analysis of the Global Burden of Disease Study (*2021 GBD Study*) attributed 28.2% (32.2% among men and 23.1% among women) of global deaths from all causes in 2021 to behavioural risk factors (excluding overweight

[1] Doll R, Hill AB (1954). *The mortality of doctors in relation to their smoking habits*. BMJ 328 (7455): 1529-33; doi:10.1136/bmj.328.7455.1529

[2] Syed S Mahmood et al. (2014). The Framingham Heart Study and the epidemiology of cardiovascular disease: a historical perspective. The Lancet 383 (9921):999-1008; https://doi.org/10.1016/S0140-6736 (13)61752-3

[3] Lalonde M., A New Perspective on the Health of Canadians: a Working Document, National government publication, Ottawa 1974

[4] Badura B. (1995). What is and What Determines Health. In: Scientific Foundations for Public Health Policy in Europe. Eds.: Laaser U., de Leeuw E., Stock Ch., Juventa Verlag, Munchen.

and obesity)[5]. The results for Poland are similar: 28.3%, 33.3%, and 22.9%, respectively, with a slightly larger difference for men. It should be noted, however, that the data refers to the period of the COVID-19 pandemic when the importance of behavioural risk factors for mortality intensity was lower than average. In 2021, the values of the above indicators were the lowest in the entire analysed period (1990-2021). According to the 2018 GBD results, their influence contributed to 33.8% of deaths worldwide (39.1% among men and 27.5% among women). For Poland, the values were higher: 36.2%, 42.9% and 29.1%.

In 2021, in Poland, behavioural, i.e., modifiable, risk factors accounted for 25.6% of total *Disability-adjusted life years* (DALYs) – the years of life that a society loses due to premature death or damage to the health of its members. These values were 30.9% for men and 19.5% for women. Due to the pandemic, as observed in the case of deaths, the values were the lowest in the analysed period (1990-2021).

As knowledge about the importance of behavioural risk factors has expanded, national authorities and international organisations have undertaken various education and prevention activities. At the initiative of the WHO, the Global Action Plan for the Prevention and Control of Non-Communicable Diseases was also developed, identifying smoking, harmful alcohol consumption, unhealthy diet and lack of physical activity as factors whose reduction could prevent many illnesses and most premature deaths due to the above worldwide. In 2019, the Plan was extended to 2030. One of its goals is to reduce modifiable risk factors for non-communicable diseases (NCDs) and underlying social factors by creating health-supportive environments[6]. The 2025-2028 WHO General Programme of Work recommends a comprehensive, multi-sectoral, and multi-stakeholder approach[7].

In Poland, the reduction of the prevalence of several lifestyle risk factors is included in the 2021-2025 National Health Programme, the primary public health policy document outlining its objectives and key tasks[8]. To implement the Programme's strategic goal, i.e., "increasing the number of years lived in good health

[5] Institute for Health Metrics and Evaluation, GBD Results, https://vizhub.healthdata.org/gbd-compare/ access: 7 April 2025

[6] WHO (2022) Updated Appendix 3 of the WHO Global NCD Action Plan 2013-2030.

[7] WHO (2025). A Global Health Strategy for 2025-2028 – advancing equity and resilience in a turbulent world: fourteenth General Programme of Work. Geneva.

[8] Regulation of the Council of Ministers of 30 March 2021 on the 2021-2025 National Health Programme (Dz. U. /Journal of Laws/ of 2021, item 642)

and reducing social inequalities in health", two operational objectives directly related to improving health behaviour were defined, i.e. overweight and obesity prevention and addiction prevention. The first includes tasks associated with promoting proper nutrition and increased physical activity in the population, and the second one concerns reducing smoking and alcohol consumption.

Use of traditional tobacco products and their substitutes

Fig. 13.1 shows trends in smoking traditional tobacco products in Poland, the European Union and selected EU countries, where the situation is best and worst.

Since 2006, a consistent decline in daily use of traditional tobacco products (cigarettes, pipes, cigars) has been observed in Poland among both men and women (Fig. 13.1). However, this trend has slowed down in recent years, particularly after 2020. In this study, at the beginning of 2025, 28.8% of men and 20.3% of women declared daily smoking. There has been a slight increase in smoking rates for men, a reversal of the earlier trend. As regards women, the decline rate has also slowed down, with the levels currently stable and without clear further improvement.

In the European Union, the overall trend continues to decline for both men and women. Poland lags behind the countries with the lowest smoking rates – for women, these include Sweden (8%) and the Netherlands (13%), and for men – the Netherlands (10%) and Sweden (9%). At the same time, changes (of different magnitude and in different directions) in the number of daily smokers are observed in different countries. These changes are not only related to the COVID-19 pandemic. It is worth noting the significant increase in daily female smokers in Greece (from 2012 to 2020) and Romania (from 2017 to 2023), as well as long-term positive changes in Sweden, the Netherlands and Denmark. Interesting changes are taking place in France, where a consistent, positive trend is also evident, but the absolute level of the percentage of daily female smokers remains high. Among men, attention should be drawn to the lack of favourable changes in the countries with very high rates of daily smoking (excluding Greece) and a certain slowdown, or even an increase in 2023, of positive trends in countries with the lowest level of that indicator (Sweden, the Netherlands, Finland, Ireland). In Poland, the current smoking prevalence corresponds to the levels observed in the above countries about two decades ago.



Fig. 13.1. Prevalence of daily smoking in Poland, the European Union and selected countries (data: Eurostat)

Fig. 13.2 shows the percentage of daily smokers in 2025 by gender, age and place of residence. In the 20–39 age group, 29.3% of men and 22.6% of women reported daily smoking. In the 40-59 age group, the prevalence was 34.5% in men and 25.0% in women. In the 60-74 age group, daily smoking was declared by 25.7% of men and 17.4% of women. In the 75+ age group, 6.3% of men and 6.2% of women declared daily smoking. In all age groups, except 75+, the prevalence of daily smoking men exceeded that of women. Among both men and women, the percentage of smokers is significantly higher in urban areas than in the countryside (by 5.9 percentage points for men and 9.2 percentage points for women).

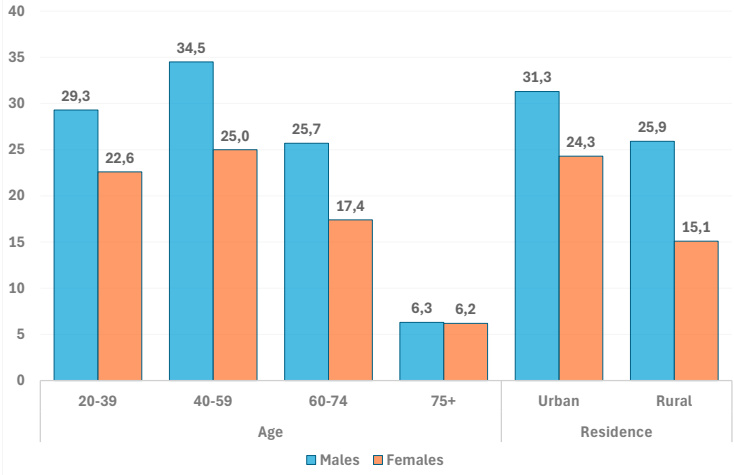


Fig. 13.2. Prevalence of daily smoking by gender, age and place of residence in Poland in 2025 (own elaboration based on the 2025 National Institute of Public Health NIH – National Research Institute Risk Factors Study)

In 2025, in Poland, the levels of daily smoking clearly varies depending on gender, level of education and self-assessment of economic status. Among women, there is a notably higher (33.3%) smoking prevalence among those with lower secondary school education or below. Among men, the highest prevalence was observed in the group with basic vocational education while the lowest among those with a university degree.

Similar patterns were observed in relation to self-assessment of economic status. As part of the Health and Risk Factors Study conducted by NIZP PZH - PIB in 2025, participants were asked about the financial difficulties related to meeting basic needs, such as food, clothing and housing and utility costs. Based on the responses, three categories of economic status were defined. Among both men and women, smoking

is most frequently declared by those who assess their economic status as bad, and least often by those who perceive their status as moderate or relatively good.

In all categories analysed, with the exception of the group with the lowest level of education – the prevalence of daily smoking was consistently higher among men than among women.

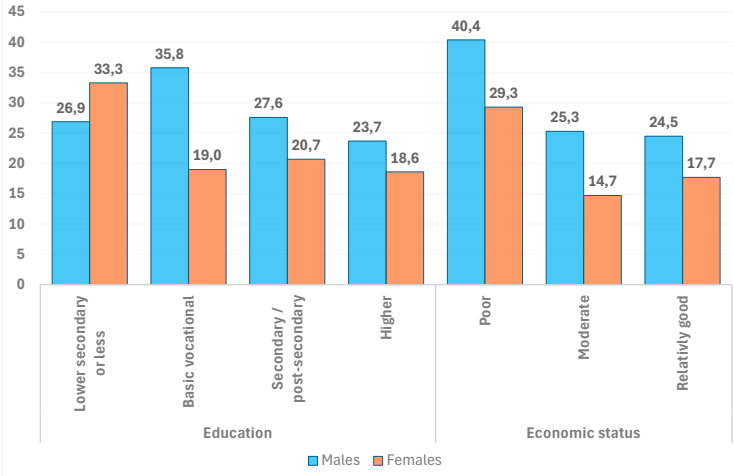


Fig. 13.3. Prevalence of daily smoking by gender, education and economic status in Poland in 2025 (own elaboration based on the NIZP PZH – PIB Risk Factors Study)

In the study, 56.9% of current male smokers and 63.6% of current female smokers declared past attempts to quit smoking. At the same time, among current non-smokers, 32.9% (39.1% of men and 28.2% of women) used to smoke (declared daily or occasional smoking in the past). These findings indicate a substantial potential of possible actions to reduce the prevalence of smoking. Of those who tried to quit smoking, professional help (physician, psychotherapist, participation in smoking cessation programs) was sought by only 18.4% (both men and women). The majority of those, 77.7% of men and 84.6% of women, received such assistance, and it was free of charge in the case of 65.6% and 76.1%, respectively.

Fig. 13.4 shows the percentage of women and men who use substitutes of traditional tobacco products, e.g. e-cigarettes, tobacco heaters, nicotine pouches, chewing tobacco, on a daily basis, by age, education level and economic status. The highest prevalence was observed among individuals aged 20-39. None of the respondents aged 75 and over reported using electronic tobacco products. For both men and women the prevalence of substitute use was more than one-third higher among urban residents compared to those living in rural areas. Greater differences, depending on education,

were observed in the group of women – the highest score was obtained in the groups with higher education, lower secondary school education and below. The different nature of the correlation between education level and the frequency of using substitutes of traditional tobacco products is noteworthy – the relative variation in the male population is smaller, with the highest percentage of daily smokers observed in the groups with secondary and basic vocational education, and among women – in the groups with higher education and lower secondary school education. For both men and women, the most frequent use of substitutes of traditional tobacco products is observed in the group of respondents with the worst economic status.

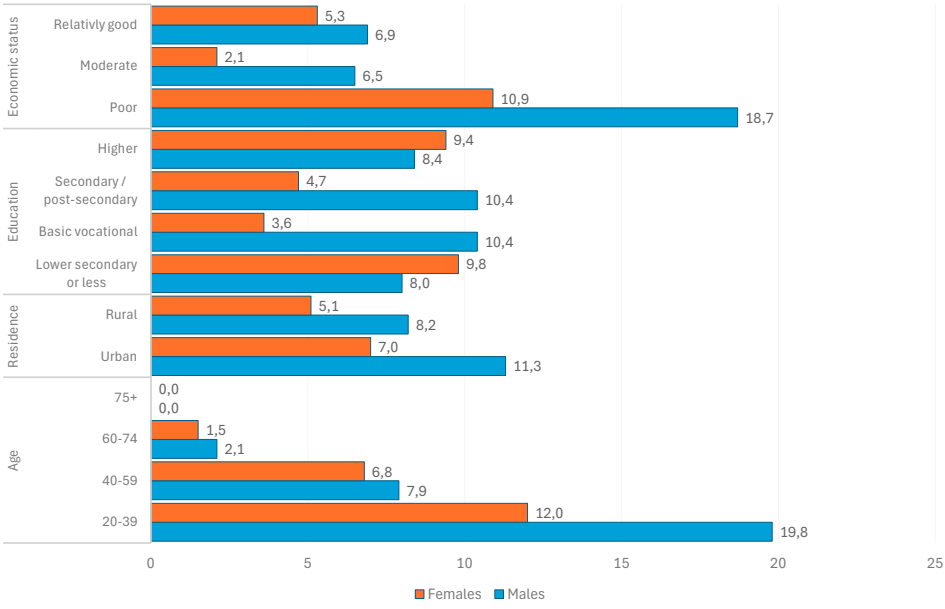


Fig. 13.4. Daily use of substitutes of traditional tobacco products (e.g. e-cigarettes, tobacco heaters, nicotine pouches, chewing tobacco), by age, place of residence, education level and economic status, by gender (own elaboration based on the NIZP PZH – PIB Risk Factors Study)

An important issue is the simultaneous use of tobacco products and their substitutes. The analysis revealed that among daily smokers, 23.0% also used substitutes, including 16.4% of the respondents using tobacco product substitutes every day, and another 6.6% using them less often than daily. In the group of respondents smoking less often than daily, the corresponding percentages were 17.3% and 13.7%. This means that a total of 31.0% of this group uses substitutes despite the limited use of traditional tobacco products, which indicates a tendency to supplement tobacco consumption with alternative nicotine products.

Alcohol consumption

Presenting the level of alcohol consumption in Poland against the background of European Union countries is a unexpectedly complex challenge. The data available in the WHO, Eurostat and OECD databases is incomplete or outdated, which, in the context of the decline in alcohol consumption in Poland in the last two years (Fig. 13.5) and the COVID-19 epidemic, makes the task more difficult. A reliable source may be the Global Health Observatory's forecasts[9], prepared based on alcohol sales data and estimates of unrecorded consumption, placing Poland above the European average.

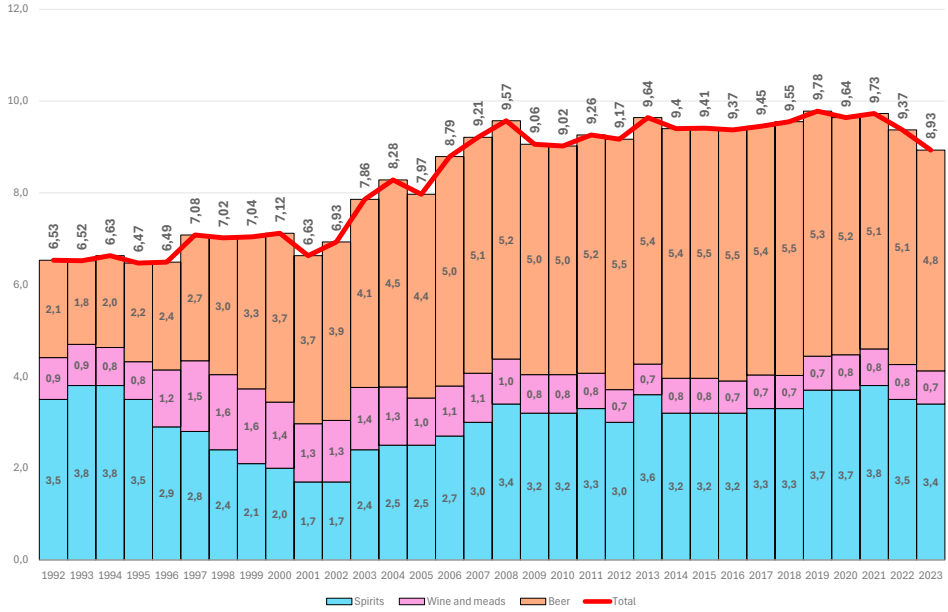


Fig. 13.5. Changes in per capita alcohol consumption and structure of the type of alcohol consumed in Poland in the years 1992-2013 (Source: National Centre for Counteracting Addictions[10] based on Statistics Poland data[11])

[9] "Alcohol, Total (Recorded + Unrecorded) per Capita (15+) Consumption with 95%CI, Projections". Access: 12 April 2025. https://www.who.int/data/gho/data/indicators/indicator-details/GHO/alcohol-total-(recorded-unrecorded)-per-capita-(15-)-consumption-with-95-ci-projections.

[10] „Spozycie-napojow-alkoholowych-na-jednego-mieszkanca2023.pdf". Access: 12 April 2025. https://kcpu.gov.pl/wp-content/uploads/2024/09/Spozycie-napojow-alkoholowych-na-jednego-mieszkanca2023.pdf.

[11] Statistics Poland "Domestic market deliveries and consumption of some consumer goods per capita in 2023". stat.gov.pl. Access: 12 April 2025. https://stat.gov.pl/obszary-tematyczne/ceny-handel/handel/dostawy-na-rynek-krajowy-oraz-spozycie-niektorych-artykulow-konsumpcyjnych-na-1-mieszkanca-w-2023-roku,9,14.html.

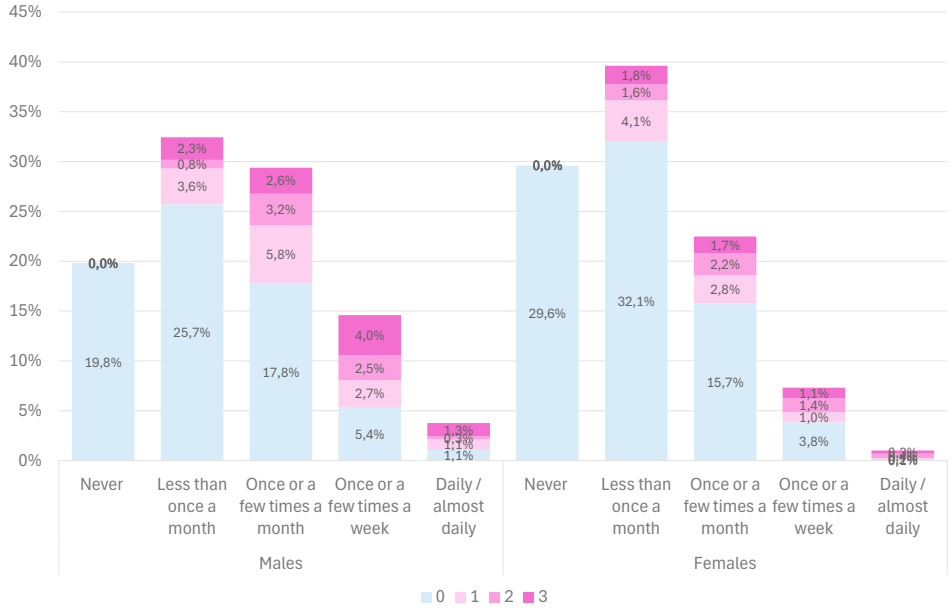


Fig. 13.6. Declared frequency of alcohol consumption taking into account the number of risky drinking indicators (own elaboration based on the NIZP PZH – PIB Risk Factors Study)

Fig. 13.6 shows the self-reported frequency of alcohol consumption, taking into account the responses of male and female respondents related to indicators of risky drinking. Risky drinking was assessed by means of three questions concerning the occurrence of thoughts that the respondent was consuming too much alcohol, feeling bad or guilty due to alcohol consumption, and the respondent's irritation because of comments of others regarding the respondent's alcohol consumption, reported during the interview. An positive response to one of such questions qualified the respondent as having indicators of risky drinking.

Overall, a potentially harmful frequency of alcohol consumption (once or more often per week) was declared by 18.4% of men and 8.3% of women. At least one indicator of risky drinking (regardless of the declared frequency of consumption) was noticed in 29.6% of men and 18.0% of women.

In the following section of the study, the category of respondents who either reported a potentially harmful frequency of alcohol consumption or were in the group of people with 2 or 3 indicators of risky drinking will be analysed. According to this definition, the proportion of risky drinkers was 27.2% among men and 15.7% among women, indicating substantial gender differences.

Fig. 13.7 shows the percentage of women and men with indicators of risky drinking, by age, place of residence, education level and economic status.

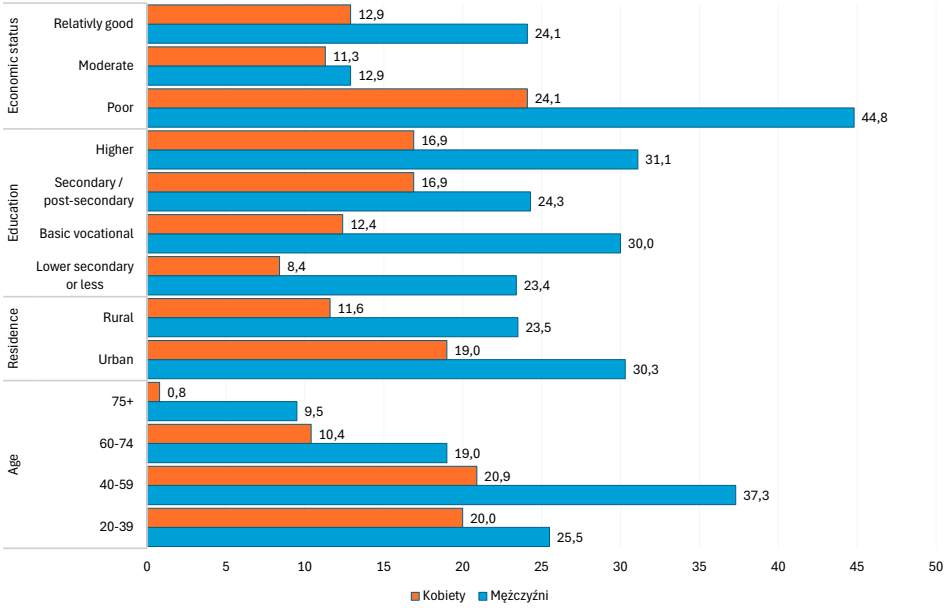


Fig. 13.8. Prevalence of risky alcohol drinkers by age, place of residence, education level and economic status, broken down by gender, 2025 (own elaboration based on the NIZP PZH – PIB Risk Factors Study)

Among men, the highest prevalence of risky drinkers was observed in the 40-59 (37.3%) age group, among respondents with higher education (31.1%) and basic vocational education (30.0%) and declaring a poor economic status (44.8%). Risky drinking was approximately one-third more prevalent among urban residents compared to those living in rural areas. The highest percentages of responses that could indicate risky drinking among women were observed in the 40–59 (20.9%) and 20–39 (20.0%) age groups, in the groups of respondents with higher education and secondary/post-secondary education (16.9% each) and those with poor economic status (24.1%). The prevalence of risky drinking among women living in urban areas was nearly two-thirds higher than among their rural counterparts.

Use of psychoactive substances

For the first time, the current edition of the risk factor prevalence study included questions related to the use of psychoactive substances. Respondents were asked about cannabis, stimulants (amphetamine, ephedrine, novel psychoactive

substances) and substances with high addictive potential commonly referred as hard drugs (heroin, LSD, cocaine).

Fig. 13.8 shows the use of cannabis. The percentage of men using cannabis was higher than that of women, both in terms of lifetime use (16.3% vs 11.5%) and in the past 12 months (6.1% vs 3.7%). The use of cannabis was reported mainly by those under the age of 60 - in the 20-39 age group, the percentage of lifetime users was 18.8%, and in the 40-59 age group - 21.1%; it was 8.9% and 6.0%, respectively, in the last 12 months.

The highest rates of lifetime use of cannabis was observed among those with lower secondary education or below (23.7%, 11.9% in the last 12 months) and by the respondents with a poor economic status (25.6%, 11.8% in the last 12 months).

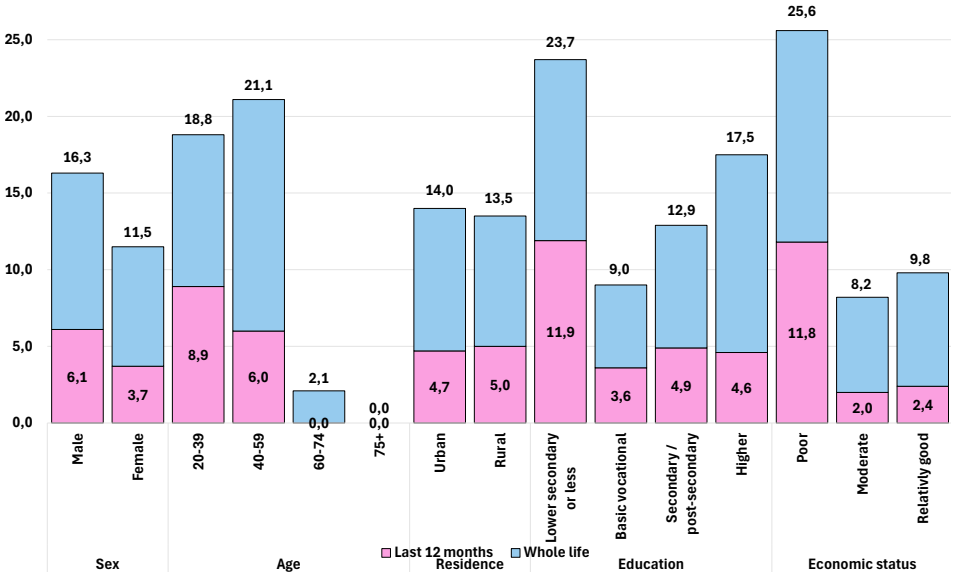


Fig. 13.8. Cannabis use in the last 12 months and ever in lifetime, 2025 (own elaboration based on the NIZP PZH - PIB Risk Factors Study)

Fig. 13.9 shows the use of stimulants such as amphetamine, ephedrine and novel psychoactive substances. Men reported higher rates of stimulant use than women, both in terms of lifetime prevalence (7.3% vs 3.9%) and in the last 12 months (3.9% vs 1.1%). According to the results, the problem of stimulant use affected almost exclusively those under the age of 60, in the 20-39 age group, the percentage of lifetime users was 10.4%, and in the 40-59 age group - 6.4%; and 6.3 % and 1.3 %, respectively, in the last 12 months.

The highest lifetime prevalence of stimulants use was observed among individuals with lower secondary education or below (16.1%) and those with a poor economic status (14.5%). In the last 12 months, the highest rates were recorded in the same groups: 4.5% and 7.9%, respectively. In the 20-39 age group, the total use was 10.4%, and it was 6.3% in the last 12 months.

The frequent use of stimulants by people reporting a poor financial status is noteworthy.

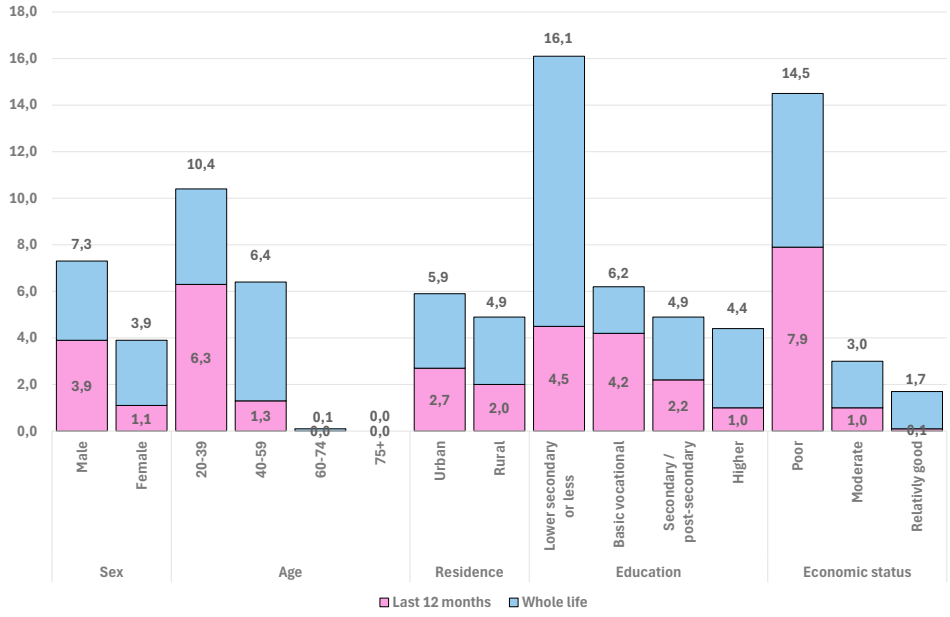


Fig. 13.9. Stimulant use in the last 12 months and ever in lifetime, 2025. (own elaboration based on the NIZP PZH - PIB Risk Factors Study)

Figure 13.10 shows the percentage of users of psychoactive substances with high addictive potential (LSD, cocaine, heroin, etc.). Men reported higher rates of hard drug use than women, both in terms of lifetime prevalence (5.0% vs 2.0%) and in the past 12 months (1.8% vs 0.6%). The substances were mainly used by the respondents under the age of 60. In the 20-39 age group, the proportion of lifetime users was 6.1%, and in the 40-59 age group - 4.2%; it was 2.5% and 1.1%, respectively, in the last 12 months.

The highest lifetime prevalence of hard drugs use was observed among individuals with lower secondary education or below (9.8%) and those declaring a poor economic status (9.1%). In the last 12 months, the highest values were for

the same groups: 1.0% and 3.7%, respectively. It is worth noting that the Health and Risk Factor Study conducted by NIZP-PZH - PIB was cross-sectional, meaning that education, economic status and use of psychoactive substances were assessed simultaneously. Therefore, the observed correlations do not indicate a causal relation.

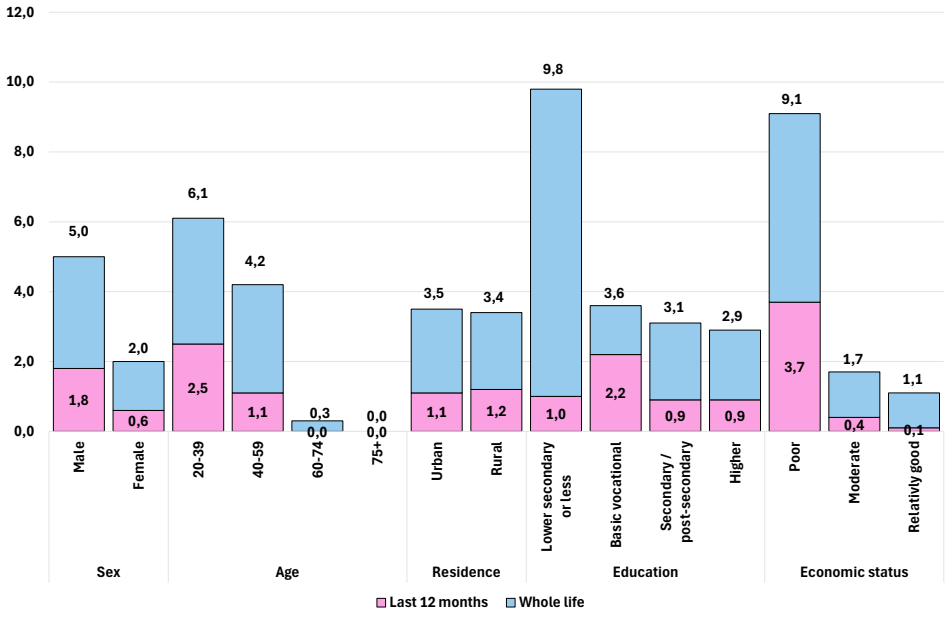


Fig. 13.10. Use of psychoactive substances with high addictive potential (own elaboration based on the NIZP PZH - PIB Risk Factors Study)

Overweight and obesity

According to the results of the 2021 Global Burden of Disease (GBD) study, excess body weight is the fifth major health risk factor in Poland, accounting for 7.7% of all deaths and 7.6% of years of healthy life lost[5]. For women, it is the second leading risk factor in terms of DALYs (8.9%) and fourth in terms of deaths (9.3%); for men, it is the sixth (6.5%) and eighth (6.2%), respectively.

The latest available estimates of the prevalence of overweight and obesity in Poland are based on surveys that included respondents' self-assessments of body weight and height. The obtained results vary, also due to methodological

differences. For example, the *European Social Survey*, carried out within the framework of the *European Research Infrastructure Consortium* in the social sciences and humanities in 2023/24, estimated the prevalence of excessively high body weight (BMI ≥ 25) among the population aged 15 or over at 57.6% (69.0% among men and 47.4% among women) and obesity (BMI ≥ 30) at 18.8% (22.1% and 16.5%, respectively)[12].

Similar results were obtained in the "Health of Adults" study conducted by Statistics Poland in 2022 as part of the EU Statistics on Income and Living Conditions (EU-SILC). The prevalence of excess body weight among the Polish population at the age of 16 or over was estimated at 57.1% (65.7% among men and 49.3% among women), and that of obesity at 18.0% (19.5% and 16.7%, respectively).[13]

The WHO results regarding the scale of the problem, based on many sources (with a preference for measurement-based data), are generally significantly overestimated. In 2022, the proportion of Polish adults (aged 18 or older) with excessively high body weight was estimated at 68.5% (men: 77.8% and women: 55.9%), and concerning obesity, it was 31.4% (men: 33.8% and women: 29.4%)14. The percentage of men with excess body weight (equal to that observed in Romania) was the highest among the 27 European Union countries; for women, it was 10th position, counting from the highest value. The share of Poles with obesity places the country in the 6th and 9th position in the EU, respectively.

The results of the health and risk factors study conducted by the National Institute of Public Health NIH – National Research Institute in February 2025 indicate that 55.8% of Poles aged 20 or older are overweight, while 13.9% are obese. This problem is much more common in men than in women (by gender, the percentages of overweight persons were 64.1% and 48.3%, respectively, and concerning obesity, it was 15.3% and 12.6%). After taking into account the age structure of both subpopulations, these proportions remain almost unchanged; the age-standardised percentages were 64.5% and 47.7% for overweight and 15.3% vs 12.4% for obesity. These values are lower than those obtained in the aforementioned studies, particularly for obesity. However, they show an increase in the prevalence of both problems since autumn 2018, when the previous edition of this study was conducted.

[12] European Social Survey (2025). What do Poles say about themselves? New European Social Survey data (N=1442), https://ess.ifispan.pl, access: 8 April 2025; ESS data viewer

[13] Statistics Poland (2023). Income and living conditions of the Polish population (EU-SILC 2022 study report)

[14] WHO The Global Health Observatory, https://www.who.int/data/gho/data/indicators, access: 18 April 2025

Based on the results of our two studies, the situation has worsened compared to the state before the COVID-19 pandemic - the prevalence of excess body weight has increased significantly (by 7.2 pp among women and 5.3 pp among men, for obesity by 1.7 pp and 4.4 pp, respectively) and this is only partly the result of the population ageing. After converting the age-specific frequencies of overweight and obesity from 2018 to the current age structure of the population, it turns out that excess body weight would be the case for 60.5% of men and 43.0% of women. For obesity, the percentages would be 11.5% among Poles of both genders.

The prevalence of excess body weight increases with age, reaching a maximum in the 75-84 age category (Fig. 13.11). It should be emphasised that already at the age of 20-39, more than half of men weigh too much, and in the older age groups (60-84), their share exceeds ¾. In all the age groups under study, the proportion of overweight women is significantly lower than that of men, with differences of 17-19 pp in the 74-year-old group and 8-9 pp among the elderly. For both genders, the lowest levels of obesity are observed in the youngest adult group, i.e. aged 20-39 (8.2 % of men and 6.7 % of women). The issue reaches its maximum already among men at the age of 40-59 – in this category, the most significant gender differences are observed concerning obesity (19.1% of men and 12.7% of women). In older age groups, the differences are minor and do not exceed 2 pp. The highest number of obese women (17.8%) is in the 60- 74 age group.

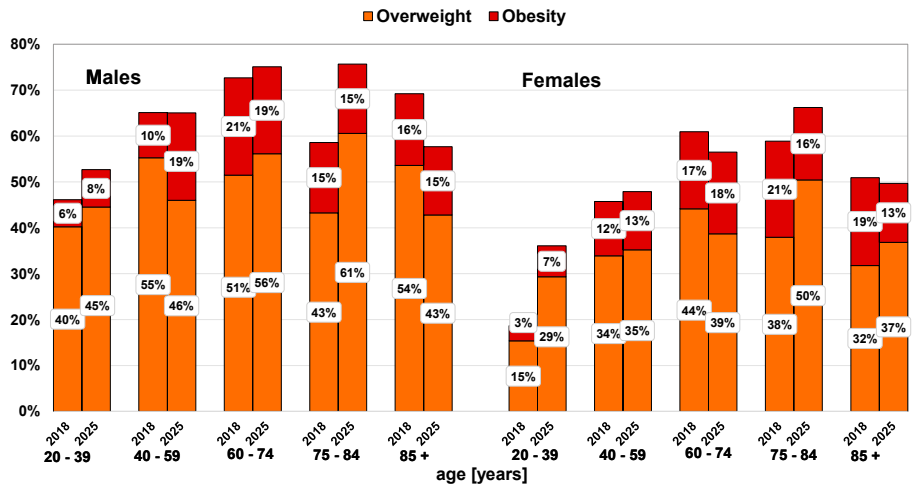


Fig. 13.11. Prevalence of overweight and obesity among the Polish population aged 20 and over in the years 2018-2025, by gender and age (values rounded to 1%); (data: National Institute of Public Health NIH – National Research Institute)

In almost all age groups under study, the prevalence of excess body weight increased compared to 2018. (Fig. 13.11). The unfavourable situation of the youngest women (20-39 years old) is noteworthy - in this group, both the prevalence of overweight and obesity doubled over less than seven years. In turn, among Polish women aged 75 and over, the proportion of overweight individuals (BMI below 30) increased, but the prevalence of obesity decreased significantly (by 6.3 pp in the 85 or over age category and by 5.2 pp in the 75-84 age category). Among men, the increase in obesity levels mainly concerned only those under the age of 60 (by 9.2 pp in the 40-59 age category and by 2.2 pp in the 20-39 age group). Against this background, a significant decrease in the prevalence of excess weight among the oldest men is worth noting (by as much as 11.6 pp), primarily due to a 10.8 pp. reduction of overweight with BMI < 30.

In the case of women, the study results confirm a clear link between excess body weight and education level (Fig. 13.12). A correlation has been observed for many years: overweight individuals are most often found among those with less education. In 2025, these were Polish women with basic vocational education (59.8% of them were found to be overweight, and 18.9% were obese) and lower secondary education or below (57.8% and 26.5%, respectively). Among women with higher education, the values were significantly lower (more than twice for obesity) and were 37.8% and 8.8%. After the standardising procedure and eliminating the differences in the age structure of the compared categories, the more favourable situation of better-educated Polish women is still clear (the prevalence of overweight is 39.3%, and obesity is 8.6%, compared to 56.3% and 28.2% for those with lower secondary education or below, and 57.4% and 16.5% for those with basic vocational education).

The situation is slightly different among men – although excess body weight was most common among Poles with basic vocational education (73.6%), it was least common among those with the lowest and highest education (53.7% and 54.2%, respectively). After eliminating the differences in the age structure of the compared categories, the most vulnerable remain people with basic vocational education (standardised frequency: 73.5%). However, an apparent discrepancy is visible between the group with higher education (56.2%) and those with lower secondary or primary education levels (62.3%). The most significant number of obese individuals is observed among men with vocational education (18.7%) and higher education (18.4%), and the smallest - among those with secondary education (12.1%). This effect results from differences in the age structure of the groups; after eliminating them, the highest risk of obesity concerns men with lower secondary school education or below (age-standardised frequency), followed by those with basic vocational education (18.4%) and higher education (18.1%), with 12.1% in the case of secondary or post-secondary education.

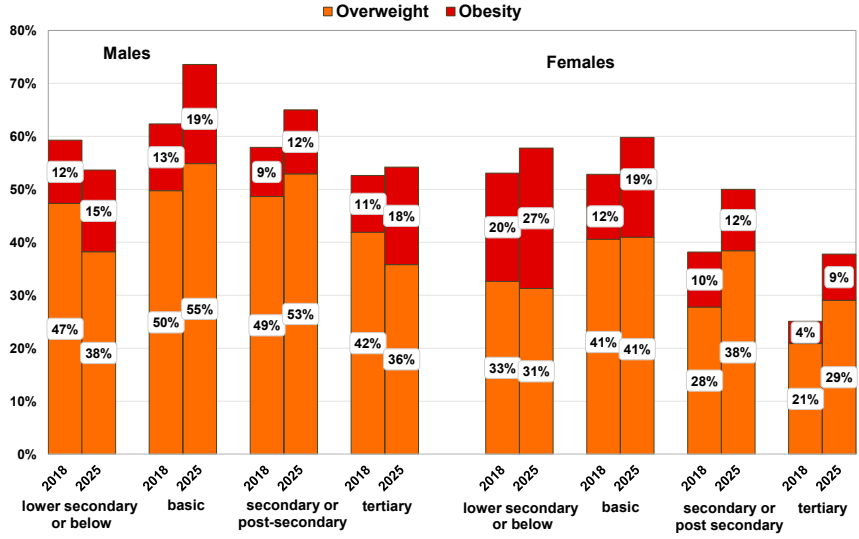


Fig. 13.12. Prevalence of overweight and obesity among the Polish population aged 20 and over in the years 2018-2025, by gender and education level (values rounded to 1%); (data: National Institute of Public Health NIH – National Research Institute)

The presented results indicate that differences between men and women in the prevalence of overweight, and especially obesity, also strongly depend on the education level. Among Poles with higher education, after eliminating differences in age structure, obesity is 2.1 times more common in men. The presented results indicate that differences between men and women in the prevalence of overweight, and especially obesity, among women and men also strongly depend on the education level. Among Poles with higher education, after eliminating differences in age structure, obesity is 2.1 times more common in men. In contrast, among those with primary education, it is 1.4 times more common in women. As regards the remaining education categories, the prevalence of obesity is similar for both genders, with slight surpluses (up to 11% of the standardised frequency value) in men. The prevalence of excess body weight (after age-standardisation) in all educational categories is higher in men than in women; the standardised frequency surpluses increase steadily with higher education levels. They are 11% for lower secondary school education or below, 28% for basic vocational education, 32% for secondary education and 43% for higher education.

Compared to 2018, obesity is more common among Poles of both genders at all levels of education, with one exception for excess body weight (among the least educated men, this percentage has decreased by 5.6 pp). The most considerable

– unfavourable change concerns the group of women with higher education, where the share of those with obesity increased 2.1 times over less than 7 years, and those overweight (BMI < 30) – 1.4 times. As a result, the share of overweight individuals increased 1.5 times (by 12.7 pp). The increase in the prevalence of excess body weight among Polish women with secondary education is primarily due to the increase in the prevalence of overweight in terms of BMI < 30 (by 10.7 pp), while among less educated Polish women, the increase in the share of obese persons (by 6.6 pp for basic vocational education and by 6.0 pp for lower secondary education or below). The prevalence of obesity among men increased most significantly among those with higher education (by 7.7 pp) and with basic vocational education (by 6.1 pp). In the latter group, the share of overweight people with a BMI below 30 also increased strongly (by 5.1 pp), which, given the high percentage of people with excess body weight already in 2018, led to the value reaching a record level of 73.6%.

The prevalence of overweight and obesity is also associated with socioeconomic status. Particularly noteworthy in this respect are members of households that have consistently or frequently lacked sufficient funds for food, clothing or housing bills over the past year. Polish women in this group, compared to other women, are characterised by an almost twofold higher prevalence of obesity (19.0% vs 10.8%) with a similar level of prevalence of excess body weight (49.1% vs 48.1%). The differences deepen after eliminating the influence of the age structure of both subpopulations; the age-standardised percentages for obesity are 21.8% vs 9.7%, respectively, while for excess body weight, these are 53.6% and 46.2%. For men, the pattern has the opposite character. In the group with financial problems, a lower prevalence of excess body weight (52.2% vs 68.8%) and obesity (11.4% vs 16.4%) is observed compared to those in a better financial situation. When standardised by age, the differences remain significant; the frequencies for excessively high body weight are 55.7% vs 66.9%, and for obesity, 11.9% vs 16.5%. It is worth emphasising that among the materially disadvantaged, obesity is more often recorded among women, while in the case of individuals in a better financial situation - among men.

Compared to 2018, the prevalence of excess body weight and obesity has decreased among less well-off men by 5.9 pp and 2.9 pp, respectively. After converting the age-specific frequencies of overweight and obesity from 2018 to the current age structure of the population (the population in 2025 is older), the decline is even greater (by 6.8 pp and 4.3 pp). About excess body weight, this result is consistent with the above-mentioned significant decrease in its prevalence among men with lower secondary education or below – in this group, as many

as 76% of the study subjects are in a difficult financial situation, many more than in the case of other education categories (from 19% among men with higher education to 31% among those with basic vocational education). In the group of better-off men, the prevalence of excess body weight and obesity increased by 9.6 pp and 6.3 pp, respectively. This effect is only remotely the result of population ageing – after eliminating it, the differences are slightly minor, amounting to 7.9 pp and 5.9 pp.

Since 2018, the prevalence of excess body weight in women has increased by 5.6 pp among those with lower incomes and by 7.7 pp among those in a better financial situation (when converted to the current age structure, the differences are 4.9 pp and 5.4 pp). The increase in the prevalence of obesity concerned almost exclusively women who frequently experienced financial difficulties – it amounted to 5.6 pp (5.5 pp after standardising the age structure of the compared groups); in the group of Polish women in a better financial situation, the increase was minimal – by 0.5 pp (0.2 pp).

The share of Poles with excess body weight is higher among rural residents compared to the urban, both for men (67.9% vs 60.6%) and women (50.9% vs 46.4%). This effect is not due to differences in the age structure of the compared subpopulations, as standardised percentages were 68.7% vs 60.8% and 51.3% vs 45.4%, respectively. At the same time, the prevalence of obesity among rural residents is higher only for women (13.4% vs 12.0%, and after age-standardised percentages: 13.8% vs 11.7%). Among men, urban residents are more likely to be obese (16.1% vs 14.3%, and after standardisation, 15.9% vs 14.5%).

Compared to 2018, the prevalence of excess body weight increased among urban men by 2.4 pp (by 1.0 pp after adjusting for population ageing). The change in the prevalence of obesity was greater. It was 4.7 pp (3.8 pp after standardising the age structure of the groups being compared), which means a decrease in the share of people who are less overweight (BMI below 30); it can be assumed that many of them exceeded the obesity threshold after 2018. Among rural male residents, the prevalence of overweight increased by 8.1 pp (6.4 pp after adjusting for age structure), representing a stronger increase compared to urban men. The prevalence of obesity increased similarly to that in urban areas by 4.1 pp (3.7 pp). The increase in the prevalence of overweight among women was hardly associated with place of residence, and it amounted to 7.0 pp (5.3 pp) in urban areas and 6.9 pp (5.3 pp) in rural areas.

The prevalence of overweight and obesity among schoolchildren is presented in Chapter XX of this report.

Physical activity

According to the results of the Global Burden of Disease (2021 GBD) study in 2021, in Poland, low physical activity was the cause of 1.3% of total deaths (0.8% of men and 1.9% of women) and 0.9% of lost healthy life years - DALY (1.3% in the case of women and 0.6% for men)5. The leading cause was cardiovascular diseases, followed by cancer (for mortality), diabetes and kidney diseases (DALY).

In Poland, physical activity studies employ various methodologies, including the definition of outcome indicators. However, their results consistently indicate a decline in physical activity with age, as well as a correlation with the level of education of the study subjects. A high proportion of people who do not engage in recreational physical exercise is also observed.

According to the results of the above-mentioned European Social Survey, conducted at the turn of 2023 and 2024, 34.7% of Poles aged 15 or over (36.5% of women and 32.7% of men) declared that in the week before the survey, they had not spent even 30 minutes practising sports or other forms of physical activity (including brisk walking)12. The share of inactive people increased with age; among the youngest Poles (below the age of 24), nearly one in five (19.6%) were inactive, and among the oldest respondents (aged 65 or over), nearly half (48.7%). The share of individuals who did not undertake any exercises consistently depended on the level of education, with percentages of 45.1%, 35.5%, and 23.0% for lower secondary, secondary, and above secondary education levels, respectively.

Based on the "Health of Adults" study by Statistics Poland in 2022, carried out as a module of the EU Statistics on Income and Living Conditions (EU-SILC), 23.6% of Poles aged 16 or over (23.1% of men and 24.0% women) do not engage in sports or recreational non-work-related physical activities (lasting at least 10 minutes and causing at least a slight increase in breathing or heart rate)13. Their share in the population steadily decreases depending on the level of education, and it is 36.2% among those with lower secondary education or below, 33.0% with basic vocational education, 20.5% with secondary education and only 9.7% with higher education.

The WHO recommends at least 150 minutes per week of moderate-intensity or 75 minutes of high-intensity exercises (or a roughly equivalent combination of both15) for adults to stay healthy. The health and risk factors study,

[15] WHO guidelines on physical activity and sedentary behaviour: at a glance. Geneva: World Health Organisation; 2020. Licence: CC BY-NC-SA 3.0 IGO.

conducted by the National Institute of Public Health NIH – National Research Institute in February 2025, determined the amount of time per week in the spring or autumn season that Poles devoted to activities (gymnastics, brisk walking, running, cycling, swimming, gym, sports, etc.) recommended for recreational purposes (not related to work or travel to work). 42.3% of Poles (43.2% of men and 41.6% of women) exercise for at least 10 minutes without a break. On average, they devote 200 minutes per week to such activities, or nearly 30 minutes per day.

These results indicate that more than half of Poles (57.7%, including 56.8% of men and 58.4% of women) aged 20 or older do not regularly engage in recreational physical exercise for at least 10 minutes a week. The higher percentage of inactive women is due to differences in the age structure of gender subpopulations - women are generally older than men. After age standardisation, the percentages become almost equal, amounting to 57.7% for men and 57.8% for women. The results are considerably less favourable than those obtained in the studies presented above but apply to slightly older people (aged 20 or more).

Departing from the requirement of at least moderate effort and including people who limit their physical activities to walking into the group engaged in exercise reduces the share of inactive individuals to 27.3% (28.5% among men and 26.2% among women, and after standardisation for age to 28.8% and 26.2%, respectively).

At the same time, the WHO recommendations, which include not only the intensity of exercises but also the minimum amount of exercise time per week, are met by 30.6% of men and 27.9% of women (including cycling for transport purposes as a form of recreational exercise). After standardising the frequencies by age, the male advantage decreases to 29.9% vs 28.3%.

The frequency of undertaking at least moderate-intensity exercises decreases with age (Fig. 13.13). 46.3% of those aged 20-39 and 73.8% of those aged 75-year-olds or older are inactive in this respect. 41.0% of the youngest and 14.5% of the oldest Poles report fulfilling the WHO recommendations. In the 20-39 age group, men exercise more often than women – the shares of inactive are 44.2% compared to 48.4%, and meeting the WHO recommendations: 42.8% vs 39.3%. In the 40-59 age group, the share of inactive individuals of both genders is similar (55.9% vs 56.9%). However, men spend more time practising physical activity and more frequently fulfil the WHO recommendations (31.5% vs 28.4%). Among Poles over the age of 60, women exercise more often and longer than men, with an evident difference in the 60-74 age group, where percentages of physically inactive individuals are 70.9% for men and 65.3% for women.

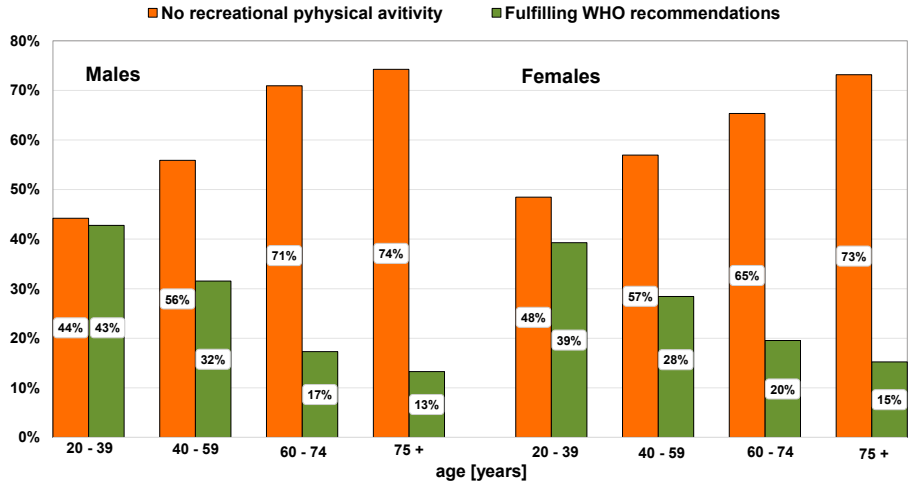


Fig. 13.13. Physical activity of Poles aged 20 or more by gender and age in 2025 – share of those not undertaking recreational physical exercises and meeting the WHO recommendations related to the length of physical activities (values rounded to 1%) (the National Institute of Public Health NIH – National Research Institute data)

The engagement in recreational exercises of both genders increases with the level of education (Fig. 13.14). The range of values of the compared indicators is very significant. Men with higher education fulfil the WHO recommendations 2.4 times more frequently than those with primary education (37.1% vs 15.4%), and women even 3.6 times (36.0% vs 9.9%). Recreational exercises are not undertaken at all by 78.7% of men with primary education and 47.6% with higher education. For women, these values are 84.2% and 48.3%, respectively. The foregoing results only to a small extent from differences in the age structure of the groups under study (older people are less educated - according to Statistics Poland data, based on the results of the 2021 National Population and Housing Census, among Poles aged 70 or over, 32.0% had primary education and 13.3% had higher education, while for those aged 25-39, the values were 3.3% and 45.1%, respectively). After age-standardising the percentages, the values for the different levels of education still vary considerably. The percentages of inactive people are, in increasing order of education level (i.e. lower secondary school or below, basic vocational education, secondary education and higher education): 77.2%, 67.2%, 55.3%, and 49.1% for men and 85.2%, 63.79%, 60.1%, and 51.0% for women. Similarly, the shares of those meeting the WHO recommendations are 14.8%, 19.6%, 33.1%, and 36.5% for men and 11.6%, 20.1%, 27.5%, and 34.6% for women.

Among the study subjects with higher education and basic vocational education, both physical activity indicators have similar values for men and women

(Fig. 13.14). In the other education categories, men are more active. Among those with secondary education, the share of men who do not exercise is 5.2 pp lower, and the share of meeting the WHO recommendations is 6.2 pp higher than for women. Regarding the group of lower secondary education or below, the analogous differences are 5.5 pp for both indicators.

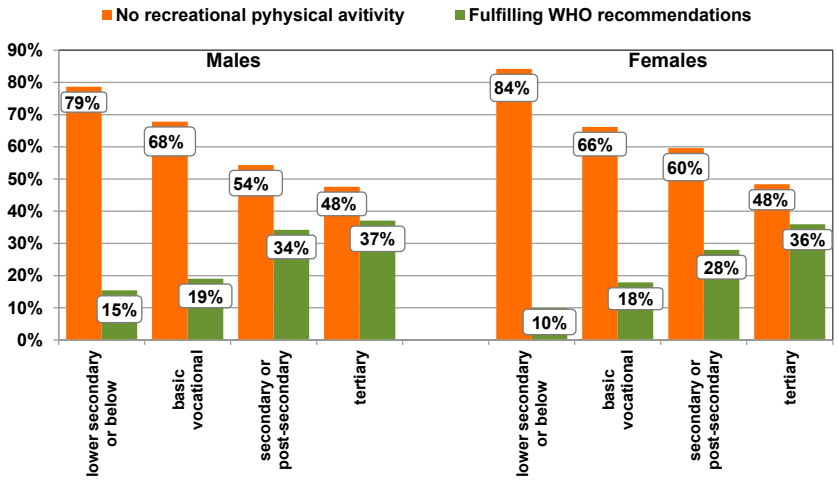


Fig. 13.14. Physical activity of Poles aged 20 or over by gender and education level in 2025 – share of those not undertaking recreational physical exercises and meeting the WHO recommendations related to the length of physical activities (values rounded to 1%) (NIZP PZH – PIB data)

The physical activity of Poles also correlates with their material situation. Individuals from households with a consistent or frequent lack of money for food, clothing, or housing fees were significantly less likely than others to engage in recreational activities (percentages of inactive: 64.4% vs 55.1%). They are also less likely to meet the WHO recommendations (23.8 vs 31.2%), even considering only those who exercise (66.7% vs 69.5%). The differences are slightly greater when the age structure of the compared groups is taken into account. After standardisation, the percentage of those not engaging in physical exercise is 67.6% vs 54.4%, and that of those following the recommendations is 21.8% vs 33.7%. Representatives of both genders in a difficult financial situation are equally likely to give up physical activity – 64.3% of men and 64.4% of women (after standardisation, 65.0% vs 63.9%, respectively) and meet the WHO recommendations – 24.1% vs 23.7% (after standardisation – 23.7% vs 23.9%). Among the better-off respondents, men were slightly more active than women (the percentage of those not undertaking physical activities is 56.0% vs 54.2%, and that of those fulfilling the

recommendations is 32.9% and 29.6%). However, after eliminating differences in the age structure of the compared subpopulations, this effect disappears for the first indicator (after standardisation: 55.3% vs 55.2%) and decreases significantly for the second one (32.0% vs 30.2%).

Rural residents exercise slightly less frequently than urban residents (the percentage of those not undertaking physical exercises is 58.9% vs 56.6%). This phenomenon is more noticeable in women, with 60.2% of rural and 57.0% of urban residents being inactive, whereas the differences are smaller for men (57.5% vs 56.3%). For both genders, this difference becomes more pronounced after accounting for the age structure of the compared groups (age-standardised coefficients differ by 4.3 pp for women (60.6% vs 56.3%) and 2.8 pp for men (59.2% vs 56.4%). The physical activity level of both genders living in cities is therefore very similar; in rural areas, women exercise less often than men, which is, however, partly due to the age structure of the groups. The percentage of rural and urban residents meeting the WHO recommendations is similar (for the total population, 29.7% vs 28.7%; the "urban-rural" differences in gender-specific coefficients do not exceed 1.1 pp). Regardless of place of residence, men are more likely than women to meet the recommendations (30.3% vs 27.4% in urban and 31.0% vs 28.5% in rural areas).

Information on the physical activity of Polish pupils is provided by the *Health Behaviour in School-aged Children Survey (HBSC)*, conducted every 4 years.[16][17][18][19][20] It analyses the percentage of children aged 11-16 who maintain the level of activity recommended by the WHO for preserving good health and supporting proper development (i.e., 60 minutes of moderate to high-intensity exercise every day). In 2022, 19% to 29% of boys and 12% to 27% of girls met those recommendations, depending on age (Fig. 13.15).

[16] Instytut Matki i Dziecka (2007). Zdrowie subiektywne, styl życia i środowisko psychospołeczne młodzieży szkolnej w Polsce. Raport techniczny z badań HBSC w Polsce w 2006 r. Eds.: Mazur J, Woynarowska B, Kołoło H, Warszawa

[17] Instytut Matki i Dziecka (2011). Wyniki badań HBSC 2010. Raport techniczny. Eds.: Mazur J, Małkowska-Szkutnik A, Warszawa

[18] Instytut Matki i Dziecka (2015). Zdrowie i zachowania zdrowotne młodzieży szkolnej w Polsce na tle wybranych uwarunkowań socjodemograficznych. Wyniki Badań HBSC 2010. Ed.: Mazur J, Warszawa

[19] Instytut Matki i Dziecka (2018). Zdrowie uczniów w 2018 roku na tle nowego modelu badań HBSC. Eds.: Mazur J, Małkowska-Szkutnik A, Warszawa

[20] Rakić J G et al. (2024). A focus on adolescent physical activity, eating behaviours, weight status and body image in Europe, Central Asia and Canada: Health Behaviour in School-aged Children international report from the 2021/2022 survey. Volume 4. WHO. Regional Office for Europe, Copenhagen License: CC BY-NC-SA 3.0 IGO

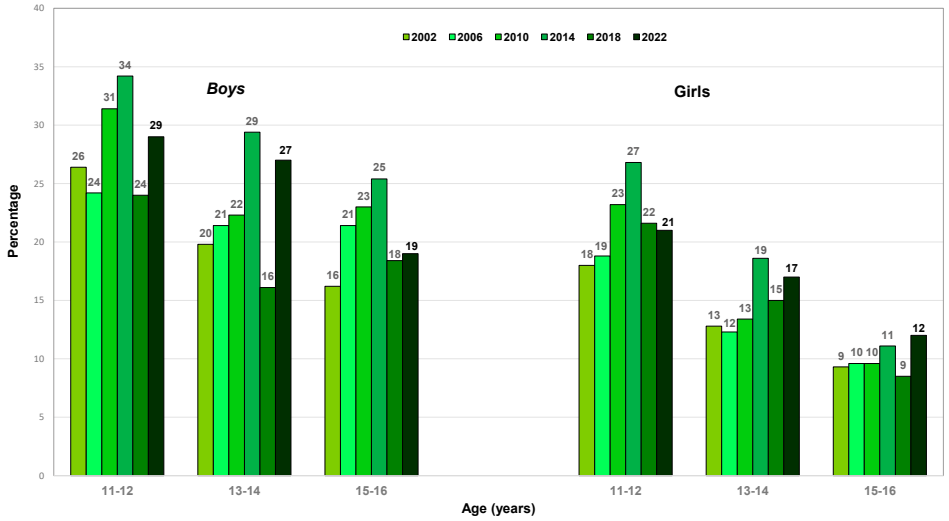


Fig. 13.15. Percentage of school-aged children meeting the daily physical activity recommendations in 2002, 2006, 2010, 2014, 2018, and 2022 by age and gender (source: HBSC survey)

The long-term upward trend in this indicator broke down for all age categories in 2018. In 2022, the situation improved compared to the previous survey, except for the youngest girls' group, where the downward trend continued. However, youth activity did not exceed the 2014 level – the only exception was the group of the oldest girls (15-16 years old), characterised by very low activity levels and their slight fluctuations (in the 21st century, the figures fluctuated between 9% and 12%, reaching a maximum in 2024).

The basic trends observed for many years have not changed: in all categories analysed, boys are more active than girls, and for both genders, the percentage of pupils meeting the WHO recommendations decreases with age. Individual adolescents are becoming less active over time. Thus, 19% of 15-16-year-old boys exercise at the recommended level, while it was 24% in 2018 (for 11-12-year-olds). This effect is even stronger among girls – in the group of 15-16-year-olds, the share of physically active female students decreased from 22% (a level similar to that of boys) to 12% over four years.

14. EATING HABITS OF POLES
14A. EATING HABITS OF CHILDREN AND YOUTH IN POLAND

Anna Dzielska, Anna Liber, Anna Fijałkowska

Proper nutrition is fundamental to the health of a child and affects the risk of developing diseases in later stages of life. The eating habits and nutrition of children are closely related to the processes of growth and maturation, and an improper diet may lead to long-term health consequences. Nutrition is particularly important during the first years of life, when the child's psychomotor development is intensive and the immune system matures. The period from conception until the age of 2, known as "the first 1,000 days", is the time when the body is particularly sensitive to environmental factors, including nutrition. That period is the so-called "opportunity window" for metabolic programming, and inappropriate nutrition may lead to metabolic disorders and an increased risk of cardiovascular diseases at a later age.[1] The first years of a child's life are also critical for the development of the gut microbiome, which plays an important role in the maturation of the immune system and influences the child's overall health. The gut microbiota is subject to dynamic changes during that stage, depending on, e.g., the diet. Disturbances of its balance in early life may lead to long-term health consequences, including the development of autoimmune diseases, allergies and neurodevelopmental disorders.[2]

The importance of proper nutrition does not diminish with the age of a child and consecutive stages of development – from preschool age, through early school period, to adolescence – also require adequate coverage of the demand for

[1] Williams TC, Drake AJ. What a general paediatrician needs to know about early life programming. Arch Dis Child. 2015 Nov;100(11):1058-63. doi: 10.1136/archdischild-2014-307958. Epub 2015 May 19. PMID: 25990501.

[2] Cukrowska B, Znaczenie programowania mikrobiotycznego w rozwoju przewlekłych chorób nieinfekcyjnych—Standardy Medyczne. (n.d.). Znaczenie programowania mikrobiotycznego w rozwoju przewlekłych chorób nieinfekcyjnych – Standardy medyczne. https://www.standardy.pl/artykuly/id/1203

energy and nutrients. In that context, the nutritional status of children and adolescents becomes an important indicator of population health. Regular anthropometric measurements, including calculation of body mass index (BMI) taking into account percentile charts, allow monitoring of physical development, identifying malnutrition, overweight and obesity, as well as assessing the risk of future metabolic disorders.[3]

The increasing prevalence of overweight and obesity in children and youth is currently one of the greatest public health challenges.[4] Child obesity is associated with a range of serious metabolic, cardiovascular, orthopaedic and psychosocial consequences. Overweight children are at greater risk of depression, social stigma, self-esteem issues and eating disorders later on. Moreover, a high percentage of obese children maintain excess body weight in adulthood, as confirmed by the results of long-term studies.[5]

In nutritional recommendations for children and adolescents, both national and international, the need for a balanced diet while limiting the intake of simple sugars and trans fats is clearly emphasised.[6] Meal regularity, especially not skipping breakfast, is important in the prevention of overweight and obesity.

The purpose of this chapter is to comprehensively analyse the eating habits and nutritional status of children and youth in Poland – from infants, through young children and pupils in the lower grades of primary school, to students of older school age – based on available population data, research findings and national and international guidelines. Special attention is given to identifying current nutrition-related health problems and opportunities for their prevention.

[3] Świąder-Leśniak, A., Majcher, A., Pyrżak, B., Dziechciarz, P., & Department of Paediatrics, Medical University of Warsaw, Warsaw, Poland. (2020). Consensus on the principles of physical development monitoring in children, possible or not? Pediatria i Medycyna Rodzinna, 16(3), 268–274. https://doi.org/10.15557/PiMR.2020.0049

[4] Buoncristiano, M., Spinelli, A., Williams, J., Nardone, P., Rito, A. I., García-Solano, M., Grøholt, E. K., Gutiérrez-González, E., Klepp, K. I., Starc, G., Petrauskienė, A., Kunešová, M., Hassapidou, M., Pérez-Farinós, N., Pudule, I., Kelleher, C. C., Duleva, V., Rakovac, I., Chatterjee, S., & Breda, J. (2021). Childhood overweight and obesity in Europe: Changes from 2007 to 2017. Obesity Reviews: An Official Journal of the International Association for the Study of Obesity, 22 Suppl 6, e13226. https://doi.org/10.1111/obr.13226

[5] Simmonds, M., Llewellyn, A., Owen, C. G., & Woolacott, N. (2016). Predicting adult obesity from childhood obesity: A systematic review and meta-analysis. Obesity Reviews: An Official Journal of the International Association for the Study of Obesity, 17(2), 95–107. https://doi.org/10.1111/obr.12334

[6] https://www.who.int/news-room/fact-sheets/detail/healthy-diet?

Neonatal Nutrition

Based on the Nationwide Polish Hospital Morbidity Study (Polish: OBChSO), detailed in Chapter 4, 'Hospitalised Morbidity in Poland', data were collected on neonatal feeding practices during childbirth-related hospitalisations. Three neonatal feeding methods were identified:

- Exclusive breastfeeding or feeding with expressed breast milk,
- Mixed feeding,
- Formula feeding.

The data were further classified according to the mode of delivery (as recorded on the MZ/Szp-11 form, a national hospital birth reporting form) using the relevant ICD-10 codes. Three types of delivery were identified:

- Vaginal delivery – code O80 (singleton births) and O84.0 (multiple pregnancies),
- Caesarean section – code O82 (singleton births) and O84.2 (multiple pregnancies),
- Other delivery methods (e.g. assisted with forceps or vacuum extraction) – remaining codes from the O80-O84 group.

Vaginal and caesarean deliveries collectively accounted for more than 98% of all deliveries in each year analysed.

The analysis included infants for whom complete information on gestational age at birth, feeding method and mode of delivery was available. The proportion of missing data between 2020 and 2023 was similar, ranging from 10.8% in 2022 to 13.6% in 2023. Ultimately, 87.7% of neonates recorded in the OBChSO were included in the analysis.

In all years analysed, the proportion of infants exclusively breastfed was lower following caesarean delivery compared with vaginal delivery. This trend was observed both in preterm infants (e.g. in 2023: 45.2% vs. 60.4%) and term infants (55.3% vs. 70.6%).

A gradual decline in the proportion of infants exclusively breastfed was observed in both preterm and term groups. The decline was more pronounced among term infants, particularly following vaginal delivery (from 76.7% in 2020 to 70.6% in 2023).

Between 2021 and 2023, a gradual increase was observed in the proportion of infants receiving mixed feeding. Among term neonates delivered vaginally, this proportion rose from 23.3% in 2021 to 27.1% in 2023 and among those delivered by caesarean section from 37.3% to 41.1%. A similar trend was noted in preterm infants: in vaginal deliveries, mixed feeding increased from 29.4% to 34.9% and in caesarean deliveries from 42.9% to 48.2%.

The proportion of infants receiving formula feeding between 2021 and 2023 remained relatively low and fairly stable. In 2023, among term neonates, formula feeding was recorded in 2.3% of those delivered vaginally and in 3.6% of those delivered by caesarean section. Among preterm infants, 4.7% delivered vaginally and 6.6% delivered by caesarean section were formula-fed.

Table 14a.1 presents the number of neonates included in the analyses in 2020-2023, stratified by gestational age at birth (term and preterm), mode of delivery (vaginal delivery, caesarean section, other) and feeding method (exclusive breastfeeding or feeding with expressed breast milk, mixed feeding, formula feeding).

Table 14a.1. Number of neonates included in the analyses, by gestational age at birth, mode of delivery and feeding method, 2020-2023

	Year			
	2020	2021	2022	2023
Number of neonates included in the analyses	274 645	284 489	249 708	223 788
Gestational age at birth				
Term infant	254 432	262 135	229 407	206 414
Preterm infant	20 213	22 354	20 301	17 374
Mode of delivery				
Vaginal delivery	144 189	145 046	126 199	110 859
Caesarean section	126 084	134 996	119 369	109 241
Other	4 372	4 447	4 140	3 688
Feeding methods				
Exclusive breastfeeding or feeding with expressed breast milk	186 952	190 021	160 173	139 195
Mixed feeding	80 737	86 945	82 205	77 527
Formula feeding	6 956	7 523	7 330	7 066

Source: Calculations based on the OBChSO study

Table 14a.2 presents the proportion of neonates who were exclusively breastfed or fed expressed breast milk, received mixed feeding or were formula-fed, according to mode of delivery (vaginal delivery, caesarean section, other delivery methods) and gestational age at birth (term and preterm infants) between 2020 and 2023.

Data from 2020 to 2023 indicate a gradual decline in the proportion of neonates exclusively breastfed, particularly among term infants delivered vaginally. At the same time, the prevalence of mixed feeding increased in both preterm and term infants, especially following caesarean section. The proportion of formula-fed infants remained low and relatively stable across all groups analysed.

Table 14a.2. Proportion of neonates exclusively breastfed or fed expressed breast milk, receiving mixed feeding or formula-fed, by mode of delivery between 2020 and 2023

Year/ Mode of delivery/ Feeding method	Exclusive breastfeeding or feeding with expressed breast milk			Mixed feeding			Formula feeding		
	Vaginal delivery	Caesarean section	Other	Vaginal delivery	Caesarean section	Other	Vaginal delivery	Caesarean section	Other
Preterm infants									
2020	66.1	48.5	63.2	29.5	44.8	31.0	4.5	6.7	5.9
2021	66.5	50.0	63.2	29.4	42.9	35.7	4.2	7.1	1.2
2022	65.6	47.1	64.3	30.5	46.1	34.7	3.9	6.8	1.0
2023	60.4	45.2	63.0	34.9	48.2	31.5	4.7	6.6	5.4
Term infants									
2020	76.7	60.1	66.0	21.7	36.9	32.2	1.6	3.1	1.8
2021	75.1	59.6	62.3	23.3	37.3	36.1	1.7	3.2	1.6
2022	72.6	56.8	62.6	25.5	39.7	35.5	2.0	3.5	1.9
2023	70.6	55.3	61.9	27.1	41.1	35.7	2.3	3.6	2.4

Source: Own calculations based on the OBChSO study

Enhancing prenatal education on the benefits of breastfeeding for both mother and child is strongly recommended. It is equally important to strengthen lactation support in maternity wards, particularly for mothers of preterm infants and those who have undergone caesarean section. Education on the advantages of breastfeeding should begin during pregnancy through midwife-led prenatal classes and continue during postnatal home visits, during which the midwife encourages breastfeeding, provides lactation counselling and assists in resolving breastfeeding-related challenges. Midwives should provide ongoing maternal care, encompassing breastfeeding support and lactation counselling, for as long as the mother requires it.

Children aged 5-36 months

In 2006, in the Institute of Mother and Child in Warsaw, under the supervision of prof. dr hab. Halina Weker, the PITNUTS 2016 study was conducted to comprehensively assess the diet and nutritional status of children aged 5 to

36 months.[7] 450 infants (5-12 months) and 600 young children (13-36 months) were included in the study. The selection of participants ensured that the results were representative of the population of children in Poland. Only healthy children, not on elimination diets, were qualified for the study, and the respondents were parents or carers. Diet was assessed using a food frequency questionnaire (FFQ) and a 3-day food diary. The diet analysis was conducted using the Diet 5.0 programme, with portion sizes determined using the Food and Nutrition Photo Album. The results were compared with the nutritional standards for children.[8]

The nutritional status was assessed based on the child's weight and length or height, using the weight-for-height z-score according to the WHO standards (2006). The classification of nutritional status was based on the following ranges: severe underweight (<-3 SD), underweight (-3 to -2 SD), normal weight (-2 to +1 SD), at risk of overweight (+1 to +2 SD), overweight (>+2 SD), obese (>+3 SD).

Infant nutrition

Breastfeeding is considered the gold standard for infant nutrition in the first six months of life. The World Health Organisation recommends exclusive breastfeeding during the first six months of a baby's life, and then continuing it alongside the introduction of complementary foods – for as long as the mother and baby need it. Breastfeeding has numerous benefits for both baby and mother. For the baby, it is the best source of nutrients, it supports the development of the immune system and reduces the risk of many infectious diseases of childhood – especially respiratory and gastrointestinal disorders. For mothers, breastfeeding contributes to a reduction in the risk of postpartum bleeding as well as breast and ovarian cancers, and also helps to return to a healthy body weight after the delivery.[9]

[7] Weker H (ed.). (2017). STUDY REPORT. COMPREHENSIVE EVALUATION OF FEEDING PRACTICES IN CHILDREN AGED 5 TO 36 MONTHS, POLISH NATIONWIDE STUDY 2016. PITNUTS 2016, Fundacja Nutricia, Instytut Matki I Dziecka. QZPYyktd2kh7JJW6yjHm.pdf.
[8] Jarosz, M., & Jarosz, M. (2012). Normy żywienia dla populacji polskiej—Nowelizacja. Instytut Żywności i Żywienia.
[9] Szajewska H., Horvath A., Rybak A., Socha P.: Karmienie piersią. Stanowisko Polskiego Towarzystwa Gastroenterologii, Hepatologii i Żywienia Dzieci. Standardy Medyczne. Pediatria 2016; 13: 9-24

Retrospective data obtained from a survey conducted among the parents/carers of children participating in the 2016 PITNUTS study showed that 54.1% of infants were breastfed for at least 6 months, but only 5.9% were exclusively breastfed. Breastfeeding for less than 6 months was declared in the case of 39.7% of infants, while 6.2% of newborns were never breastfed.

The above data underline the need to promote breastfeeding as the most beneficial way of feeding infants and small children, with emphasis on the health benefits not only for children but also for mothers.

Introducing complementary foods is another important element of infant nutrition. Sadly, almost 61.1 % of infants received such food too early, i.e. before the 5th month of life. Only 30.2 % of infants received their first complementary food as recommended, i.e. between 17 and 26 weeks of life. Approximately 30 % of infants aged 4 months received fruit or vegetable puree, 24.8 % gluten-free gruel and porridge, 21 % fruit juice and 11.4 % porridge with gluten.

The presence of biscuits and sponge cakes in the diet of the youngest children is noteworthy. They were fed to 6.7% of infants in their 4th month of life, 53.1% of children in their 7th-8th month of life and as many as 86.7% of babies aged 10-12 months. Such a diet favours the development of a preference for sweet tastes, which at a later stage of life can make it difficult to accept foods with a less attractive taste, such as vegetables, meat, fish or eggs.

The lack of fish in the diet of infants is also worrying, which is a valuable food being a source of high-quality, easily digestible protein, long-chain omega-3 fatty acids (EPA and DHA), iodine, selenium, B vitamins (especially B12) and vitamin D.

Analysis of the implementation of dietary standards in non-breastfed infants showed too low fat supply, which was the case in as many as 95% of babies aged 5–12 months. In 34% of infants, adequate energy coverage from the diet was also not provided. Such deficiencies may lead to impaired growth.

The infant diets were also deficient in iodine – insufficient intake of that element was found in 82% of babies.

Vitamin D deficiency in the diet was found in 75% of children, but the difficulty of meeting the demand for that nutrient solely from food is well known, which is why routine vitamin D supplementation is recommended throughout the first year of life.

The diet of every fourth non-breastfed infant was deficient in iron – the key element for the proper formation of red blood cells and the functioning of the

nervous system. Iron deficiency may lead to the development of anaemia and may also adversely affect the pace of the child's development.

Nutrition of children aged 13-36 months

Among the children included in the study, 10% were still breastfed. However, in this group, there was an insufficient consumption of basic product groups: milk and fermented milk drinks in 88% of children, vegetables in 87.9%, fruit in 74.3% and fish in 77.5%, vegetable oil in 71.7%. Such deficiencies may result in incomplete coverage of the demand for nutrients necessary for proper development.

The diets of children aged 13-36 months, similar to infants, were characterised by a deficiency in fat – 58.7% of the study participants, including in particular long-chain polyunsaturated fatty acids (LCPUFA), the deficiency of which was noted in as many as 99% of children. At the same time, excessive protein consumption was demonstrated – the median daily intake was 40 g, which significantly exceeds the nutritional standards for that age group, i.e. 12 g. Excessive protein supply in early childhood may increase the risk of developing overweight and obesity later in life.

Calcium deficiency was reported in 42.3% of the children, which was mainly due to insufficient consumption of dairy products. Iodine deficiency was found in 27% of the children, which was associated with low fish consumption. In 59% of the children, too low intake of vitamin E was observed, and in 20.8% – folate, which was a consequence of insufficient amounts of vegetables in the diet.

As many as 90% of the children consumed too much salt, and 80% had too much sugar in their diet. Such a dietary pattern may favour the formation of poor eating habits and increase the risk of metabolic disorders and hypertension.

Nutritional status assessment

A proper nutritional status was the case in 67.6% of infants, while in the group of children aged 13-36 months, the share was 67.8%. The results indicate that approximately two-thirds of children aged 5 to 36 months received proper nutrition. Among the infants, weight deficiency was found in 9.4%, while severe weight deficiency was reported in 5.1% of children in this group. Overall, weight deficiency

was the case in 14.5% of infants aged 5-12 months. In the group of children aged 13-36 months, reduced body weight was observed in 2.3% of the study subjects and severe deficiency in 1.8%. In total, weight deficiency was observed in 4.1% of children in this age category. In the infant group, excessive weight was noticed in 2.9% of the study subjects, while obesity was reported in 1.3%. Possible risk of becoming overweight was observed in 13.7% of the infants, which means that 17.9% of the children aged 5-12 months were overweight or at such risk. Among children aged 13-36 months, the risk of becoming overweight was observed in 18.4% of the study subjects. 6.9% of the children were overweight and obesity was the issue in 2.8% of the infants under study, meaning that the problem of excess body weight or such a risk concerned 28.1% of children in this age group. The problem of inadequate weight gain was more common among infants aged 5-12 months, while excessive nutrition was the case in children aged 2-3 years.

It is worth emphasising that poor nutritional status was found in one-third of the children participating in the study. Both under- and over-nutrition can lead to serious health consequences, such as reduced immunity, increased susceptibility to infections, impaired cognitive function and delayed psychomotor development. Nutritional disorders in early childhood can have long-term health consequences that manifest later in life, including adulthood. These include an increased risk of obesity, type 2 diabetes, cardiovascular diseases and osteoporosis, inter alia. The study results highlight the need for early nutrition standards implementation, individualisation of recommendations in children with poor nutritional status and systematic monitoring of nutritional status, especially in the youngest child population.

Early school-age children

The data on children aged 7-9 is obtained from the European Childhood Obesity Surveillance Initiative (COSI WHO) programme, implemented in the school year 2022/2023 as part of the 2021-2025 National Health Programme.[10] The study included 6,464 pupils in grades I-III from 127 randomly selected primary schools; data concerning 6,383 children with a complete set of anthropometric measurements and the data necessary to assess nutritional status was analysed.

[10] Fijałkowska, A., & Dzielska, A. (2024). ZDROWIE DZIECI WE WCZESNYM WIEKU SZKOLNYM. Instytut Matki i Dziecka, Warszawa.

Nutritional status was assessed based on BMI (according to WHO 2007) [11,12] and waist and hip circumference (OLAF standards).[13] Overweight was diagnosed at BMI ≥+1 SD, obesity at >+2 SD and underweight at <-1 SD. A waist circumference of ≥90th percentile was considered to increase the risk of cardiovascular disease.[14]

The frequency of consumption of selected foods (fruit, vegetables, dairy, meat, processed foods, sweetened beverages) was assessed, as well as the habit of breakfast consumption, shared meals and eating while using screen devices - based on parents' responses.

Fruit and vegetable consumption

The analysis of the frequency of fruit consumption shows that children at the age of 7-9 reach for fruit with fairly high regularity, although there are significant gender- and age-dependent differences. Girls are more likely than boys to eat fruit every day or more often. Among 7-year-old girls, 49.1% declared daily fruit consumption (total responses of "once a day" and "more often than once a day"), while in the case of boys of the same age, it was 43.1%. Among 9-year-olds, the difference is also noticed, 45.8% of girls vs 41.8% of boys. It is noteworthy that the percentage of boys consuming fruit daily decreases with age, while for girls it remains at a similar level. This may indicate differences in developing eating habits and the potential influence of environmental factors, e.g. family dietary patterns, which are more stable in girls.

In the case of vegetables, the findings were similar, though slightly more varied. Girls of all ages are more likely to report daily consumption of vegetables

[11] Childhood Obesity Surveillance Initiative (COSI), Protocol, October 2016, World Health Organisation 2017. Childhood Obesity Surveillance Initiative (COSI), Protocol, October 2016, World Health Organisation 2017, http://www.euro.who.int/data/assets/pdf_file/0018/333900/COSI-protocol-en.pdf.

[12] Blössner M et al. WHO Anthro Plus for personal computers manual: software for assessing growth of the world's children and adolescents. Geneva, World Health Organisation 2009 (http://www.who.int/entity/growthref/tools/who_anthroplus_manual.pdf).

[13] Świąder-Leśniak A, Kułaga Z, Grajda A, Gurzkowska B, Góźdź M, Wojtyło M, Różdżyńska-Świątkowska A, Litwin M, Wartości referencyjne obwodu talii i bioder polskich dzieci i młodzieży w wieku 3-18 lat, Standardy Medyczne/Pediatria 2015, vol. 12: 137-150.

[14] The IDF consensus definition of the Metabolic Syndrome in children and adolescents, International Diabetes Federation 2007.

(once a day or more often), and the gender differences are more noticeable than for fruit. Among 9-year-old girls, 38.3% of the respondents declared daily vegetable consumption, compared to 35.9% of boys. Vegetable consumption at the "most days of the week" level (4–6 days) increases with age in both boys and girls, which may indicate the development of more regular dietary patterns with adolescence. However, it is worth noting that in each age group, the share of children who do not eat vegetables at all or very rarely (less often than once a week), although low, still exists, ranging from 6% to 9%, with it being slightly higher among boys.

Table 14a.1. Frequency of fruit and vegetable consumption by gender and age

	Gender	boys						girls					
	Age	7 years of age		8 years of age		9 years of age		7 years of age		8 years of age		9 years of age	
		N	%	N	%	N	%	N	%	N	%	N	%
Fruit	Never	6	1.4	19	1.6	14	1.5	4	0.8	15	1.2	12	1.2
	Less often than once a week	15	3.6	50	4.3	41	4.5	11	2.3	36	2.8	34	3.5
	Several times a week (1-3 days)	100	24.0	268	22.9	218	23.9	101	21.2	277	21.3	207	21.5
	Most days of the week (4-6 days)	116	27.8	301	25.7	259	28.3	127	26.6	382	29.4	269	27.9
	Once a day	89	21.3	284	24.2	227	24.8	113	23.7	299	23.0	253	26.2
	More often than once a day	91	21.8	250	21.3	155	17.0	121	25.4	291	22.4	189	19.6
Vegetables	Never	5	1.2	25	2.1	20	2.2	8	1.7	9	0.7	16	1.7
	Less often than once a week	26	6.3	71	6.1	64	7.1	32	6.7	55	4.2	42	4.4
	Several times a week (1-3 days)	126	30.3	297	25.4	229	25.3	119	25.0	331	25.5	232	24.3
	Most days of the week (4-6 days)	102	24.5	327	28.0	266	29.4	130	27.3	401	30.9	299	31.3
	Once a day	92	22.1	276	23.7	199	22.0	106	22.3	298	23.0	213	22.3
	More often than once a day	65	15.6	171	14.7	126	13.9	81	17.0	204	15.7	153	16.0

Protein products: meat, fish, eggs and pulses

Meat is the most regularly consumed group of protein products among all the considered groups. More than 75% of children, irrespective of gender and age, report consuming meat at least several times a week. In boys, the pattern of frequent meat consumption is dominant, with as many as 78% of 7-year-olds

consuming meat at least four times a week, and in 8- and 9-year-olds, the share is 75.8% and 74.8%, respectively. In girls, the values are lower, which may indicate a more varied diet or a lower preference for meat products. At the same time, however, a small percentage of children declare a complete lack of meat consumption – the values do not exceed 1.3% in the groups under study.

Fish, unlike meat, is consumed much less frequently. More than half of the children (approximately 55-60%) declared eating them less often than once a week, which suggests a low presence of fish in the diet of children in Poland. As regards fish, the answer "several times a week" was selected by approximately 26-29% of parents. Daily fish consumption was declared by less than 3% of the respondents. Small discrepancies between boys and girls confirm that low fish consumption is population-wide rather than selective. This may reflect barriers such as taste, availability or family preference.

Egg consumption also varies, with the dominant pattern being several times a week. The highest values are observed among girls - as many as 57.2% of 7-year-old girls and 53.9% of 9-year-old girls consume egg dishes 1-3 times a week. However, daily egg consumption remains low (approximately 5%), suggesting that although the presence of eggs in the diet is common, it is not the main product.

Legume consumption is significantly lower than that of other products being sources of protein. As many as 70-80% of children consume them very rarely (less often than once a week) or never. The highest percentage of complete lack of consumption is observed among boys, especially at the age of 7 (41.3%). As children get older, there is no clear change in the consumption of that group of products, which may indicate a persistent lack of legumes in the daily diet of children.

Consumption of milk and milk products

Semi-skimmed or skimmed milk is consumed more often than full-fat milk, with girls more likely than boys to choose such milk. 51.8% of girls at the age of 8 declared that they consumed semi-skimmed milk at least several times a week, while in the case of boys, it was 45%. Consumption of full-fat milk is lower and decreases with age, with 34.9% of 9-year-old boys not consuming it at all. A similar share is observed in girls (32.4%). It can be assumed that children switch from full-fat to semi-skimmed milk as they grow up, which may be due to dietary recommendations or changes in taste preferences.

Table 14a.2. Frequency of consumption of animal and vegetable products as sources of protein by gender and age

	Gender	boys						girls					
	Age	7 years of age		8 years of age		9 years of age		7 years of age		8 years of age		9 years of age	
		N	%	N	%	N	%	N	%	N	%	N	%
Meat	Never	1	0.2	15	1.3	10	1.1	3	0.6	9	0.7	8	0.8
	Less often than once a week	11	2.7	30	2.6	19	2.1	12	2.5	51	4.0	30	3.1
	Several times a week (1-3 days)	153	37.1	437	37.5	349	38.5	225	47.5	530	41.1	417	43.5
	Most days of the week (4-6 days)	163	39.6	442	37.9	348	38.4	155	32.7	471	36.5	339	35.4
	Once a day	74	18.0	168	14.4	130	14.3	55	11.6	169	13.1	131	13.7
	More often than once a day	10	2.4	74	6.3	51	5.6	24	5.1	59	4.6	33	3.4
Fish	Never	57	14.1	135	11.8	110	12.3	45	9.8	152	11.9	116	12.3
	Less often than once a week	217	53.6	646	56.4	492	55.0	278	60.3	743	58.4	527	56.1
	Several times a week (1-3 days)	104	25.7	319	27.9	258	28.8	123	26.7	325	25.6	254	27.0
	Most days of the week (4-6 days)	13	3.2	24	2.1	14	1.6	6	1.3	26	2.0	20	2.1
	Once a day	14	3.5	14	1.2	16	1.8	7	1.5	19	1.5	18	1.9
	More often than once a day	0	0.0	7	0.6	5	0.6	2	0.4	6	0.5	5	0.5
Egg dishes	Never	20	4.9	77	6.7	57	6.4	14	3.0	54	4.3	26	2.8
	Less often than once a week	104	25.3	249	21.7	192	21.5	102	22.0	304	24.1	238	25.4
	Several times a week (1-3 days)	205	49.9	614	53.6	473	52.9	265	57.2	657	52.0	505	53.9
	Most days of the week (4-6 days)	63	15.3	158	13.8	119	13.3	63	13.6	177	14.0	123	13.1
	Once a day	15	3.6	34	3.0	40	4.5	18	3.9	59	4.7	41	4.4
	More often than once a day	4	1.0	13	1.1	13	1.5	1	0.2	13	1.0	4	0.4
Legumes (e.g. beans, lentils)	Never	171	41.3	434	37.5	345	38.5	160	34.0	437	34.1	323	33.9
	Less often than once a week	183	44.2	553	47.8	409	45.7	233	49.5	641	50.0	444	46.5
	Several times a week (1-3 days)	49	11.8	139	12.0	109	12.2	60	12.7	158	12.3	152	15.9
	Most days of the week (4-6 days)	7	1.7	25	2.2	23	2.6	15	3.2	29	2.3	25	2.6
	Once a day	3	0.7	3	0.3	4	0.4	3	0.6	9	0.7	5	0.5
	More often than once a day	1	0.2	3	0.3	5	0.6	0	0.0	9	0.7	5	0.5

Consumption of milk products such as cheese remains stable. It is most often consumed "several times a week" – this was the response of approximately 39-41% of the parents of the children from all the groups. Daily consumption of cheese does not exceed 10%, and a total lack of consumption was declared by 7-10% of the children.

Milk desserts, yoghurts and other fermented products are much less popular, with as many as 65-72% of the children declaring that they do not consume them at all. Since they can be a valuable source of calcium and probiotics, their low share in the diet indicates the need for nutritional education of both children and their parents/carers.

Table 14a.3. Frequency of consumption of milk and milk products by gender and age

	Gender	boys						girls					
	Age	7 years of age		8 years of age		9 years of age		7 years of age		8 years of age		9 years of age	
		N	%	N	%	N	%	N	%	N	%	N	%
Semi-skimmed or skimmed milk	Never	59	14.8	173	15.1	137	15.7	63	13.8	147	11.8	107	11.6
	Less often than once a week	43	10.8	157	13.7	122	13.9	67	14.6	164	13.1	147	15.9
	Several times a week (1-3 days)	108	27.0	295	25.7	224	25.6	135	29.5	359	28.7	272	29.4
	Most days of the week (4-6 days)	91	22.8	219	19.1	182	20.8	73	15.9	286	22.9	202	21.8
	Once a day	72	18.0	221	19.3	159	18.2	95	20.7	215	17.2	152	16.4
	More often than once a day	27	6.8	82	7.1	51	5.8	25	5.5	78	6.2	45	4.9
Whole milk	Never	130	34.2	368	33.8	295	34.9	148	32.8	410	34.5	292	32.4
	Less often than once a week	83	21.8	234	21.5	186	22.0	112	24.8	305	25.7	216	24.0
	Several times a week (1-3 days)	65	17.1	209	19.2	165	19.5	83	18.4	195	16.4	173	19.2
	Most days of the week (4-6 days)	50	13.2	113	10.4	68	8.0	51	11.3	127	10.7	102	11.3
	Once a day	34	8.9	108	9.9	90	10.6	48	10.6	108	9.1	92	10.2
	More often than once a day	18	4.7	57	5.2	42	5.0	9	2.0	43	3.6	25	2.8
Cheese	Never	35	8.6	126	10.9	85	9.4	42	9.2	97	7.7	73	7.7
	Less often than once a week	86	21.2	219	19.0	147	16.3	94	20.5	232	18.4	175	18.5
	Several times a week (1-3 days)	155	38.3	401	34.7	356	39.5	179	39.1	523	41.6	372	39.4
	Most days of the week (4-6 days)	86	21.2	239	20.7	201	22.3	93	20.3	266	21.1	206	21.8
	Once a day	31	7.7	118	10.2	74	8.2	35	7.6	99	7.9	85	9.0
	More often than once a day	12	3.0	51	4.4	39	4.3	15	3.3	41	3.3	33	3.5

	Gender	boys						girls					
	Age	7 years of age		8 years of age		9 years of age		7 years of age		8 years of age		9 years of age	
		N	%	N	%	N	%	N	%	N	%	N	%
Flavoured milk	Never	12	2.9	60	5.2	45	5.0	13	2.8	34	2.7	26	2.7
	Less often than once a week	46	11.2	147	12.7	126	14.0	51	10.9	137	10.8	132	13.8
	Several times a week (1-3 days)	142	34.5	410	35.3	337	37.3	178	38.0	535	42.0	372	39.0
	Most days of the week (4-6 days)	118	28.7	310	26.7	224	24.8	124	26.5	343	26.9	240	25.1
	Once a day	70	17.0	173	14.9	133	14.7	77	16.5	180	14.1	155	16.2
	More often than once a day	23	5.6	60	5.2	38	4.2	25	5.3	44	3.5	30	3.1
Yoghurt, milk pudding, cream cheese, cottage cheese or other milk products	Never	255	65.1	750	67.3	600	68.7	327	71.9	846	68.6	629	67.9
	Less often than once a week	90	23.0	250	22.4	176	20.2	95	20.9	262	21.2	210	22.7
	Several times a week (1-3 days)	30	7.7	73	6.5	52	6.0	20	4.4	76	6.2	49	5.3
	Most days of the week (4-6 days)	7	1.8	20	1.8	19	2.2	7	1.5	27	2.2	22	2.4
	Once a day	7	1.8	12	1.1	15	1.7	5	1.1	15	1.2	12	1.3
	More often than once a day	3	0.8	10	0.9	11	1.3	1	0.2	7	0.6	4	0.4

Consumption of beverages other than water

Consumption of sweetened beverages is common among early school-aged children. More than 60% of the surveyed children reach for such products at least several times a week, and approximately 10% – every day. Boys are more likely than girls to drink beverages containing sugar daily or more often. 10.1% of boys at the age of 9 drink them more often than once a day, compared to 7.5% of girls. Parents of girls more often declare complete resignation of their children from such beverages – for example, in the group of 7-year-olds, it was as much as 10.9% vs 4.9% in the group of boys.

"Light" and diet drinks are rarely consumed. Over 60% of children do not drink them at all, and only 1-2% declare daily consumption. This is fairly good news from the point of view of children's nutrition, considering the controversy over the safety and negative health effects of sugar substitutes.

"100% juices", in turn, are more popular than sweetened or diet drinks. Approximately 35% of children reach for them several times a week, and 15-20% daily. Girls show more regularity in their consumption, especially the 9-year-old group, with daily consumption (once a day or more often) in the group at the level of 17.4% (vs 15.6% in boys).

Table 14a.4. Frequency of consumption of beverages other than water by gender and age

	Gender	boys						girls					
	Age	7 years of age		8 years of age		9 years of age		7 years of age		8 years of age		9 years of age	
		N	%	N	%	N	%	N	%	N	%	N	%
Beverages containing sugar	Never	20	4.9	73	6.3	52	5.8	51	10.9	78	6.0	66	6.9
	Less often than once a week	119	28.9	340	29.4	270	29.9	150	31.9	380	29.4	313	32.9
	Several times a week (1-3 days)	131	31.8	379	32.8	280	31.0	141	30.0	414	32.1	283	29.7
	Most days of the week (4-6 days)	54	13.1	122	10.5	105	11.6	41	8.7	149	11.5	97	10.2
	Once a day	51	12.4	135	11.7	104	11.5	55	11.7	154	11.9	122	12.8
	More often than once a day	37	9.0	108	9.3	91	10.1	32	6.8	116	9.0	71	7.5
Diet or "light" carbonated beverages	Never	250	60.5	700	60.4	519	58.1	318	67.4	833	65.3	601	62.9
	Less often than once a week	108	26.2	347	29.9	276	30.9	113	23.9	315	24.7	269	28.1
	Several times a week (1-3 days)	37	9.0	75	6.5	68	7.6	34	7.2	85	6.7	65	6.8
	Most days of the week (4-6 days)	8	1.9	14	1.2	14	1.6	6	1.3	18	1.4	11	1.2
	Once a day	6	1.5	17	1.5	10	1.1	1	0.2	16	1.3	5	0.5
	More often than once a day	4	1.0	6	0.5	6	0.7	0	0.0	8	0.6	5	0.5
100% fruit juice	Never	16	3.9	56	4.8	45	4.9	27	5.7	57	4.4	53	5.5
	Less often than once a week	118	28.4	339	29.0	241	26.3	157	33.1	380	29.4	266	27.8
	Several times a week (1-3 days)	132	31.8	406	34.7	329	36.0	152	32.1	451	34.9	335	35.0
	Most days of the week (4-6 days)	70	16.9	198	16.9	157	17.2	61	12.9	206	16.0	144	15.1
	Once a day	43	10.4	108	9.2	89	9.7	46	9.7	120	9.3	109	11.4
		36	8.7	63	5.4	54	5.9	31	6.5	77	6.0	49	5.1

Snack consumption

In terms of consumption of salty snacks such as crisps, popcorn or nuts, a relatively high share of moderate consumption is observed – more than half of children eat them once a week or less often. Daily consumption (once a day or more often) is low – approximately 2-3%, with no significant gender differences. This may be indicative of the existence of certain "reward" habits (e.g. consumption of snacks at weekends), but without the dominant presence of such products in the daily diet.

Sweet snacks are even more popular among children. Nearly half of the children in each age group consume them several times a week, and another

15-20% consume them daily. Girls are slightly more likely than boys to declare daily consumption (e.g. at age of 9: 10.6% of girls vs 6.8% of boys), which may indicate a greater attachment to sweet tastes. A very small proportion of children declare a complete lack of consumption of sweets – less than 3%.

Table 14a.5. Frequency of snack consumption by gender and age

	Gender	boys						girls					
	Age	7 years of age		8 years of age		9 years of age		7 years of age		8 years of age		9 years of age	
		N	%	N	%	N	%	N	%	N	%	N	%
Salty snacks (e.g. crisps, corn chips, popcorn, peanuts)	Never	27	6.5	65	5.6	54	6.0	31	6.5	74	5.8	62	6.5
	Less often than once a week	237	57.4	683	59.0	521	58.0	279	58.9	771	60.2	586	61.4
	Several times a week (1-3 days)	116	28.1	334	28.8	264	29.4	138	29.1	357	27.9	249	26.1
	Most days of the week (4-6 days)	16	3.9	43	3.7	40	4.5	17	3.6	45	3.5	34	3.6
	Once a day	12	2.9	21	1.8	10	1.1	8	1.7	25	2.0	16	1.7
	More often than once a day	5	1.2	12	1.0	9	1.0	1	0.2	9	0.7	7	0.7
Sweet snacks (e.g. cakes, biscuits, sweet desserts)	Never	4	1.0	18	1.5	29	3.2	11	2.3	22	1.7	21	2.2
	Less often than once a week	98	23.7	312	26.8	266	29.5	110	23.2	344	26.7	275	28.6
	Several times a week (1-3 days)	190	45.9	533	45.8	391	43.3	216	45.6	608	47.3	430	44.7
	Most days of the week (4-6 days)	65	15.7	165	14.2	127	14.1	73	15.4	167	13.0	134	13.9
	Once a day	48	11.6	101	8.7	61	6.8	52	11.0	115	8.9	85	8.8
	More often than once a day	9	2.2	36	3.1	28	3.1	12	2.5	30	2.3	17	1.8

Meal eating habits

The habit of having breakfast

Eating breakfast regularly, including meals eaten at school, is recognised as one of the key factors supporting children's normal physical and cognitive development. The data collected among early school-age children shows that most of them eat breakfast daily. Nevertheless, some differences are observed, both between age groups and genders. Among boys, the highest percentage of daily breakfast consumption was observed in the group of 8-year-olds – as many as 83.9% of them declared that they ate breakfast every day. In the other age groups, the share was slightly lower, but still very high - 81.0% of the 7- and 9-year-olds. It should be noted that despite the overall dominance of the habit of eating breakfast

every day, approximately 18-19% of boys in each age group declared less regular patterns of eating that first meal. Particular attention should be paid to the fact that the highest number of boys skipping breakfast was among those at the age of 7 (1.9%), while among 8-year-olds, this share dropped by almost half (0.9%). For girls, the habit of daily breakfast consumption also remains high, ranging from 79.3% among 7-year-olds to 82.4% among 8-year-olds. It is noteworthy that 7-year-old girls are most likely not to eat breakfast compared to the other groups (1.0%), and are also more likely than their male peers to report eating breakfast only "a few days a week" (7.1%). This may indicate a slightly greater variation in dietary patterns among younger girls. Although gender differences are not significant, the data suggest that boys aged 8 are most likely to maintain the habit of eating breakfast daily, while girls aged 7 are slightly less likely than their peers in the other age groups to have that meal regularly. In both groups, a stable level of daily breakfast consumption can be observed among those at the age of 9 (81.0%).

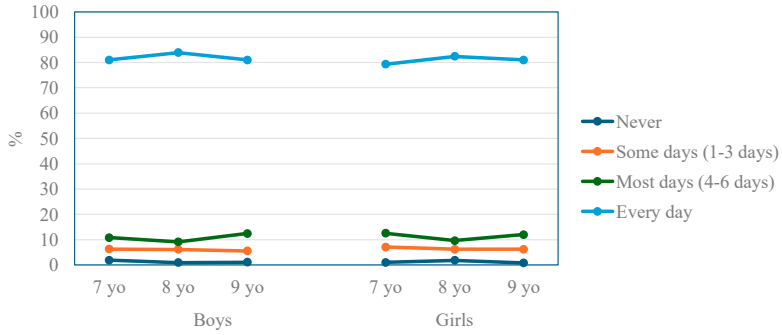


Fig. 14a.1. The habit of breakfast consumption by children, per week, by age and gender

Having meals together as a family

Having breakfast together with a child is not a daily practice for most families, although it is not uncommon either. Only approximately 20-22% of parents declared that they had breakfast together with their child every day. These values are similar across all age groups and both genders – slightly higher shares are observed among parents of 7-year-old girls (21.7%) and 8-year-old boys (21.6%). The dominant pattern is the "1-2 days a week" response – selected by 42-48% of the respondents. Such a high share of this category suggests that family breakfasts are most often an occasional ritual, associated with, e.g., weekends or days off from work. Rare (less often than once a week) or complete

avoidance of shared breakfasts was declared by approximately 10-14% of the parents - the highest score in the group of 9-year-old boys (13.8%). This may indicate time limitations related to the morning schedule and differences in the organisation of family life.

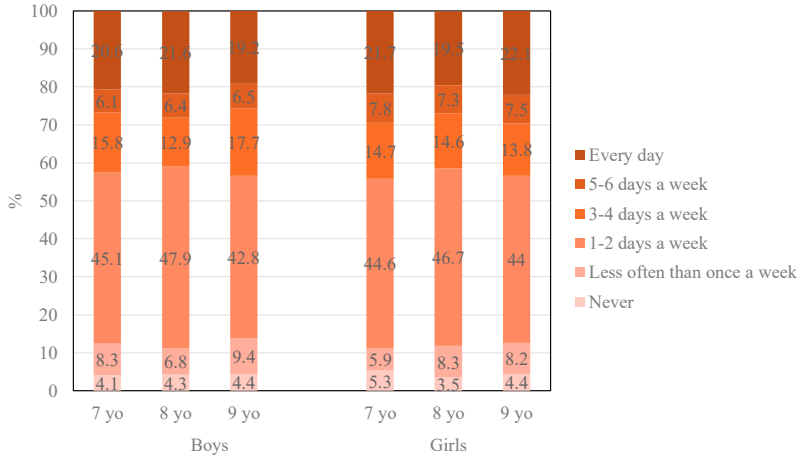


Fig. 14a.2. The habit of having breakfast together as a family, by age and gender of children (%)

Lunch is the meal eaten together most often. Over 40% of parents in each gender and age group declared eating lunch with their children every day. The highest score was obtained for 7-year-old boys (44.1%) and 8-year-old boys (43.9%). Girls aged 9 years also often eat lunch with a parent, 41.2% of the "every day" responses. Importantly, the "never" and "less often than once a week" responses were very rare (less than 2% in each group), which confirms the habit of eating lunch by parents together with children of younger school age in Polish families. The consumption of lunch "3-4 days a week" and "1-2 days a week" was equally frequent (16-22%), which may reflect differences in parents' daily routine, e.g. shift work, presence at home only on certain days of the week or work duties to be performed during lunch time.

Dinner is the second most common meal eaten together as a family, after lunch. Approximately half of the parents (50-54%) declared having dinner together with their children every day, and the values are relatively stable regardless of the child's gender and age. The highest response scores were noticed for 7-year-old boys (54.3%) and 9-year-old girls (52.0%). At the same time, it was noticed that with the child's age, the share of the "1–2 days a week" answer

increases slightly – especially in the 9-year-old boys group (10.1%), which may suggest greater independence of children or changing household habits in the families with older children. The high values of the "5-6 days a week" category (approximately 15-19%) may be indicative of the great importance of dinner as an evening family gathering moment, even though it does not always happen every day. In contrast to breakfast, having dinner together with a child may be easier to organise as this is at the end of the working and studying day.

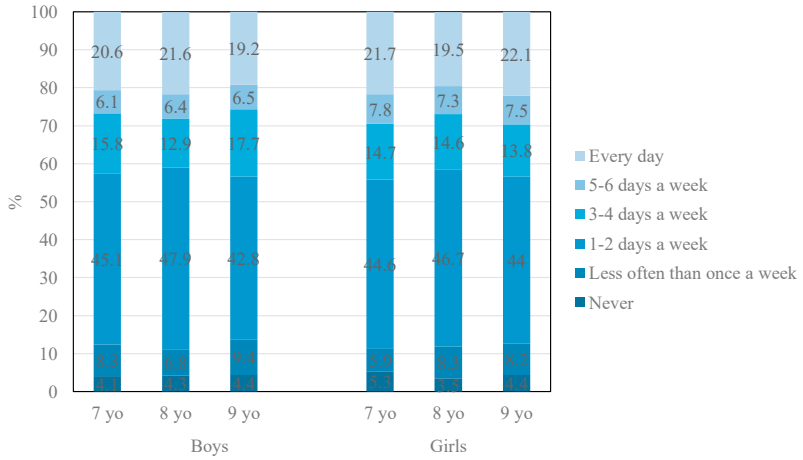


Fig. 14a.3. The habit of having lunch together as a family, by age and gender of children (%)

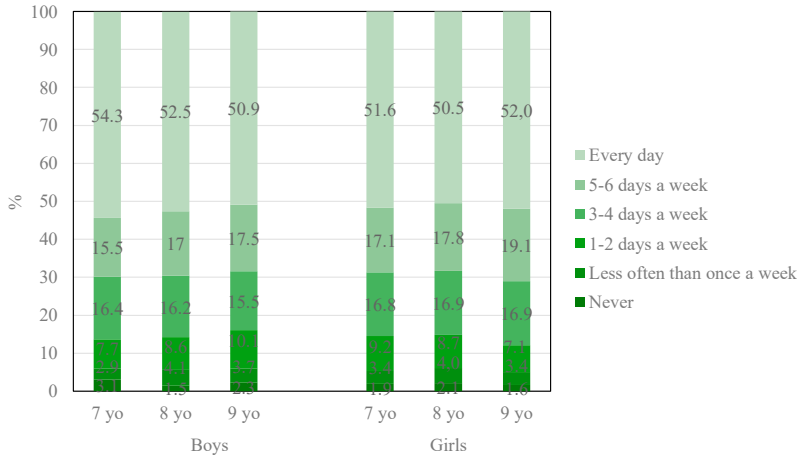


Fig. 14a.4. The habit of having dinner together as a family, by age and gender of children (%)

Children's eating habits in the context of electronic media use

Watching TV seems to be one of the most common occasions to reach for snacks. As many as around 70% of children, regardless of age and gender, consume snacks while watching TV at least once a week. The most common responses are: "less often than once a week" and "1-2 days a week", which account for more than 65% of indications, in total. This habit is slightly more common among boys, with 37.0% of 9-year-old boys having a snack while watching TV less often than once a week, compared to 37.9% of girls of the same age. However, the differences are insignificant. Interestingly, the fewest children indicate that they do so every day - the percentage of "every day" responses is only 4-5% and does not differ significantly between the groups. It is worth noting that the number of children never reaching for a snack while watching TV decreases with age in the case of boys, from 8.2% (7 years old) to 6.9% (9 years old). In the case of girls, the values are more varied, and in the age group of 9-year-olds, the score is 6.5%, confirming the general trend of avoidance of such practices with age.

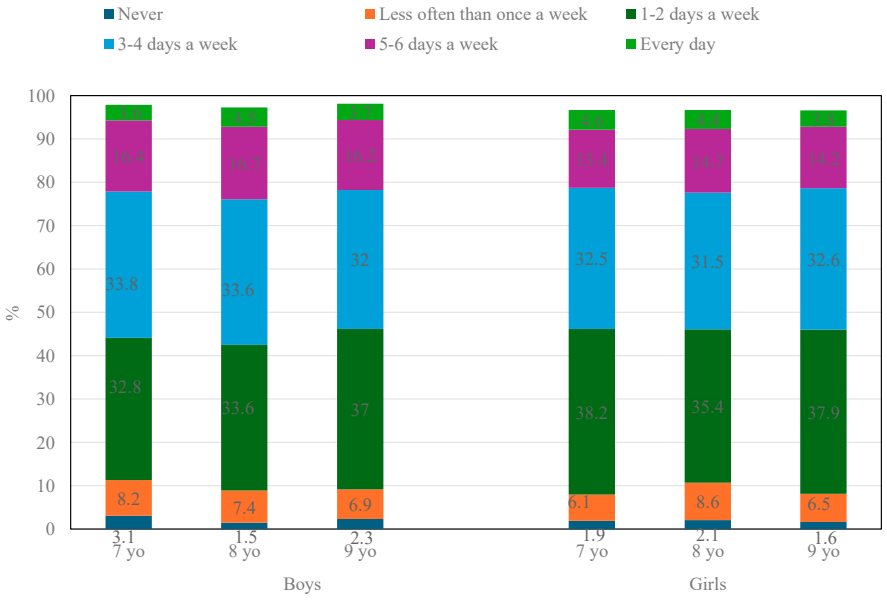


Fig. 14a.5. Snack consumption while watching TV, by age and gender of children (%)

Having a snack while using the computer is much less popular than when watching TV, but cannot be ignored – especially in the case of boys. As many as 60.8% of 9-year-old boys declare that they sometimes have a snack while at the

computer (i.e. all answers except "never"). To compare, 55% of 9-year-old girls. The most frequently selected answer in that category is "never", which may suggest greater parental control over computer use or a lower frequency of that habit in younger children.

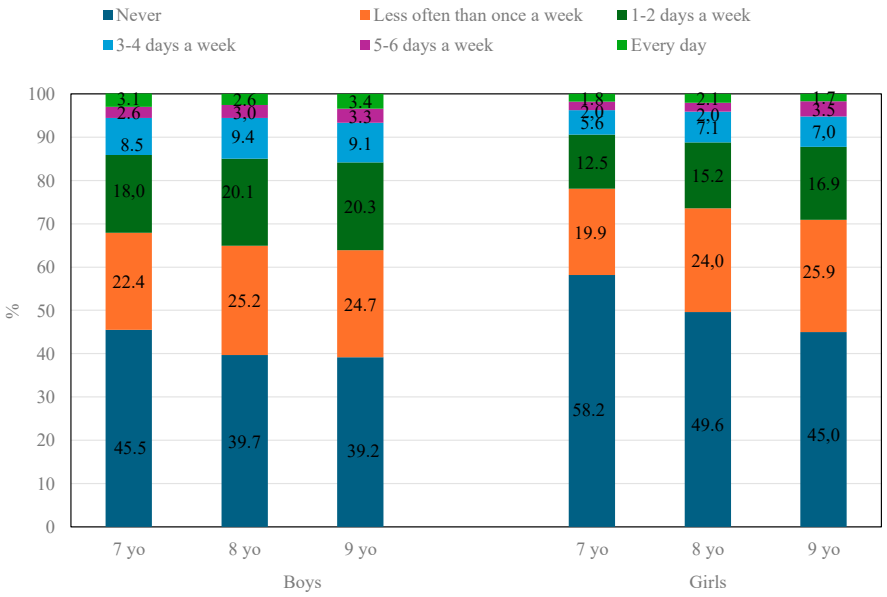


Fig. 14a.6. Snack consumption while using the computer, by age and gender of children (%)

It is worth noting, however, that the number of children eating snacks every day while using the computer does not exceed 3-4%, meaning that the habit is rather occasional. In boys, there is a slightly upward trend in the frequency of such a habit with age. For example, the number of responses "1-2 days a week" increases from 18.0% (7 years old) to 20.3% (9 years old), while a similar increase in the group of girls (from 12.5% to 16.9%) indicates a slow formation of a habit of eating while in front of a computer in that group as well.

The last situation analysed was **having meals while watching TV, cartoons or films**. This phenomenon is common and occurs regularly in a significant number of children. The most frequently indicated answer is "1-2 days a week" (approximately 20-22%) and "3-4 days a week" (approximately 19-23%), which may indicate that such a habit is becoming part of a weekly ritual - e.g. dinners while watching cartoons or weekend breakfasts with a film. The "every day" option was indicated by 13-18% of the children – the highest score among 8-year-old boys

(17.9%) and 8-year-old girls (16.0%). This means that up to one in five children of that age combine eating a meal with watching TV every day. Interestingly, the share of children who **never** watch TV during meals increases with age, from 11.1% (7-year-old boys) to 15.2% (9-year-old boys) and 15.6% (9-year-old girls). This may indicate a growing health awareness among parents or changing household rules in families with older children.

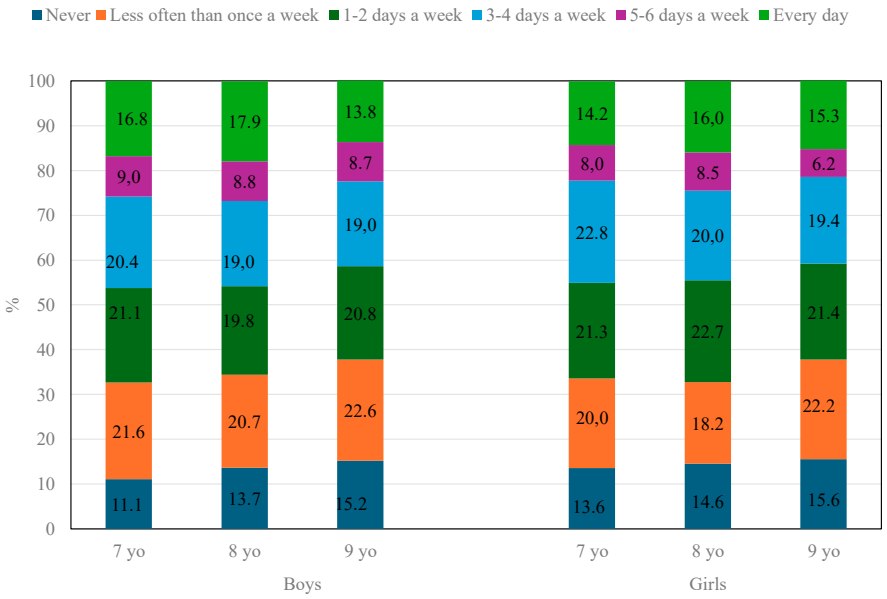


Fig. 14a.7. Having meals while watching TV, cartoons or films, by age and gender of children (%)

Nutritional status of children aged 7-9 in Poland

Analysis of the nutritional status of children aged 7-9 years, carried out based on the WHO BMI classification, shows clear differences depending on age and gender of the study subjects. A phenomenon worth highlighting is the increase in obesity with age. While among 7-year-olds, obesity was the case in 10.3% of the children, in the group of 9-year-olds, the score increased to 15.9%. Among boys, the dynamics of this increase is exceptionally strong: from 13.2% in the group of 7-year-olds to 19.3% for 9 9-year-olds. To compare, among girls, obesity in the same age range increases from 7.8% to 12.6%. This means that boys are more

likely to be overweight, but also that this issue increases with age. Overweight also remains high and is recorded in approximately 17-19% of children in each age group, but unlike obesity, the increase rate is less rapid. It is also interesting to note that the proportion of overweight children is almost identical in boys and girls at the age of 9 (18.9% in each group).

Underweight concerns a small percentage of children in all analysed groups – from 3.1% to 3.6%, and the share of underweight children is similar in both gender groups and in each age group, which may suggest a relatively constant nature of that phenomenon in the population of early school children.

Table 14a.6. BMI categories according to the WHO classification among children aged 7-9 in Poland (%)

Age	Gender	BMI category			
		Underweight	Normal weight	Overweight	Obesity
7 years of age	Boys	2.6	67.6	16.6	13.2
	Girls	3.6	70.7	17.9	7.8
	Total	3.1	69.3	17.3	10.3
8 years of age	Boys	3.2	60.4	18.2	18.3
	Girls	3.2	68.1	17.8	10.9
	Total	3.2	64.4	18.0	14.5
9 years of age	Boys	3.1	58.7	18.9	19.3
	Girls	3.8	64.7	18.9	12.6
	Total	3.5	61.7	18.9	15.9

Increased waist and hip circumference values

The percentage of children with waist circumference exceeding the 90th percentile increases systematically with age, which highlights the growing problem of excess body weight and abdominal obesity. Among 7-year-olds, that threshold is exceeded in 23.5% of children, among 8-year-olds, it is already 26.2%, and among 9-year-olds - 29.2%. Although boys in all age groups are more likely to have a waist circumference >90th percentile than girls (e.g. 9-year-olds: 27.9% vs 30.6%), the differences are not statistically significant. A similar trend is observed for hip circumference. The percentage of children with a score above the 90th percentile increased from 18.7% in 7-year-olds to 21.4% in 8-year-olds, and 23.6% in the case of 9-year-olds. Also in this case, the results for boys and girls differ slightly, but the differences are not statistically significant.

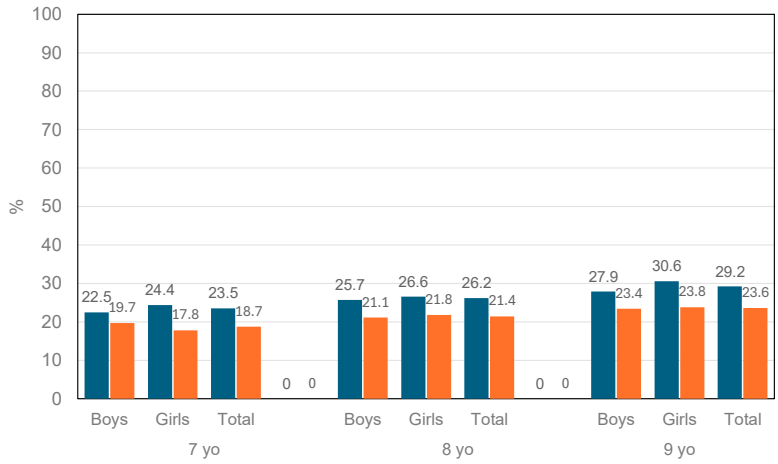


Fig. 14a.8. Percentage of children with waist and hip circumferences above the 90th percentile, by age and gender of children (%)

Children and youth aged 11-17

For school children aged 11, 13, 15 and 17, the data from the 2021/2022 Health Behaviour in School-aged Children (HBSC) survey, conducted according to an international protocol, was used[15]. 7,111 school children were included in the study.

The nutritional status was determined based on self-assessed body weight and height, which, despite potential errors, is in line with international standards and allows for monitoring trends in the population, taking into account the tendency of girls to underestimate body weight and boys to overestimate body weight and height[16]. Classification criteria in accordance with the 2007 WHO standards were adopted, analogous to those for early school-age children.

In the assessment of dietary habits, the frequency of consumption of fruit, vegetables, sweetened and "light" beverages, as well as the regularity of breakfast

[15] Gudelj Rakić, J., Hamrik, Z., Dzielska, A., Felder-Puig, R., Oja, L., Bakalár, P., Nardone, P., Ciardullo, S., Abdrakhmanova, S., Adayeva, A., Kelly, C., Fismen, A.-S., Wilson, M., Brown, J., Inchley, J., & Ng, K. (2024). A focus on adolescent physical activity, eating behaviours, weight status and body image in Europe, central Asia and Canada,WHO Regional Office for Europe. https://hbsc.org/publications/reports/a-focus-on-adolescent-physical-activity-eating-behaviours-weight-status-and-body-image-in-europe-central-asia-and-canada/

[16] Kopcáková, J., Dzúrová, D., & Klein, D. (2014). Self-reported height and weight and their validity: the case of Slovak adolescents. Central European Journal of Public Health, 22(4), 282-287.

consumption during the week (summary index of breakfast consumption on school days and weekends) were analysed.

Breakfast consumption

The frequency of breakfast consumption throughout the week decreases with age. Analysis of gender differences reveals less favourable dietary patterns among girls, especially in older age groups.

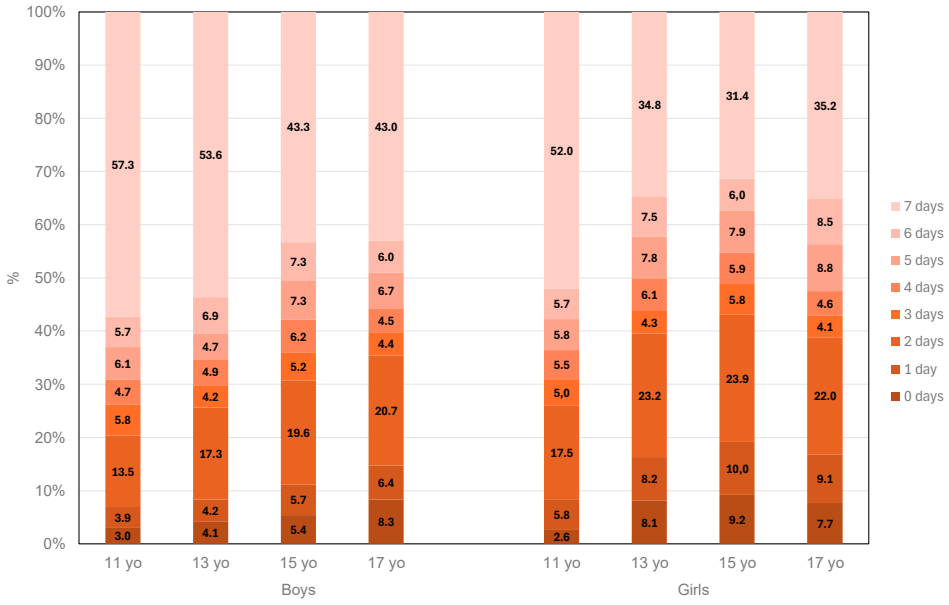


Fig. 14a.9. Frequency of breakfast consumption (number of days per week: 0-7) by children and youth aged 11-17 years, by gender and age (%)

52% of girls at the age of 11 report having breakfast daily, but from the age of 13 onwards, it is already approximately one-third of girls, which remains the case at the age of 15 (31.4%) and 17 (35.2%). Importantly, skipping breakfast (0 days) is declared by 2.6% of girls aged 11 and as many as 9.2% of those aged 15. In the case of boys, there is also a decrease in regularity with age, but it is less rapid. In the group of 11-year-old boys, 57.3% have breakfast daily, and more than half of the 13-year-olds also have breakfast every day. In the group of 15- and 17-year-olds, approximately 43% do so. At the same time, the percentage of boys who do not have breakfast at all increases from 3.0% (11-year-olds) to 8.3% (17-year-olds), indicating a deterioration in the consumption pattern at an older age. The number of teenagers who do not have

breakfast regularly, once or twice a week, also increases with age. In the 13-15 age group, the share is 30% in girls and approximately 26% in boys. This may indicate a lack of time, organisational difficulties or deliberate skipping of the meal.

Fruit and vegetable consumption

Based on the HBSC survey data, there is a noticeable decrease in the frequency of fruit consumption with the age of children. In the group of 11-year-olds, almost one in four (23.8 %) declare daily consumption of fruits more often than once a day, but in the 17-year-old group, the score drops by almost half to 11.5 %. The highest percentage of regular fruit consumers is noticed in 11-year-old girls (25.9%) and the lowest in 17-year-old boys (9.4%). With age, the proportion of youth who reach for fruit only once a week or less often increases. For example, in the group of 17-year-old boys, 14.2% consume fruit only once a week, and as many as 9.7% consume fruit less often than once a week. In the case of girls, these values are lower (12.9% and 6.9%, respectively), confirming that girls have better eating habits in this respect.

Although vegetables are consumed slightly more often than fruit, there is also a worrying downward trend with age, especially for boys. Daily consumption of vegetables, more often than once a day, is declared by 18.8% of 11-year-olds (20.4% of girls and 17.3% of boys), and in the group of 17-year-olds, 16.9% (19.5% of girls, 13.4% of boys). Moreover, the number of children and teenagers consuming vegetables 2-4 times a week increases with age, from 25.0% for 11-year-olds to 34.5% in the case of 17-year-olds.

Consumption of sweets

Unlike fruit and vegetables, sweets are consumed frequently and regularly across all age groups. The largest proportion of school children – approximately 30-36% – reach for them 2-4 times a week, with no clear gender or age-related differences. For example, in the 15-year-olds group, 35.9% of boys and 35.5% of girls eat sweets 2-4 days a week. Daily consumption of sweets (once or more often a day) is also common: in the group of 15-year-old girls, 30.5% of the respondents (14.7% – once a day, 15.8% – more often than once) indicate such a habit, and in the case of boys – 22.8%. Significantly, only a small percentage of youth declare that they never eat sweets, from 1.3% to 3.9%, which indicates their constant presence in the diets.

Beverages with added sugar

Consumption of drinks with added sugar is still popular, although slightly more moderate than the consumption of sweets. Approximately 10-13% of boys

and 7-10% of girls reach for such drinks daily (once or more often). In the group of 15-year-olds, almost twice as many boys as girls (8.8% vs 4.7%) drink sweetened drinks more often than once a day. In contrast, more than 20% of youth report consuming such drinks 2-4 times a week - boys dominate. Girls are more likely than boys to avoid sweetened drinks, with as many as 20.3% of 17-year-old girls declaring that they never drink such beverages, compared to 13.3% of boys.

"Light" drinks

"Light" drinks are chosen less frequently than their classic substitutes. The majority of school-aged children (approximately 30-37%) declare that they do not drink them at all. Daily consumption (once or more often per day) is the case in approximately 6-8% of school children, with no significant gender differences. As regards daily consumption of "light" drinks (more often than once a day), the greatest score was achieved by 11-year-old boys (7.3%) and the lowest by 17-year-old girls (5.0%).

Table 14a.7. Frequency of consumption of selected products by school children and youth aged 11-17, by gender and age (%)

	Gender	boys				girls				Total			
	Age	11 years of age	13 years of age	15 years of age	17 years of age	11 years of age	13 years of age	15 years of age	17 years of age	11 years of age	13 years of age	15 years of age	17 years of age
Fruit	Never	2.5	2.8	3.8	3.5	1.2	1.8	1.7	1.3	1.9	2.3	2.7	2.3
	Less often than once a week	4.6	6.3	6.1	9.7	4.1	4.9	5.8	6.9	4.3	5.6	5.9	8.1
	Once a week	6.0	7.9	10.1	14.2	7.5	8.7	10.8	12.9	6.7	8.3	10.5	13.4
	2-4 days per week	32.1	34.9	40.7	40.6	26.8	31.7	39.2	38.1	29.4	33.4	39.9	39.2
	5-6 days per week	16.9	14.0	13.0	11.3	17.6	17.5	14.1	14.5	17.2	15.7	13.6	13.2
	Daily, once	16.4	14.9	13.5	11.3	17.0	16.1	14.6	13.2	16.7	15.5	14.1	12.4
	Daily, more often than once	21.6	19.2	12.7	9.4	25.9	19.3	13.9	13.1	23.8	19.2	13.4	11.5
Vegetables	Never	5.8	4.7	4.4	2.6	2.2	2.7	3.6	1.3	4.0	3.7	4.0	1.9
	Less often than once a week	5.5	6.4	5.1	5.6	6.3	5.8	3.8	3.1	5.9	6.1	4.4	4.2
	Once a week	11.9	11.0	8.8	9.3	10.6	9.5	6.9	5.9	11.2	10.3	7.8	7.3
	2-4 days per week	26.0	27.5	34.5	37.0	24.1	26.6	33.1	32.6	25.0	27.1	33.7	34.5
	5-6 days per week	20.1	18.5	17.5	18.0	19.3	18.3	19.7	19.9	19.7	18.4	18.7	19.1
	Daily, once	13.4	16.6	15.2	14.2	17.2	18.3	16.2	17.7	15.3	17.5	15.8	16.2
	Daily, more often than once	17.3	15.3	14.4	13.4	20.4	18.8	16.7	19.5	18.8	17.0	15.7	16.9

	Gender	boys				girls				Total			
	Age	11 years of age	13 years of age	15 years of age	17 years of age	11 years of age	13 years of age	15 years of age	17 years of age	11 years of age	13 years of age	15 years of age	17 years of age
Sweets	Never	3.9	3.3	3.5	3.8	2.2	2.3	1.8	1.3	3.0	2.8	2.6	2.4
	Less often than once a week	12.7	13.0	9.8	12.0	8.5	9.4	6.9	9.0	10.6	11.2	8.2	10.3
	Once a week	17.0	15.5	13.1	18.6	15.6	12.2	10.4	12.1	16.3	13.9	11.6	14.9
	2-4 days per week	30.1	30.1	35.9	35.2	30.7	32.9	35.5	35.9	30.4	31.5	35.7	35.6
	5-6 days per week	14.0	12.5	14.9	9.3	13.6	14.7	14.8	12.8	13.8	13.6	14.9	11.3
	Daily, once	10.3	12.7	11.4	8.6	14.1	12.9	14.7	15.7	12.2	12.8	13.2	12.7
	Daily, more often than once	12.0	12.9	11.4	12.4	15.3	15.6	15.8	13.1	13.7	14.2	13.9	12.8
Beverages with added sugar	Never	15.2	11.9	9.5	13.3	17.7	16.2	15.8	20.3	16.4	14.0	13.0	17.3
	Less often than once a week	28.9	25.9	24.1	25.3	33.4	33.2	30.3	31.1	31.2	29.5	27.5	28.6
	Once a week	20.2	19.3	16.2	17.9	20.9	17.1	18.2	15.0	20.6	18.2	17.3	16.2
	2-4 days per week	17.9	22.3	26.5	24.7	14.6	17.2	21.8	20.4	16.2	19.8	23.9	22.2
	5-6 days per week	6.1	8.8	9.2	7.7	6.4	5.3	5.6	4.8	6.2	7.1	7.2	6.0
	Daily, once	5.3	5.3	5.6	4.2	2.2	5.1	3.7	4.2	3.8	5.2	4.6	4.2
	Daily, more often than once	6.3	6.6	8.8	7.0	4.9	5.8	4.7	4.2	5.6	6.2	6.5	5.4
"Light" drinks	Never	32.8	30.4	35.0	37.9	33.1	29.5	32.2	34.9	33.0	29.9	33.5	36.2
	Less often than once a week	24.1	24.0	21.8	24.6	25.5	30.2	25.6	26.0	24.8	27.1	23.9	25.4
	Once a week	15.4	12.0	10.9	9.8	13.6	11.1	11.8	12.4	14.5	11.5	11.4	11.3
	2-4 days per week	9.8	14.8	16.3	13.5	11.0	11.3	15.8	13.1	10.4	13.1	16.0	13.3
	5-6 days per week	6.7	8.4	5.8	4.9	6.7	6.4	5.2	4.7	6.7	7.5	5.5	4.8
	Daily, once	3.9	4.2	2.9	3.4	2.7	4.0	3.6	3.8	3.3	4.1	3.3	3.6
	Daily, more often than once	7.3	6.3	7.4	5.9	7.2	7.5	5.8	5.0	7.3	6.9	6.5	5.4

Nutritional status of children and youth aged 11-17 in Poland

Assessment of the nutritional status of youth based on body mass index (BMI) provides important information about the scale of malnutrition, overweight or obesity in the population of school-age children. In the group of 11-year-olds, overweight and obesity are observed in more than 40% of boys - 29.2% and 11.6%, respectively, which means that almost every second boy at that age has a body weight exceeding the WHO standards. In comparison, in the same age group,

the problem is noticeable in 19% of girls (15.2% overweight, 3.7% obese). Among younger girls, there is also a higher rate of underweight (7.3%) than in boys (5.5%). In the seventh grade (13 years old), the proportions change slightly, but obesity is still noticed in 13% of the study subjects – the highest score among all age groups. Girls at this age present a more favourable picture, with only 2.8% meeting the obesity criteria. 22.7% of boys and 14.9% of girls are overweight, which means that there is a continuing prevalence of the issue of excess body weight among boys. In the first year of high school (15 years), a further improvement in the indicators for girls is apparent. The lowest values for overweight (10.0%) and obesity (3.0%) are recorded. In boys, the scores are also improving, although more than a quarter of them are overweight (19.2%) or obese (8.1%). In the oldest age group (17-year-olds), the favourable nutritional status profile is maintained in girls, with 4.0% and 9.2% obese and overweight, respectively. In boys, the situation remains less optimistic. The percentage of overweight boys (23.6%) is on the rise again, and obesity is noticed in 7.5% of 17-year-old boys.

Throughout adolescence, there is a noticeable and persistent predominance of more favourable nutritional status indicators in girls. In every age group, there are lower rates of overweight and obesity observed compared to boys. Boys are more likely to be overweight, and that indicator is less likely to improve with age.

Table 14a.8. BMI categories according to the WHO classification among children aged 11-19 in Poland (%)

Age	Gender	BMI category			
		Underweight	Normal weight	Overweight	Obesity
11 years of age	Boys	5.5	53.6	29.2	11.6
	Girls	7.3	73.8	15.2	3.7
	Total	6.4	64.0	22.0	7.6
13 years of age	Boys	3.5	60.7	22.7	13.0
	Girls	4.7	77.6	14.9	2.8
	Total	4.1	69.0	18.9	8.0
15 years of age	Boys	3.0	69.8	19.2	8.1
	Girls	3.3	83.7	10.0	3.0
	Total	3.2	77.3	14.2	5.4
17 years of age	Boys	2.0	66.9	23.6	7.5
	Girls	2.3	84.5	9.2	4.0
	Total	2.2	76.8	15.5	5.5

14. EATING HABITS OF POLES
14B. FOOD CONSUMPTION IN HOUSEHOLDS AND EAITING HABITS OF ADULTS

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Adherence to a healthy lifestyle, including proper nutrition and physical activity, is essential for maintaining good health. A healthy diet throughout life reduces the risk of health disorders, including malnutrition, overweight and obesity, as well as other chronic non-communicable diseases such as diabetes, cardiovascular disease and some cancers. Increased production of processed foods, rapid urbanisation and changing lifestyles have led to changes in dietary patterns. In recent years, consumption of foods high in energy, fats, free sugars and salt/sodium has been observed, and many people do not consume enough vegetables, fruits or other fibre-rich foods such as whole-grain cereals.[1]

Monitoring of the diet is an important element of assessing the population's health status, especially when it is performed at regular intervals and involves a nationally representative group of people. Data from the annual household budget surveys conducted by Statistics Poland, covering a representative group of households, is useful for that purpose.[2] Budget surveys are a source of information on food consumption in the country. They are also used to analyse trends in the consumption of various product groups and possible changes in the population's dietary pattern.

Assessing diets at the individual level enables a more accurate analysis of the eating habits of different population groups. One of the methods for an individual assessment of the quality of diet is the examination of the frequency of consumption of selected food groups.

[1] WHO. Healthy diet. https://www.who.int/news-room/fact-sheets/detail/healthy-diet (access: 10 April 2025)

[2] Statistics Poland Household budgets 2023. Warsaw 2024, p. 116

This chapter presents the results of the analysis of food consumption and energy and nutrient intake in the years 2019-2023, based on household budget surveys in Poland. Additionally, the results of research on the frequency of consumption of selected food product groups, some eating habits and other parameters related to the diet of Poles in 2025 are described.

Analysis of food product consumption and energy and nutrient intake by Poles in the years 2019-2023, based on household budget surveys

The assessment of food consumption in Poland was made based on the data acquired by the – NIPH NIH – NRI from the household budget surveys conducted 2019-2023 by Statistics Poland. These surveys covered from 28,089 (in 2023) to 35,923 (in 2019) households each year, selected using a two-stage, stratified sampling scheme with different selection probabilities at the first stage. The first stage sampling units were statistical areas (up to several census tracts) or clusters of areas, while flats were selected at the second stage2. The number of persons living in the selected households was 93,674 in 2019, and it dropped to 68,329 in 2023.

The household budget survey method involved the registration by a selected household of the amount of food purchased in a given month for cash, using a payment card, on credit or using funds obtained by the household in another way (from their own farm or employee plot, home garden, own enterprise, received as a gift, etc.). The advantage of the study is that it is conducted annually on a representative sample of households in Poland. In turn, the disadvantage is that it involves a random person in a given household and not all individuals in that dwelling. Moreover, the study does not take into account food consumed in catering facilities and such products as: pizza and other flour dishes, other ready-made meals, potato flour, popcorn, porridge, diet food, canned fish, milk drinks (e.g. kefir and buttermilk), sauces and spices.

The energy value of the diet and its nutrient content were calculated based on data in the „Tables of composition and nutritional value of food".[3] When linking the data on the consumption of food products with that from the above tables conversion factors developed at NIPH NIH – NRI were used, which enabled the appropriate assignment of individual items from the tables to the assortment groups from the Statistics Poland data.

[3] Kunachowicz H., Nadolna I., Przygoda B., Iwanow K., Tabele składu i wartości odżywczej żywności, PZWL Wydawnictwo Lekarskie, Warszawa, 2018.

Food consumption data show that the consumption of cereals varied in 2019-2023 (Table 14b.1). Among the products from this group, the most common was bread, the consumption of which decreased from almost 3 kg/person/month in 2019 to 2.6 kg/person/month in 2023.

As in previous years, there was a decline in the consumption of potatoes and processed potatoes, by 0.4 kg/person/month in the period from 2019 to 2023.

The consumption of vegetables and processed foods increased slightly in 2019-2020, but declined in the following 3 years. Particularly low consumption of these products was recorded in 2023. The consumption of fruit and preserves varied. The lowest was in 2022, and did not change much in the following year. The insufficient consumption of fruit and vegetables in Poland should be emphasised. In 2019-2023, it ranged from 298-325 g/person/day and was lower than the WHO recommendations, according to which the intake of vegetables and fruits, excluding potatoes and other starchy vegetables, should be at least 400 g per day.[4]

In 2022-2023, the consumption of products from the meat, offal and processed products group was slightly lower than in 2019-2021. Meat consumption remained at a similar level with slight fluctuations over the period. No change was observed in the consumption of pork, and a persistently low share of beef and veal was noticed, as well as fluctuations in the consumption of poultry. For processed meat, a slight downward trend was observed with varied consumption of red meat products.

According to the National Institute of Public Health NIH – National Research Institute recommendations, the consumption of red meat and meat products should not exceed 0.5 kg per week[5]. Taking into account the results of household budget surveys, the consumption of pork, beef, veal and all meat products/processed meat was in the range of 773-817 g/person/week in 2019-2023, which significantly exceeded the experts' recommendations.

As in previous years, there was a low consumption of fish and processed fish, with slight fluctuations.

In terms of fats, both of animal and plant origin, the consumption was at a level of approximately 1 kg/person/month. The diet of Poles contained more than half as much vegetable fat as animal fat. Butter was the main source of animal fat.

[4] WHO, A healthy diet sustainably produced: information sheet, 2018, https://www.who.int/publications/i/item/WHO-NMH-NHD-18.12 (dostęp z dnia 09 04 2025)

[5] NIZP PZH – PIB, Zalecenia zdrowego żywienia, 2020, https://ncez.pzh.gov.pl/abc-zywienia/talerz-zdrowego-zywienia/ (access: 9 April 2025)

In 2020, milk consumption increased compared to the previous year, followed by a decline. The consumption of other dairy products varied. No change was observed in the number of eggs consumed, which remained at the level of approximately 11 pcs/person/month.

Sugar consumption showed a slight downward trend, with variations from year to year. There was no clear change in the consumption of confectionery products.

The consumption of salt varied from 0.15 to 0.16 kg/person/month, i.e. 5-5.3 g per day. It should be noted that this is only table salt added to products and dishes; the amount does not include salt already contained in the consumed products. These figures also exclude consumption in catering facilities and purchased ready meals.

In the group of non-alcoholic beverages, there were fluctuations in the consumption of mineral and spring water and a decrease in the consumption of other non-alcoholic beverages in the analysed period.

Based on food consumption data the energy and nutrient intake in households was estimated. After a slight increase in 2020 compared to 2019 (by 2.4%), the energy value of the Poles' diet decreased by over 100 kcal (by 6.6%) in the years 2020-2023 (Table 14b.2). During that period, there was a decrease in the content of all macronutrients in the diet. The digestible carbohydrates intake decreased to the greatest extent (by 9%), while there was a smaller decline in the intake of protein (by 4.3%) and fat (by 4.6%). In the case of fat, the main decrease was observed in the content of vegetable fat in the diet (by 6.6%), the decrease in the content of animal fat was less significant (by 2.9%). The reduction in fat intake was due to a decrease in the intake of all types of fatty acids, but the largest decrease was observed for polyunsaturated fatty acids (by 7.4%).

The share of energy from individual macronutrients also changed; the percent of energy from fat, including saturated fatty acids, increased, and the percent of energy from digestible carbohydrates decreased.

In 2020, the fibre content in the diet was similar to the previous year, but a significant decrease was recorded (by 8.1%) in 2020-2023.

In 2020, the content of most of the analysed minerals and vitamins in the diet was higher compared to 2019. However, in 2020-2023, the reduction in the energy value of the diet was combined with a decrease in the content of almost all minerals and vitamins. There was no change in copper intake. In contrast, there was a significant decline in the intake of manganese (by 7.1%), vitamin B_1 (by 9.8%), B_2 (by 7.8%), B_6 (by 9.7%), C (by 7.3%) and folate (by 7.7%). It should be noted that the content of most minerals and vitamins in the diet in 2023 was also lower than that recorded in 2019. This particularly concerned vitamins: E, D, B_1, B_2, B6 and folate.

The observed changes in the nutritional value of the Poles' diet were not beneficial. The decrease in fat intake in 2020-2023 was primarily due to the decrease in the consumption of plant products that are a source of that ingredient. In the period from 2019 to 2023, the percentage of energy from fat, which was already relatively high, increased. This was largely associated with an increase in energy from saturated fatty acids, which should be as low as possible.

The fibre content in the diet of Poles was too low based on the dietary reference values.[6] In the case of minerals and vitamins, a low intake of calcium and vitamin D was noted. The reduction in their content in the diet in 2020-2023 was all the more unfavourable.

A beneficial change, however, was the reduction in sodium content in the diet of Poles, which in 2023 was lower than in 2019. Nevertheless, despite the decrease, it was well above the dietary reference values for that nutrient. While converting the sodium content into salt consumption, it was found that it was 8.8 g/person/day in 2020, and 8.3 g in 2023. These values indicate the total amount of table and cooking salt, as well as salt already found in the consumed products. During the analysed period, the value was well above the maximum amount of 5 g recommended by the World Health Organisation.[7]

Table 14b.1. Total average monthly consumption[a/] of food in the households in the years 2019-2023; per person

Food products	Unit of measurement	2019	2020	2021	2022	2023
Bread	kg	2.98	2.75	2.67	2.58	2.61
Other bakery products	kg	0.98	0.99	1.05	1.08	1.04
Wheat flour and other flours	kg	0.59	0.70	0.63	0.61	0.58
Groats and cereals, rice	kg	0.42	0.45	0.41	0.42	0.38
Pasta and pasta products	kg	0.40	0.42	0.41	0.42	0.39
Potatoes and potato products [b/]	kg	3.02	2.96	2.77	2.72	2.60
Vegetables and vegetable products	kg	4.77	4.91	4.83	4.57	4.39
Fruit and fruit products	kg	4.75	4.92	5.05	4.62	4.68
Meat, offal, and their products	kg	5.08	5.09	4.96	4.8	4.86
of which: meat	kg	2.87	2.90	2.82	2.67	2.79
pork	kg	1.22	1.24	1.26	1.22	1.20

[6] Rychlik E., Stoś K., Woźniak A., Mojska H., Normy żywienia dla ludności Polski. National Institute of Public Health NIH – National Research Institute. Warszawa 2024

[7] World Health Organisation. Guideline: Sodium intake for adults and children, World Health Organisation, 2012.

Food products	Unit of measure-ment	2019	2020	2021	2022	2023
beef and veal	kg	0.12	0.11	0.1	0.08	0.09
poultry	kg	1.53	1.55	1.45	1.36	1.49
Meat products	kg	2.21	2.19	2.14	2.13	2.07
of which: cold cuts excluding poultry c/	kg	1.44	1.42	1.38	1.38	1.40
Fish and fish products d/	kg	0.27	0.27	0.28	0.24	0.24
Fat: total	kg	1.04	1.08	1.02	1.01	1.01
animal (excluding butter)	kg	0.07	0.07	0.07	0.07	0.06
vegetable	kg	0.69	0.69	0.63	0.66	0.63
butter	kg	0.28	0.32	0.32	0.28	0.32
Milk and milk-based drinks e/	1	3.38	3.61	3.47	3.41	3.36
Cheese	kg	0.90	0.95	0.97	0.94	1.00
Cream	kg	0.35	0.36	0.35	0.34	0.35
Eggs	pc.	10.99	11.04	10.8	10.5	10.60
Sugar	kg	0.80	0.84	0.75	0.76	0.70
Confectionery products	kg	0.49	0.52	0.54	0.54	0.52
Table salt:	kg	0.15	0.16	0.16	0.16	0.15
Mineral and spring water	1	5.78	5.83	5.93	5.78	5.95
Other non-alcoholic beverages	1	3.86	3.89	3.43	3.54	3.13

a/ – excluding the consumption in catering facilities; b/ – with crisps; c/ – premium meat: sirloin, ham, gammon and dry sausages; other cured meat; d/ – excluding canned fish, salted herring and other fish and seafood products; e/ – excluding dairy desserts and dairy drinks such as: kefir, buttermilk, yoghurt.

Table 14b.2. Total average energy and selected nutrients intake in the households in the years 2019-2023; per person

Energy and nutrients	Unit	2019	2020	2021	2022	2023
Total energy	kcal	1674	1715	1663	1637	1601
	kJ	7009	7180	6965	6856	6705
Energy from animal products	kcal	526	546	540	518	530
Energy from vegetable products	kcal	1148	1168	1123	1119	1071
Macronutrients:						
Protein: total	g	61.7	62.6	61.5	60.0	59.9
animal	g	41.1	41.8	41.2	40.1	40.7
vegetable	g	20.6	20.9	20.3	19.9	19.2
Fat: total	g	69.0	71.4	69.7	68.7	68.1
animal	g	36.2	38.0	37.6	35.7	36.9
vegetable	g	32.7	33.4	32.1	33.0	31.2

Energy and nutrients	Unit	2019	2020	2021	2022	2023
Carbohydrates	g	195	199	191	189	181
Percent of energy derived from:						
Proteins	%	15.0	14.8	15.0	14.9	15.2
Fat	%	36.5	36.8	37.0	37.1	37.6
Carbohydrates	%	47.4	47.2	46.8	46.9	46.0
Fatty acids:						
Saturated acids:	g	25.1	26.2	25.9	25.1	25.4
Monounsaturated	g	27.6	28.5	27.8	27.7	27.1
Polyunsaturated	g	12.0	12.2	11.6	11.7	11.3
Percent of energy from saturated fatty acids	%	13.5	13.7	14.0	13.8	14.3
Ratio of polyunsaturated to saturated acids (P:S)		0.5	0.5	0.4	0.5	0.4
Cholesterol	mg	228	234	230	222	227
Fibre	g	13.4	13.5	13.2	12.7	12.4
Minerals:						
Sodium	mg	3395	3516	3487	3463	3332
Potassium	mg	2939	3015	2972	2902	2864
Calcium	mg	529	553	550	539	539
Phosphorous	mg	957	978	962	939	936
Magnesium	mg	288	296	293	287	282
Iron	mg	9.0	9.1	9.0	8.7	8.6
Zinc	mg	7.8	7.9	7.8	7.6	7.5
Copper	mg	1.3	1.3	1.3	1.3	1.3
Manganese	mg	2.7	2.8	2.7	2.6	2.6
Iodine	µg	141	150	149	148	141
Vitamins:						
Vitamin A	µg	929	943	929	884	891
Beta-carotene	µg	2229	2320	2288	2138	2059
Vitamin D	µg	2.86	2.85	2.8	2.7	2.7
Vitamin E	mg	10.0	10.1	9.7	9.8	9.4
Vitamin B1	mg	1.20	1.22	1.2	1.2	1.1
Vitamin B2	mg	1.37	1.41	1.4	1.4	1.3
Niacin	mg	18.0	18.3	18.0	17.6	17.6
Vitamin B6	mg	1.52	1.55	1.5	1.5	1.4
Folate	µg	189	194	190	183	179
Vitamin B12	µg	3.06	3.10	3.1	3.0	3.0
Vitamin C	mg	77.0	79.5	79.8	75.1	73.7

A study assessing the dietary habits of the adult population in Poland, conducted between 2017 and 2020 by the Medical University of Warsaw (WUM) as part of the National Health Programme, revealed numerous nutritional inadequacies. The study was representative of the Polish population and included two age groups: 19-64 years[8] and 65 years and older[9].

Consistent with findings from household budget surveys, a high proportion of energy from saturated fatty acids was observed, exceeding 10% of total energy intake in 78% of individuals aged 19-64 years and 80% of those aged 65 years and older. Excessive intake of saturated fats was also associated with high dietary cholesterol consumption.

Dietary fibre intake was low. Only 14% of adults aged 19-64 years consumed fibre in amounts meeting recommended levels. Among those aged 65 years and older, 23% met the recommended intake, although it should be noted that the recommended amount for older adults is lower.

Analysis of vitamin intake indicated that insufficient vitamin D intake was the most prevalent issue. The proportion of individuals with vitamin D intake below the recommended adequate intake was 98% in the 19-64 age group and 96% in those aged 65 years and older. Folate intake was also inadequate in a substantial proportion of participants: 79% in the younger group and 85% in the older group. Diets of Polish adults were frequently low in vitamin C, with inadequate intake observed in 46% and 49% of individuals in the younger and older age groups, respectively.

Among minerals, inadequate calcium intake was most commonly observed: 80% of adults aged 19-64 years and 96% of those aged 65 years and older consumed less than the recommended amount. A substantial proportion of Polish adults also had insufficient dietary potassium (65% of the younger group and 81% of the older group). Magnesium intake was below recommended levels in 53% and 70% of individuals in the younger and older age groups, respectively.

The study also found that the adult Polish population was characterised by excessive sodium intake, with intake above the amount recommended by the World Health Organisation (WHO) observed in 94% of individuals in both age groups.

[8] Traczyk I. [ed.], Project: Conducting comprehensive epidemiological studies on dietary habits and nutritional status of the Polish population, with particular focus on adults, including identification of risk factors for eating disorders, assessment of physical activity levels, nutritional knowledge and health inequalities, Final Report, 2020.

[9] Szostak-Węgierek D. [ed.], Project: Conducting comprehensive epidemiological studies on dietary habits and nutritional status of the Polish population, with particular focus on older adults, including identification of risk factors for eating disorders, assessment of physical activity levels, nutritional knowledge and health inequalities, Final Report, 2020.

Eating habits of Poles

The study of dietary habits was conducted in 2025, among 3,000 people at the age of ≥ 20 from all over Poland. The sampling method, characteristics and description of the study are presented in chapter 12 „Subjective assessment of health and the level of satisfaction of health needs".

The data on the dietary habits of Poles was collected using the „Basic health and risk factor survey for adults (20 years of age and older)" – section „Diet". The survey included questions on the number of portions of fruit and vegetables consumed, frequency of consumption of red meat, sea fish, whole grain products, milk and dairy products, pulses, fast food, sweetened drinks, sweets and energy drinks. Questions were also asked about selected eating habits, e.g., the type of fat used as bread spread, for frying, baking and stewing. The respondents also had to state whether they were on a diet or not, and if so, what kind of diet it was and what factors hindered their healthy eating. The data on dietary habits was analysed for the general population, by gender, age (2 age groups: 20-49 and 50+ years) and place of residence (urban, rural).

The differences in the number of servings of fruit and vegetables consumed, the frequency of consumption of particular groups of products and the type of fat used for bread spreading, for frying, baking and stewing by gender, age and place of residence were analysed using the *Chi*-square test (α=0.05).

The analysis of the dietary habits of the Polish adult population revealed many irregularities. The habits often differed depending on gender, age and place of residence.

According to the WHO recommendations4, at least 2-3 portions of vegetables and at least 2-3 portions of fruit should be consumed per day. In the adult Polish population, however, their consumption turned out to be too low. Two or more portions of vegetables (not including potatoes) per day were consumed by only 52% of Poles, even less in the case of fruit - 46.6%. More women than men ate two or more portions of vegetables per day. In the case of fruit, slightly more women than men consumed 2 or more portions per day, while more men than women did not eat fruit every day. Between the age groups: 20-49 and ≥ 50 years, as well as between urban and rural residents, small differences were observed in the number of daily portions of vegetables and fruit consumed (Table 14b.3).

Table 14b.3. Number of portions of fruit and vegetables consumed by the Polish population

Number of portions/day		1	2	3	4	≥5	I do not eat every day
Vegetables							
Parameters		**% of respondents**					
	Total	40.6	29.7	16.6	4.0	1.8	7.4
Gender	Men	43.4	28.1	16.1	3.2	1.4	7.8
	Women	38.1	31.1	17.0	4.7	2.1	7.0
Age	20-49 years	40.5	29.5	16.6	4.8	1.7	6.9
	≥50 years	40.7	29.9	16.5	3.1	1.9	7.9
Place of residence	Urban area	42.1	29.4	17.5	3.6	1.9	5.6
	Rural area	39.4	30.0	15.8	4.3	1.6	8.9
Fruit							
Parameters		**% of respondents**					
	Total	43.4	28.0	13.2	4.0	1.3	10.1
Gender	Men	43.3	27.0	14.0	3.4	1.0	11.3
	Women	43.5	28.9	12.5	4.6	1.5	9.0
Age	20-49 years	42.7	26.3	15.1	5.2	1.4	9.2
	≥50 years	44.1	29.8	11.2	2.8	1.2	11.0
Place of residence	Urban area	46.5	26.8	12.4	3.6	1.4	9.4
	Rural area	40.8	29.0	13.9	4.4	1.2	10.7

Concerning cereal products, whole grain products should be the main choice.4 It is recommended to include them in every meal.5 However, it was observed that only 8.4% of adult Poles consumed whole grain products, such as wholemeal bread, wholemeal pasta, coarse groats, brown rice, oatmeal, 3 times a day or more often. Most people (26.1%) consumed such products 1-2 times a day, slightly fewer ate them 3-6 times a week or 1-2 times a week. In the case of men and women, the frequency of consumption of whole grain products was similar. Small differences in the consumption of these types of products were observed between the two groups of respondents – aged 20-49 and ≥ 50 years. More respondents in the older age group than younger consumed whole grain products 1-2 times a day, while fewer consumed them 3 times a day, 1-2 times a week and less than once a week. It was also observed that more adult Poles living in rural areas than those living in cities/towns consumed whole grain products 3 times a day or more often, while fewer people consumed them 1-2 times a week (Table 14b.4).

Table 14b.4. Frequency of consumption of whole grain products by the Polish population

Consumption frequency		3 times a day or more often	1-2 times a day	3-6 times a week	1-2 times a week	Less often than once a week	I don't eat
Parameters		% of respondents					
	Total	8.4	26.1	22.1	20.0	13.5	10.0
Gender	Men	8.7	24.7	24.0	20.3	11.4	10.9
	Women	8.0	27.3	20.4	19.7	15.4	9.3
Age	20-49 years	9.4	24.3	22.1	20.7	14.6	8.9
	≥50 years	7.2	28.0	22.1	19.2	12.3	11.2
Place of residence	Urban area	6.7	26.1	22.0	22.3	13.1	9.8
	Rural area	9.7	26.0	22.2	18.0	13.8	10.2

It is recommended to consume 2 glasses of milk per day. Milk can be replaced by an appropriate amount of dairy products such as yoghurt, kefir, buttermilk and cottage cheese.5 However, the consumption of such products in the Polish population is insufficient. Only 12.4% of adult Poles consume milk and milk products twice a day or more often. Most people (27.3%) declared consuming these products 3-6 times a week, followed by once a day (25.1%). Small differences in the frequency of consumption of milk and dairy products were observed between the respondents aged 20-49 and those aged ≥ 50 years, as well as between the residents of urban and rural areas. In turn, no such differences were observed between men and women (Table 14b.5).

Table 14b.5. Frequency of consumption of milk and dairy products by the Polish population

Consumption frequency		Twice a day or more often	Once a day	3-6 times a week	Twice a week	Once a week	Less often than once a week	I don't eat
Parameters		% of respondents						
	Total	12.4	25.1	27.3	17.8	7.5	6.0	3.9
Gender	Men	10.7	22.8	27.2	18.9	8.7	7.0	4.7
	Women	13.8	27.2	27.5	16.8	6.4	5.1	3.2
Age	20-49 years	12.4	23.8	25.4	19.2	8.6	6.2	4.5
	≥50 years	12.3	26.6	29.4	16.2	6.3	5.9	3.3
Place of residence	Urban area	13.7	23.7	28.1	17.1	7.9	6.4	3.2
	Countryside	11.3	26.3	26.7	18.3	7.2	5.7	4.5

Experts recommend limiting the consumption of red meat and processed meat products. No more than 500 g of such products should be consumed per week.4,5 Most Poles (29.5%) ate red meat (pork, beef, sheep) and meat products (cold cuts, sausages, tinned food, pate and other offal products, etc.) 3-6 times a week, and a similar number of people (27.5%) ate such products twice a week. Red meat and processed meat products were consumed slightly more often by men, the respondents at the age of ≥ 50, those living in the city, compared to: women, the respondents at the age of 20-49 years, the residents living in the countryside, respectively (Table 14b.6).

Table 14b.6. Frequency of consumption of red meat and processed meat products by the Polish population

Consumption frequency		Every day	3-6 times a week	Twice a week	Once a week	Less often than once a week	I do not eat
Parameters		% of respondents					
	Total	10.9	29.5	27.5	15.7	10.8	5.7
Gender	Men	12.3	31.9	26.4	14.7	9.7	5.1
	Women	9.7	27.4	28.4	16.6	11.8	6.2
Age	20-49 years	10.9	26.8	27.6	16.4	12.4	5.9
	≥50 years	11.0	32.2	27.3	14.9	9.2	5.4
Place of residence	Urban area	11.5	33.4	25.5	14.5	10.5	4.7
	Rural area	10.5	26.2	29.1	16.7	11.1	6.5

A good alternative to meat is dishes made from pulses, such as soya, beans, peas, lentils.4,5 A quarter of Poles consumed such dishes several times a week, and a similar number of the respondents once a week. Most people consumed pulses less often than once a week. It was observed that those aged 20-49 ate them more often than the residents at the age of ≥ 50 years, as did those living in urban areas compared to those from the countryside. In contrast, no such differences were observed between men and women (Table 14b.7).

Consuming fish, especially sea fish, is recommended twice a week.4,5 However, in the Polish population, sea fish such as e.g. herring, tuna, mackerel, salmon, sardines were most often consumed less frequently than once a week (41.2% of the respondents), and almost one-fifth of adult Poles did not eat them at all. Only one in ten respondents consumed fish as recommended. No difference in the frequency of fish consumption was observed between men and women. More

respondents aged 20-49 than those aged ≥ 50 years ate sea fish once a week, while fewer consumed it less often. The frequency of sea fish consumption also depended on the place of residence. It was slightly higher among those living in the countryside compared to the residents of urban areas (Table 14b.8).

Table 14b.7. Frequency of consumption of dishes made from pulses by the Polish population

Consumption frequency		A few times a day	Once a day	Several times a week	Once a week	Less often than once a week	I do not eat
Parameters		% of respondents					
	Total	2.3	3.6	24.6	27.1	35.6	6.8
Gender	Men	2.8	3.9	26.1	27.7	32.2	7.3
	Women	1.9	3.3	23.2	26.6	38.6	6.4
Age	20-49 years	3.9	4.8	27.7	24.6	30.2	8.8
	≥50 years	0.7	2.3	21.3	29.9	41.3	4.6
Place of residence	Urban area	2.0	4.3	24.1	32.2	32.0	5.4
	Rural area	2.6	3.0	25.0	23.0	38.5	7.9

Table 14b.8. Frequency of sea fish consumption by the Polish population

Consumption frequency		At least twice a week	Once a week	Less often than once a week	I do not eat
Parameters		% of respondents			
	Total	9.8	30.8	41.2	18.2
Gender	Men	10.5	30.1	40.7	18.7
	Women	9.1	31.3	41.7	17.8
Age	20-49 years	9.3	32.5	39.2	18.9
	≥50 years	10.3	28.9	43.4	17.5
Place of residence	Urban area	8.6	28.6	46.1	16.8
	Rural area	10.8	32.5	37.3	19.4

It is harmful to health to consume products that contain large amounts of fat, salt and sugar. Fast food, sweetened beverages and sweets, etc., should therefore be avoided.4,5 Fast food products (e.g. pizza, hamburgers, hot-dogs, chips, toasties, kebabs) were consumed by 39.4% of Poles once a week or more often. One-third of the residents consumed such types of products less often than once a week. Men were more likely than women to consume the products in question. Those aged 20-49 were also more likely to consume fast food products than the respondents aged ≥ 50 years.

Urban residents were slightly more likely to consume such products compared to those living in rural areas (Table 14b.9). One in five Poles consumed sweetened non-carbonated or carbonated drinks such as Coke, orangeade, lemonade, nectars and fruit drinks 3-6 times a week or even daily. In contrast, a similar number of people did not consume such drinks at all. Most people (26.9%) consumed them less often than once a week. No differences in the frequency of consumption of sweetened beverages were observed between men and women. People at the age of 20-49 consumed drinks of that type more frequently than those aged ≥ 50 years. More respondents living in cities than in rural areas drank sweetened beverages twice or once a week, while more people living in rural areas than in cities consumed such products every day or did not consume them at all (Table 14b.9). It was noted that 31.2% of Poles consumed sweets (e.g. candies, chocolate, chocolate bars, cakes, wafers, etc.) 3-6 times a week, or even daily. One in four Poles consumed such products twice a week. It was noted that women, people aged 20-49, those living in the countryside reached for sweets more often than men, the respondents aged ≥ 50 years or city residents, respectively (Table 14b.9).

Table 14b.9. Frequency of consumption of fast food, sweetened non-carbonated and carbonated drinks and sweets by the Polish population

Consumption frequency		Every day	3-6 times a week	Twice a week	Once a week	Less often than once a week	I do not eat/ drink
Fast food							
Parameters		**% of respondents**					
	Total	2.0	5.8	13.9	17.7	33.1	27.5
Gender	Men	1.8	8.4	17.0	20.4	28.8	23.5
	Women	2.1	3.5	11.2	15.3	36.9	31.1
Age	20-49 years	3.0	9.3	21.3	24.9	32.0	9.5
	≥50 years	0.9	2.0	6.0	10.0	34.3	46.8
Place of residence	Urban area	1.1	6.4	15.6	18.3	31.2	27.4
	Rural area	2.7	5.3	12.5	17.2	34.7	27.6
Sweetened non-carbonated and carbonated drinks							
Parameters		**% of respondents**					
	Total	8.5	12.2	18.6	14.1	26.9	19.7
Gender	Men	10.4	13.6	21.8	15.7	22.5	16.1
	Women	6.8	11.0	15.7	12.8	30.8	22.9
Age	20-49 years	10.7	16.1	23.3	17.9	19.7	12.3
	≥50 years	6.1	8.1	13.5	10.1	34.5	27.6

Consumption frequency		Every day	3-6 times a week	Twice a week	Once a week	Less often than once a week	I do not eat/ drink
Place of residence	Urban area	6.4	12.7	20.7	16.1	27.1	17.0
	Rural area	10.2	11.9	16.9	12.5	26.6	21.9
Sweets							
Parameters		**% of respondents**					
	Total	12.1	19.1	23.8	20.6	19.3	5.1
Gender	Men	10.0	18.8	24.4	19.7	21.6	5.6
	Women	14.0	19.3	23.3	21.5	17.3	4.7
Age	20-49 years	12.6	20.1	24.0	21.0	17.1	5.3
	≥50 years	11.6	18.1	23.6	20.2	21.7	4.8
Place of residence	Urban area	9.4	17.5	23.9	22.6	22.0	4.6
	Rural area	14.4	20.4	23.6	19.1	17.1	5.5

Energy drinks should not be consumed frequently. Most Poles have never drunk them, and among those declaring to consume them, it was the case of 1-3 times a month (Table 14b.10). Non-consumption of energy drinks was more often declared by women, although the percentage of people consuming them once or several times a day was similar among women and men. Consumption of such drinks differed depending on age. Among the respondents aged 20-29, more than twice as many people declared consuming them as in the group of those aged ≥ 50 years. The proportion of people consuming energy drinks at least once a day was also higher in the younger age group. However, the differences in the frequency of consumption of such beverages depending on the place of residence were small.

Table 14b.10. Frequency of consumption of energy drinks by the Polish population

Consumption frequency		A few times a day	Once a day	Several times a week	Once a week	1-3 times a month	Never
Parameters		**% of respondents**					
	Total	3.9	3.3	9.1	12.2	16.8	54.8
Gender	Men	3.6	3.6	12.0	15.9	19.7	45.1
	Women	4.1	3.0	6.5	9.0	14.2	63.3
Age	20-49 years	3.9	5.2	15.0	19.0	22.4	34.5
	≥50 years	3.9	1.3	2.6	4.9	10.8	76.5
Place of residence	Urban area	3.6	2.4	10.0	12.3	18.0	53.7
	Rural area	4.2	4.0	8.3	12.2	15.8	55.6

It is recommended to limit the consumption of animal fats and replace them with vegetable fats such as rapeseed oil or olive oil.4,5 It was observed that three-quarters of Poles used butter as bread spread. Other fats used for that purpose were margarine, mixed fats and lard. In contrast, 11.1% of Poles did not use fat as bread spread at all. More men than women used margarine and lard. More people aged ≥ 50 years than those in the younger age group used butter or mixed fats as bread spreads. In contrast, more residents in the 20-49 age group than in the older age group did not use bread spread at all. No differences were observed in using fat as bread spread between people living in the city and in the countryside (Table 14b.11).

Table 14b.11. Type of bread spread used by the Polish population (1 or 2 answers possible)

Type of fat		Butter	Margarine	Mixed fats	Lard	Other	I do not use
Parameters		% of respondents					
Gender	Men	74.3	30	15.1	7.1	0	11.8
	Women	75.8	24	14.6	5.1	0	10.4
Age	20-49 years	73.2	27	13.6	6.1	0	13.9
	≥50 years	77.2	27	16.2	6.0	0	8.0
Place of residence	Urban area	76.0	28	13.8	5.8	0	10.8
	Rural area	74.4	26	15.7	6.2	0	11.3

For frying, baking and stewing, however, most Poles used oil or olive oil. These were followed by butter, lard, margarine or mixed fats and other fats (e.g. coconut oil). For frying, baking and stewing, more men than women used butter, margarine or mixed fats. In contrast, more women than men used oil or olive oil for that purpose. More Poles aged ≥ 50 years than in the younger age group used lard for frying, baking and stewing, while more younger respondents used butter and other fats (e.g. coconut oil). Compared to the rural population, fewer urban dwellers used oil and olive oil for frying, while more of them used margarine or mixed fats and lard (Table 14b.12).

Poles were also asked whether they followed a special diet. The vast majority of the respondents did not follow any diet. The most frequently indicated diets were: low-fat or low-cholesterol (8.6% of the respondents), food allergy-related diets (e.g. allergy to nuts, milk, shellfish) (8%) and low-salt diet (7.6%). More people aged ≥ 50 than those at the age of 20-49 years followed special diets, particularly low-fat or low-cholesterol diets or diets associated with food allergies (e.g. allergy to nuts, milk, shellfish), low salt and diabetic diets. The use of special diets also

depended on gender. More women than men followed diets, while there were small differences between urban and rural residents (Table 14b.13).

Table 14b.12. Type of fat for frying, baking and stewing used by the Polish population (1 or 2 answers possible)

Type of fat		Oil or olive oil	Butter	Margarine or mixed fats	Lard	Other	I do not use
Parameters		% of respondents					
	Total	70.6	26.5	13.8	18.6	2.2	3.6
Gender	Men	64.9	28.6	16.7	20.4	2.6	3.9
	Women	75.7	24.6	11.3	17.0	1.8	3.3
Age	20-49 years	68.1	31.7	15.8	13.7	3.4	3.9
	≥50 years	73.4	20.8	11.8	23.8	0.8	3.3
Place of residence	Urban area	68.5	24.0	15.8	23.8	2.1	3.4
	Rural area	72.4	28.5	12.2	14.3	2.2	3.8

Table 14b.13. Special diets of Poles

Type of diet	Total	Gender		Age		Place of residence	
		Men	Women	20-49 years	≥50 years	Urban area	Rural area
	% of respondents						
Slimming	4.1	3.0	5.2	5.3	2.9	3.6	4.6
Vegetarian	2.2	2.6	1.8	3.4	0.8	2.1	2.2
Diabetic	6.2	6.2	6.3	4.7	7.9	5.3	7.0
Low-fat or low-cholesterol	8.6	7.7	9.5	4.6	13.0	9.5	7.9
Gluten-free	4.7	5.3	4.1	4.8	4.5	5.8	3.8
With low salt content	7.6	8.6	6.8	6.2	9.2	7.9	7.4
Related to food allergies (e.g. nuts, milk, shellfish)	8.0	7.6	8.4	6.4	9.7	6.8	9.0
Lactose-free (dairy products)	3.4	2.9	3.9	2.1	4.8	3.0	3.8
Vegan	0.1	0.0	0.1	0.2	0.0	0.1	0.0
Other	2.4	1.3	3.4	3.8	1.0	1.6	3.1
I do not follow any diet	67.0	70.0	64.3	73.4	60.1	67.2	66.9

Regarding the factors that make healthy eating difficult, the largest number of Poles indicated high prices of healthy food (29.3% of people). A significant

number of people felt that preparing a healthy meal takes too much time (14.7%). However, almost one-fifth of Poles stated that they had no need to eat healthily. In contrast, 25.6% felt that they ate healthily and did not see any difficulties. More women than men noticed factors that made it difficult to eat healthily, e.g. high prices of healthy food, the time it took to prepare a healthy meal or the small selection of healthy food in the store where they most often did their grocery shopping. In contrast, more men than women felt that there was no need to eat healthily. Compared to the younger age group, more people aged ≥ 50 years indicated high prices of healthy food as a factor hindering healthy eating and also admitted that there was no need to eat healthily. In contrast, more people aged 20-49 chose the answer: „I have never been taught how to eat healthily" or „no information about healthy meals in restaurants/canteens". Slight differences were observed between residents of urban and rural areas. More people living in the city felt that they ate healthily and did not see any difficulties. In contrast, more people living in rural areas identified the following as factors that made it difficult to eat healthily: high prices of healthy food and the small selection of healthy food in the store where they most often did their shopping (Table 14b.14).

Table 14b.14. Factors hindering healthy eating indicated by Poles (1, 2 or 3 answers possible)

Factors	Total	Gender		Age		Place of residence	
		Men	Women	20-49 years	≥50 years	Urban area	Rural area
	% of respondents						
I eat healthy, I don't see any difficulties	25.8	26.5	25.2	25.5	26.1	28.2	23.8
High prices of healthy food	29.3	25.9	32.3	27.0	31.8	27.2	31.0
Small selection of healthy food in the places where I shop most often	9.2	7.7	10.5	9.5	8.9	7.4	10.7
It takes too long to prepare a healthy meal	14.7	13.1	16.1	15.7	13.6	14.3	15.0
Small selection of healthy food in restaurants, canteens, food vending machines	6.4	6.6	6.3	8.2	4.6	6.6	6.3
Lack of information about healthy meals in restaurants, canteens	5.7	6.2	5.2	7.0	4.2	5.2	6.0
I don't know how to prepare healthy food	7.8	8.0	7.7	8.5	7.1	7.3	8.3

Factors	Total	Gender		Age		Place of residence	
		Men	Women	20-49 years	≥50 years	Urban area	Rural area
	% of respondents						
I have never been taught how to eat healthily	9.2	9.7	8.7	11.1	7.1	9.0	9.3
I don't like healthy food	10.7	10.5	10.8	11.5	9.8	10.9	10.5
Other people encourage me	3.0	3.4	2.7	4.1	1.9	2.9	3.2
I have no need (no desire)	19.4	21.5	17.5	16.9	22.0	19.8	19.0
Other reasons	0.0	0.0	0.0	0.0	0.0	0	0

Similar results concerning dietary habits were observed in epidemiological studies conducted between 2017 and 2020 by the Medical University of Warsaw (WUM) within the framework of the National Health Program (NPZ) (Traczyk, 2020; Szostak-Węgierek, 2020). Among individuals aged 19–64, numerous irregularities were found in the frequency of consumption of food groups, classified into those with potentially beneficial and adverse effects on the body, with more dietary mistakes observed in men than in women. Fruits and vegetables, milk and fermented dairy beverages, wholemeal bread, fish, and legumes were consumed too infrequently, whereas butter, white bread, highly processed cereal products such as white rice, sweets, red meat and canned meat products, as well as fried dishes, were consumed too often (Traczyk, 2020).

Individuals aged 65 and over also consumed less frequently than recommended such products as vegetables and fruits, whole-grain bread, dairy products, legumes, and fish, while too often they consumed butter, cold cuts, white bread, fried foods, lard, and sweets (Szostak-Węgierek, 2020).

15. ASSESSMENT OF CHANGES IN PM2.5 CONCENTRATIONS AND HEALTH EFFECTS RESULTING FROM LONG-TERM EXPOSURE TO THESE CONCENTRATIONS IN POLAND IN THE PERIOD 2019-2023 IN THE LIGHT OF THE REVISION OF EU DIRECTIVES AND WHO GUIDELINES

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Air pollution, as a mixture of gases, aerosols, and suspended particulate matter (the dispersed phase of aerosols), is a significant factor influencing human health. Numerous published epidemiological studies (summarised, among others, in the regularly updated guidelines of the WHO[1,2,3,4]) have demonstrated an association between exposure to air pollution and a wide range of adverse health effects in the general population. The pollutants most commonly included in health impact assessments are particulate matter along with its content of heavy metals and polycyclic aromatic hydrocarbons, ozone (O_3), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), and carbon monoxide (CO). Findings from health risk assessment studies indicate that, in terms of health impact, exposure to airborne particulate matter – especially its finest fraction, PM2.5 (particles with a diameter of less than 2.5 micrometres) – is of greatest concern[5]. It is estimated

[1] Air quality guidelines for Europe. WHO Regional Office for Europe. WHO Regional Publications, European Series, No. 23, Copenhagen, 1987

[2] Air quality guidelines for Europe, 2nd ed. WHO Regional Office for Europe. WHO Regional Publications, European Series, No. 91, Copenhagen, 2000

[3] Air Quality Guidelines. Global update 2005. Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide, WHO Regional Office for Europe, WHO Regional Publications, European Series, No. 91. Copenhagen, 2006

[4] WHO global air quality guidelines. Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. Geneva: World Health Organization; 2021

[5] WHO global air quality guidelines. Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. Geneva: World Health Organization; 2021

that long-term exposure to PM2.5 particulate matter contributes to 4.2 million premature deaths globally[6], accounting for approximately 8% of the total burden of disease[7,8]. In the case of Poland, estimates have ranged from around 50,000 premature deaths annually in previous years to slightly over 30,000 in more recent assessments[9,10].

Atmospheric particulate matter includes both primary particles (direct emissions into the atmosphere) and secondary particles (those formed as a result of chemical transformations in the atmosphere, long-range transport from arid regions, or the re-suspension of particles from surfaces). In both cases, the sources of the particles themselves and their precursors may be of natural origin (e.g. volcanic emissions, sea salt aerosol) or anthropogenic origin (e.g. fossil fuel combustion)[11]. In recent years, a number of additional measures have been undertaken in Poland to accelerate the reduction of anthropogenic emissions of suspended particulate matter into the atmosphere, including legal instruments (local legislation – so-called anti-smog resolutions, fuel quality regulations) and economic instruments (the „Clean Air" programme, local subsidy schemes).

This chapter presents the results of analyses concerning trends in annual average concentrations of PM2.5 particulate matter and the number of premature deaths attributable to population exposure to this pollutant in Poland over the past five years (2019–2023), with consideration of the country's administrative division into districts. Population exposure assessments were based on spatial distribution maps of PM2.5 particulate matter concentrations, developed using mathematical modelling of pollutant transformation and transport carried out by the Institute of Environmental Protection – National Research Institute, and corrected using objective estimation methods. These maps were made available

[6] https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health.
[7] https://www.healthdata.org/research-analysis/health-risks-issues/air-pollution
[8] Global burden and strength of evidence for 88 risk factors in 204 countries and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. Brauer, Michael et al. The Lancet, Volume 403, Issue 10440, 2162 – 220
[9] Soares, J., Plass, D., Kienzler, S., González Ortiz, A., Gsella, A., Horálek, J. (2023). Health Risk Assessment of Air Pollution: assessing the environmental burden of disease in Europe in 2021 (Eionet Report – ETC HE)
[10] Jakość powietrza w Polsce w roku 2022 w świetle wyników pomiarów prowadzonych w ramach Państwowego Monitoringu Środowiska (PMŚ). Skotak Krzysztof et al., GIOŚ, Warsaw, 2023
[11] Pyły drobne w atmosferze. Kompendium wiedzy o zanieczyszczeniu powietrza pyłem zawieszonym w Polsce. Biblioteka Monitoringu Środowiska, GIOŚ, Warsaw 2016

by the Chief Inspectorate for Environmental Protection (GIOŚ)[12]. Annual average concentrations at the district level were calculated as area-weighted means based on grid cell data from the maps. The estimation of premature deaths was carried out using a methodology aligned with that applied by the European Environment Agency, assuming a relative mortality risk increase of 8% per 10 μg/m^3)[13] rise in concentration. An additional assumption was made to exclude health impacts below the threshold recommended by the WHO in its latest guidelines (i.e. 5 μg/m^3)[14]. To assess variability in both annual average PM2.5 concentrations and the number of premature deaths across districts in the 2019–2023 period, the average annual rate of change was used. A summary of the results is presented in Table 15.1.

Table 15.1 Annual mean concentration of PM2.5 and estimated number of premature deaths due to long-term exposure and medium-term rate of change in Poland for the period 2019-2023

Indicator	Value					Medium-term rate of change (%)		
	2019	2020	2021	2022	2023	mean	min	max
Exposed population (million)	38.383	38.089	37.908	37.766	37.637	-0.9%	-2.8%	5.4%
Annual mean concentration of PM2.5 from the State Environmental Monitoring stations (μg/m^3)	18.9	16.9	19.2	16.6	14.5	-	-	-
Annual mean concentration of PM2.5 from model (μg/m^3)	15.4	10.5	13.2	12.9	10.7	-8.6%	-15.8%	0.6%
Estimated number of premature deaths (person)	27,647	19,589	31,170	23,940	18,064	-12.1%	-100.0%	5.4%

The analysis of the annual average PM2.5 particulate matter concentrations in individual districts during the 2019–2023 period shows that among the 380 districts in Poland, only the cities of Gdańsk and Gdynia can be considered to have very good air quality. In these districts, the average PM2.5 concentration

[12] https://powietrze.gios.gov.pl/pjp/maps/modeling

[13] Soares, J., Plass, D., Kienzler, S., González Ortiz, A., Gsella, A., Horálek, J. (2023). Health Risk Assessment of Air Pollution: assessing the environmental burden of disease in Europe in 2021 (Eionet Report – ETC HE)

[14] WHO global air quality guidelines. Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. Geneva: World Health Organization; 2021

remained below 5 μg/m^3 – with Gdynia recording values below the level recommended by the WHO in its latest Guidelines in every year analysed. In Gdańsk, slightly higher concentrations were recorded in 2019 and 2021 (Fig. 15.1). It is worth noting that the current legally binding annual limit value for PM2.5—set at 20 μg/m^3 to protect human health and applicable both in Poland and across the European Union—was exceeded, based on the 2019–2023 average, in only 13 districts. These include the cities with district rights of Świętochłowice, Chorzów, Piekary Śląskie, Rybnik, Zabrze, Siemianowice Śląskie, Bytom, Jastrzębie-Zdrój, Żory, Ruda Śląska and Nowy Sącz, as well as Rybnik district. The recently published Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (OJ L 2024/2881, 20.11.2024) introduces a significant tightening of this limit to 10 μg/m^3. At present, this lower threshold is exceeded in more than half of all districts (299 out of 380).

The analysis of changes in annual average PM2.5 particulate matter concentrations across individual districts between 2019 and 2023 indicates a general improvement in air quality during this period. This positive trend may support the achievement of the new standards set by the European Union in the near future, as well as compliance with the values recommended by the WHO. However, success in this regard will depend on the intensity of actions undertaken to reduce air pollutant emissions, as well as on the pace of observed changes in pollutant concentrations in different regions of Poland. The results of the average annual rate of change in PM2.5 concentrations over the 2019–2023 period show a significant improvement in air quality in Poland. Among the 380 districts analysed, a positive average rate of change (indicating a slight deterioration in air quality) of +0.6% was observed in only one district—the city of Legnica. A high rate of improvement, exceeding –10% per year, was recorded in 93 districts, most notably in the city district of Nowy Sącz (–15.8%) and Nowy Sącz district (–15.0%) (see Fig. 15.2).

It is worth noting at this point that such a positive picture is not shown by the index of average relative changes calculated from year to year. In 19 out of the 380 districts in Poland, this indicator is positive. This results from significant fluctuations in annual concentrations. The highest average positive (i.e. adverse) year-on-year relative changes over the 2019–2023 period – exceeding 10% – were observed in five districts: Ząbkowice district (14.4%), the city of Wałbrzych (14.1%), Nakło district (12.8%), Wałbrzych district (12.7%), and Dzierżoniów district (11.2%). This occurred despite these districts having negative average annual

rates of change in the range of -10% to -3%. The greatest relative decreases in annual average PM2.5 concentrations, exceeding 10%, were recorded in the following districts: the city of Nowy Sącz (-14.6%), Brzesko district (-12.6%), Oświęcim district (-11.7%), the city of Dąbrowa Górnicza (-11.5%), Będzin district (11.3%), Bieruń-Lędziny and Pszczyna districts (-10.9%), the city of Koszalin and Jaworzno (10.8%), as well as Chrzanów district (-10.5%), Bochnia district (-10.4%), and Nowy Sącz district (-10.1%).

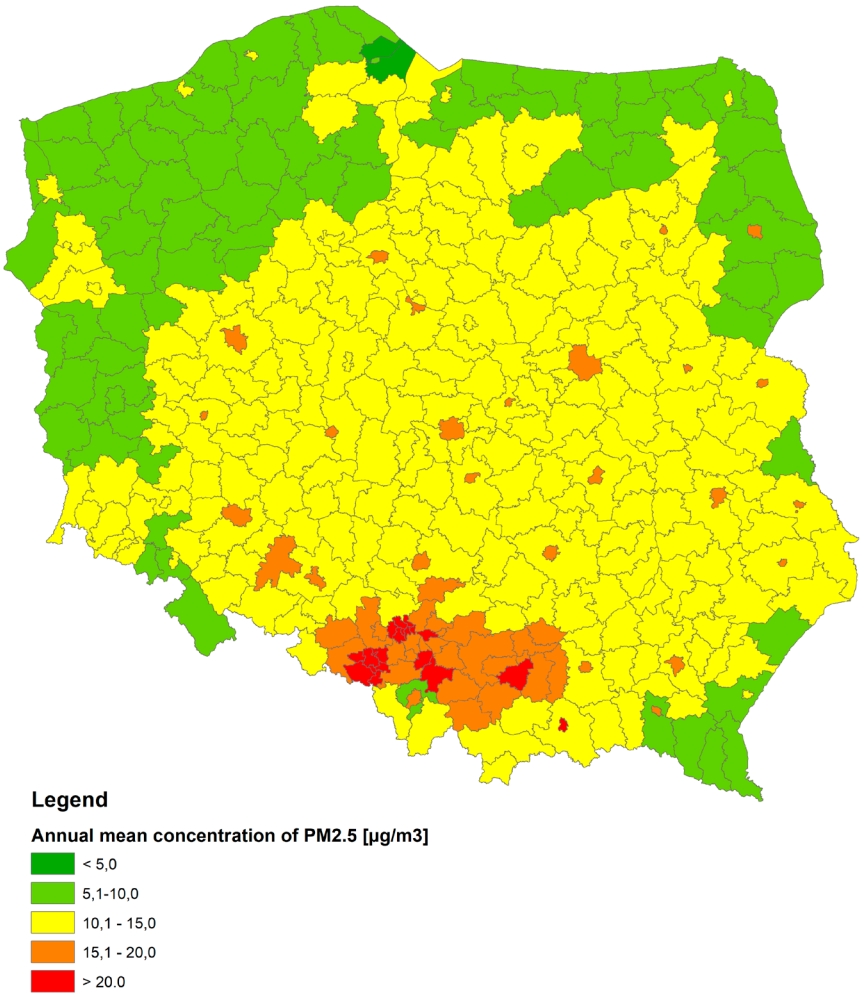


Fig. 15.1. Annual average concentration of PM2.5 in the districts in the period 2019-2023

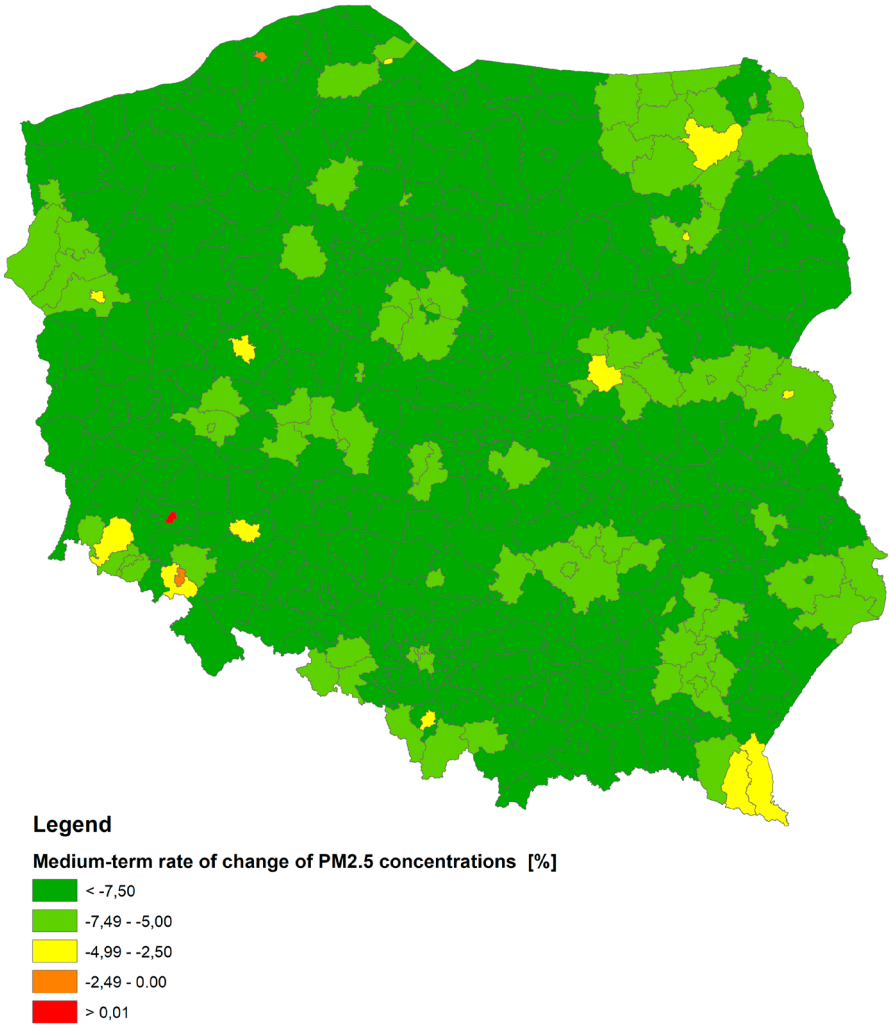


Fig. 15.2. Medium-term rate of change of PM2.5 concentrations in the districts in the period 2019-2023

Improvements in air quality have a tangible impact on reducing the health effects resulting from exposure to specific pollutants. The estimated annual average number of premature deaths attributable to long-term exposure to PM2.5 concentrations exceeding μg/m^3 during the 2019–2023 period exceeds 24,000. These health impacts are not evenly distributed over time and space, as their magnitude depends on the level of pollution, the size of the exposed population, and that population's vulnerability, defined by the mortality rate from natural causes. Due to population density, the highest number of premature deaths is observed

in the largest city districts, namely: the Capital City of Warsaw, Kraków, Łódź, Wrocław, Poznań, and Katowice—each of which recorded, on average, over 300 premature deaths annually during the 2019–2023 period. Notably, in these six districts alone, premature deaths accounted for over 18% of the national total, despite the population of these districts constituting only 12% of the country's total population. An exception to this trend is found in the cities of Gdynia and Gdańsk, where, despite their large populations, the low concentration of PM2.5 does not result in any significant number of premature deaths (0 cases in Gdynia, 9 in Gdańsk). Only a few premature deaths (no more than 6 annually) were recorded in the least populated districts (with populations not exceeding 25,000), such as Bieszczady, Nowy Dwór, Sejny, Lesko, and Gołdap (see Fig. 15.3).

A different picture emerges when looking at the indicator of premature deaths per 100,000 inhabitants. The highest values (exceeding 140 cases per 100,000 inhabitants) are observed in the south of Poland, in the cities of Chorzów, Świętochłowice, Siemianowice Śląskie, Bytom, Piekary Śląskie, and Sosnowiec, as well as in Wodzisław district. The lowest values (not exceeding 18) are recorded in the cities of Gdynia, Gdańsk, and Świnoujście, and in the districts of Puck, Nowy Dwór, Police, Bieszczady, and Koszalin (see Fig. 15.4)

The analysis of the obtained results regarding the medium-term rate of change in the number of premature deaths caused by long-term exposure of residents in individual districts to PM2.5 particulate matter between 2019 and 2023 indicates, in many cases, significant and positive changes. The most positive changes were observed in Gdańsk, where concentrations fell below the expected values and the number of premature deaths attributed to air pollution has now dropped to 0, and in Gdynia, where no changes were observed due to the absence of health effects throughout the entire analysis period. High negative rates of change in the number of premature deaths – exceeding -10% annually – are seen in 257 districts, most notably in Nowy Dwór district (-48%) and in Żary, Elbląg and Żagań districts (each exceeding -23% per year). Unfortunately, the slowest rate of decline in the number of premature deaths among all districts in Poland is generally found in cities with district rights (19 of the 25 districts with the lowest rate of change are such cities), with increases observed in the cities of Legnica (5.4%) and Wałbrzych (1.7%), and virtually no change in Wrocław and Łomża (values below 0.1%) (see Fig. 15.5).

In recent times, numerous reports have appeared in the media and press concerning the most polluted cities in Europe, often highlighting cities in Poland. These rankings are based on various data sources and estimates. Frequently, they take into account only information from monitoring stations, thus excluding cities where no air quality monitoring is conducted.

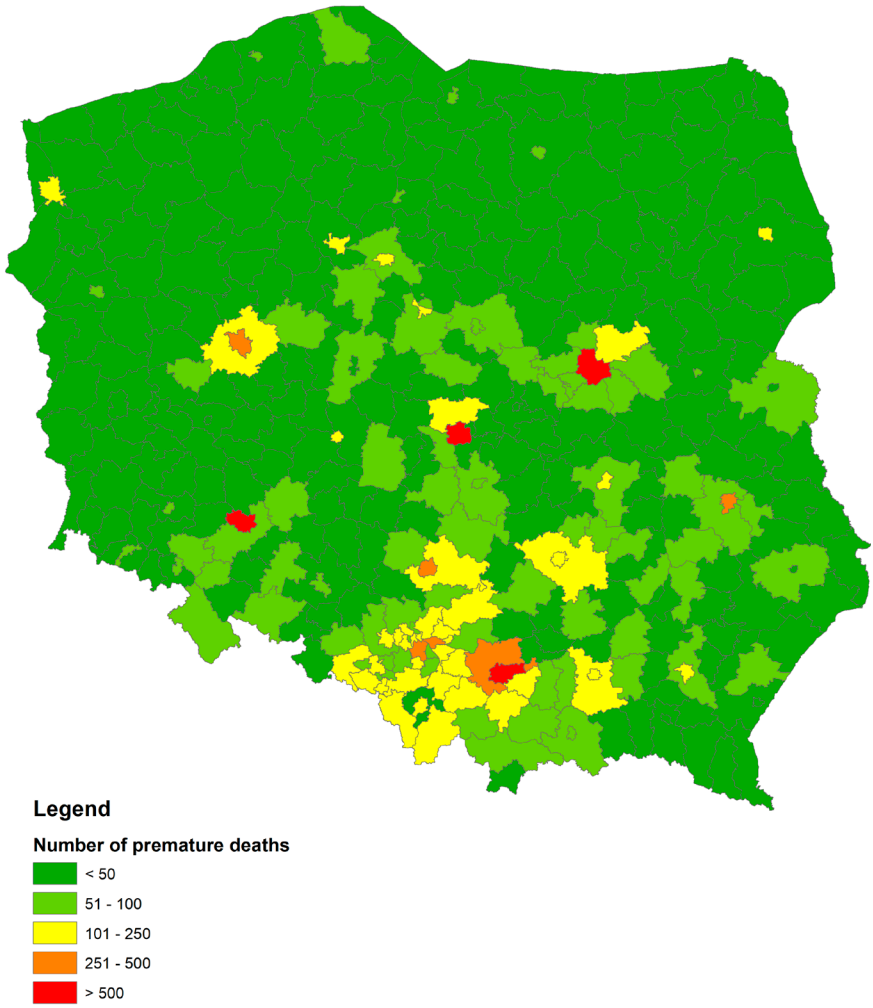


Fig. 15.3. Average number of premature deaths resulting from long-term exposure to PM2.5 concentrations in the districts in the period 2019-2023

Moreover, concentration values derived from monitoring stations do not sufficiently reflect spatial variations in pollution levels within cities. This may lead to an underestimation of risk if stations are located in areas with low concentrations, or an overestimation if they are placed in the most polluted spots, such as near busy roads. It is important to note that air quality monitoring stations in Polish cities are generally located in densely populated areas with potentially the highest concentrations, in order to identify exceedances of air quality standards and thereby indicate the need to develop corrective measures (Air Quality Programmes).

This pattern is also demonstrated by the data presented in Table 15.1, where average PM2.5 concentrations calculated from monitoring station data are higher than the area-weighted averages derived from modelled data corrected using objective estimation methods (maps show concentrations consistent with measurements in the vicinity of the stations and their representative zones). This further confirms the validity of the station placements within the State Environmental Monitoring (Państwowy Monitoring Środowiska) system (as they are located in areas of highest health risk while ensuring high population representativeness for each station).

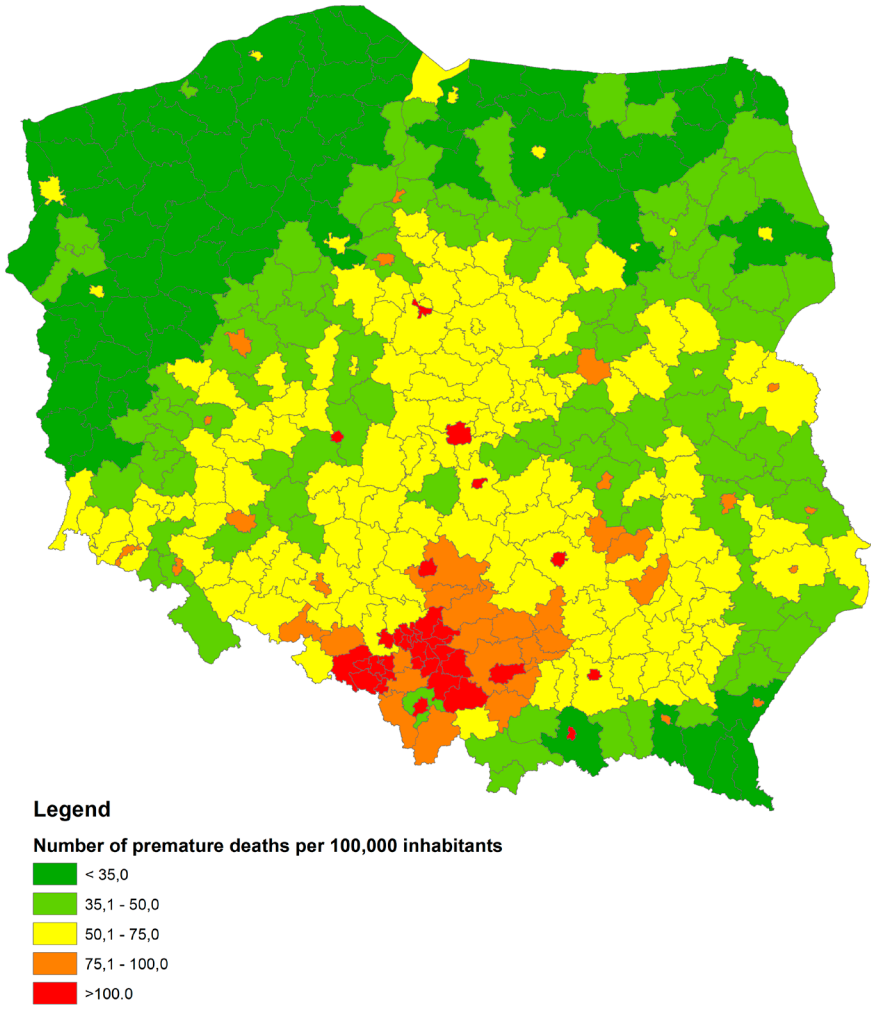


Fig. 15.4. Average number of premature deaths per 100,000 inhabitants resulting from long-term exposure to PM2.5 concentrations in districts in the period 2019-2023

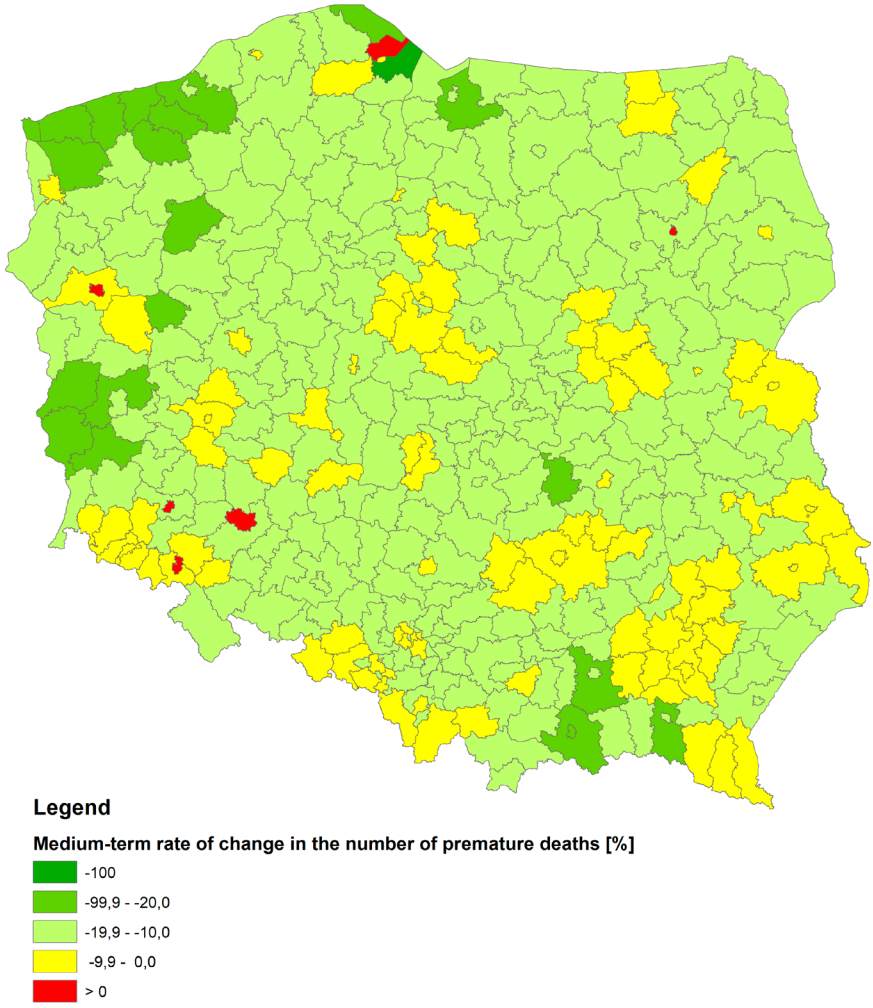


Fig. 15.5. Medium-term rate of change in the number of premature deaths resulting from long-term exposure to PM2.5 concentrations in districts in the period 2019-2023

Below is a summary of the analysis results for the 66 largest cities in Poland (cities with district rights), which are home to nearly one-third of the country's population (12.5 million residents), taking into account the level of exposure to PM2.5 particulate matter, the associated health impacts, and the rate of change over the period 2019–2023.

The results obtained for the period 2019–2023 (to minimise the effect of year-to-year variability, annual average concentrations for each district have been calculated as five-year averages) indicate that, among Poland's largest cities, the

most polluted in terms of PM2.5 are, in order: Świętochłowice, Chorzów, Piekary Śląskie, Rybnik, Zabrze, Siemianowice Śląskie, Bytom, Jastrzębie-Zdrój, Żory, Ruda Śląska, and Nowy Sącz. These cities do not comply with the applicable average annual limit value of 20 μg/m^3 for PM2.5 concentrations. It should be emphasised that the stricter limit value set out in the revised Directive 2024/2881 (10 μg/m^3) is met in only five cities: Gdynia, Gdańsk, Świnoujście, Sopot, and Zielona Góra, while the value recommended by the WHO is met only in Gdynia and Gdańsk. The annual average concentrations in these five cities indicate the best air quality over the past five years (see Fig. 15.6).

Despite air quality problems in the majority of Polish cities (in light of the tightened criteria under Directive 2024/2881), which require intensified efforts to improve air quality, the observed rate of change in many cities indicates the potential for significant improvement in a relatively short period. A positive rate of change (i.e. decreasing concentrations) was recorded in all cities except Legnica, which saw a slight increase of 0.6% over the 2019–2023 period. Among the cities with the poorest air quality, the largest reduction in annual average PM2.5 concentrations was observed in Nowy Sącz (nearly 16%), followed by Piekary Śląskie and Rybnik (over 9%), as well as Żory, Zabrze, and Jastrzębie-Zdrój (over 8%). It is worth noting that a significant medium-term rate of change, exceeding 9% over the 2019–2023 period, was found in 23 of the 66 cities assessed. Among the cities with a strong chance of achieving the tightened EU limit due to their high rate of improvement are Suwałki (-6.8% with an annual average PM2.5 concentration of 11.0 μg/m3), Koszalin (-12.6% with 11.2 μg/m3), and Elbląg (-11.1% with 11.5 μg/m3) (see Fig. 15.6).

The level of health risk in the analysed cities is indicated by the average premature mortality rate per capita. The highest values of this rate, averaged over the 2019-2023 period and exceeding 150 deaths per 100,000 inhabitants, were observed in the most polluted cities, namely Chorzów, Świętochłowice, Siemianowice Śląskie, and Bytom, where the medium-term rate of change in premature deaths remains insufficient (not exceeding 10%). The best premature mortality rates per capita (fewer than 50 cases per 100,000 inhabitants) were recorded in cities with the lowest annual average PM2.5 concentrations – specifically Gdynia, Gdańsk, Świnoujście, Zielona Góra, Sopot, Suwałki, and Koszalin. In these cities (except for Sopot), the medium-term rate of change in the number of premature deaths exceeds 10% (see Fig. 15.7). It is worth emphasising that a high rate of change (above 10%) in premature deaths caused by long-term exposure to PM2.5 was observed in 40% of cities with district rights (27 out of 66), including one of the most polluted cities – Piekary Śląskie. In addition to the cities mentioned above, very high and positive indicators reflecting a significant rate of reduction in the health impacts of PM2.5 exposure were recorded in Nowy

Sącz (20.6%), Elbląg (19.1%), Dąbrowa Górnicza (16.5%), and Przemyśl (15.2%). A negative rate of change in the number of premature deaths (i.e. an increase over the 2019–2023 period) was observed only in Legnica (5.4%) and Wałbrzych (1.7%), while no change (around 0.1%) was recorded in Wrocław and Łomża.

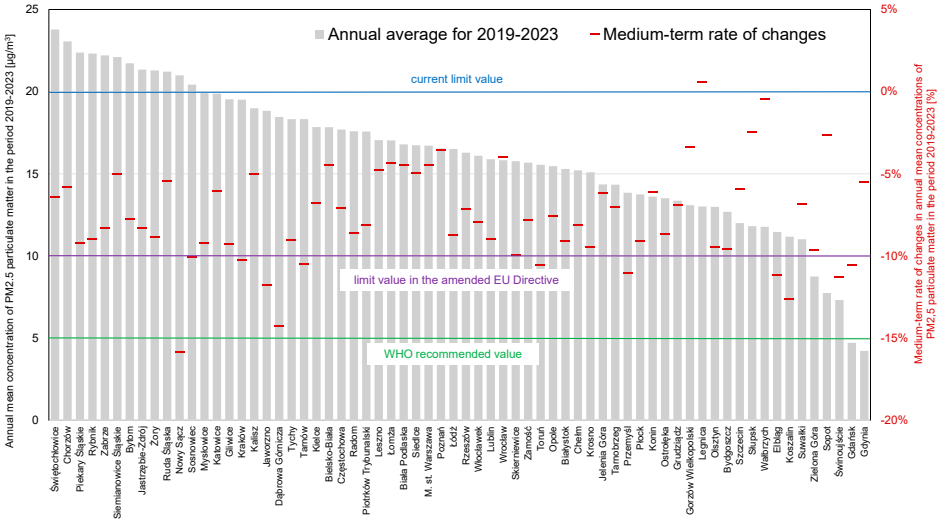


Fig. 15.6. Average annual PM2.5 concentration and medium-term rate of change in concentrations in cities with district rights in 2019-2023 compared to permissible levels and WHO recommended values

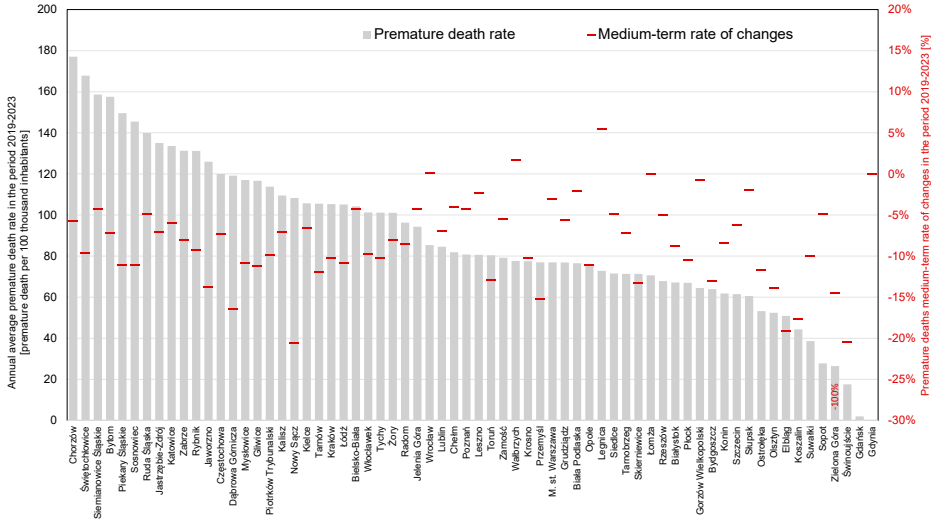


Fig. 15.7. Average annual rate of premature deaths per 100,000 inhabitants due to exposure to PM2.5 and medium-term rate of change in the number of premature deaths in cities with district rights in 2019-2023

16. PUBLIC HEALTH ACTIVITIES IMPLEMENTED IN POLAND IN 2022–2023, REPORTED IN THE PROFIBAZA SYSTEM, IN RESPONSE TO THE HEALTH NEEDS OF MIGRANTS AND WAR REFUGEES FROM UKRAINE

Katarzyna Lewtak, Małgorzata Gajewska, Maria Piotrowicz, Ewa Urban

Challenges in response to the sudden influx of migrants and war refugees from Ukraine to Poland

Before the outbreak of the war in Ukraine, according to the 2021 National Census, approximately 1.4 million migrants were temporarily residing in Poland, the majority of whom were men (62.4%). The largest group consisted of adults aged 20–40 (57.6%), while children and adolescents (aged 0–19) accounted for 4.3%, and persons over 60 years of age made up 3.6% of the migrant population[1]. After 24 February 2022, Poland became one of the main destinations for war refugees from Ukraine. From the beginning of the conflict until the end of 2023, a total of 17.1 million Ukrainians arrived in Poland, of whom 15.3 million returned to their home country[2]. As of the end of 2023, approximately one million Ukrainians remained in Poland, with the largest numbers residing in the following voivodships: Mazowieckie (217,000), Dolnośląskie (111,000), Śląskie (97,000), and Wielkopolskie (95,000)[3] (Fig. 16.1).

[1] Główny Urząd Statystyczny. Migracje zagraniczne na pobyt czasowy – wyniki NSP (31.08.2023 r.), https://stat.gov.pl/spisy-powszechne/nsp-2021/nsp-2021-wyniki-ostateczne/migracje-zagraniczne-na-pobyt-czasowy-wyniki-nsp-2021,4,1.html

[2] Selected activities of the Ministry of Health of the Republic of Poland for the benefit of Ukraine and its citizens in connection with the armed conflict. Ministry of Health Republic of Poland, April 2024.

[3] Statistics Poland. Refugee Health in Poland, https://healthofrefugees.stat.gov.pl/

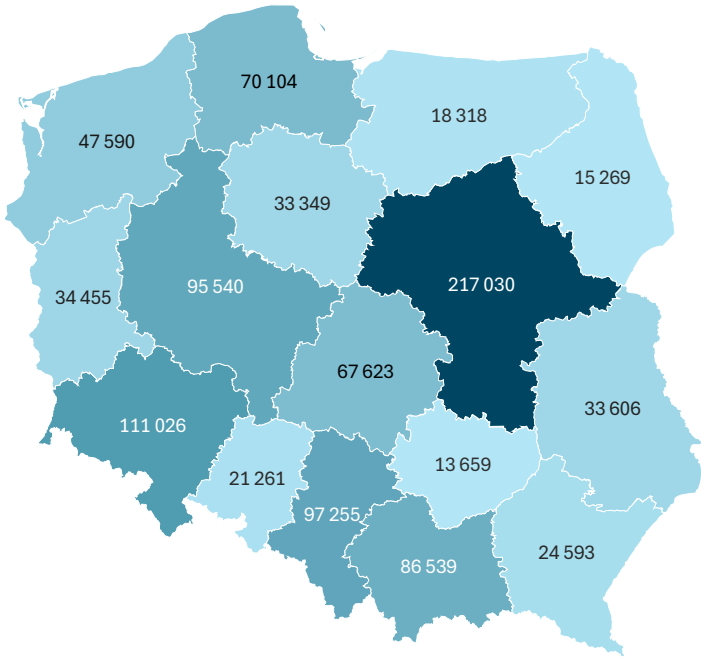


Fig. 16.1. Number of migrants and war refugees from Ukraine in the fourth quarter of 2023 (own study based on data from Statistics Poland https://healthofrefugees.stat.gov.pl/)

The war has also affected the demographic structure of migrants residing in Poland. According to the 2023 survey of the National Bank of Poland, among adult migrants from Ukraine, 68% were women and half were aged 27-44. More than 40 per cent of refugees were living with children[4].

The sharp increase in the number of Ukrainian nationals in Poland necessitated the development of long-term systemic solutions. On 12 March 2022, the Polish Parliament passed an act (Journal of Laws of 2022, item 583) regulating the legalization of stay for Ukrainians and providing public support mechanisms. Public administration, in cooperation with non-governmental organizations and other entities, began implementing these measures across all designated areas. One such initiative was the Local Government Roundtable (Samorządowy Okrągły Stół), held on 8-9 May 2022, which brought together representatives of local governments, central government, NGOs, academics, employers, trade

[4] Sytuacja życiowa i ekonomiczna migrantów z Ukrainy w Polsce w 2023 roku. Raport z badania ankietowego. NBP. Departament Statystyki. Warsaw 2023 r., https://nbp.pl/wp-content/uploads/2024/01/raport_migranci_z-Ukrainy_2023.pdf

unions, and Ukrainian communities. The outcome of this effort was the White Book („Biała Księga") - a document addressing key issues such as social integration, the labor market, housing, security, education, social assistance, and healthcare, including preventive measures. The document highlighted the need for activities promoting immunization, including the option for Ukrainians to receive vaccinations while completing formalities related to residence, employment, and access to healthcare services. It also stressed the importance of effective communication policies and improving access to healthcare services.

The influx of refugees has prompted both public bodies (government and local authorities) and the private sector and non-governmental organizations to launch large-scale humanitarian, social and financial aid initiatives in Poland and Ukraine[5].

Health needs of migrants and war refugees

War, the need to flee one's home, and the accompanying stress have led to numerous health problems among migrants, increasing demand for medical care and placing additional strain on the Polish healthcare system, including the budgets of the National Health Fund and local authorities. According to data from the Ministry of Health, between 24 February 2022 and 31 October 2023, over 1.1 million Ukrainians received services under the public healthcare system. This included 0.9 million patients receiving primary healthcare, more than 385,000 accessing outpatient care, and over 330,000 migrants receiving hospital treatment. Psychiatric care – both inpatient and outpatient – was provided to nearly 14,500 individuals from Ukraine[6].

People arriving in Poland most frequently required medical attention for urgent symptoms such as fever, diarrhea, and coughing, as well as for chronic conditions, dental problems, and psychological and psychiatric support. Refugees with chronic illnesses most commonly required treatment for cardiovascular diseases, diabetes, cancer, and respiratory diseases. The majority of individuals

[5] Biała Księga: Wyzwania systemowego wsparcia uchodźców na poziomie lokalnym i krajowym. Samorządowy Okrągły Stół. Wrocław, 9.05.2022 r., https://www.batory.org.pl/wp-content/uploads/2022/06/Okragly_stol_Biala-ksiega_www_S.pdf

[6] Selected activities of the Ministry of Health of the Republic of Poland for the benefit of Ukraine and its citizens in connection with the armed conflict. Ministry of Health Republic of Poland, April 2024.

in need of healthcare services were aged 65 or older (over 70% of that age group), followed by people aged 55–64 (56%) and children under the age of five (52%)[7].

Public health activities

The mass influx of war refugees into Poland was associated with a significant increase in the risk of epidemic outbreaks. Among the institutions operating in the field of public health, activities undertaken by the State Sanitary Inspection, local government units, and central institutions played a particularly important role.

The activities of the State Sanitary Inspection, through monitoring and assessment of threats, focused primarily on ensuring epidemiological safety. In cooperation with local government units, reception points, refugee centers, temporary accommodation facilities, and other places that were particularly important for maintaining the sanitary-epidemiological safety of the country were supervised. At the same time, health services, local government units, and central institutions carried out numerous public health interventions, including disease prevention and health education campaigns, preparing materials in Polish and Ukrainian on the prevention of infectious diseases and vaccination.

The significant number of war refugees from Ukraine, including primarily women and children, made immunization a matter of critical importance. According to current regulations, all children under the age of 18 residing in Poland for more than three months are subject to mandatory vaccinations under the national vaccination schedule. According to information provided by the Ministry of Health, since 2022, more than 29,400 children have been vaccinated, resulting in the immunization rate among Ukrainian children residing in Poland now being comparable to that of Polish children[8,9].

[7] Health of refugees from Ukraine in Poland 2022. Household survey and behavioral insights research. Statistics Poland, World Health Organization 2023. https://stat.gov.pl/wydarzenia/wydarzenia-miedzynarodowe/health-of-refugees-from-ukraine-in-poland-2022-survey-findings,7,1.html.

[8] Act of 5 December 2008 on preventing and combating infection and infectious diseases (Journal of Laws of 2008 No. 234, item 1570, as amended).

[9] Selected activities of the Ministry of Health of the republic of Poland for the benefit of Ukraine and its citizens in connection with the armed conflict. Ministry of Health Republic of Poland, April 2024.

The ProfiBaza system as a repository of information on public health interventions implemented in Poland for migrants and war refugees

The ProfiBaza system was launched at the NIPH NIH-NRI in 2021 at https://profibaza.pzh.gov.pl/. Its main objective is to collect information on planned and ongoing public health interventions in Poland, including measures targeting migrants and war refugees. In addition, the system aims to improve the quality of data collected, promote multisectoral cooperation and reduce social inequalities in health.

The system consists of two parts. The first is intended for institutions reporting data on public health tasks (the so-called Public Health Intervention Register, RIZP). The second part serves as a knowledge translation platform in health promotion and disease prevention and is addressed to a broad audience.

Electronic submission of annual information via the ProfiBaza system began in 2022. The entities obliged to transfer their data are central institutions (including ministries, the State Sanitary Inspection, scientific and research institutes, uniformed services organizational units) and local government units (including Marshal's Offices, district offices, cities with district rights, municipal offices). The RIZP collects information on planned and implemented interventions covering: health-promoting activities, monitoring and assessment of the population's health status, sanitary-epidemiological supervision, scientific research, and legislation.

Essential Public Health Functions (EPHFs)

Essential Public Health Functions (EPHFs) are a set of fundamental, interconnected and interdependent activities, both within and beyond the health sector, that are required to ensure effective public health action to prevent disease, promote and protect health and well-being, and address broad determinants of health.

In response to current health challenges, particularly the gaps in and fragmentation of health systems revealed by the COVID-19 pandemic, in February 2022, the WHO presented a proposal for a renewed list of Essential Public Health

Functions. Among the twelve proposed EPHFs are equivalents or extensions of the previously applicable European functions (Essential Public Health Operations, EPHOs)[10].

In addition, two new functions were added – concerning the quality and accessibility of health services, and access to and utilization of health products, supplies, equipment, and technologies[11,12].

The EPHFs propose dividing functions into two groups: services-oriented and enabling-oriented (Fig. 16.2). The services-oriented functions should be integrated with services at all levels of care, particularly with primary care. This group includes, among others, emergency and crisis management. In contrast, the enabling functions comprise activities embedded within the health system, other systems/sectors, and communities. Public health intelligence is a cross-cutting function that is service-oriented while also playing a supportive role.

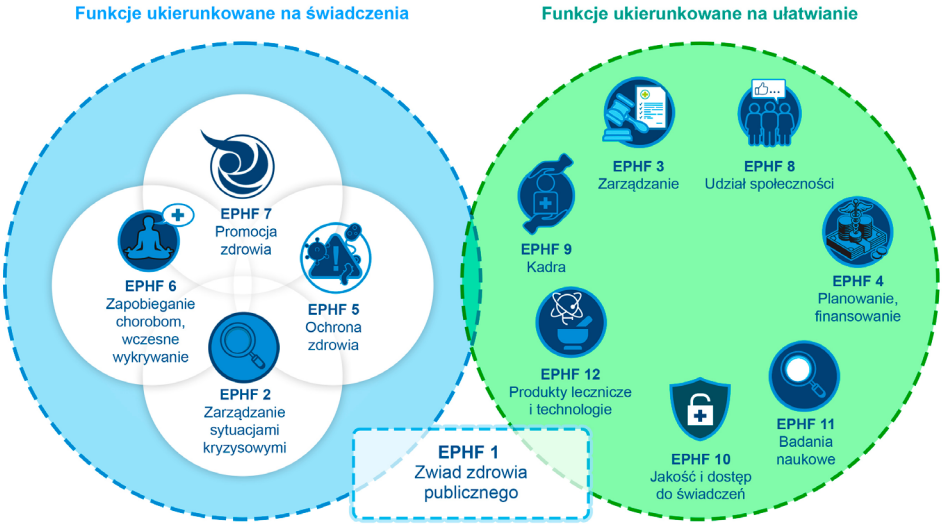


Fig. 16.2. Essential Public Health Functions (EPHFs) presented by the WHO in 2022.

[10] WHO: Strengthening public health capacities and services in Europe: a framework for action. WHO Regional Office for Europe, Copenhagen 2011.

[11] Cianciara D. Odnowione przez WHO podstawowe funkcje zdrowia publicznego powinny być mapą drogową do budowy potencjału zdrowia publicznego i odpornego systemu zdrowia w Polsce. Med Og Nauk Zdr. 2023; 29(2): 63–72. doi: 10.26444/monz/167457

[12] Application of the essential public health functions: an integrated and comprehensive approach to public health. Geneva: World Health Organization; 2024. Licence: CC BY-NC-SA 3.0 IGO.

Public health activities supporting the health of migrants and war refugees from Ukraine according to EPHFs

According to ProfiBaza data, between 2022 and 2023, 3,198 health-related activities were carried out in Poland for Ukrainian migrants and war refugees, of which 1,423 (44.5%) took place in 2022, i.e., in the first year after the outbreak of the war with Russia. The greatest share of measures was implemented in the following voivodships: Śląskie (415 activities), Kujawsko-Pomorskie (342) and Lubuskie (322) (Fig. 16.3).

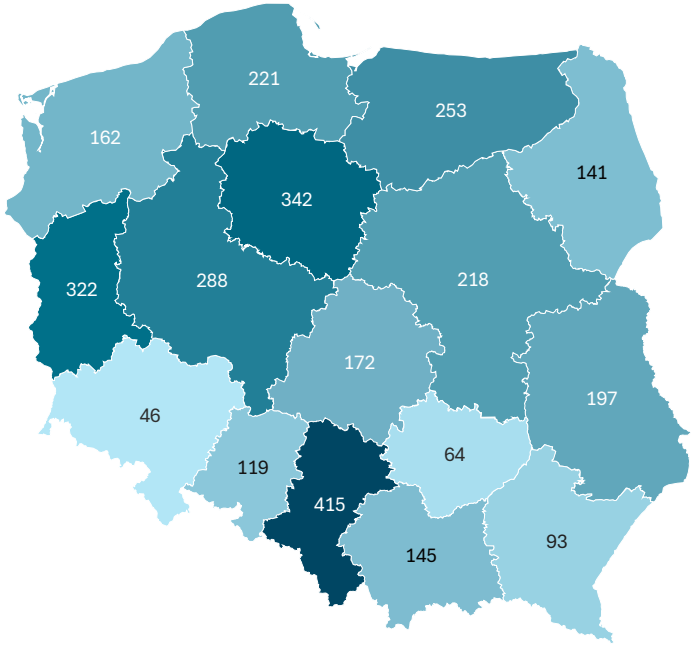


Fig. 16.3. Number of activities supporting the health of migrants and war refugees implemented in 2022–2023 by voivodship (own study based on data from the ProfiBaza system)

In view of the sudden influx of people from war-torn Ukraine to Poland, and then the need to support this group in the host country, units of the State Sanitary Inspection carried out 1,800 activities (56.3% of all reported activities), local government units at all levels carried out 1,353 activities (42.3%), and central institutions carried out 45 activities (1.4%).

The number of activities promoting the health of migrants and war refugees varied by quarter, ranging from 992 in Q1 2022 to 1,344 in Q4 2023. The highest number of activities in 2022 was implemented in Q2 and Q3, and in 2023 – in Q4 (Fig. 16.4). The average duration of a given activity was 215.5 days (SD = 155.0), with a median of 290 days. Every third activity was implemented throughout the entire calendar year (1,120 activities; 35.0%), while 13.5% (433 activities) lasted only one day.

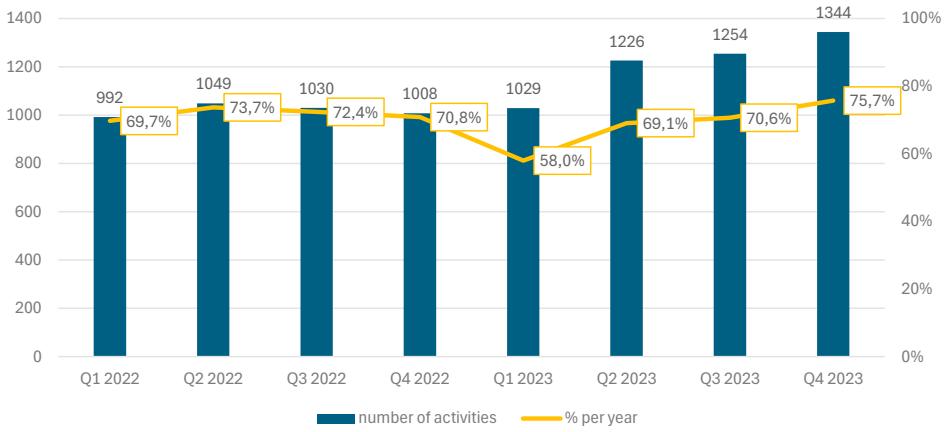


Fig. 16.4. Number of activities supporting the health of migrants and war refugees carried out in a given quarter and in a given year (own study based on data from the ProfiBaza system)

The highest number of measures was targeted at groups of less than 100 people (1,110 activities, 35%) and between 101 and 1,000 people (1,131, 35%). The activities were mostly aimed at both adults and children (1,535, 48%), people regardless of gender (2,743 activities, 86%), or place of residence (2,108 activities, 66%) (Fig. 16.5).

All activities targeting migrants and war refugees reported in the ProfiBaza system were classified under the respective Essential Public Health Functions (EPHFs). These included activities aimed exclusively at migrants, war refugees, or Ukrainians, as well as activities where this group constituted part of the target population (e.g. activities addressed to all municipality residents, including migrants and refugees). Most activities were carried out under the following functions: EPHF5 (1,701 activities), EPHF6 (2,654 activities), and EPHF7 (2,151 activities) (Fig. 16.6).

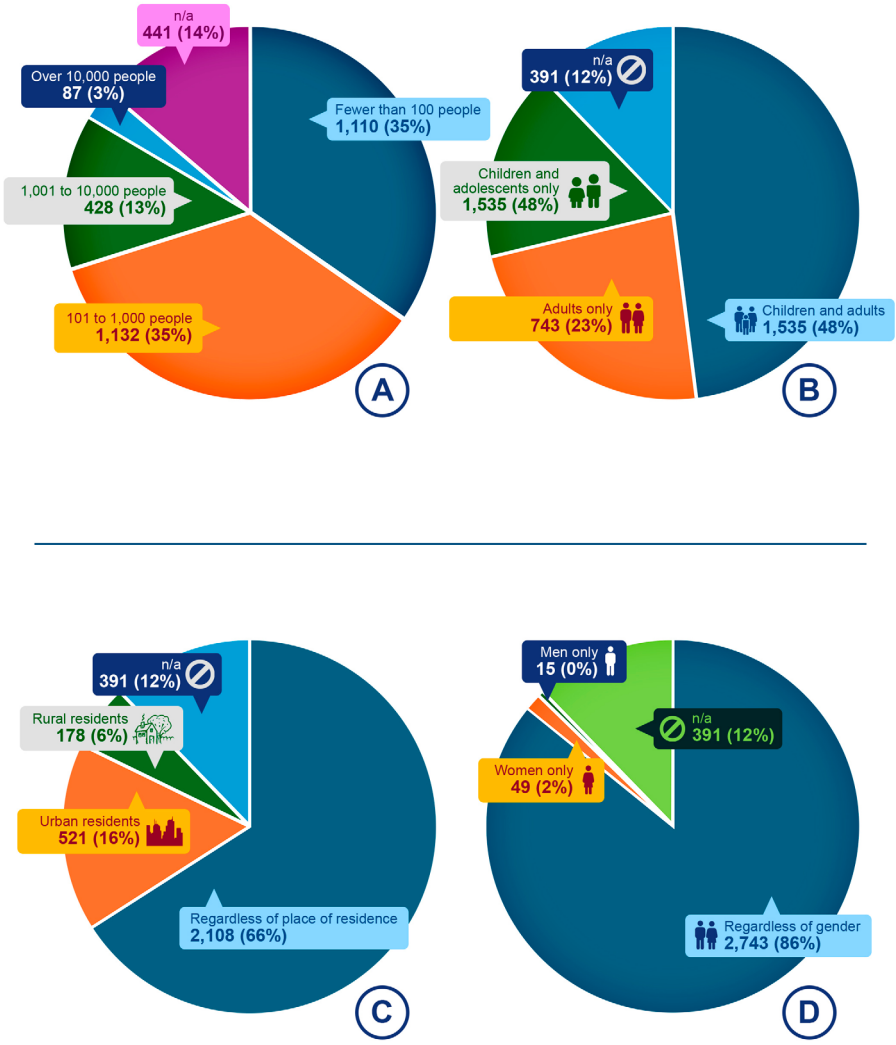


Fig. 16.5. Number of activities by target group, i.e. A – number of recipients, B – age groups, C – place of residence, and D – sex (own compilation based on data from the ProfiBaza system)

EPHF1. Public health surveillance and monitoring: Monitoring and surveillance of population health status, risk, protective and promotive factors, threats to health, and health system performance and service utilization

Under the first Essential Public Health Function, 348 activities were carried out (10.9% of all activities targeting migrants and war refugees from Ukraine).

These included, among others, the collection and analysis of data concerning the epidemiological situation, population health status, and its determinants (329 activities; 94.5%), mainly in the context of environmental health (111 activities; 31.9%), infectious diseases (100 activities; 28.7%), and behavioral risk factors (24 activities; 6.9%). Monitoring the population's health status aimed to assess the scale of health problems, both those affecting the migrant and refugee population from Ukraine and the host country population, their trends, and regional variations. This made it possible to identify areas of priority importance for public health and existing health inequalities. The knowledge gained is used in various fields, including health service planning and health impact assessment (HIA).

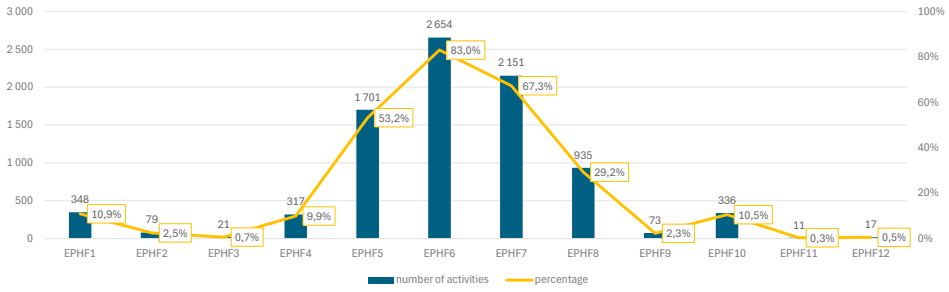


Fig. 16.6. Number of activities supporting the health of migrants and war refugees implemented in 2022–2023 by Essential Public Health Functions (EPHFs) (own study based on data from the ProfiBaza system)

In addition, under this function, activities were undertaken to support the planning, implementation, monitoring, and evaluation of health promotion efforts, as well as the use of medical services by migrants and war refugees (14 activities; 4.0%). The collection of data on the health status of the population and its determinants, as well as potential health threats (including the prevalence of diseases and health issues), was carried out primarily by units of the State Sanitary Inspection (340 activities; 97.7%), operating at the district level. In 2023, NIPH NIH–NRI updated forecasts of new HIV infections in Poland, taking into account migration from Ukraine, and assessed trends in the provision of services in this area. For this purpose, data collected by NIPH NIH–NRI within the epidemiological surveillance system EpiBaza were used, along with data provided by the National AIDS Centre and the National Health Fund, in the context of diagnostics and healthcare use among people living with HIV.

EPHF2. Public health emergency management: Managing public health emergencies for international and national health security

A public health threat refers to the likelihood of an event occurring that may have an adverse impact on human health, particularly one that may lead to international spread or constitute a serious direct threat[13]. On the other hand, an emergency situation, is an event that negatively affects the safety of people, property on a large scale, or the environment, causing significant limitations in the operations of the relevant public administration bodies due to the inadequacy of available resources and means[14].

Under the second essential public health function, 79 activities (2.5%) concerned managing and coordinating public health threats. These focused on comprehensive crisis management, which includes, among others, risk anticipation and proactive measures, forecasting, planning and preparedness, prevention, control and mitigation, early detection, notification, reporting, response, maintenance and restoration of essential health services, and recovery after a public health threat has subsided. These activities were carried out year-round by NIPH NIH–NRI and units of the State Sanitary Inspection.

As part of this public health function, the National Institute of Public Health National Institute of Hygiene – National Research Institute (NIPH NIH-NRI) carried out activities in the field of epidemiological surveillance of infectious diseases, including ensuring the 24-hour operation of the NFPs and the EWRS.

The International Health Regulations (IHR) are a legally binding international instrument for all Member States of the WHO concerning establishing an international early warning system for any public health threat, including those previously unknown. Their aim is to support appropriate and timely action, based on national human resources, infrastructure, and international cooperation, in the event of a health threat. They provide a unique framework for the prevention, detection, assessment, and control of the spread of diseases and for a coordinated response to events that may pose a public health risk of international concern – proportionate to the threats and without causing unnecessary disruption to travel and trade.

The NFP is a center established by each WHO member state. In Poland, it was established by the Minister of Health and launched in 2007 within the Department of Epidemiology of Infectious Diseases and Surveillance at the NIPH NIH. The National Focal Point operates within the early warning system in accordance

[13] WHO. International Health Regulations (2005). https://www.who.int/publications/i/item/9789241580496

[14] Act of 26 April 2007 on crisis management (Journal of Laws of 2007 No. 89, item 590, as amended).

with the International Health Regulations (IHR). At the end of 2020, its responsibilities were expanded to include the tasks of the National Contact Point for the Early Warning and Response System, including the operation of the early warning and response system (EWRS).

EPHF3. Public health stewardship: Establishing effective public health institutional structures, leadership, coordination, accountability, regulations and laws

Health governance encompasses the activities of governments and other actors aimed at guiding communities, countries, or groups of countries towards achieving health and well-being through whole-of-government and whole-of-society approaches to health. The concept of health governance promotes joint action by the health sector and other sectors, representatives of the public and private sectors, and citizens, undertaken in the name of shared interests[15].

Under the third essential public health function, 21 activities (0.7%) were undertaken. These included, among others, efforts to strengthen the country's epidemic preparedness by monitoring communicable diseases and other health threats. These activities were carried out within the EU-level Early Warning and Response System for serious cross-border health threats. Furthermore, representatives of the Ministry of the Interior and Administration, within the framework of international cooperation, participated in meetings of the World Health Assembly, the UN Security Council, and the UN General Assembly, providing information on the health impacts of the Russian aggression against Ukraine and the assistance provided by Poland to Ukrainian migrants and refugees, particularly regarding their access to healthcare in the host country. Within the framework of the Joint United Nations Programme on HIV/AIDS (UNAIDS), financial support was provided for activities implemented in Ukraine. Additionally, the National Centre for Prevention of Addictions participated in legislative work of the Intergovernmental Working Group on Cooperation in Combating Drug Abuse and the Illicit Trafficking of Narcotic Drugs.

EPHF4. Multisectoral planning, financing and management for public health: Supporting effective and efficient health systems and multisectoral planning, financing and management for public health

This function aims to ensure that public health services are regulated and coordinated through effective mechanisms and processes by the relevant institutions of the broader health system.

[15] Kickbusch I, Gleicher D. Governance for health in the 21st century. World Health Organization. Regional Office for Europe, 2012.

Under the fourth essential public health function, 317 activities (9.9%) were implemented, focusing on integrating a public health orientation into the activities of the health system, as well as multisectoral planning and financing of initiatives for the benefit of migrants, war refugees, and the host community. These activities included aligning health sector planning, sustainable financing, and management of health programs with the health needs and priorities of both war refugees and migrants from Ukraine and the host population, in an integrated and public health-oriented manner.

In the analyzed period, over two-thirds of activities (204 activities, 64.4%) in this area were implemented by central institutions (respectively: State Sanitary Inspection – 129 activities, 40.7%; other central institutions – 75 activities, 23.7%). Local government units implemented 113 activities (35.6%). Activities under this function addressed, among others, the adaptation of the scope of work and organizational structures of various institutions responsible for health management and protection to the crisis caused by the war in Ukraine. An example of such an activity was the „POWER Ukraine" project carried out by the State Sanitary Inspection, aimed at increasing health security for citizens, including Ukrainian migrants and war refugees, by strengthening the sanitary-epidemiological surveillance in Poland and implementing measures to facilitate access to healthcare services. The project also included developing the System of Records of the State Sanitary Inspection and purchasing IT equipment and software. Furthermore, within the framework of intersectoral cooperation, various institutions supporting migrants (including from the education, healthcare, social welfare sectors, and NGOs) were involved in the implementation of tasks and organized meetings and consultations to develop joint methods for responding to the current needs of this group and for financing planned activities. Representatives of the Ukrainian community were also included in these activities. Other tasks carried out included improving infrastructure by adapting premises to new needs or modernizing medical facilities.

EPHF5. Health protection: Protecting populations against health threats, for example environment and occupational hazards and communicable and noncommunicable diseases, including mental health conditions, food insecurity, and chemical and radiation hazards

The fifth public health function is related to the provision of health services in the context of, among other things, environmental health (including climate change and sustainable development), occupational health, food and consumer

product safety, road safety and patient safety (including supervision of the safety of medicines, monitoring of adverse reactions to vaccines, control of communicable diseases and infections related to the provision of health services).

Over half of all analyzed activities were carried out under this public health function (1,701 activities, 53.2%). The aim of these initiatives was to protect the health of the population, including migrants and war refugees, against threats posed by both the natural environment and human activity. Most activities in this area were carried out by sanitary-epidemiological stations (971 activities, 57.1%), and less frequently by other central institutions (438 activities, 25.8%) or local government units (292 activities, 17.1%).

The implemented programs most often concerned environmental health (642 measures, 37.7%), while 17.3% of measures related to health protection at places of education and work (294 measures). These measures mainly consisted of inspections in subordinate institutions and the distribution of educational materials. One in ten activities implemented in this area concerned food safety (171 activities, 10.1%). An example was the implementation of tasks under the European Food Safety Authority (EFSA) campaign „Choose Safe Food", which aimed to encourage consumers to make informed choices about food and food safety.

Patient safety measures accounted for 1.8% of all activities carried out in this area (31 measures) and focused mainly on combating antibiotic resistance and hospital infections. Several programs implemented by the State Sanitary Inspection addressed the issue of vaccine adverse events (VAE). Road safety was also addressed (15 activities, 0.9%), with measures including the safety of pupils on their way to school.

EPHF6. Disease prevention and early detection: Prevention and early detection of communicable and noncommunicable diseases, including mental health conditions and injuries

Disease prevention is any activity aimed at preventing the occurrence of a disease, as well as minimizing the impact of disease and disability. Disease prevention in the context of the public health function concerns all stages of prevention, although the greatest emphasis is placed on primary prevention and secondary prevention (early detection of diseases).

The 2,654 activities implemented (83.0%) mainly involved State Sanitary Inspection (1,493 tasks; 56.3%) and local government units (1,137 activities; 42.8%). Every second activity was aimed at both children and adults (1,328; 50.0%), and every fifth one was directed exclusively at children and young people (503; 19.0%).

In the area of the sixth public health function, tasks focused primarily on resources, processes and activities supporting the prevention and early detection of infectious and non-infectious diseases (including mental health disorders) among migrants and war refugees from Ukraine. The dominant theme was lifestyle and behavioral risk factors common to many diseases (1,411 activities; 53.2%). Tasks in the area of overweight and obesity prevention accounted for 14.7% of all activities in this area (390 tasks). 1,094 activities (41.2%) concerned the prevention of infectious diseases, including HIV infection and AIDS (196 activities; 7.4%) and COVID-19 (147; 5.5%). Mental health was the subject of 768 activities (28.9%), and addiction – 595 activities (22.4%).

Disease prevention measures are available to Ukrainian war refugees and migrants ne on the same terms as citizens of the host country, and numerous information and education campaigns have been dedicated to spreading knowledge and facilitating access to services and programs.

Activities in the area of primary prevention reported in the ProfiBaza system mainly concerned health education (2,312 activities; 87.1%), and to a lesser extent vaccinations (682 activities; 25.7%, including vaccinations carried out in only 6 programs) and were targeted at individuals and the environment in which they live in order to reduce the likelihood of disease or health disorders. They were primarily used to improve health literacy and build trust in vaccinations among Ukrainian migrants and war refugees. The community of migrants and war refugees from Ukraine was encouraged to participate in preventive vaccinations in accordance with the national vaccination schedule for the given year and to participate in vaccinations to fill gaps in immunization. These tasks were often multisectoral and involved institutions from the health care, social care and education sectors, as well as State Sanitary Inspection, local government units and NGOs. They were often part of celebrations such as European Immunization Week, European Antibiotic Awareness Day, World Health Day and/or health promotion programs, e.g. Stay Fit! („Trzymaj Formę!"), Know your moles („Znamię – znam je"), Clean air around us („Czyste powietrze wokół nas") or regular educational events on safety during the holidays or promoting personal hygiene rules, such as Hand washing school („Szkoła mycia rąk").

Secondary prevention (158 tasks; 6.0%) included early detection of diseases and rapid response measures aimed at stopping the progression of the disease. The screening tests included early detection of cancer, hearing and vision impairments, metabolic diseases (including diabetes) and infectious diseases (e.g. hepatitis, COVID-19). There were also preventive measures in the form of basic tests aimed at Ukrainian women, among others, and depression diagnosis. In the

area of secondary prevention, efforts were also made to increase the participation of Ukrainian citizens and the local community in the Prevention 40 Plus („Profilaktyka 40 Plus") program.

Phase III prevention focused on treatment and rehabilitation measures (64 tasks; 2.4%) aimed at limiting the effects of the disease and reducing the risk of recurrence, mainly in the areas of medical rehabilitation and disability prevention. Four programs concerned palliative care.

EPHF7. Health promotion: Promoting health and well-being as well as actions to address the wider determinants of health and inequity

According to the Ottawa Charter, an international agreement concluded under the auspices of the WHO in Ottawa in 1986, health promotion is a process that enables people to increase control over and improve their health. This process involves action in five priority areas, such as: (1) building healthy public policy, (2) creating supportive environments, (3) strengthening community action, (4) developing personal skills, and (5) reorienting health services[16].

Health promotion focuses on people and the conditions in which they live. Health problems arise in the neighborhood – in a specific life context – where people live, work and play, norms and value systems are formed, customs are established, social bonds are created, and communication systems develop. Health promotion treats health as the result of a variety of factors. It pays particular attention to the social determinants of health and health inequalities, and promotes social justice, solidarity, and health equity.

Efforts undertaken as part of the seventh public health function included 2,151 activities (67.3%) aimed at promoting health among communities, including migrants and war refugees. These focused on interventions leading to changes in people's behavior, lifestyle and living environment (e.g. environmental and psychosocial factors). Such activities aim to reduce social inequalities in health and empower individuals and communities to increase control over their health and its determinants.

The measures taken were mostly educational (1,653 measures, 76.8%), and every tenth measure concerned building a health-promoting environment and changing the environment (247 measures, 11.5%), including the development of sports infrastructure in schools, ensuring residents' access to sports and recreational services, as well as renovating and equipping relevant facilities.

[16] Cianciara D. Zarys współczesnej promocji zdrowia. PZWL Wydawnictwo Lekarskie, Warsaw 2010.

The most common initiatives promoted healthy lifestyles and health behaviors (1,476 activities; 68.6%). One in three health promotion activities addressed mental and social health (789 activities; 36.7%). The most common topics of health promotion activities were infectious diseases, such as HIV/AIDS or vaccine-preventable diseases (533 activities, 24.8%) and lifestyle issues, such as physical activity (298 activities, 13.8%), alcohol (286 activities, 13.3%), nutrition/diet (167 activities, 7.8%), and smoking (134 activities, 6.2%).

The activities were carried out in various places frequented by migrants and war refugees, reflecting the so-called community-based approach to health promotion. Most activities were carried out in educational institutions (766 activities, 35.6%), recreation/sports/leisure facilities (230 activities, 10.7%), public utility institutions such as libraries (224 activities, 10.4%) and the media/virtual space (189 activities, 8.8%).

The recipients of health promotion activities were most often both adults and children (1,157 activities, 53.8%), while fewer programs were targeted exclusively at children (474 activities, 22.0%) or exclusively at adults (481 activities, 22.4%).

Ukrainian citizens – migrants and war refugees – were the main target group or part of the target population. Activities dedicated to Ukrainian migrants included programs such as Health promotion among people arriving from Ukraine („Promocja zdrowia wśród osób przybywających z Ukrainy") (187 activities, 8.7%) and „POWER Ukraine" project (54 activities, 2.5%), as well as several other activities (e.g. psychological support for refugees from Ukraine, helping Ukrainian students cope in Polish schools, antenatal classes for Ukrainian women). Activities aimed at the broader population, including migrants and refugees, included the National Programme for HIV Prevention and AIDS Control, the Local Program for Alcohol Prevention and Problem Solving and Drug Prevention, activities promoting safe leisure among young people and a healthy lifestyle, physical activity and healthy eating (including the Stay Fit! („Trzymaj Formę!") program implemented in schools).

EPHF8. Community engagement and social participation: Strengthening community engagement, participation and social mobilization for health and well-being

Health communication is the art and technique of informing, influencing and motivating both individual and institutional and public audiences on health-related topics. Its scope includes disease prevention, health promotion, health policy, as well as quality of life and the health status of the population. Health advocacy is one of the three main strategies for health promotion and uses various

methods, such as the media, community mobilization through coalition building, participation in public consultations and public debate.

Communication and community engagement to inform, motivate and engage the community in health issues were included in 935 activities (29.2%) under the eighth public health function. These were primarily activities aimed at building a health-promoting environment in which well-informed community members are able to make decisions and share responsibility for their own health and mainly focused on working and learning conditions (447; 47.8%) and living and leisure conditions (404; 43.2%). Their objectives included building health literacy and counteracting the phenomenon of infodemic in order to promote community participation in the design and planning of health services and to strengthen the ability to seek, understand and use reliable sources of information to reduce health risks, prevent disease, promote health, use health services and engage in health advocacy. Various communication methods were used, including traditional methods, such as printed materials available in Ukrainian (303 activities), social media (214 tasks) and mass events (e.g. health promoting picnics).

Most of the activities related to this public health function were carried out by State Sanitary Inspection (496 activities, 53.0%), while local government units carried out 175 activities (18.7%). These activities were aimed at both children and adults (581; 62.1%), with only 88 activities (9.4%) targeting exclusively the youngest migrants and war refugees.

Some of the activities carried out were aimed at integration with the local community, e.g. the Project Ukraine („Projekt Ukraina") program, which organized meetings between parents of Ukrainian children who had joined local primary schools. Virtual space, including social media, was used for educational and informational purposes.

EPHF9. Public health workforce development: Developing and maintaining an adequate and competent public health workforce

This function covers resources, processes, and activities relating to the public health workforce. It concerns the development of appropriate skills and competencies to support the provision and implementation of public health services in accordance with the identified health needs of the population. Competent staff are essential for building public health capacity – a team of people with the proper knowledge and skills to translate theory and research findings into practical action to improve the health of migrants and war refugees in the host country and the native community, as well as to make efforts to reduce social inequalities in health.

Seventy-three activities (2.3%) were identified in this area. Most of the activity concerned the implementation by State Sanitary Inspection units of the „POWER Ukraine" project (22 activities, 30.1%), under the Operational Programme Knowledge Education Development 2014-2020: Measure 7.1 Strengthening human resources in the health care system. The objectives of the project included strengthening the human resources of State Sanitary Inspection units, including the development and improvement of the soft skills of their employees, and the employment of people fleeing Ukraine due to the armed conflict in Ukraine in inspection bodies throughout the country.

Central institutions and local government units conducted training for various groups of employees involved in assisting migrants and war refugees in response to the needs of the local community, including the program Development of personnel involved in the implementation of public health tasks („Rozwój kadr uczestniczących w realizacji zadań z zakresu zdrowia publicznego"), Development of the competences of employees of the Social Welfare Centre in the Żoliborz District („Rozwój kompetencji pracowników Ośrodka Pomocy Społecznej w Dzielnicy Żoliborz") and Training in preventive programs for teaching staff, educators, students and parents („Szkolenia z programów profilaktycznych dla kadry nauczycielskiej, pedagogów, uczniów i rodziców").

EPHF10. Health service quality and equity: Improving appropriateness, quality and equity in provision of and access to health services

Under the tenth public health function, 336 activities (10.5%) were recorded, covering support and ensuring equal access to comprehensive, high-quality and integrated health services that respond to the identified health needs of migrants and war refugees from Ukraine.

Activities in this area were mainly implemented by local government units (252; 75%). Examples of such activities included the Provision of psychological services for Ukrainian citizens („Świadczenie usług psychologicznych dla obywateli Ukrainy") and the Safe Space („Bezpieczna Przystań") - psychological assistance for children and families with refugee experience.

Events such as White Sundays („białe niedziele"), Health Day („dzień dla zdrowia"), and other initiatives were also organized, during which Ukrainian migrants and war refugees, as well as members of the host community, had access to health education activities, psychological, nursing, and medical consultations, and the possibility to undergo basic examinations (e.g. blood pressure measurements, laboratory tests including those for HIV), dental fluoridation for children,

and vaccinations. Social welfare and healthcare facilities were also equipped with electronic translators to help overcome language barriers and improve communication with migrants and refugees who do not speak Polish.

Other activities included the operation of a Medical Information Point by qualified medical personnel recruited from among Ukrainian refugees, intended for individuals who arrived from Ukraine after 23 February 2022. On-call staff included Ukrainian doctors, a special needs education specialist, and a speech therapist. As part of the point's activities, educational meetings for parents were also held, and a 24-hour first-contact helpline was launched, in accordance with the provisions of the Act of 12 March 2022 on Assistance to Citizens of Ukraine in connection with the Armed Conflict in the Territory of that State.

EPHF11. Public health research, evaluation and knowledge: Advancing public health research and knowledge development

Public health research aims to identify factors that influence population health and/or determine effective interventions to improve health, quality of life, healthy life expectancy, and reduce social health inequalities. In recent years, increasing emphasis has been placed on the use of knowledge, research, and evidence in the development of health policies, strategies, plans, and programs. Demands to link practical actions with research findings are being made across various areas of the health system, including public health.

Activities under the eleventh essential public health function focused on the development of scientific research in public health. In the area of migrant and war refugee health, this included 11 actions (0.3%) covering five research projects.

The „Increased Access to Vaccination for Newly Arrived Migrants" project (acronym: AcToVax4NAM), implemented between 2021 and 2024 by a consortium of European countries, responded to the European Commission's strategy aimed at improving vaccination rates across the EU while reducing inequalities in access to immunization. The project targeted improved access to vaccination for disadvantaged, isolated, and hard-to-reach groups. The beneficiaries included newly arrived migrants in the EU/EEA transit and destination countries. Poland's participation in this project gained particular significance in the context of the influx of refugees from Ukraine. The NIPH NIH-NRI, the Polish institution responsible for implementing AcToVax4NAM, also carried out other research activities concerning the health of Ukrainian migrants and refugees. These included studies on health inequalities in the context of migration policy, the role of primary healthcare in response to the migration crisis, and monitoring the

HIV epidemic in Europe. The National Centre for Prevention of Addictions conducted a research project entitled Quality of life and its determinants in the face of war experiences – a study of Ukrainian mothers and children („Jakość życia i jej wyznaczniki w obliczu doświadczeń wojennych – badania matek i dzieci ukraińskich").

EPHF12. Access to and utilization of health products, supplies, equipment and technologies: Promoting equitable access to and rational use of safe, effective and quality-assured health products, supplies, equipment and technologies

As part of the twelfth essential public health function, 17 activities (0.5%) were carried out to ensure equitable access for migrants and war refugees to essential medicines, medical products and technologies (e.g. vaccines, pharmaceuticals, diagnostic methods, medical equipment, and information and communication technologies for health), as well as their rational use within the host country's healthcare system.

Under the Act of 12 March 2022 on assistance to Ukrainian citizens in connection with the armed conflict on the territory of that country, the so-called Special Act („specustawa"), specific legal provisions were adopted to provide access to medical services for Ukrainian nationals who arrived in Poland after 24 February 2022 due to Russia's military aggression. These services were made available on the same terms and to the same extent as for individuals insured in Poland.

Guidelines issued by, among others, WHO and ECDC in response to the war in Ukraine and the mass migration of refugees indicated that vaccinations in accordance with the national vaccination schedule, both in transit and destination countries, should begin as soon as possible within the migrant and refugee population. In the communications of the Minister of Health dated 8 and 10 March 2022, the following were identified as priority vaccinations for children from Ukraine: MMR at age 2, DTP and polio vaccines appropriate for age, hepatitis B (age-appropriate), and COVID-19 vaccination (not included in the vaccination schedule).

In this public health function area, research was conducted to identify the needs of migrants and war refugees, including access to vaccinations (e.g. the European project Increased Access To Vaccination for Newly Arrived Migrants – AcToVax4NAM), as well as on health inequalities in the context of migration policy – for example, access to healthcare for foreigners in Poland. The tools and solutions developed under these projects included a multilingual glossary of

vaccination-related terminology and the Newly Arrived Migrants (NAM) Vaccination Pathway – a model aimed at country-specific actions or standard operating procedures to overcome systemic barriers hindering effective vaccination of NAMs. The intended users of this tool are health professionals, specialists working with NAMs, and representatives of healthcare system organizations.

Local government authorities also implemented actions such as the use of mobile medical ambulances, in which Ukrainian citizens could receive medical and nursing assistance in Ukrainian, the provision of menstrual hygiene products in primary and secondary schools for Ukrainian female students, and the purchase of SARS-CoV-2 infection tests.

17. IDENTIFICATION OF THE MOST SIGNIFICANT HEALTH PROBLEMS AFFECTING THE POPULATION OF POLAND AND ITS VOIVODSHIPS BASED ON CURRENT RESULTS OF THE GLOBAL BURDEN OF DISEASE (GBD) STUDY

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The challenges faced by the healthcare sector place high and increasingly demanding expectations on those responsible for shaping the system and allocating resources. There is a growing demand for healthcare services, driven by technological advancements that encourage the adoption of new technologies, a relative shortage of resources, and rising medical service costs.

Decision-makers responsible for the effectiveness of health policy at both central and local levels are constantly operating under the pressure of changing conditions within the healthcare environment. At the same time, they are obliged to formulate health policies and establish priorities that support the development of health potential, that is, by reversing the trend of health loss and generating a population-wide increase in healthy life years. With knowledge of the diseases that pose the greatest threat to life and health, policymakers are able to plan actions aimed at more effective prevention aligned with the current health situation, implement measures to control epidemiological threats, reduce risk factors, improve the detection and treatment of chronic diseases, and – in a broader

context – reduce inequalities in access to healthcare for the entire population, regardless of the socio-economic status of specific social groups.

At the core of each of these decisions lie the health problems affecting Polish men and women. The overarching aim of any reform is to enhance the effectiveness and quality of healthcare services, which in turn will build health potential. It is therefore beyond doubt that information on diseases that pose the most serious threat to life, health, and well-being constitutes a fundamental value underpinning decisions regarding the organisation, structure, and allocation of the available, yet limited, healthcare resources.

This chapter is devoted to an extensive overview of the most up-to-date estimates regarding the health status of Poland's population, including the identification of major health problems and risk factors at the voivodship level. The data and analyses presented herein primarily illustrate the scale and causes of health loss by age, sex, and across Poland's 16 regions. Furthermore, the analysis and data presentation allow for the characterisation of health loss through the share of deaths and years lived with disability, as well as the relationship between exposure to risk factors and health loss.

The data presented for various time periods (e.g. 30-year or 10-year spans) enable the analysis of health trends, the identification of areas that have improved, and those requiring intensified efforts to improve population health. It is worth emphasising that the 2020–2021 period was marked by the unprecedented impact of the COVID-19 pandemic on global health, including in Poland. This pandemic significantly disrupted existing epidemiological trends, causing a marked increase in mortality and disease burden, as reflected in the data presented here. Moreover, the impact of COVID-19 has shown regional variation, particularly evident in the considerable differences in incidence and mortality rates between voivodships. These observations introduce a new context to the analysis of health inequalities in Poland, which must be taken into account when interpreting long-term health trends. The analysis of the comprehensive and objective indicator known as disability-adjusted life years (DALY) provides additional value, as it enables comparisons between voivodships in Poland and broadens the scope for international comparisons (not only country-to-country but also region-to-country). Therefore, the GBD study offers a unique opportunity to compare the effectiveness of health policies and create an optimal financial and investment model for the healthcare system.

A comprehensive and exhaustive report on disease burden must be based on a reliable estimation of population health metrics that are epidemiologically significant (i.e. morbidity and mortality). A consistent, comparable, and standardised

tool for describing the health status of the population plays a key role in improving decision-making and operational processes in healthcare. The Global Burden of Disease and Risk Factors Study (GBD), periodically conducted by the Institute for Health Metrics and Evaluation (IHME), is precisely such a coherent source of information on the global burden of disease. It integrates morbidity and mortality data and provides a foundation for comparison.

At the time of preparing this report, the most current version of the study was the GBD 2021 edition, released in 2023, which analysed the health status of the global population from 1990 to 2021.

The GBD study presents an exceptionally broad analytical and comparative scope in the international context. It currently includes data on 459 diseases and risk factors from 204 countries and territories worldwide, enabling the compilation of a database containing over 607 billion values and standardised measurements. On this basis, IHME conducts analyses of the current health situation and explores future health trends. An analysis of the data presented in the 2024 publication cycle[1,2,3,4,5] indicated that between 1950 and 2021, the average global

[1] Murray CJL; GBD 2021 Collaborators. Findings from the Global Burden of Disease Study 2021. Lancet. 2024 May 18;403(10440):2259-2262. doi: 10.1016/S0140-6736(24)00769-4. PMID: 38762327.

[2] GBD 2021 Causes of Death Collaborators. Global burden of 288 causes of death and life expectancy decomposition in 204 countries and territories and 811 subnational locations, 1990-2021: a systematic analysis for the Global Burden of Disease Study 2021. Lancet. 2024 May 18;403(10440):2100-2132. doi: 10.1016/S0140-6736(24)00367-2. Epub 2024 Apr 3. Erratum in: Lancet. 2024 May 18;403(10440):1988. doi: 10.1016/S0140-6736(24)00824-9. PMID: 38582094; PMCID: PMC11126520.

[3] GBD 2021 Diseases and Injuries Collaborators. Global incidence, prevalence, years lived with disability (YLDs), disability-adjusted life-years (DALYs), and healthy life expectancy (HALE) for 371 diseases and injuries in 204 countries and territories and 811 subnational locations, 1990-2021: a systematic analysis for the Global Burden of Disease Study 2021. Lancet. 2024 May 18;403(10440):2133-2161. doi: 10.1016/S0140-6736(24)00757-8. Epub 2024 Apr 17. PMID: 38642570; PMCID: PMC11122111.

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[5] GBD 2021 Risk Factors Collaborators. Global burden and strength of evidence for 88 risk factors in 204 countries and 811 subnational locations, 1990-2021: a systematic analysis for the Global Burden of Disease Study 2021. Lancet. 2024 May 18;403(10440):2162-2203. doi: 10.1016/S0140-6736(24)00933-4. Erratum in: Lancet. 2024 Jul 20;404(10449):244. doi: 10.1016/S0140-6736(24)01458-2. PMID: 38762324; PMCID: PMC11120204.

life expectancy increased by nearly 23 years, from 49 to 71.7 years. However, between 2019 and 2021, life expectancy fell by 1.6 years. Life expectancy decreased in more than 84% of the countries studied, including Poland. At the same time, the GBD study, in its long-term analysis of health trends (extending to 2050 or even 2100), forecasts, among other things, that by 2050, 60% of adults and 31% of children will be overweight or obese, the number of people living with dementia will triple globally. By 2100, ischaemic heart disease will remain the leading cause of health loss in the population.

The GBD study provides information that can support policymakers in making informed decisions and shaping health policies grounded in reliable data. It enables monitoring the effectiveness of implemented measures. It facilitates adopting best practices from countries whose solutions yield the most beneficial outcomes, such as gains in healthy life years and reduced health loss due to disease.

Measures of disease burden – the significance of the DALY indicator and its components

The definition of the disability-adjusted life years (DALY) indicator reflects a measure of health loss resulting from a shortened life expectancy as well as reduced quality of life caused by disease or injury.[1] Interventions implemented by the healthcare system aim to reduce the DALY indicator, thereby extending the time an individual and the population as a whole live in good health. This indicator is often referred to as the "burden of disease" because it consists of two components: years of life lost (YLL) due to premature mortality, and years lived with disability (YLD). This dual structure allows for an accurate determination of the extent to which a specific health problem negatively affects population health.

An analysis of the main categories of health loss causes for both sexes in Poland in 2021 highlights significant differences in the contribution of the individual components of DALY. In the case of the most critical health issues, such as diseases of the circulatory system (DCS) and neoplasms, premature deaths predominate (DCS: 7,057.0 YLL per 100,000 population; neoplasms: 6,971.0 YLL per 100,000 population), while the health loss due to reduced mobility is comparatively lower (DCS: 668.6 YLD per 100,000 population; neoplasms: 194.5 YLD per 100,000 population). This suggests that these diseases are characterised by high mortality rates, an acute or rapid course, or are diagnosed at late and often

incurable stages, as well as by the absence or failure to apply effective interventions. A similar pattern was observed for diseases of the digestive system in 2021, where the share of premature deaths exceeded 75% (1,361.8 YLL and 420.5 YLD per 100,000 population). For other categories of health issues, such as musculoskeletal disorders, injuries, diabetes and kidney diseases, mental disorders, other non-communicable diseases, and sense organ diseases, the health burden on the population mainly results from decreased functionality and reduced quality of life (high YLD contribution). Detailed data on the DALY rates for specific causes are presented in Figure 17.1.

Information on the dominant component of years of healthy life lost constitutes a key element in identifying unmet health needs of society. In the case of diseases with high mortality rates, the healthcare sector's efforts should focus on intensifying health prevention, eliminating harmful health behaviours, improving the quality and accessibility of diagnostics, and expanding access to advanced and effective treatment methods. Conversely, for conditions where the burden arises primarily from disability, in addition to public health interventions aimed at reducing incidence, systemic actions are essential. These should be centred on the development of reference centres and social care mechanisms that mitigate the long-term consequences of such health problems (e.g. coordinated primary healthcare, outpatient specialist care, pain management medicine, among others).

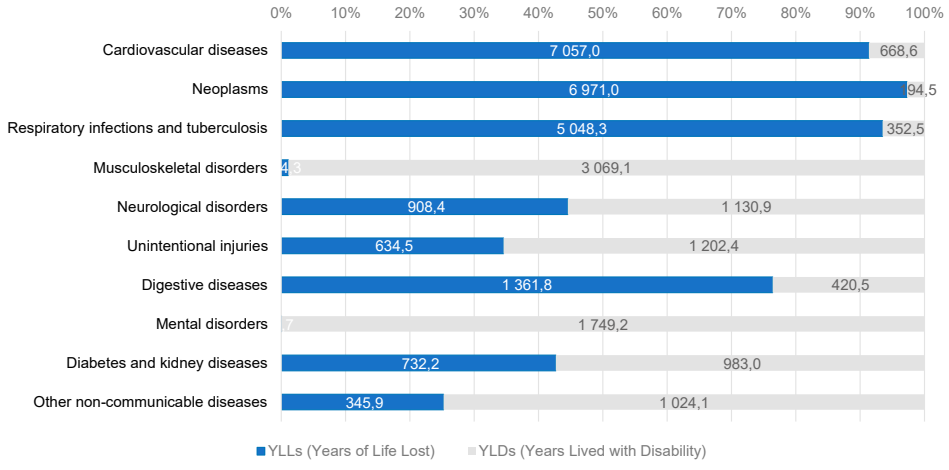


Fig. 17.1. Share of years of life lost due to premature deaths (YLL) and years lived with disability (YLD) expressed as a percentage of DALY for the 10 leading health problems in Poland, both sexes, in 2021.

Leading causes of health loss (DALY) among women and men in Poland and its 16 voivodships

In 2021, the rate of disability-adjusted life years (DALYs) lost due to all causes in the male population of Poland reached 45,307.2 DALYs per 100,000 men. Łódzkie voivodship recorded the highest regional total disease burden at 51,515.7 DALYs per 100,000, while Małopolskie voivodship reported the lowest rate at 39,820.3 DALYs per 100,000. Diseases of the circulatory system were the leading cause of disease burden in the male population in 10 voivodships, with the highest rate observed in Świętokrzyskie voivodship (11,350 DALYs per 100,000, representing 23.7% of the region's total burden). The lowest rate was found in Wielkopolskie voivodship, at 7,713.3 DALYs per 100,000, accounting for 18.3% of the total disease burden in that region. The Polish average for diseases of the circulatory system stood at 8,820.07 DALYs per 100,000 (19.5% of the total burden). When analysing the percentage share of diseases of the circulatory system in the overall disease burden of individual voivodships, particular attention should be paid to Małopolskie and Świętokrzyskie, where these conditions accounted for 22.6% and 23.7% of all years of healthy life lost, respectively. In contrast, in Mazowieckie and Warmińsko-Mazurskie voivodships, this share was lower, fluctuating between 17% and 18%.

In four voivodships – Kujawsko-Pomorskie, Łódzkie, Warmińsko-Mazurskie, and Wielkopolskie – neoplasms were the leading cause of premature mortality and reduced quality of life among men. The Polish average for neoplasm-related DALYs was 8,346.65 per 100,000 (18.4% of the total burden). The highest neoplasm-related DALYs was recorded in Zachodniopomorskie voivodship – 9,533.94 DALYs per 100,000 (20.0% of the regional disease burden), and the lowest in Małopolskie voivodship – 6,849.86 DALYs per 100,000 (17.2% of the burden). Neoplasms contributed the most significantly to the regional disease burden in Kujawsko-Pomorskie, at 20.6% (9,352.28 DALYs per 100,000).

In 2021, the burden classified under respiratory infections and tuberculosis (including COVID-19) was the third largest cause of years of healthy life lost among men, reaching 6,528.99 DALYs per 100,000 (14.4% of the total burden), with COVID-19 accounting for 5,477.96 DALYs per 100,000. The highest rates among men were observed in Łódzkie voivodship (7,594.36 DALYs per 100,000, 14.7% of the regional burden) and Podlaskie voivodship (7,581.75 DALYs per 100,000, 16.4% of the regional burden), and the lowest in Małopolskie (5,013.54 DALYs per 100,000, 12.6% of the regional burden). A significant share of these

values was attributable to the COVID-19 pandemic, which further highlights the regional impact of the health crisis during 2020–2021.

In 2021, unintentional injuries (accidents) ranked as the fourth leading cause of health loss among men in Poland and its regions. The lowest burden from this cause was recorded in Wielkopolskie voivodship (2,281.72 DALYs per 100,000, accounting for 5.4% of the local disease burden). Accidents represented the most significant problem in Podlaskie voivodship (2,974.89 DALYs per 100,000, or 6.4% of the total disease burden) and in Śląskie voivodship (2,928.46 DALYs per 100,000, at 6.2% of the burden). The Polish average for this group of causes was 2,568.20 DALYs per 100,000, representing 5.7% of all years of healthy life lost among Polish men. A substantial contribution of accidents to men's health loss was also observed in Pomorskie (6.0%), Małopolskie (6.1%), and Opolskie (6.0%) voivodships.

Musculoskeletal disorders, diseases of the digestive system, diabetes and kidney diseases, as well as neurological disorders, also had a significant impact on health loss among men in Poland. Table 17.1 presents a detailed list of these and other health problems that contributed most substantially to health loss among men in Poland and its voivodships in 2021.

The total disease burden among women in Poland in 2021 amounted to 36,176.4 DALYs per 100,000, with significant differences observed between voivodships. The lowest DALYs for all causes were recorded in Małopolskie (32,354.0 DALYs/100,000) and Podkarpackie (32,636.2 DALYs/100,000) voivodships. Conversely, the highest burden was reported in Łódzkie voivodship, where DALY reached 41,089.1 per 100,000.

As with the male population, the leading cause of health loss among women was diseases of the circulatory system, with a national rate of 6,699.05 DALYs per 100,000 (accounting for 18.5% of the total disease burden). These conditions ranked as the top cause of premature death or disability in 11 voivodships. The highest DALYs in this category were observed in Świętokrzyskie voivodship (8,476.33 DALYs/100,000) and Lubelskie (8,102.59 DALYs/100,000), where diseases of the circulatory system represented 23.1% and 21.9% of the regional disease burden among women, respectively. Regional variation in cardiac DALYs ranged widely from 16.5% to 23.1%, with cardiac diseases responsible for nearly one-quarter of all health loss among women in Świętokrzyskie.

In the remaining five voivodships – Kujawsko-Pomorskie, Lubuskie, Mazowieckie, Wielkopolskie, and Warmińsko-Mazurskie – neoplasms were the primary cause of disease burden among women. The highest neoplasm-related DALY rate was noted in Lubuskie voivodship, at 6,931.95 per 100,000 (18.7% of the regional burden).

Table 17.1. Disease burden by cause category among men in Poland and its voivodships in 2021, expressed as actual DALYs per 100,000 population and as percentage contribution to the total disease burden. (Ranking of causes 1–15)

Cause	Poland	Dolnośląskie	Kujawsko-pomorskie	Lubelskie	Lubuskie	Łódzkie	Małopolskie	Mazowieckie	Opolskie	Podkarpackie	Podlaskie	Pomorskie	Śląskie	Świętokrzyskie	Warmińsko-mazurskie	Wielkopolskie	Zachodniopomorskie
Total	45 307.2 (100%)	47 137.7 (100%)	45 304.0 (100%)	47 305.6 (100%)	46 724.1 (100%)	51 515.7 (100%)	39 820.3 (100%)	46 052.9 (100%)	44 297.9 (100%)	41 569.2 (100%)	46 221.1 (100%)	41 596.0 (100%)	47 470.3 (100%)	47 831.7 (100%)	45 344.4 (100%)	42 102.9 (100%)	47 783.6 (100%)
W tym:																	
Cardiovascular diseases	8820.07 (19.5%)	10028.80 (21.3%)	7983.22 (17.6%)	9880.11 (20.9%)	9764.53 (20.9%)	9109.63 (17.7%)	9014.50 (22.6%)	7770.72 (16.9%)	9591.06 (21.7%)	7904.57 (19.0%)	7994.54 (17.3%)	7961.21 (19.1%)	9565.50 (20.2%)	11350.45 (23.7%)	8148.40 (18.0%)	7713.26 (18.3%)	9984.63 (20.9%)
Neoplasms	8346.65 (18.4%)	8751.61 (18.6%)	9352.28 (20.6%)	8463.57 (17.9%)	8910.58 (19.1%)	9476.25 (18.4%)	6849.86 (17.2%)	8183.97 (17.8%)	8026.59 (18.1%)	7242.94 (17.4%)	7668.92 (16.6%)	7314.54 (17.6%)	8960.00 (18.9%)	8980.24 (18.8%)	8507.21 (18.8%)	8173.10 (19.4%)	9533.94 (20.0%)
Respiratory infections and tuberculosis	6528.99 (14.4%)	5859.32 (12.4%)	7181.57 (15.9%)	7429.71 (15.7%)	6211.89 (13.3%)	7594.36 (14.7%)	5013.54 (12.6%)	7566.04 (16.4%)	5985.46 (13.5%)	6336.96 (15.2%)	7581.75 (16.4%)	5714.04 (13.7%)	6538.68 (13.8%)	6430.98 (13.4%)	6574.63 (14.5%)	5984.38 (14.2%)	6309.23 (13.2%)
Unintentional injuries	2568.20 (5.7%)	2720.78 (5.8%)	2301.79 (5.1%)	2738.92 (5.8%)	2587.91 (5.5%)	2654.72 (5.2%)	2420.05 (6.1%)	2474.69 (5.4%)	2660.61 (6.0%)	2441.83 (5.9%)	2974.89 (6.4%)	2481.32 (6.0%)	2928.46 (6.2%)	2499.84 (5.2%)	2502.76 (5.5%)	2281.72 (5.4%)	2581.39 (5.4%)
Musculoskeletal disorders	2419.83 (5.3%)	2450.49 (5.2%)	2422.23 (5.3%)	2419.56 (5.1%)	2413.09 (5.2%)	2582.41 (5.0%)	2380.21 (6.0%)	2392.89 (5.2%)	2536.04 (5.7%)	2399.95 (5.8%)	2390.87 (5.2%)	2359.48 (5.7%)	2431.76 (5.1%)	2484.24 (5.2%)	2369.39 (5.2%)	2351.35 (5.6%)	2473.58 (5.2%)
Digestive diseases	2245.18 (5.0%)	2404.17 (5.1%)	2183.91 (4.8%)	1966.68 (4.2%)	2443.18 (5.2%)	3058.09 (5.9%)	1779.78 (4.5%)	2274.80 (4.9%)	2315.74 (5.2%)	1872.06 (4.5%)	2165.60 (4.7%)	2000.06 (4.8%)	2791.74 (5.9%)	1943.72 (4.1%)	2353.75 (5.2%)	1883.36 (4.5%)	2245.34 (4.7%)

Cause	Poland	Dolnośląskie	Kujawsko-pomorskie	Lubelskie	Lubuskie	Łódzkie	Małopolskie	Mazowieckie	Opolskie	Podkarpackie	Podlaskie	Pomorskie	Śląskie	Świętokrzyskie	Warmińsko-mazurskie	Wielkopolskie	Zachodniopomorskie
Diabetes and kidney diseases	1773.81 (3.9%)	1837.00 (3.9%)	1743.81 (3.8%)	1710.05 (3.6%)	1920.28 (4.1%)	1952.24 (3.8%)	1364.09 (3.4%)	1654.11 (3.6%)	1968.95 (4.4%)	1540.82 (3.7%)	1748.00 (3.8%)	1831.89 (4.4%)	2146.95 (4.5%)	1645.95 (3.4%)	1988.93 (4.4%)	1736.28 (4.1%)	1777.15 (3.7%)
Mental disorders	1611.16 (3.6%)	1614.69 (3.4%)	1621.19 (3.6%)	1622.55 (3.4%)	1623.08 (3.5%)	1607.16 (3.1%)	1606.36 (4.0%)	1594.74 (3.5%)	1626.46 (3.7%)	1625.32 (3.9%)	1615.04 (3.5%)	1598.99 (3.8%)	1611.15 (3.4%)	1628.49 (3.4%)	1619.91 (3.6%)	1602.78 (3.8%)	1623.66 (3.4%)
Neurological disorders	1614.68 (3.6%)	1597.01 (3.4%)	1550.90 (3.4%)	1630.97 (3.4%)	1503.15 (3.2%)	1769.47 (3.4%)	1604.91 (4.0%)	1627.85 (3.5%)	1603.78 (3.6%)	1612.12 (3.9%)	1707.32 (3.7%)	1541.70 (3.7%)	1696.35 (3.6%)	1667.85 (3.5%)	1593.91 (3.5%)	1496.07 (3.6%)	1584.32 (3.3%)
Substance use disorders	1496.72 (3.3%)	1635.66 (3.5%)	1558.63 (3.4%)	1218.49 (2.6%)	1485.53 (3.2%)	2088.43 (4.1%)	1160.10 (2.9%)	1368.87 (3.0%)	940.41 (2.1%)	1298.39 (3.1%)	1959.57 (4.2%)	1748.11 (4.2%)	1498.53 (3.2%)	1271.75 (2.7%)	2027.93 (4.5%)	1405.55 (3.3%)	1581.57 (3.3%)
Other COVID-19 pandemic-related outcomes	1456.89 (3.2%)	1519.83 (3.2%)	954.81 (2.1%)	1538.22 (3.3%)	1307.13 (2.8%)	2077.33 (4.0%)	843.46 (2.1%)	2172.89 (4.7%)	1071.96 (2.4%)	1414.88 (3.4%)	1963.33 (4.2%)	1071.75 (2.6%)	1376.79 (2.9%)	1411.62 (3.0%)	1059.07 (2.3%)	1199.28 (2.8%)	1627.23 (3.4%)
Self-harm and interpersonal violence	1307.02 (2.9%)	1324.65 (2.8%)	1390.76 (3.1%)	1399.67 (3.0%)	1496.90 (3.2%)	1721.73 (3.3%)	1023.99 (2.6%)	1547.84 (3.4%)	1092.83 (2.5%)	1122.13 (2.7%)	1270.56 (2.7%)	1109.49 (2.7%)	1202.55 (2.5%)	1228.53 (2.6%)	1538.34 (3.4%)	1065.32 (2.5%)	1468.03 (3.1%)
Chronic respiratory diseases	1147.99 (2.5%)	1267.60 (2.7%)	1086.33 (2.4%)	1034.50 (2.2%)	1125.29 (2.4%)	1365.69 (2.7%)	1195.30 (3.0%)	1305.33 (2.8%)	941.95 (2.1%)	1026.50 (2.5%)	1166.39 (2.5%)	1058.19 (2.5%)	995.87 (2.1%)	1077.05 (2.3%)	1196.38 (2.6%)	1120.06 (2.7%)	1128.61 (2.4%)
Other non-communicable diseases	1080.10 (2.4%)	1178.15 (2.5%)	1036.49 (2.3%)	1040.70 (2.2%)	1096.91 (2.3%)	1164.49 (2.3%)	1005.91 (2.5%)	1066.82 (2.3%)	1064.32 (2.4%)	1028.45 (2.5%)	1042.85 (2.3%)	1076.59 (2.6%)	1021.54 (2.2%)	1017.94 (2.1%)	997.50 (2.2%)	1278.05 (3.0%)	1042.34 (2.2%)
Transport injuries	967.72 (2.1%)	1001.34 (2.1%)	1030.00 (2.3%)	1330.78 (2.8%)	979.95 (2.1%)	1168.84 (2.3%)	675.31 (1.7%)	1114.07 (2.4%)	876.57 (2.0%)	814.49 (2.0%)	1041.80 (2.3%)	789.75 (1.9%)	718.42 (1.5%)	1295.30 (2.7%)	1014.14 (2.2%)	1025.32 (2.4%)	922.45 (1.9%)

Table 17.2. Disease burden by cause category among women in Poland and its voivodships in 2021, expressed as actual DALYs per 100,000 population and as percentage contribution to the total disease burden. (Ranking of causes 1–15)

Cause	Poland	Dolnośląskie	Kujawsko-pomorskie	Lubelskie	Lubuskie	Łódzkie	Małopolskie	Mazowieckie	Opolskie	Podkarpackie	Podlaskie	Pomorskie	Śląskie	Świętokrzyskie	Warmińsko-Mazurskie	Wielkopolskie	Zachodniopomorskie
Total	36 176.4 (100%)	37 223.3 (100%)	36 126.2 (100%)	37 008.5 (100%)	36 985.5 (100%)	41 089.1 (100%)	32 354.0 (100%)	37 014.5 (100%)	36 072.8 (100%)	32 636.2 (100%)	36 143.1 (100%)	33 686.5 (100%)	38 513.4 (100%)	36 627.6 (100%)	35 231.6 (100%)	34 224.4 (100%)	36 921.5 (100%)
W tym:																	
Cardiovascular diseases	6699.05 (18.5%)	7102.01 (19.1%)	6201.93 (17.2%)	8102.59 (21.9%)	6844.10 (18.5%)	7487.02 (18.2%)	6591.00 (20.4%)	6108.02 (16.5%)	7066.70 (19.6%)	5982.38 (18.3%)	6686.28 (18.5%)	5912.23 (17.6%)	7408.56 (19.2%)	8476.33 (23.1%)	5900.83 (16.7%)	5761.08 (16.8%)	6962.64 (18.9%)
Neoplasms	6057.72 (16.7%)	6591.75 (17.7%)	6862.61 (19.0%)	5519.11 (14.9%)	6931.95 (18.7%)	6887.74 (16.8%)	4917.21 (15.2%)	6214.27 (16.8%)	5728.63 (15.9%)	4457.39 (13.7%)	5063.06 (14.0%)	5627.25 (16.7%)	6717.17 (17.4%)	5579.12 (15.2%)	6163.45 (17.5%)	6102.88 (17.8%)	6760.48 (18.3%)
Respiratory infections and tuberculosis	4342.59 (12.0%)	3946.91 (10.6%)	4731.59 (13.1%)	5023.53 (13.6%)	4149.58 (11.2%)	5207.24 (12.7%)	3331.52 (10.3%)	5060.95 (13.7%)	3934.56 (10.9%)	4206.05 (12.9%)	5130.63 (14.2%)	3734.24 (11.1%)	4206.46 (10.9%)	4259.96 (11.6%)	4397.29 (12.5%)	3978.77 (11.6%)	4089.70 (11.1%)
Musculoskeletal disorders	3744.49 (10.4%)	3773.23 (10.1%)	3684.66 (10.2%)	3744.22 (10.1%)	3627.74 (9.8%)	4160.39 (10.1%)	3735.40 (11.5%)	3754.79 (10.1%)	3951.72 (11.0%)	3741.90 (11.5%)	3776.54 (10.4%)	3636.44 (10.8%)	3692.68 (9.6%)	3812.40 (10.4%)	3620.55 (10.3%)	3592.52 (10.5%)	3730.17 (10.1%)
Neurological disorders	2437.64 (6.7%)	2480.20 (6.7%)	2396.46 (6.6%)	2523.71 (6.8%)	2373.11 (6.4%)	2630.68 (6.4%)	2370.98 (7.3%)	2497.55 (6.7%)	2485.30 (6.9%)	2409.49 (7.4%)	2549.07 (7.1%)	2285.45 (6.8%)	2457.57 (6.4%)	2561.25 (7.0%)	2372.34 (6.7%)	2270.62 (6.6%)	2400.90 (6.5%)
Mental disorders	1880.10 (5.2%)	1885.92 (5.1%)	1896.41 (5.2%)	1886.39 (5.1%)	1898.89 (5.1%)	1879.90 (4.6%)	1871.92 (5.8%)	1868.92 (5.0%)	1898.39 (5.3%)	1880.88 (5.8%)	1877.83 (5.2%)	1864.17 (5.5%)	1883.89 (4.9%)	1890.64 (5.2%)	1884.75 (5.3%)	1868.03 (5.5%)	1899.51 (5.1%)
Diabetes and kidney diseases	1660.19 (4.6%)	1645.43 (4.4%)	1629.23 (4.5%)	1545.49 (4.2%)	1925.37 (5.2%)	1785.92 (4.3%)	1280.69 (4.0%)	1537.94 (4.2%)	1911.07 (5.3%)	1360.16 (4.2%)	1650.32 (4.6%)	1688.54 (5.0%)	2087.17 (5.4%)	1501.66 (4.1%)	1936.10 (5.5%)	1688.30 (4.9%)	1571.32 (4.3%)

Cause	Poland	Dolnośląskie	Kujawsko-pomorskie	Lubelskie	Lubuskie	Łódzkie	Małopolskie	Mazowieckie	Opolskie	Podkarpackie	Podlaskie	Pomorskie	Śląskie	Świętokrzyskie	Warmińsko-Mazurskie	Wielkopolskie	Zachodniopomorskie
Other non-communicable diseases	1641.77 (4.5%)	1725.84 (4.6%)	1604.31 (4.4%)	1614.34 (4.4%)	1688.02 (4.6%)	1747.97 (4.3%)	1536.94 (4.8%)	1642.72 (4.4%)	1658.81 (4.6%)	1605.92 (4.9%)	1596.77 (4.4%)	1644.38 (4.9%)	1570.16 (4.1%)	1575.64 (4.3%)	1597.37 (4.5%)	1804.40 (5.3%)	1605.09 (4.3%)
Digestive diseases	1348.18 (3.7%)	1443.91 (3.9%)	1322.28 (3.7%)	1001.20 (2.7%)	1344.68 (3.6%)	1820.48 (4.4%)	1143.37 (3.5%)	1375.86 (3.7%)	1334.91 (3.7%)	1100.78 (3.4%)	1187.32 (3.3%)	1289.36 (3.8%)	1747.52 (4.5%)	995.61 (2.7%)	1369.39 (3.9%)	1155.27 (3.4%)	1360.10 (3.7%)
Sense organ diseases	1197.70 (3.3%)	1237.40 (3.3%)	1186.29 (3.3%)	1237.90 (3.3%)	1168.41 (3.2%)	1297.41 (3.2%)	1155.56 (3.6%)	1187.46 (3.2%)	1254.22 (3.5%)	1163.95 (3.6%)	1223.92 (3.4%)	1123.39 (3.3%)	1235.94 (3.2%)	1284.07 (3.5%)	1147.06 (3.3%)	1123.55 (3.3%)	1207.74 (3.3%)
Injuries	1151.01 (3.2%)	1211.72 (3.3%)	993.00 (2.7%)	1042.55 (2.8%)	1134.04 (3.1%)	1245.26 (3.0%)	1052.70 (3.3%)	1154.56 (3.1%)	1192.75 (3.3%)	964.68 (3.0%)	1127.44 (3.1%)	1127.90 (3.3%)	1426.77 (3.7%)	984.74 (2.7%)	967.91 (2.7%)	1195.89 (3.5%)	1135.09 (3.1%)
Chronic respiratory diseases	956.79 (2.6%)	1058.50 (2.8%)	915.58 (2.5%)	761.43 (2.1%)	922.98 (2.5%)	1073.29 (2.6%)	877.77 (2.7%)	1024.12 (2.8%)	929.20 (2.6%)	904.15 (2.8%)	853.62 (2.4%)	918.01 (2.7%)	1043.10 (2.7%)	834.66 (2.3%)	967.43 (2.7%)	934.46 (2.7%)	968.18 (2.6%)
Other COVID-19 pandemic-related outcomes	942.89 (2.6%)	977.98 (2.6%)	598.12 (1.7%)	1025.48 (2.8%)	833.33 (2.3%)	1372.88 (3.3%)	537.87 (1.7%)	1417.95 (3.8%)	670.88 (1.9%)	903.98 (2.8%)	1303.52 (3.6%)	669.18 (2.0%)	872.46 (2.3%)	921.81 (2.5%)	684.99 (1.9%)	766.52 (2.2%)	1032.44 (2.8%)
Skin and subcutaneous diseases	492.74 (1.4%)	473.57 (1.3%)	466.65 (1.3%)	464.59 (1.3%)	454.43 (1.2%)	570.30 (1.4%)	515.82 (1.6%)	534.07 (1.4%)	507.50 (1.4%)	511.03 (1.6%)	488.30 (1.4%)	502.92 (1.5%)	472.57 (1.2%)	457.32 (1.2%)	448.12 (1.3%)	465.63 (1.4%)	451.50 (1.2%)
Substance use disorders	467.62 (1.3%)	516.31 (1.4%)	460.67 (1.3%)	393.27 (1.1%)	497.57 (1.3%)	568.08 (1.4%)	386.27 (1.2%)	435.53 (1.2%)	397.40 (1.1%)	365.33 (1.1%)	482.50 (1.3%)	527.80 (1.6%)	536.44 (1.4%)	380.07 (1.0%)	554.69 (1.6%)	437.67 (1.3%)	532.12 (1.4%)

Notably, although neoplasms were not the leading cause of health loss in Łódzkie voivodship, one of the highest rates in Poland for this group was recorded there – 6,887.74 DALYs per 100,000 (16.8% of the region's burden). The lowest number of healthy life years lost due to neoplasm was observed in Podkarpackie voivodship – 4,457.39 DALYs per 100,000 (13.7% of the regional burden). For comparison, the Polish average neoplasm burden for women was 6,057.72 DALYs per 100,000, constituting 16.7% of the total disease burden among Polish women.

The third most significant cause of healthy life years lost among women in Poland was respiratory tract infections and tuberculosis (including COVID-19). This health issue accounted for 4,342.59 DALYs per 100,000 (12.0% of the total burden), with COVID-19 alone responsible for 3,755.2 DALYs per 100,000. In terms of regional differences, the highest rates in this category were recorded in Łódzkie voivodship – 5,207.24 DALYs per 100,000 (12.7% of the region's burden) – and Podlaskie voivodship – 5,130.63 DALYs per 100,000 (14.2%). The lowest was observed in Małopolskie voivodship – 3,331.52 DALYs per 100,000 (10.3%).

The fourth most common cause of disease burden among women in Poland was musculoskeletal disorders, contributing to 3,744.49 DALYs per 100,000 nationally (10.4% of the total burden). Comparing voivodships, the highest rate for this category was found in Łódzkie voivodship – 4,160.39 DALYs per 100,000 (10.1% of the region's burden), and the lowest in Wielkopolskie voivodship – 3,592.52 DALYs per 100,000 (10.5%). In relative terms, the highest proportion of disease burden from musculoskeletal disorders was noted in Podkarpackie and Małopolskie voivodships (both 11.5%), while the lowest was in Śląskie voivodship (9.6%).

Subsequent key health issues among women in Poland included neurological disorders, mental health disorders, diabetes and kidney diseases, other non-communicable diseases, and diseases of the digestive system. Detailed data on DALYs per 100,000 women and their percentage contribution to the total disease burden by voivodship are presented in Table 17.2.

Risk factors associated with population health loss in Poland – analysis of burden by sex and voivodship

The disease burden attributable to all causes and assigned to all risk factors among men in Poland reached 13,377.6 DALYs per 100,000 population,

accounting for a total of 41.2% of all DALYs (with the corresponding unstandardised values being 19,745.8 and 43.6%). In Poland, tobacco use was the dominant risk factor, responsible for 11.7% (13.5% unstandardised) of the total burden, equivalent to 3,803.0 DALYs per 100,000. This was followed by alcohol use at 8.9% (also unstandardised), or 2,902.2 DALYs per 100,000, and high systolic blood pressure at 8.4% (9.6% unstandardised), at 2,740.9 DALYs per 100,000.

An analysis of the regional distribution reveals considerable variation in the impact of individual risk factors. Tobacco use had the highest burden in the voivodships of Kujawsko-Pomorskie (13.3%), Dolnośląskie (12.9%), and Zachodniopomorskie (12.6%) and the lowest in Podlaskie (9.9%), Łódzkie (10.5%), and Pomorskie (10.9%). Health burdens related to alcohol use were most pronounced in Łódzkie (13.3%), Śląskie (9.8%), and Warmińsko-Mazurskie (9.7%) voivodships, while the lowest impact of this factor was observed in Małopolskie (7.5%), Opolskie (7.7%), and Podkarpackie (7.9%). High systolic blood pressure had the strongest impact in Świętokrzyskie (10.4%) and Małopolskie (9.7%) voivodships and the weakest in Śląskie and Podlaskie (both 7.2%). Table 17.3 presents complete data on other significant risk factors contributing to the total disease burden among men.

The disease burden among women in Poland in 2021, attributed to all causes and all risk factors, amounted to 7,115.00 DALYs per 100,000 population, representing 32.3% of the total DALYs (with the corresponding unstandardised values being 13,267.8 and 36.7%, respectively). Among the leading contributors to health loss, high body mass index (BMI) was dominant, accounting for 7.2% of the total burden (8.9% unstandardised), which equates to 1,593.7 DALYs per 100,000. Closely following were high systolic blood pressure at 6.2% (9.2% unstandardised), or 1,360.9 DALYs per 100,000, and dietary risks at 6.1% (8.5% unstandardised), corresponding to 1,349.7 DALYs per 100,000.

Significant regional differences were observed in the impact of individual risk factors. An excessively high BMI contributed most significantly to women's health loss in Podlaskie (127.1%) and Podkarpackie (26.2%) voivodships and the least in Łódzkie and Zachodniopomorskie (21.2% and 21.1%, respectively).

High blood pressure had the greatest negative impact on women's health in Lubelskie, Podkarpackie (both at 7.7%), and Świętokrzyskie (7.6%) voivodships. The smallest effects were observed in Podlaskie (5.3%) and Opolskie (5.5%). Table 17.4 details comprehensive data on all significant risk factors contributing to the total disease burden among women.

Table 17.3. Disease burden attributable to major risk factors among men in Poland and its voivodships in 2021, expressed in age-standardised DALYs per 100,000 population, in relation to all diseases/health conditions

Risk factor	Poland	Dolnośląskie	Kujawsko-pomorskie	Łódzkie	Śląskie	Świętokrzyskie	Lubelskie	Lubuskie	Małopolskie	Mazowieckie	Opolskie	Podkarpackie	Podlaskie	Pomorskie	Warmińsko-mazurskie	Wielkopolskie	Zachodniopo-morskie
Total:	13377.6 (41.2%)	14279.2 (43.2%)	13527.5 (41.3%)	14534.3 (40.5%)	13928.4 (43.0%)	13589.1 (41.7%)	13717.7 (40.5%)	14227.5 (42.1%)	12608.6 (42.7%)	12916 (38.6%)	12743.2 (42.1%)	12081.6 (39.4%)	12731.3 (38.4%)	12929.8 (41.8%)	13989.2 (41.5%)	12860.8 (40.8%)	14061.4 (42.1%)
Smoking	3803 (11.7%)	4274.4 (12.9%)	4369.8 (13.3%)	4156.4 (10.5%)	3747.9 (11.1%)	3772.9 (11.2%)	3703.1 (12.3%)	3904.1 (11.1%)	3506.5 (12.5%)	3367.5 (11.7%)	3287.2 (11.6%)	3367 (11.0%)	3611.1 (9.9%)	3662.9 (10.9%)	3927.8 (11.7%)	3705.2 (11.8%)	4223.4 (12.6%)
Alcohol use	2902.2 (8.9%)	3135.4 (9.5%)	2795.7 (8.5%)	2761 (10.7%)	3037.8 (9.8%)	3844.6 (8.1%)	2211.3 (8.1%)	3017.5 (9.0%)	2329.9 (7.5%)	2421.1 (9.0%)	3122.9 (7.7%)	2759.9 (7.9%)	3169.4 (9.4%)	2625.4 (8.9%)	3283.8 (9.7%)	2757.5 (8.7%)	2861.4 (8.6%)
High systolic blood pressure	2740.9 (8.4%)	2915.7 (8.8%)	2551.2 (7.8%)	3030.7 (7.2%)	3130.7 (8.9%)	2577.8 (10.4%)	2856.3 (9.0%)	2433.1 (9.3%)	2870.9 (9.7%)	2587.8 (7.3%)	2370.3 (9.5%)	2628.5 (8.4%)	2895.5 (7.2%)	3376.6 (8.5%)	2658.4 (7.9%)	2577.9 (8.2%)	3040.4 (9.1%)
High body-mass index	2723.1 (8.4%)	2970.9 (9.0%)	2564.9 (7.8%)	3008.1 (7.1%)	3098.5 (8.8%)	2545.5 (9.6%)	2923.4 (8.9%)	2304.2 (9.2%)	2917 (9.9%)	2593 (6.9%)	2463.1 (9.6%)	2731 (8.5%)	2852.1 (7.4%)	3125.2 (8.8%)	2741.6 (8.1%)	2535.8 (8.0%)	2996.7 (9.0%)
High fasting plasma glucose	2068.6 (6.4%)	2140.9 (6.5%)	1971.2 (6.0%)	2059.1 (6.1%)	2284 (7.1%)	2180.8 (6.0%)	1912 (6.1%)	1936.4 (6.8%)	2122.5 (6.5%)	1724.2 (5.8%)	1937.8 (7.0%)	2178.8 (5.6%)	2301.9 (5.8%)	1942 (7.0%)	2322.8 (6.9%)	2062.9 (6.5%)	2097.6 (6.3%)
High LDL cholesterol	1896.8 (5.8%)	1997.1 (6.0%)	1802.5 (5.5%)	2018.2 (5.1%)	2093.5 (6.2%)	1815.1 (6.4%)	1822.6 (5.9%)	1797.6 (6.2%)	1997.2 (6.2%)	1753.9 (5.4%)	1690.3 (6.6%)	1923.2 (5.7%)	2010.7 (5.1%)	2085.8 (6.2%)	1840.9 (5.5%)	1894.7 (6.0%)	1962.4 (5.9%)
Ambient particulate matter pollution	1365.5 (4.2%)	1542.7 (4.7%)	1220.7 (3.7%)	1431.1 (3.7%)	1582 (4.3%)	1309.2 (5.0%)	1605.9 (4.2%)	1150.1 (4.7%)	1468.8 (5.4%)	1230.7 (3.4%)	1112.5 (4.9%)	1385.6 (4.0%)	1398.1 (3.4%)	1614.5 (4.5%)	1327.4 (3.9%)	1220.5 (3.9%)	1599.4 (4.8%)
Diet high in sodium	1362.1 (4.2%)	1372.4 (4.2%)	1159 (3.5%)	1341.9 (4.4%)	1169.9 (5.5%)	1585.1 (4.6%)	1776.9 (4.0%)	1241.2 (3.5%)	1409.5 (6.0%)	1273.4 (3.7%)	1034.2 (4.7%)	934.5 (4.1%)	1783.7 (3.1%)	1509 (3.0%)	1115 (3.3%)	1262.7 (4.0%)	957 (2.9%)
Diet low in whole grains	1017.6 (3.1%)	912.8 (2.8%)	1109.2 (3.4%)	973.3 (2.7%)	981.1 (3.3%)	974.9 (3.3%)	1096.2 (2.9%)	960.6 (2.9%)	947 (3.7%)	984.6 (2.9%)	906.5 (3.1%)	1164.9 (3.2%)	1065.9 (2.7%)	1078.2 (3.8%)	979.7 (2.9%)	1004.5 (3.2%)	1074.9 (3.2%)
Kidney dysfunction	688.3 (2.1%)	718.1 (2.2%)	692.5 (2.1%)	736.4 (1.9%)	754.7 (2.3%)	668.9 (2.4%)	667.7 (2.2%)	586.8 (2.2%)	736.1 (2.3%)	700 (1.8%)	641 (2.4%)	710.9 (2.3%)	740.2 (1.9%)	785.6 (2.3%)	700.3 (2.1%)	633.2 (2.0%)	766.6 (2.3%)

Table 17.4. Disease burden attributable to major risk factors among women in Poland and its voivodships in 2021, expressed in age-standardised DALYs per 100,000 population, in relation to all diseases/health conditions

Risk factor	Poland	Dolnośląskie	Kujawsko-pomorskie	Łódzkie	Śląskie	Świętokrzyskie	Lubelskie	Lubuskie	Małopolskie	Mazowieckie	Opolskie	Podkarpackie	Podlaskie	Pomorskie	Warmińsko-mazurskie	Wielkopolskie	Zachodniopomorskie
Total:	7115 (32.3%)	7382.8 (33.4%)	7278.2 (32.7%)	7444.3 (31.5%)	7829.5 (34.4%)	6838.1 (32.5%)	6894 (31.4%)	7565.1 (33.1%)	6657.7 (32.5%)	6884.9 (30.6%)	6967.7 (32.6%)	6148.1 (29.7%)	6387.9 (29.5%)	7201 (33.1%)	7287.6 (32.8%)	7091.3 (32.4%)	7434 (33.2%)
High BMI	1593.7 (7.2%)	1597.9 (7.2%)	1544.1 (6.9%)	1628.8 (6.6%)	1727.3 (7.6%)	1563.2 (7.7%)	1513.5 (7.4%)	1552.2 (7.6%)	1647.9 (7.4%)	1448.3 (6.9%)	1501.1 (7.7%)	1609 (7.0%)	1733.4 (6.9%)	1619.5 (7.4%)	1592.8 (7.2%)	1625.7 (7.4%)	1566.5 (7.0%)
High systolic blood pressure	1360.9 (6.2%)	1342.8 (6.1%)	1293.6 (5.8%)	1520.8 (5.7%)	1499.4 (6.8%)	1340.1 (7.3%)	1364.5 (7.0%)	1245.2 (6.6%)	1426.7 (6.7%)	1231.6 (5.5%)	1146 (6.7%)	1325.9 (6.0%)	1536 (5.3%)	1540 (6.1%)	1252.7 (5.7%)	1314.4 (6.0%)	1436.6 (6.4%)
Dietary risks	1349.7 (6.1%)	1394.9 (6.3%)	1322.6 (5.9%)	1442.7 (5.5%)	1507.3 (6.7%)	1304.8 (6.8%)	1348.7 (6.6%)	1172.2 (6.6%)	1445.2 (6.6%)	1198 (5.2%)	1202.8 (6.8%)	1409.2 (5.8%)	1521.6 (5.6%)	1435.1 (6.5%)	1337.1 (6.0%)	1317.6 (6.0%)	1408.8 (6.3%)
Fasting plasma glucose	1318.7 (6.0%)	1299.2 (5.9%)	1286.6 (5.8%)	1236.7 (5.6%)	1493.4 (6.8%)	1333.7 (5.7%)	1179.9 (5.6%)	1252.7 (6.5%)	1378 (5.8%)	1050.2 (5.6%)	1228.3 (6.4%)	1415.3 (5.1%)	1549.7 (5.7%)	1197.6 (6.5%)	1494.9 (6.7%)	1376.2 (6.3%)	1269.3 (5.7%)
Tobacco	1298.9 (5.9%)	1509.2 (6.8%)	1528.8 (6.9%)	1077.7 (5.4%)	1269.7 (5.6%)	1282.8 (5.0%)	1148.2 (4.9%)	1411 (5.6%)	1024 (5.6%)	923 (6.3%)	989.8 (4.8%)	1381.2 (4.5%)	1264.3 (4.6%)	1053 (6.3%)	1404.2 (6.3%)	1416.1 (6.5%)	1574.5 (7.0%)
Air pollution	686.3 (3.1%)	668.5 (3.0%)	604.5 (2.7%)	643.8 (3.4%)	593 (4.3%)	794.3 (3.3%)	833.8 (2.9%)	622 (2.6%)	720.9 (4.1%)	603 (2.8%)	506.3 (3.4%)	505.1 (2.9%)	974 (2.3%)	685 (2.3%)	571.6 (2.6%)	653.4 (3.0%)	476 (2.1%)
Maternal and child malnutrition	636.5 (2.9%)	616.8 (2.8%)	720 (3.2%)	663.9 (3.0%)	615.8 (2.9%)	710.1 (3.2%)	593.6 (3.0%)	579.5 (2.7%)	696.5 (2.9%)	658.9 (2.6%)	683.8 (3.3%)	647.7 (3.2%)	658.7 (3.2%)	678.7 (3.0%)	683.2 (3.1%)	570.6 (2.6%)	657.8 (2.9%)
Alcohol use	589.7 (2.7%)	657.1 (2.8%)	568.7 (2.5%)	483.9 (2.6%)	620 (2.9%)	721.5 (3.0%)	458.8 (2.8%)	607.4 (2.8%)	491.3 (3.2%)	427.8 (2.2%)	522.2 (2.9%)	587.8 (2.4%)	737.6 (2.1%)	468.2 (2.9%)	636.5 (2.5%)	565.4 (2.5%)	631.9 (2.8%)
High LDL cholesterol	588.1 (2.7%)	620.4 (3.0%)	564.1 (2.5%)	601.8 (3.1%)	637.1 (3.2%)	613 (2.2%)	661.9 (2.2%)	486.3 (2.7%)	627.6 (2.2%)	501.8 (2.7%)	463.3 (2.3%)	635.1 (2.1%)	663.4 (2.4%)	623.2 (2.7%)	557.9 (2.9%)	548.3 (2.6%)	630.6 (2.8%)
Occupational risks	490 (2.2%)	462.4 (2.1%)	504.4 (2.3%)	506 (2.1%)	510.1 (2.0%)	486.8 (2.5%)	514.1 (2.3%)	478.6 (2.2%)	474.2 (2.5%)	499.6 (2.1%)	500.9 (2.2%)	507.4 (2.4%)	466.1 (2.3%)	524 (2.3%)	490.1 (2.2%)	484.6 (2.2%)	498.6 (2.2%)

Disease burden in 2020–2021 related to the COVID-19 pandemic in Poland and selected European countries

The analysis of disease burden indicators related to COVID-19 reveals significant variation in health impacts both among European countries and across the voivodships of Poland during the 2020–2021 period. In 2020, among the countries analysed, the United Kingdom recorded the highest burden of health consequences due to COVID-19 (2,353.13 DALYs per 100,000), while Greece reported the lowest (839.25 DALYs per 100,000). The situation changed considerably in 2021, when Hungary recorded the highest burden (6,886.6 DALYs per 100,000) and Spain the lowest (1,633.8 DALYs per 100,000).

When data for Polish voivodships were compared with the national average of 2,751.73 DALYs per 100,000 in 2020, the highest values were recorded in the following voivodships: Łódzkie (3,620.62 DALYs), Świętokrzyskie (3,346.33 DALYs), Podkarpackie (3,115.43 DALYs), Śląskie (3,026.62 DALYs), Mazowieckie (2,901.64 DALYs), and Opolskie (2,918.47 DALYs). In 2021, with the national average increasing to 4,589.0 DALYs per 100,000, the most heavily affected voivodships were Lubelskie (5,537.3 DALYs), Podlaskie (5,466.1 DALYs), Mazowieckie (5,253.4 DALYs), Łódzkie (5,216.7 DALYs), Kujawsko-Pomorskie (5,062.0 DALYs), Podkarpackie (4,678.1 DALYs), and Świętokrzyskie (4,658.1 DALYs). It is worth noting that in 2021, an overall increase in DALYs related to COVID-19 was observed in most of the analysed European countries, including Poland. This increase was especially marked in Central Europe, with Hungary showing the steepest rise. In Poland, the highest increase was recorded in Lubelskie voivodship. Figure 17.2 presents data on years of healthy life lost due to COVID-19 and other COVID-19-related diseases for selected European countries and Polish voivodships, along with the national average.

An analysis of the period 1990–2021 revealed a significant decline in the age-standardised DALYs across all examined populations. Among the countries analysed, Slovenia achieved the best result with a reduction of -32%, while Greece recorded the smallest decrease, at just -14%. Poland, with a 25% reduction, ranked high among countries successfully lowering their national disease burden (Figure 17.3). Significantly, some Polish voivodships achieved better results than the average for many countries, such as Pomorskie (-31%), Wielkopolskie (-28%), and Mazowieckie (-27%). At the other end of the spectrum was Świętokrzyskie voivodship, which recorded only an 18% decrease, placing it close to Greece's result.

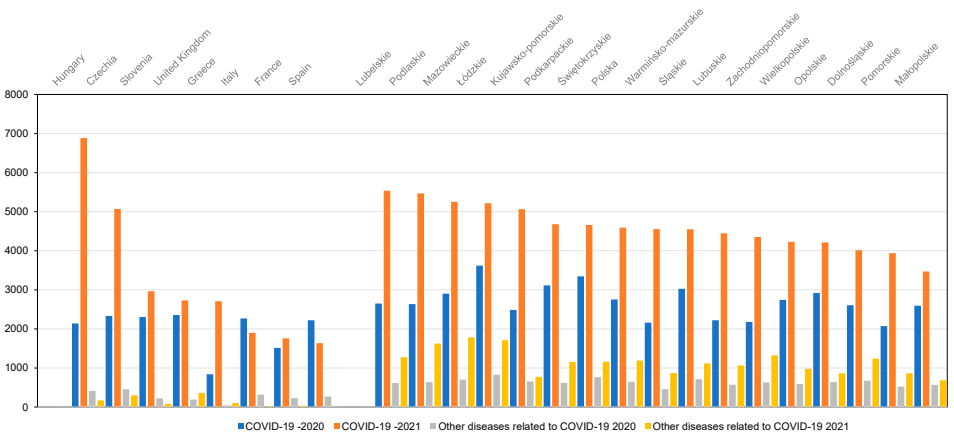


Fig. 17.2. DALYs due to COVID-19 and other COVID-19-related consequences in Poland and its 16 voivodships compared to selected European countries in 2020–2021

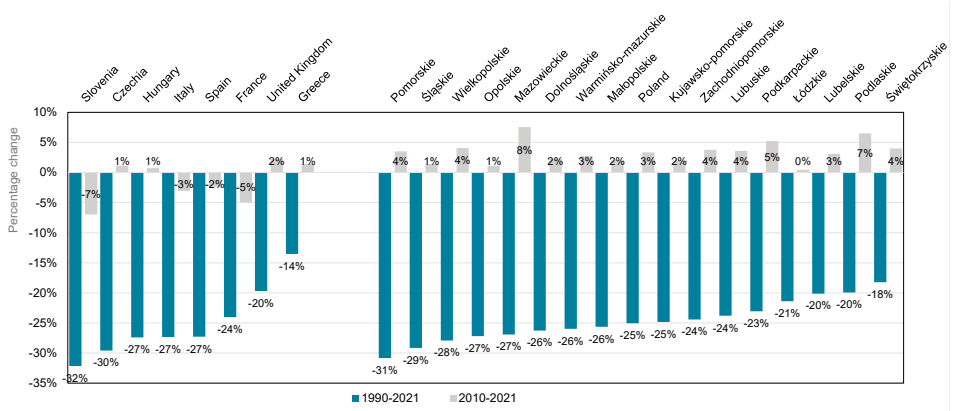


Fig. 17.3. Trends in DALY changes due to all causes in Poland and its 16 voivodships compared to selected European countries (over the last 30 and 10 years)

Trends in disease burden changes between 1990 and 2021 and 2010 and 2021

Looking at a shorter, 10-year comparison period (2010–2021), the situation appears different. Apart from Slovenia (-7%), the most favourable change in disease burden reduction was observed in France (-5%), while slight increases were noted in Greece, the Czech Republic, and Hungary (all at +1%), and a +2% increase

in the United Kingdom. During the same period, Poland experienced an unfavourable upward trend in disease burden, with an increase of +3%. A particularly concerning situation occurred in Mazowieckie, Podlaskie, and Podkarpackie voivodships, where the DALYs increased the most, reaching +8%, +7%, and +5%, respectively (Figure 17.3). The high DALYs recorded in 2020–2021 were linked to the COVID-19 pandemic, which resulted in lower reductions than would have been expected based on the previous trend.

Over the last three decades, Poland has observed a significant reduction in the disease burden associated with diseases of the circulatory system, reaching -59%. The most notable improvement occurred in Mazowieckie voivodship, where the decline reached as much as 66%. In other voivodships, the reduction ranged between 52% and 64%. Only Świętokrzyskie voivodship, which showed the smallest improvement at -44%, recorded a result lower than that of Greece, where the reduction stood at -49%. It is worth noting that both Slovenia and the Czech Republic achieved reductions comparable to that of Mazowieckie voivodship, at -64%, while the United Kingdom saw a decrease of -65%.

When analysing the shorter period of 2010–2021, Łódzkie voivodship recorded the highest reduction in DALYs for diseases of the circulatory system among all regions (-34%), followed by Mazowieckie and Kujawsko-Pomorskie (both -29%). These achievements contributed to Poland's high national average of -24%, positioning the country close to France (-24%) and slightly below Slovenia (-29%) in terms of health progress among European countries with comparable socio-economic levels (Figure 17.4).

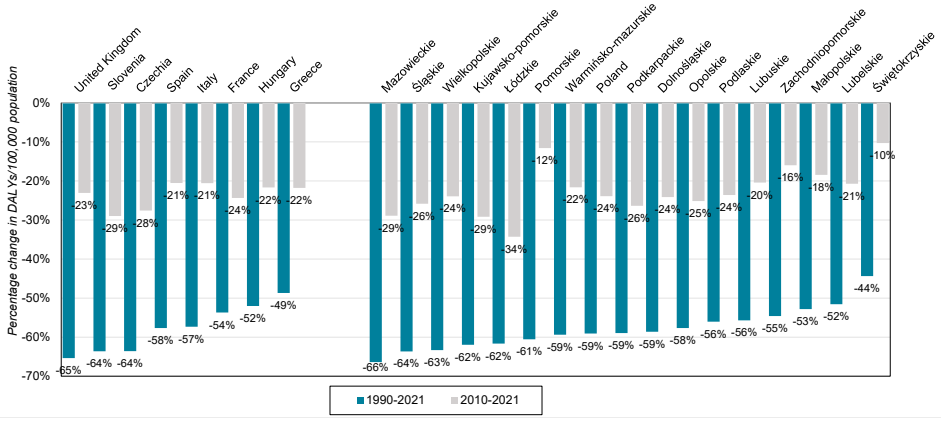


Fig. 17.4. Trends in DALYs change due to diseases of the circulatory system in Poland and its 16 voivodships compared to selected European countries (over the last 30 and 10 years)

In contrast to diseases of the circulatory system, the thirty-year trend in DALYs due to neoplasms shows a significantly smaller decrease, meaning cancer remains a major public health concern and a leading cause of health loss in the populations analysed. The Czech Republic reported the most substantial improvement in DALYs (-38%), while Greece showed the smallest progress (-15%). Unlike the previous indicators, Poland ranked lower in the international comparison, with a 21% reduction since 1990. Among Polish regions, Pomorskie voivodship achieved the best results in reducing the neoplasm-related disease burden. The DALY rate dropped by 37% between 1990 and 2021. Substantial improvements were also recorded in Małopolskie and Warmińsko-Mazurskie voivodships (both -27%). The weakest progress was observed in Świętokrzyskie voivodship, where the DALY rate fell by only 6%, placing the region among those with the least health improvement in the group analysed. In the shorter period of 2010–2021, Greece recorded the smallest improvement in neoplasm burden reduction (-1%), followed by Mazowieckie voivodship (-6%) and the United Kingdom (-12%). The best results were achieved by Slovenia and Hungary (both -18%) and by France and the Czech Republic (both -17%). Among Polish voivodships, Pomorskie again ranked first (-21%), followed by Warmińsko-Mazurskie and Opolskie (both -16%). It is worth noting that the national average reduction in Poland over the 10-year period was -12% (Fig. 17.5).

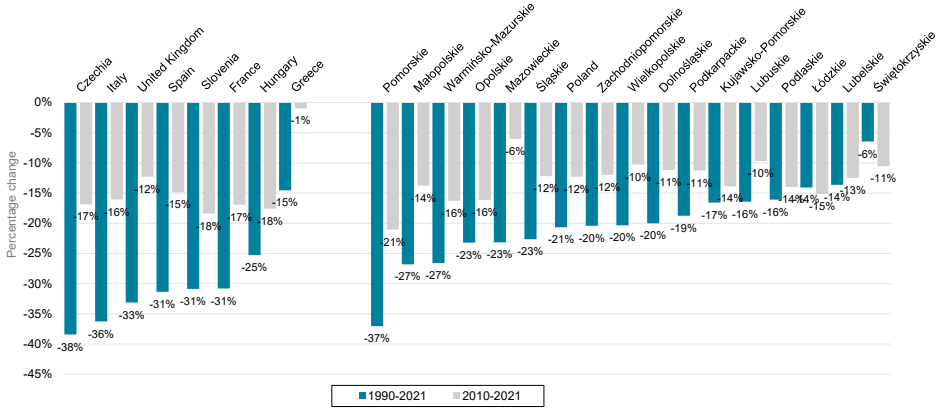


Fig. 17.5. Trends in DALY changes due to neoplasm in Poland and its 16 voivodships compared to selected European countries (over the last 30 and 10 years)

18. HEALTHCARE EXPENDITURE AND INFRASTRUCTURE OF THE HEALTHCARE SYSTEM IN POLAND

Katarzyna Kwiatkowska, Olga Partyka, Monika Pajewska, Aleksandra Czerw

Expenditure on healthcare in Poland and other EU countries

The healthcare system in Poland has been struggling with insufficient funding for many years, resulting in difficulties in accessing medical services and shortages of medical personnel, among other things. Although public funding is significant, accounting for 74% (2022), patient co-payments are also substantial, accounting for almost one-fifth of private health expenditure (19%, 2022).[1] This section presents data on public and private healthcare expenditures and changes in these expenditures over the last few years. The primary data source was the National Health Accounts, published annually by Statistics Poland, which contain basic information on healthcare expenditure in several standardised categories. The following section also presents data on expenditure in comparison with other EU and OECD countries to illustrate the international situation and compare Poland's situation with that of different countries. These tables primarily use data from the Organisation for Economic Co-operation and Development (OECD).

Public and private expenditure

As shown in Figure 18.1, current expenditures on healthcare, both public and private, are steadily increasing year on year. However, public spending is growing more dynamically – over the five years between 2018 and 2023, public expenditure increased by 103%, while private spending increased by only 14%, which is

[1] Główny Urząd Statystyczny, Narodowy Rachunek Zdrowia za 2022 rok [22.01.2025] https://stat.gov.pl/sygnalne/komunikaty-i-obwieszczenia/lista-komunikatow-i-obwieszczen/obwieszczenie-w-sprawie-narodowego-rachunku-zdrowia-za-2022-rok,283,11.html

related to the steady increase in public spending on healthcare. Current expenditures in 2023 amounted to PLN 238,296 million, of which 82% were public and 18% private.

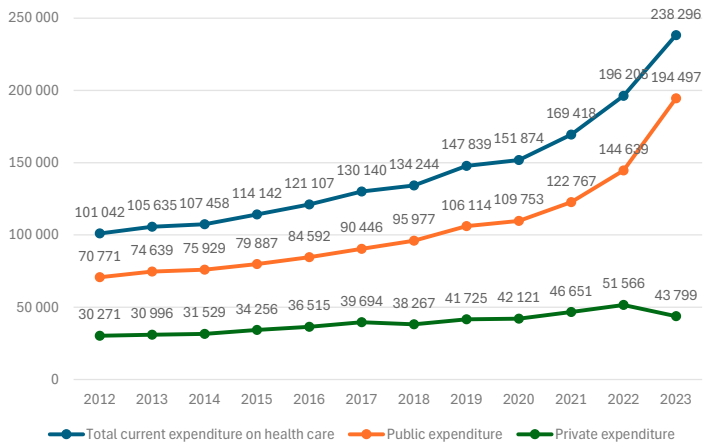


Fig. 18.1. Public expenditure on healthcare in 2012–2023 in PLN million (Statistics Poland, Health and health care [2013–2023])

The vast majority of public expenditure comes from health insurance contributions, which accounted for 87% in 2023, compared to around 80% in previous years (Fig. 18.2).

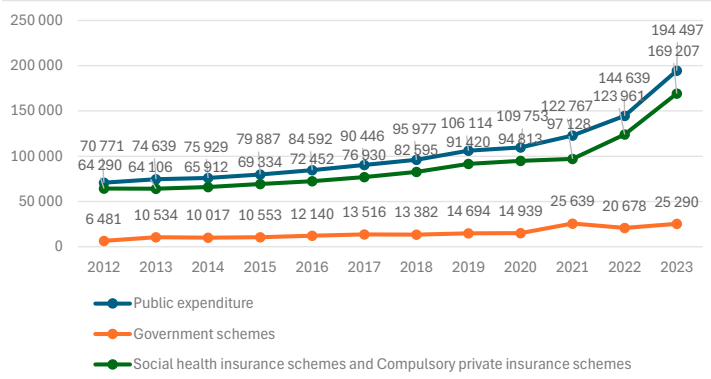


Fig. 18.2. Public expenditure on healthcare in 2012–2023 in PLN million (Statistics Poland, Health and health care [2012–2023])

Analysis of private expenditure shows that household out-of-pocket payments consistently account for the largest share. Out-of-pocket payments increased slightly over the years but declined in 2018. Another increase was observed in 2019. (Fig. 18.3). The largest out-of-pocket payments are made on medicines (approximately 60%), followed by dental and outpatient care. Patients spend the least on medical products, hospital care and diagnostic tests.[2]

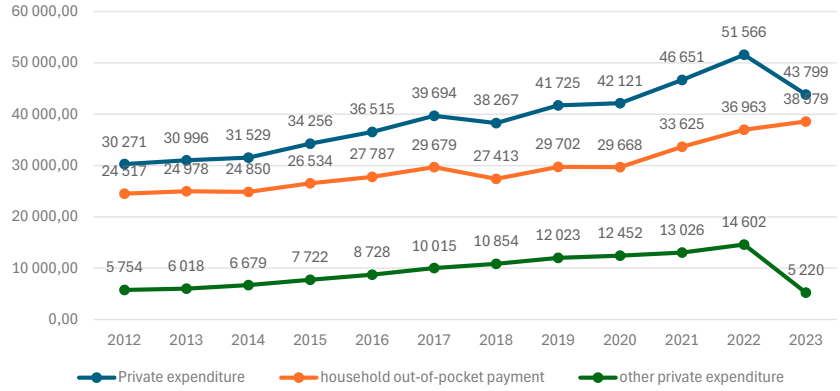


Fig. 18.3. Private expenditure on healthcare in 2012–2023 in PLN million (Statistics Poland, Health and health care [2013–2023])

One of the main factors when comparing healthcare systems is the percentage of GDP spent on healthcare. In Poland, it remains low and has been hovering around 6% since 2012, with slight fluctuations over the years. In 2023, the percentage of GDP allocated to healthcare was 7%, which is still lower than the EU average of 9.9%[3] (Fig. 18.4). At this point, it is worth noting that the methodology for calculating the percentage of GDP allocated to health has changed. Until 2017, the share of health expenditure was calculated in relation to the current year's GDP. In the amended Act on healthcare services financed from public funds of 24 November 2017,[4] the gross domestic product began to be determined based on the figure specified in the announcement of the President of Statistics Poland

[2] Tambor M, Pavlova M. Can people afford to pay for health care? New evidence on financial protection in Poland. Copenhagen: WHO Regional Office for Europe; 2020

[3] OECD/European Observatory on Health Systems and Policies (2021), Poland: Country Health Profile 2021, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels

[4] Act of 24 November 2017 on amendment to the Act on healthcare services financed from public funds, Dz.U. /Journal of Laws/ 2017, item 2434

as at 31 August. Statistics Poland publishes the final GDP figure with a two-year delay, so in real terms, the share of expenditure is calculated in relation to GDP two years prior rather than the current year, as was the case before 2017. These changes should be considered when analysing health expenditure data over the last few years.

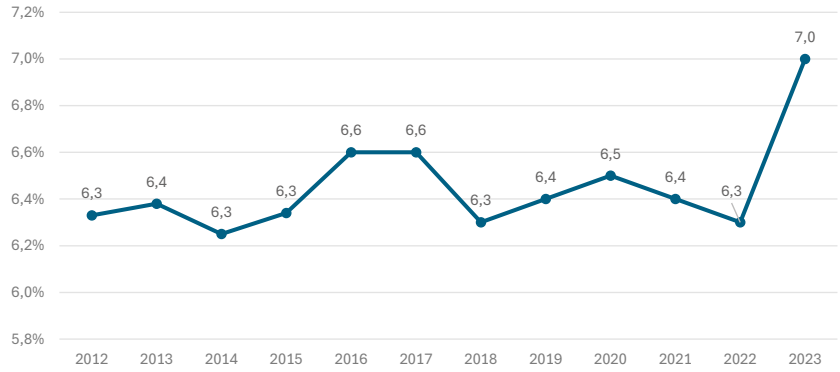


Fig. 18.4. Total healthcare expenditure as % of GDP in 2012–2023 (Statistics Poland, Health and healthcare [2013–2023])

Most healthcare expenditure is allocated to medical services, consistently accounting for over 50% in 2013–2022. Another important element is medical products, which accounted for approximately 20% of the total in the analysed years. The expenditure structure has not changed significantly over the years, but it is worth noting that spending on long-term care has increased by 2 percentage points over the last 5 years (from 6% to 8%) (Fig. 18.5).

Healthcare expenditure includes spending on prevention and healthcare. In the National Health Account published annually by Statistics Poland, this type of expenditure is classified under "Prevention and public health". Figure 18.6 shows the share of expenditure groups in total health expenditure in 2014–2022. Since 2014, the share of these expenditures has fluctuated around 2–3%, with a downward trend prevailing in recent years. The highest share of expenditure on public health and prevention in recent years was recorded in 2016 (3.1%), while it had fallen to only 1.9% by 2022.

Figure 18.7 shows the share of expenditures on prevention and public health as a percentage of GDP from 2014 to 2022. The proportion of these expenditures did not exceed 0.20% in the analysed period, with the highest share recorded in 2016 (0.20%) and the lowest in 2020 and 2022 (0.12%).

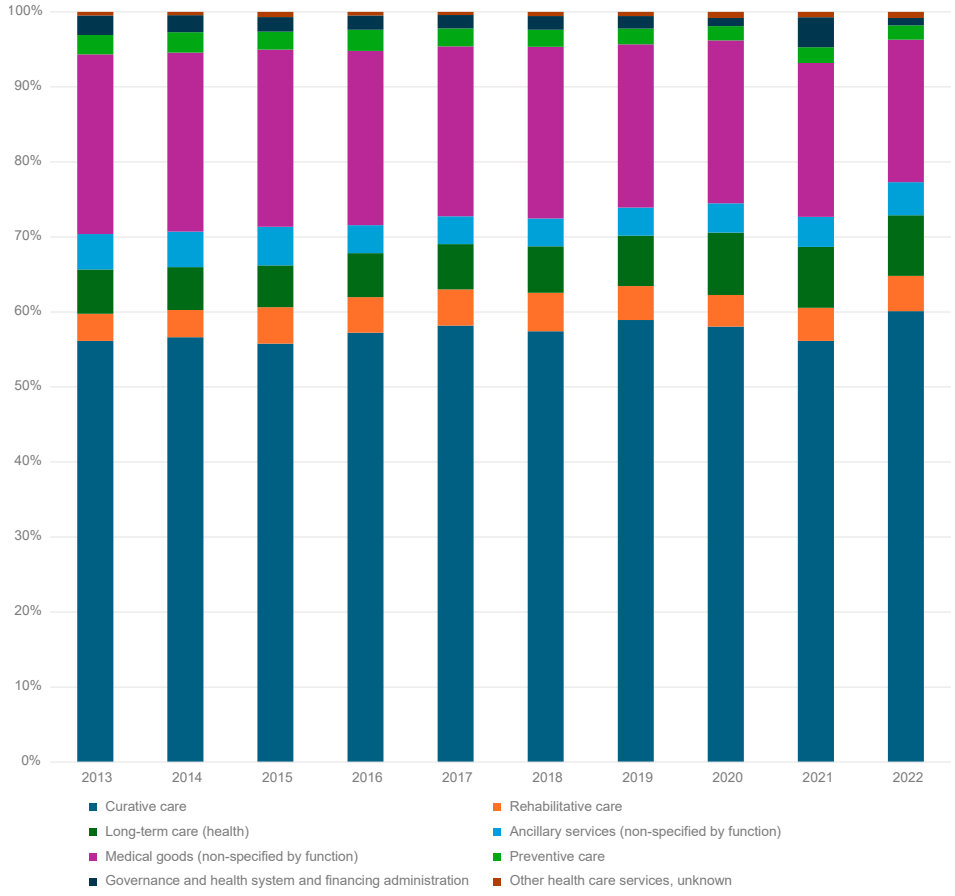


Fig. 18.5. Structure of healthcare expenditure in 2013–2022 by function (Statistics Poland, Health and health care [2013–2023])

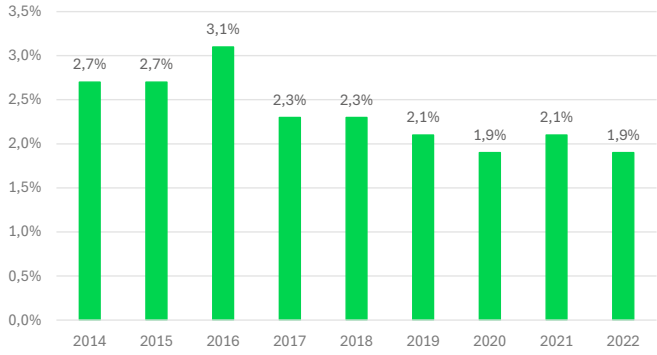


Fig. 18.6. Expenditure on prevention and public health as % of total healthcare expenditure in 2014–2022 (Statistics Poland, Health and health care [2015–2023])

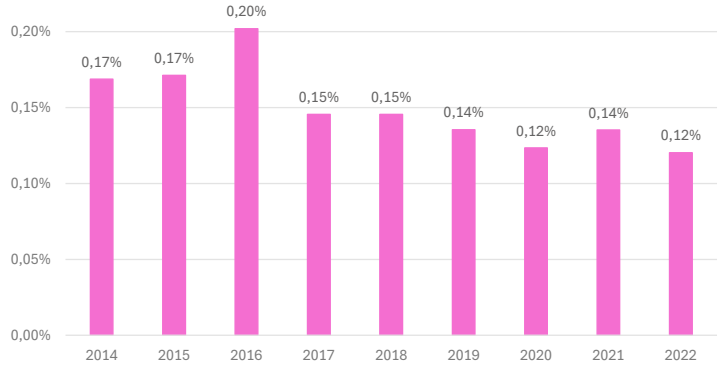


Fig. 18.7. Expenditure on prevention and public health as % of GDP in 2014–2022 (Statistics Poland, Health and health care [2015–2023])

In European Union countries, the share of expenditure on prevention and public health in total health expenditure ranged from almost 8% (Germany 7.8%, Austria 7.4%) to around 2% (Poland 1.9%, Slovakia 2%) (Fig. 18.8). Based on national data for other types of expenditure and compared with other countries, expenditure on prevention and public health in Poland has remained low for many years.

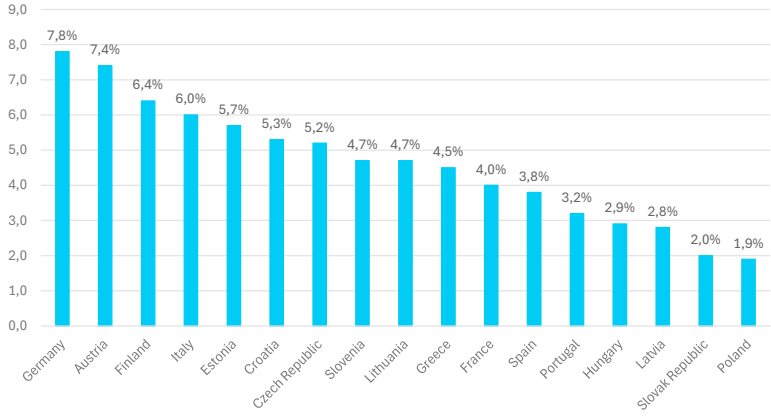


Fig. 18.8. Prevention and public health expenditure as % of total health expenditure in 2022 (OECD, Health at a Glance: Europe 2024)

In terms of GDP spending, Germany was in the lead with 12.7% in 2022. Only Ireland (6.1%) and Luxembourg (5.5%) reported figures lower than Poland (Fig. 18.9).

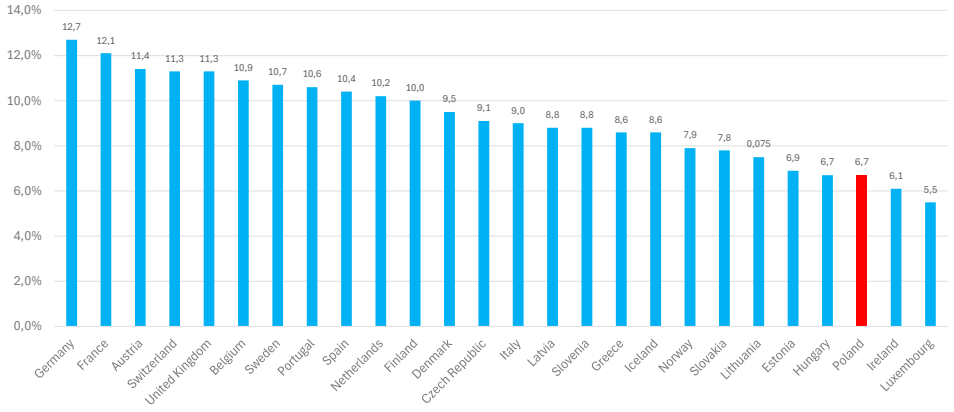


Fig. 18.9. Total healthcare expenditure as % of GDP in 2022 (OECD, Health at a Glance: Europe 2024)

Figure 18.10 illustrates the extent to which medical services provided in a country are covered by public funds. Poland performs relatively well in this comparison, with 74% in 2022. The same percentage was recorded in Spain, Slovenia and Italy, while slightly higher figures were reported in Estonia (75%) and Belgium (75%). Germany, on the other hand, performed best, achieving 87%.

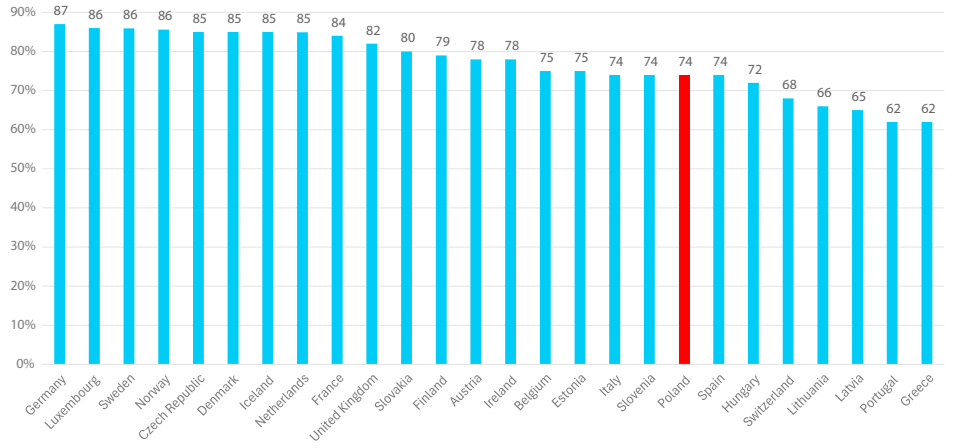


Fig. 18.10. Coverage of the cost of all medical services by public funds and universal insurance by 2022, % (OECD, Health at a Glance: Europe 2024)

In addition to the above breakdown, the public funding of hospital and outpatient care, the two most cost-intensive aspects of medical care, is presented (Fig.

18.11). Poland, likewise, ranked somewhere in the middle, with 71% for outpatient care and 94% for hospital care. In most countries, hospital care accounts for the largest portion of public spending, with Slovakia being the exception. These numbers are very similar in some countries, like Greece and the Czech Republic.

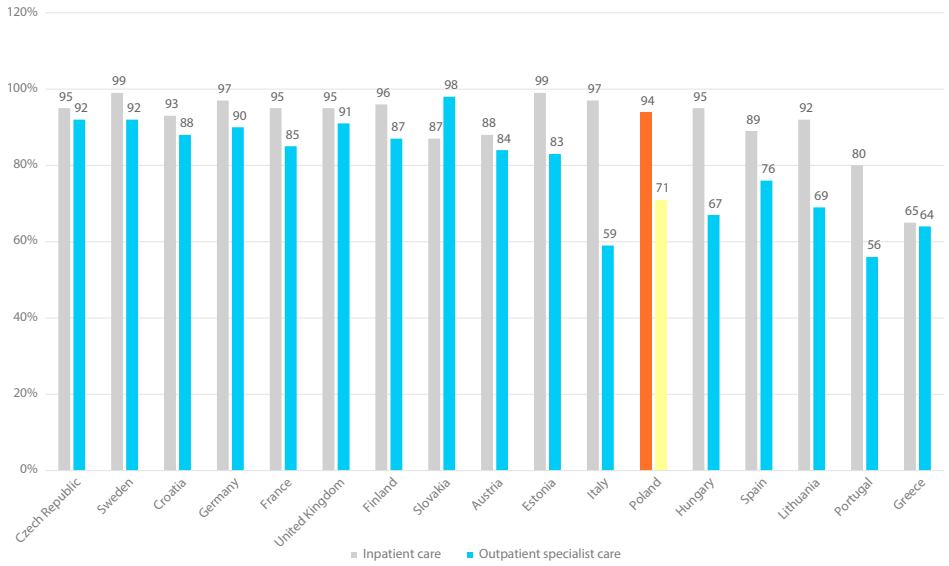


Fig. 18.11. Coverage of the cost of outpatient specialist care and hospital care from public funds and universal insurance in 2022, % (OECD, Health at a Glance: Europe 2024)

The structure of healthcare expenditure in OECD countries shows great diversity. Hospital care accounts for the largest share of healthcare costs in most countries, sometimes falling behind outpatient care (e.g. Finland, Latvia, Portugal, Estonia). In Poland, the figures are quite similar (37% hospital care and 33% outpatient care). Also noteworthy is the higher share of long-term care in the expenditure structure, which can be observed, for example, in Norway, the Netherlands, Sweden and Belgium (more than 20%). In Poland, it is 8%, similar to Spain (9%), Estonia (10%) and Lithuania (7%) (Fig. 18.12).

Healthcare resources

Healthcare resources include both human resources and infrastructure (medical facilities, number of beds, medical equipment, etc.). The ability to meet citizens' health needs depends largely on the quality of healthcare resources.

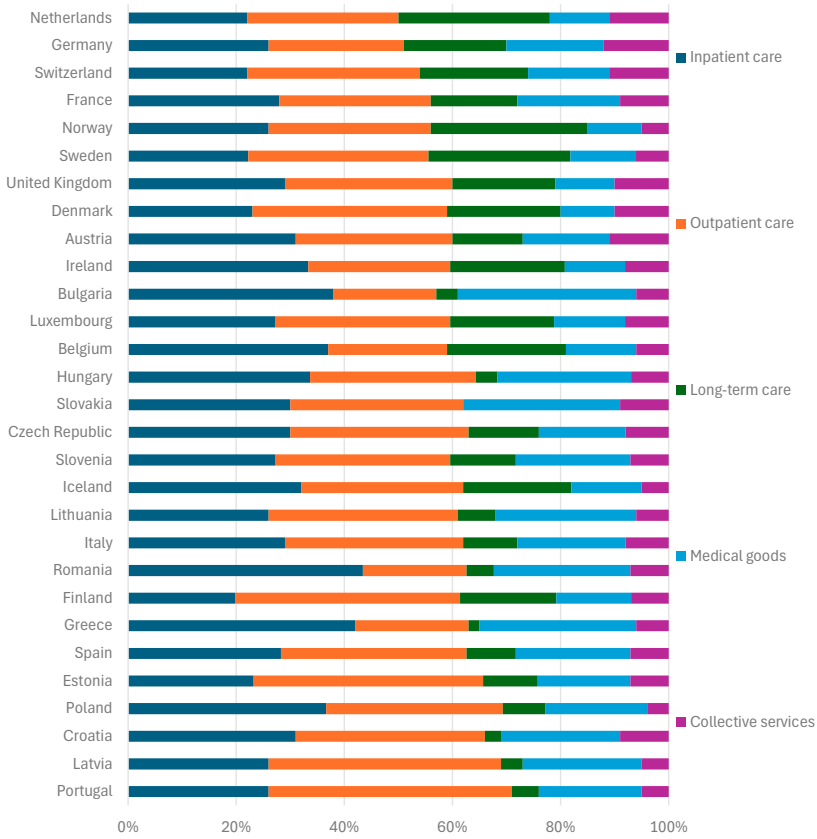


Fig. 18.12. Structure of healthcare expenditure in OECD countries in 2022 (OECD, Health at a Glance: Europe 2024)

As indicated by the WHO, high-quality medical services can be ensured by combining various resources, such as financial, human, and material and technical resources.[5] The following breakdowns are based on data from the Polish Chamber of Physicians and Dentists, the Polish Chamber of Laboratory Diagnosticians, the Polish Pharmaceutical Chamber, the Polish Chamber of Nurses and Midwives, Statistics Poland and the Ministry of Health.

Medical personnel in the health care system

According to data from the Polish Chamber of Physicians (Naczelna Izba Lekarska), in 2024 nearly 156,000 physicians and 41,000 dentists were practising. Data for pharmacists and laboratory diagnosticians were available for 2023 (Fig. 18.13).

[5] Wyzwania w systemie ochrony zdrowia - zasoby ludzkie i zasoby organizacyjne w centralnych instytucjach, (ed. A. Zybała), Krajowa Szkoła Administracji Publicznej, Warsaw 2009.

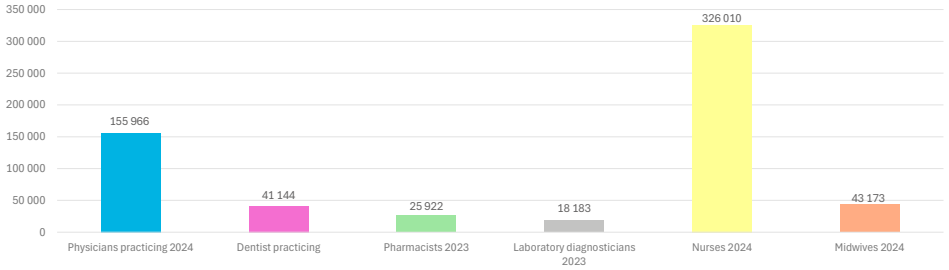


Fig. 18.13. Number of medical personnel in Poland (Polish Chamber of Physicians and Dentists, National Chamber of Laboratory Diagnosticians, Statistics Poland, Polish Chamber of Nurses and Midwives)

An analysis of data on gender shows a clear feminisation of the medical profession. Among men, the largest age group was over 71 (8,530, 13%), followed by the 56-60 age group (7,657, 12%) and the 26-30 age group (6,976, 11%). Among women, the largest group was the over-71 age group (12,272, 13%), followed by the 26-30 age group (11,715, 13%) and the 31-35 age group (11,466, 12%) (Fig. 18.14).

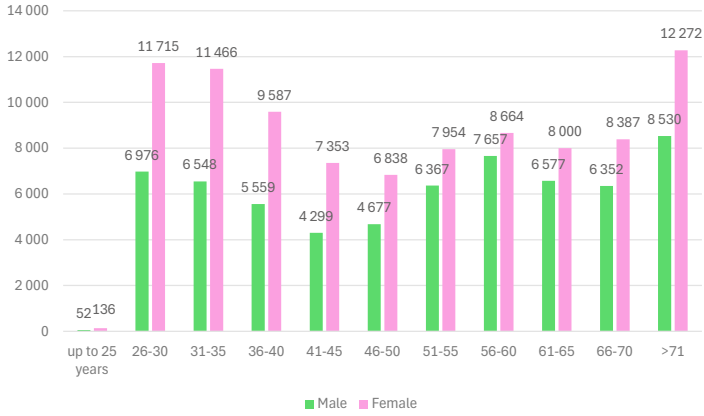


Fig. 18.14. Distribution of physicians practising in 2024 by gender and age (Polish Chamber of Physicians and Dentists, Statistical Information [https://nil.org.pl/rejestry/centralny-rejestr-lekarzy/informacje-statystyczne])

Based on the data presented, the average age for men was 51 years and for women 50 years, which is higher due to the number of doctors who remain professionally active after reaching retirement age (approx. ¼). Analysing the data on age structure, it appears that the number of doctors in the younger age groups is sufficient to ensure generational replacement. This is confirmed by recent analyses by the Polish Chamber of Physicians and Dentists, according to which

maintaining the current level of education limits could lead to a surplus of doctors of up to 20% in 2048. The current demand is approximately 4.1 physicians per 1,000 people, while the actual number is between 3.4 and 3.6, creating a gap of approximately 15%. According to the analysis of the Polish Chamber of Physicians and Dentists, the number of doctors currently studying will be sufficient to fill this gap. According to the model developed by the Polish Chamber of Physicians and Dentists, in the coming years, the Ministry of Health should gradually reduce the number of places on medical courses, which will allow the supply and demand of doctors in the healthcare system to be balanced.[6]

According to data from the Central Register of Nurses and Midwives, in 2024 there were 326,010 registered nurses and 43,173 midwives[7] in Poland (Fig. 18.13). Based on the Report on the state of nursing and midwifery in Poland[8], the largest age group among both nurses and midwives was 51-60 years (29.4% of midwives and 31.5% of nurses, respectively). This means that, on average, every third nurse and midwife in Poland is of pre-retirement age. According to forecasts by the Polish Chamber of Nurses and Midwives from April 2022, by 2030 as many as 65% of currently employed nurses and 60% of midwives will be of retirement age.[9] The situation in this age group is considerably more critical than among physicians and as reported by NIPiP in 2022 and confirmed by CRPiP data, current figures indicate a lack of replacement of retiring personnel in this professional group (Fig. 18.15).[10]

In addition to the number of registered nurses and midwives, the employment rate is also important, as it shows the percentage of nurses and midwives who are active in their profession. The data shows that it is highest in the 41-60 age group, hovering around 80% for both nurses and midwives. However, it is relatively low in the youngest age group, i.e. 21-30 years (56.5% for nurses and 55.3% for midwives). According to the survey, the most common reasons for leaving the

[6] Polish Chamber of Physicians and Dentists, Aktualności, Polska na drodze do marnowania miliarda złotych rocznie na kształcenie nadmiarowych lekarzy [retrieved: 5 February 2025] https://nil.org.pl/aktualnosci/8502-polska-na-drodze-do-marnowania-miliarda-zlotych-rocznie-na-ksztalcenie-nadmiarowych-lekarzy

[7] Central Register of Nourses and Midwives, Warsaw 2024

[8] National Chamber of Nurses and Midwives, Report on the State of Nurses and Midwives, 8th National Congress of Nurses and Midwives, Warsaw 2023

[9] Polish Chamber of Nurses and Midwives, Raport o stanie pielęgniarstwa i położnictwa w Polsce, VIII Krajowy Zjazd Pielęgniarek i Położnych, Warsaw 2023

[10] Polish Chamber of Nurses and Midwives, Report of the Polish Council of Nurses and Midwives: Pielęgniarka, Położna zawody deficytowe w polskim systemie ochrony zdrowia, Warsaw, April 2022

profession are low pay or looking for a new job, while other reasons include temporary inactivity due to pregnancy, maternity leave or parental leave.[11]

In terms of the number of physicians per 1,000 inhabitants, Poland, with a value of 3.5, ranks in the middle of the lower half of the ranking. Eurostat provides slightly different figures, reporting 2.4 physicians per 1,000 inhabitants in 2021, which paints a less favourable picture of Poland. This discrepancy stems from Eurostat's different data collection methodology, as well as incomplete or inflated data from some countries.

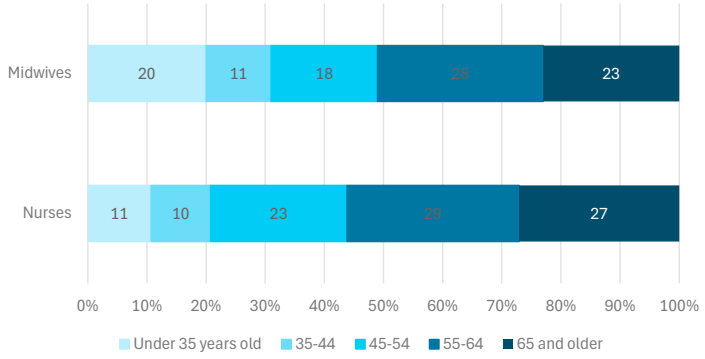


Fig. 18.15 Age structure of nurses and midwives in 2023 (NIPiP, Central Register of Nurses and Midwives)

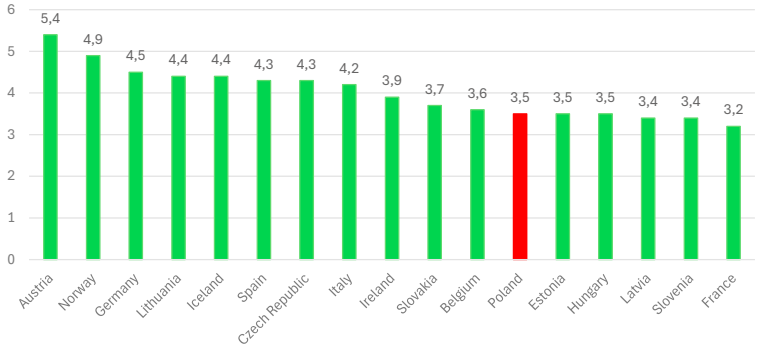


Fig. 18.16. Number of physicians per 1,000 people in 2022 (OECD, Health at a Glance: Europe 2024)

Figure 18.17 shows the number of physicians per 1,000 people in OECD countries in 2012 and 2022. All countries analysed saw an increase in the number of

[11] Polish Chamber of Nurses and Midwives, Raport o stanie pielęgniarstwa i położnictwa w Polsce, VIII Krajowy Zjazd Pielęgniarek i Położnych, Warsaw 2023

physicians, with Poland experiencing a significant increase compared to other countries. The highest rates in 2022 were recorded in Greece (6.6), Portugal (5.7) and Austria (5.4). In Poland, the indicator reached 3.5 in 2022.

For nurses, the ratio per 1,000 inhabitants increased slightly (Poland, Greece), while in some countries it decreased (Slovakia, Hungary, Latvia) (Fig. 18.18).

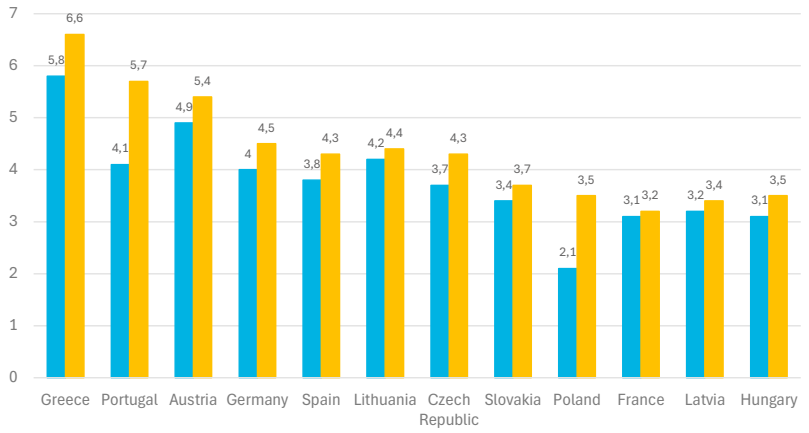


Fig. 18.17. Number of physicians per 1,000 people in 2012 and 2022 (OECD, Health at a Glance: Europe 2024)

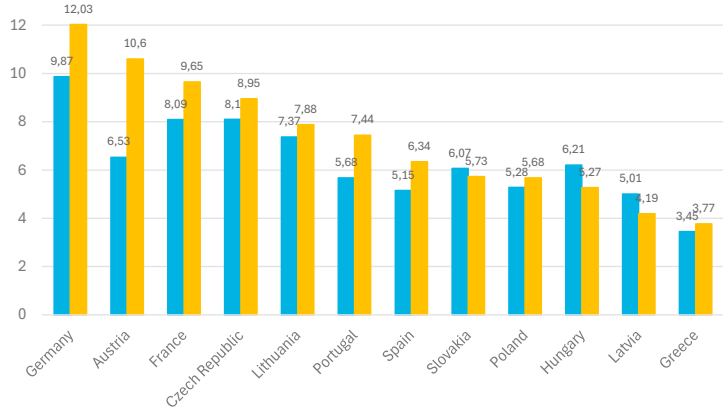


Fig. 18.18. Number of nurses per 1,000 people in 2010 and 2021 (OECD, Health at a Glance 2023)

24-hour inpatient care

In 2023, there were 872 hospitals operating in Poland, with the highest numbers located in the following voivodships: Śląskie (141), Mazowieckie (115), and Dolnośląskie (77) (see Fig. 18.19). A similar distribution was observed in the number of hospital beds, which amounted to 157,813 nationwide in 2022. The

largest numbers of beds were recorded in Mazowieckie (22,466), Śląskie (21,175), and Małopolskie voivodships (13,255). In terms of the number of beds per 1,000 people, the highest ratios were noted in the following voivodships: Śląskie (4.9), Łódzkie (4.72), and Lubelskie (4.67) (see Fig. 18.20).[12] Although the overall number of beds appears relatively high, their distribution across the country is uneven, which directly affects access to healthcare services.[13]

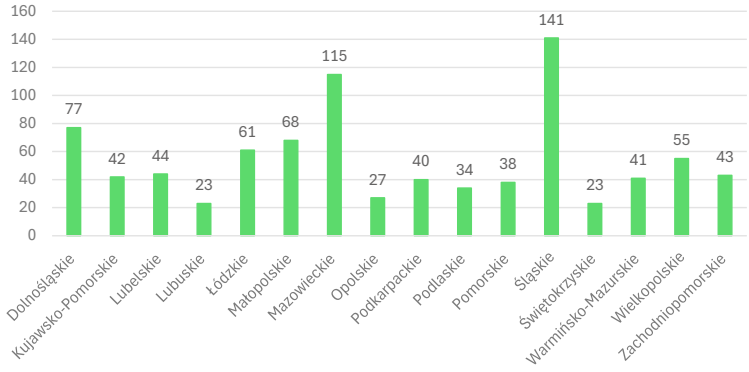


Fig. 18.19. Number of hospitals by voivodship in 2023 (Ministry of Health, Statistical Bulletin of the Minister of Health 2024)

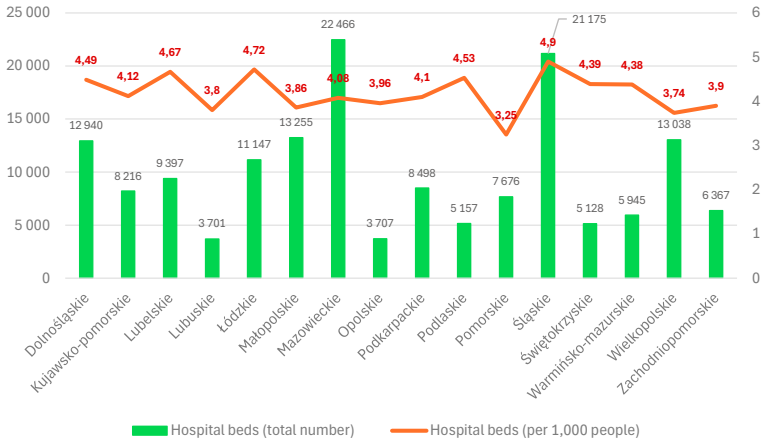


Fig. 18.20. Number of beds by voivodship and rate per 1,000 people in 2023 (Ministry of Health, Statistical Bulletin of the Minister of Health 2024)

[12] Statistical Bulletin of the Minister of Health 2023, Centre for e-Health, Warsaw 2023

[13] OECD/European Observatory on Health Systems and Policies (2021), Poland: Country Health Profile 2021, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels

An additional issue is the low bed occupancy rate, which leads to unjustified and excessive costs for healthcare providers and, on a national scale, results in increased expenditure for the healthcare system. According to a report by the Supreme Audit Office (NIK) on the functioning of the basic hospital healthcare service system, the lowest bed occupancy rates were observed in gynaecology and obstetrics, neonatology, paediatrics, and ophthalmology wards.[14]

International data on the number of hospital beds differ slightly from national data. According to the OECD, the rate for Poland is 6.13 beds per 1,000 inhabitants. As noted in the OECD report 'Health at a Glance: Europe 2024', the data presented are primarily drawn from official national statistics and collected through joint OECD and Eurostat questionnaires. It should be borne in mind that data submitted to international institutions are reported at specific intervals, whereas at the national level they are continuously verified and updated, which can lead to discrepancies between figures published by national and international bodies. In the OECD report, Poland ranked relatively well compared with other countries, just behind Austria, Hungary and the Czech Republic, which had similar values. Germany recorded the highest rate (7.7), while Denmark (2.5), the United Kingdom (2.5) and Sweden (1.9) had the lowest rates (Fig. 18.21).

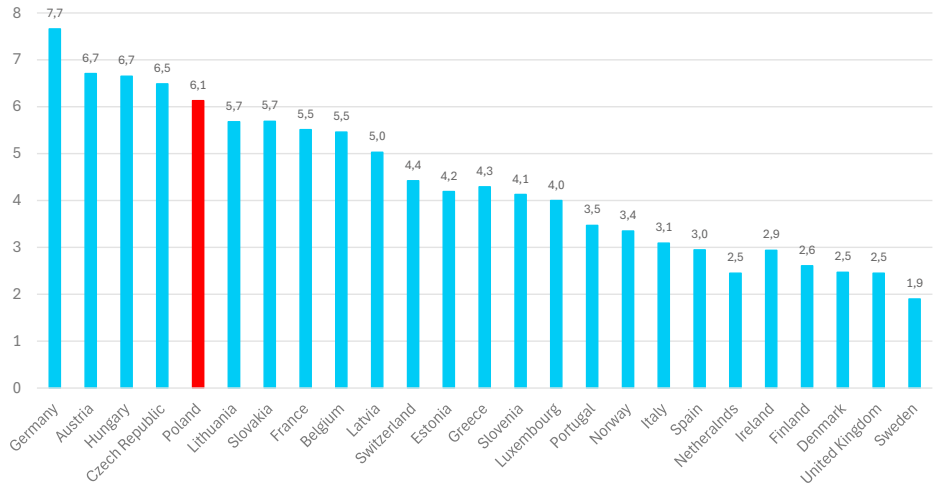


Fig. 18.21. Number of beds per 1,000 people in 2022 (OECD, Health at a Glance: Europe 2024)

[14] Supreme Audit Office, Funkcjonowanie systemu podstawowego szpitalnego zabezpieczenia świadczeń opieki zdrowotnej [retrieved: 22 January 2025] https://www.nik.gov.pl/kontrole/P/18/059/KZD/

Figure 18.22 shows the rate of total medical consultations per capita in OECD countries. The data shown are for all medical consultations (primary care and specialists) at all levels of care (outpatient, inpatient, etc.). In Poland, 7.1 visits per capita were recorded in 2022. The highest rate was recorded in Italy (9.7), while the lowest in Sweden (2.3).

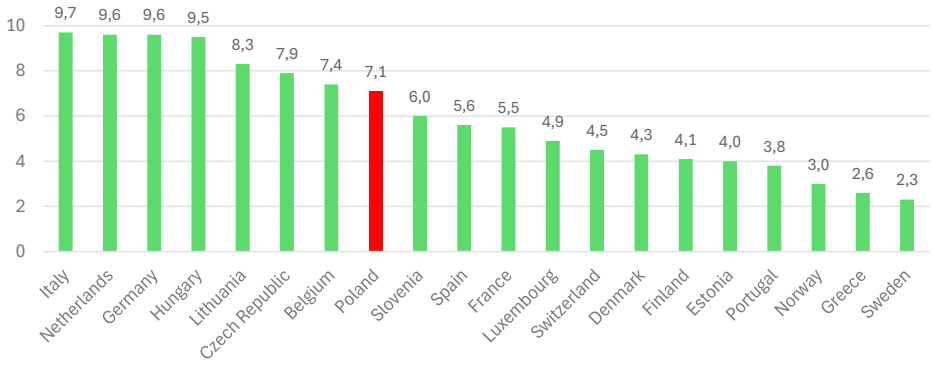


Fig. 18.22. Rate of all medical consultations per capita in 2022 (OECD, Health at a Glance: Europe 2024)

An analysis of the structure of outpatient consultations in Poland shows that primary health care plays the main role, accounting for 53.3% of consultations, while consultations with specialists ranked second with a share of 36.7%. Dental consultations had the smallest share (Fig. 18.23).

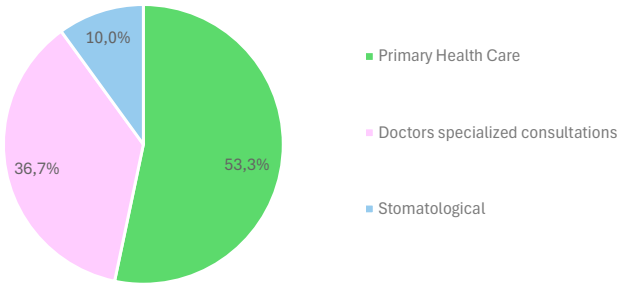


Fig. 18.23. Structure of outpatient advice in 2022 (Statistics Poland, Health and health care in 2023)

Fig. 18.24 shows the regional variation in the number of outpatient advice provided. Invariably, all voivodships have the highest number of primary care advice given. The highest total amount of advice was provided in the voivodships

of Mazowieckie, Śląskie and Małopolskie, while the lowest amount was provided in Opolskie, Lubuskie and Świętokrzyskie.

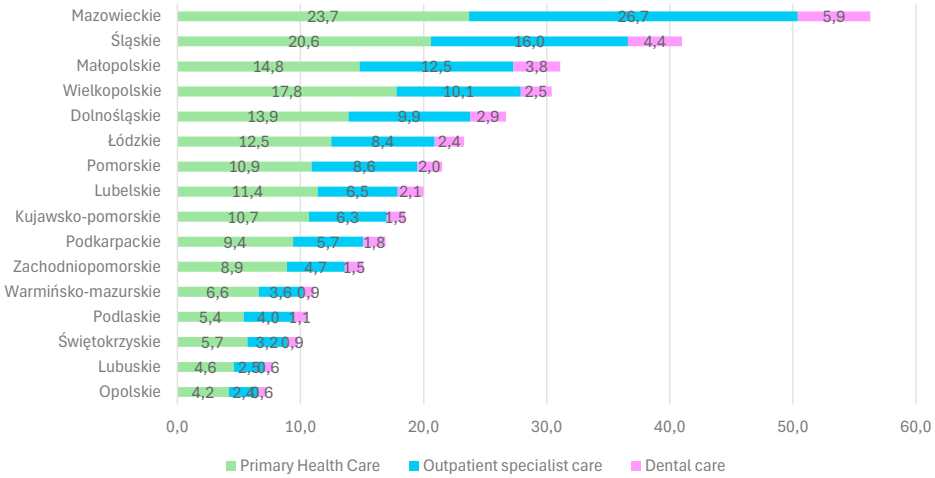


Fig. 18.24. Breakdown of outpatient visits by voivodeship in 2023 (data in millions) (GUS, Outpatient Healthcare in 2023)

Availability of health care services among the elderly and geriatric care

The ageing of the population in Poland is progressing year by year. According to data from the Statistics Poland, at the end of 2022, the number of people aged 60 and over was already 9.8 million, which represented an increase of 0.7% compared to the previous year. The demographic burden ratio, i.e. the number of people aged 65 and over per 100 people aged 15 to 64, was 29.9% in 2022.[15] The current demographic situation is not without impact on the healthcare system, which is already being felt today. Demographic forecasts leave no room for illusions, which is why it is so important to plan healthcare resources properly in order to provide care for the ever-growing group of seniors.

One of the important indicators in elderly care is the number of healthcare and residential care centres. Between 2018 and 2023, the number of both types of facilities increased, with a more pronounced increase in the number of healthcare centres (Fig. 18.25). However, it should be remembered that the provision of services by healthcare centres cannot be equated with comprehensive medical

[15] Statistics Poland, The situation of older people in Poland in 2022, Warsaw, Białystok 2023

care for older people with multiple diseases. High-quality care for these patients can only be provided by specialized geriatric wards and clinics.[16]

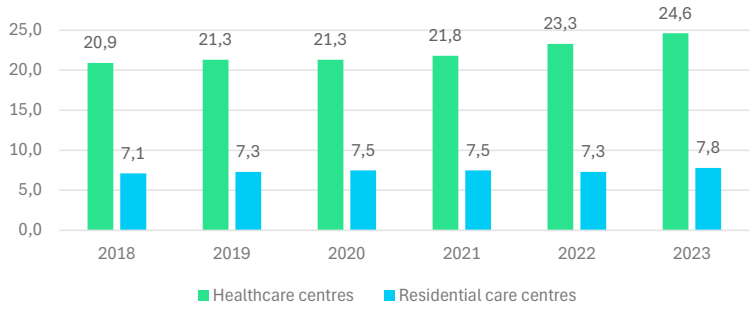


Fig. 18.25 Number of beds in general long-term care and nursing-care facilities (excluding psychiatric beds) in 2023, in thousands (GUS, Health and Healthcare in 2023)

Analysing the number and utilisation of beds in geriatric wards over the past few years, we observe that although the number of beds has increased, their utilisation has fluctuated, compared with 2018, showing a trend towards improvement (2019) and a decline (2020-2022). In 2023, the utilisation rate was similar to that of 2018, at 64.6% (Fig. 18.26). As indicated in the 2021 Supreme Audit Office report on the functioning of geriatric care, the most important problem is the insufficient number of medical personnel qualified in this field, both doctors and nurses. In addition to the insufficient number of geriatric specialists, there is also the problem of their uneven distribution across the country, which means that there are voivodships (e.g. Warmińsko-Mazurskie) where there are no specialists in this field.[17]

In 2023, there were 62 geriatric wards and 195 geriatric clinics operating in Poland. As already mentioned, there are significant regional differences in this respect. For example, there was only one geriatric ward in Warmińsko-Mazurskie and Zachodniopomorskie voivodships, while the highest number was recorded in Śląskie (13) and Małopolskie (8) voivodships. The fewest geriatric clinics are found in the voivodships of Podkarpackie, Świętokrzyskie and Warmińsko-Mazurskie (3 in each voivodship). Similarly to wards, the highest number of geriatric

[16] Supreme Audit Office, Funkcjonowanie medycznej opieki geriatrycznej [Functioning of geriatric care] [22 January 2025] https://www.nik.gov.pl/kontrole/P/21/072/LKI/
[17] Supreme Audit Office, Funkcjonowanie medycznej opieki geriatrycznej [Functioning of geriatric care] [22 January 2025] https://www.nik.gov.pl/kontrole/P/21/072/LKI/

clinics was recorded in the following voivodships: Śląskie (40), followed by Mazowieckie (26) and Małopolskie (24) (Fig. 18.27).

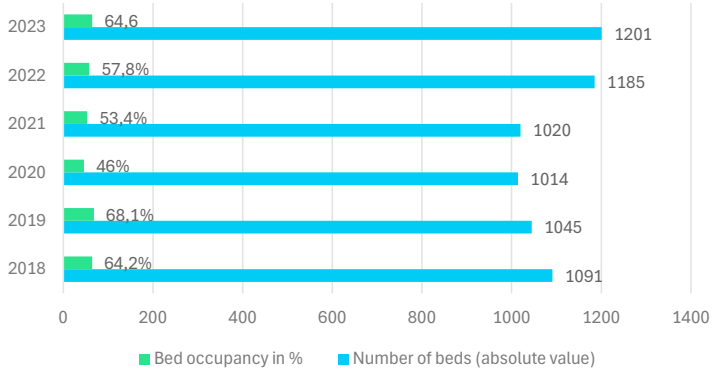


Fig. 18.26. Number of beds and bed utilisation in geriatric wards in 2018-2022 (Ministry of Health, Statistical Bulletin of the Minister of Health [2019-2024])

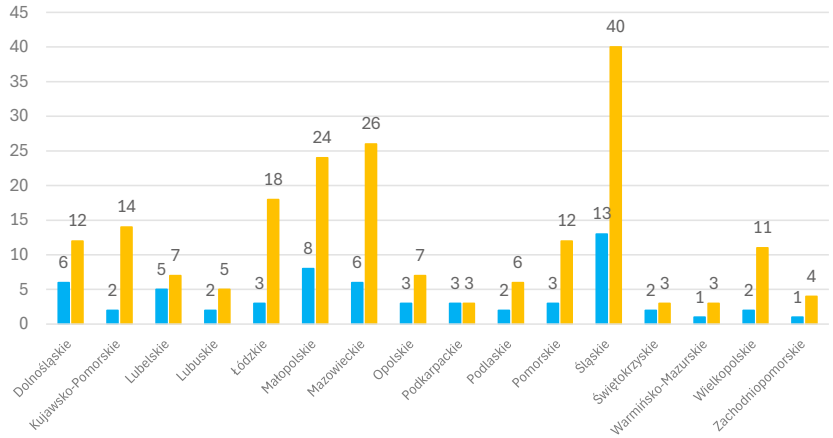


Fig. 18.27. Number of outpatient clinics and geriatric wards in 2023. (Statistics Poland, The situation of older people in Poland in 2023).