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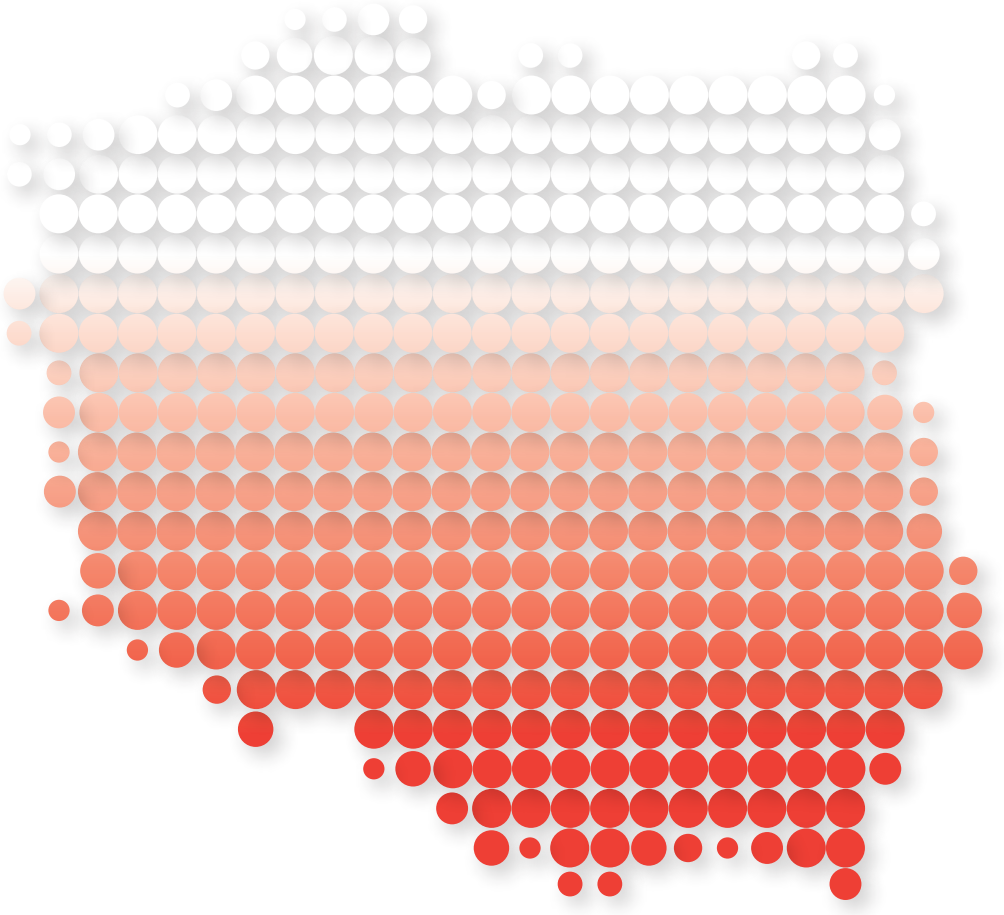
Social inequalities in health in Poland



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Abstract

The study presents a first comprehensive report summarizing current knowledge on the scale of health inequalities in Poland, measurement methods used in assessing these, and the risk of health inequalities in various age groups, populations and regions. Numerous accounts of preventive initiatives in place across the country supplement the numerical data, providing first evidence of interventions aimed at tackling health inequalities. The study comprises four chapters: two on the determinants of inequalities (at macro and individual levels) and two on specific populations (children and adults).

The first chapter deals with selected upstream determinants of health in Poland, such as relative poverty, education, and expenditure on health care. Poland belongs to a group of Organisation for Economic Co-operation and Development countries in which the level of health care expenditure is among the lowest in relation to gross domestic product. The country's level of relative poverty is similar to the European Union average. However, in contrast to many other European Union countries, the risk of poverty among children and adolescents is still very high, although between 2005 and 2008, the ratio fell from 29% to 22%. The level of educational attainment of the Polish population has also been gradually improving, with the percentage of people with higher (university-level) education gradually increasing – between 2002 and 2007, this ratio increased by almost half among people aged 13 years and over.

The second chapter features the results of large-scale surveys, which allowed for an assessment of the threat of the key risk factors among the adult population in Poland. The third chapter is devoted to health inequalities in children and adolescents. Analysis of infant mortality according to the mother's education level has shown that, in spite of a substantial decline in the overall mortality rate, social inequalities have risen. In 2000–2007, a decline in mortality was observed in all social groups, but it was proportionally greater among women with higher education. The last chapter is composed of three parts: the first is devoted to an analysis of mortality in adults; the second features an account of the relationship between the population's state of health and education level; and the third includes relevant analysis arried out at regional level.

An analysis of three age groups was taken into account, as well as four main causes of death within each group: cardiovascular diseases, malignant neoplasms, external causes and diseases of the digestive system. Gender is an interesting factor in terms of the differences in risk of death in Poland – male mortality is much higher than female mortality, and the biggest gap can be observed at a relatively young age, that is, 25–44 years. Urban or rural place of residence has relatively little impact, while the region of residence is of greater significance to differences in mortality, especially in terms of risk of death caused by digestive and pulmonary system diseases, and external causes. Regional differences in mortality due to cancer and cardiovascular disease are less pronounced. As expected, higher mortality rates are observed in less-educated individuals. The average life expectancy of people aged 25 years with post-secondary or tertiary-level education was 13 years longer in men and 9 years longer in women in 2002 (compared to people with no secondary education).

A set of recommendations are presented at the end of the report.

Keywords

Health status disparities
Socioeconomic factors
Social class
Risk factors
Poland

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Abbreviations and acronyms

BCA	Biennial Collaborative Agreement
BMI	Body mass index
CINDI	Countrywide Integrated Noncommunicable Disease Intervention
CSAP	Child Safety Action Plan
CSDH	Commission on Social Determinants of Health
CVD	Cardiovascular disease(s)
DFLE	Disability-free life expectancy
EHEMU	European Health Expectancy Monitoring Unit
EU	European Union
EU15	15 Member States belonging to the EU prior to 1 May 2004
EU27	27 Member States belonging to the EU from 1 May 2004
FAS	Foetal Alcohol Syndrome
FCTC	Framework Convention on Tobacco Control (World Health Organization)
GATS	Global Adult Tobacco Survey
GDP	Gross domestic product
GUS	Polish Central Statistical Office
HBSC	Health Behaviour in School-aged Children
ICD-10	International Classification of Diseases (10^{th} revision)
IMiD	Institute of Mother and Child
ISO	International Organization for Standardization
LE	Life expectancy
NFZ	Polish National Health Fund
NGO	Nongovernmental organization
NNI	Net national income
NPZ	Polish National Health Program
NUTS	Nomenclature of Territorial Units for Statistical Purposes
OECD	Organisation for Economic Co-operation and Development
PARPA	State Agency for the Prevention of Alcohol-Related Problems
PL	Poland
POLKARD	National Program for Prevention and Treatment of Cardiovascular Diseases
PPP	Purchasing power parity
SDR	Standardized death rate
SHE	Schools for Health in Europe Network
UNDP	United Nations Development Programme
VAT	Value-added tax

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Forewords

Long-lasting Polish development, seriously stimulated by reforms introduced within the country and by its membership in the European Union has positively influenced the quality of life and health status of the Polish population. These positive trends, however, have been accompanied by rising inequalities in health across various groups, resulting from differences in social and economic living and working conditions – so-called social determinants. Tackling inequities in health is a public health challenge which is gaining increasing prominence in Poland, just as in other countries. Effective policy responses are complex and demand the development of intersectoral, long-range strategies informed by evidence, along with whole-of-society approaches and strong international cooperation. Therefore, Poland participates in activities of WHO, which established the Commission on Social Determinants of Health in 2005 and the European Review of Social Determinants and the Health Divide in 2009, with the purpose, inter alia, of strengthening the evidence base and proposing policy options to reduce the above-mentioned avoidable differences in health by acting on social determinants. Commitment to act with other sectors, countries and international partners was demonstrated by including this issue in the programme of the Polish European Union Presidency in 2011.

This publication is a significant contribution towards better understanding of social inequalities in health in Poland. It is an important starting point for further domestic and international discussion about how to ensure the best health outcomes on equal terms for individuals from all socioeconomic groups.

Jakub Szulc
Secretary of State, Ministry of Health, Poland

Health in the WHO European Region is improving but not as rapidly as it could and at different rates across the population. Evidence collected by WHO, both globally and in Europe, clearly shows that there are gaps in health within countries. Such gaps follow a pattern depending on a person's income level and security, housing tenure, educational attainment, employment opportunities and conditions, as well as access to appropriate health services and social protection measures. Ethnicity and gender norms, and societal values further affect opportunities to be healthy and the risk of experiencing poor health and an early death. Where avoidable gaps in health exist, these are a challenge to the social and economic progress of society and to the attainment of the key European values of fairness and cohesion. The good news is that many of these factors – also known as the social determinants of health – can be influenced through public policy measures and through mechanisms which engage all levels of government and the whole of society in promoting and protecting health. New evidence and technologies are available to support efforts at local, national and European levels, in order to reduce avoidable gaps in health by addressing their social determinants. Developments in our approaches to governing for health in the 21st century – characterized by factors such as citizen engagement, mutisectoral policy development and better integrated systems for treatment and care – give us more opportunity to increase life chances, as well as the health potential of individuals and whole communities. This report on social inequalities in health in Poland will provide a strong foundation for informing future policy decisions and alliances for health at national and local levels. It is therefore an important step in realizing the health potential of the Polish population and in contributing to a more fair and sustainable society, thereby reflecting the key values and goals of the new European policy for health – Health 2020 – and, with luck, taking these forward in practice in Poland.

Zsuzsanna Jakab
WHO Regional Director for Europe

Executive summary

The most commonly used definition of health inequities is based on the assumption that they reflect **unnecessary and avoidable** differences in health, in addition considered to be **unfair and unjust**. Reducing health inequities is an ethical imperative, accepted by most modern societies.

One of the breakthrough moments in the recent activity of the World Health Organization was establishing the Commission on Social Determinants of Health in 2005. The Commission's 2008 *(1)* report entitled *Closing the gap in a generation: health equity through action on the social determinants of health* provides the framework for identifying interventions that will affect social determinants in a way that will impact on health equity across the social gradient.

In Poland, reducing health inequalities is quoted as the overriding objective of the National Health Program for 2007–2015 (*Narodowy Program Zdrowia*). Against this background, Poland announced its intention to join the Commission on Social Determinants of Health, to work alongside other measures in the field of health set out in the Polish National Health Program and key strategic documents. Following the publication of the Commission on Social Determinants of Health report, it was considered desirable to produce a preliminary national report identifying the relevance of the analysis and recommendations to the situation in Poland, as has been carried out in other countries. The report may serve as a starting point for a discussion on the national strategy for combating health inequalities and provide the basis for implementing a system to monitor this issue.

The concept of the report was designed and its constituent parts were written with the participation of researchers and academics from the National Institute of Public Health – National Institute of Hygiene, the Institute of Statistics and Demography WSE, the Institute of Mother and Child in Warsaw, Gdańsk Medical University, as well as the WHO Country Office, Poland (Warsaw) and the Polish administration.

The study summarizes the current knowledge on the scale of health inequalities in Poland, measurement methods used and the risk of health inequities in various age groups, populations and regions. Numerous accounts of preventive initiatives taken across the country provide a supplement for numerical data, although it was difficult to carry out a systematic review of interventions at this stage.

The structure of the study comprises two chapters on the determinants of inequalities (macro-level and individual) and two chapters on specific populations (children and adults).

Several recommendations based on accumulated knowledge are presented at the end of this report.

1. Macro-level social determinants of inequalities in health

In the first chapter, selected upstream determinants of health in Poland are discussed, such as relative poverty, education, and expenditure on health care.

Poland has a low level of absolute poverty, which in today's terms is defined by the World Bank as the daily income per capita below US$ 2.15, and the country's level of relative poverty[1] is quite close to the European Union average (in 2008 it was 16.9% in Poland, compared to 16.4% in all 27 European Union countries). However, in contrast to many other European Union countries, relative poverty levels

1 Measured using the Eurostat definition, at 60% of median equivalized income.

among children and adolescents is still very high. On a positive note, between 2005 and 2008, the level fell from 29% to 22%, which was the biggest reduction recorded in the European Union. Relative poverty increases with the number of dependent children in a family. Among families with four or more dependent children, almost half are in poverty.

Thus, the policy response in this context should focus not only on creating conditions for households to have higher incomes (through employment policy, among others) but also to provide direct support to low-income households. In particular, the existing social assistance system should be improved so that – without compromising the principle of preference for good work over inactivity – it would support, first and foremost, families in the most difficult income situations – that is, typically large families, households with disabled children and single-parent families. While the former would have an impact on reducing inequalities in the longer term and address the social gradient, the latter is needed to tackle the most acute needs of the poor.

The level of educational attainment of the Polish population has been gradually improving. The percentage of people with higher (university-level) education has been rising – between 2002 and 2007, this ratio has increased almost by half among people aged 13 years and over, from 11.1% to 16.5%. Programmes aiming to reduce inequalities in health should consider the educational differences in the level of control that less-educated people have over their lives and the (lack of) capability this gives them to alter their health behaviours and the other determinants of health.

Poland belongs to a group of Organisation for Economic Co-operation and Development countries in which the level of expenditure on health care is among the lowest in relation to gross domestic product. The current level of health care funding in the country:

- adversely affects the capacity for effective action aiming to reduce disparities between the health status of Polish society and the health status of more developed societies in western Europe;

- represents one of the factors which contributes to the emergence and persistence of social inequalities in health.

The main aim is to make sure that the gradual increase in resources directed towards the health care sector is accompanied by measures successively leading to: (i) elimination of public funding for procedures which are not cost-effective, medically and financially; and (ii) improvements in the system of payments for health care services. Another important condition for reducing social inequalities in health should be to increase health literacy among individuals with low socioeconomic status.

2. Counteracting social risk factors resulting in inequalities in health in Poland, with special emphasis on noncommunicable diseases and lifestyle

Noncommunicable diseases represent the main cause of mortality, morbidity and disability in European populations. In a group of seven diseases representing the cause of the largest number of deaths in Europe, as many as six are related to noncommunicable diseases, namely: ischaemic heart disease, depression disorders, cerebrovascular diseases, alcohol-related diseases, chronic obstructive pulmonary disease, and lung cancer. Most of the aforementioned diseases are linked to several risk factors, which can be prevented to a large extent. These factors include: high arterial blood

pressure, tobacco use, abusive and risky alcohol consumption, high cholesterol level, overweight, high salt intake and low consumption of vegetables and fruit. Many of these risk factors are strongly related to social inequality. Effective action on health inequalities requires measures to be taken across every step of this causal pathway, although upstream interventions are likely to have a more wide-ranging impact than those closest to the development of the disease.

Chapter 2 features the results of large-scale surveys which allowed for an assessment of the threat of the above-mentioned risk factors among the adult population in Poland. For example, as part of the "WOBASZ" National Multi-centre Health Survey project, 14 000 people were surveyed in 2003–2005 and reliable indicators for the regions were obtained. A great deal of numerical data were provided on the diversity of risk factors of noncommunicable diseases by education, age, gender and place of residence, including its size and the province of residence.

It is necessary to increase the effectiveness of relevant public health programmes. According to the analysis, only few of these programmes take into account the issue of social inequalities in health. It would be desirable to evaluate the extent to which these programmes reach various social groups.

3. Inequalities in child and adolescent health

A separate chapter is devoted to health inequalities in children and adolescents (Chapter 3). There is a correlation between living conditions in adolescence and health at an older age. Transferring health inequalities from one generation to the next and across several generations (inheriting inequalities) should be prevented.

In light of international data from the most recent year available, the infant mortality rate in Poland is higher than that in the countries belonging to the European Union prior to 1 May 2004. The gap between Poland's average and the European Union infant mortality rate is greater in the case of deaths occurring in the first month (and first week), compared to the deaths of infants older than 28 days.

In spite of the decreasing trend, mortality of children and adolescents above first year of life in Poland remains at a higher level than in most European Union countries. At present, the gap between Poland and the average for countries belonging to the European Union prior to 1 May 2004 is greater in terms of the rate of death resulting from accidents, poisoning and injury than any other causes.

Analysis of infant mortality according to the mother's education has shown that, in spite of a substantial decline in the overall rate, social inequalities have been on the rise. Between 2000 and 2007, a decline in mortality was observed in all social groups, but it was proportionally greater among women with higher education.

The international surveys Health Behaviour in School-aged Children are of particular value as information sources relating to health inequalities in school youths, aged 11–15 years. These surveys provide indicators of subjective health and health-related quality of life in adolescents, along with important indicators of their lifestyle. Due to the fact that in this age group mortality rate does not reflect actual health problems, reaching for these kinds of data sources seems even more important.

In the Health Behaviour in School-aged Children surveys, family socioeconomic status is usually measured with the family affluence scale, which provides a proxy measure of the family income. Polish

papers based on Health Behaviour in School-aged Children data emphasized the meaning of a broader assessment of children's social environment and social capital in the area of their residence. Favourable home and school environments, a high level of social support, as well as the great potential of individual resources may protect children from the negative impact of growing up in inferior material conditions.

Efforts should be made to increase economic security of families with small children. Appropriate services (medical and educational) should be provided at the basic level; that is, they should be readily available in the area of living. As a priority, they should be developed in neglected regions and should be provided for the social groups which need them the most. Examples of programmes which proved to be efficient – and which were implemented in other countries as a way of combating the effects of social inequalities – include the system of assistance for families combined with parent education; that is, providing knowledge relating to the developmental needs of children, along with guidelines on how those needs can be fulfilled. Comprehensive programmes of assisting development in the early years of children's lives, as well as providing equal access to medical services and education at various life stages are also considered to be effective.

4. Regional and social differences in health status of the adult Polish population, 2005–2007

The fourth chapter is composed of two parts. The first is devoted to an analysis of mortality in adults, while the second features an account of the relationship between the state of health and education level.

The analysis shows that mortality among adult Poles is still very high in comparison with the more highly developed pre-May 2004 European Union accession countries and average life expectancy is much shorter in Poland, especially for men. Moreover, this unfavourable gap has begun to grow in recent years. It is worth noting that healthy life expectancy of Polish males aged 25 years is shorter by three years than the average for the countries belonging to the European Union prior to May 2004, while there is practically no difference for women.

An analysis of three age groups is presented, as well as four main causes of death within each group: cardiovascular diseases, malignant neoplasms, external causes and diseases of the digestive system (replaced by diseases of the respiratory system in the elderly group). Based on the data from 2005 to 2007, differences are analysed with regard to gender, rural and urban areas, and region (*voivodship*) of residence. Gender is a very important factor in terms of differences in the risk of death in Poland – male mortality is much higher than female mortality, and the biggest gap can be observed at a young age, that is, 25–44 years. Urban or rural place of residence has relatively little impact from the standpoint of differences in mortality, while the region of residence is of greater significance, especially in terms of risk of death caused by digestive and respiratory system diseases, as well as external causes. Regional differences in mortality due to cancer and cardiovascular diseases are less pronounced.

Huge differences in health status are observed between people of differing levels of education. As expected, higher mortality rates occur in less-educated people. The average life expectancy of individuals aged 25 years with post-secondary or tertiary education in 2002 was 13 years longer in men and 9 years longer in women when compared to individuals with primary education. This gap increased further by some 1.5 years when healthy life expectancy was considered. The educational differential in health in Poland is larger than the average for European Union countries and especially more developed

countries, such as Finland, Italy, Malta, Norway and Sweden. However, the differences among more educated people are much smaller than among those with a lower level of education, which indicates that the latter group of the Polish population is in a particularly disadvantageous health situation.

5. Recommendations

Domestic and international research proves that social determinants of inequalities in health – that is, those that do not result from biological factors – represent one of the most significant, modifiable causes of excess mortality in Poland. Therefore, in the final chapter, we present recommendations for action – the implementation of which should lead to substantial improvement in health, in particular among people with the lowest socioeconomic status. These recommendations are broken down into the following three categories:

1. recommendations for strategy and policy formulation, monitoring and coordination
2. recommendations for action aiming to improve socioeconomic status of the population
3. recommendations for targeted public health programmes.

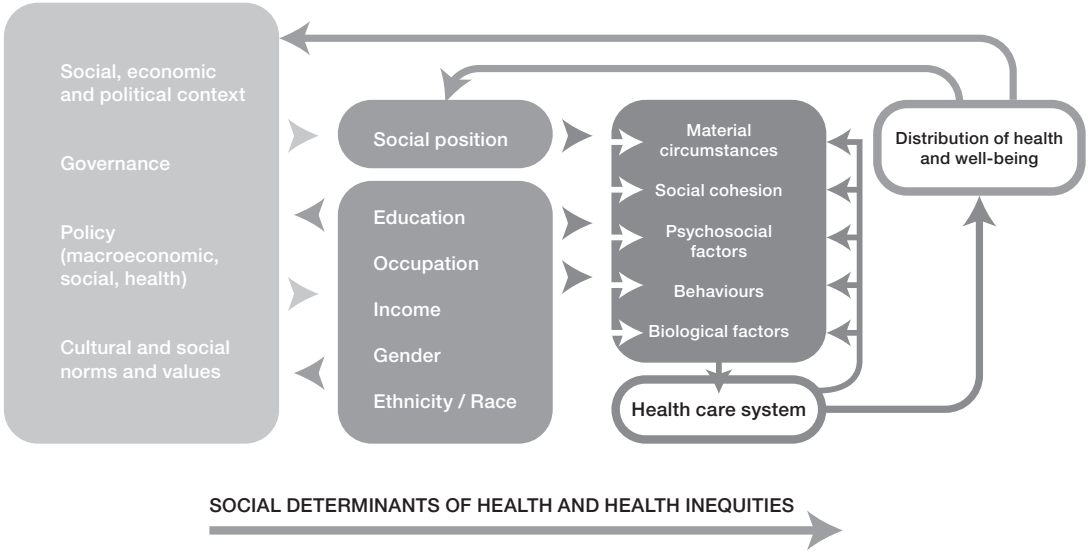
Introduction

Michal Marek

Many European countries have experienced steady growth in life expectancy (LE) and significant improvements in health status. These favourable phenomena, however, have often been accompanied by increasing inequalities in health across various social groups. Such inequalities are due to the fact that – although mortality has been decreasing in all socioeconomic groups – the process is faster in those groups with higher than with lower socioeconomic status.

First and foremost, inequalities in health result from social determinants which affect the conditions in which people are born and raised, find employment and access medical treatment. They include the "upstream" determinants, such as type of economic policy; poverty and unemployment levels; health hazards in the workplace; social capital; and organization and functioning of the health and welfare systems, as well as "downstream" determinants, including lifestyle and behaviours (e.g. tobacco use; alcohol abuse; physical exercise; and diet) and functioning of health delivery *(2)*. These factors all affect various social groups to varying degrees, which largely contributes to the existence of social inequalities in health. This introductory chapter strives to illustrate the complex interrelations between social determinants and health status (see also Fig. 0.1).

Fig. 0.1. Social determinants of health



Source: CSDH *(1)*.

In European Union (EU) Member States for which data are available, premature mortality and morbidity rates are typically higher among the groups characterized by lower education levels, more physical labour and lower income levels compared to other social groups. Such inequalities are observed in all age categories and they apply to both genders, although they are smaller in the case of women, compared to men.

These inequalities create a very serious social hazard. For example, if at the beginning of the 1990s, death rates for all employed males in England and Wales had been the same as those prevailing among men who held qualified job positions, the number of deaths would have dropped by 17 000 per year.

According to similar estimations in Spain, excess deaths in the poorer regions of Spain – compared to the most affluent regions – amounted to 35 000 people *(3)*.

Yet, inequalities in health can be observed not only between the least and the most affluent social groups but also throughout the whole of society. This phenomenon is referred to as the social gradient.

Efforts aimed at reducing social inequalities in health encompass the following three objectives, which should be pursued in conjunction:

1. improving the health status of social groups living in poverty;
2. reducing inequalities in health between groups occupying the two extremes of the social ladder, that is, those with the lowest and the highest socioeconomic statuses;
3. reducing inequalities in health across the entire society.

In 2005 the World Health Organization (WHO) established the Commission on Social Determinants of Health (CSDH) with the purpose, inter alia, of delivering effective methods of reducing the aforementioned discrepancies. Poland is among the Commission's Member countries. In 2008, after several years of work, the Commission prepared a report which defines fundamental social issues that affect health, together with corresponding mitigation measures. At the same time, WHO prepared the Global Strategy for the Prevention and Control of Noncommunicable Diseases for 2008–2013. Furthermore, the WHO European Office for Investment for Health and Development (Venice Office) was established, with the mandate to pursue that topic, and Poland has been cooperating with the Venice Office for several years.

Combating social inequalities in health has been gaining increasingly more prominence in Poland, just as in other countries. For this reason, the overarching objective of the National Health Program (*Narodowy Program Zdrowia*, NPZ) for the years 2007–2015 has been defined in the following way: "Improvement of health and health-related quality of life of the population and reduction of inequalities in health" *(4)*. This objective is intended to be pursued by:

- promoting healthy lifestyle among the general public;
- creating healthy living, working and learning conditions;
- getting local and regional self-government units and nongovernmental organizations (NGOs) involved in health promotion efforts.

In order to achieve these goals, multi-sector action must be taken over a long period, in compliance with the WHO approach of health in all policies.[2] This concept stipulates that the links between health policy and other areas of social and economic policy should be reinforced – among others, these include links with agricultural, educational, environmental, financial, housing and transport policies.

To attain this objective some financial outlay will be required, but there may also be economic benefits to reap, such as: (i) lower mortality among people of productive age; (ii) extending the retirement age in the future (in some countries this threshold is set at 70 years for women and men alike); and (iii) lower absenteeism from work due to sickness, leading – among other things – to decreased labour costs. That said, the principal reason for which we should tackle social inequalities in health is not the rationale based on economic benefits, but the human right to a life in good health.

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2 See, for example, Stahl T et al. *Health in all policies. Prospects and potentials.* Helsinki, Finnish Ministry of Social Affairs and Health, 2006 *(22)*.

Socially determined inequalities in health have been subject to research all over the world. Research findings emphasize the concurrent impact of biological and social factors. In that context, health targets should not only be based on the analysis of mortality and morbidity, but they should also take into consideration social determinants of health.

The social determinants may add to the risk of noxious biological, chemical or physical agents. For example, culturally established attitudes and behaviour patterns contribute to increased morbidity resulting from high blood pressure and obesity by sanctioning a sedentary lifestyle and an unhealthy diet. Moreover, weaker social bonds, limited social support, lack of social integration or the presence of long-term stress may also have a negative impact on health.

Research into social inequalities in health has been carried out in Poland, for example, by the Institute of Mother and Child (IMiD), the National Institute of Public Health, and medical universities in the cities of Gdańsk and Łódź.

In Poland, the first health programme dedicated to that issue was a 7-year National Program for Prevention and Treatment of Cardiovascular Diseases (POLKARD), launched in 2002. The purpose of this programme, funded by the Minister of Health, was both to increase access to health care services and to develop preventive measures. POLKARD was implemented, among others, in 400 small towns with populations of up to 5000 each, scattered throughout 12 administrative regions (called *voivodships*). These towns are located away from large cities, and their residents have for years been faced with numerous economic difficulties, accompanied by unfavourable health indicators *(5)*.

The purpose of this brief study is to summarize the knowledge in the field of social inequalities in health prevailing in Poland and to present a preliminary set of recommendations for long-term multisectoral national health policy.

The report is focused on both the health status of the whole population and inequalities in health across the life course. The health status of the whole society is compared to that of the 15 Member States of the EU prior to 1 May 2004 (EU15). In the different sections of the report inequalities in health are discussed in the context of such social determinants as: age, sex, level of education, social and economic status, urban/rural areas, various social characteristics, as well as geographic differences between Polish administrative regions.

The authors of all sections of the report attempted to answer at least two questions, namely:

1. What is the gap between Poland and the more developed countries of western Europe?
2. What challenges does Poland face in terms of social inequalities in health?

Furthermore, in several sections of the report a preliminary review is presented, detailing pro-health measures initiated to date.

In Chapter 1, selected upstream determinants of health in Poland are discussed, such as relative poverty, early years development, education, and expenditure on health care. An important decrease of relative poverty has been observed in the country but the rate of children living in poverty is still one of the highest within the EU. Moreover, particularly positive trends have been observed in education, with a fast-paced, major increase of people acquiring university-level education. Average total public expenditure on social welfare is higher in Poland than average expenditures within Organisation for Economic Co-operation and Development (OECD) countries. However, expenditure on health care is

much lower than in most of the OECD countries. The analysis is supplemented by a review of sets of socio-demographic factors (such as households' characteristics, economy and labour conditions, social conditions) in an attempt to determine which of those factors exert a prominent influence on population health status within the *voivodships*, and thus represent determinants of social inequalities in health.

In Chapter 2, seven risk factors are presented, which exert a strong influence on the health status of the whole population, as well as on social inequalities in health in Poland, namely: tobacco use, high blood pressure, high level of blood cholesterol, obesity, alcohol consumption, low consumption of fruit and vegetables, lack of physical exercise. Individuals can modify hazards related to these factors to a much greater extent than the hazards resulting from social determinants that exist at macro level. Section 2 also includes a short review of activities aiming to reduce the hazards. Most Polish national public health programmes do not address problems of social inequalities in health. Therefore, according to WHO experts,[3] their implementation increases (not decreases) social inequalities in health.

Chapters 3 and 4 are devoted to a discussion on the health status of the Polish population, with particular focus on the assessment of the scale of health status differences according to age, gender, education and place of residence (urban/rural, regional).

In Chapter 3, social health inequalities of children and adolescents are analysed. Although infant mortality in Poland is decreasing, it is still higher than in the EU15. In this section, the suggestion is discussed that in the relatively near future it will be possible to reduce this type of mortality to fewer than 4 cases per 1000. This aside, there has also been an increase in inequalities. On average, more infant deaths occur in families with lower than higher socioeconomic status.

In the case of adolescents, external causes (accidents) are the principal reason for deaths. Therefore, the development of a national programme aimed at the protection of children and adolescents against accidents is proposed. Important differences are also noted in the self-reported health status of adolescents from different socioeconomic groups.

In Chapter 4, health status of three age groups is analysed: 25–44 years, 45–65 years and 65 years and over. Average LE as well as healthy life years in Poland are shorter than those in the EU15. The greatest differences in mortality are observed in the case of men and women in the age group 25–64 years, and the reduction in these differences is slow. Excess mortality in Poland (over the EU15 level) is mostly caused by cardiovascular diseases (CVD), cancer and external causes (accidents).

This chapter also includes analysis of social determinants of health (such as age, sex, level of education, place of living, urban/rural area) and their influence upon social inequalities in health. Besides, the number of region-associated excess deaths was calculated for the principal causes of mortality. The outcome of the analysis is used as the foundation for formulating a set of propositions regarding next steps and actions aimed at the reduction of social inequalities in health. Moreover, some propositions are drafted on the basis of the existing body of knowledge and draw on the experience of other countries that are actively involved in research into this field.

The report is a starting point for further considerations concerning such important and various issues as: (i) improvement of databases; (ii) development and implementation of multisectoral health policies; (iii) equal access to health care services and; (iv) organizational solutions to improve

3 The Mission of WHO in Poland, Warsaw, 11–13 May 2007.

treatment for major noncommunicable diseases. In addition, continuation of selected analysis is necessary. Therefore, further activities focused on social inequalities in health are included in the Biennial Collaborative Agreement (BCA) for 2010 and 2011, agreed between the Polish Ministry of Health and WHO Regional Office for Europe.

The concept of the report was designed and its constituent parts were written with the participation of researchers and academics from the National Institute of Public Health – National Institute of Hygiene, the Institute of Statistics and Demography WSE, the IMiD in Warsaw, Gdańsk Medical University as well as the WHO Country Office (Warsaw) and the Polish administration. Invitation for cooperation, extended to all authors of the study, was an attempt to initiate tangible cooperation between experts dealing with health and social issues alongside experts and staff employed by the administration, since such cooperation is required to ensure the success of both ongoing and future efforts which aim to reduce social inequalities in health.

The national report is followed by another, entitled *Health and socioeconomic characteristics of district-level population in Poland.* The two complementary reports were designed as two parts of one overall presentation of the subject. The report that focused on districts was also developed thanks to financial support from WHO (within the framework of the BCA 2010–2011). In the second report:

- socioeconomic characteristics of districts are presented based on five groups of indicators covering the following areas: (i) demography; (ii) economic and labour market situation; (iii) social cohesion; (iv) access to health care and (v) education;
- health status analysis of district populations is based on LE at birth, standardized death rates (SDRs) from main groups of causes, and infant mortality.

The non-health factors, according to the regression models, are significantly associated with the overall mortality outcomes of the district's population and LE at birth. Socioeconomic determinants also explain some 30–40% of variation in the case of district-level cancer mortality and mortality from external causes in younger men. Selected indicators also explain some 20% of variation in the mortality caused by CVD in the total population and by diseases of the digestive system in the younger age group within the inhabitants of certain districts.

Moreover, the analysis of final models reveals that in the case of all groups of selected indicators, some of them more frequently play a significant role in explaining mortality differentials. These include: (i) share of households with a bathroom; (ii) local governments' election turnover; (iii) lower secondary school exam results from humanities; (iv) share of employment in agriculture; (v) population density; (vi) unemployment rate.

There are also three variables which are almost always associated with decreased mortality outcomes in districts. These are: (i) share of employment in agriculture, (ii) local election turnover, and (iii) exam results from humanities. In the conclusions of the report some hypotheses on these results are put forward.

The population density, the local budget revenue per inhabitant, as well as the share of children in preschool education seem to have a smaller and mixed impact on mortality outcomes when other variables/factors are taken into account.

Such analysis – focusing on this territorial dimension – has been carried out for the first time since the territorial reform (which re-established districts in Poland) was introduced in 1999.

The report could be used, inter alia, as an empirical basis for:

- comprehensive periodical analysis of territorial and social differences in health status of district communities;
- setting long-range priorities and goals of health policies developed at national, regional and local levels;
- developing and evaluating multi-sector comprehensive strategies focused on generally improving the health status of the whole population, as well as at reducing social inequalities in health in particular districts;
- developing consistent financing in order to reduce territorial and social inequalities in health;
- periodical evaluation of the efficacy of long-range activities focused on improving health status and reducing social inequalities in health in particular districts or population groups thereof.

It is therefore proposed that similar analysis is to be carried out every few years.

1. Macro-level social determinants of inequalities in health

Agnieszka Chłoń Domińczak

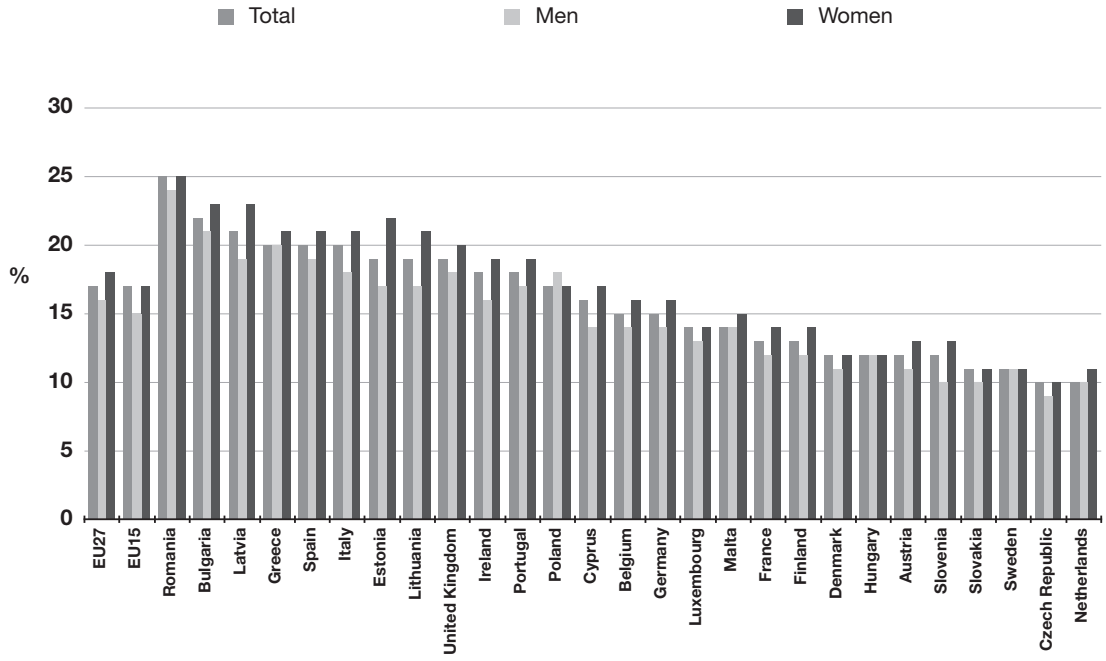
1.1 Poverty

From the viewpoint of macro-level social determinants of health care policy, exposure to the risk of poverty represents an important factor. Poverty risk is widely recognized as an indicator which not only denotes material poverty, but also social exclusion, understood – among other things – as including limited access to not only various services, particularly adequate social welfare, but also health care services.

Exposure to poverty risk is one of several structural indicators, monitored at the level of the EU and its Member States. It was defined as the percentage of people whose income does not exceed 60% of the median equivalized net income per person in a household. As such, it is a relative measure. According to this definition, the risk of poverty in Poland is at a level close to the EU average. Interestingly, it should be emphasized that it is one of relatively few countries in which the exposure to the risk of poverty for women is slightly lower than that for men.

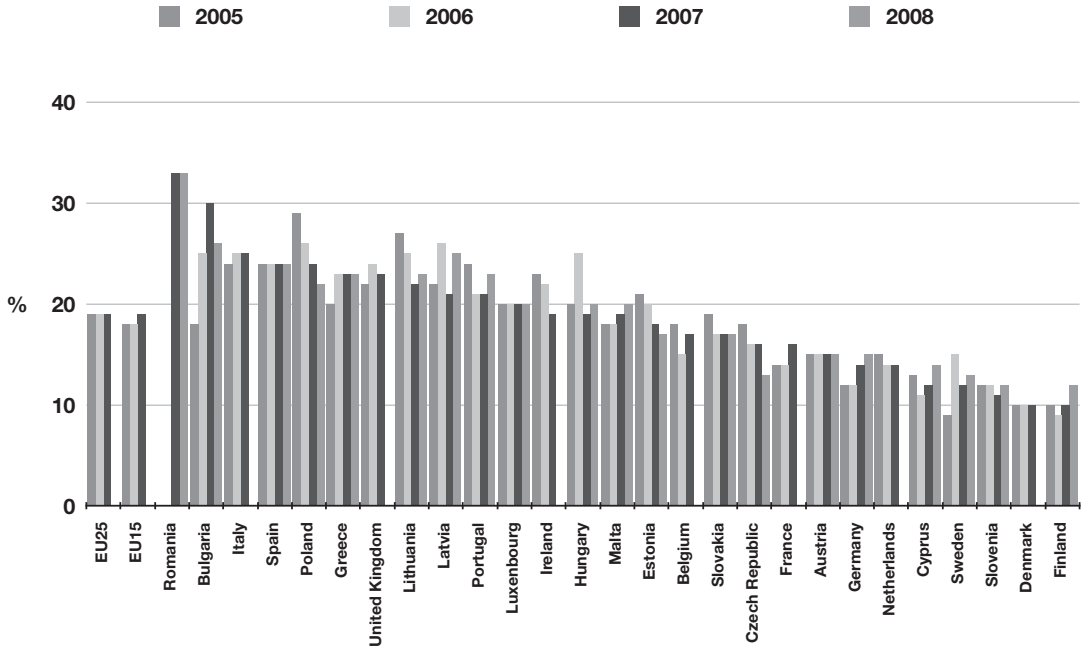
Although the overall exposure to poverty risk is similar to the EU average (see Fig. 1.1), in Poland there is high risk of poverty among children and adolescents. In 2007 the risk of poverty in this age group was equal to 24%, compared to 17% overall poverty risk (see Fig. 1.2).

Fig. 1.1. Poverty in EU countries, 2007



Source: Eurostat *(6).*

Fig. 1.2. Poverty of children aged 0–17 years in EU countries, 2005–2008



Source: Eurostat *(6)*.

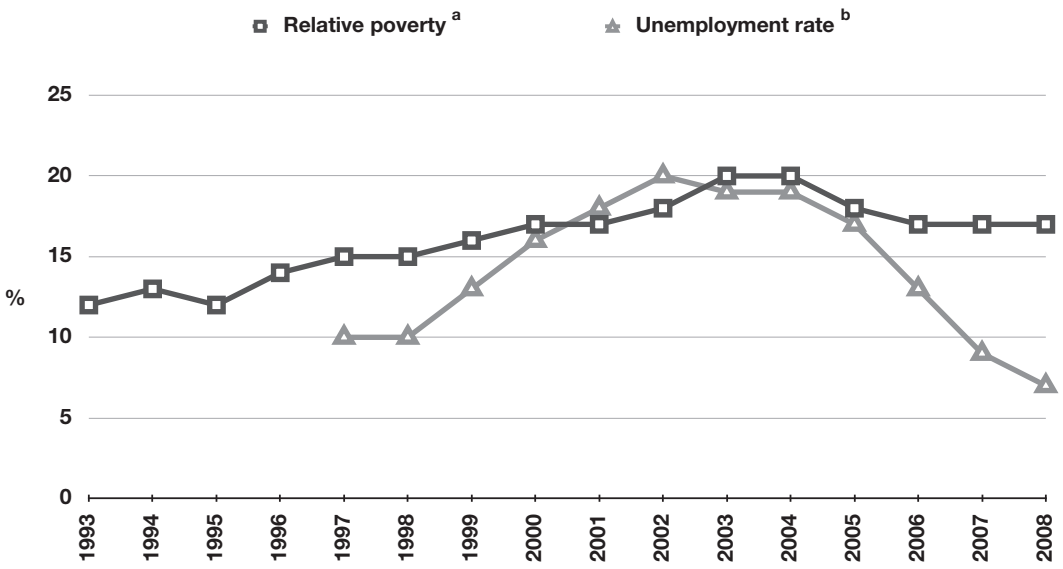
On a positive note, the risk of poverty among children (aged 0–17 years) in Poland has been on the decline. Between 2005 and 2008, the ratio fell from 29% to 22%. This was the biggest reduction in poverty risk ratio in that age group recorded in the EU. As a result, exposure to child poverty risk in Poland in 2008 was tenth highest in Europe; lower than in Spain, Greece, Portugal or the Baltic countries (Lithuania, Latvia, Estonia). Nevertheless; it was higher than the average EU ratio (20.2%).

When we observe the evolution of poverty risk over time in Poland, it is clear that the risk has been gradually increasing since 1993 (see Fig. 1.3). This growth was particularly conspicuous during the increase in unemployment that took place at the beginning of the 21st century. Strong correlation between the exposure to relative poverty risk indicator[4] and the unemployment rate suggests that unemployment is one of the most fundamental causes of poverty exposure. The World Bank *(7)* shows the important role played by employment status in determining the probability of falling into poverty. At the aggregate level it also shows the close correlation between the trends in poverty incidence and the employment rate.

In addition, it highlights the importance of growing inequalities in labour income – that is, the amount of household income derived from labour – in explaining the growth of inequality between 1992 and 2001. Since both unemployment and poverty risk are factors that affect health status, their joint incidence may additionally aggravate the impact.

4 In Polish statistics, the poverty threshold is defined at the level of 50% of average household expenditure. In European statistics, it is 60% of the median equivalized income of household members. Due to the fact that those values are different, data presented for Poland are not comparable to the data for EU countries presented.

Fig. 1.3. Exposure to poverty (1993–2008) and unemployment rate (1997–2008) in Poland



[a] Relative poverty calculated as expenditures below 50% of average monthly household expenditures; [b] Unemployment rate: annual average according to Labour Force Survey.

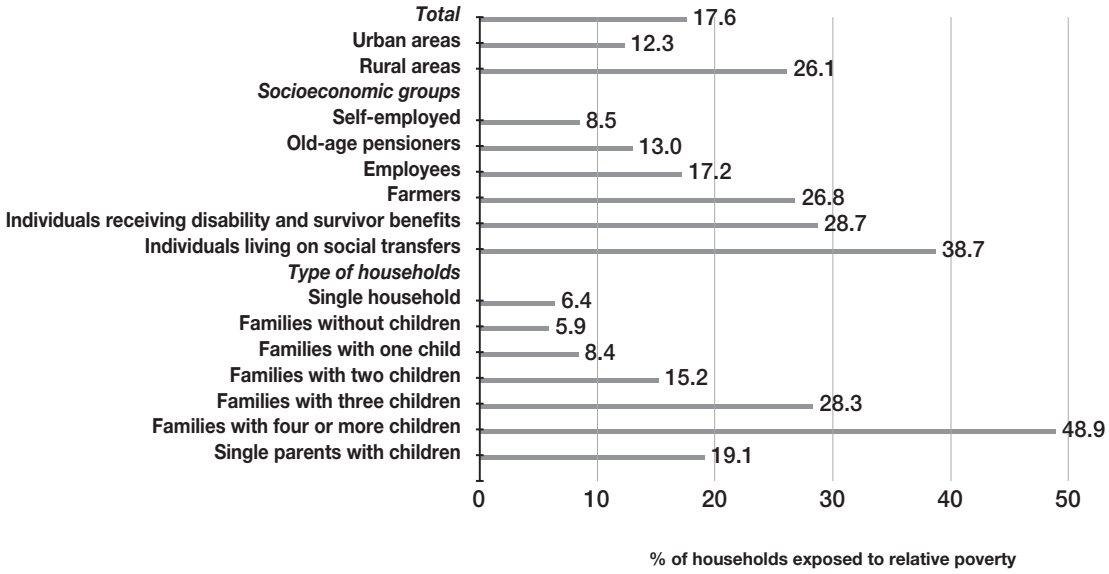
Sources: GUS *(8), (9)* (poverty risk), *(10)* (unemployment rate). See also Fig. 1.7. part 2.

Poland is characterized by great diversity of poverty, in terms of the relevant population's place of residence, socioeconomic group and type of household. Risk of poverty primarily affects people living in rural areas; urban residents are affected to a lesser extent. The Ministry of Labour and Social Policy *(11)* indicates that the standard of living differs a great deal depending on a region and rural/urban areas. The most difficult situation can be seen in the regions in which the labour market situation is particularly difficult. This concerns, for example, northern regions of Poland which suffer from the collapse of national agriculture and have underdeveloped non-agricultural sectors. Regions with a relatively low standard of living include also Poland's so-called "Eastern Wall", that is, Poland's eastern border territory areas which are characterized by a low level of urbanization and industrialization, along with poor infrastructure.

Families in small towns and villages live in relative poverty most often, while inhabitants of large urban agglomerations do so more rarely. In urban areas there are also poverty "enclaves" – deprived areas which require particular attention in the context of local social inclusion and health policies.

Poverty also depends on the source of income. The highest level of poverty is reported among those who live on social transfers (other than retirement pensions and disability benefits), disability pensioners and farmers. The smallest exposure to poverty risk is observed in households of self-employed people and old-age pensioners. Furthermore, poverty risk increases with the number of dependent children in a family. Half of all families with four or more dependent children are poor (see Fig. 1.4).

Fig. 1.4. Relative poverty in Poland by household type, 2008

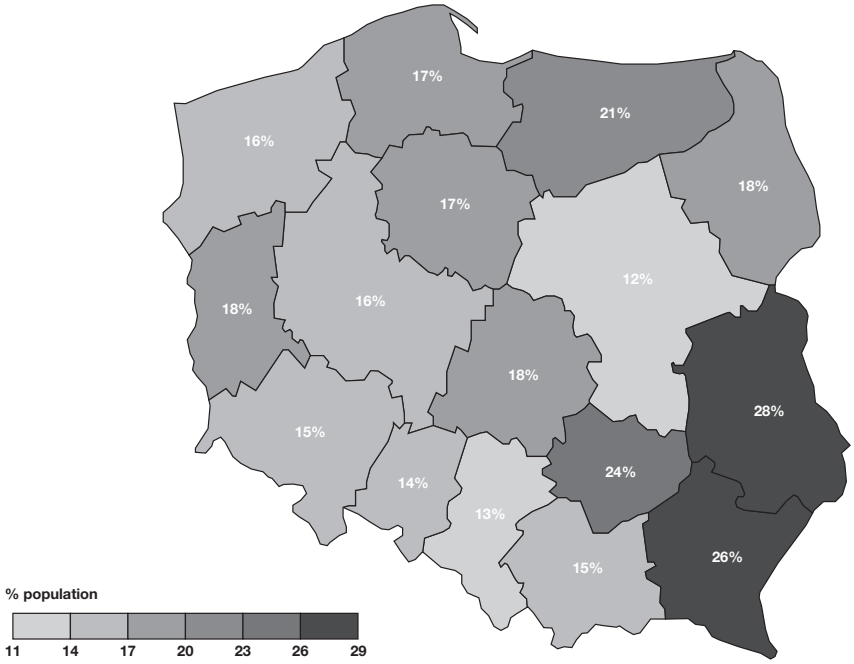


Source: GUS *(12)*.

Moreover, there are visible disparities in poverty levels across *voivodship*s (regions). This is demonstrated by analyses based on relevant monetary as well as non-monetary indicators. In 2007 the highest coverage of monetary poverty risk by far was reported in Lubelskie, Podkarpackie, Warmińsko-Mazurskie and Świętokrzyskie, and the lowest was in Śląskie, Opolskie and Mazowieckie. These outcomes are consistent with the percentage of people living in poverty. As far as the highest coverage of non-monetary poverty risk is concerned, this was observed in Dolnośląskie and Łódzkie, with the lowest levels in Podlaskie, Wielkopolskie and Opolskie *(13)*. This is also confirmed by European Union Statistics on Income and Living Conditions (EU-SILC) data from 2008.

Based on the EU poverty threshold, monetary poverty in Polish *voivodship*s varied from 12% to 28% *(14)*. The lowest poverty rates were observed in Mazowieckie and Slaskie, while the highest in Lubelskie, Podkarpackie and Swietokrzyskie (Fig. 1.5). It is worth noting that there is also significant variation in poverty levels within *voivodships*. The United Nations Development Programma (UNDP) *(15)* provides estimates of *poviat* poverty rates in 2005, based on small areas, with estimation methods showing that Mazowieckie *voivodship* has the largest variation of poverty rates by *poviats*, while Łódzkie, Wielkopolski and Opolskie are more homogeneous in this respect.

Fig. 1.5. Relative poverty in Poland by region, 2008

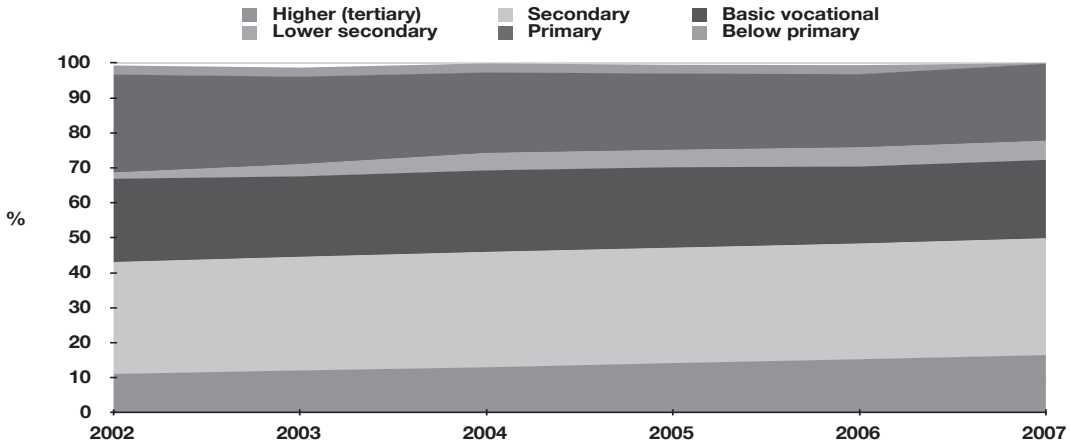


Source: GUS *(14)*.

1.2 Education

According to the relevant literature, the level of educational attainment impacts upon the health status of the population. People who achieve higher levels of education typically have a healthier lifestyle, and a higher income means they can have a better diet. Education level also indirectly affects working conditions.

Fig. 1.6. Structure of education of the population aged 13 years and over in Poland, 2002–2007



Source: Authors' own calculations based on GUS data *(16)*.

The level of educational attainment of Poland's population has been gradually improving. The percentage of people with higher (university) education has been on the rise – between 2002 and 2007, this ratio has increased almost by half among people aged 13 years and over, from 11.1% to 16.5% (see Fig. 1.6). At the same time, the share of people with elementary education and lower secondary has decreased. Whereas in 2001 they represented almost 31% of population aged 13 years and over, in 2008 that ratio fell to 22.2%.

1.3 Health expenditure

Health and the prosperity of economies are interrelated *(17, 18)*. Bloom and colleagues *(19)* indicate that better health status of the society improves the economic growth rate. For high-income countries, correlation with LE is less pronounced, but literature points at positive correlation between good health status and economic development; whereas poor health status of the population hinders development potential. More pronounced socioeconomic disparities translate into poorer health status.

Suhrcke and colleagues *(18)* state: "There is a sound theoretical and empirical basis to the argument that human capital contributes to economic growth. Since human capital matters for economic outcomes and since health is an important component of human capital, health matters for economic outcomes. At the same time, economic outcomes also matter for health".

Social inequalities in health lead to material reduction in prosperity of societies and represent an obstacle to the attainment of growth and developmental objectives of a country, irrespective of economic conditions.

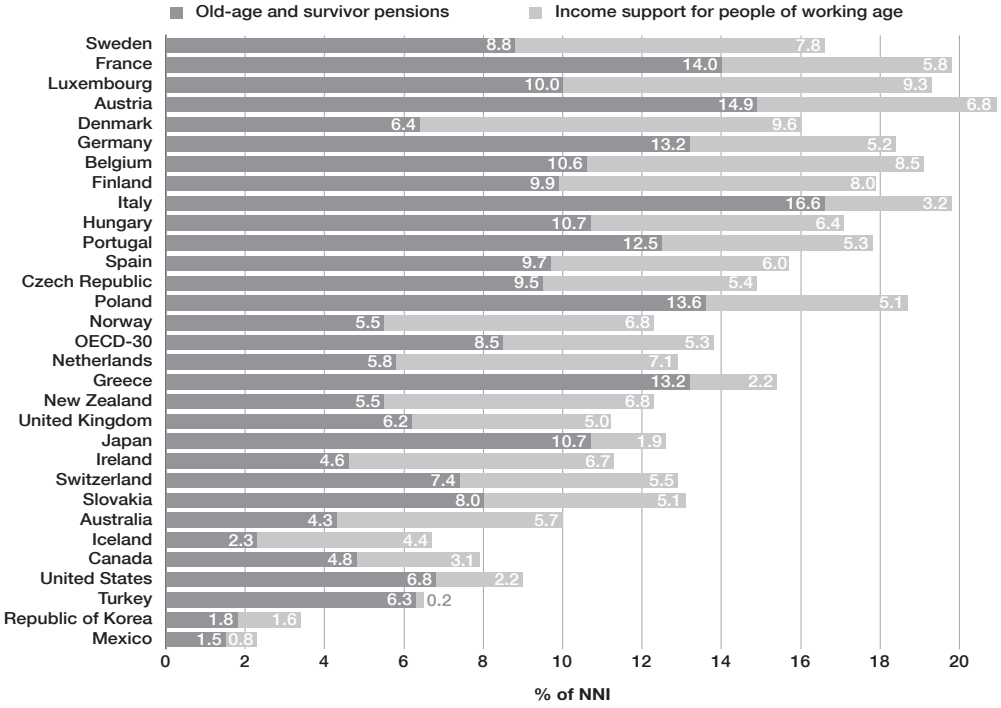
According to analyses carried out within the EU, the cost of inequalities in health is high *(20)*. For example, the estimates of annual losses resulting from inequalities in health demonstrate that those losses are equivalent to approximately 15% of social insurance system expenditure and 20% of health care system expenditure in middle- and high-income countries. The same estimates lend themselves to the conclusion that the losses resulting from inequalities in health understood as capital value in EU countries amount to €141 billion. A 10% reduction in inequalities in health would translate into the following economic benefits:

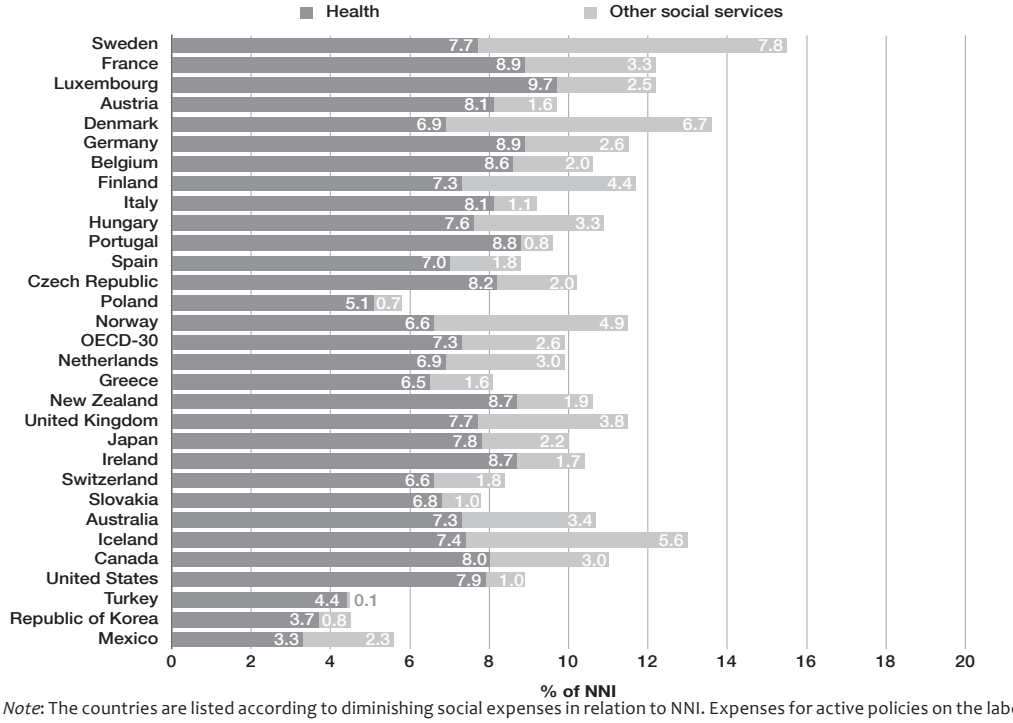
- €14 billion resulting from health profits understood as capital value
- €70 billion deriving from health profits understood as consumer goods
- €18 billion as a result of the reduction in health care expenditures
- €6 billion through a reduction in social insurance costs.

With this in mind, the presence of social inequalities in health represents a significant challenge for health policy development.

According to OECD data (presented in Fig. 1.7), in 2005 expenditures on social purposes in OECD countries were on average at almost a quarter of net national income (NNI).

Fig. 1.7. Public expenses for social goals, in groups of expenditures, as a percentage of NNI, 2005





Note: The countries are listed according to diminishing social expenses in relation to NNI. Expenses for active policies on the labour market could not be divided into cash transactions and services in kind; they were included in total expenditure.

Source: OECD *(21)*.

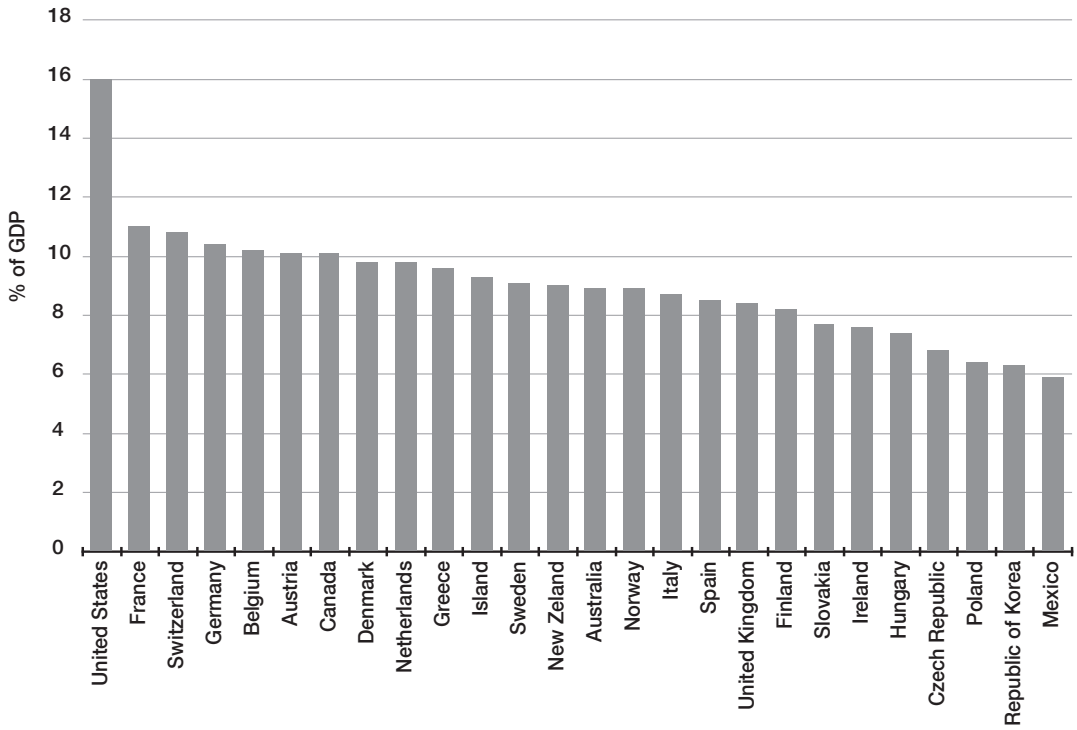
The level of total expenditure for these purposes in Poland was slightly above the average. Nevertheless, health expenditure in Poland (5.1% of NNI) was at a much lower level than the OECD average (7.3%), with the share of expenditure on cash transfers – mostly retirement and family pensions – remaining far above the average level. Thus, one could venture that high expenditure on cash transfers in Poland resulted in limitations in expenditure on social services, including health care services.

Under the health in all policies concept, activities and expenditures from various areas of public policy affect the distribution of social factors which impact health (see, for example, Ståhl, *(22)* and Suhrcke, *(18)*). Still, health care expenditures represent the most significant area.

Health expenditure represents an important portion of overall public expenditures in OECD countries. In 2007, health care expenditure in Poland was equivalent to 6.4% of gross domestic product (GDP), and was below the OECD average of 8.9% of GDP. In relation to GDP, Poland spends less on health care than other countries in the region, such as the Czech Republic, Hungary or Slovakia (see Fig. 1.8).

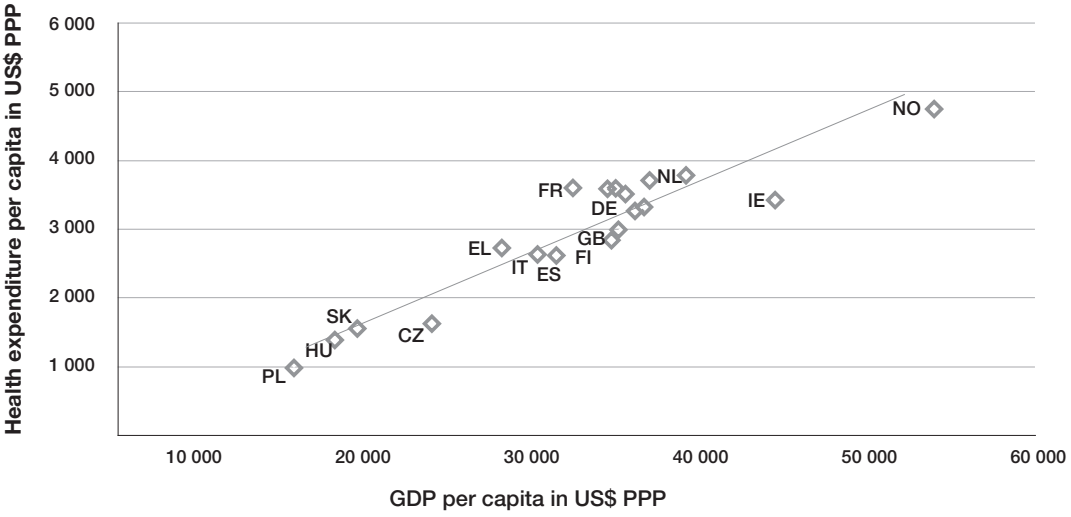
Fig. 1.9 illustrates the relationship between economic development and health policy in EU countries. As one can see, there is a very strong positive correlation between GDP per capita and health expenditure, and the situation observed in Poland positions the country exactly on the trend line. Further, the volume of expenditure on health is positively correlated with LE at birth, as illustrated in Fig. 1.10.

Fig. 1.8. Expenditure on health care as a percentage of GDP in OECD countries, 2007



Source: OECD *(23)*.

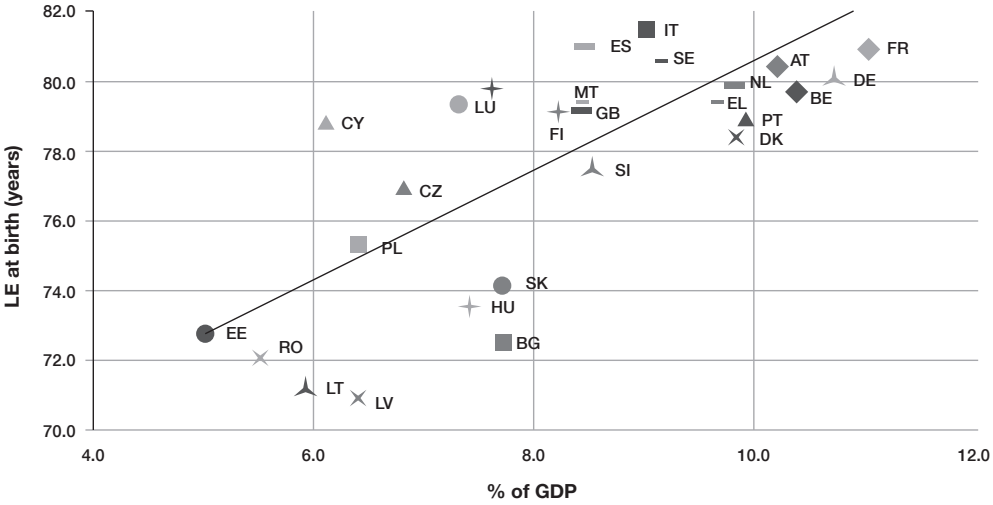
Fig. 1.9. Expenditure on health care and GDP per capita in EU countries and in Norway, 2007



Note: CZ: Czech Republic; DE: Germany; EL: Greece; ES: Spain; FI: Finland; FR: France; GB: United Kingdom; HU: Hungary; IE: Ireland; IT: Italy; NL: Netherlands; NO: Norway; PL: Poland; SK: Slovakia[5].

Source: Authors' own calculations based on data from OECD *(23)*.

Fig. 1.10. Life expectancy at birth and total expenditure on health as a percentage of GDP, 2007 (or latest available year)



Note: AT: Austria; BE: Belgium; BG: Bulgaria; CY: Cyprus; CZ: Czech Republic; DE: Germany; DK: Denmark; EE: Estonia; EL: Greece; ES: Spain; FI: Finland; FR: France; GB: United Kingdom; HU: Hungary; IT: Italy; LT: Lithuania; LU: Luxembourg; LV: Latvia; MT: Mauritius; NL: Netherlands; PL: Poland; PT: Portugal; RO: Romania; SE: Sweden; SK: Slovakia; SI: Slovenia[5].

Sources: European Communities *(24)*; OECD *(25)*; WHO Regional Office for Europe European Health for All database *(26)*.

5 International Organization for Standardization (ISO) country codes (ISO 3166-2).

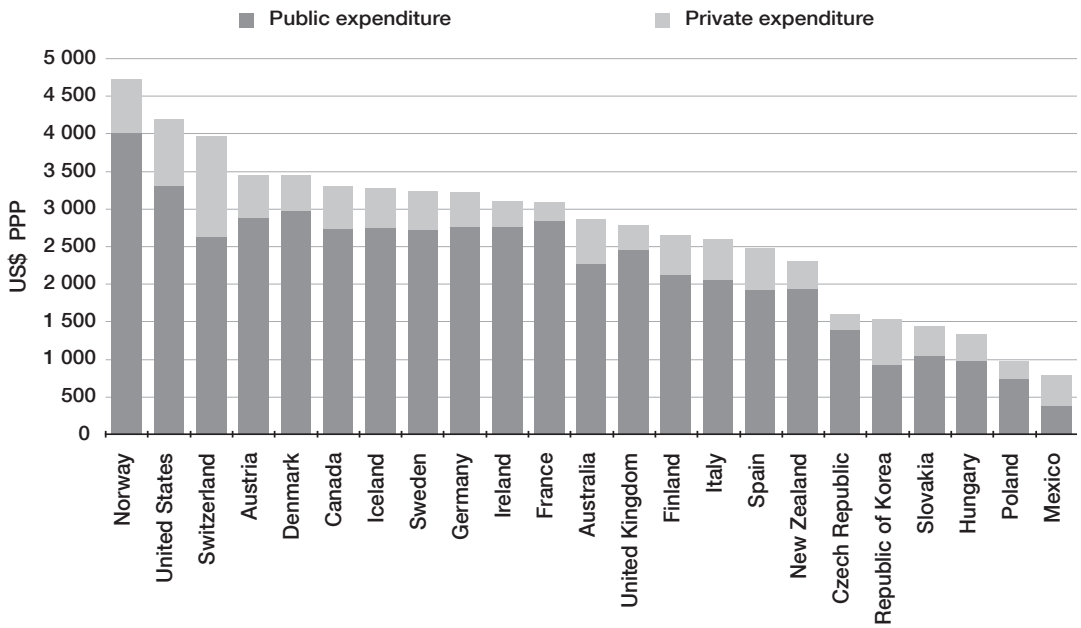
The importance attached by Europeans to their health care system and its condition is confirmed by findings from public opinion surveys. Within the framework of a Eurobarometer survey *(27)*, 26% of respondents considered health care to be one of the top five problem issues in EU countries (along with unemployment, cost of living, pensions and crime). Analogically, Poles pay a lot of attention to health care issues, which were indicated by 40% of respondents as one of the two most important national problems (along with the retirement and disability pension system, indicated by the same percentage of respondents).

According to 17% of Europeans, health care issues will also continue to be a major point of concern for future generations.

A high percentage of people who indicate that health care issues are a serious problem in Poland may also be associated with a relatively large share of private spending within the total volume of expenditure on health. In Poland in 2007 the share of private spending was equivalent to 29.2% of overall expenditure, compared to a 27% average in OECD countries (see Fig. 1.11).

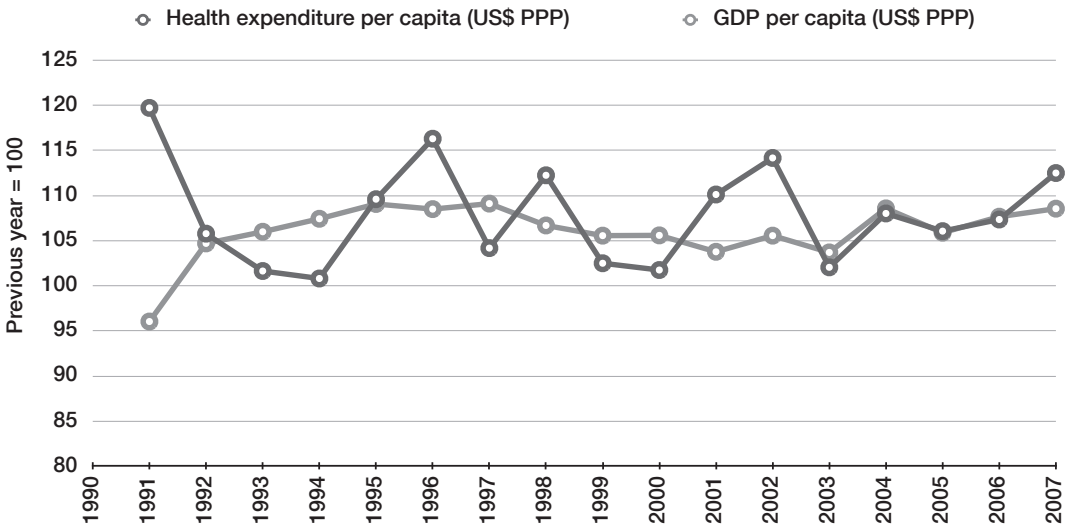
As mentioned earlier, Poland belongs to a group of OECD countries in which the level of expenditure on health care is among the lowest in relation to GDP. At the same time, it should be noted that before 2002 the dynamics of growth in health expenditure in relation to GDP growth were highly volatile, although the cumulative rate of increase in health expenditure was higher than GDP growth per capita. Since 2003 we have observed similar growth dynamics in both indicators (Fig. 1.12).

Fig. 1.11. Health care expenditure per capita (US$ PPP), public and private, in OECD countries, 2007



Source: OECD *(23)*.

Fig. 1.12. Increase in expenditure on health and GDP per capita (US$ PPP) in Poland, 1991–2007



Source: Authors' own calculations based on data from OECD *(23)*.

The current level of health care funding in the country:

- adversely affects the capacity for effective action aiming at reducing disparities between the health status of Polish society and the health status of well-developed societies in western Europe;
- represents one of the factors which contributes to the emergence and persistence of social inequalities in health.

People who live in poverty are very strongly dependent on access to health services financed from public funds, since they are usually unable to pay for health care services with private finances or to afford private insurance. Consequently, restrictions in access to those services have greater impact on their potential to access medical treatment than in the case of people who have higher income levels. Meanwhile, waiting times for some health care services in Poland can be quite long *(28)*.

1.4 Non-health factors influencing health inequalities – regional perspective in Poland

This section presents the non-health factors which may affect the health status at regional (*voivodship*) (NUTS-3)[6] level in Poland. The analysis was carried out on the basis of indicators chosen from the standpoint of assessing the situation in selected problem areas within the health in all policies approach. The analysis aims to identify the potential coexistence of regional differences observed in selected non-health indicators and health outcomes. Some of the selected indicators (such as level of education of adult population, income of households or poverty) are not available at lower levels of territorial disaggregation. Indicators are grouped under three headings: demographic composition, labour market and education,

6 Nomenclature of Territorial Subunits for Statistical Purposes – geographical nomenclature subdividing the territory of the EU into three administrative levels (NUTS 1, 2 and 3).

economic situation and social situation of households. Analysis is based on the empirical indicators which are objectified and available from the system of public statistics using the Local Data Bank of the Polish Central Statistical Office (GUS).[7] In principle, indicators apply to 2008. This allows the analysis to be linked to other parts of the report, as well as a subsequent report presenting the social inequalities in health at *poviat* level. The full set of indicators is available for a period of a year, so all of the indicators can be analysed annually.

It should be noted that differences between *voivodships*, though existing, are probably smaller than differences that can be observed at a lower (NUTS-3) level of regional disaggregation. The second part of this study aims to look deeper into local differences in terms of non-health factors (available at NUTS-3 level) and their potential coexistence with selected health variables. Table 1.1 shows the values of selected health indicators at *voivodship* level.

Table 1.1. SDRs and LE at voivodship level, 2008

Voivodship	SDRs			LE			
	Total	Men	Women	Men age 0	Men age 65	Women age 0	Women age 65
Łódzkie	914.4	1281.9	643.7	69.1	14.1	78.9	18.5
Mazowieckie	779.4	1075.0	556.5	71.7	15.3	80.6	19.4
Małopolskie	754.5	1026.1	550.5	72.9	15.2	80.9	19.4
Śląskie	858.9	1148.2	636.4	70.9	14.6	78.9	18.5
Lubelskie	839.6	1196.7	567.5	70.2	14.4	80.5	19.1
Podkarpackie	741.9	1029.2	527.4	73.1	15.2	81.3	19.5
Podlaskie	752.6	1062.4	513.4	72.0	15.2	81.4	19.9
Świętokrzyskie	815.8	1143.9	564.2	71.2	14.8	80.7	19.5
Lubuskie	855.4	1188.1	612.0	70.5	14.1	79.3	18.8
Wielkopolskie	817.0	1110.4	599.1	71.8	14.7	79.9	18.8
Zachodniopomorskie	846.6	1174.0	602.1	70.6	14.2	79.6	18.8
Dolnośląskie	854.7	1179.1	619.4	70.4	14.3	79.0	18.7
Opolskie	791.5	1071.3	577.6	71.9	14.8	80.0	18.9
Kujawsko-Pomorskie	842.1	1160.8	610.6	71.0	14.4	79.6	18.8
Pomorskie	794.3	1065.4	589.2	72.1	14.9	79.9	19.0
Warmińsko-Mazurskie	834.6	1162.1	589.7	70.6	14.4	79.8	19.0

Source: SDR calculated by B. Wojtyniak using individual mortality data gathered by the GUS; Local Data Bank for LE figures.

In order to assess the relationship between the indicators in the analysis and the health status of the population, for each of the indicators the correlations with SDR and LE (at ages 0 and 65 years for men and women) are shown. Table 1.2 presents the values of indicators, as well as correlations and coefficients of variation (unweighted) for each of the selected indicators.

7 The Local Data Bank provides information on various statistics disaggregated at NUTS-2 level or lower. It draws from public statistics data.

In each subsection that follows, the reader will find proposed indicators, together with a brief description, explanations relating to the reasons why the indicators were included in the analysis, and the sources of data. Finally, there is a brief discussion of findings obtained from the analysis.

Table 1.2. Voivodship indicators, 2008

Voivodship	Demography		Labour market			Economy	
	Feminization rate	Old-age dependency rate	Employment rate (15–64)	Unemployment rate	% with higher education	GDP per capita (PL = 100)	Revenue of local budget per capita
Łódzkie	96.5	28.5	61.3	6.8	14.9	93.1	1 585.9
Mazowieckie	100.5	27.2	64.6	5.9	21.9	157.7	2 709.4
Małopolskie	99.3	25.3	60.9	6.4	15.5	86.3	1 463.9
Śląskie	98.2	25.7	56.3	6.6	13.9	108.0	1 908.4
Lubelskie	92.4	27.2	59.0	9.3	14.7	69.4	1 047.5
Podkarpackie	95.6	24.4	57.8	8.6	13.6	69.0	1 076.0
Podlaskie	94.2	27.3	61.7	6.6	14.7	73.0	1 243.9
Świętokrzyskie	92.4	27.9	60.8	9.1	14.3	80.0	1 122.3
Lubuskie	96.3	22.0	56.9	6.6	12.1	85.8	1 414.5
Wielkopolskie	97.8	22.7	60.1	6.1	13.3	104.4	1 607.7
Zachodniopomorskie	96.3	22.7	54.2	9.6	15.5	90.7	1 689.1
Dolnośląskie	97.7	24.8	56.9	9.2	14.7	107.6	1 963.6
Opolskie	100.0	25.4	57.4	6.5	13.5	84.8	1 403.5
Kujawsko-Pomorskie	97.3	23.7	55.6	9.2	12.2	86.4	1 447.1
Pomorskie	99.1	23.0	58.7	5.5	15.3	94.9	1 862.9
Warmisko-Mazurskie	93.7	21.8	55.8	7.4	12.5	74.2	1 313.9
Correlations:							
with SDR	-0.153	-0.022	-0.357	0.241	-0.263	0.073	0.099
with life expectancy of men at age 0	0.325	-0.129	0.233	-0.309	0.141	-0.031	-0.052
with life expectancy of men at age 65	0.266	0.280	0.593	-0.391	0.474	0.177	0.120
with life expectancy of women at age 0	-0.244	0.275	0.491	-0.013	0.262	-0.256	-0.341
with life expectancy of women at age 65	-0.285	0.314	0.532	-0.029	0.309	-0.194	-0.259
coefficient of variation	*0.03*	*0.09*	*0.05*	*0.19*	*0.15*	*0.23*	*0.26*

Source: Authors' own calculations based on GUS Local Data Bank.

1.4.1 Demographic composition

Two indicators are applied for assessing the demographic situation of *voivodships*. The first indicator is the feminization rate, showing the number of women per 100 men in the age group 25–34 years. This indicator is regarded as one of the most important indicators of demographic structure deformation resulting from long-term, selective migrations.

The second indicator is the old-age demographic dependency rate. It was defined as the number of individuals of post-productive age per 100 people of productive age, according to the GUS definition.[8]

8 People of post-productive age include women aged 60 years and over and men aged 65 years and over. Productive age in Poland is defined as being from 18 years of age until 59 years for women and 64 years for men.

The indicators are based on the population data available from the GUS using the Local Data Bank.

As can be inferred from the analysis of *voivodship* indicators in terms of proposed mortality, the feminization rate has shown some (but not very strong) negative correlation with overall mortality, as well as positive correlation with men's LE and negative correlation with women's LE. The old-age dependency rate is positively correlated with most LE indicators.

It can be concluded that there is some – albeit not very strong – correlation between the demographic composition of the population in the *voivodship* concerned and the general health status of that population.

1.4.2 Labour market and education

Three indicators were adopted with this dimension in mind. The first variable is the employment rate of people of working age (15–64 years). The second is the unemployment rate, showing the proportion of economically active people who do not work. The third variable is the share of people with higher (tertiary) education. Educational data are included, since literature suggests that the level of education affects health status. All three indicators are based on the results of the Labour Force Survey.

Compared to other groups, these indicators show relatively high correlations both with mortality rates and LE. In particular, the employment rate and the share of people with a higher education level have a high positive correlation with LE of men and women at age 65 years. The latter in particular can indicate the impact of non-health factors related to employment and education on the health status of the population.

The correlation with employment rate is stronger than with unemployment rate, and is positive. This can indicate that having a job is more important from the perspective of analysing social inequalities in health. Yet, there is relatively high correlation between the unemployment rate and LE of men (both at age 0 and 65 years), which shows that unemployment is a more important non-health factor for men than for women.

We have observed that, in general terms, a favourable labour market situation and educational attainment are conducive to good health status of the population. Analogically, less favourable labour market development results in health status deterioration.

1.4.3 Economic situation

The third group is made up of indicators that describe the economic situation of the *voivodship*. The first indicator shows the level of GDP per capita (taking the Polish level as 100). The second indicator shows the average revenue of local budgets per capita, which indicates the level of paid taxes (including value-added tax (VAT), along with corporate and personal income tax shares of local budgets).

Selected indicators show little correlation with overall death rate. Both GDP per capita and tax income have relatively significant negative correlation with LE. This indicates that level of economic development does not have any positive impact on the health status of the population; in fact, we can even observe the contrary. The potential hypothesis of such a development can be that circumstances or conditions in more developed *voivodships* influence LE (the most notable example is the Silesia region, which still has a high level of GDP per capita and at the same time relatively unfavourable health indicators).

1.4.4 Households' social situation

The fourth group of indicators covers the social status of households. These can be divided into three aspects. The first pertains to the income situation and poverty level of households, the second aspect

pertains to the social infrastructure and the third to how well the household is equipped in terms of selected goods.

The first aspect encompasses three indicators, the first of which is the average per capita income in households, including all sources of income. This shows the general level of health of households at the *voivodship* level. The second indicator is the relative poverty level of households, which shows the share of households with equivalized per capita income below 60% of the median.[9] The third indicator shows the percentage of households, that have income per capita below subsistence minimum. The minimum level of subsistence is calculated by the Institute of Labour and Social Studies and it is widely adopted as the level of extreme poverty in Poland *(29)*. All three indicators are calculated using the EU-SILC data and are drawn from the Local Data Bank. The EU-SILC survey provides data on households' income and living conditions, representative at NUTS-2 level. Further territorial disaggregation is not possible.

The second aspect consists of the indicator that shows the share of 4-year-olds involved in preschool education. This is also an indicator used by Eurostat, which measures the educational activity of a cohort of oldest children, who are not mandated to attend school. This indicator demonstrates, on the one hand, access to educational facilities, and on the other it may illustrate general access to social infrastructure at *voivodship* level. Establishment of preschool facilities is one of the tasks entrusted to self-government units, and so one may assume that access to such facilities is better in the areas in which the social infrastructure is more developed.

The third aspect pertains to indicators describing the equipment of households. There are three indicators proposed. The first is the share of households equipped with computers with access to the Internet, based on the EU-SILC survey. The other proposed indicators are the shares of housing units equipped with a bathroom in urban and rural areas, based on the data drawn from the Local Data Bank. They reflect the quality of housing stock within *voivodships* in urban and rural areas.

Looking at the correlations of the proposed indicator with health status, it should be noted that the third aspect – taking into account the equipment of houses – shows the highest correlations with health status indicators. In particular, there is a very strong correlation between the share of housing units equipped with bathrooms in urban areas and SDR, as well as strong positive correlation with LE. If we look at the share of households equipped with computers with access to the Internet, the results are more puzzling, as we can see positive correlation of this indicator with LE of men (at both ages), while there is negative correlation with female LE. This phenomenon calls for further investigation of gender differences in health and non-health related factors.

Indicators related to income and poverty seem to have a relatively weak correlation with death rate, but a stronger one with LE of women. However, the direction of this correlation is also puzzling – those regions with higher overall poverty rates seem to have longer female LE. It is likely that other factors also influence this.

Thus, the argument advocating a significant influence of social factors on health status of the population seems to have some validity in this context.

9 This is the relative poverty threshold used by Eurostat.

1.5 Socioeconomic dimensions of health status – summary of *voivodship*-level analysis

In summary, one can conclude that for each dimension included in the analysis – demographic composition, labour market and education, economic situation, and social status of households – some of the indicators analysed are correlated with mortality risk.

Such correlations appear to be especially significant within the scope of certain indicators or groups of indicators. Primarily, indicators related to the level of educational attainment of the population should be included in the social status indicators group – the higher the education, the lower the mortality, at *voivodship* level. Other indicators connected with social development, such as presence of bathroom appliances in a housing unit in urban areas, or preschool attendance rate, also play an important role.

As far as labour market indicators are concerned, it is clear that a better quality of labour market (higher employment and lower unemployment) translates into lower mortality risk and, in particular, higher LE. The economic situation of individual *voivodships* does not seem to influence the mortality risk or LE of their populations.

With regard to demographic indicators, feminization rate deserves particular attention. High feminization rate – resulting in part from high attractiveness and appeal of a *voivodship*, leading to an inflow of new residents – among other things, is correlated with lower mortality.

One should also pay attention to the way in which the analysis was carried out: it is based on the *voivodship* level, ignoring intra-*voivodship* variation, which can have significant impact on health outcomes. As work continues and more detailed territorial dimensions at *poviat* level are taken into account in the analysis, and as more sophisticated analytical methods are applied, we will be able to carry out a more comprehensive impact assessment of demographic, economic, social and geographical determinants of health.

2. Counteracting social risk factors resulting in inequalities in health in Poland, with special emphasis on noncommunicable diseases and lifestyle

Dorota Kaleta, Tomasz Zdrojewski, Paulina Miśkiewicz

2.1 Introductory remarks

Noncommunicable diseases represent the main cause of mortality and disability in the WHO European Region. According to *The European health report 2005, public health action for healthier children and populations*, noncommunicable diseases in 2002 were the cause of more than 8 million deaths in Europe and accounted for approximately 77% of population burden of disease *(30)*.

In a group of seven diseases representing the cause of the largest number of deaths in Europe, as many as six are related to noncommunicable diseases, namely: ischaemic heart disease, depression disorders, cerebrovascular diseases, alcohol-related diseases, chronic obstructive pulmonary disease and lung cancer. Most of the above-mentioned diseases are caused by several risk factors, which can be prevented to a large extent. Those factors include: high arterial blood pressure, tobacco use, abusive and risky alcohol consumption, high cholesterol level, overweight and low consumption of vegetables and fruit.

Analogical trends can be observed in Poland, but the Polish population displays a much higher index of tobacco use, compared to most WHO European Region countries, including those that constitute the EU. Among the 27 countries belonging to the EU since January 2007 (EU27), a higher index was reported only in Hungary and Denmark.

A comparison of the impact of leading individual risk factors relating to population health status in Poland and in other EU countries, measured as a percentage of total deaths, is presented in Table 2.1.

As shown in Table 2.1, many risk factors which exert a strong influence on population health status in Poland represent a much less prominent threat in other EU Member States. For example, tobacco use accounts for 25.3% of total deaths in Poland, whereas in Sweden this factor accounts for 10.8% of deaths, and in Austria for 15.8% of deaths. In Poland, alcohol abuse accounts for 6.7% deaths, while in countries such as Austria or France the rate is much lower. Such a comparison may be used as a tool to set out long-term objectives for Poland's public health policy.

Outcomes of policies aimed at reducing health risk factors can be estimated as a result of various studies. From 1991, mortality due to coronary heart disease in Poland started to decline. In 2005, over 26 000 fewer CVD deaths were recorded among adults aged 25–74 years. Observed improvement in duration of life in Poland was attributable for the most part to the decrease in cardiovascular mortality. The analysis suggests that approximately half (54%) the recent fall in CVD in Poland between 1991 and 2005 may be attributable to reductions in major risk factors (see Fig. 2.1).

The most important are (see Fig. 2.2):

- decrease in the mean level of cholesterol in the Polish population, connected with change in lifestyle (40% fewer deaths);
- reduced number of smoking men (11% fewer deaths);
- increase in physical activity.

Table 2.1. Comparison of the 10 key health risk factors of noncommunicable diseases in Poland and in EU countries (% of total deaths)

Country	% of total deaths for 10 leading causes in Poland and EU countries									
	Tobacco	High blood pressure	High cholesterol	High body mass index	Alcohol	Low fruit and vegetable intake	Low physical activity	Urban air pollution	Unsafe sex	Lead
Poland	**25.3**	**25.0**	**13.8**	**10.6**	**6.7**	**6.6**	**6.1**	**1.7**	**1.1**	**0.9**
Czech Republic	21.8	26.8	18.3	11.4	–	5.2	7.3	0.6	0.9	–
Slovakia	19.2	29.7	14.3	14.0	11.5	7.4	7.2	1.9	0.9	1.0
Hungary	26.3	26.0	17.2	11.1	11.4	10.3	7.5	1.1	–	0.8
Austria	15.8	22.8	14.3	9.6	2.2	4.2	6.0	0.5	0.8	–
Belgium	23.3	13.4	11.2	7.3	–	3.3	4.5	0.5	0.7	–
Bulgaria	13.5	40.0	14.3	14.2	6.5	7.4	7.1	2.0	0.8	1.3
Cyprus	9.7	23.6	9.8	4.3	0.9	4.8	4.4	1.2	0.4	–
Denmark	25.7	11.8	11.5	8.4	–	3.4	5.1	0.5	0.8	–
Estonia	17.4	28.3	23.7	11.4	10.9	12.6	9.1	1.2	0.8	0.8
Finland	13.9	22.0	17.3	8.9	–	4.5	6.3	0.6	0.5	–
France	16.2	12.8	6.4	6.5	4.6	2.3	3.3	–	0.8	–
Greece	19.3	25.0	11.6	8.3	–	3.9	5.0	0.6	0.5	–
Spain	16.8	15.6	8.9	7.9	0.8	3.0	4.2	–	0.8	–
Netherlands	23.7	17.4	8.1	7.8	–	3.2	4.5	0.5	0.6	–
Italy	18.8	21.7	11.1	10.0	0.6	3.5	5.0	0.6	0.6	–
Ireland	23.2	18.0	14.4	8.4	–	4.1	5.6	–	0.5	–
Lithuania	17.8	33.0	23.2	10.5	10.7	12.0	9.1	1.2	1.1	0.8
Luxembourg	17.7	15.2	10.7	7.9	3.1	3.2	4.5	0.5	0.6	–
Latvia	16.5	31.7	23.0	11.1	10.8	12.4	8.9	1.2	1.0	0.9
Malta	15.4	25.0	19.9	11.7	–	4.9	7.2	0.6	0.6	–
Germany	18.3	25.9	15.1	9.9	–	4.1	5.9	0.6	0.7	–
Portugal	12.1	23.0	10.7	10.2	3.1	3.6	5.0	0.5	1.6	–
Romania	16.3	31.8	14.4	13.9	12.4	7.1	6.6	2.1	1.2	1.3
Slovenia	19.7	17.8	12.1	10.0	6.5	3.6	5.1	0.5	0.8	–
Sweden	10.8	25.2	14.5	8.4	–	3.8	5.7	0.5	0.6	–
United Kingdom	24.4	19.4	13.3	8.0	–	4.0	5.5	0.6	0.6	–

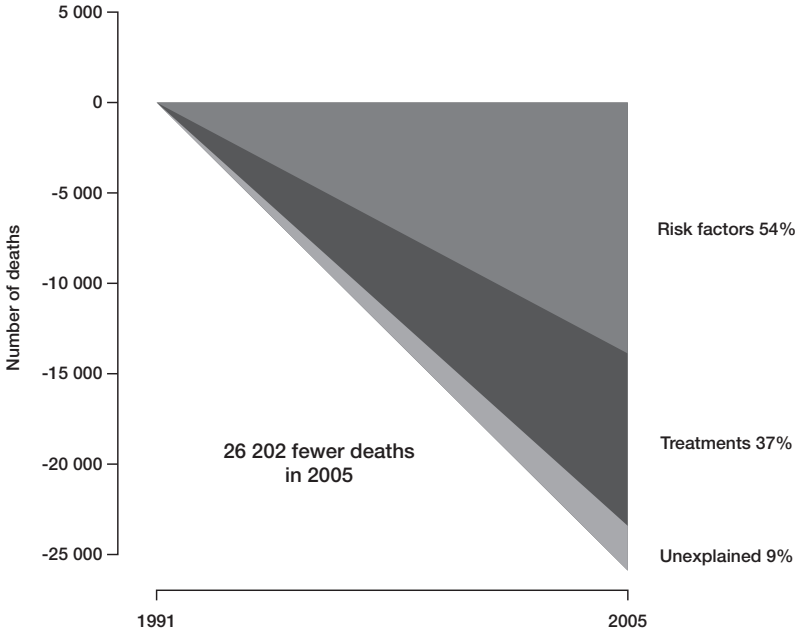
Source: WHO Regional Office for Europe *(30)*.

Modern therapies, which have been extensively developed in Poland during this period are responsible for a 37% decline in CVD mortality. These include:

- expensive hospital procedures in myocardial infarction or unstable angina – a total of 9%
- secondary prevention therapies after myocardial infarction or revascularization – 6%
- chronic angina treatment (including surgical revascularization) – 3%
- heart failure treatments – 12%
- hypertension treatments – 2%
- hypercholesterolemia treatments with drugs among people without myocardial infarction – 3%.

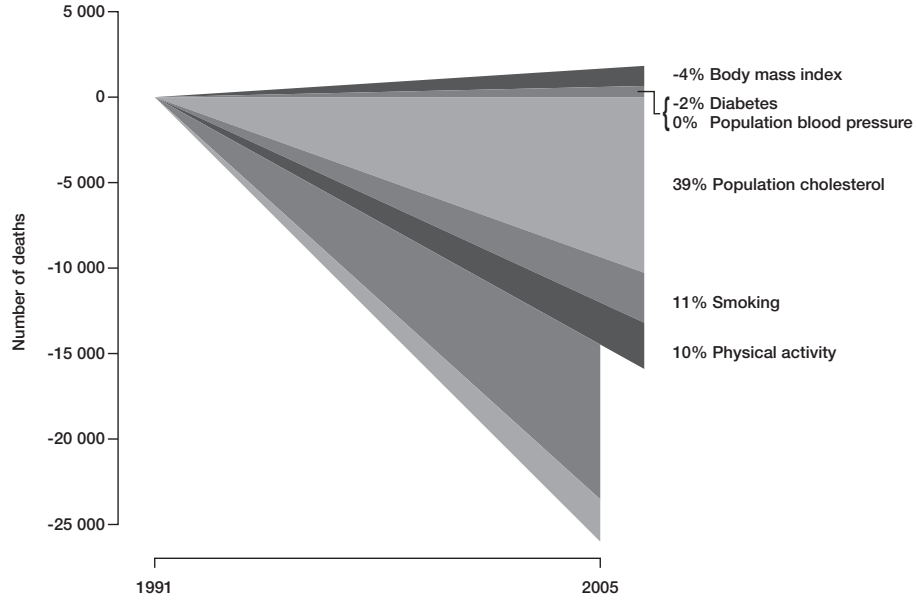
Premature mortality from CVD is still approximately twice as high in Poland as in some other countries in eastern Europe. The main reasons for this are downstream risk factors: mostly diet and smoking. Differences in social determinants of health in Poland (described in other chapters) play a crucial role in this.

Fig. 2.1. Explaining the fall in coronary artery disease mortality in Poland between 1991 and 2005



Source: Bandosz et al. *(31)*.

Fig. 2.2. Explaining the fall in coronary artery disease mortality in Poland between 1991 and 2005 with sub-analysis of risk factors



Source: Bandosz et al. *(31)*.

This is why long-term health policies should be aimed at:

- a further decrease in mean artery pressure level in the population (for example, by means of salt reduction in food and proper social marketing);
- a further decrease in the mean level of cholesterol (for example, by limiting sales of unhealthy food in schools);
- further reduction of passive smoking (for example, through new restrictions imposed by legal regulations and their strict observance).

Such changes have much greater potential to save lives than expenditure on medical treatment of CVD.

The majority of risk factors are very strongly connected with lifestyles, and especially with consumption models. Individual behaviours, such as tobacco use, alcohol abuse or a lack of physical exercise affect the health status of the entire population and are socially developed; thus, they contribute to the emergence of certain social inequalities in health *(2)*.

2.2. Selected modifiable risk factors pertaining to chronic noncommunicable diseases

The aetiology of chronic noncommunicable diseases is typically complex and multifactorial in nature. From the standpoint of chronic disease prevention, key importance is attached to the so-called modifiable factors, related to lifestyle *(32)*. Key modifiable risk factors pertaining to chronic diseases in Poland include:

- tobacco use
- hypertension, high cholesterol level and high blood glucose level
- overweight and obesity
- little physical exercise
- low consumption of vegetables and fruit
- excessive alcohol consumption.

Each of these factors is discussed in the subsections that follow.

2.2.1 Tobacco smoking

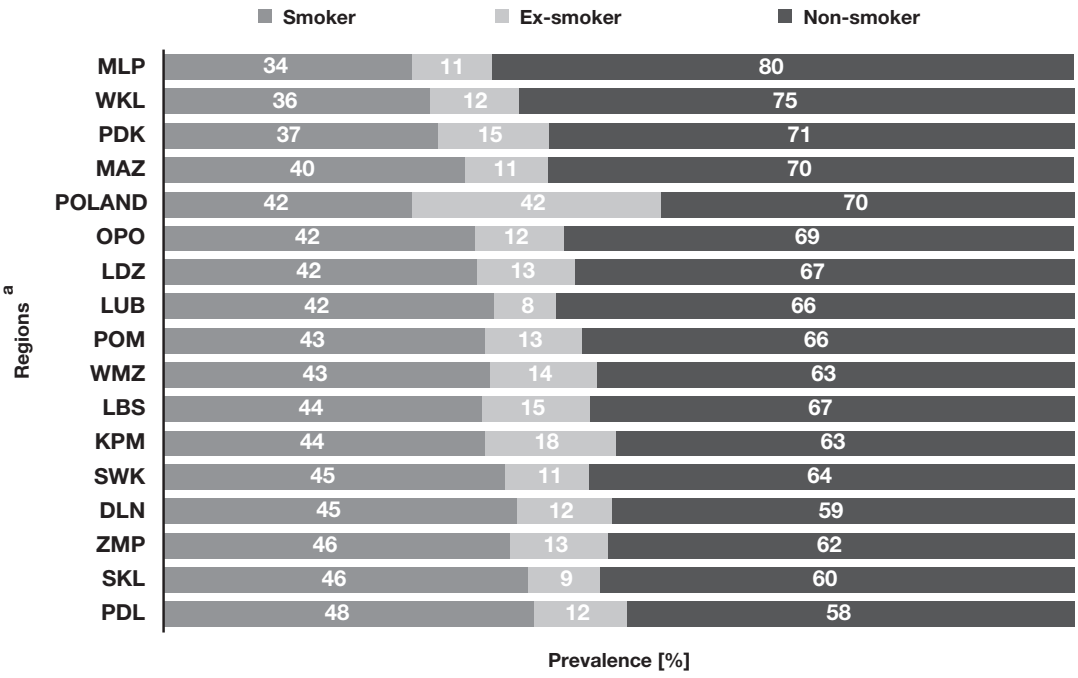
Tobacco smoking is commonly regarded as the most serious identified risk factor of numerous lifestyle diseases, and in particular CVD, respiratory diseases and cancer. In the societies of industrialized countries, smoking-related diseases are the main causes of death that are modifiable through behaviour change. According to the findings of research conducted in 14 European countries, Poland is one of the countries with a high intensity of nicotine use and the country with the highest dynamics of tobacco-related diseases.

Analysis of the "WOBASZ" National Multi-centre Health Survey (involving more than 14 000 adult Poles in the period 2003–2005) has shown that approximately 42% of men and 25% of women smoke more than one cigarette a day *(33)*. The frequency of smoking varies considerably across regions – between 34% (Małopolskie) and 48% (Podlaskie) among men, and between 16% (Podkarpackie) and 34% (Warmińsko-Mazurskie) among women (Fig. 2.3 and Fig. 2.4).

The biggest proportion of male smokers is reported in Podlaskie, Śląskie and Zachodniopomorskie (46–48%), and the smallest in Małopolskie (34%) (Fig. 2.3).

Among women, in 10 regions more than 25% are smokers, most frequently in Warmińsko-Mazurskie, Lubuskie and Dolnośląskie (32–34%). The least frequent smoking habits are reported in Podkarpackie and Małopolskie (20%) (see Fig. 2.4).

Fig. 2.3. Prevalence of tobacco smoking among men by region



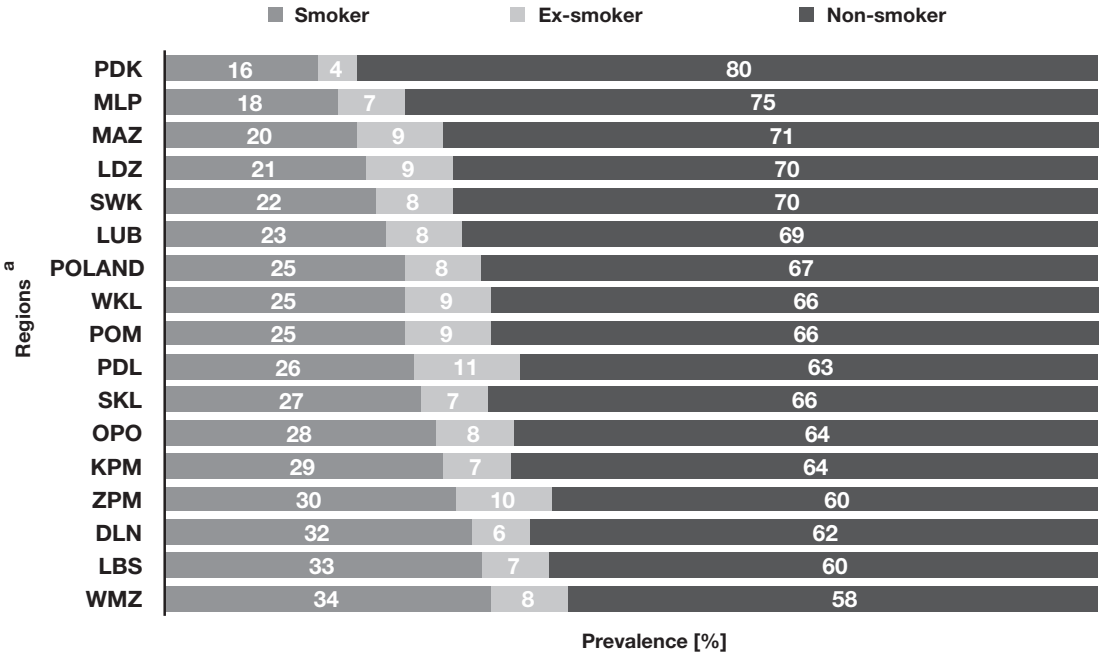
[a] MLP: Małopolskie; WKL: Wielkopolskie; PDK: Podkarpackie; MAZ: Mazowiecki; OPO: Opolskie; LDZ: Łódzkie; LUB: Lubelskie; POM: Pomorskie; WMZ: Marmińsko-mazurskie; LBS: Lubuskie; KPM: Kujawsko-Pomorskie; SWK: Świętokzyskie; DLN: Dolnośląskie; ZMP: Zachodniopomorskie; SKL: Śląskie; PDL: Podlaskie.

Source: Based on WOBASZ data *(33)*.

Poorer people tend to suffer more frequently from diseases related to smoking habits and therefore prematurely die of those diseases much more frequently than affluent people. They are not able to free themselves from the vicious circle of poverty and disease. Although the risks resulting from tobacco use do not abide by any socioeconomic boundaries, tobacco epidemics affect most those households and countries that are the poorest.

According to the analysis of data obtained in a survey conducted by the GUS among the Polish adult population in 2004, there is correlation between the level of education and prevalence of smoking, among men as well as women (Fig. 2.5). A standardized percentage of women aged 20 years or over who are current smokers among the group with tertiary education was the lowest, amounting to 16%; in the group with upper-secondary and post-secondary education it was equivalent to 21%; in the group with low-secondary vocational education it amounted to 27%; and it was the highest (33%) in the group of women who had only achieved primary-level education. Among men, current smokers were most frequently found (51%) in the group of men who had only achieved primary-level education, followed by 43%, 30% and 21%, respectively, in groups with low-secondary vocational education, upper-secondary and post-secondary education, and tertiary-level education.

Fig. 2.4. Prevalence of tobacco smoking among women by region

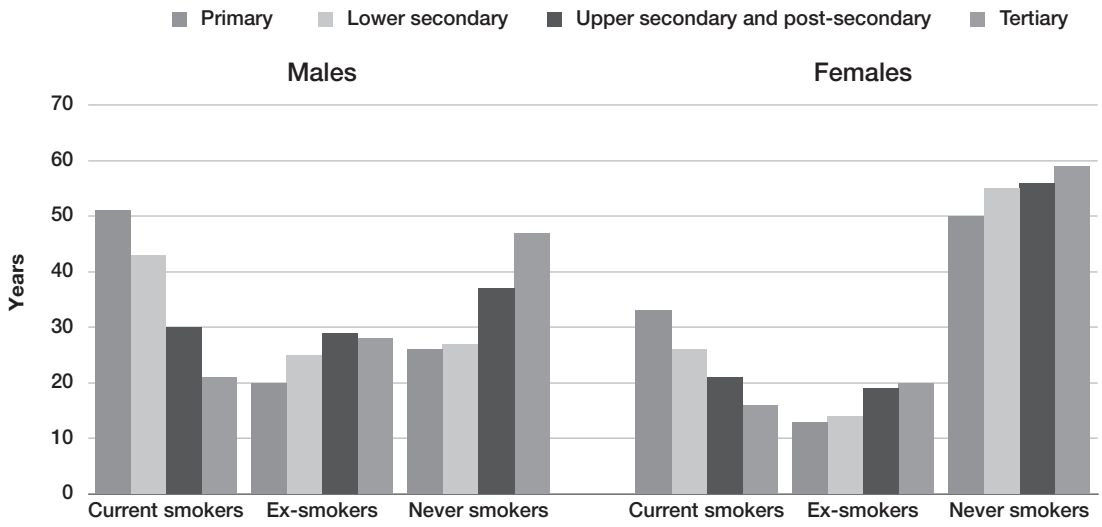


[a] PDK: Podkarpackie; MLP: Małopolskie; MAZ: Mazowiecki; LDZ: Lódzkie; SWK: Świętokzyskie; LUB: Lubelskie; WKL: Wielkopolskie; POM: Pomorskie; PDL: Podlaskie; SKL: Śląskie; OPO: Opolskie; KPM: Kujawsko-Pomorskie; ZPM: Zachodniopomorskie; DLN: Dolnośląskie; LBS: Lubuskie; WMZ: Marmińsko-mazurskie.

Source: Based on WOBASZ data *(33)*.

By the same token, analysis of tobacco smoke determinants carried out on a representative group of residents of productive age from the Łódzkie region has shown that people from a small municipality smoke with significantly higher frequency than people from a municipality with the population of more than 40 000 inhabitants *(34)*. Risk of tobacco smoking was found to be lower for people aged over 64 years. Men with primary/vocational education smoke with significantly higher frequency than people with tertiary education, divorced women and widows. Among men, the risk of cigarette smoking was found to be greater when the income per family member was low.

Fig. 2.5. Age-standardized percentage of people aged 20 years and over according to smoking status, by education level, 2004



Source: Prepared by B. Wojtyniak (calculations based on GUS Health Interview Survey data).

The trends in smoking related to place of living and education were confirmed recently by the results of the Global Adults Tobacco Survey (GATS) conducted in Poland in 2009–2010 on a nationally representative sample of 14 000 households. The survey revealed that 36.9% of adult men, 24.4% of adult women and 30.3% of all adults smoke. The highest percentage of tobacco users in this survey was among adults with vocational education, in contrast to the 2004 GUS survey. In addition, the percentage of adults who use tobacco products was higher in urban (31.9%) than in rural (26.1%) settings *(35)*.

2.2.2 Cholesterol level, hypertension, increased blood glucose level

In 2002 in Poland the prevalence threat relating to the main risk factors for CVD was examined on the basis of research involving a representative sample of adult Polish residents. According to research findings, lipid disorders (observed in more than half of the adults) and hypertension are the most common risk factors. It is estimated that more than 8.6 million adults in Poland suffer from hypertension, and almost 9 million have blood pressure at the upper limit of the normal range. Diabetes, especially type 2, represents another important risk factor. According to estimations, the number of people suffering from this disease will double between 2005 and 2030. At present, the prevalence of diabetes in the adult population is equivalent to almost 6% (approximately 1.8 million people).

Hypertension represents one of the main independent risk factors of coronary heart disease, stroke, heart failure, peripheral atherosclerosis and renal failure; antihypertensive therapy significantly reduces the risk of complications. Collins and MacMahon's meta-analysis has shown that treatment of hypertension and reduction of diastolic blood pressure by 56 mm Hg reduces the risk of stroke by 38%, and of cardiovascular events by 16% (meta-analysis by Collins and colleagues) *(36)*.

The findings of research involving residents of 400 small towns in Poland have confirmed a strong impact of socioeconomic factors on health indicators. Apart from age, education had the biggest impact on health. Interestingly enough, in this case high income was not positively correlated with

health indicators. Indeed, high income correlated with a minimum positive impact on hypertension, but it also correlated with clearly increased blood glucose and cholesterol levels, along with increased waist measurement.

Taken together, socioeconomic factors included in the study account for 14.4% variability in total cholesterol level, 34.0% variability in blood pressure, and 13.3% variability in blood glucose level. High levels of certain variables – such as social support, place of residence and education – correlate with low cholesterol, blood pressure and glucose levels. On the other hand, high levels of variables such as depression and age are correlated with high levels of the three above-mentioned risk factors.

The analysis of overall results in standardized form has shown that cholesterol level modulation, age and marital status of the individual involved are of key importance, followed by gender, education, income and place of residence. Variables such as depression and social support appear to have no impact on cholesterol level.

Blood pressure level is affected to the greatest extent by age and gender, and then by education, marital status and social support. The remaining socio-demographic variables, namely depression and income, exert only minimal influence on blood pressure level.

Blood glucose level is mostly contingent upon age and gender, and then upon education and income. Depression, social support, place of residence and marital status exert only minimal influence on blood glucose level. Biological mechanisms of the impact of socioeconomic status on health parameters are still unclear in many areas.

2.2.3 Overweight and obesity

Overweight and obesity are among the risk factors related to increased morbidity and mortality in respect of many chronic diseases, especially CVD, cancer and diabetes. Furthermore, they substantially contribute to the development of motor system diseases of strain-related aetiology. Overweight and obesity are often accompanied by hypertension and metabolic disorders such as hyperlipidemia or hyperglycemia. Location of body fat is clearly related to the occurrence of certain specific complications, with abdominal type obesity being particularly disadvantageous. It is estimated that in the WHO European Region 150 million adults and 15 million children meet obesity diagnosis criteria *(37)*.

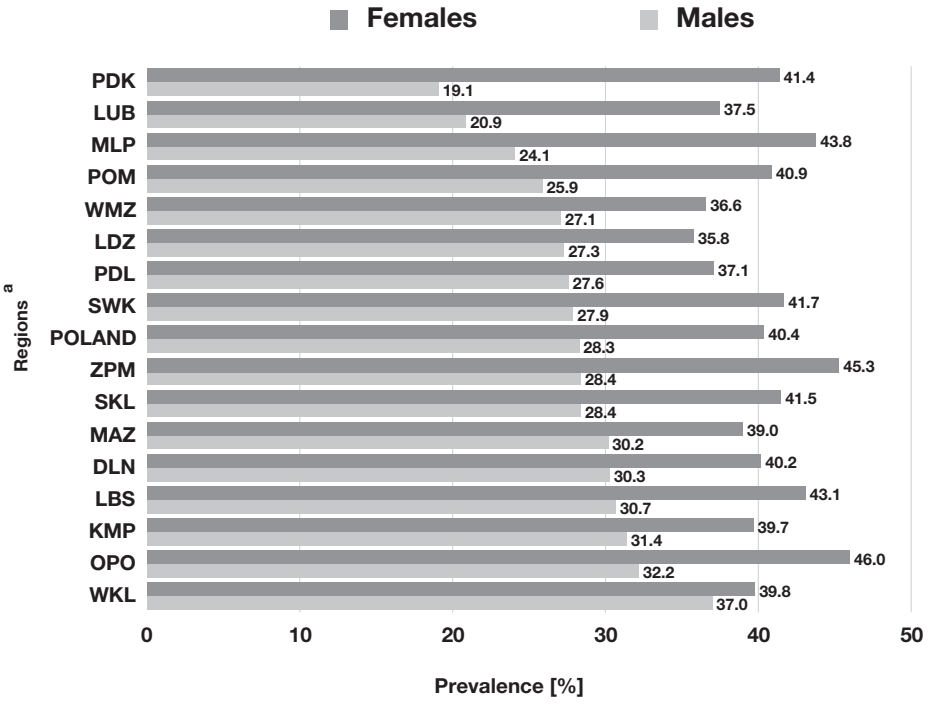
In 2005 in Poland, the percentage of people with normal weight was higher among women (49.7%) than men (38.4%). Overweight (body mass index (BMI) 25–29, 9 kg/m^2) applies to 40.4% of men and 27.9% of women, whereas the prevalence of obesity (BMI >/= 30 kg/m^2) is similar for both genders (20.6% of men and 20.2% of women). There are significant differences in the incidence of obesity, including abdominal obesity, across regions.

Frequency of obesity among men is two times higher in the Wielkopolskie region than in Małopolskie (28.2% compared to 14.2%). The highest percentage of women with obesity was recorded in the Opolskie region (24%), and the lowest percentage in Podkarpackie (16.1%) (Fig. 2.6).

Among women involved in the 2004 GUS study, the standardized percentage of women with overweight or obesity was highest in the group of respondents with primary education (36%), and lowest among women with tertiary education (21%). Among men the discrepancies were not so pronounced (Fig. 2.7). Similarly, in a survey involving a random group of employees in the city of Łódź, higher levels of educational attainment and higher socioeconomic status were correlated with lower risk of incidence of excessive body weight among individuals involved in the research *(38)*. Among men and women alike, the level of education was definitely correlated with BMI. Among men with primary education the

risk of overweight or obesity incidence was almost three times greater than among men with tertiary education. Among women with primary education the risk of overweight or obesity incidence was more than five times greater than among women with tertiary education. In a group of men with the lowest level of monthly income per family member, the risk of BMI > 25(kg/m^2) was almost twice as high as in the group of men whose monthly income exceeded €250. In a group of women with the lowest level of monthly income per family member, the risk of BMI > 25(kg/m^2) was higher than in the group of women whose monthly income exceeded €250.

Fig. 2.6. Prevalence of abdominal obesity by region



[a] PDK: Podkarpackie; LUB: Lubelskie; MLP: Małopolskie; POM: Pomorskie; WMZ: Marmińsko-mazurskie; LDZ: Łódzkie; PDL: Podlaskie; SWK: Świętokzyskie; ZPM: Zachodniopomorskie; SKL: Śląskie; MAZ: Mazowiecki; DLN: Dolnośląskie; LBS: Lubuskie; KMP: Kujawsko-Pomorskie; OPO: Opolskie; WKL: Wielkopolskie.

Source: Based on WOBASZ data *(39)*.

In Europe there is particular concern over increasing obesity trends among adolescents and younger children – their numbers have grown ten fold since 1970. In Poland, overweight is diagnosed in 8.5% of children aged 13–15, and obesity in 4.5% of children within that age category. Two thirds of that group are girls. Excessive body weight is most frequent in the Podlaskie and Pomorskie regions, and least frequent in Kujawsko-Pomorskie.

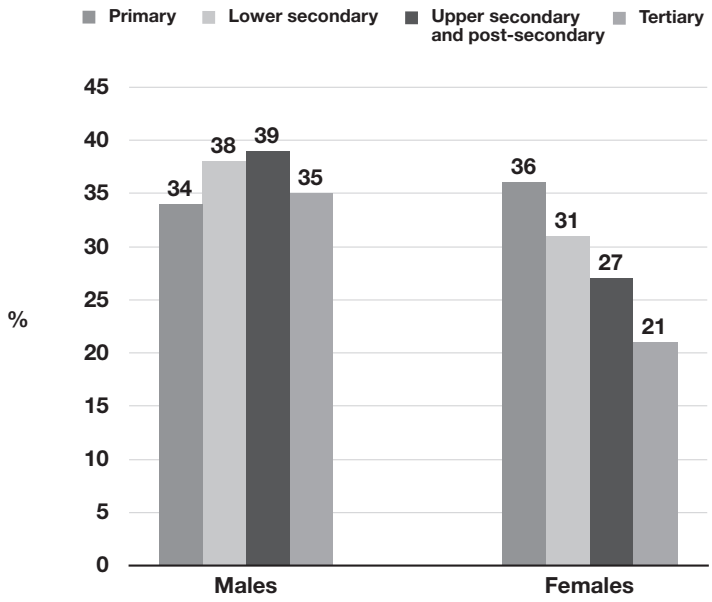
2.2.4 Low level of physical activity

Low level of physical activity is one of the most common risk factors in industrialized countries in respect of CVD, cancer, diabetes and motor system diseases *(40)*. According to recently published results of a meta-analysis of several dozen epidemiological studies, regular physical exercise may reduce the risk of overall mortality by as much as approximately 30%.

In Poland, according to WOBASZ data, 35% of the population (37% of women and 32% of men) do not do any physical exercise for at least 30 minutes daily in their leisure time. Low levels of physical activity continues to be one of most prevalent risk factors of ischaemic heart disease and other chronic diseases in Poland. The WOBASZ project data demonstrate significant differences in physical activity levels across various socioeconomic groups *(41)*. Women declared having a sedentary lifestyle more often than men, both with regard to their occupation and leisure. Age is another significant factor.

Physical inactivity was observed most frequently among people aged 65 years and over, and this result was much higher than among senior citizens from some European countries or the United States (30%). Physical inactivity in leisure time is less prevalent among people under 35 years, those with higher education and the residents of rural areas. The lowest level of physical activity in leisure time, at work and when commuting to and from the workplace was confirmed among the residents of big urban agglomerations. These results are consistent with previously published reports in that field, and confirm that urbanization rate affects lifestyle-related behaviours.

Fig. 2.7. Age-standardized prevalence of overweight in the Polish adult population (aged 20 years and over) by education, 2004



Source: Prepared by B. Wojtyniak (calculations based on GUS Health Interview Survey data).

It should be underlined that in Poland gender gaps remain and can be reflected in the labour market. Long-term unemployment is more common among women (4.5%) than men (3.5%). Women's careers are shorter, slower to progress and less well paid. The fact that they will be exposed to poverty – particularly for women aged over 65 years – may increase the risk of poverty (5% more women compared to men at age 65 years and over are likely to be exposed to poverty).

The employment rate gap between women and men was lower in 2007 by 13%; it was 50.6% for women (aged 15–64 years) and 63.6% for men *(42, 43)*. This gap increases with age and is highest among older workers (aged 55–64 years) at 22%. Moreover, differences in gender role attitude between men and women can be observed in all aspects of quality of work, such as: work–life balance, work management that does not take advantage of competencies, health aspects and workplace safety. The evidence

points to a decrease in employment rate of women with children (approximately 13%). The employment rate for women with children is 60.8%, but 88% for men in the same situation.

The percentage of female employees working part time is 36.5%, which is more than 1 in 3 women, compared to 1 in 10 men. Also, more women work on a contract basis for a definite period of time. The gender pay gap in Poland is relatively low. In 2006, monthly earnings among women were 12% lower than earnings among men. High divergence in earnings between men and women is registered mainly in the upper limit of the wage distribution. While monthly earnings of workers with the lowest 10% of earnings are comparable, the difference at the upper limit of the wage distribution (that is, among the highest earning 10% of people) exceeds 20%.

It is worth noting that crucial differences in the upper limit of the wage distribution result from under-representation of women in executive posts. In 2006, women constituted over 35% of high-level directors within companies. Reasons for the differences in gender pay (taking labour time into account) may include levels of education and human capital of these groups; differences in relation to age and job seniority, motivation to work and effort input; differences in character/profile of workplace; and discrimination – this latter is the average difference between earnings of men and women with identical individual characteristics and workplaces. In 2006, the average age of permanent departure from paid labour was 57 for women and 62 for men.

Poland is a country in which many women participate in the labour market, but at the same time some women in Poland (among other European countries) retire from the labour market at an early stage and before reaching statutory retirement age, which results in very low labour supply and low employment levels of individuals approaching retirement age *(44)*.

2.2.5 Diet

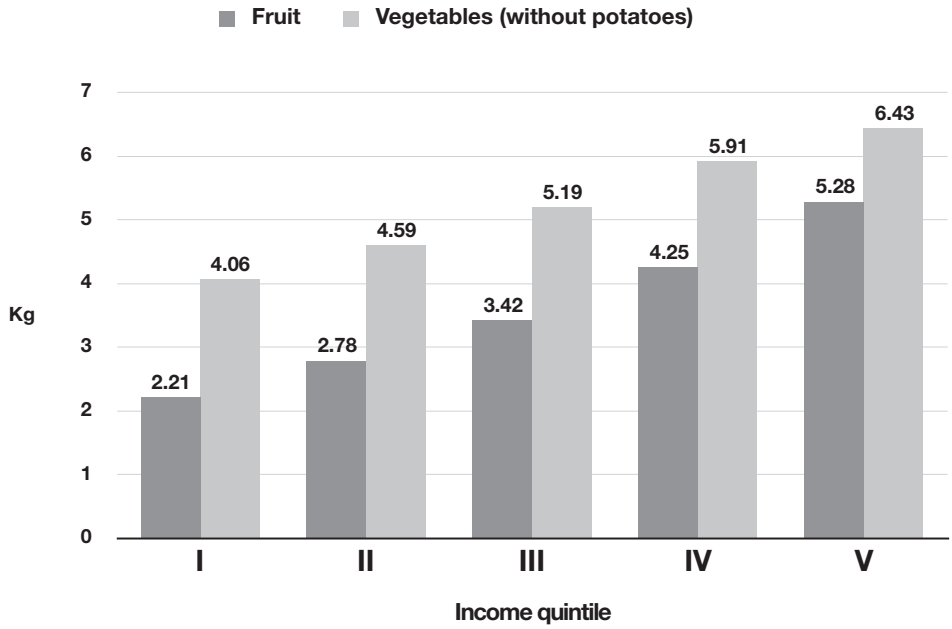
Dietary habits are among key determinants of health status of a society. According to contemporary knowledge, inappropriate diet has substantial impact on the development and severity of diet-related diseases, such as CVD, many types of cancer, obesity, diabetes and osteoporosis *(45)*.

Assessment of dietary habits – carried out on the basis of detailed nutritional questionnaires – has shown that the average diet of adult residents in Poland differs considerably from international recommendations *(46)*. First, high atherogeneity of the diet is evident, resulting from excessive consumption of animal fats. Another point of concern is insufficient content of minerals in the diet, especially calcium, magnesium and vitamin B1. Shortage of a number of minerals may result from low intake of cereal products and milk. The amount of daily consumption of vegetables and fruit should be regarded as satisfactory, as in most regions it exceeds the minimum recommended value of 400 g per day. According to GUS data there is a strong association between income and average consumption of fruit and vegetables per person per month (Fig. 2.8).

2.2.6 Alcohol consumption

Since the late 1990s the culture of alcohol consumption has changed in Poland. In 2007, beer consumption (per capita) amounted to 93.4 litres; wine and mead to 8.6 litres; and vodka and other spirits (100% equivalents) to approximately 3.0 litres, according to the State Agency for the Prevention of Alcohol-Related Problems (Państwowa Agencja Rozwiązywania Problemów Alkoholowych, PARPA) *(48)*. According to annual reports of the PARPA, consumption of 100% alcohol per capita in Poland went up by 2.69 litres, from 6.52 litres in 1993 to 9.21 litres in 2007. On average, men drink 4.5 times more alcohol than women *(49)*. The highest level of alcohol consumption among men is reported in the groups aged 30–39 and 40–49 years; those with vocational education; the unemployed; and

Fig. 2.8. Average consumption of fruit and vegetables per person per month, by household and by income quintile, 2008



Source: GUS *(47)*.

non-qualified workers living in the cities with a population of 50 000 to 500 000. Among women, the highest level of alcohol consumption is reported in the groups aged 18–29 and 30–39 years; unmarried women; women with tertiary education; female residents of the cities with a population above 50 000; housewives; and white-collar female workers without tertiary education. Among the youth, a surge in alcohol consumption was observed over the decade from 1984 to 1994.

2.3 Noncommunicable diseases – prevention

Prevention of chronic diseases causing the most serious health, social and economic complications has a relatively long track record in many countries.

The United Kingdom, Canada and Scandinavian countries, especially Finland *(50)*, have been particularly successful in that regard. Many measures aimed at combating noncommunicable diseases have been initiated in Poland as well.

Experience from these countries, and in particular the North Karelia Project, has been taken into consideration in the study on the implementation of the Countrywide Integrated Noncommunicable Disease Intervention Programme (WHO CINDI) *(50)*. The following initiatives are among the best known CINDI measures in Poland: the national anti-tobacco "Quit & Win" campaign and the first Polish national fitness campaign "Revitalize Your Heart" *(52)*. Among the most active demonstration sites involved in programme implementation are the following cities and towns: Łódź, Toruń, Chorzów, Ostrów Wielkopolski, Kalisz, Cieszyn, Chojnice and Rawa Mazowiecka.

Public health programmes funded from the central budget, as well as those financed within a health insurance framework mostly involve activities aimed at reducing risk factors related to noncommunicable diseases and health promotion. Many programmes are targeted at one risk factor (for example, PARPA, or a programme focused on containing the implications of tobacco smoking), whereas other programmes are targeted at a specific group of diseases, where several risk factors are implicated (for example the National Program for Prevention and Treatment of Cardiovascular Diseases (POLKARD), or the National Program for Cancer Prevention) (see Table 2.2). Nevertheless, none of these programmes take into account the many aspects related to social determinants of health, their formation and persistence. Furthermore, planned action steps set out in the programmes are not focused on reducing the discrepancies in health within Poland's population. An exception to this is the NPZ for 2007–2015 and the Polish Project 400 Towns (PP400M), implemented within the framework of POLKARD.

The NPZ for 2007–2015 is a national public health strategy, with the main objectives defined as improvement to health and health-related quality of life of the population, and reducing inequalities in health.

Table 2.2. Programmes and social determinants of noncommunicable diseases financed by public payers

Programmes	1	2	3	4	5	6	7	8	
	Tobacco	Alcohol	Low consumption of fruit and vegetables	Low level of physical activity	High blood pressure	High level of cholesterol	Overweight	High level of glycaemia	Reference to social inequalities in health
National anti-tobacco programme	X								
National programme for solving alcohol abuse problems for years 2006–2010		X							
National programme for solving problems of obesity and chronic noncommunicable diseases			X	X			X		
POLKARD	X		X	X	X	X	X	X	X
Screening programme for high blood pressure	X				X				
Prevention of diabetic diseases, along with their treatment								X	

Source: Based on Wojtyniak & Goryński *(53)*.

In recent years two programmes were carried out: the National Program for Heart Protection and the National Program for Brain Stroke Prevention and Treatment for 1993–2001. The overriding purpose was to stop unfavourable mortality dynamics due to CVD and to improve access to diagnostic, medical and rehabilitation services.

As a follow-up to those programmes, in 2002 a team of experts appointed by the Ministry of Health designed POLKARD *(54)*. The main goal of the programme was to maintain the momentum in the reduction of mortality due to CVD in Poland, at least at the level observed in the period 1990–2000, and to reduce mortality among people aged 65 and over by 30% by 2012. Besides, POLKARD was implemented, among others, in 400 small towns with populations of up to 8000 each, scattered throughout 12 administrative regions (*voivodships*). These towns are located away from large cities, and their residents have for years been faced with numerous economic difficulties, accompanied by unfavourable health indicators *(5)*.

Another important effort in the field of chronic disease epidemiology and prevention is the NATPOL III PLUS study, carried out in 2002 *(55)*. The study was performed concurrently in 300 different sites all over the country, involving a representative group of 3051 individuals aged 18–94 years.

Preventive projects of the future should not be restricted merely to more effective screening methods, but should also address the social inequalities in health. Because of considerable disparity in the burden of chronic diseases and the prevalence of risk factors in Poland, a deeper analysis of reasons for this diversity and, consequently, the implementation of adequate preventive measures equally available to all demographic and socioeconomic groups must be a priority. Therefore, applying a social inequality analysis is one of the most important issues for national databases and statistics. Unfortunately, current approaches in Poland err in focusing primarily on data gathering, analysing and publishing in relation to the general health status of the population, without reference to the social and economic characteristics. In light of these basic requirements and faced with existing barriers, there is also considerable work to be carried out in terms of redressing gaps in research examining social inequalities in health. One such project is the reanalysis or secondary analysis of large data sets to identify the social determinants of health inequalities that may already exist, but are not recognized or remain unpublished. A second is the development of a fully informed research agenda that accounts not only for gender influences, but also for social determinants of health, among others.

A significant barrier to achieving these goals remains the limited access in Poland to databases, and lack of financial means allocated for surveillance.

Moreover, the most difficult challenge yet to be overcome is to ensure that preventive measures are not organized in campaign form, such as the WOBASZ project or other similar initiatives, but are instead gradually incorporated into existing social systems. This would help to ensure proper conditions for systematic, sustainable efforts for health improvement. Furthermore, it would also seem necessary to establish an information platform, with data on preventive programmes and evaluation of their effectiveness. It is important to equip policy-makers, scientists and self-government representatives with access to good practices with proven effectiveness, which could be implemented – after appropriate modification – as a background for new preventive programmes.

As shown in many countries, the reduction in major risk factor prevalence and, consequently, the decrease in chronic disease incidence and mortality rates may be accomplished only by means of the combined efforts of various sectors; that is, health care providers, central and regional authorities, representative and social organizations, mass media and society at large. Following other countries' experience in effective prevention, more focus should be placed on the necessity of comprehensive, multi-pronged, multisectoral undertakings, that is, with the active participation of the aforementioned actors.

There is a clear need for working out new – or implementing already prepared – national long-term preventive programmes which would address obesity, diabetes and other metabolic disorders, focusing on inequalities. New prevention programmes should ensure stable and continuous funding supplies are secured, regardless of the current economic and political situation.

3. Inequalities in child and adolescent health

Joanna Mazur

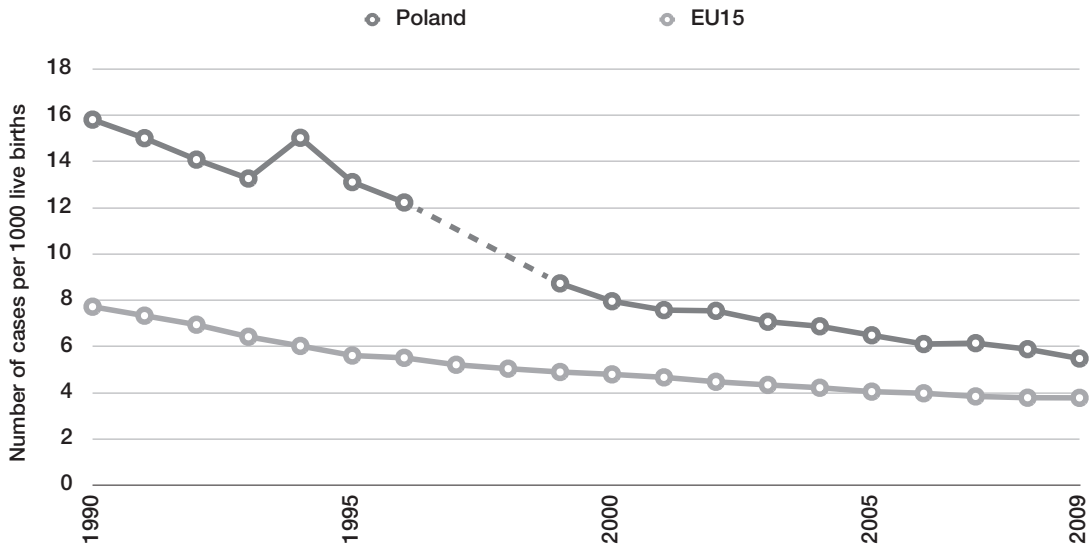
There is still limited access to high-quality data sources which could be used to analyse social determinants of health among children and adolescents in Poland. One prerequisite for undertaking research on health inequalities in this age group is the conviction that population health status may be influenced by socioeconomic circumstances prevailing at an early stage of life. Entities responsible for devising health policy and managing health programmes should make use of analyses of health inequalities in children and adolescents in order to plan, implement and monitor intervention programmes which will be coherent with the previously elaborated national strategy. This chapter contains references to various data available in the social and regional breakdown, which include mortality statistics and the results of regularly repeated studies, such as the Health Behaviour in School-aged Children (HBSC) survey.

3.1 Mortality

3.1.1 Infant mortality

In the years 1990–2009, the infant mortality rate in Poland fell from 19.4 to 5.6 cases per 1000 live births (Fig. 3.1). This falling trend continues, but once a certain level is reached, a further decrease in mortality rates will be increasingly hard to achieve. However, it is still possible to reduce disparities between social groups and regions of the country. Even though infants represent a small proportion of the population at developmental age, the share of infants in death statistics is prevalent. The structure of infant mortality causes is different from that observed in older age groups, with the dominant share of perinatal causes, including disorders resulting from prematurity. Quality of prenatal care and a great many socioeconomic factors beyond this care not only reduce the risk of infant death, but also affect the more general health condition of neonates that survive. According to Barker's theory, adverse influences arising in fetal life as well as in the first year of life may have an important effect on later adult outcomes *(56)*.

Fig. 3.1. Infant mortality in Poland compared to EU15 countries, 1990–2009



Source: WHO Regional Office for Europe *(57)*.

In light of international data from the most recent year available, the infant mortality rate in Poland is higher than that in the EU15 (see Fig. 3.1). The gap between Poland and the EU average infant mortality rates is greater in the case of deaths occurring in the first month (and first week), compared to the deaths of infants older than 28 days.

Based on international comparisons, it seems feasible that infant mortality in Poland could be reduced to under 4 deaths per 1000 live births. Such a low level of infant mortality has already been observed in many European countries and some Polish regions are getting close to that rate.

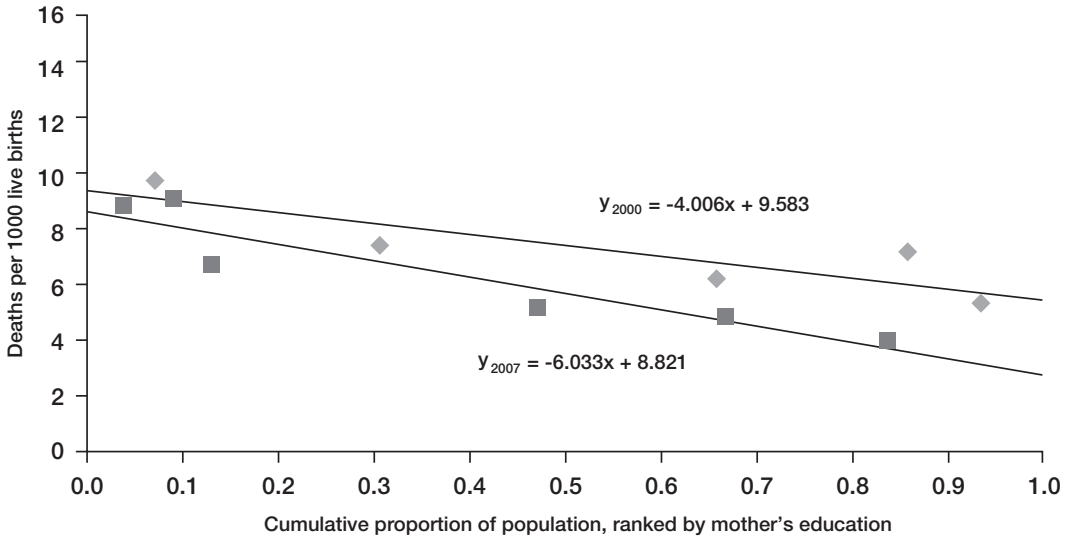
According to the PERISTAT European Perinatal Health Report *(58)*, mortality of prematurely born infants in Poland is still much higher than in western European countries. In that context, it should be analysed to what extent a decrease in early infant mortality is contingent on socioeconomic factors, and to what extent it is related to the quality of perinatal care.

Analysis of infant mortality rate according to the mother's education has shown that in spite of a substantial decline in the overall rate, social inequalities have been on the rise.

In 2000–2007, the level of infant mortality in Poland decreased from 8.11 to 5.99 per 1000 live births. A decline in mortality has been observed in all social groups, defined according to mother's education, but it was proportionally greater among infants born by mothers with higher education. At the same time, the share of women with higher education in the population of women giving birth has more than doubled. Changes in the level of inequalities in health are illustrated in Fig. 3.2, estimated by means of regression method. Regression lines provide an indication of the social gradient, expressed in terms of the estimated difference in mortality between the bottom and the top of the social ladder.

In 2000, the slope inequality index was equal to -4.0, while in 2007 it was -6.0. With the application of regression analysis, one can compare data in spite of changes to maternal education categories within birth statistics, and lower secondary school education was added in the meantime.

Fig. 3.2. Change in mother-education-based slope index of inequality in infant mortality, 2000–2007

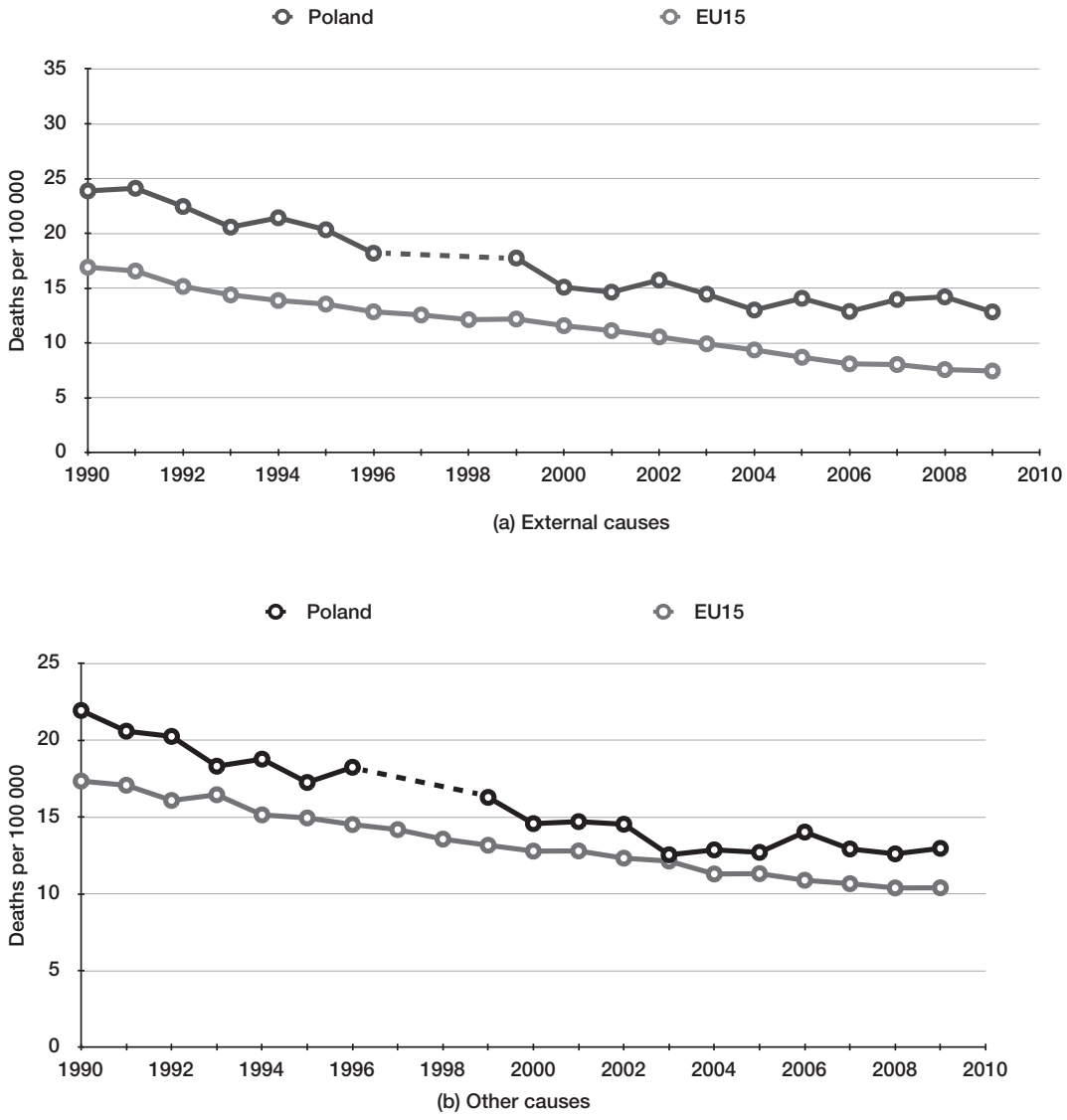


Source: Authors' own calculations based on GUS data *(59)*.

3.1.2 Mortality of children and adolescents aged 1–19 years

At present, there are 2 346 000 deaths of children and adolescents aged 1–19 years annually, which represents 28.9 per 100 000 people. Consistently, mortality among boys is higher than among girls, and the mortality rate in rural areas is greater than that in urban areas. In spite of the decreasing trend, mortality of children and adolescents in Poland remains at a higher level than in most EU countries (position 19 on a ranking list of 27 countries). Poland looks especially unfavourable in specifications describing deaths due to external causes. At present, the gap between Poland and the EU15 average is greater in terms of the rate of death resulting from accidents, poisoning and injury than any other causes (Fig. 3.3).

Fig. 3.3. Mortality among children and adolescents aged 1–19 years related to (a) external and (b) other causes in Poland compared to EU15 countries, 1990–2009



Source: WHO Regional Office for Europe *(60)*.

In the years 1990–2007, the most prominent falling trend was observed in the group aged 1–4 years, in which external causes as a share of total causes of death was smaller. In older age groups the falling trend in mortality observed previously was inhibited after the year 2000. In view of the fact that a major proportion of deaths are accidental deaths, efforts aimed at improving safety surrounding children and adolescents should be intensified. Recent European programmes, such as the Child Safety Action Plan (CSAP) and AdRisk should be considered as the basis for the design and implementation of the national programme for the prevention of injury among children and adolescents. This topic will be discussed in greater detail in a special issue of *Medycyna Wieku Rozwojowego* [*Developmental Age Medicine*], dedicated to the health of children and adolescents *(61)*. The WHO policy briefing released in 2009 indicated that people with low socioeconomic status and those living in more deprived areas are likely to suffer from injuries and are at higher risk of death and disability *(62)*.

3.1.3 Regional disparities in infant, child and adolescent mortality

There are significant disparities in infant mortality within the country. According to the latest report of the Polish Government Population Council (*Rządowa Rada Ludnościowa*) *(63)*, average region rates for the period 2002–2009 fluctuated from 5.05 per 1000 live births in Opolskie to 7.53 per 1000 in Dolnośląskie. As emphasized by the authors of that report, regional differences are a function of local conditions – in particular the differences in the state of the environment, access to health care facilities and social infrastructure status. This topic requires in-depth analyses, distinguishing between neonatal and post-neonatal mortality. Some authors claim that the survival of a newborn with low weight at birth depends predominantly on high quality of care during pregnancy and delivery *(64)*. However, a more recent report based on data relating to all singleton live births in England and Wales in 2005/2006 indicated that the prevalence of preterm birth, low-birth-weight and small-for-gestational-age is rising with increasing levels of deprivation *(65)*.

Table 3.1 presents a comparison of regional mortality rates for children and adolescents aged 0–19 years. Based on the average data for the years 2004–2006, the overall rate for this age group varied between 45.2 per 100 000 lives in Opolskie to 60.1 per 100 000 in Lubuskie. On a national scale, the gap in child and adolescent mortality between urban and rural areas is rather small (52.3 versus 54.3 deaths per 100 000 people aged 0–19 years). Six regions located towards the end of the mortality rate ranking list have particularly high excess mortality of rural residents. However, there are also examples of regions in which child and adolescent deaths are more prevalent in urban areas.

At present, regional data in a more detailed format – by subregions and districts – are also available from the GUS. As far as the child and adolescent populations are concerned, only infant mortality data are available.

Since 1 January 2008 a new division of Poland's territory compliant with the NUTS-3 nomenclature (consistent with the nomenclature obligatory in the EU countries) has been in force, with 66 subregions identified. In future the analysis of regional disparities in infant, child and adolescent mortality are to be based on that system. To date, general data under NUTS-3 are only available for 2007 *(66)*, so it would be difficult to assess the stability of rate values in the 66 subregions. Infant mortality rates varied almost threefold, from the level of 3.30 per 1000 live births (Opolski subregion) to 9.46 per 1000 (Katowicki subregion). There were 19 subregions identified in which the infant mortality rate exceeded 6.60 per 1000 live births (double the minimal level). The percentage of infants born in those regions is 28.3%. In other words, approximately one third of neonates live in the regions in which the probability of surviving the first year of life is more than twice as low as in the most favourable region in the country. Metropolitan regions are protected against high infant mortality, as a result of limited access to highly specialized perinatal medical care. The city of Łódź is an example of this, with its Polish Mother's Memorial Hospital (*Centrum Zdrowia Matki Polki*).

Table 3.1. Deaths of children and adolescents aged 0–19 years by region and place of residence (average from the years 2004–2006)

Region	Population			Number of deaths			Deaths per 100 000		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Opolskie	119 727	119 445	239 172	60	48	108	50.4	39.9	45.2
Małopolskie	349 131	469 742	818 872	164	225	389	47.1	47.8	47.5
Świętokrzyskie	124 853	179 884	304 738	59	89	148	47.3	49.5	48.6
Pomorskie	327 401	222 592	549 993	163	115	278	49.7	51.8	50.5
Łódzkie	332 296	228 601	560 898	165	122	287	49.7	53.5	51.2
Warmińsko-Mazurskie	205 536	166 350	371 886	96	96	193	46.9	57.9	51.8
Mazowieckie	678 306	489 723	1 168 029	329	284	613	48.6	58.0	52.5
Wielkopolskie	432 314	407 224	839 538	233	210	443	53.8	51.6	52.7
Podkarpackie	205 236	352 146	557 383	112	183	295	54.4	52.0	52.9
Śląskie	781 102	248 552	1 029 653	448	111	559	57.3	44.7	54.3
Kujawsko-Pomorskie	285 052	223 698	508 750	140	139	279	49.0	62.3	54.8
Podlaskie	174 350	115 328	289 678	88	72	160	50.5	62.1	55.1
Zachodniopomorskie	253 938	146 439	400 377	143	90	232	56.2	61.2	58.0
Lubelskie	237 503	306 123	543 626	131	186	317	55.3	60.7	58.3
Dolnośląskie	418 931	216 548	635 479	236	137	373	56.4	63.1	58.7
Lubuskie	147 938	98 471	246 409	87	61	148	58.8	61.9	60.1
Total	507 3614	3 990 865	9 064 480	2 654	2 167	4 821	52.3	54.3	53.2

Source: Authors' own calculations based on GUS data.

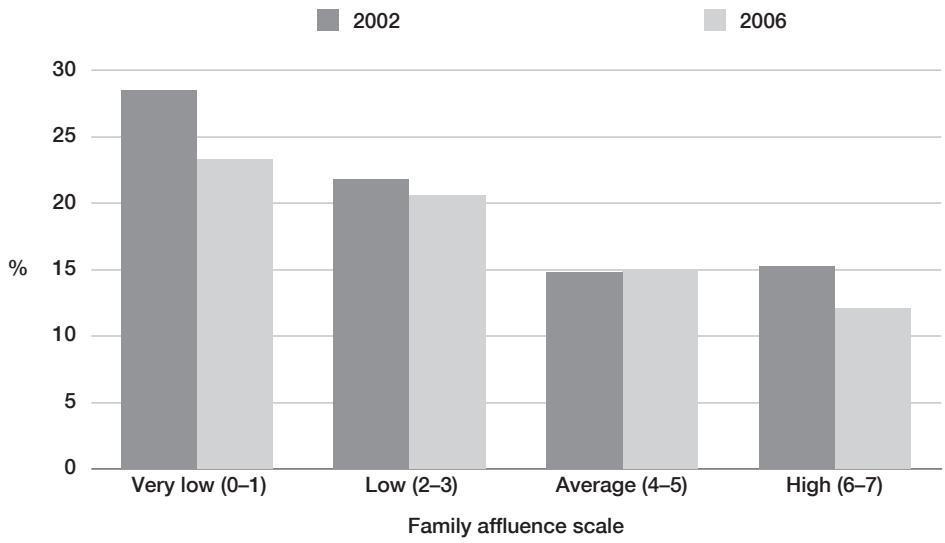
3.2 Subjective health

Mortality rates and cause of death structures, which are usually used in analyses of adult population health, can be used only to a limited extent in the studies relating to children and adolescents. Priority areas, which should be included in the organization of health care, prevention of the most common disorders and also in child and youth health promotion programmes were clearly defined in the *European strategy for child and adolescent health and development* published in 2005 *(67)*. Attention has been drawn to new problems, which should be included in analyses of health inequalities. Considering falling mortality rates, the focus should move to chronically ill children, in whom the effects of disease and poverty can accumulate. In the following subsection, self-rated health is considered as the main outcome variable, recognized as a reliable and valid measure for overall health condition.

3.2.1 Social gradient in self-rated health

According to the HBSC 2006 study, 16.3% of surveyed 15-year-olds in Poland self-rated their health as "poor" or "fair". The percentage of adolescents who evaluate their health as being at a more negative level is significantly higher in poorer families. In the years 2002–2006 the percentage of 15-year-olds who reported a worsening in self-rated health was reduced by 2.6%, but positive change was observed only in the groups with extremely low and extremely high affluence (Fig. 3.4). Over the same period of time, the percentage of 15-year-olds raised in extremely poor families (<2 points on the family affluence scale) fell from 12.6% to 6.7%. The regression method indicates only a small reduction in inequalities in self-rated health: the absolute regression inequality index fell in that period from -15.3 to -13.4.

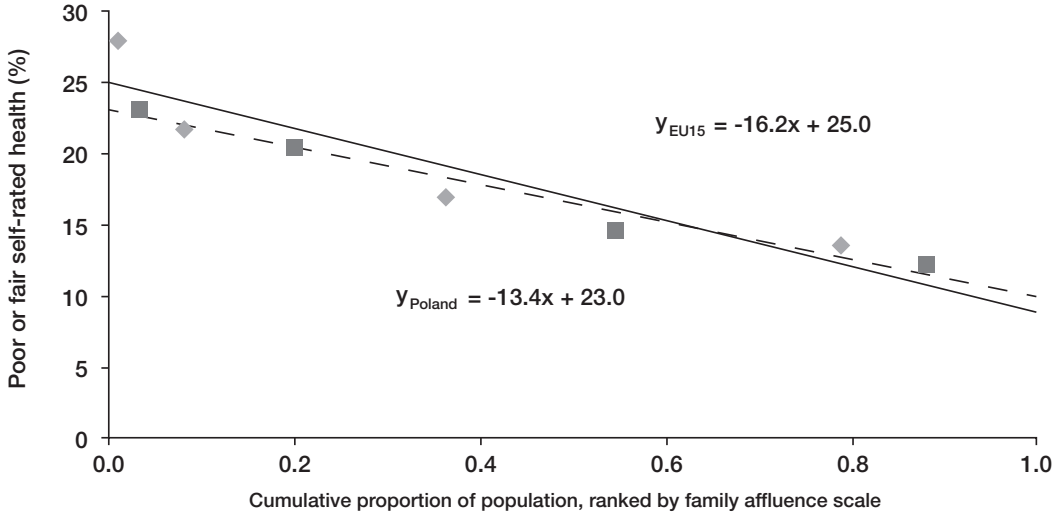
Fig. 3.4. Adolescents aged 15 years (%) reporting "fair" or "poor" self-rated health, 2002 and 2006



Source: Mazur et al. *(68)*.

In addition, the level of inequalities in self-rated health by students in Poland and in EU15 countries was compared, based on HBSC data for 2005/2006. In the population of 15-year-olds, the percentage of students who self-rate their health as being "poor" or "fair" is almost identical in Poland and in the EU15 (16.3%).The EU15 level of inequalities in self-rated health is actually greater than in Poland. The value of an analogically calculated regression index reached the value of -16.2 in the EU15 countries (see Fig. 3.5).

Fig. 3.5. Family-affluence-based slope index of inequality in self-rated health in Poland and combined sample of EU15 countries

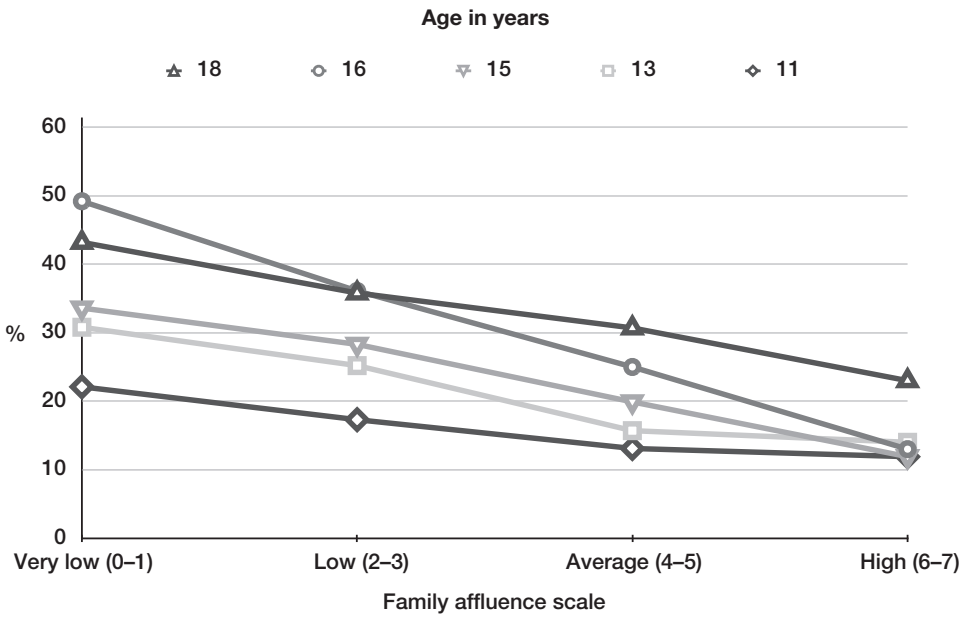


Source: Authors' own calculations based on raw HBSC data.

3.2.2 Changes related to age

In a 2009 publication *(69)*, changes in life satisfaction of adolescent students aged 11–18 were examined, based on the information from HBSC studies carried out in 2006 on a group of students aged 11–15, and similar studies conducted in the IMiD in 2007 on a group of students aged 16–18. The presence of a strong social gradient was demonstrated; that is, worsening of life satisfaction scores together with the deterioration of family affluence. The strength of the association is different in different age categories. The strongest gradient can be observed in the 3rd grade of primary school and in the 1st grade of lower secondary school (Fig. 3.6). This indicates the need to reinforce the system supporting the youth during the critical period as they move on to the next level of education.

Fig. 3.6. Adolescents dissatisfied with their lives, by age and family affluence



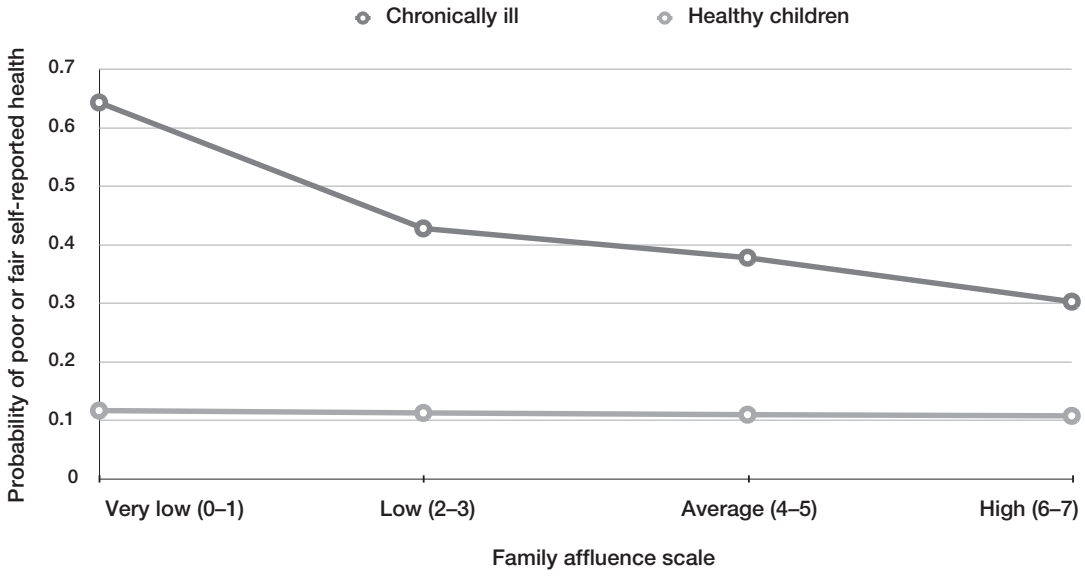
Source: Mazur et al. *(69)*.

Presented research is related to the long-standing discussion on the presence or absence of inequalities in health during the period of adolescence, which was triggered by the study of P. West, with his equalization theory *(70)*. If we assume that satisfaction with life (quality of life) should be regarded as the measure of broadly defined health, combining the elements of physical and psychosocial health, we will notice that in Poland equalization can be observed only among primary school students, that is, up to 11–12 years of age. The time of primary school education and transfer to secondary school are accompanied by a sharp increase in the level of inequalities in health.

3.2.3 Subjective health of chronically ill adolescents

In recent years research has been undertaken with the focus on chronically ill children and adolescents, in the context of socioeconomic factors. It was demonstrated that the financial status of the family has a minor impact on the prevalence of chronic diseases in the population of adolescent students. At the same time, however, it was determined that social gradient of self-rated health is stronger in a group of chronically ill children, as compared to their healthy peers (Fig. 3.7).

Fig. 3.7. Probability of "fair" or "poor" self-rated health in relation to chronic disease status and family affluence



Source: Mazur *(72)*.

3.2.4 Multi-factor determinants

In many of the studies already mentioned, the analysis of the impact of social factors on health and lifestyle of children and adolescents goes beyond analysis of the socioeconomic status of the family and impact of the place of living (urban/rural). The HBSC survey questionnaire includes one scale that measures social capital characterized by norms of trust and reciprocity in the community and another scale that measures intensity of local problems at the place of living (for example, poor sanitary conditions in the neighbourhood, or groups of troubled youths). The first scale was used for the first time in 2010, while the other one was described in great detail on the basis of the previous Polish HBSC surveys. In the research into the impact of place of living on the subjective health of adolescents, a group of students was defined with at least one problem in the area of subjective health (poorer self-rated health, dissatisfaction with life according to Cantril Scale, and recurring subjective complaints) *(71)*. It was determined that the high level of local problems in the neighbourhood is a stronger predictor of worsening subjective health than family poverty. School problems, poor communication with parents and lack of peer support appeared to be other important predictors of poor subjective health. This indicates that inequalities in health should be analysed in the broader context of proximal and distal social determinants.

3.3 Efforts aiming to reduce inequalities in health among children and adolescents

3.3.1 Reducing the scale and consequences of poverty

Efforts intended to combat poverty and counteract social exclusion among children and adolescents include: the state social welfare system; diverse social programmes; other broader based programmes counteracting social exclusion; and sustainable regional development programmes.

State social welfare programmes include, to date:

- a system of family benefits for families within certain income thresholds;
- financial allowances and housing allowances distributed within the framework of social assistance;
- state programme of nutritional aid;
- scholarship system;
- tax allowances for families with children;
- further government efforts, for example, in the National Action Plan for Social Inclusion (*Krajowy Plan Działań na rzecz Integracji Społecznej*).

3.3.2 Improvements in medical care

In Poland the standards of medical care have been developed and implemented for years, including in preventive care for children and the youth across various age groups. The programmes concerned are universal in coverage, that is, they should reach out to all families. However, more attention should be paid to children with special health care needs. Among recent efforts, the following should be mentioned: roll-out of the Perinatal Care Improvement Program; implementation of preventive care for pupils; and a recently initiated project for the design of new standards for care of infants and young children *(73)*.

3.3.3 Friendly environment

Efforts in this field have been initiated in schools and local communities and they may be targeted at children, parents or families. The following initiatives – described elsewhere – are carried out:

- Schools for Health in Europe Network (SHE) – formerly the Health Promoting Schools programme;
- programmes for the construction of widely accessible, multi-functional sports and recreation facilities in each municipality *(74)*;
- a programme called "Invisible children" (*Niewidzialne dzieci*), rolled out as a pilot scheme by the Dzieci Niczyje Foundation and modelled upon a United Kingdom programme called "Sure Start", targeted at small children from rural areas in Poland.

3.4 Final remarks

3.4.1 Methodological aspects

Conclusions from the analysis of health inequalities among children and adolescents are contingent on the measures of health and social status applied, and on the method of analysis. In the future, a set of indicators should be designed – and such analytical methods applied – that are practical and most favourable from the standpoint of the evaluation of the intervention effort planned.

The significance of traditional analyses, based on death statistics, will remain in force for many years to come in view of continued, substantial disparities across the country and the gap between Poland and the more developed EU countries. Nevertheless, mortality data should be supplemented with other information pertaining to important health issues within the population of children and adolescents.

Provision of adequate health care, developing early intervention programmes and improving living conditions for chronically ill and disabled children represent a particular challenge in this day and age. While the category of children with special educational needs is featured within the educational system,

children with special medical needs are discussed less frequently in Poland. These are children who – because of their diseases and inherent or acquired dysfunctions – require medical assistance on a greater scale than their peers. Unequal access to medical treatment and rehabilitation, which stems from lower socioeconomic status and living in a less favourable area, should be considered an explicit sign of social injustice. From a wider perspective, poor children with serious chronic diseases and disabilities are at risk from social exclusion. A rise in the problem of chronic diseases in children should be anticipated, also because of falling infant mortality rates and increasing LE with regard to diseases that previously resulted in high mortality rates.

When discussing social determinants of health and lifestyle of children and adolescents, a broader environmental assessment of adolescence should be taken into consideration, rather than only economic conditions and simple urban/rural classification. Friendly school and household environments, alongside social support, as well as strengthening one's personal competencies and skills, may help to offset the negative consequences of growing up in less favourable conditions. Traditional urban/rural comparisons should be gradually supplemented with analyses that focus on real problems observed in the neighbourhood or on the development of social capital.

3.4.2 Research findings

By means of repeated surveys (such as HBSC) it is possible to keep track of changes in the scope of a number of indicators describing health and lifestyle of adolescent students, both in total and classified according to social groups. In their current form, however, such surveys do not provide indicators at the regional and local (district) levels, although they do lend themselves to the evaluation of local environment, understood as a "school form" and a school itself.

Improvement in the overall indicator does not always bring about a decrease in social inequalities in health. Interestingly, inequalities in health affect poor countries to the same extent as affluent ones. In fact, the social gradient may even be stronger in a prosperous country, while the actual percentage of the population suffering from poverty is greater in poorer countries.

In terms of many indicators pertaining to subjective health, Poland is no different from the EU15 countries, both with regard to the overall indicator, as well as indicators that characterize particular social groups. That said, the percentage of poor families in Poland is much greater than in western Europe.

3.4.3 Intervention programmes

One could provide examples of many programmes implemented at central, regional and local levels, with significant involvement of NGOs. It would be difficult to ascertain, however, which programmes were evaluated, and whether the programmes were assessed from the standpoint of effectiveness in various social groups.

Several highly developed countries started implementing comprehensive strategies aimed at improving living conditions and development opportunities for the young generation(s). The focus should be on lessons learnt from their example, especially in the countries which have managed compelling achievements in the field of reducing inequalities in the health of children and adolescents.

Efforts should be made to increase the economic security of families with small children, since numerous studies have identified a link between low economic status and the occurrence of diseases and developmental disorders at every development stage. Appropriate services (medical and educational) should be provided at the basic level, that is, should be readily available in the area of living. As a priority, they should be developed in neglected regions and should be directed at social groups which need them the most. The examples of programmes which proved to be efficient, and which were implemented in

other countries as a way of combating the effects of social inequalities, include the system of assistance for families combined with parent education; that is, providing knowledge on the developmental needs of children, along with guidelines on how those needs can be fulfilled. Comprehensive programmes of assisting development in the early years of children's lives as well as providing equal access to medical services and education at various life stages are also considered to be effective steps.

Health inequalities levelling programmes should prevent the transfer of inequalities between generations and within the life-cycle of one generation. Although programmes aimed at small children are considered to be the most effective, development opportunities for children from less privileged backgrounds should be seized during the period of school education. Intersectoral cooperation is the precondition for implementing programmes which support the development of children and young people, in particular among the Ministry of Health, Ministry of National Education and Ministry of Labour and Social Policy.

4. Regional and social differences in health status of the adult Polish population, 2005–2007

Bogdan Wojtyniak, Jakub Stokwiszewski

Social causes of inequalities in health status of the population are currently among the most important public health issues in European countries. The purpose of this chapter is to assess the extent of disparities in health status, measured primarily by exposure to the risk of death in adults within Polish society, according to gender, urban or rural place of residence, region of residence, and education level. The introductory section presents differences in the health status of adult Poles compared to the situation observed in EU15 countries. The majority of outcomes are derived from authors' calculations, but the authors also relied on data published by the GUS and data available from international databases, such as the WHO Regional Office for Europe European Health for All database (January 2010) *(26)* and the European Mortality Database (January 2010) *(75)*; from Eurostat *(6)*; and from the EU-funded project European Health Expectancy Monitoring Unit (EHEMU) *(76)*. Death rates for men and women, urban and rural residents, and residents by region were standardized according to age directly, with the so-called European age structure – identical for men and women – used as a standard. This age structure is used by the WHO Regional Office for Europe, among others. The number of deaths that could be avoided in Poland was calculated based on the assumption that the mortality level for men and women in every region is the same as in the region in which it is the lowest, separately in urban and in rural areas.

4.1 Health status of the Polish population compared to EU15 residents

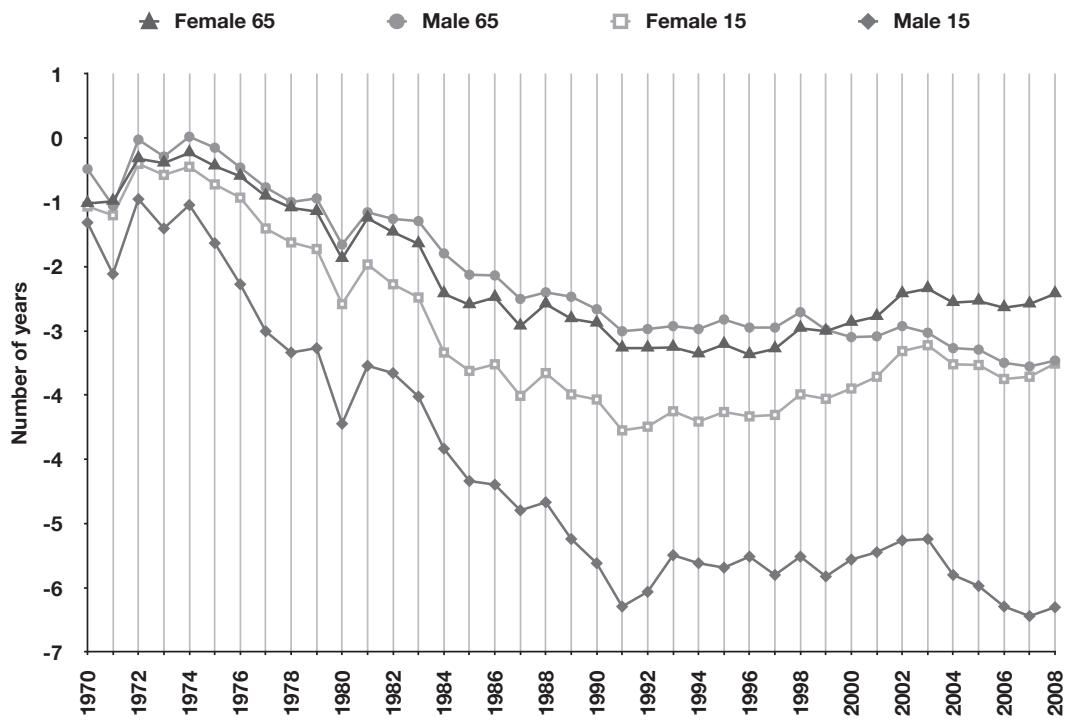
The health status of adult residents of Poland is worse than the average in the EU, especially in the EU15 countries, which have higher levels of economic development. In 2008, men aged 25 years living in the EU15 could expect, on average, 53.5 more years of life; Poles of the same age could expect to live for another 47.4 years on average (that is, a shorter lifespan by over six years). In the case of women, the gap was smaller and amounted to a difference of three years (58.9 compared to 55.8 years). It is worth noting that the unfavourable gap in LE between adult residents of Poland and those living in the EU15 is narrowing at a very slow pace, especially in the case of men, for whom in recent years the gap was actually growing, while in women it has stopped getting narrower (Fig. 4.1).

According to the EU EHEMU project estimations, based on the results of the EU-SILC survey carried out in Poland by the GUS on a random sample of the Polish population, healthy life expectancy (HLE) (that is, without activity limitation due to health problems) for people aged 25 years was equal in 2008 to 38.9 years for women (70% of their LE) and 35.2 years for men (74% of LE). This life-span for Polish men was shorter than the EU15 average (38.2 years) by 3.0 years, while for Polish women it was longer than the EU15 average (38.8 years) by 0.1 year.

Shorter LE of Polish residents compared to EU15 residents results from greater mortality from the main causes of death. As Fig. 4.2 shows, such excess mortality applies especially to the population in the age range of occupational activity, that is, 25–64 years. In Poland, male mortality in that age category is twice as high, and female mortality is as high again as half the average in EU15 countries. This is observed primarily in the case of deaths caused by CVD (mortality among Polish men is higher by more than two and a half times, and among Polish women by more than twice), as well as deaths from external causes (mortality among Polish men is higher by two and a half times) and digestive system diseases.

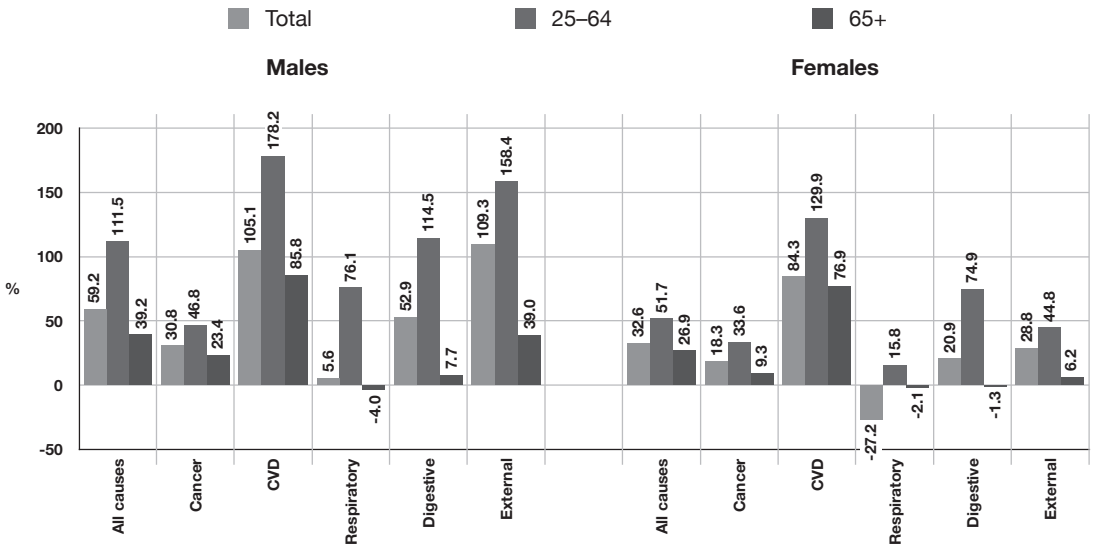
In the sections that follow, this unfavourable mortality situation for the adult Polish population is described in relation to the region of residence, taking into account the urban or rural character of the area in which they live. Analysis was carried out separately for three age groups: 25–44 years, 45–64 years, and 65 years and over, and the 3-year period from 2005 to 2007, taking into account the most common causes of death.

Fig. 4.1. Differences in LE at ages 15 and 65 years in Poland and average for EU15 countries by gender, 1970–2008



Source: Authors' own calculations based on data from WHO Regional Office for Europe European Health for All database *(26)*.

Fig. 4.2. Excess mortality in Poland in relation to average level for EU15 countries, as a whole and for age groups 25–64 and 65 years and over by main causes of death, 2008



Source: Authors' own calculations based on data from WHO Regional Office for Europe European Health for All Mortality database *(76)*.

4.2 Mortality of the Polish population aged 25–44 years

In the years 2005–2007, a total of 50 271 people aged 25–44 years died in Poland, which represented 4.5% of the total population of deceased Poles. Men represented 77% of the deceased.

Table 4.1 presents age-SDRs for residents of particular regions, broken down according to rural and urban residents. The overall male mortality rate was 3.3 times higher than the female mortality rate. Excess in male mortality versus female mortality was greater in rural areas (with the male death rate 3.9 times higher) than in urban areas (3.0 times higher). There were relatively minor discrepancies in mortality between rural and urban residents: the male death rate in the cities was 10% lower than in the countryside, but in the case of women the risk of death for females living in urban environments was 18% greater than that for women living in rural areas.

By far the worst situation and the highest mortality rate in this age category was observed in the Łódzkie region – the male death rate was 45% higher than the national rate, and the female death rate was higher by one third. It should also be noted that the risk of death for female urban residents in that region was 47% higher than the national average for women, whereas in the case of women living in rural areas in that region the risk was greater by only 5%.

As far as men are concerned, a very bleak picture could be observed in rural areas of the Warmińsko-Mazurskie region, where the male mortality rate was 38% higher than the national male mortality rate in Poland. Among women, higher risk of death could be observed in the case of female residents in the cities of the Śląskie and Dolnośląskie regions – it was higher than the national rate by 23% and 17%, respectively. The gap between death rates in the least favourable region (Łódzkie) and the most favourable one (Opolskie for men and Podkarpackie for women) was more or less double.

If we were to assume that the male and female mortality rate for the population aged 25–44 years in all Polish regions was at the lowest possible level (that is, the one reported in the most favourable region in Poland in 2005–2007), each year there would be 4600 fewer deaths (28% of deaths in this age group).

4.2.1 Malignant neoplasms

Malignant neoplasms account for 15.7% of deaths of people aged 25–44 years, but in the case of women the level is as high as 35%, while in the case of men it represents only 10%. In spite of substantial differences in the share of deaths caused by cancer in male and female mortality patterns, the level of risk of death due to cancer is very similar in both gender categories (Table 4.2). At national level, the difference in mortality resulting from cancer between urban and rural residents is insignificant.

The highest mortality rate due to cancer in this age group can be observed in the Kujawsko-Pomorskie region – for men and women alike, it is higher than the national rate by more than one fifth, and excess mortality is slightly higher in urban than in rural areas. Dolnośląskie is another region in an unfavourable situation, similar to Wielkopolskie in terms of rural residents. The gap in mortality between the least favourable and the most favourable regions (Lubelskie for men and Podkarpackie for women) is equal to approximately 50%. If mortality was reduced to the lowest possible level observed in Poland, the number of people dying due to cancer during a year would decrease by approximately 600 people (24% of cancer deaths in this age group).

Table 4.1. Age-standardized mortality rates of Polish citizens aged 25–44 years, all causes of death, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	162.2	247.2	75.8	157.8	237.4	80.4	169.5	262.6	68.2
Dolnośląskie	174.4	261.9	86.0	174.1	260.4	89.0	176.0	266.4	78.8
Kujawsko-Pomorskie	166.4	254.8	78.1	159.9	245.3	78.4	177.1	269.9	77.7
Lubelskie	180.5	284.1	72.5	166.5	261.7	75.6	193.5	303.5	69.5
Lubuskie	167.3	251.4	81.5	157.1	235.2	80.0	185.5	278.9	84.6
Łódzkie	230.1	358.1	100.8	230.2	354.7	111.5	230.1	364.5	79.7
Małopolskie	127.6	195.2	58.4	122.7	185.1	61.8	132.5	205.3	55.0
Mazowieckie	164.9	257.7	71.6	148.3	227.3	72.6	196.9	311.9	69.9
Opolskie	119.0	174.4	62.3	127.0	184.3	70.5	110.7	164.2	53.7
Podkarpackie	126.8	194.3	56.7	121.3	183.3	61.8	130.6	201.3	53.2
Podlaskie	164.1	261.7	62.9	146.0	236.0	60.4	193.8	299.5	67.6
Pomorskie	144.0	212.6	74.3	143.2	209.2	78.0	146.1	220.3	67.1
Śląskie	164.6	242.2	86.3	171.7	250.1	93.2	140.0	215.8	61.8
Świętokrzyskie	170.9	271.4	64.9	158.5	247.8	71.6	181.4	290.9	58.8
Warmińsko-Mazurskie	183.4	283.3	80.8	157.4	241.1	76.9	222.3	342.2	86.9
Wielkopolskie	147.8	219.0	76.2	136.7	198.8	77.0	162.4	244.7	75.0
Zachodniopomorskie	165.1	245.4	83.1	155.9	228.5	84.1	185.4	281.1	80.9

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

4.2.2 CVD

CVDs account for 16.2% of deaths of people aged 25–44 years, and the share for men and women is very similar (16.5% and 15.1%, respectively). Yet, the male mortality rate was 3.6 times higher than the female one (see Table 4.3). On a national scale, the difference in mortality between urban and rural residents is not very high – in the case of men, the risk of death for city dwellers is approximately 10% lower than that for rural residents, and in the case of women the opposite is true.

Without doubt the worst situation and the highest mortality rate due to CVDs in this age group can be observed in the Łódzkie region – for men, it is 34% higher than the national rate, and for women it is 40% higher; however, the mortality rate of women living in urban areas is greater than the national average

Table 4.2. Age-standardized mortality rates from cancer of the Polish population aged 25–44 years, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	25.8	25.1	26.6	25.7	24.6	26.8	26.0	25.7	26.3
Dolnośląskie	29.5	29.5	29.3	29.1	29.1	29.0	30.5	30.7	30.3
Kujawsko-Pomorskie	31.3	30.4	32.2	31.8	30.7	32.9	30.6	30.1	31.1
Lubelskie	21.6	19.7	23.6	21.7	20.1	23.3	21.5	19.4	23.9
Lubuskie	24.8	22.1	27.6	21.6	20.0	23.2	30.2	25.3	35.5
Łódzkie	26.6	25.6	27.5	25.8	24.3	27.1	28.0	27.8	28.1
Małopolskie	22.3	22.3	22.3	22.1	22.0	22.2	22.5	22.6	22.5
Mazowieckie	24.1	22.6	25.6	23.6	21.7	25.3	25.2	24.3	26.0
Opolskie	22.0	22.4	21.6	23.0	24.5	21.5	20.9	20.1	21.8
Podkarpackie	21.2	21.6	20.9	20.1	19.6	20.7	22.0	22.8	21.1
Podlaskie	25.4	25.0	25.8	24.7	23.8	25.5	26.6	26.7	26.4
Pomorskie	27.9	28.4	27.4	28.2	27.7	28.8	27.0	29.3	24.6
Śląskie	28.3	27.7	28.8	29.1	27.7	30.4	25.3	27.5	23.1
Świętokrzyskie	24.8	26.6	22.9	22.8	21.7	23.8	26.5	30.5	22.2
Warmińsko-Mazurskie	24.6	22.8	26.4	24.1	23.1	25.0	25.3	22.1	28.8
Wielkopolskie	27.9	26.0	29.8	25.4	23.0	27.6	31.0	29.6	32.6
Zachodniopomorskie	27.1	25.3	29.0	26.2	25.0	27.4	29.1	25.8	32.7

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

by as much as nearly 60%, while for female residents of rural areas the death rate is higher by only 4%. The Świętokrzyskie region also reports unfavourable mortality rates due to CVD, especially among men, and in the Podlaskie region the risk of death for men living in rural areas is 1.5 times greater compared to the national rate. The gap between the death rates in the least and the most favourable regions (Opolskie for men and Podlaskie for women) is more or less double.

If mortality was reduced to the lowest possible level observed in Poland, the number of people aged 25–44 years dying due to CVD during a year would decrease by approximately 900 people (34% of CVD deaths in this age group).

Table 4.3. Age-standardized mortality rates from CVD of the Polish population aged 25–44 years, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	26.8	41.9	11.6	25.5	39.4	12.0	29.0	45.6	11.0
Dolnośląskie	28.9	46.6	11.2	27.6	44.7	11.0	32.1	50.8	12.0
Kujawsko-Pomorskie	27.3	42.3	12.3	26.8	42.0	12.5	28.0	43.0	11.9
Lubelskie	23.4	37.5	8.8	20.1	33.0	8.1	26.4	41.2	9.6
Lubuskie	27.4	41.7	12.8	27.5	39.8	15.5	27.1	44.9	7.9
Łódzkie	36.3	56.3	16.2	33.6	49.9	18.3	41.1	66.9	12.0
Małopolskie	21.4	32.9	9.5	19.2	30.5	8.3	23.5	35.3	10.8
Mazowieckie	24.5	39.3	9.6	20.3	32.1	9.0	32.1	51.4	10.7
Opolskie	21.1	30.7	11.2	21.0	28.3	13.8	21.1	32.6	8.4
Podkarpackie	23.4	35.9	10.6	24.1	36.4	12.6	23.1	35.8	9.2
Podlaskie	28.6	49.0	7.5	21.9	39.3	5.6	39.4	62.8	11.2
Pomorskie	28.9	45.2	12.3	28.1	45.0	11.4	30.5	45.7	14.2
Śląskie	28.5	43.7	13.1	28.9	44.0	14.0	26.8	42.8	10.2
Świętokrzyskie	33.4	53.7	12.0	31.7	50.1	14.1	34.7	56.7	10.0
Warmińsko-Mazurskie	22.5	34.2	10.6	18.1	26.7	10.0	29.0	44.5	11.6
Wielkopolskie	27.3	41.7	12.9	27.4	41.5	13.9	27.3	42.1	11.5
Zachodniopomorskie	28.6	42.7	14.3	26.0	38.6	13.7	34.1	51.1	15.5

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

4.2.3 External causes

External causes are the most common cause of death of Polish residents aged 25–44 years, accounting for 36.5% of deaths (41% among males and 21% among females). During the period included in the analysis, male mortality was more than six times higher than the female mortality rate, and in rural areas it was eight times as high (see Table 4.4).

There is a substantial gap in mortality from external causes between urban and rural residents, both at national and regional levels, but it is different for women and men. In the case of men, rural residents have a higher risk of death (by one fifth), while in the case of women the opposite is true.

Table 4.4. Age-standardized mortality rates from external causes of the Polish population aged 25–44 years, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	57.8	99.1	15.7	51.3	86.5	16.8	68.3	118.6	13.8
Dolnośląskie	59.1	99.7	17.9	56.7	94.1	19.7	65.2	113.5	13.4
Kujawsko-Pomorskie	62.9	110.6	15.0	54.8	96.2	15.0	75.7	132.6	15.0
Lubelskie	46.9	81.5	10.7	33.7	57.3	10.7	59.2	102.3	10.7
Lubuskie	66.1	114.5	16.6	57.2	98.2	16.7	81.8	142.1	16.5
Łódzkie	76.4	132.0	20.1	67.3	114.8	21.6	93.4	161.8	17.2
Małopolskie	47.4	83.6	10.4	40.3	69.0	12.2	54.2	97.1	8.6
Mazowieckie	58.8	101.9	15.3	47.0	79.7	15.6	81.4	141.9	14.8
Opolskie	42.0	69.7	13.8	43.2	71.2	15.5	40.9	68.4	12.0
Podkarpackie	47.1	81.2	11.7	40.2	68.9	12.3	51.7	88.7	11.4
Podlaskie	63.0	111.5	12.6	52.6	94.8	12.2	80.4	136.8	13.4
Pomorskie	53.7	88.6	18.3	50.6	81.9	19.7	60.0	101.9	15.4
Śląskie	54.3	91.2	17.0	54.8	91.2	18.2	52.8	91.6	12.8
Świętokrzyskie	65.8	114.2	14.6	51.6	87.8	16.0	77.9	135.6	13.3
Warmińsko-Mazurskie	77.2	132.1	20.6	59.8	102.1	18.9	103.5	174.7	23.2
Wielkopolskie	55.6	93.9	17.0	45.3	74.5	17.0	69.0	118.2	16.9
Zachodniopomorskie	66.4	112.9	18.7	60.2	99.9	20.6	80.1	140.3	14.4

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

The worst situation and the highest mortality rate due to external causes in this age group can be observed in the Warmińsko-Mazurskie and Łódzkie regions – it is one-third higher than the national rate, and excess mortality is slightly greater in the case of men than in women. In the Łódzkie region there is high risk of death from external causes in both rural and urban areas, while in Warmińsko-Mazurskie the rural residents are in a particularly life-threatening situation. The gap between mortality rate in the two worst regions and the best one (Opolskie for men and Małopolskie for women) is approximately double.

If mortality was reduced to the lowest possible level observed in Poland, the number of people aged 25–44 years dying from external causes over the course of a year would decrease by approximately 2300 people (37%).

4.2.4 Diseases of the digestive system

Diseases of the digestive system account for 8.4% of deaths of people aged 25–44 years, with a very similar share for men (8.4%) and women (8.2%). However, the male mortality rate in urban areas was 3.1 times higher than the rate for females, and in rural areas it was 4.7 times higher (see Table 4.5). There is a clear gap in mortality between urban and rural residents – in the case of men, risk of death for urban residents is higher by half than for rural ones, and in the case of women it is more than twice as high.

Table 4.5. Age-standardized mortality rates from digestive diseases of the Polish population aged 25–44 years, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	13.8	21.2	6.3	16.1	24.5	8.0	10.2	16.4	3.5
Dolnośląskie	18.6	27.3	9.9	20.6	29.8	11.7	14.0	21.8	5.6
Kujawsko-Pomorskie	10.7	17.3	4.2	12.1	20.8	3.9	8.7	12.4	4.8
Lubelskie	12.8	20.7	4.6	15.0	22.6	7.6	10.8	18.9	1.6
Lubuskie	11.2	15.7	6.6	12.0	16.4	7.5	9.9	14.6	4.9
Łódzkie	25.6	39.4	11.7	30.3	46.6	14.7	17.1	27.3	5.8
Małopolskie	9.6	14.3	4.9	11.3	15.9	6.8	8.0	12.8	2.9
Mazowieckie	14.0	22.5	5.4	14.6	23.6	6.0	12.9	20.8	4.2
Opolskie	9.0	13.7	4.1	9.6	14.0	5.3	8.3	13.3	2.8
Podkarpackie	10.4	16.9	3.6	12.5	19.8	5.6	8.9	15.0	2.2
Podlaskie	13.1	21.3	4.6	15.0	25.1	5.5	9.9	15.7	3.0
Pomorskie	11.7	17.2	6.2	14.4	20.6	8.2	6.8	11.2	2.1
Śląskie	17.5	25.7	9.1	19.6	28.6	10.6	9.8	15.9	3.6
Świętokrzyskie	10.3	17.5	2.8	13.8	24.8	3.2	7.4	11.9	2.4
Warmińsko-Mazurskie	11.9	17.9	5.8	13.3	20.5	6.5	9.8	14.3	4.6
Wielkopolskie	11.7	18.2	5.2	13.6	20.8	6.7	9.4	15.3	3.1
Zachodniopomorskie	11.5	16.9	6.0	12.5	18.0	7.1	9.4	14.8	3.5

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

The highest death rate (and therefore the worst situation) due to digestive system diseases in this age group can be observed in the Łódzkie region – for men and women alike, it is approximately 85% higher than the national rate, and excess mortality among urban residents is slightly greater than that for rural residents. An unfavourable situation can also be observed in the Dolnośląskie and Śląskie regions, although as regards the latter this applies to urban areas only. The gap in mortality rate between the least favourable and the most favourable regions (Opolskie for men and Świętokrzyskie for women) is almost threefold in the case of men and more than fourfold in the case of women.

If mortality was reduced to the lowest possible level observed in Poland, the number of people aged 25–44 years dying due to digestive system diseases over the period of a year would decrease by approximately 600 people (43%).

4.3 Mortality of the Polish population aged 45–64 years

In the years 2005–2007, 268 217 people aged 45–64 years died in Poland, which represented 24.1% of the total population of deceased Poles. Men represented a significant majority of the deceased, that is, 71%. Table 4.6 presents age-SDRs for residents of particular regions, broken down into rural and urban residents. The overall male mortality rate was 2.66 times higher than the female mortality rate. Slightly greater excess in male mortality versus female mortality was observed in rural areas (the male mortality rate was 3.5 times higher) than in the cities (where the rate was 3.0 times as high). There were relatively minor discrepancies in mortality between rural and urban residents: male mortality in the cities and towns was 3% lower than in the countryside, but the risk of death for females in urban areas was 16% greater than that for women living in rural areas.

Table 4.6. Age-standardized mortality rates of the Polish population aged 45–64 years, all causes of death, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	925.3	1 379.1	518.8	919.4	1 364.6	542.8	937.1	1 405.8	468.0
Dolnośląskie	959.3	1 407.0	559.9	943.1	1 390.2	563.4	1 008.9	1 455.8	550.3
Kujawsko-Pomorskie	951.6	1 387.5	565.8	931.0	1 360.8	574.8	991.3	1 435.8	545.8
Lubelskie	923.8	1 457.7	446.5	859.9	1 338.5	471.4	991.3	1 568.5	419.8
Lubuskie	957.4	1 412.0	545.7	916.9	1 353.0	541.4	1 045.1	1 530.0	557.2
Łódzkie	1 143.1	1 746.5	618.4	1 170.5	1 787.6	666.3	1 083.0	1 663.6	501.1
Małopolskie	793.7	1 184.5	441.7	788.6	1 180.2	461.5	801.3	1 192.5	414.9
Mazowieckie	897.6	1 363.6	491.6	863.4	1 293.9	511.8	974.5	1 504.6	441.7
Opolskie	842.6	1 235.3	481.5	835.0	1 230.7	493.2	853.8	1 242.8	463.8
Podkarpackie	741.1	1 126.3	388.4	716.3	1 071.7	412.8	763.2	1 169.4	368.3
Podlaskie	877.1	1 361.5	439.6	824.0	1 266.0	457.5	970.8	1 505.4	412.2
Pomorskie	900.0	1 299.3	536.9	880.7	1 272.4	542.1	956.5	1 373.0	523.6
Śląskie	992.7	1 446.2	585.8	1 025.3	1 489.6	616.3	850.5	1 267.0	446.6
Świętokrzyskie	888.2	1 365.5	443.5	841.5	1 284.5	466.1	937.3	1 441.1	417.9
Warmińsko-Mazurskie	999.1	1 494.1	546.7	959.0	1 449.0	538.2	1074.0	1 572.5	565.7
Wielkopolskie	889.9	1 299.5	522.9	869.6	1 271.4	530.9	922.3	1 340.9	509.1
Zachodniopomorskie	942.5	1 375.0	542.2	902.1	1 319.6	532.8	1 057.3	1 521.8	572.6

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

By far the worst situation (determined by the highest mortality rate) within this age category is observed in the Łódzkie region – the male mortality rate is 27% higher and the female mortality rate 19% higher than the national rate, with excess mortality greater in urban than in rural areas. Another region in a slightly less

unfavourable situation is Śląskie, but only with regard to city dwellers. As far as rural residents are concerned, the picture is bleak in the Warmińsko-Mazurskie and Zachodniopomorskie regions, with death rates higher than the national rate by 15% and 13%, respectively. The gap between the mortality rate in the least favourable (Łódzkie) and the most favourable (Podkarpackie) regions is nearly 60%. If we were to assume that male and female mortality rate for the population aged 45–64 years in all Polish regions was at the lowest possible level – that is, as reported in the best region in Poland in 2005–2007 – each year there would be 19 000 fewer deaths (21%).

4.3.1 Malignant neoplasms

Malignant neoplasms are the most common cause of death in the age group 45–64 years, accounting for one in three deaths thereof (34%). However, they cause as much as almost half of all deaths in women (48%), and over a quarter of deaths in men (28%). In spite of such a noticeable difference in the share of cancer deaths in male and female mortality figures, the risk of death due to cancer is 60% higher in men (see Table 4.7). At national level, the difference in mortality between urban and rural residents is not particularly high for men – risk of death for male urban residents is 6% lower than for male rural inhabitants – and for women the opposite is true, with mortality as a result of malignant neoplasms in the cities higher by 19%.

Table 4.7. Age-standardized mortality rates from cancer of the Polish population aged 45–64 years, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	318.0	400.7	246.2	319.6	392.2	259.5	315.0	416.2	217.8
Dolnośląskie	326.0	401.9	260.3	322.6	391.6	265.4	336.0	429.6	243.2
Kujawsko-Pomorskie	356.4	449.4	276.6	352.5	439.3	282.2	363.8	467.9	263.5
Lubelskie	264.2	346.0	193.8	268.4	331.7	218.1	260.4	359.4	167.2
Lubuskie	331.0	417.0	255.2	318.1	391.3	256.1	359.5	470.5	253.7
Łódzkie	334.4	423.6	259.4	337.8	414.5	276.8	327.4	442.3	217.5
Małopolskie	287.9	364.4	221.0	283.1	346.2	231.3	294.3	386.4	206.9
Mazowieckie	307.0	387.0	239.6	302.7	366.8	251.9	316.6	428.7	209.1
Opolskie	310.4	394.2	234.9	312.5	391.5	244.8	307.6	398.8	219.5
Podkarpackie	260.1	334.2	194.5	259.6	321.8	207.2	261.1	344.4	183.8
Podlaskie	289.5	368.6	220.6	287.9	352.5	235.6	294.8	393.1	198.0
Pomorskie	349.4	437.4	270.9	340.2	416.1	275.5	374.9	493.8	254.7
Śląskie	334.2	416.9	261.7	344.8	424.7	276.0	288.1	384.9	196.5
Świętokrzyskie	294.4	383.1	214.3	291.2	361.9	232.1	298.1	403.3	194.2
Warmińsko-Mazurskie	339.5	432.7	256.3	325.1	404.8	257.7	366.7	480.7	254.3
Wielkopolskie	342.6	425.6	270.3	342.9	420.9	278.3	341.8	432.4	255.9
Zachodniopomorskie	332.0	413.4	258.0	321.0	386.5	263.6	363.1	483.5	241.7

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

The worst situation (with the highest mortality due to malignant neoplasms) in this age group can be observed in the Kujawsko-Pomorskie region – for men and women, the level is 12% higher than the national rate. Another region in an unfavourable situation is Pomorskie, alongside Śląskie, in terms of urban residents. In addition, the high death rate reported for men living in rural areas in the Warmińsko-Mazurskie and Zachodniopomorskie regions must not be overlooked. The mortality gap between the least favourable and the most favourable regions (Podkarpackie for men, Lubelskie and Podkarpackie for women) is equal to 34% and 43%, respectively. If mortality was reduced to the lowest possible level observed in Poland, the number of people dying due to cancer over the course of a year would decrease by approximately 5900 (20%).

4.3.2 CVD

CVDs account for 29.8% of all deaths of people aged 45–64 years, and the share for men (31.9%) is higher than that for women (24.8%). The male mortality rate is 3.4 times higher than the female one (see Table 4.8). On a national scale, the difference in mortality between urban and rural residents is insignificant – in the case of men as well as women, the risk of death caused by CVD for urban inhabitants is slightly lower than that for rural residents (5% and 1%, respectively).

Table 4.8. Age-standardized mortality rates from CVD of the Polish population aged 45–64 years, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	279.5	446.7	130.5	271.3	438.6	130.3	295.7	461.3	131.1
Dolnośląskie	312.6	493.9	151.8	301.4	484.5	146.8	346.5	519.1	169.5
Kujawsko-Pomorskie	285.3	439.6	149.1	271.0	424.0	144.4	313.4	468.1	159.1
Lubelskie	266.2	433.3	118.6	240.0	396.2	113.9	293.3	467.9	124.2
Lubuskie	291.5	459.6	139.3	279.0	449.1	132.8	318.4	479.2	154.8
Łódzkie	321.4	517.0	152.8	314.2	508.0	156.9	338.2	535.1	143.0
Małopolskie	246.5	399.5	109.7	236.8	392.8	107.2	259.2	407.8	113.5
Mazowieckie	242.0	393.7	110.8	223.1	364.7	108.0	285.0	452.9	117.8
Opolskie	268.6	428.0	122.9	260.8	419.4	124.6	279.9	439.5	121.0
Podkarpackie	244.6	402.8	100.3	237.0	390.6	105.8	251.3	412.7	95.9
Podlaskie	248.5	417.3	97.5	221.2	373.8	95.4	292.8	479.4	100.7
Pomorskie	262.9	415.2	124.7	255.4	410.6	121.6	285.4	428.9	136.5
Śląskie	325.7	508.3	162.7	331.5	518.8	167.2	300.2	464.2	141.7
Świętokrzyskie	286.8	473.5	113.7	259.5	446.4	101.5	315.3	498.4	127.3
Warmińsko-Mazurskie	260.7	417.7	118.5	243.1	402.4	106.9	294.1	445.1	142.6
Wielkopolskie	275.1	440.7	126.9	264.3	432.9	122.4	292.4	452.2	135.2
Zachodniopomorskie	294.6	460.7	141.3	274.8	441.0	128.0	351.5	514.2	182.2

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

The highest mortality rate due to CVD in this age group can be observed in three regions: Śląskie, Łódzkie and Dolnośląskie, but in the case of Śląskie this is true only of urban residents. Overall excess mortality in those regions is equal to, respectively: 17%, 15% and 12%, and is higher for women than for men. Among rural residents, high mortality is also observed in the Zachodniopomorskie region – the risk of death for female rural residents in that region is almost 40% higher than in the case of all Polish women.

The gap between the mortality rate in the least favourable regions (Łódzkie for men and Śląskie for women) and the most favourable ones (Mazowieckie for men and Podlaskie for women) is equal to 31% and 67%, respectively.

If mortality was reduced to the lowest possible level observed in Poland, the number of people aged 45–64 years dying from CVD over the course of a year would decrease by 4800 (18%).

4.3.3 External causes

External causes account for 1 in 10 deaths of Polish residents aged 45–64 years, and their share is twice as high in male deaths (12.6%) as in female ones (5.7%). During the analysed period, male mortality in the cities was more than five times higher than female mortality, and in rural areas it was seven times higher (see Table 4.9).

There is a significant gap in the mortality rates of urban and rural male residents, both at national and regional levels – rural residents as a whole are at risk of death due to external causes by 30% more than urban residents, and in the Lubelskie region the difference is as high as 80%. In the case of women, differences in mortality between urban and rural female residents are much less conspicuous, and they exist in both directions – in some regions mortality is higher in urban areas, such as in Śląskie and Świętokrzyskie, while in some regions it is higher in rural areas, such as in Mazowieckie and Opolskie.

The worst situation (demonstrated by the highest mortality rate due to external causes) within this age group can be observed in the Łódzkie then region – it is higher than the national rate by almost 30%, and excess mortality is slightly greater in the case of men than women. In principle, it is only in the Łódzkie region that high risk of death applies to both men and women, across both rural and urban residents. In the Śląskie region, a high death rate is observed, especially among men, as well as in the Podlaskie region among men who live in rural areas (with a death rate – similar to the Łódzkie region – approximately 60% higher than the overall male death rate in that age group in Poland).

The mortality gap between the least favourable region (Łódzkie) and the most favourable ones (Podkarpackie for men and Lubelskie for women) is equivalent to (for men and women, respectively) 60% and 100%.

If mortality was reduced to the lowest possible level observed in Poland, the number of people aged 45–64 years dying due to external causes over the course of a year would decrease by approximately 2800 (29%).

4.3.4 Diseases of the digestive system

Diseases of the digestive system account for 6.9% of deaths of people aged 45–64, with a similar share for men (7.2%) and women (6.2%). The mortality rate for men living in the cities was 2.9 times higher than for women, and in the case of men living in the countryside, it was 3.8 times higher (see Table 4.10). There is a noticeable gap between the mortality rates of urban and rural residents – in the case of men living in the cities, the risk of death is (on average) higher by one third than that observed in the case of men living in rural areas (in the Łódzkie and Śląskie regions, as much as 60% higher), and in the case of women almost 80% higher (in Świętokrzyskie and Śląskie, more than twice as high).

Table 4.9. Age-standardized mortality rates from external causes of the Polish population aged 45–64 years, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	93.7	164.3	28.9	84.6	148.4	29.7	111.2	192.1	27.1
Dolnośląskie	95.5	164.5	32.5	90.0	156.2	32.5	111.8	186.9	32.6
Kujawsko-Pomorskie	87.3	154.1	26.4	77.0	136.2	26.8	106.9	184.8	25.6
Lubelskie	78.8	144.7	18.0	55.6	101.8	17.6	102.8	184.1	18.4
Lubuskie	94.4	161.7	32.0	86.9	149.9	31.8	110.2	185.1	32.4
Łódzkie	120.2	214.3	36.1	106.5	191.5	35.7	150.8	259.4	36.9
Małopolskie	86.1	151.5	25.7	80.5	143.8	26.8	93.4	160.8	24.1
Mazowieckie	94.6	169.0	28.0	78.6	140.5	27.3	129.4	224.0	29.9
Opolskie	82.8	145.2	23.5	78.4	142.2	22.2	88.3	148.7	25.1
Podkarpackie	74.9	133.9	19.2	58.2	105.0	17.8	89.1	156.4	20.5
Podlaskie	110.8	201.6	26.5	86.3	158.0	25.5	152.4	266.4	28.6
Pomorskie	92.7	158.9	31.2	86.2	148.8	31.4	109.0	182.5	30.3
Śląskie	93.3	158.8	33.3	92.9	157.2	35.2	94.5	165.5	24.3
Świętokrzyskie	94.7	168.4	24.4	72.5	126.7	26.2	117.8	207.7	22.4
Warmińsko-Mazurskie	112.0	198.8	30.7	100.7	180.8	31.0	131.9	228.0	30.1
Wielkopolskie	88.9	152.5	30.4	79.3	135.5	31.1	103.9	176.9	29.2
Zachodniopomorskie	97.6	167.5	31.8	90.8	157.0	31.8	114.9	191.5	31.8

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

A very unfavourable situation within this age group – demonstrated by high mortality due to digestive system diseases – can be observed in the Łódzkie, Śląskie and Dolnośląskie regions. In these regions, excess mortality compared to the national rate varies, depending on the sub population, from 22% in the case of men in the Dolnośląskie region to 45% in the case of women in the Śląskie region. The mortality gap between the least favourable region and the most favourable one (Podkarpackie) is approximately double in the case of men and approximately two and a half times in the case of women.

If mortality was reduced to the lowest possible level observed in Poland, the number of people aged 45–64 years dying due to digestive system diseases over the course of a year would decrease by approximately 2000 (32%).

Table 4.10. Age-standardized mortality rates from digestive diseases of the Polish population aged 45–64 years, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	62.1	95.7	31.6	68.6	105.9	36.8	49.6	77.9	20.6
Dolnośląskie	77.1	116.8	41.3	79.5	120.2	44.6	70.5	108.7	30.9
Kujawsko-Pomorskie	53.8	83.9	26.7	57.4	91.4	29.0	46.9	71.2	22.3
Lubelskie	52.2	87.0	20.5	56.7	97.7	23.2	47.5	77.2	17.4
Lubuskie	61.3	96.9	28.9	58.3	94.2	27.1	68.1	102.9	33.3
Łódzkie	85.3	130.6	45.5	96.3	149.0	52.8	60.8	93.8	27.4
Małopolskie	45.7	72.7	21.0	51.0	80.7	25.9	39.4	64.2	14.4
Mazowieckie	61.1	97.6	28.8	65.5	104.1	33.6	51.4	84.7	16.9
Opolskie	47.8	72.1	25.1	49.9	75.2	28.0	44.7	67.8	20.7
Podkarpackie	41.0	65.5	18.0	44.8	71.7	21.6	37.9	60.8	14.8
Podlaskie	58.4	91.7	27.8	62.5	97.4	33.4	52.5	84.8	17.3
Pomorskie	65.7	94.4	39.2	70.9	104.3	41.8	52.4	71.4	32.2
Śląskie	80.6	118.8	45.8	87.1	128.4	50.3	51.8	79.0	25.0
Świętokrzyskie	50.9	81.0	22.2	61.1	97.3	30.2	40.2	65.8	12.9
Warmińsko-Mazurskie	65.5	102.2	31.6	70.1	109.6	36.0	57.0	89.8	22.5
Wielkopolskie	50.6	78.3	25.4	53.8	82.7	29.1	45.5	71.9	19.0
Zachodniopomorskie	57.7	87.8	29.6	60.8	92.7	32.3	50.1	77.3	21.2

Source: Authors' own calculations based on individual mortality data gathered by the GUS .

4.4 Mortality of Polish population aged 65 years and over

In the years 2005–2007, 775 688 people aged 65 years and over died in Poland, which represented 69.6% of the total population of deceased Poles. More than half of the deceased (54%) were women. Since women represent a significant majority of the population in that age group, and their dominance in terms of numbers continues into older age, the general age-standardized male death rate was 62% higher than female rate. Table 4.11 presents age-SDRs for residents of particular regions, broken down into rural and urban residents. Excess male compared to female mortality was similar in rural (65%) and urban (59%) areas. The mortality rate of urban residents was slightly lower than that of rural residents: for men by 7% and for women by 4%.

Table 4.11. Age-standardized mortality rates of the Polish population aged 65 years and over, all causes of death, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	4 979.2	6 533.6	4 042.4	4 848.3	6 328.1	3 978.6	5 165.5	6 814.9	4 127.2
Dolnośląskie	5 024.9	6 691.6	4 087.1	4 918.5	6 506.8	4 024.4	5 297.1	7 193.7	4 227.9
Kujawsko-Pomorskie	5 162.0	6 797.5	4 193.8	4 961.7	6 573.2	4 052.8	5 500.4	7 164.1	4 433.1
Lubelskie	5 074.7	6 802.7	4 018.9	4 744.4	6 264.1	3 847.7	5 259.4	7 096.9	4 110.0
Lubuskie	5 215.8	6 806.1	4 285.8	5 093.9	6 635.7	4 205.1	5 435.9	7 123.6	4 423.8
Łódzkie	5 285.9	7 035.6	4 292.0	5 203.8	7 015.4	4 242.9	5 396.9	7 044.6	4 351.2
Małopolskie	4 788.2	6 207.6	3 910.0	4 668.2	5 988.8	3 868.2	4 909.6	6 422.3	3 949.3
Mazowieckie	4 679.7	6 119.2	3 806.2	4 505.3	5 854.8	3 712.6	4 978.6	6 549.4	3 959.6
Opolskie	4 971.6	6 518.9	4 050.8	4 882.6	6 361.9	4 033.2	5 060.2	6 670.9	4 068.6
Podkarpackie	4 844.8	6 292.0	3 943.3	4 569.6	5 869.1	3 762.4	4 993.3	6 514.3	4 038.5
Podlaskie	4 718.6	6 150.4	3 778.0	4 440.7	5 858.5	3 588.8	4 955.4	6 377.4	3 936.1
Pomorskie	4 831.0	6 326.6	3 905.0	4 683.3	6 055.2	3 836.3	5 257.5	7 087.5	4 109.0
Śląskie	5 129.2	6 563.5	4 227.3	5 115.8	6 528.0	4 226.2	5 161.4	6 653.3	4 220.2
Świętokrzyskie	4 982.7	6 644.2	3 974.5	4 894.8	6 487.9	3 968.0	5 037.3	6 762.8	3 967.9
Warmińsko-Mazurskie	5 027.1	6 906.4	3 939.8	4 838.3	6 599.8	3 832.4	5 318.8	7 373.0	4 109.1
Wielkopolskie	5 105.2	6 680.5	4 170.6	4 933.4	6 408.3	4 087.0	5 347.1	7 042.1	4 290.0
Zachodniopomorskie	5 069.5	6 710.2	4 111.9	4 942.9	6 492.8	4 038.9	5 389.0	7 279.1	4 285.9

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

In general, in can be concluded that differences in mortality between regions among senior citizens, measured with relative indicators, are much smaller than for younger age groups. This is due to significantly higher values of mortality rates in that age group, as well as – most likely – less pronounced inequalities in health status of the oldest members of the population. In absolute terms these inequalities are responsible for the large differences in the number of deaths. The highest mortality rate among people aged 65 years and over is reported in the Łódzkie region: in the case of men it is 7.7% higher than the national rate, and in the case of women it is 6.2% higher, with excess mortality in urban areas greater than in rural areas. The unfavourable situation of rural residents in the Kujawsko-Pomorskie, Zachodniopomorskie and Lubuskie regions should also be mentioned. The mortality gap between the least favourable region (Łódzkie) and the most favourable ones (Mazowieckie for men and Podlaskie for women) amounts to as little as approximately 15%. Assuming that male and female mortality in the population aged 65 years and over in all regions was at the lowest possible level (that is, the level reported for the best region in Poland in the period 2005–2007), each year there would be 19 700 fewer deaths (8%). Therefore, such a radical improvement in the oldest age group would bring about a less spectacular effect – in relative as well as in absolute terms, as far as a reduction in the number of premature deaths is concerned – than a reduction in mortality in the population aged 45–64 years.

4.4.1 Malignant neoplasms

Malignant neoplasms are the second most prevalent cause of death among people aged 65 years and over, and they account for 22.5% of deaths in that age category, with the rate for women at the level of 18.5%, and that for men at 27.3%. For men in general, the risk of death due to cancer is more than twice as high as for women (see Table 4.12). The gap in mortality between urban and rural residents at country level is relatively small in the case of men – risk of death for male urban residents is 5% higher than that for male rural residents, whereas in the case of women the gap is rather pronounced (urban mortality is higher by more than a quarter (27%)), primarily due to much higher mortality from lung cancer, breast cancer and cancer of the cervix uteri.

The worst situation and the highest mortality level due to malignant neoplasms in that age group is reported in the Pomorskie region – for men and women this is higher than the national rate by 15% and 18%, respectively. An unfavourable situation can also be observed in Kujawsko-Pomorskie, as well as in the Wielkopolskie and Dolnośląskie regions. One should also note the high male mortality rate in Warmińsko-Mazurskie. The mortality gap between the least favourable (Pomorskie) and the most favourable regions (Lubelskie) amounts to 36% and 57% for men and women, respectively. If mortality was reduced to the lowest level observed in Poland, the number of deaths due to cancer would decrease by 9900 annually (17%).

4.4.2 CVD

CVDs are the most frequent cause of death in the population aged 65 years and over, and they account for more than half of all deaths in that age group (54.0%) – in the case of women to a greater extent (58.7%) than in the case of men (48.6%). Taking into account the differences in the number and age structure of males and females in this age group, the standardized male mortality rate is 39% higher than that for females, with such an excess observed in urban as well as in rural areas (Table 4.13). At country level, the mortality rate of urban residents is lower by approximately 13% than that of rural residents, both for men and for women (with the biggest gap, of more than 20%, found in the Mazowieckie region).

The worst situation (as per the highest level of mortality resulting from CVD) in this age group is reported in three regions (Lubelskie, Łódzkie, Opolskie and Śląskie), as well as among urban residents of the Dolnośląskie region. Overall excess mortality in those regions, however, does not exceed 10%. If mortality due to CVD of rural residents in those regions is compared with the national mortality level, it is clear that it is higher by a approximately 12%. The gap in the mortality levels between the least favourable regions (Lubelskie for men and Łódzkie for women) and the most favourable one (Podlaskie) amounted to approximately one third. If mortality was reduced to the lowest level possible in Poland, the number of people aged 65 years and over dying due to CVD would decrease by 27 600 annually (20%).

4.4.3 External causes

External causes account for only 2.6% of deaths of Polish residents aged 65 years and over, with the share of those causes slightly greater in male deaths (3.0%) than in female (2.2%). The standardized male mortality rate is approximately twice as the high as the female rate, and in the Warmińsko-Mazurskie region it is over three times higher (see Table 4.14).

Risk of death among men living in urban areas is slightly lower (on average, by 13%) than among rural male residents. The female mortality rate in urban and rural areas is similar at country level. However, for example, in the Podlaskie and Świętokrzyskie regions, it is almost one third higher in urban areas, while in the Opolskie and Warmińsko-Mazurskie regions it is over one fifth higher in rural areas.

Table 4.12. Age-standardized mortality rates from cancer of the Polish population aged 65 years and over, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	1 109.5	1 678.9	770.9	1 159.3	1 718.0	840.1	1 035.6	1 629.8	662.1
Dolnośląskie	1 186.2	1 823.9	833.3	1 190.2	1 784.8	861.3	1 181.2	1 942.4	756.8
Kujawsko-Pomorskie	1 234.7	1 882.8	854.2	1 250.7	1 865.3	910.0	1 211.1	1 926.4	753.8
Lubelskie	897.3	1 417.1	580.8	959.6	1 461.1	669.9	862.6	1 400.4	526.2
Lubuskie	1 123.3	1 677.3	807.8	1 148.6	1 679.6	852.3	1 079.0	1 683.1	722.9
Łódzkie	1 067.2	1 651.9	735.6	1 098.3	1 695.5	783.8	1 016.4	1 593.3	650.2
Małopolskie	1 052.7	1 587.3	728.2	1 113.2	1 621.4	820.8	990.1	1 557.1	628.8
Mazowieckie	1 086.9	1 622.8	767.1	1 143.5	1 674.1	843.2	988.7	1 549.9	623.2
Opolskie	1 087.2	1 622.8	777.5	1 122.3	1 623.1	834.8	1 055.1	1 622.5	723.3
Podkarpackie	997.9	1 549.3	660.0	1 040.3	1 548.6	740.4	975.7	1 554.8	613.4
Podlaskie	1 053.0	1 604.5	697.4	1 117.5	1 692.5	782.1	1 000.0	1 543.1	617.2
Pomorskie	1 293.9	1 931.5	910.5	1 312.5	1 916.9	953.6	1 241.0	1 971.7	785.6
Śląskie	1 130.8	1 664.4	808.0	1 168.7	1 708.8	845.9	999.5	1 517.7	673.6
Świętokrzyskie	983.4	1 550.6	635.8	1 040.6	1 590.8	712.9	946.5	1 531.6	581.7
Warmińsko-Mazurskie	1 195.1	1 907.6	785.9	1 208.4	1 882.8	825.1	1 174.6	1 945.3	726.1
Wielkopolskie	1 204.6	1 788.1	858.0	1 224.2	1 793.0	902.2	1 177.2	1 785.3	792.6
Zachodniopomorskie	1 180.9	1 761.8	844.8	1 196.3	1 739.9	883.3	1 144.2	1 826.2	745.6

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

The worst situation – as defined by the highest mortality rate due to external causes – in this age group is reported in the Wielkopolskie region; it is higher than the national rate by over 30%, and in the case of women the gap is greater than 50%. A substantially higher risk of death (compared to the national average) is also reported in Podlaskie (in total, higher by 20%), as well as in the case of women in the Śląskie region (higher by 21%). The gap in mortality rates between the most favourable region and the least favourable one (Kujawsko-Pomorskie) amounts to 56% for men and 190% for women (that is, almost threefold).

If mortality was reduced to the lowest level observed in Poland, the number of people aged 65 years and over dying annually due to external causes would be reduced by 2400 (37%).

4.4.4 Respiratory diseases

As regards people aged 65 years and over, diseases of the respiratory system represent a greater risk than digestive system diseases. The former account for 6.0% of all deaths of people in that age group, whereas the latter account for 3.4% of deaths. The share is greater among men (7.5%) than women (4.7%), and the male mortality rate in urban areas was 2.3 times higher than that of females.

Table 4.13. Age-standardized mortality rates from CVD of the Polish population aged 65 years and over, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	2 687.7	3 248.0	2 337.9	2 537.0	3 067.5	2 209.6	2 905.8	3 491.8	2 527.2
Dolnośląskie	2 837.7	3 493.2	2 461.0	2 736.3	3 364.3	2 376.0	3 092.3	3 833.1	2 664.0
Kujawsko-Pomorskie	2 757.8	3 291.9	2 426.6	2 583.9	3 129.1	2 256.8	3 049.0	3 540.2	2 721.6
Lubelskie	2 941.0	3 618.4	2 524.5	2 714.0	3 323.6	2 352.5	3 070.4	3 780.5	2 623.8
Lubuskie	2 653.8	3 258.8	2 286.2	2 534.1	3 145.3	2 167.1	2 865.4	3 458.2	2 497.2
Łódzkie	2 917.8	3 554.9	2 551.7	2 706.2	3 376.3	2 346.2	3 237.4	3 783.8	2 881.2
Małopolskie	2 701.6	3 233.8	2 360.6	2 578.6	3 089.1	2 254.6	2 827.2	3 374.7	2 469.7
Mazowieckie	2 377.5	2 839.2	2 087.0	2 146.6	2 547.7	1 892.4	2 772.4	3 295.6	2 429.9
Opolskie	2 911.2	3 553.5	2 514.0	2 794.0	3 360.7	2 453.9	3 024.7	3 737.9	2 571.7
Podkarpackie	2 756.7	3 326.2	2 392.0	2 554.7	3 100.2	2 204.9	2 866.4	3 445.5	2 494.2
Podlaskie	2 212.1	2 704.4	1 882.0	1 968.1	2 476.2	1 657.9	2 417.5	2 878.4	2 076.3
Pomorskie	2 387.1	2 871.2	2 062.2	2 268.1	2 716.7	1 965.8	2 729.0	3 305.6	2 343.4
Śląskie	2 898.4	3 434.8	2 538.6	2 835.8	3 344.3	2 488.9	3 104.7	3 715.3	2 705.0
Świętokrzyskie	2 743.9	3 311.7	2 386.1	2 636.9	3 237.4	2 278.7	2 814.2	3 369.6	2 455.5
Warmińsko-Mazurskie	2 412.6	2 974.0	2 080.6	2 296.2	2 839.8	1 977.7	2 592.5	3 179.0	2 241.0
Wielkopolskie	2 636.6	3 229.2	2 274.4	2 517.8	3 078.4	2 185.0	2 803.7	3 429.0	2 402.5
Zachodniopomorskie	2 767.3	3 412.6	2 380.1	2 645.1	3 256.5	2 273.5	3 071.7	3 804.6	2 643.8

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

In rural areas it was 3.2 times higher (see Table 4.15). The mortality gap among urban and rural residents is larger in the case of men: the risk of death for rural residents is higher than for urban residents across all regions – on average by a quarter, but in six regions by more than 50%. In the case of women, mortality of female urban residents was on average slightly higher than that of rural female residents, and in the Łódzkie region it was higher by as much as 50%.

The highest mortality rate due to respiratory system diseases in this age group (and therefore the worst situation recorded) is observed in the Warmińsko-Mazurskie region. Male and female mortality due to this type of diseases is higher than the average for the country by as much as 54% and 69%, respectively, and excess mortality among rural residents is even greater. The mortality gap between the Warmińsko-Mazurskie and Podkarpackie regions, with the lowest mortality, is twofold for men and almost threefold for women.

If mortality was reduced to the lowest level observed in Poland, the number of people aged 65 years and over dying annually from respiratory system diseases would be reduced by 5500 (36%).

Table 4.14. Age-standardized mortality rates from external causes of the Polish population aged 65 years and over, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	130.2	191.2	91.4	126.8	180.9	93.1	136.3	207.5	89.2
Dolnośląskie	121.7	192.3	81.0	118.8	187.6	79.5	131.0	207.8	85.4
Kujawsko-Pomorskie	84.2	142.2	48.0	81.3	138.0	47.2	89.8	150.3	49.5
Lubelskie	115.2	175.3	77.9	97.6	128.3	74.3	125.6	200.1	79.5
Lubuskie	101.3	169.8	60.4	89.7	141.8	58.3	124.5	220.7	66.5
Łódzkie	134.2	203.4	93.1	128.2	196.4	90.5	144.3	215.1	97.4
Małopolskie	120.0	176.6	83.0	112.5	156.8	84.9	128.3	197.5	81.2
Mazowieckie	143.1	206.4	103.0	134.6	185.1	102.8	159.7	243.8	103.8
Opolskie	112.2	178.9	69.7	103.1	174.9	61.6	121.3	183.6	77.6
Podkarpackie	105.9	164.1	66.4	101.9	150.3	70.8	108.9	173.1	63.9
Podlaskie	156.1	214.7	113.8	158.8	199.0	130.4	156.5	231.5	99.2
Pomorskie	129.7	186.4	90.7	126.0	178.2	90.2	140.4	209.4	92.0
Śląskie	147.1	200.9	111.0	147.0	199.2	111.8	146.6	205.1	108.3
Świętokrzyskie	131.4	202.6	86.7	145.5	219.2	102.4	125.0	197.4	77.8
Warmińsko-Mazurskie	91.4	163.2	48.7	85.5	156.4	44.9	100.2	172.4	54.7
Wielkopolskie	171.6	222.4	139.1	164.8	209.2	137.8	182.0	241.8	141.5
Zachodniopomorskie	119.4	180.3	81.7	120.5	175.7	86.4	117.9	193.6	70.1

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

To summarize the outline of diversity in mortality levels among adult Polish residents detailed in the previous subsections, it can be concluded that gender is a very important factor in terms of in the risk of death in Poland – male mortality is much higher than female mortality, and the biggest gap can be observed at a young age, that is, 25–44 years (see Fig. 4.3, Fig. 4.4, Fig. 4.5). Except for the most senior citizens, excess in male mortality versus female mortality is highest in the case of external causes of death. It is necessary to emphasize that the excess male mortality is a much larger problem in Poland than in the EU15 countries. In consequence, the gap in mortality of Poles and the average for EU15 citizens is more noticeable and disturbing in the case of males than females.

Urban or rural place of residence has relatively little impact from the standpoint of differences in mortality. This is definitely a very positive phenomenon that is not often realized by policy-makers, along with the fact that the most disadvantageous health situation – as measured by the LE – is found in the smallest towns (Fig. 4.6).

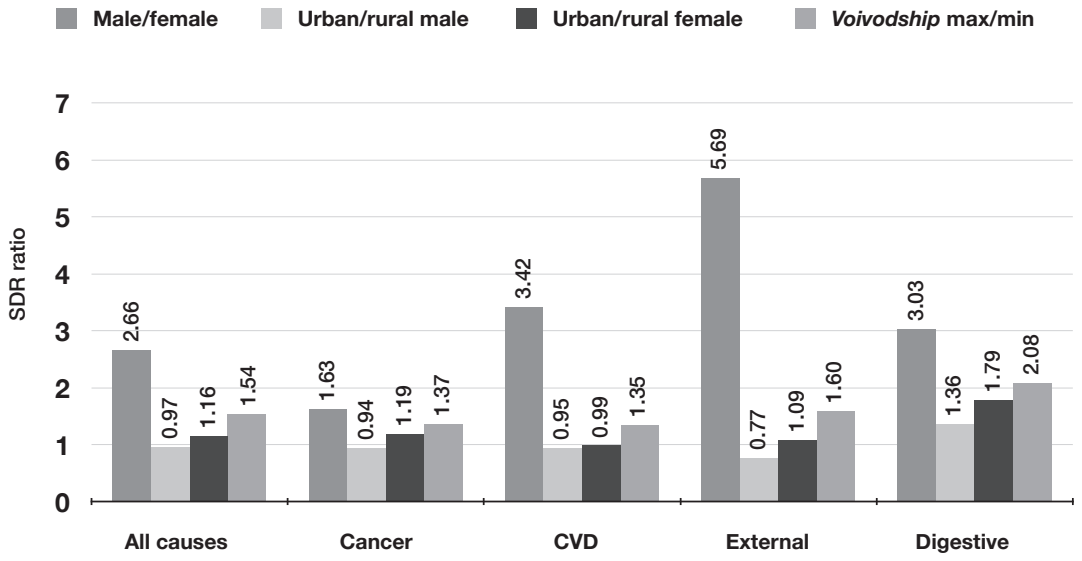
Table 4.15. Age-standardized mortality rates from respiratory diseases of the Polish population aged 65 years and over, 2005–2007

Region (*voivodship*)	Urban and rural areas			Urban area			Rural area		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Poland	293.4	492.0	187.3	279.5	444.6	195.4	315.1	561.8	175.0
Dolnośląskie	241.0	409.4	152.7	227.7	382.3	145.7	275.1	480.4	170.7
Kujawsko-Pomorskie	333.5	564.1	212.9	308.4	509.2	211.6	376.4	656.5	214.6
Lubelskie	246.3	462.1	123.8	204.5	350.4	126.7	272.2	527.9	121.7
Lubuskie	272.9	471.6	169.7	257.7	421.9	173.2	302.9	561.6	165.7
Łódzkie	340.6	572.3	222.4	349.3	551.2	254.8	329.7	609.3	169.1
Małopolskie	274.5	437.4	184.8	238.1	360.0	171.4	312.0	513.6	199.0
Mazowieckie	339.9	540.1	230.5	331.1	501.8	244.1	357.9	610.9	206.3
Opolskie	231.6	405.4	138.5	227.4	405.6	138.9	236.7	406.7	139.1
Podkarpackie	203.2	372.8	110.2	164.0	279.1	98.8	224.8	422.1	115.9
Podlaskie	327.5	542.3	199.4	262.5	411.4	182.7	383.9	644.4	213.9
Pomorskie	293.3	474.5	197.2	271.0	418.9	194.7	357.7	630.1	204.9
Śląskie	293.0	476.7	198.9	292.9	467.3	203.7	292.8	506.2	182.0
Świętokrzyskie	307.3	550.8	176.6	301.7	499.2	205.5	313.6	591.7	158.5
Warmińsko-Mazurskie	467.6	760.2	316.1	426.7	657.5	308.9	530.3	916.3	327.3
Wielkopolskie	243.2	439.9	140.6	214.2	358.6	143.6	284.6	548.8	136.4
Zachodniopomorskie	267.7	461.1	167.9	245.8	403.9	167.4	325.3	614.9	168.3

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

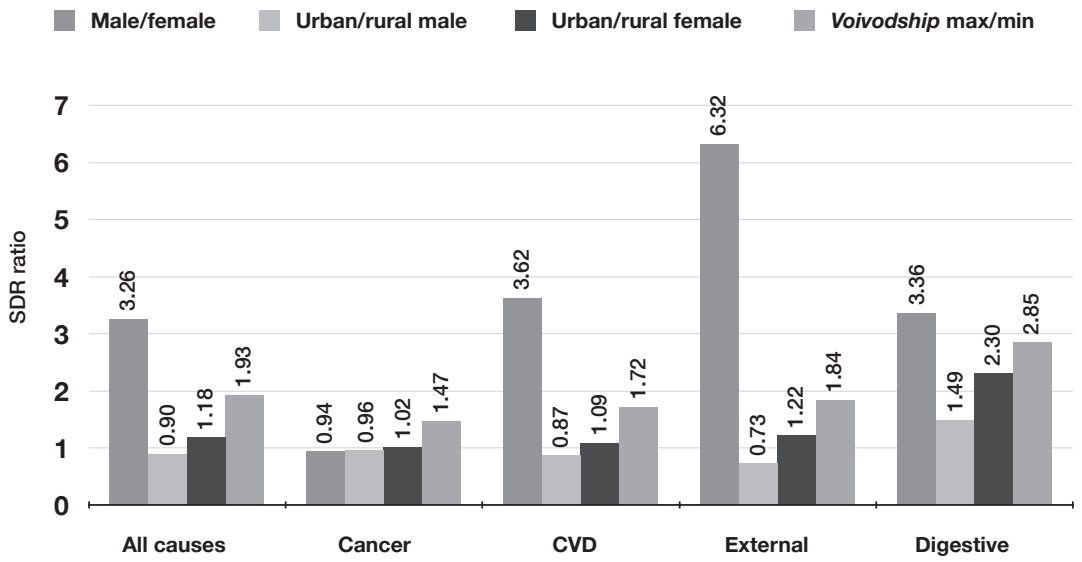
The region of residence is of greater significance, especially in terms of risk of death caused by digestive and pulmonary system diseases, as well as external causes. Regional differences in mortality due to cancer and CVD are less pronounced. It is clear that there is no single most or least favourable region, in which residents have the lowest or the highest risk of death for all main groups of diseases. The regional distribution of the death risk for each analysed group of causes of death – as well as age category – is different. Those regional differences in mortality level are associated with many explanatory factors, which are described in other sections of this report.

Fig. 4.3. Ratio of SDR in population aged 25–44 years according to gender, place of residence and voivodship, selected causes of death



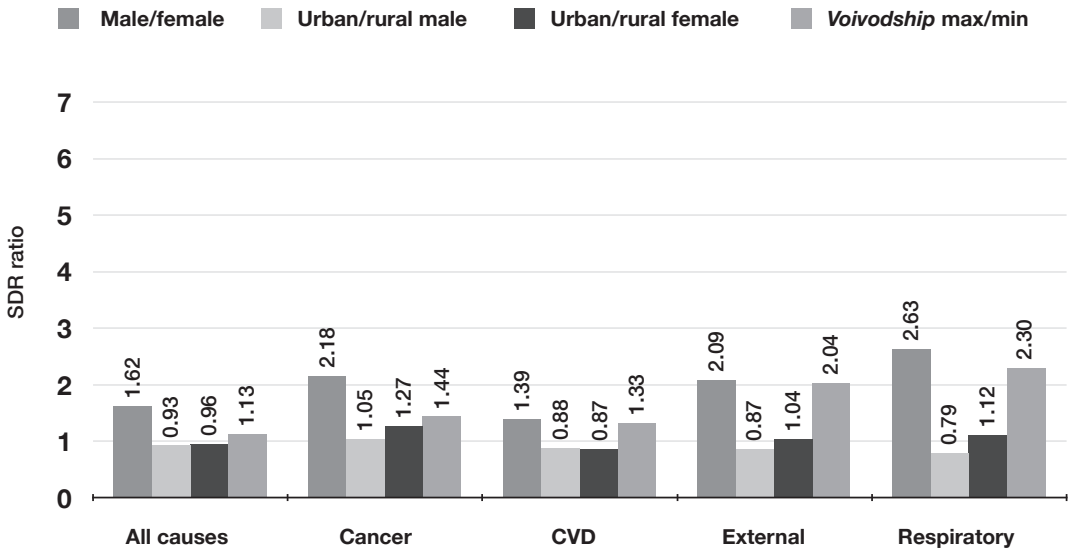
Source: Authors' own calculations using data from Tables 4.1 to 4.5.

Fig. 4.4. Ratio of SDR in population aged 45–64 years according to gender, place of residence and voivodship, selected causes of death



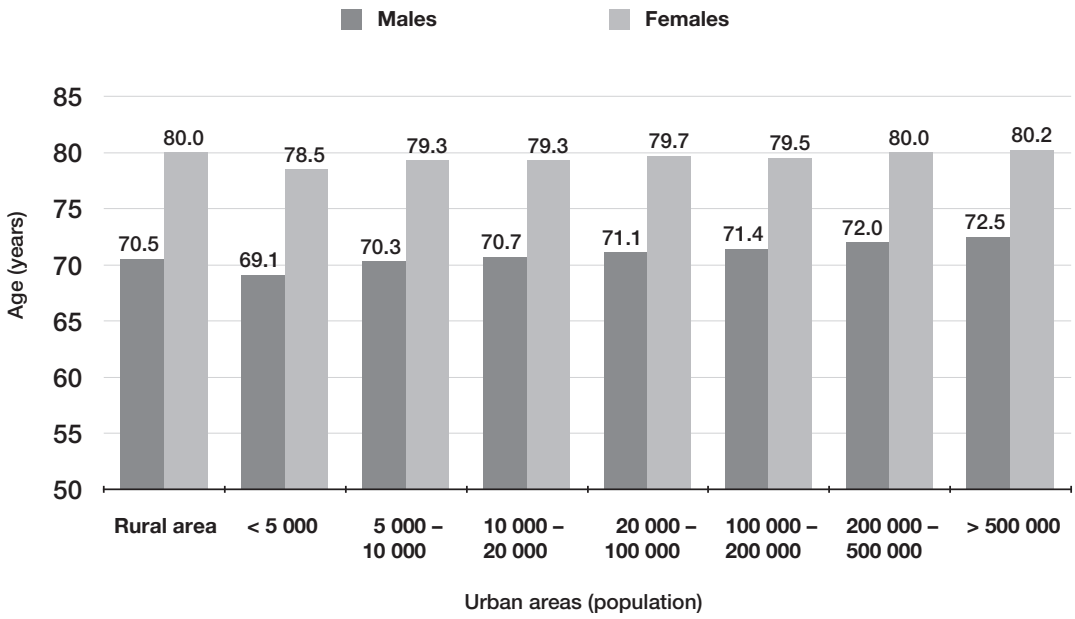
Source: Authors' own calculations using data from Tables 4.6 to 4.10.

Fig. 4.5. Ratio of SDR in population aged 65 years and over according to gender, place of residence and voivodship, selected causes of death



Source: Authors' own calculations using data from Tables 4.11 to 4.15.

Fig. 4.6. Average LE in a rural area and in urban areas of different population sizes, 2006–2008



Source: Authors' own calculations based on individual mortality data gathered by the GUS.

4.5 Education-related differences in health status of the Polish population

Level of educational attainment is one of the most important factors behind inequalities in the health status of a population. Attempts to define the importance of this factor are often hampered by a lack of adequate statistical data. In the case of Poland, data pertaining to the education level of the deceased have been collected for many years and can be used to compare the structure of cause of death relating to different levels of educational attainment. Table 4.16 presents percentage shares of the main causes of death according to educational groups of the Polish population. The most striking characteristic in the distribution of causes of death is the increasing emergence of malignant diseases as cause of death, together with the increase in educational attainment. This does not imply, however, that people with higher education die of malignant neoplasms more frequently than people with elementary education. To be able to draw such conclusions, one would have to know the number of Polish residents according to age group and educational level. Such information is only available through data from the population census, the last of which was carried out in Poland in 2002. Moreover, during the census data collection respondents were asked about being completely or seriously limited in everyday activities (adequate for their age) due to disability or chronic disease. More thorough analysis of LE, HLE and mortality of the Polish population by education level could therefore be carried out for the year 2002 or the period 2001–2003.

Table 4.16. Causes of death by gender, level of education and age group (% distribution), 2005–2007

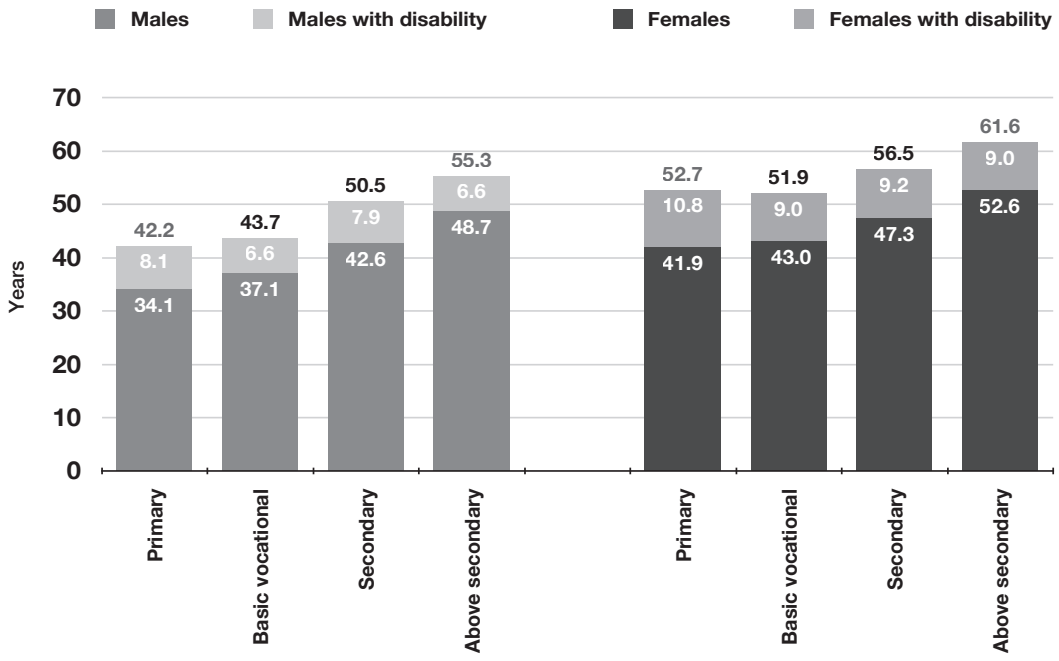
Cause of death	Men				Women			
	University education	High school	Basic vocational	Basic	University education	High school	Basic vocational	Basic
25–44 years old								
Total (%) in particular:	100	100	100	100	100	100	100	100
- Cancer	20.7	13.2	10.0	6.5	45.7	40.3	35.0	23.0
- CVD	14.3	16.4	17.1	16.2	10.0	14.6	16.0	17.0
- Respiratory diseases	0.5	1.4	2.0	3.3	0.7	1.6	2.5	5.1
- Digestive diseases	5.9	8.5	8.7	8.5	2.8	6.5	9.2	11.7
- External causes	45.0	42.6	41.4	38.9	30.9	21.6	19.5	18.4
45–64 years old								
Total (%) in particular:	100	100	100	100	100	100	100	100
- Cancer	34.0	30.8	28.5	27.5	61.9	53.1	46.6	41.0
- CVD	32.8	33.5	32.4	31.3	15.4	21.3	26.2	30.7
- Respiratory diseases	1.8	2.4	3.0	4.2	2.0	2.2	2.6	3.9
- Digestive diseases	8.3	7.8	7.5	6.3	4.4	6.4	6.3	5.4
- External causes	9.8	11.2	13.4	13.0	6.4	6.1	6.2	5.4
65 years old and over								
Total (%) in particular:	100	100	100	100	100	100	100	100
- Cancer	32.7	31.5	30.8	24.4	30.9	26.3	25.1	16.2
- CVD	45.3	46.5	46.4	50.3	46.5	50.7	52.5	60.5
- Respiratory diseases	5.3	5.8	6.4	8.5	4.3	5.0	4.4	4.7
- Digestive diseases	3.7	3.9	3.6	3.3	3.3	4.1	4.2	3.6
- External causes	2.7	2.4	3.1	3.0	3.2	2.5	2.6	2.2

Source: Authors' own calculations based on individual mortality data gathered by the GUS.

LE, as well as HLE (that is life without activity limitation due to health problems) of males and females in Poland reveals a strong declining gradient with lower educational attainment (Fig. 4.7) *(77)*. LE of 25-year-old men with elementary education in 2002 was shorter than LE of men with education higher than secondary level by 13.1 years, and HLE was as much as 14.6 years shorter. For women, these differences are slightly less pronounced and amount to, respectively, approximately 9 years and just under 11 years. Women live longer than men, both with and without activity limitation; however, the proportion of life without activity limitation is slightly higher among men, regardless of education level. Another interesting finding is that the decline in LE as well as HLE related to lower educational attainment is stronger in urban than in rural areas (see Fig. 4.8). It should also be highlighted that both the LE and HLE of men and women with secondary education and below are higher in rural than in urban populations.

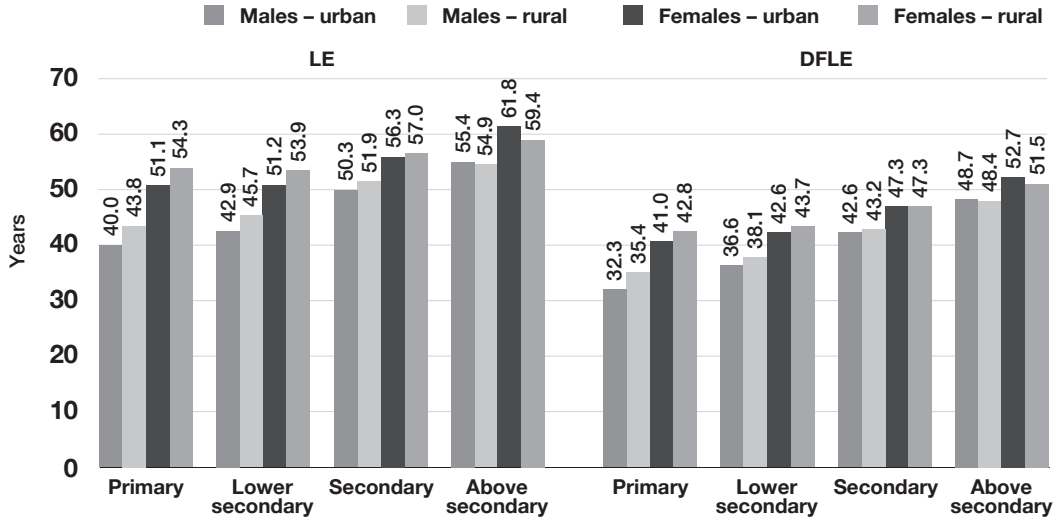
Level of education has a strong association with mortality due to all main causes of death among the Polish population. The highest risk of death is observed among people with elementary or basic vocational education and the lowest among people with higher education. Ratios of SDRs due to main causes of death among people with elementary education and higher than secondary education are presented in Fig. 4.9. Interestingly, differences in the risk of death related to educational level are greater in the case of men than women for all causes of death except CVD. Moreover, while in women the ratio is rather similar for all main causes, in men it shows noticeable differences, with clearly the highest for external causes (for which the death rate among men with primary education is 4.7 times higher than among those with above-secondary education). A high rate ratio for male mortality from ill-defined conditions *(76)* clearly indicates difficulties in terms of assigning and coding a cause of death for deceased individuals with a low level of education. It may suggest a lack of proper medical care during illness in less-educated groups of people, since we have found (although the data are not presented here) that men with education below secondary level died in hospital less often than better educated groups.

Fig. 4.7. LE and DFLE at age 25 years by gender and education level in Poland, 2002



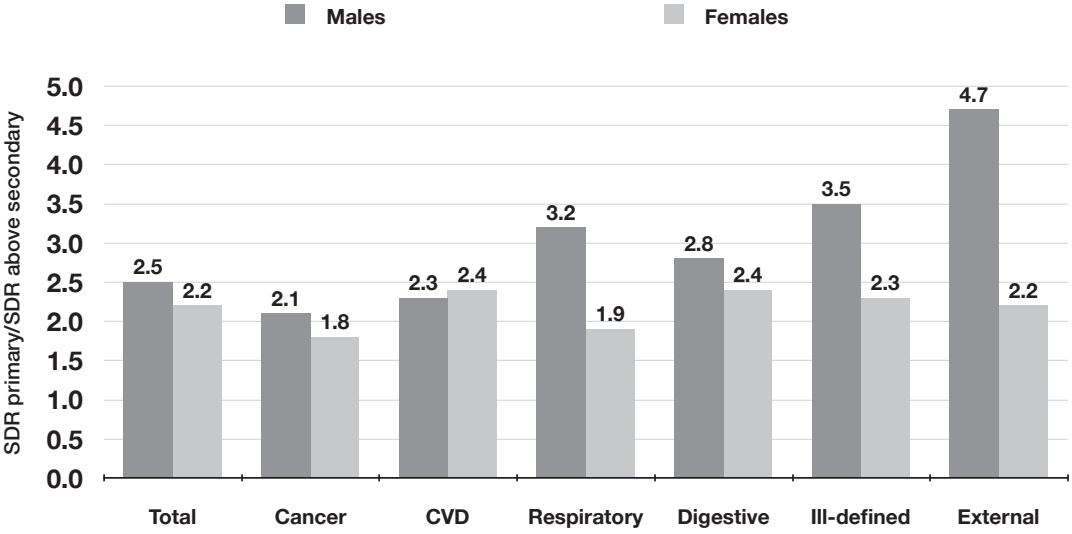
Source: Wojtyniak et al. *(77)*.

Fig. 4.8. LE and DFLE at age 25 years in urban and rural populations by gender and education level in Poland, 2002



Source: Wojtyniak et al. *(77)*.

Fig. 4.9. Ratio of SDR in adults aged 25 years and over with primary education and those educated above secondary level by gender and main causes of death in Poland, 2002

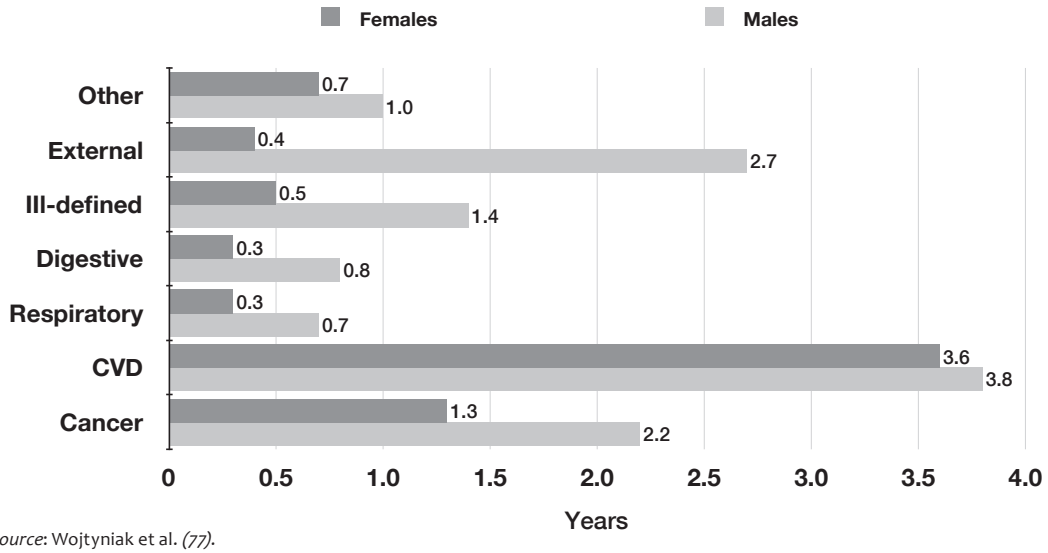


Source: Authors' own calculations based on individual mortality data gathered by the GUS.

Since death rates from all main causes are higher among people with lower than higher education levels, this indicates that all diseases contribute to shortening the lives of less-educated people when compared with better educated individuals. This contribution does not depend only on a difference in the mortality level within those groups, but also on the number of deaths from a given cause. We calculated the contribution of the main causes of death to shortening the LE of people aged 25 years

with primary education, compared to those with tertiary education. As can be seen in Fig. 4.10 the cause that is most responsible for shortening the lives of less-educated people when compared with better educated individuals is CVDs. In this category, a difference of half (3.6 years), in terms of female LE and 30% (3.8 years) in terms of male LE can be attributed to deaths due to CVDs. In men, external causes and cancer also each play a significant role.

Fig. 4.10. Contribution of main causes of death to shortening LE of people aged 25 years with primary education, compared to LE of those with tertiary education in Poland, 2001–2003



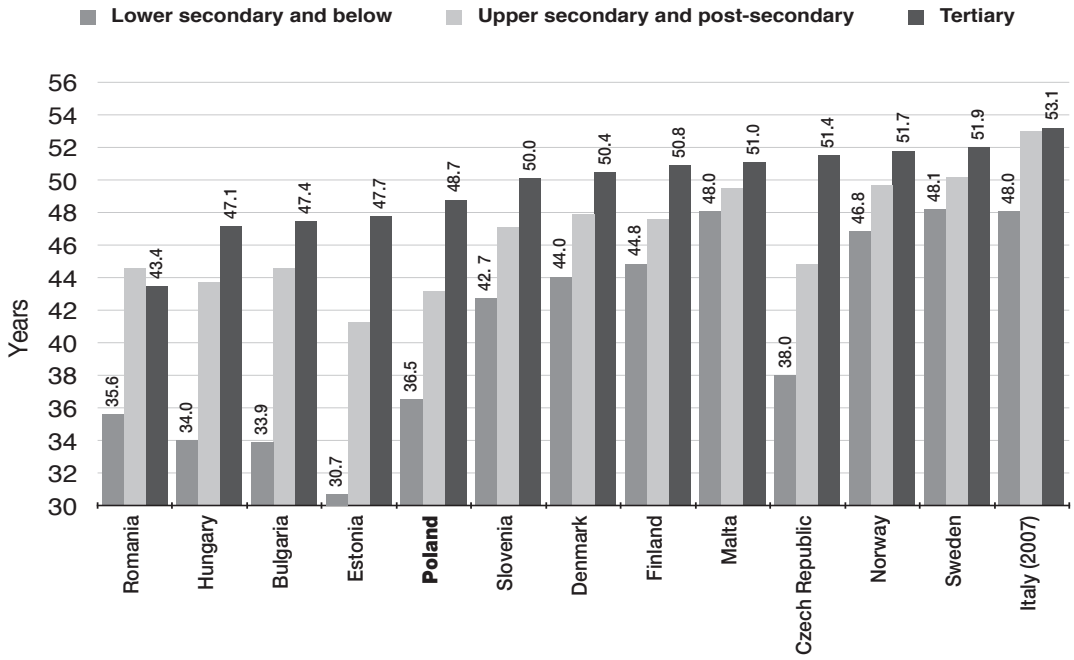
Source: Wojtyniak et al. *(77)*.

Education-related differences in overall mortality can be observed in virtually all EU Member States. According to recent analyses involving 22 European countries, the results in Poland are similar to those reported for the Czech Republic and Hungary, but substantially greater than in more developed EU economies *(75)*. Also, recent data from the European Commission Eurostat database on LE by education level for Poland and some other European countries show that the educational differential in Poland is larger than in more developed countries such as Finland, Italy, Malta, Norway and Sweden (Fig. 4.11 and 4.12). It should be pointed out that differences among better educated people are much smaller than among those with lower levels of education, which indicates that the latter group of Poles are in a particularly disadvantageous health situation.

In recent years, comparison of certain aspects of health status resulting from self-assessment by individuals under study became an important component contributing to the comparative evaluation of the health status of various social groups. The dimensions of considered health status pertain to: (i) overall health assessment; (ii) presence of long-term health problems or a chronic disease lasting for six months or longer; and (iii) presence of limited capacity to perform daily activities due to health problems lasting for six months or longer. Such information is collected in EU countries within the framework of the EU-SILC survey, carried out under the auspices of the European Commission's Eurostat activities. In Poland, the survey is conducted by the GUS. Age-standardized frequency of people who self-rate their health as "poor" or "very poor" – with long-term health problems and more or less severely limited capacity to perform daily activities – is presented in Fig. 4.13, Fig. 4.14 and Fig. 4.15, by educational levels in Poland and the average for EU countries. All three health status indicators are clearly related to educational attainment, both in Poland and in the whole of the EU, but this relationship is the weakest (relatively) in the case of long-term health

problems. It is worth noting that differences in the prevalence of negative health status parameters among people with elementary education and among those with a higher level of education in the Polish population are greater than the averages in EU countries.

Fig. 4.11. Male LE at age 30 years by educational attainment in Poland and selected European countries, 2008 (or latest available year)

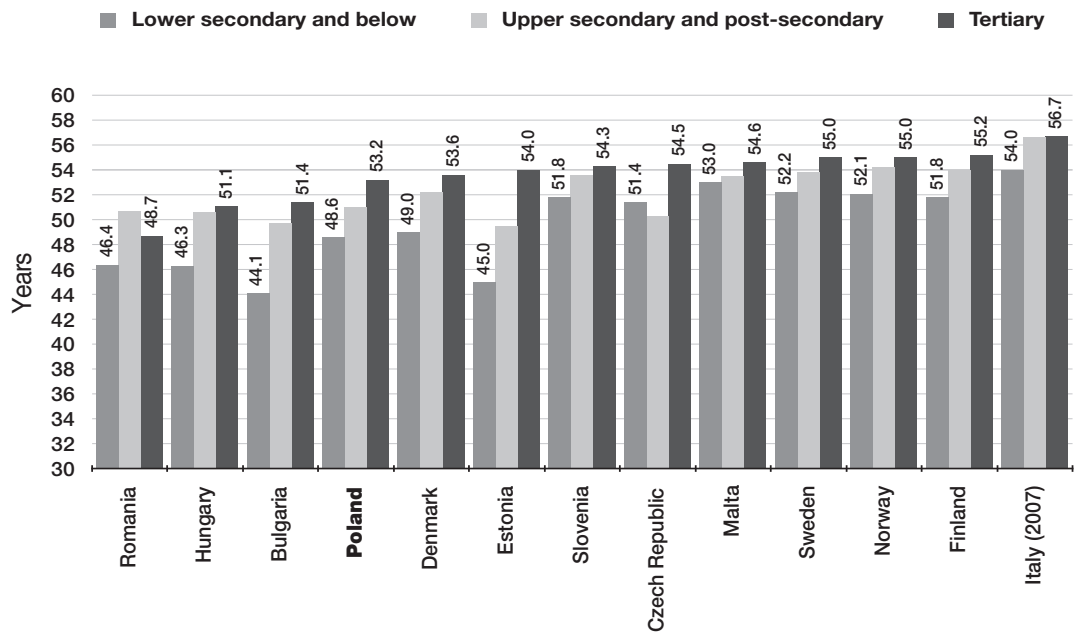


Source: Eurostat *(6)*.

In summary of the results outlined throughout this section, it can be concluded that the health status of the adult residents of Poland – measured in such a serious dimension as mortality, but also by means of a subjective assessment of some of its non-fatal aspects – demonstrates clear differences related to the level of education in both men and women, across both urban and rural areas. Such differences are also observed at EU level, but they are less striking, on average. It may also be stressed that the gap in health measures of the Polish population and the populations of the more economically developed EU countries is particularly noticeable in less-educated people.

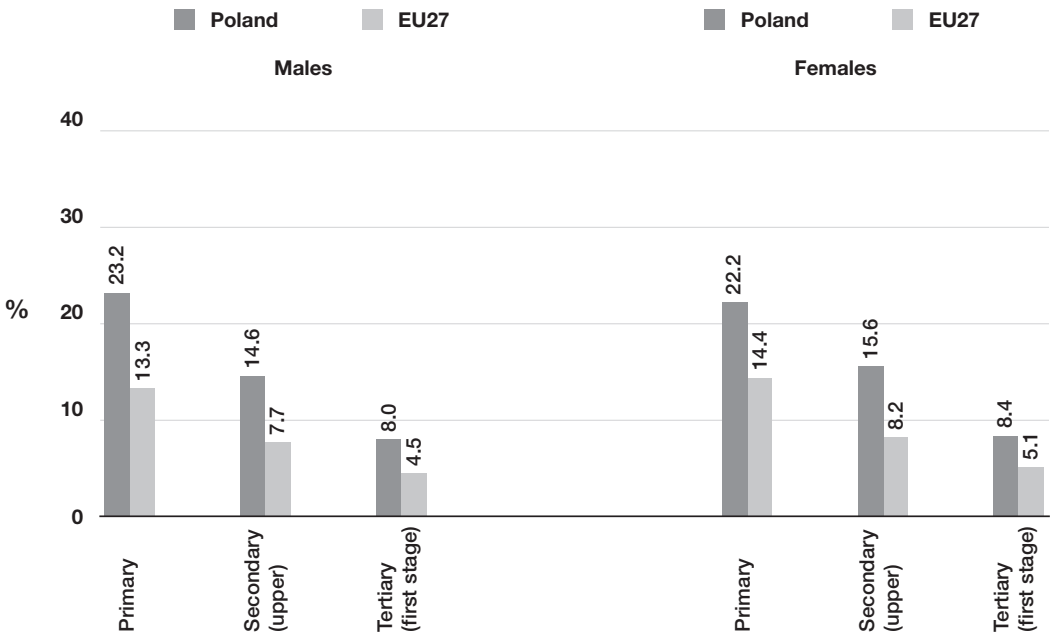
It should be emphasized that, even though for all main groups of diseases, death rates are higher for less-educated men and women, the main contributor to shortening the lives of those with lower levels of education when compared with those with higher levels is CVDs and, in men in particular, external causes of death; namely, road traffic accidents and suicide.

Fig. 4.12. Female LE at age 30 years by educational attainment in Poland and selected European countries, 2008 (or latest available year)



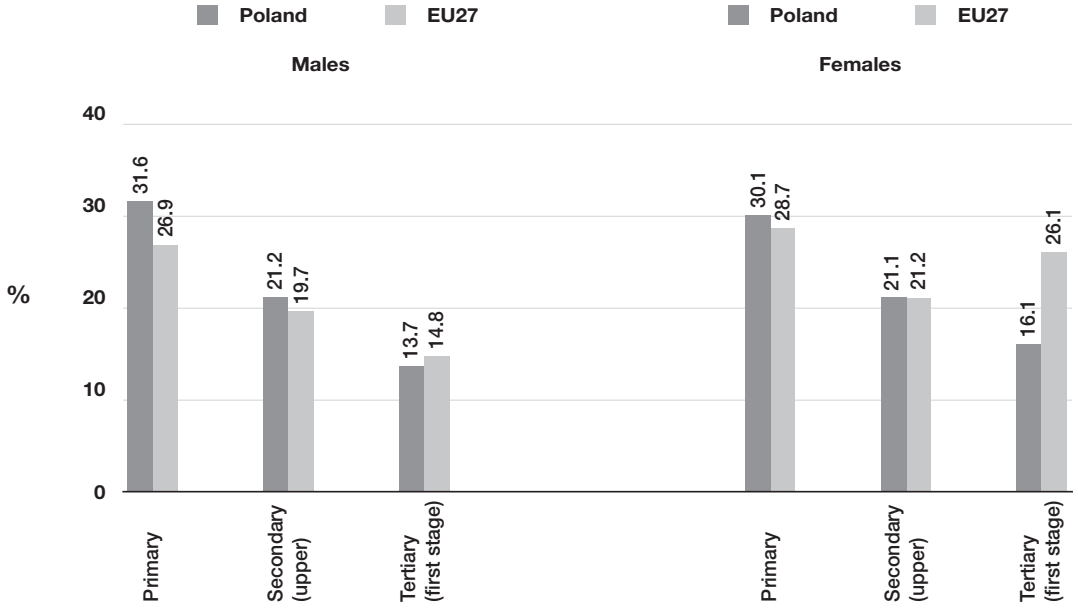
Source: Eurostat *(6)*.

Fig. 4.13. Age-standardized percentage of people aged 15 years and over, rating their health to be "bad" or "very bad", by level of education in Poland and EU27 countries, 2007



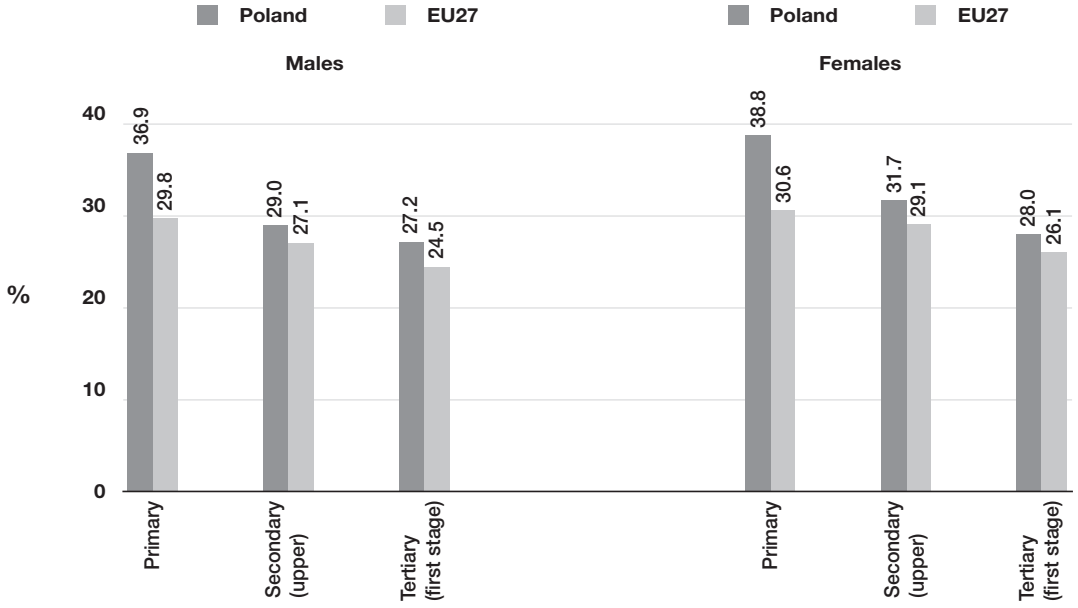
Source: Authors' own calculations based on data from Eurostat *(6)*.

Fig. 4.14. Age-standardized percentage of people aged 15 years and over who have chronic illnesses or health problems, by level of education in Poland and EU27 countries, 2007



Source: Authors' own calculations based on data from Eurostat *(6)*.

Fig. 4.15. Age-standardized percentage of people aged 15 years and over whose activities have been limited because of a health problem for at least six months, by education level in Poland and EU27 countries, 2007



Source: Authors' own calculations based on data from Eurostat *(6)*.

5. Recommendations

Dorota Poznańska

Domestic and international research has shown that social determinants of inequalities in health – that is, those that do not result from biological factors – represent one of the most significant, modifiable causes of excess mortality. Therefore, in this chapter, we present recommendations for various actions – the implementation of which should lead to substantial improvement in health, in particular among people with the lowest socioeconomic status. These recommendations are broken down into the following sections:

- Recommendations for strategy and policy formulation, monitoring and coordination
- Recommendations for actions aiming to improve the socioeconomic status of the population
- Recommendations for targeted public health programmes.

5.1 Recommendations for strategy and policy formulation, monitoring and coordination

Apart from the overarching objective of improving population health status, the aim of reducing social inequalities in health underlined in the NPZ for the years 2007–2015 should be also included in the Long-Term National Development Strategy (*Długookresowa Strategia Rozwoju Kraju*) and its individual implementation strategies, namely: Strategy for Human Capital Development (*Strategia Rozwoju Kapitału Ludzkiego*), Strategy for Social Capital Development (*Strategia Rozwoju Kapitału Społecznego*) and the National Strategy for Regional Development (*Krajowa Strategia Rozwoju Regionalnego*), as well as in local strategies for addressing social problems. The inclusion of this objective into a new system of strategic documents requires the creation of a system to monitor progress in reducing the social gradient in health.

In compliance with WHO principles, efforts should be aimed at "creating opportunities and achieving the health potential of *all* people. It involves the fair distribution of resources needed for health, fair access to the opportunities available, and fairness in the support offered to people when ill" *(3)*. According to the health in all policies approach, achieving an improvement in population health status requires measures to be undertaken not only within the health care sector but, more importantly, by means of an intersectoral approach that also includes the following sectors: fiscal, social security, infrastructure, education, labour, sport, accident prevention, environment and consumer protection. As many public policies do not have an immediate and direct health impact, but do have a substantial long-term impact on health, the scale of this impact should be an obligatory element for regulatory impact assessment of all policies and legal acts. This should also focus on non-health outcomes that have a long-term impact on health.

The total level of social expenditure in Poland is slightly higher than the OECD average. It should be noted, however, that while expenditures on cash transactions in Poland are among the highest, outlays in terms of benefits in kind (including for health care in particular) represent one of the lowest levels, compared to other OECD Member countries. Overly generous expenditure on cash transactions can produce disincentives to work and lead to benefit traps, while excessively limited spending on benefits in kind hinders access to important public goods, especially in the case of the most disadvantaged groups. This situation is unfavourable from a macroeconomic standpoint as well as from an equity perspective, and its gradual modification should be one of the priorities of the state redistribution policy. This priority should be included in the aforementioned Long-Term National Development Strategy, as well as in the Strategy for Human Capital Development.

Apart from that, in view of the large number of widely dispersed programmes (carried out locally as well as on a national scale) – which aim to improve the socioeconomic and health-related situation(s) of socially vulnerable groups – it is necessary to:

- integrate selected local public health programmes to achieve better results and improve the cost–effectiveness of their implementation;
- implement a system of long-term monitoring of results from national and local programmes, including cost–effectiveness analysis (evaluation of outcomes versus outlays), with the purpose of identifying the best practices and subsequently eliminating or modifying programmes which are not cost-effective;
- design a publicly accessible database of best practices to address selected problem areas, with examples of policies that have a proven record of efficiency, based on domestic as well as international experience (which will become feasible as a result of the measures described earlier);
- look beyond those that deal only with vulnerable groups to those that deal with the whole social gradient.

5.2 Recommendations for actions aiming to improve the socioeconomic status of the population

Substantial improvement in population health status can be achieved through measures aiming to improve socioeconomic conditions across the social gradient. One of the key activities in this regard is to improve labour market adaptability by, inter alia, developing policies that support lifelong learning, retraining, effective job placement, access to transport and child care infrastructure, and giving preference in state redistribution policy to active labour market programmes that promote sustainable work in contrast to inactivity or precarious, unstable work. As a result of these measures, the risk of long-term unemployment and inactivity should be contained, which in turn will lead to better living conditions and less pronounced social inequalities in health.

An issue of utmost importance for effective inclusion is also support for the development of social capital and local communities, especially through co-financing of the implementation of programmes which address local issues, create public places for leisure activities to promote healthy lifestyles, and support local communities and self-help groups.

One of the most important causes behind disparities in health status and LE due to socioeconomic status is represented by the accumulation of adverse factors – especially those observed in the early stages of life and even in the prenatal period. This is why a strategy aiming to promote equal opportunities must include a component focused on improving the situation of children and adolescents – especially those raised in families with low socioeconomic status living in especially disadvantaged areas or exposed to the risk of disability. This should be achieved in particular through:

- implementing programmes that address the general public as well as precisely defined target groups, whose effectiveness has been proven, such as early years development, parenting programmes and family partnerships;
- downstream interventions to promote prevention programmes namely - those related to smoking and second-hand smoke exposure by pregnant women and small children; programmes focused on preventing alcohol consumption during pregnancy and nutritional supplementation in the

periconceptional period (for example, folic acid); those aiming to prevent pregnancy of minors; and programmes to promote breastfeeding;

- facilitating assistance extended to families with young children (0–3 years old) who experience developmental problems or disabilities, in order to prevent the aggravation of developmental deficiencies and initiate early rehabilitation, as appropriate – such measures must be designed in a way that ensures that they will not stigmatize the child or parent;
- enhancing preschool care, in small groups, with the purpose of achieving greater social, emotional and cognitive development of preschool children;
- developing a support system focused on parental and child-rearing responsibilities (family assistants, access to family therapy or cognitive behavioural therapy, child care arrangements and other forms of assistance in problem solving), with simultaneous reduction of practices whereby children are placed outside of their biological families for reasons such as poverty or deficient hygiene;
- further modification of the model of alternative care for children deprived of adequate parental care (developing a foster family model and accelerating the dissolution of large alternative care facilities);
- implementing programmes aiming to ensure equal opportunities in education, and promoting healthy habits at preschool level, as well as in schools at every level of education, by means of various educational activities, carried out in all facilities, such as:
  - inclusion in the general core curriculum of subject matters related to the promotion of physical activity, as well as developing life skills to make informed choices regarding health and ergonomics of learning;
  - teacher training to help teachers recognize the symptoms of very early (as early as the age of 9–10 years) tobacco smoking, which – according to research findings – represents a very strong predictor of hazardous behaviour later in life;
  - enhancing personal protective assets to give children greater control over their lives, lifestyles and behaviours, so as to avoid, in particular, high-risk or disruptive behaviours including substance abuse, delinquency, violent and aggressive behaviours, as well as unplanned and unprotected sexual intercourse;
  - limiting the sales of unhealthy food in schools;
- providing further equal opportunities programmes in schools, by means of other intervention measures implemented in facilities in selected areas, such as:
  - healthy meals at school, co-financed for all children living in the areas with high poverty exposure;
  - development of a network of schools in which health is promoted, currently operating as the SHE project;
  - lessons on safety behaviour, with subjects adjusted to local conditions (for example, safety on a farm or on the road).

Poland has a low level of absolute poverty, which in today's terms is defined by the World Bank as the daily income per capita below US$ 2.15, and the country's level of relative poverty is quite close to the EU average. However, in contrast to many other EU countries, in Poland the highest risk of poverty exposure is observed not among senior citizens, but among children and adolescents under 17 years of age. Despite significant progress observed in this regard in the years 2005–2008, such risk is still higher in Poland than the averages for EU15 and EU27 countries. The challenge for the coming years is to improve the functioning of the existing social assistance system so that – without compromising the principle of preference for work over inactivity – it would support, first and foremost, families in the most difficult income situations – that is, large families, households with disabled children and single-parent families.

In spite of huge success in reducing infant deaths between 1990 and 2008, the level of infant mortality in Poland is still higher than in the EU15. Based on international comparisons, it seems feasible that infant mortality could be reduced to under 4 deaths per 1000 live births. More importantly, although a decline in mortality has been observed in all social groups, defined according to mother's education it was proportionally greater among infants born by mothers with higher education. This seems to indicate a need to improve prenatal care across the social gradient. The feature characteristic to Poland is also the fact that higher (as compared to the EU15) mortality pertains mostly to neonates in the first seven days of life, although the percentage of neonates with birth weight below 2.5 kg is even lower than in the EU15. This seems to indicate the need for further development of hospital infrastructure and health care organization dedicated to neonatal care across the social gradient.

A decrease in infant mortality and an increase in the survival rate of children born with congenital defects and metabolic disorders are accompanied by an increase in the percentage of children with chronic diseases, who should be provided with adequate treatment, rehabilitation and educational opportunities. There is a need to counteract the "drifting" of families with chronically ill children towards the lower strata of the social ladder; namely, by increasing access to systematic, high-quality care. The effectiveness of such efforts depends on diagnosing the disorder at a sufficiently early stage; developing the network of early intervention facilities; unambiguous definition of the legal basis for the financing of such services; and social assistance extended to the families who still have difficulties in getting involved in therapeutic programmes. The actions addressing special medical needs should be targeted first at families with lower socioeconomic status. As shown by the data on self-rated health, although financial status has a minor impact on the prevalence of chronic diseases of adolescents, the probability of reporting "fair" or "poor" health is higher the worse the financial status of the family. It seems that dedicated programmes could also be targeted to education entities, especially lower secondary schools. As can be seen from the data, the transfer to secondary education is accompanied by a sharp increase in the level of inequalities in health. It should be investigated whether chosen education entities could be an effective channel for intervention programmes aiming to reduce social inequalities in health.

5.3 Recommendations for public health interventions

As can be seen from the mortality analysis, the pronounced social gradient is observed in the case of people who died from CVD and respiratory diseases. As WHO research shows, in the years 2005–2015 more than 300 000 deaths in Poland (mainly from these causes) could be averted by implementing population-based strategies that result in reduced tobacco consumption and salt intake *(79)*. This would also reduce social inequalities in health.

To reduce tobacco consumption, the WHO Framework Convention on Tobacco Control (FCTC) has proposed a set of policies to reduce demand for tobacco. In the case of Poland, due to particularly high tobacco exposure and smoking impact ratios, currently the most important are an effective ban on smoking in public places, further increases in excise taxes, as well as comprehensive information regarding tobacco, including comparative information about the harmfulness of various cigarette brands *(80)* and anti-tobacco advertising. It is also very important to provide effective services targeted at encouraging people to stop smoking and supporting their efforts to do so. As shown by the data on current smokers, ex-smokers and those who have never smoked, smoking status in this respect is strongly correlated with socioeconomic position, measured by type of education. For example, people with the lowest levels of education are the most likely to be current smokers as well as the least likely to be ex-smokers. Therefore, it is of utmost importance to research and subsequently address the social determinants that impede smoking cessation.

A second important measure to reduce social inequalities in health and avoid premature deaths due to CVD is the reduction of salt consumption. The Polish diet is high in salt, with the majority coming from processed foods. The consumption of salt in Poland correlates with place of residence, as well as with income level *(81)*.

The required decrease in salt intake can be achieved in particular by means of a reduction in the salt content of processed foods and condiments by manufacturers. Another effective measure in this respect is a sustained mass-media campaign aimed at encouraging dietary change within households and communities *(80)*(action in this direction has been already included in the first module of a public health programme, titled National Program of Protection against Diseases of Civilization (*Narodowy program przeciwdziałania chorobom cywilizacyjnym*), developed by the Ministry of Health for years 2007–2011). Such activities have a great probability of success because as salt intake is reduced people will appear to prefer food with less salt, which is probably related to the accommodation of taste receptors over the course of weeks to months. In the United Kingdom, a population-wide reduction in dietary salt of 10% was achieved in four years, without a reduction in sales of food products included in the initial effort and without consumer complaints about taste *(82)*. The only potentially adverse effect of the intervention would be an increase in prevalence of iodine-deficiency diseases from reduced consumption of iodized salt. For this reason, the public campaign to reduce salt intake should be accompanied by activities aimed to supplement its consumption with sufficient iodine, to protect people who previously ate 5g of salt per day *(79)*.

The analyses presented in this book suggest that some modifiable health risks affecting the health of the entire population and contributing to the emergence of social inequalities in health not only do not decrease, but actually are on the rise. This applies to, for example, alcohol consumption or obesity. Under the circumstances, it is necessary to analyse in great detail the underlying reasons for this, in order to be able to increase the effectiveness of relevant public health programmes. According to the analysis, only few of these programmes take into account the issue of social inequalities in health. It would be desirable to evaluate the extent to which these programmes reach various social groups.

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