European Observatory on Health Systems and Policies

# HEALTH IN THE EUROPEAN UNION

## Trends and analysis

Philipa Mladovsky, Sara Allin, Cristina Masseria, Cristina Hernández-Quevedo, David McDaid, Elias Mossialos

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# Health in the European Union


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# List of abbreviations

| | |
|---|---|
| ADHD | Attention deficit hyperactivity disorder |
| AIDS | Acquired immunodeficiency syndrome |
| BIRO | Best Information through Regional Outcomes |
| BMI | Body mass index |
| CC | Candidate country |
| CEE | Central and eastern Europe |
| CHD | Coronary heart disease |
| CI | Concentration index; confidence interval |
| CIS | Commonwealth of Independent States |
| COPD | Chronic obstructive pulmonary disease |
| CVD | Cardiovascular diseases |
| DALE | Disability-adjusted life expectancy |
| DFLE | Disability-free life expectancy |
| DG SANCO | Directorate-General for Health and Consumers, European Commission |
| DSM | Diagnostic and Statistical Manual of Mental Disorders |
| ECHP | European Community Household Panel (survey) |
| ECMT | European Conference of Ministers of Transport |
| EMCDDA | European Monitoring Centre on Drug and Drug Addiction |
| ESPAD | European Schools Project on Alcohol and Other Drugs |
| ESS | European Social Survey |
| ETS | Environmental tobacco smoke |

| | |
|---|---|
| EU | European Union |
| EU10 | Member States joining the EU in May 2004 |
| EU12 | Member States joining the EU in May 2004 and January 2007 |
| EU15 | Member States belonging to the EU before May 2004 |
| EU25 | Member States belonging to the EU up to and including May 2004 accession |
| EU27 | Member States belonging to the EU up to and including the January 2007 accession |
| EUROCHIP | European Cancer Health Indicator Project |
| GDP | Gross domestic product |
| GNP | Gross national product |
| GP | General practitioner |
| HBSC | Health Behaviour in School-aged Children |
| HI | Horizontal inequity |
| HIV | Human immunodeficiency virus |
| ICD | International Classification of Diseases (WHO) |
| IDU | Intravenous drug user |
| IHD | Ischaemic heart disease |
| MSM | Men who have sex with men |
| NAC | Newly acceded country |
| NCD | Noncommunicable disease |
| OECD | Organisation for Economic Co-operation and Development |
| PDU | Problem drug use |
| SILC | Survey on Income and Living Conditions |
| SHARE | Survey of Health, Ageing and Retirement in Europe |
| STI | Sexually transmitted infection |
| TB | Tuberculosis |
| UNODC | United Nations Office on Drugs and Crime |
| WHO | World Health Organization |

# List of country abbreviations

| | |
|---|---|
| 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 |
| HR | Croatia |
| HU | Hungary |
| IE | Ireland |
| IT | Italy |
| LT | Lithuania |
| LU | Luxembourg |
| LV | Latvia |
| MK | The former Yugoslav Republic of Macedonia |
| MT | Malta |
| NL | Netherlands |
| NO | Norway |

| | |
|---|---|
| PL | Poland |
| PT | Portugal |
| RO | Romania |
| SE | Sweden |
| SI | Slovenia |
| SK | Slovakia |
| TK | Turkey |
| UK | United Kingdom |

# Executive summary

Good health can be considered one of the most fundamental resources for social and economic prosperity. While the goal to improve average levels of population health is important for any government, there has been an increasing focus on disparities at national and European levels. Improvements have been seen over the past few decades in both health status and living and working conditions in Europe. However, the level of heterogeneity in characteristics of living conditions has widened tremendously in the European Union (EU) and will continue to do so as it goes through the enlargement process. The diversity in living conditions has translated into diversity in patterns of health across the region. Inequalities in income, education, housing and employment affect population health, both directly (for example, good housing reduces risks associated with poor health) and indirectly through psychosocial factors (such as stress). From the life course perspective, individuals are affected by different sets of risks related to disease and illness; certain diseases and causes of death are more likely to affect young people, whereas the majority are associated with older ages.

Investigating differences in health status within and between European countries provides the focus of this report. The relationship between living conditions, socioeconomic factors and health is discussed and analysed with the objective of stimulating a debate and policy action for creating a healthier and more equitable society. We aim to present an overview of key issues and not a comprehensive literature review or exhaustive analysis of the topics involved.

## Summary measures of health

Measures of health show that the health of EU populations continues to increase. However, there are some marked differences across countries in terms of life expectancy, infant mortality and avoidable mortality. Life expectancy at birth has increased in all countries, and women on average continue to live longer than men. The two most recent countries to join the EU, Bulgaria and Romania, lag behind EU averages in most mortality and morbidity indicators. A gap between the EU and two candidate countries (CCs) – Turkey and the former Yugoslav Republic of Macedonia – can also be seen across all measures of health. The third CC, Croatia, has a health profile that is more comparable to the central and eastern European (CEE) countries within the EU. Since 1980, infant mortality has been reduced substantially in all countries, and is well under 10 deaths per 1000 live births at the time of writing in all but two EU countries (Romania, Bulgaria) and two CCs (Turkey and the former Yugoslav Republic of Macedonia).

Self-reported health provides a useful summary measure of overall health and well-being beyond mortality rates. Self-reported health shows considerable variation across countries, even among western European countries. It is important to bear in mind that cultural differences both within and across countries may impact the validity of both national and international comparison.

Healthy life expectancy combines estimates of self-assessed health with estimates of life expectancy. It appears that CEE countries, those of south-eastern Europe and the Baltic states have not only shorter life expectancy but also shorter expected lifespan in good health than western European countries. Finally, the level of deaths that could be avoided in the presence of timely and effective health care ("avoidable mortality") has been improving in all countries. This implies that health services and preventive health policies have been effective in improving population health. At the time of writing, wide variations in avoidable mortality remain across countries, suggesting that there is room for improvement, especially in Romania, Latvia and Hungary, and also in the United Kingdom, Portugal and Ireland.

## Chronic diseases

Chronic diseases constitute the main cause of death in the EU. The most significant chronic diseases are heart disease, cerebrovascular disease and cancer. The most common cardiovascular disease (CVD) is ischaemic heart disease (IHD), which is the leading cause of death in Europe except in Greece, the former Yugoslav Republic of Macedonia and Portugal, where the leading cause of death is stroke. There is a considerable gender gap in death rates

from heart disease in all countries, and deaths are considerably higher in CEE than in western Europe, especially among men. Standardized death rates for heart disease have fallen, in some cases steeply, in the last 25 years in western Europe, both in the north and south, as well as for men and for women.

Cancer incidence continues to rise in the EU. Lung cancer accounts for the largest proportion of cancer deaths, although breast cancer is the leading cause of cancer mortality among women. There are significantly higher rates of cancer among men than women in almost all countries, although the increase in deaths due to lung cancer among women is leading to a narrowing of the gender gap. There are large variations across countries in terms of cancer death rates, with the highest found in Hungary, the Czech Republic, Denmark, Ireland and Sweden.

Additional chronic diseases of particular importance in the EU are diabetes, respiratory diseases and liver disease. Diabetes is the fourth leading cause of death in Europe, and an important risk factor for CVD. Type 2 diabetes, which occurs late in life, accounts for approximately 90% of all diabetes in high-income countries. An important concern with diabetes is the high proportion of people who are unaware of their condition; estimates suggest that this proportion is approximately 50%. Respiratory diseases include chronic obstructive pulmonary disease (COPD), lung cancer and pneumonia. These rank second in Europe (after CVDs) in terms of mortality, incidence, prevalence and costs. Mortality rates for COPD are two to three times higher for males than for females. Deaths rates are highest for men in the CEE and CCs, and highest for women in Ireland and Romania. Liver diseases are mostly attributable to alcohol consumption, and affect men in particular. The highest death rates are seen in Hungary and Slovakia, but in western Europe the United Kingdom and Finland have seen an increase in liver disease since the 1980s.

## Mental health

Mental health is increasingly recognized by EU governments as a priority area for health and social policy. Estimates suggest that mental health problems account for 20% of the total burden of ill health across Europe. There are, however, substantial gaps in our knowledge on the prevalence of mental health disorders and steps to encourage the collection of such data would be helpful to future European comparative analysis. It appears that CEE countries have seen a decline in population mental health, along with increasing rates of alcohol use disorders, violence and suicide. Data also show a trend towards increasing absenteeism and early retirement due to mental illness (particularly depression) across Europe for both men and women.

## Communicable diseases

In spite of the eradication of many communicable diseases, they remain a significant health threat. This is mainly due to the high rates of tuberculosis (TB) and growing rates of human immunodeficiency virus (HIV) infection in several Member States and bordering countries (particularly in the Commonwealth of Independent States (CIS)), as well as the continuing threat from other (mainly epidemic-prone) communicable diseases and the emergence of new diseases. Of increasing concern is the recent rise in sexually transmitted infections (STIs), HIV and TB – particularly in the Baltic states – the high rate of drug-resistant disease, and the coexistence of HIV and resistant TB. Chlamydial infection is the most commonly diagnosed STI, with substantial increases in western Europe since 1995. Rates of gonorrhoea and syphilis had either declined or disappeared in the late 1980s but data from many countries now show that rates have been increasing since the mid-1990s. In the EU, 24 184 newly diagnosed cases of HIV infection were reported in 2004 in 23 countries (excluding Italy and Spain), representing a rate of 68 HIV infections per million population. Although rates of TB declined throughout the 20th century, TB has re-emerged in many countries. Estonia, Latvia, Lithuania and Romania are considered to be high-burden countries with high priority for TB control. Deaths under the age of 5 years from acute respiratory infection, pneumonia and influenza have declined considerably in CEE countries and the Baltic states, as well as in Portugal, in the last 30 years; rates have almost converged with the EU average.

## Injuries and accidents

Injuries are the fourth most common cause of death in the EU. Two areas of particular importance are road traffic accidents and domestic accidents. Road traffic in the EU is continually increasing. However, road traffic fatalities are decreasing in several EU countries, including Germany, the Netherlands, Sweden and the United Kingdom. Policy initiatives at various levels have been credited for the favourable trend; however, in 2002, Poland, Slovakia, Latvia, Estonia and the Czech Republic experienced figures worse than those of 1985. A total of 75% of the people involved in crashes in the World Health Organization (WHO) European Region were male. This gender difference is especially pronounced among people aged 15–29 years. Road traffic accidents particularly affect young people; they are the third leading cause of death for individuals aged under 25 years in the WHO European Region. Poor quality roads, lax enforcement of speed limits and alcohol consumption all contribute to the high level of road traffic accidents in CEE countries.

An estimated 63% of all unintentional injuries occur in the home, during sports or leisure time. The fatality rate in the EU due to home and leisure/sport accidents is twice that of road traffic accidents, and more than 10 times that of workplace accidents, at 22 per 100 000 inhabitants. Over half of all home and leisure accidents occur in and around the home. Domestic accidents are more common among the very old and very young age groups, along with females and disadvantaged socioeconomic groups. There is great variability in rates of domestic accidents in the EU, with especially high rates of injury mortality in eastern Europe. This indicates that high rates of injury can be avoided. It is difficult to obtain disaggregated figures for domestic and leisure accidents as there are variations in data collection systems. However, 12 EU countries are participating in the Injury Database Project which collects hospital treatment data by type of injury. Evidence suggests that injuries are foreseeable and can be prevented and treated, thus reducing their burden on health and welfare systems. Housing conditions are a significant risk factor for domestic accidents.

## Preventable risk factors

The causes of the main chronic disease epidemics are well established and well known. The most significant preventable risk factors are: tobacco use; unhealthy diet, including excessive alcohol consumption and excessive caloric intake; and physical inactivity. These causes are expressed through the intermediate risk factors of raised blood pressure, raised glucose and cholesterol levels, and overweight and obesity. Smoking is the largest cause of avoidable death and disease in the EU, killing over 650 000 people every year. Ireland, the United Kingdom, Norway and Iceland were the most effective in reducing national smoking rates between 1985 and 2005, where prevalence declined by 20–25%, whereas the least successful were Luxembourg, Romania and Latvia. Youth smoking is a significant problem, with many countries showing increasing rates of smoking among youths and adolescents.

Alcohol is estimated to be the third most significant cause of premature death and ill health in the EU, ahead of overweight/obesity and second only to smoking and high blood pressure.

Obesity, physical inactivity and unhealthy diet are of growing concern to policy-makers in the EU. Over 50% of the adult population in the EU is overweight or obese. Obesity prevalence has tripled in the last 20 years and, if current trends continue, there will be an estimated 150 million obese adults (20% of the population) and 15 million obese children and adolescents (10% of the population) in the WHO European Region by the year 2010.

Obesity is caused by high caloric intake and low levels of physical activity. It is associated with several significant causes of mortality and morbidity. Europe is facing growing prevalence rates of overweight children.

Illicit drug use presents a considerable threat to physical and mental health. Drug use in the EU remains at an historically high but overall stabilized level: the popularity of cannabis may have peaked and heroin, Ecstasy and amphetamine use appears to be roughly stable over recent years, while recent data suggests an increase in cocaine use. While the situation in the Baltic states remains of concern, HIV incidence related to injecting drug use seems to have fallen, but prevalence of hepatitis C in Europe is high, with 1 million intravenous drug users (IDUs) infected.

## Socioeconomic inequalities in health and health care

Reducing inequalities in health and ensuring equitable distribution of health services are key priorities among EU countries. Evidence from national and international studies show clear inequalities in mortality and health status across socioeconomic groups in all countries, and over time as health has improved, inequalities do not appear to have reduced. Income, education and occupational status affect risk factors (such as smoking and obesity), health status and mortality both directly and indirectly through psychosocial and environmental factors. Poverty and unemployment are significant contributors to inequalities, although a gradient in health is present all along the socioeconomic spectrum.

Access to health care may be reduced for lower income individuals because of financial barriers in the form of out-of-pocket payments. In some countries (such as Cyprus, Bulgaria, Greece and Latvia), such payments constitute over 40% of total health costs. Informal payments may also compromise access for those who cannot afford to pay. Geographical barriers to access may also be significant and, in some countries, higher income individuals are significantly more likely to report closer proximity to hospitals. There is evidence of inequity in access to health services across socioeconomic groups in all countries, in particular with regard to specialist care and in some cases also general practitioner (GP) and hospital care. Some studies also find that lower income individuals are more likely to report an unmet need for health care in most countries, signalling a need for more research to identify the cause of the unmet needs.

## Conclusions

The picture that emerges from this review of health trends is one of significant improvements in most countries. However, considerable challenges remain in the context of an increasingly diverse and ageing population in Europe. Increasing diversity challenges efforts to reduce inequalities in health, and the ageing population underlines the need for effective policies to promote healthy ageing, and to prevent disease and disability. Finally, it is important to note that there are several limitations in terms of the surveys available for comparing data between European countries. Improvements are needed in: (1) scope; (2) comparability; (3) motivation of behaviours; and (4) accessibility.

# Chapter 1
# Introduction

## 1.1 The social determinants of health

The level of heterogeneity in living conditions such as absolute and relative income, education, employment, housing and transport continues to widen within the European Union (EU). Changes in socioeconomic conditions affect population health directly, as well as through psychosocial factors. While the goal to improve average levels of population health is important for all governments, there has also been an increasing focus on health equity both at the national and European levels. Health equity implies the "absence of unfair and avoidable or remediable differences in health among population or groups defined socially, economically, demographically or geographically" (Macinko and Starfield 2002). The focus of this report is on investigating the differences in health status within and between European countries.

Economic growth is a major determinant of average health status in poor and developing countries where malnutrition and infectious diseases are the main causes of a high percentage of maternal, infant and childhood deaths. Among poor countries, a small rise in gross national product (GNP) corresponds with large gains in life expectancy; but as GNP increases, the relationship levels off. In wealthy countries, absolute income has no significant effects on longevity (Marmot 1999) but what matters is the association between relative income – or societal status – and health.

Socioeconomic inequalities in health status are persistent in all societies; even in the richest countries those that are better off live longer and report better health than the poor. The social conditions in which people live and work affect their health status and longevity and contribute to widening the gap between socioeconomic groups. The relation between health and socioeconomic status

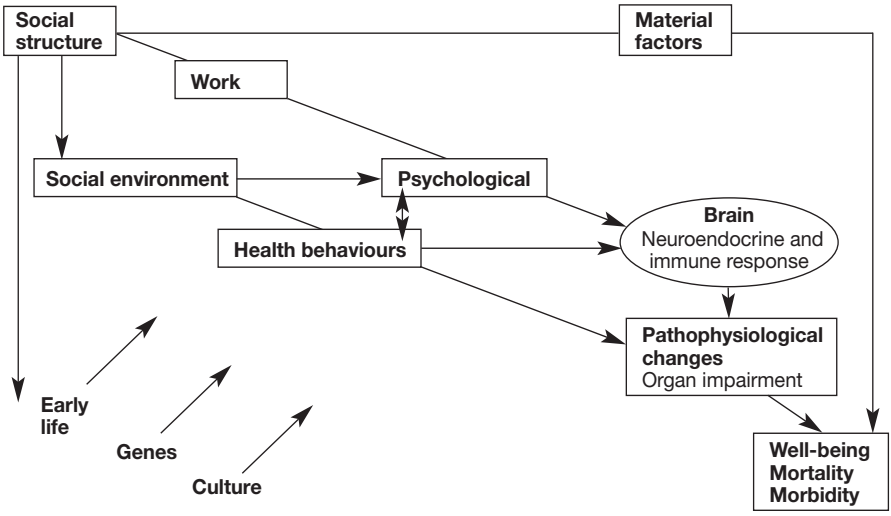
may be bidirectional: either health status influences socioeconomic position ("selection"), or social context leads to illness ("causation"). Sick individuals are more likely to lose their jobs and remain unemployed than healthy people but people in poor health are also more likely to move downward than upward (Mackenbach et al. 2002b). It has been shown that there is a higher probability of lower socioeconomic groups developing health problems than higher socioeconomic groups, suggesting that the direction is more likely to be from social environment to illness and not the other way round. "Causation" instead of "selection" therefore seems to be the predominant explanation for socioeconomic inequalities in health.

Different models have tried to synthesize the relation between socioeconomic status and health. Although these models may vary in degree of complexity and details, they are all based on the "layered" view of the causation of health inequalities (Mackenbach et al. 2002a). Lower socioeconomic status leads to ill health through a number of other factors that represent the "link" between socioeconomic status and health.

Genetic predispositions have the principal role in determining why, among the exposed, one person is more likely to fall ill than another. However, the individual level of analysis may miss the social causes of diseases. Marmot and Wilkinson link biological and social determinants of health (Fig. 1.1); individual genetic predisposition, environment and lifestyle characteristics are all factors that affect ill health (Marmot and Wilkinson 1999). The recent World Health Organization (WHO) Commission on Social Determinants of Health highlights the complex roots of inequalities within and between countries as the "unequal distribution of power, income, goods, and services, globally and nationally, the consequent unfairness in the immediate, visible circumstances of people's lives – their access to health care, schools, and education, their conditions of work and leisure, their homes, communities, towns, or cities – and their chances of leading a flourishing life" (WHO 2008).

Looking at the social gradient in health, income, education and occupational status affect health and life expectancy both directly and indirectly through psychosocial factors. People at the lower end of the social scale are more likely to report ill health than those near the top, both at individual and population levels. A health gradient is present all along the social spectrum. Lifestyle choices clearly have an effect on health. However, these appear to be influenced by social factors. For example, in the post-war period there has been a reversal of the trend towards higher social classes suffering disproportionately from the "diseases of affluence" such as heart disease, as the risk factors for these diseases (smoking, alcohol, diet and inactivity) became prevalent among lower social groups.

**Fig. 1.1** *Social determinants of health*




*Source:* Marmot and Wilkinson 1999.

Among the lifestyle-related sources of socioeconomic inequalities in health, such as diet, housing, job control, physical exercise, smoking and alcohol consumption (Mackenbach et al. 2002b), it is difficult to differentiate those that are the result of free choices from those that are influenced by the stratification of society. Indeed, only the latter can be considered a violation of social justice and avoidable and, therefore, reflect unfair socioeconomic inequality in health. Roemer has argued that unhealthy choices made by individuals in a particular social stratum have to be regarded as a product of that class structure as long as the individuals' risk-taking is not greater than the average risk-taking of the people within that stratum (Roemer 1995). A corollary of this thesis is that the behaviour of working-class people cannot be judged freely most of the time.

According to the life-course perspective, past social positions influence individuals' health status; advantages and disadvantages tend to cluster cross-sectionally and to accumulate longitudinally (Blane 1999). On the one hand, advantages and disadvantages in one sphere of life are likely to be associated with similar advantages or disadvantages in other spheres of life. On the other hand, advantages and disadvantages in one phase of life are likely to have been preceded by similar advantages or disadvantages in other phases of life. Therefore, "the underlying dynamic of this social process is the continuity of social circumstances from parental social classes to social conditions during childhood and adolescence and, eventually, to adult socioeconomic position" (Blane 1999). Individual social experiences are undeletable – they are written into the physiology and pathology of our body: a child raised in an affluent

home is likely to succeed educationally, which will favour the entrance to more privileged sectors of the labour market, and increase the probability that she/he can live in a good-quality house and earn an income that permits a healthy lifestyle. On the contrary, a child from a disadvantaged home is likely to achieve few educational qualifications, to enter the unskilled labour market, to have a low-paid job in which she/he encounters risk, all contributing to a lower probability of leading a healthy lifestyle. Family socioeconomic status is strongly related to the child's educational opportunities, which in turn are associated with subsequent occupation and income. Parental interest in the child's education is also likely to affect educational attainment, and educational attainment, along with occupation, is likely to be related to health habits, such as smoking, exercise and dietary choices.

Social hierarchy may also induce worries about possible incompetence and inadequacy, feelings of insecurity and fears of inferiority. These feelings are among the most powerful and recurrent sources of chronic stress and increase people's vulnerability to a wide range of infections and cardiovascular diseases (CVDs). The proposed pathway is therefore that income distribution affects the quality of life, which in turn affects health (Kawachi et al. 1997).

Many diseases, each with different established risk factors, show similar social patterns – this is termed the "hypothesis of generalized susceptibility" (Berkman and Syme 1976). Each social position has a different exposure probability, encountering specific patterns of health risks. Exposures may vary in terms of duration, amount and type (Diderichsen, Evans and Whitehead 2001). For example, people in lower socioeconomic groups have a higher probability of being exposed to hazards both while at work and at home (for example, greater risk of toxic exposure) and they might also be more vulnerable and susceptible to diseases than individuals that are economically better off. Therefore, even if a risk factor is distributed equally across social groups, its impact on health may be unequally distributed, given the differences among social groups in their vulnerability or susceptibility to that factor.

WHO established a Commission on Social Determinants of Health to address the gradient of health inequality. The contribution of Wilkinson and Marmot addresses 10 interlinked themes – the social gradient, stress, early life, social exclusion, work, unemployment, social support, addiction, food and transport – in order to understand the causes of health inequalities (Wilkinson and Marmot 2005). The final report of the Commission highlights the improvement of daily living conditions as one of its three overarching recommendations, with five specific areas of action advised. In relation to children, it argues for a comprehensive approach to the early years in life through policy coherence, commitment and leadership at

international and national levels. It also requires a comprehensive package of early childhood development and education programmes (WHO 2008). In relation to the communities in which people live, it calls for the assurance of access to basic goods, social cohesiveness, designs to promote good physical and psychological well-being, and protection of the natural environment. In relation to working conditions, it argues that the assurance of fair employment and decent working conditions can help eradicate poverty, alleviate social inequities, reduce exposure to physical and psychosocial hazards, and enhance opportunities for health and well-being. In relation to social protection, it argues that governments build systems that allow a healthy standard of living below which nobody should fall due to circumstances beyond her/his control.

Finally, the report highlights the importance of the health care system in improving daily living conditions. The health care system may also play a role in explaining health inequalities. Although most research in the area of health equity has focused on the social determinants of health, it is important to understand the contribution of health care to not only improving health, but also possibly reducing inequalities. Most importantly, access to health care may not be equitable across social groups, thus exacerbating existing health inequalities. Individuals in most need of health care may be less able to benefit from the services available to them, whether due to financial barriers, such as payments required, or sociocultural barriers, such as having less "voice" or ability to navigate the system. Offering universal access to health care services does not eliminate inequalities, as shown by most industrialized countries that have removed financial barriers to access. However, the extent to which improvements in health care (in terms of medical advancements) continue to benefit more privileged social classes due to inequalities in access could be tempered by a more active role by the health system in fighting health inequalities. This report provides a descriptive overview of the trends in health status, risk factors and health inequalities in Europe. In the context of increasing diversity and ageing of the European population, it also provides a resource for policy-makers and researchers interested in gaining an understanding of some of the key challenges that governments face in their efforts to ensure a healthy, productive and equitable society.

## 1.2 Methodology and structure

This report presents health data and public health policies in the EU, focusing on each of the main causes of mortality and morbidity in turn. Much of the statistical information is drawn from WHO's Health for All database. The analysis was conducted in 2008 and the most recent data available were used. Where available, supplementary sources were used to report data on, in

particular, health inequalities, diabetes, mental health, sexually transmitted infections (STIs), injuries and accidents, illicit drugs and health behaviour among children. The analysis mostly focuses on the last 25 years or so, from the time of publication. This is because in many countries, particularly in countries of central and eastern Europe (CEE), data from before this period are unavailable or may be unreliable. Comprehensive literature reviews were also carried out to identify supporting studies. Where there are technical problems with the data, for example in comparing obesity, STI or road traffic accident data across countries, this is highlighted, although addressing these problems is beyond the scope of the report. It is important to note at the outset that this report is not a comprehensive review of the literature in each subject area; rather, the aim is to identify some of the key pieces of research, legislation and summary reports in order to serve as a resource for future research and policy analysis.

The report begins with an overview of the main indicators of population health, focusing on life expectancy, infant deaths, self-reported health and premature deaths and disability. It highlights the diversity in health status across Europe, attempting to identify current differences between countries, historical trends and possible future directions. In light of these differences and similarities, at the risk of oversimplification, four broad categories are discerned in terms of levels of health and accompanying risk factors. These comprise: (1) western Europe; (2) CEE EU Member States, plus Croatia; (3) Baltic states; and (4) the south-eastern European Member States (Bulgaria and Romania) and candidate countries (CCs) (the former Yugoslav Republic of Macedonia and Turkey). In many charts in the report only a selection of countries is represented due to space constraints. The country selection is based on data availability and geographical spread.

The focus then turns to specific disease patterns. The disease-specific analysis begins with an examination of trends in chronic conditions. The chronic diseases covered comprise: CVDs; cancer; diabetes; respiratory diseases (focusing on chronic obstructive pulmonary disease (COPD) and asthma); chronic liver disease and cirrhosis; and mental health. Then follows an outline of communicable diseases in Europe, beginning with STIs, including HIV/AIDS (human immunodeficiency virus/acquired immunodeficiency syndrome). After this, trends in tuberculosis (TB), pneumonia and influenza are described; and next, mortality and morbidity caused by injuries and road traffic accidents are reported.

The report then turns to the major underlying factors for observed patterns. These comprise tobacco use; unhealthy diet, including excessive alcohol consumption and excessive energy intake; and physical inactivity. Trends in

illicit drug use are also reported. Finally, all the main causes of mortality and morbidity are drawn together in the chapter on socioeconomic inequalities in health and access to health care.

## 1.3 Definitions of the main indicators used in the report

**Box 1.1** *Main indicator definitions*

**Standardized death rate (SDR) or Standardized mortality rate (SMR)** is calculated using the direct method, that is, representing what the crude rate would have been if the population had the same age distribution as the standard European population.

**Disability-adjusted life expectancy (DALE)** estimates are based on the life tables for each country, population representative sample surveys assessing physical and cognitive disability and general health status, as well as detailed information on the epidemiology of major disabling conditions in each country.

**Disability-free life expectancy (DFLE)** is the average number of years an individual is expected to live free of disability if current patterns of mortality and disability continue to apply.

**Healthy life expectancy (HALE)** is the average number of years that a person can expect to live in "full health" by taking into account years lived in less than full health due to disease and/or injury.

**Incidence rate** is the number of newly diagnosed cases of a disease during a given calendar year. The age-standardized incidence rate represents what the crude rate would have been if the population had the same age distribution as the standard European population.

**Infant mortality rate** is the probability of dying between birth and exactly one year of age, expressed per 1000 live births. Neonatal mortality data refer to deaths during the first 28 days of life.

**Life expectancy** at birth and ages 40, 60, 65 and 80 years is the average number of years that a person at that age can be expected to live, assuming that age-specific mortality levels remain constant.

**Prevalence rate** is the cumulative number of cases of a disease (old and new cases).

**Preventable mortality** refers to deaths from conditions which are responsive to interventions that are usually outside the direct control of the health services through intersectoral health policies. Estimates of preventable mortality combine three major causes of death: lung cancer, motor vehicle and traffic accidents, and cirrhosis.

**Box 1.1** *cont.*

**Self-reported ill health** as measured by the European Community Household Panel (ECHP) is defined as either the percentage of people reporting being in either "bad" or "very bad" health, or with limitations in daily activity due to health reasons.

**Treatable mortality** refers to deaths from conditions which are responsive to medical intervention through secondary prevention and treatment. Three of the main causes of treatable deaths include infant mortality, cerebrovascular disease and testicular cancer, although over time the conditions that are considered treatable may change.

*Note*: There may be methodological difficulties associated with calculating and comparing many of these indicators. These are described in the main body of the report.

# Chapter 2
# Summary measures of health

**Box 2.1** *Summary of Chapter 2*

**Section 2.1 Life expectancy and infant deaths**

- Aggregate measures of health show that the health of EU populations continues to increase, although there are some marked differences in life expectancy, infant mortality and avoidable mortality across countries.
- Life expectancy has increased in all countries, from an average of 73.65 in 1980 to 79.05 in 2006 across EU27 countries (Member States up to and including the January 2007 accession).
- Women on average live longer than men. The gap is as large as seven years in some countries, such as France, Finland and Spain.
- The two most recent countries to join the EU, Bulgaria and Romania, lag behind EU averages in terms of most mortality and morbidity indicators. A gap between the EU and two CCs, Turkey and the former Yugoslav Republic of Macedonia, is also seen across all summary measures of health. The third CC, Croatia, has a health profile that is comparable to the CEE countries within the EU.
- Since 1980, infant mortality has been reduced substantially in all countries, and is well under 10 deaths per 1000 live births at the time of writing in all but two EU countries (Romania and Bulgaria), and in two CCs (Turkey and the former Yugoslav Republic of Macedonia).

**Section 2.2 Self-reported health**

- Self-reported health shows considerable variation across countries, including among western European countries.
- Cultural differences both within and across countries may impact on the validity of both national and international comparison.

**Box 2.1** *cont.*

**Section 2.3 Premature deaths and disability**

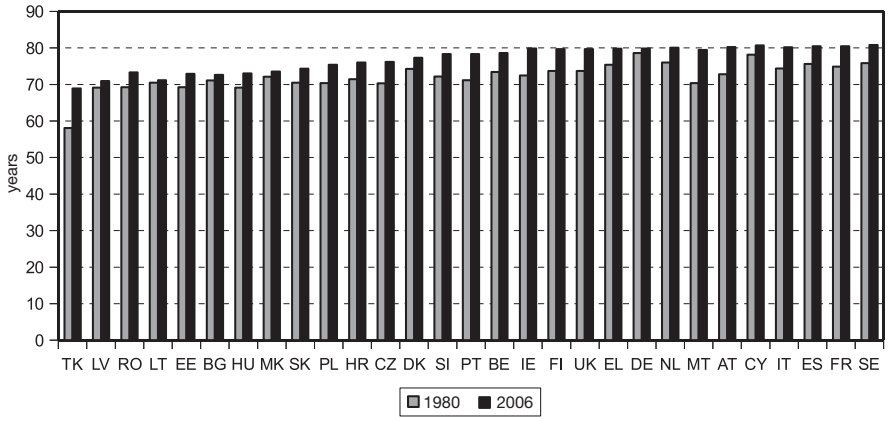
- Healthy life expectancy combines estimates of self-assessed health with estimates of life expectancy. It appears that CEE countries, south-eastern Europe and the Baltic states have shorter life expectancy, along with a shorter expected lifespan in good health than countries in western Europe.
- Levels of deaths that could be avoided in the presence of timely and effective health care ("avoidable mortality") have been improving in all countries. However, wide variations in avoidable mortality remain across countries, suggesting that there is room for improvement, especially in Romania, Latvia and Hungary, but also in the United Kingdom, Portugal and Ireland.

## 2.1 Life expectancy and infant deaths

One of the most widely cited summary measures of population health is life expectancy at birth, which continues to increase over time as mortality rates fall. Average life expectancy in EU27 countries rose from 73.65 in 1980 to 79.05 in 2006. However, the rate of improvement has differed across countries (Fig. 2.1). In January 2007 Bulgaria and Romania joined the EU as part of its sixth enlargement phase, bringing the number of Member States to 27. The process of enlargement has greatly increased the diversity in patterns of health across Europe and will continue to do so.

In light of the variability between Member States, at the risk of oversimplification, four broad regions can be discerned in terms of levels of health and accompanying risk factors. These comprise: (1) western Europe (EU15 plus Cyprus and Malta); (2) CEE countries (Croatia, the Czech Republic, Hungary, Poland, Slovakia and Slovenia); (3) the Baltic states (Estonia, Latvia and Lithuania); and (4) the four remaining south-eastern European newly acceded countries (NACs) and CCs (Turkey, the former Yugoslav Republic of Macedonia, Bulgaria and Romania). In other words, in order to facilitate analysis of health trends in Europe, this report does not categorize countries according to their EU status (EU15, EU10, EU27, NAC and CC). Rather, countries are grouped primarily according to their mortality and morbidity profile. The EU average, unless otherwise stated, includes all 27 Member States.

**Fig. 2.1** *Life expectancy, 1980* and 2006***




*Sources:* WHO Regional Office for Europe 2008b; Corens 2007.

*Notes:* * Estonia, 1981; Germany, 1990; Croatia and Slovenia, 1985; The former Yugoslav Republic of Macedonia, 1991. ** Turkey, 2004; Romania 2007; Estonia 2005; Bulgaria, 2004; Hungary, 2005; The former Yugoslav Republic of Macedonia, 2003; Slovakia, 2005; Czech Republic, 2005; Denmark, 2001; Portugal, 2004; Belgium, 2001; Malta, 2005; Italy, 2003; Spain, 2005; France, 2005; Sweden, 2005.

## Life expectancy and infant deaths in western European Member States

Western Europe has experienced a steady increase in life expectancy in the last 30 years and most of these countries have long life expectancies when compared to CEE countries (Fig. 2.2, see colour section). The most dramatic increases have been in Portugal and Malta, where life expectancy rose by approximately 10 years in that period. Italian and Spanish women, along with Italian and British men also experienced significant increases in life expectancy, of eight to nine years. Despite the convergence in life expectancy over time, there is still variation in this group: the difference between the countries with the longest longevity (Italy and Sweden) and those with the shortest (Ireland and Portugal) is approximately three years. These longevity gains are largely due to a significant fall in mortality rates at advanced ages, although a high degree of heterogeneity can be observed across countries (Fig. 2.3, see colour section).

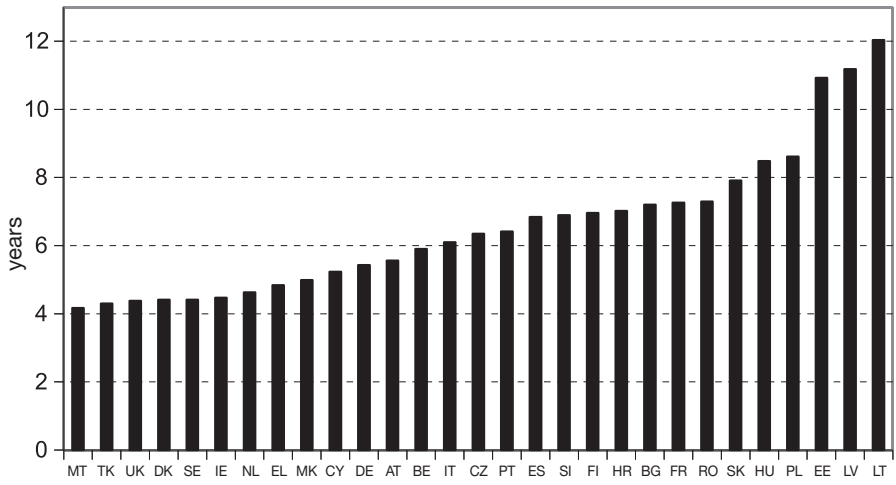
In all these countries, as in all of Europe, women are expected to live longer than men. The gap is as large as seven years in some countries, such as France, Finland and Spain (Fig. 2.4). However, there has been a narrowing gender gap in life expectancy among western European countries since the mid-1990s. Rising levels of smoking-related mortality among women (discussed in Section 7.1) have contributed significantly to this pattern.

Infant mortality has decreased in all countries because of improvements in living conditions and health care (Fig. 2.5), reaching low levels across the EU15, Malta and Cyprus in the last 30 years (Fig. 2.6, see colour section). Reproductive health policies, including the care for pregnant women and neonates, have played an important role in reducing infant deaths. In 1975, infant mortality was as high as 39 deaths per 1000 live births in Portugal and over 20 per 1000 in Greece, Italy and Austria. At the time of writing, infant mortality ranges between 3 deaths per 1000 live births in Finland and Sweden and 5 per 1000 in the United Kingdom, Malta, the Netherlands and Portugal. Portugal has seen its infant mortality rate reduced by over 90% since 1970, as it progressed from the country with the highest rate in Europe to one among the lowest.

### Life expectancy and infant deaths in central and eastern Europe

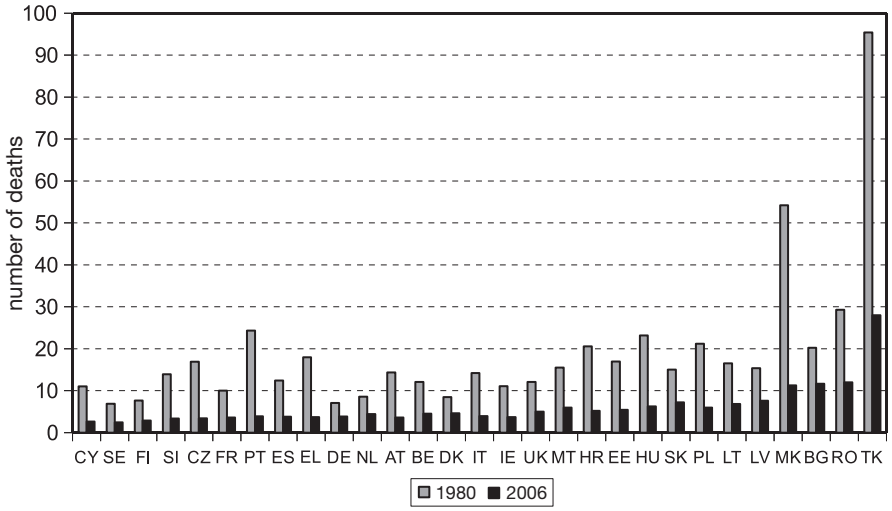
The former Eastern bloc countries that are now members of the EU experienced stagnating male mortality and only very minor improvements in female mortality in the 1970s and particularly the 1980s. During this time there was considerable variation among the CEE countries, with standardized death rates among Hungarian men being approximately two times higher than among men in Slovenia or the Czech Republic (Nolte, McKee and Gilmore 2005). Overall, death rates among middle-aged men were approximately 2.5 times higher in CEE countries than in western Europe (McKee, Adany and MacLehose 2004). Data from the 1970s and the 1980s may be unreliable

**Fig. 2.4** *Female–male differences in life expectancy at birth, latest available year*




*Sources:* WHO Regional Office for Europe 2008b; Corens 2007.

**Fig. 2.5** *Infant deaths per 1000 live births, 1980* and 2006***




*Sources:* WHO Regional Office for Europe 2008b; Corens 2007.

*Notes:* *Cyprus, 1990; Estonia, 1981; Germany, 1990; Lithuania, 1981; Slovakia, 1986; Slovenia, 1984. ** Sweden, 2005; Czech Republic, 2005; France, 2005; Portugal, 2004; Spain, 2005; Belgium, 2004; Denmark, 2004; Italy, 2003; Malta, 2005; Estonia, 2005; Hungary, 2005; Slovakia, 2005; The former Yugoslav Republic of Macedonia, 2003; Bulgaria, 2004; Romania, 2007; Turkey, 2004.

for some CEE countries and are not available for Croatia and Slovenia, formerly part of Yugoslavia. Croatian data from the early 1990s also need to be treated with caution due to the population movements during the war. By the mid-1980s the population in Slovenia and Croatia had significantly short life expectancy than countries in western Europe, yet a longer life expectancy than many of their CEE counterparts.

Most countries in the former Eastern bloc experienced a mortality crisis in the early 1990s after the fall of communism (Nolte, McKee and Gilmore 2005). In some countries, this worsening of mortality was short lived and followed by improvements in health, which were rapid in Poland and the Czech Republic, and delayed in Hungary (Bobak et al. 1997) (see Fig. 2.7, see colour section). Slovenia appears to fall somewhere in between the EU and the other CEE countries.

Today, all five central European Member States and Croatia continue to have life expectancies below the EU average, particularly Hungary, where the difference is approximately five years. However, in comparison to the Baltic states and other members of the Commonwealth of Independent States (CIS),

the CEE countries have made remarkable progress. Adult male mortality has been improving in most of the CEE countries since the early 1990s. For instance, while both Poland and the Russian Federation experienced increases in adult mortality among young adults throughout the 1980s and early 1990s, this rise was only temporary in Poland, where death rates have since fallen to approximately 30% lower than they were in 1991. In contrast, among young adults in the Russian Federation, mortality remains 60% higher than in 1991 in both men and women, and among older adults (aged 35–64) mortality rates increased by 85% in men and 66% in women from 1991 to 1994, while rates have now reduced only slightly and are still 40–50% higher than they were in 1991 (Nolte, McKee and Gilmore 2005).

Fig. 2.8 (see colour section) shows the life expectancy at age 65 among these countries, demonstrating a significant increase in longevity. The increasing proportion of older people in the population largely results from declining mortality rates among this age group. CEE countries have also seen marked falls in birth rates, contributing to the rapid ageing of their populations.

In general, the sex difference in life expectancy of CEE countries is high in comparison to western Europe, although the Czech Republic and Croatia have smaller sex differences than France. The sex difference in Hungary was as high as 9.5 years in the mid-1990s, with the recent decline probably being attributable to female mortality from smoking (lung cancer) which has been steadily increasing since the mid-1980s, while male mortality from the same cause has decreased or attenuated since the mid-1990s.

Reported presence of long-standing illness is also quite high in the CEE countries compared to those of western Europe, but it reveals a different gender effect than mortality data. In all of the CEE countries except the Czech Republic, women report greater prevalence of long-standing illness, reaching over 30% of the population in Hungary, Poland, Slovakia, Slovenia and the Baltic states (McKee, Adany and MacLehose 2004). Thus, it appears that when considering morbidity measures, surviving women fare worse than men.

While generally higher than the EU average, infant and child mortality rates in CEE countries have been falling since the 1980s and accelerated in the 1990s (Fig. 2.9, see colour section). The Czech Republic and Slovenia are in fact among the countries with the lowest infant deaths per 1000 live births in Europe at the time of writing. This has been attributed to improvements in quality of health care (McKee, Adany and MacLehose 2004). The Czech Republic and Slovenia also have lower under-5 mortality rates than the EU average.

### Life expectancy and infant deaths in the Baltic Member States

In eastern Europe, the Baltic countries (Estonia, Latvia, and Lithuania) face the greatest health challenges. The political and economic transition in the former communist countries was associated with a significant worsening of population health among these nations.

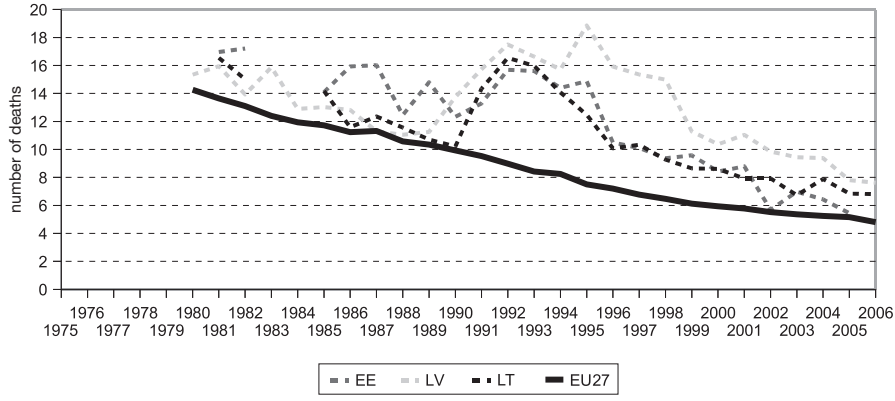
From the mid-1980s the three Baltic countries experienced fluctuating life expectancy that mirrored that of other former Soviet countries. For example, the Russian Federation and Ukraine saw an actual decline in the Human Development Index in the 1990s, reflecting an inability to reduce income and human poverty (Bobak et al. 1997). From 1994 the Baltic countries showed signs of improvement, however, so that by the year 2000 mortality among adults had generally fallen back to the 1991 level (see Fig. 2.10, see colour section), or in some cases even below those rates (such as among women aged 55–84 years) (Nolte, McKee and Gilmore 2005). The other former Soviet states such as the Russian Federation, on the other hand, have once again deteriorated (McKee, Adany and MacLehose 2004).

Recent health trends among these countries can be better understood by disaggregating mortality figures. When comparing male and female mortality rates, it is apparent that men have been especially vulnerable to the political and economic instability, as they have experienced a significant deterioration in health, probably associated with excessive alcohol consumption (McKee, Adany and MacLehose 2004; Nolte, McKee and Gilmore 2005). Reflecting this, the Baltic countries have the highest sex differences in life expectancy in the EU (see Fig. 2.4, p.12).

Age-specific mortality rates provide further insight into the source of the health gap between the Baltic countries of the EU and those of western Europe. While childhood survival has been improving in the Baltic countries, as in the CEE countries, the former experienced significant, short-term increases in child mortality in the early 1990s, contributing to the drop in life expectancy at that time. There have been improvements since the mid-1990s, however; infant mortality in the Baltic states halved, with the greatest reductions taking place between 1995 and 2000 (Fig. 2.11). There has also been a significant drop in under-5 mortality since the mid-1990s, again with the greatest improvements occurring towards the end of that decade. While the decline in childhood mortality in Latvia and Lithuania has attenuated in recent years, in Estonia it has continued falling. For example, in Latvia under-5 mortality only fell from 12.36 per 1000 in 2000 to 11.33 per 1000 in 2004, while in Estonia it fell from approximately 8.5 per 1000 in 2000 to 5.5 per 1000 in 2005 and is lower than in Hungary and Poland at the time of writing.

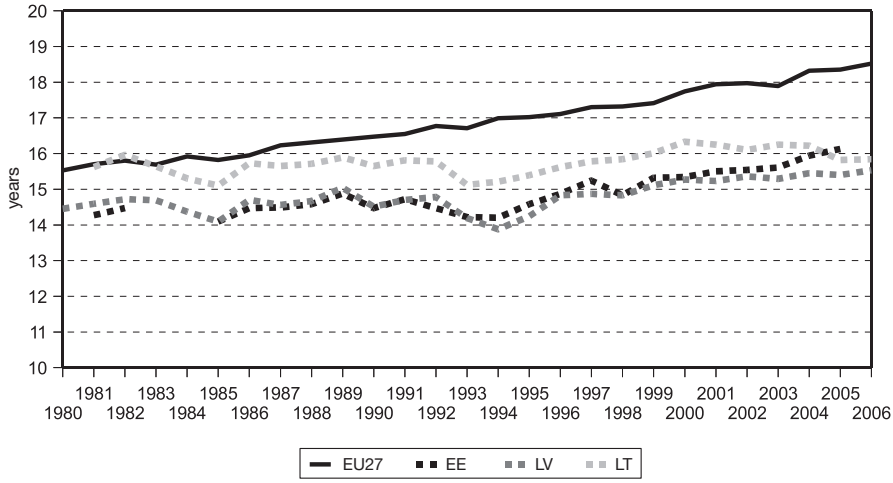
In the Baltic countries, as in CEE countries, there was a decline in old-age mortality in the late 1990s (Fig. 2.12), a few years later than in countries such as Poland and the Czech Republic. However, old-age mortality still remains significantly higher than in western European countries (Nolte, McKee and Gilmore 2005).

**Fig. 2.11** *Infant deaths per 1000 live births, EU average, Estonia, Latvia and Lithuania*




*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.12** *Life expectancy at age 65, EU average, Estonia, Latvia and Lithuania*




*Source:* WHO Regional Office for Europe 2008b.

## Life expectancy and infant deaths in south-eastern Europe: Bulgaria, Romania, Turkey and the former Yugoslav Republic of Macedonia

Life expectancy at birth in Turkey, Bulgaria and Romania has been increasing since 1970 and more rapidly since the 1980s. However, as in most countries of the former Soviet Union, Bulgaria and Romania experienced a mortality crisis in the early 1990s. After the fall of communism, men in these two countries experienced a steady deterioration in mortality and women experienced no improvements (Nolte, McKee and Gilmore 2005). In fact, the trend in life expectancy in these two countries is similar to that in CEE countries.

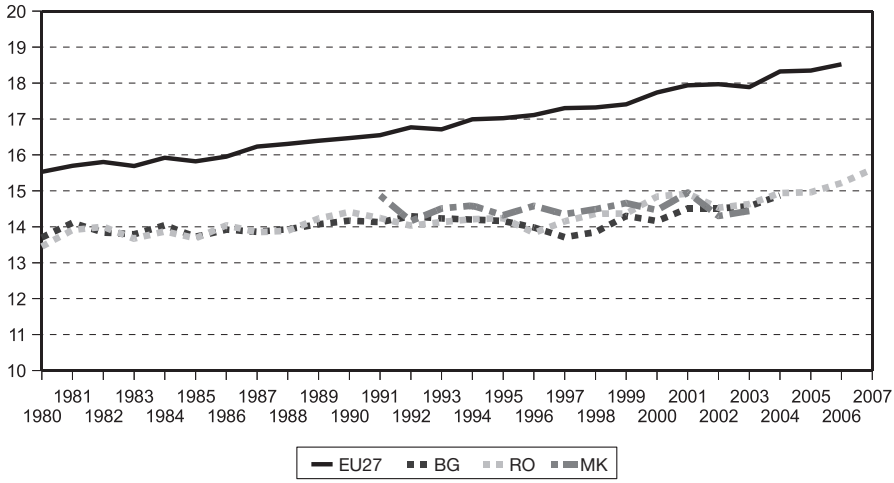
For the former Yugoslav Republic of Macedonia, reliable mortality data are only available from 1990 onwards. Life expectancy has improved since that time, by approximately two years for women and one year for men. In the former Yugoslav Republic of Macedonia life expectancy is longer than in Turkey, Bulgaria and Romania. In the last 20 years, Macedonian male life expectancy has been longer than the average for the new Member States. The sex difference in life expectancy, at five years, is two years lower in the former Yugoslav Republic of Macedonia than in Bulgaria and Romania. In fact it is amongst the lowest in Europe (see Fig. 2.4, p.12). In this the former Yugoslav Republic of Macedonia is similar to Turkey, where the difference is lower than in most of the EU.

Mortality rates in Turkey have been very different to the three other countries in this region. In 1980 the average life expectancy for Turkish women was relatively low; 60 years for women and 56 years for men against the averages of 77 and 70 years in the 27 states that constitute the EU at the time of writing. This health disadvantage has been attributed to high levels of CVD (Onat 2001; Razum, Akgün and Tezcan 2000), and high rates of infant and child mortality. In the 1970s and 1980s Turkey experienced a sharp increase in life expectancy; by 2002 the gap with the EU was smaller, with a life expectancy of 72 for women and 68 for men (see Fig. 2.13, see colour section). The early 1990s were witness to increasing rates of smoking-related cancers; however, since then, Turkey has implemented effective, wide-ranging tobacco-control policies, withstanding efforts by the transnational tobacco industry to subvert this progress (Firat 1996). Overall, Turkey appears to be facing a dual health burden of elevated levels of communicable disease (accounting for high levels of infant and child mortality) and continually rising levels of noncommunicable diseases (NCDs) in adulthood.

Although infant mortality has decreased in the last 30 years in all four countries, they still lag behind both the new Member States' average and the EU average (Fig. 2.14, see colour section). The number of infant deaths per 1000 live births is approximately 2 to 3 times higher in the former Yugoslav Republic of

Macedonia, Bulgaria and Romania than the EU 27 average (5.25 per 1000) and for Turkey the gap is far larger (5 times higher). In Turkey, perinatal conditions were the second most common cause of death (4.5% of the total) in 2002 (WHO Regional Office for Europe 2005a). A study found that the most significant causes of death were antepartum stillbirths, prematurity and lethal congenital malformations. Reduction in the perinatal mortality rate in Turkey is likely to be possible only with the improvement of prenatal, delivery and postnatal care, along with prevention of prematurity (Erdem 2003). Old-age mortality has not improved in the former Yugoslav Republic of Macedonia and has improved only marginally in Romania and Bulgaria and, 10 years ago, began lagging behind the new Member States (Fig. 2.15).

**Fig. 2.15** *Life expectancy at age 65, EU average, the former Yugoslav Republic of Macedonia, Romania and Bulgaria*




*Source:* WHO Regional Office for Europe 2008b.

*Note:* Data for Turkey not available.

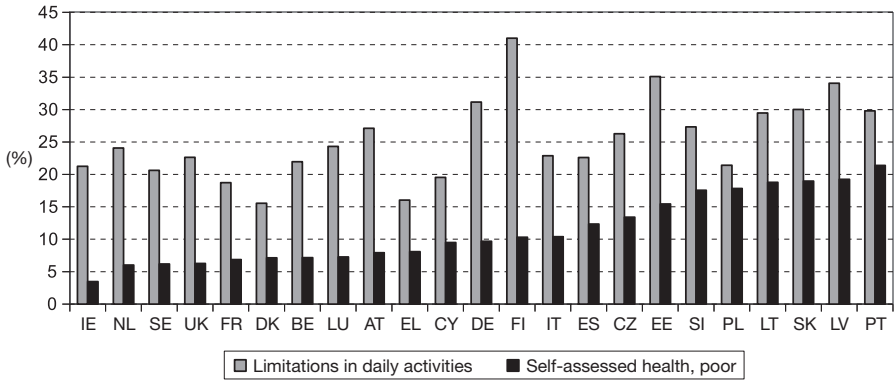
## 2.2 Self-reported health

There are many methods of measuring morbidity using macro-level and micro-level indicators. Population summary measures such as those presented earlier, albeit useful in estimating overall population health, may not provide insights into the underlying factors that potentially influence health attainment in a country. Employing objective health measures at a micro level, such as blood pressure and body mass index (BMI), is an important approach to measuring population health, but it is often expensive and may be subject to measurement error (Masseria et al. 2007). Conversely, self-assessed measures, such as general health and limitations in daily activities, are often more readily available.

Many cross-national studies have demonstrated that self-assessed indicators are better predictors of mortality than medical records, denoting that these measures capture other important influences on mortality beyond objective measures (Idler and Benyamini 1997; Mackenbach et al. 2002a; Sundquist and Johansson 1997). However, self-assessed health measures are sensitive to variations in environmental conditions, individual expectations as well as wording and meaning of assessment questions. Significant advances have been made at EU level to facilitate and improve cross-country comparisons of health status; however, improved longitudinal data are needed, along with better international coordination of survey design and implementation. The ECHP measures self-reported ill health, defined as either the percentage of people reporting being in either "bad" or "very bad" health, or with limitations in daily activity due to health reasons.

On average, central and south-eastern countries report worse self-reported health than northern countries (Fig. 2.16). The percentage of people reporting either "poor" or "very poor" health is approximately 21% in Portugal, and more than 10% in Latvia, Lithuania and Slovakia, but less than 6.5% in Ireland, the Netherlands, Sweden and the United Kingdom. It is important to take into consideration that these may be spurious differences, since individuals with the same health status may have different perceptions and expectations of their conditions. The relationship between self-assessed health and mortality is often mediated by geographic location, psychosocial factors (such as social integration, stress), gender, age and socioeconomic position (Masseria et al. 2007). Thus, self-reported health is not only a function of actual health status, but also of individuals' or population groups' perceptions of health. Large cultural differences both within and across countries may impact on the validity of both national and international comparison. As a

**Fig. 2.16** *Self-reported ill health in 10 European countries, 2000*




*Source:* European Commission 2006b.

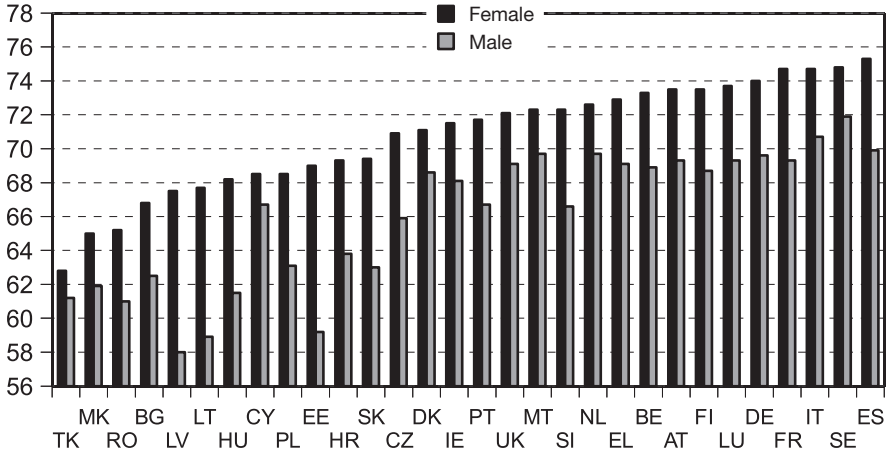
result, only part of the cross-country variation observed in self-reported health may reflect true health differences, such as chronic conditions or objective measures of health, whereas the remaining variation may be due to differences in reporting styles and other cultural specific factors (Jurges 2007). Indeed, the self-reported health status results do not appear to directly correspond to macro-level health indicators such as life expectancy or healthy life expectancy (Fig. 2.1, p.11 and Fig. 2.17). Moreover, although in each country there is large correlation between self-reported health status and limitations in daily activities (varying between 52% and 74%), still these latter results (see Fig. 2.16) present a completely different mapping of health status in Europe. Denmark, Greece and France are the countries with the lowest percentage of people reporting any limitations in daily activity because of health problems, while Latvia, Estonia and Finland are those with the highest percentage.

## 2.3 Premature deaths and disability

### Healthy life expectancy and disability-adjusted life expectancy

Measures of healthy life expectancy bring together mortality and morbidity experiences. Fig. 2.17 outlines the healthy life expectancy estimates for men and women in the EU and the CCs. These data suggest that populations of CEE countries, south-eastern Europe and the Baltic states have not only a shorter life expectancy, but also shorter expected lifespan in good health than countries in the west. For the EU15, the average of years spent in good

**Fig. 2.17** *Estimates of healthy life expectancy at birth in Europe, 2002*




*Source:* WHO Regional Office for Europe 2008b.

health is approximately 70.12 years, compared to 62.70 years among the CEE countries, south-eastern Europe and the Baltic states (Fig. 2.17).

It is important to point out that some of the reported variations in HALE between countries are probably artefactual, due to problems with harmonization of methods of calculation as well as differences in the concepts of disability or health used. At the time of writing, the only harmonized data available are those issued from the ECHP, and these have been used to calculate DFLE for 14 European countries (EHEMU 2005). Calculating the DFLE assists countries in determining whether their population's additional years of life are being spent in good health (compression of morbidity) or ill health (expansion of morbidity) (EHEMU 2007). However, as explained earlier, even these are unreliable and subject to different cultural perceptions of health along with factors such as different survey participation rates. For example, comparing the prevalence of disability at age 65–69 years from a 2002 Eurobarometer survey with the Eurostat series (ECHP) for 1995–2003, it appears that the two surveys lead to the same prevalence of disability but that specific national rankings vary, as shown in Table 2.1.

It appears that the rankings of Belgium, Austria and Finland remain similar, but vary substantially for other countries, such as Italy, Spain, Ireland and Denmark. The European Survey on Income and Living Conditions (SILC) aims to provide harmonized data and therefore will, in the future, provide the opportunity to calculate DFLE for the 25 European countries based on the same methods and similar data (EHEMU 2005).

Another measure often employed in comparisons is DALE. DALE decreased in all EU Member States between 1999 and 2001, but appears to have risen slightly in 2002 (Fig. 2.18, see colour section). However, such changes are relatively marginal overall and may be a result of refinements in surveying techniques and calculating methodology.

### Avoidable mortality[1]

Several approaches have been developed to measure the contribution of the health system to population health improvement. One such approach makes use of readily available cause- and age-specific mortality data and relies on assumptions about certain causes of death that should not occur in the presence of timely and effective medical intervention. These deaths are hence referred to as "avoidable" or "amenable to health care". Since the 1970s, rates of avoidable mortality have continuously declined in almost all countries.

[1] This section summarizes and updates the research note by Allin and Mossialos (2006).

**Table 2.1** *Differences in DFLE at age 65 for men in 2002 by ECHP and Eurobarometer ranks*

| | *Rank* | |
|---|---|---|
| **Country** | **ECHP** | **Eurobarometer** |
| Italy | 1 | 5 |
| Belgium | 2 | 3 |
| Spain | 3 | 7 |
| Germany | 4 | 12 |
| Ireland | 5 | 11 |
| Austria | 6 | 6 |
| Greece | 7 | 2 |
| Netherlands | 8 | 10 |
| Sweden | 9 | 1 |
| Denmark | 10 | 4 |
| Portugal | 11 | 14 |
| United Kingdom | 12 | 8 |
| France | 13 | 9 |
| Finland | 14 | 13 |

*Source:* European Health Expectancy Monitoring Unit 2005.

The concept of avoidable mortality was first developed by Rutstein and colleagues as a measure of quality of care in the 1970s (Rutstein et al. 1976) and has since been applied to many different national and international contexts (Charlton et al. 1983; French and Jones 2006; Holland 1986; 1988; 1991; 1993; 1997; Westerling 1992).[2] Nolte and McKee examined trends in avoidable mortality in Europe over the 1980s and 1990s (Nolte and McKee 2004), in 1998 among 19 Organisation for Economic Co-operation and Development (OECD) countries (Nolte and McKee 2003), and also over the period 1997–2003 in these 19 countries (Nolte and McKee 2008). Levels and trends in avoidable mortality are examined by calculating age-standardized death rates with direct standardization to the European standard population.

Early analyses of avoidable mortality disaggregated disease groups that could be considered effectively treatable or preventable by health care services (Newey

[2] Unfortunately the work of Walter Holland in producing the European Community Atlases of Avoidable Mortality was discontinued in 1997 with the latest available data stemming from 1985–1989. The recent work of Ellen Nolte and Martin McKee is extremely useful; however, data are only available at country (and not region) level.

et al. 2003).[3] Treatable conditions are responsive to medical intervention through secondary prevention and treatment, and preventable conditions are those that are responsive to interventions that are usually outside the direct control of the health services through intersectoral health policies.[4] Overall, this research identified France, Sweden, Spain, Italy and the Netherlands as having relatively low levels of avoidable mortality, while Romania and Bulgaria, along with Latvia and Estonia, had the highest levels of avoidable mortality. During the 1980s the improvements in life expectancy could be attributed largely to reductions in avoidable mortality, and in the 1990s improvements in avoidable mortality contributed to lengthening life expectancy in some countries (especially Portugal and Greece) more than others (Nolte and McKee 2004).

### Treatable mortality

Three of the main causes of treatable deaths include infant mortality, cerebrovascular disease and testicular cancer. As shown in Fig. 2.19, treatable mortality was highest in CEE countries (particularly Romania, Bulgaria and Hungary) in both 1990/1991 and in 2000/2002. Portugal is the only EU15 country to display similarly high levels. Levels were lowest in France (women) and Sweden (men). All countries, except Romania (men), experienced declines in treatable mortality during the 1990s, in particular Portugal, Austria and Finland as well as new EU Member States (in the Czech Republic, rates declined by approximately one third). Comparatively less progress was made in the Baltic states of Latvia and Lithuania, declining by only 0.4% and 1% for men, respectively, and 9% and 11% for women over this time period.

The proportion of all-cause mortality from treatable diseases varies across Europe (Nolte and McKee 2004). In 1990/1991, treatable mortality accounted for between 13% (Netherlands) and 30% (Bulgaria) of under-75 mortality in men and 26% (Sweden) and 44% (Romania) in women. These relative proportions changed very little over time for both men and women.

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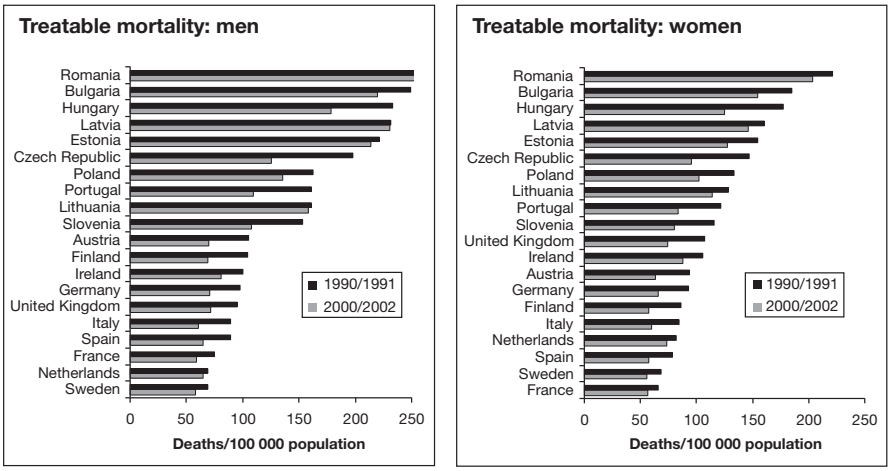
[3] It is important to note the methodological difficulties associated with attributing specific risk factors, such as diet and physical activity, to preventable conditions. More work needs to be carried out in this area to better make the link between risky behaviours and premature, preventable deaths.

[4] Over 30 conditions are considered to be treatable – some examples are: cancer of the colon, skin, cervix, testis and breast; diabetes mellitus; epilepsy; pneumonia; appendicitis; thyroid disease; and measles. Three conditions are considered to be preventable: deaths from lung cancer; motor vehicle and traffic accidents; and cirrhosis. It is important to note that over time the conditions that are considered treatable may change and it is therefore difficult to draw conclusions about time trends. However, cross-country comparisons are not subject to the same methodological limitation, since at any one point in time, the same standards in terms of quality of health care should apply to all countries.

**Fig. 2.19** *Age-standardized death rates of treatable mortality in 20 European countries, 1990/1991 and 2000/2002*




*Source:* Newey et al. 2003.

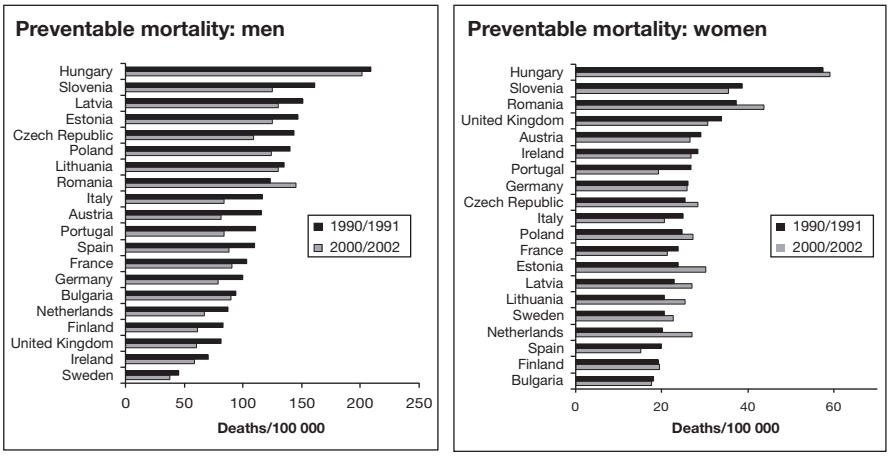
Therefore, it seems that much can be done to reduce overall mortality rates by targeting the health system – even in Sweden, which has one of the healthiest populations in Europe, mortality rates could be cut by a quarter through improved treatment of disease.

## Preventable mortality

Estimates of preventable mortality combine three major causes of death: lung cancer, motor vehicle and traffic accidents, and cirrhosis. There is a substantial gap between rates of preventable mortality for men and women in all countries, with death rates among men at least twice those among women (Fig. 2.20). This gender gap in preventable mortality is most pronounced in the new Member States (CEE countries), which also show the highest absolute values, especially for Hungarian men. This gap reflects the much greater exposure to risks such as drinking and smoking among men. For women, death rates were again highest in Hungary, followed at some distance by Slovenia and Romania, as well as the United Kingdom.

Unlike the situation with treatable causes, throughout the 1990s men consistently saw declines in preventable mortality, whilst women did not. The declines among men were most prominent in Italy, Austria, Portugal, Finland, the United Kingdom, the Czech Republic and Slovenia. Preventable mortality among women declined in some countries, particularly those in the Mediterranean region, and increased in Sweden and the Netherlands, all new Member States (except Slovenia) and Romania. By 2000/2002, levels of

**Fig. 2.20** *Age-standardized death rates of preventable mortality in 20 European countries, 1990/1991 and 2000/2002*




*Source:* Newey et al. 2003.

preventable mortality among women were lowest in Spain and Portugal, as well as in Bulgaria.

Overall, deaths from preventable causes accounted for between 10% (Sweden) and 21% (Italy) of all-cause mortality for men and between 4% (Bulgaria) and 11% (Hungary) for women in 1990. While for men the share remained fairly stable over the 1990s, it increased for women in all countries except Spain and Portugal, to over 10% in most EU15 countries in 2000/2002, with the highest proportion in Slovenia and Hungary (13–14%).

In 2002/2003 avoidable mortality continued to represent a substantial portion of overall mortality in European countries within the OECD countries (23% for males, 32% for females). However, there have been improvements; on average, there has been a 17% decline in avoidable mortality since 1997/1998 (Nolte and McKee 2008). For males, avoidable mortality constitutes between 15% of total mortality in France and 27% in the United Kingdom, and for females it ranges from 25% in France to 36% in Greece and Portugal. Rates of decline in avoidable mortality vary across countries, with many countries – in particular those with high levels at the beginning of the period (Austria, Ireland, the United Kingdom, Finland) – showing more than a 20% decline for men and over 15% decline for women. Overall, considerable progress could be made in reducing mortality rates further in Europe, in particular among the countries with the poorest performance (highest rates of avoidable mortality): Denmark, Portugal, the United Kingdom and Ireland (Nolte and McKee 2008).

# Chapter 3
# Chronic diseases

**Box 3.1** *Summary of Chapter 3*

- Chronic diseases constitute the main cause of death in the EU, accounting for 77% of the total. The most important are heart disease, stroke and cancer.

**Section 3.1 Trends in heart disease and stroke (cardiovascular diseases)**

- CVDs are the leading cause of death in the EU. They account for 51.88 death per 100 000 individuals in the population aged under 65 years in the EU27.
- The most common CVD is ischaemic heart disease (IHD), which was the leading cause of death in all EU27 and CCs, except in Greece, the former Yugoslav Republic of Macedonia and Portugal, where it was stroke.
- There is an enormous gender gap in death rates from heart disease in all countries. The mortality rate for men aged 0–64 years is 38 per 100 000, while for women it is just under 9 per 100 000 in the EU27.

**Section 3.2 Trends in cancer**

- Cancer is the second most significant cause of death in the EU. Lung cancer is by far the most significant, accounting for 20.2% (236 000) of cancer deaths in the EU25 (Member States up to and including the May 2004 accession) in 2006.
- Lung cancer accounts for the largest proportion of cancer deaths among men, at 28.73 per 100 000 in the male population aged under 65 years in the EU27. Breast cancer is the leading cause of cancer mortality among women, with the EU average being 25.14 per 100 000 women aged under 65 years.
- There are considerable variations across countries in cancer death rates, with the highest in Hungary, the Czech Republic, Denmark, Ireland and Sweden.
- Between 1985 and 2000, the number of cancer deaths increased in both men (+12%) and women (+9%) in the EU25.

**Box 3.1** *cont.*

- Between 1990 and 2000, overall cancer incidence rose across the EU25 by an average of 63 new cases per 100 000 inhabitants.

**Section 3.3–3.5 Trends in diabetes, respiratory diseases and liver disease**

- The current EU average diabetes prevalence rate is estimated to be 8.7% of the total population aged 20 years and over, but an estimated 50% of people with diabetes are unaware of their condition.
- A total of 70–80% of people with diabetes die of heart disease or stroke, making diabetes an important risk factor for these diseases.
- Type 2 diabetes accounts for approximately 90% of all diabetes in high-income countries.
- Respiratory diseases (including COPD, lung cancer and pneumonia) rank second in Europe (after CVD) in terms of mortality, incidence, prevalence and costs.
- Western European countries are more affected by COPD than eastern European countries; in 2002 the worst affected were Denmark (7% of total mortality), the Netherlands (5.2%) and Ireland (5%).
- Mortality rates for COPD are two to three times higher for males than for females.
- Liver disease is mostly attributable to alcohol consumption, and affects men in particular. The highest death rates are seen in Hungary and Slovakia, but in western Europe the United Kingdom and Finland have seen an increase since the 1980s.

The most significant causes of the burden of disease in the WHO European Region are noncommunicable (or chronic) diseases (NCDs). NCDs constitute 77% of the total; the most significant of these are heart disease, cerebrovascular diseases and cancer (Fig. 3.1, see colour section). In 2002, NCDs caused 86% of the 9.6 million deaths and 77% of the 150.3 million disability-adjusted life years (DALYs) in the WHO European Region (WHO Regional Office for Europe 2006a).

The main risk factors to NCDs are eating habits, physical activity, smoking and alcohol consumption. These causes are expressed through the following intermediary risk factors: raised blood pressure, raised glucose levels, abnormal blood lipids (particularly cholesterol), and overweight and obesity. These risk factors (in conjunction with age and heredity) in turn explain the majority of variation in rates of the main chronic diseases: heart disease, stroke, chronic respiratory diseases, diabetes and some cancer (WHO 2005b). The risk factors for these causes of death are discussed in Chapter 7. Other significant causes of death, especially at younger ages, are injury and poisoning, discussed in Chapter 6.

## 3.1 Trends in heart disease and stroke (cardiovascular diseases)

Northern European countries – particularly Germany and the United Kingdom – have reported exceptionally high rates of CVDs (MacKay and Mensah 2004). Southern European countries such as Italy and France have reported relatively low age-standardized death rates from IHD in the last 25 years compared to the rest of Europe. The north–south gradient in myocardial infarction and coronary death rates in western European regions was documented by the WHO MONICA Project in the 1990s and has been attributed in part to the Mediterranean diet.

Standardized death rates for heart disease have fallen, in some cases steeply, in the last 25 years in western Europe, both in the north and south, for men and for women. For example, mortality from coronary heart disease (CHD) in England and Wales fell by 54% between 1981 and 2000 (Unal, Critchley and Capewell 2005). In the 1960s international mortality statistics showed that Finnish men had the highest mortality rate from IHD in the world (Vartiainen et al. 2000). The national rate in Finland is approaching the EU average at the time of writing. These favourable trends have been caused by falling rates in the population of high blood pressure, cholesterol and smoking, which countries achieved by implementing public health programmes (for example the North Karelia Project in Finland) and improving diagnosis, prevention and treatment of risk factors at the health service level.

CVD has been frequently highlighted as playing an important role in the rise and subsequent decline of adult mortality in CEE countries (McKee and Shkolnikov 2001; Meslé 2002; Zatoński and Boyle 1996). Indeed, the main contributors to differences in health indicators between eastern and western Europe are CVDs and injuries for people below the age of 60 years (Powles et al. 2005). While CVD has been increasing overall in CEE countries, in recent years CVD mortality has been decreasing in a few countries (TFMCD 2008). Thus, while the standardized death rate for IHD has halved since the fall of communism in some CEE countries (such as the Czech Republic and Poland) due to improvements in nutrition and health services (particularly medication, which has contributed to narrowing the "east–west gap") the rate in other countries (such as Hungary and Slovakia) remains more than double that of the EU average.

In the countries of the former Soviet Union, such as the Baltic states, the burden of CVD accounted for almost one third of the overall burden of disease, as measured by DALYs (Nolte, McKee and Gilmore 2005). As Fig. 3.2 shows (see colour section), deaths under 65 years of age from IHD are more

than three times higher in Lithuania (73.78 deaths per 100 000 people) and Latvia (82.90 deaths per 100 000) than the EU average (22.85 deaths per 100 000 people). Data for the population aged 35–74 years in the 2008 report by the Task Force on Major and Chronic Diseases (TFMCD) of the European Commission's Directorate-General for Health and Consumers (DG SANCO) reveal even more stark differences, with mortality rates associated with IHD varying from 42.7 deaths per 100 000 in France to 327.0 deaths per 100 000 in Latvia in 2003, equating to an almost eight times higher death rate (TFMCD 2008).

In the former Soviet Union countries, in particular in the Baltic states, the risk of death related to IHD and diseases of the circulatory system increased sharply for men and women at the beginning of the 1990s, immediately after the end of the communist era, to start decreasing again in the mid-to-late 1990s; however, large differences are still present between the East and the West. Traditional risk factors such as smoking, diets rich in saturated fats and low in antioxidants – in addition to alcohol (specifically binge drinking) and psychosocial factors – are thought to largely account for the elevated levels of CVD in the East compared to the West (Bobak et al. 1997; Britton and McKee 2000; Pomerleau et al. 2001). Of the Baltic states, Estonia is the only country to have shown signs of improvement; while rates of heart disease deaths have fluctuated in Lithuania and Latvia since 2000, the rate of deaths from IHD among people aged 0–64 years in Estonia has decreased from 77.46 in 2000 to 56.92 in 2005.

There is an enormous gender gap in age-standardized death rates from heart disease. For example, in 2003, 555 per 100 000 deaths among Latvian men were attributable to IHD in comparison to only 167 deaths per 100 000 among Latvian women aged 35–74 years (TFMCD 2008). In comparison, in France 72 deaths per 100 000 were due to IHD for men, but only 16 IHD deaths per 100 000 for women (TFMCD 2008). The EU average for men aged 0–64 years is 38 per 100 000, while for women it is just under 9 per 100 000. On average, the gap is larger in CEE countries than in western Europe. The "east–west gap" in mortality rates is also evident when the standardized death rates for diseases of the circulatory system are observed. For example, the mortality rate for diseases of the circulatory system is more than three times higher in Latvia than the EU average (Fig. 3.3, see colour section).

As noted earlier, between the late 1980s and the late 1990s, favourable trends which were observed in western Europe as long ago as the early 1970s spread to the countries of central Europe. It is still difficult to assess the main determinants of such a reversal. The progress probably results from the combination of several factors, such as changes in diets, the growth of

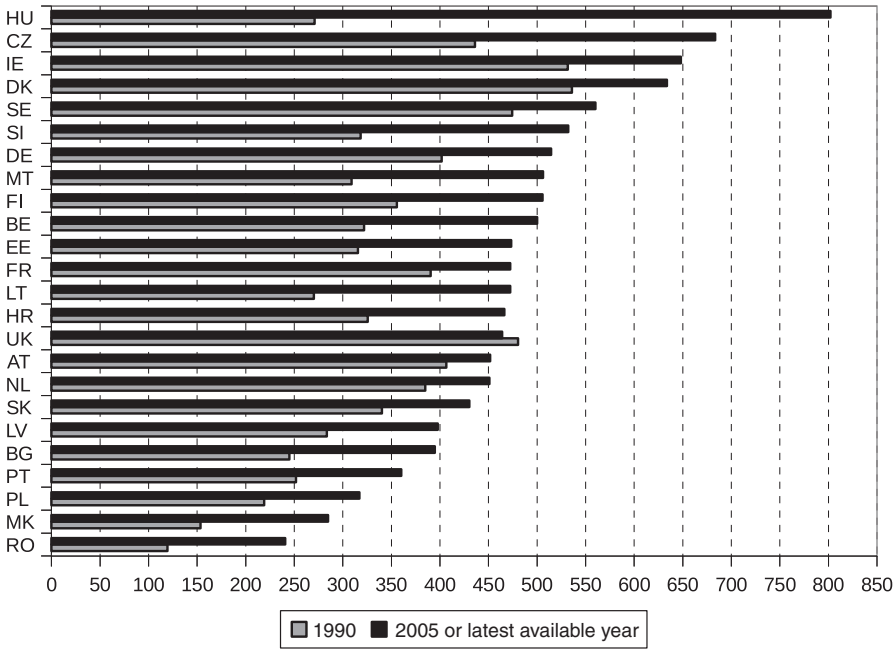
systematic prevention and screening, the spread of new forms of treatment and cardiac surgery (Meslé 2002). At the same time, countries of the former Soviet Union experienced very marked fluctuations in mortality, related to the social and economic transformation which these countries have undergone since the fall of communism. Up to the mid-1990s, the trends were completely parallel in all the European republics of the former Soviet Union. However, more recently, they have begun to diverge. While the Baltic countries show signs of improvement in mortality from heart disease, and mortality trends could soon begin to mirror those of central European countries, the Russian Federation and Ukraine are experiencing a fresh rise in mortality from infectious diseases, circulatory diseases and violence (Meslé 2002).

## 3.2 Trends in cancer

The European Cancer Health Indicator Project 2001–2003 (EUROCHIP) developed a list of cancer health indicators covering key cancer aspects, such as burden, prevention, standards of care and cure rates. There were over 2 million (2 288 100) incident cases of cancer in 2006 and over 1 million cancer deaths (1 165 500) recorded in the then 25 Member States of the EU (Ferlay et al. 2007). Between 1990 and 2000, cancer incidence rose across all of the 25 European countries for which data are available, by an average of 63 new cases per 100 000 inhabitants. The only country that reported falling incidence was the United Kingdom (where it reportedly fell by 20 per 100 000 in that decade), although this is probably an artefact caused by underestimates of cancer incidence in the early 1990s (Boyle et al. 2003). There are large variations in rates of cancer across Europe (Fig. 3.4). In Hungary, cancer incidence is more than 800 per 100 000 inhabitants; in the Czech Republic, Ireland and Denmark it is over 600 per 100 000. The lowest rates of cancer incidence are found in the former Yugoslav Republic of Macedonia, Romania and Poland, with less than 350 per 100 000 inhabitants.

The most common forms of cancer incidence in Europe in 2006 were breast cancer (319 900 cases; 14% of all incident cases), prostate cancer (301 500; 13.2%), colorectal cancer (297 200; 13%) and lung cancer (265 600; 11.6%) (Ferlay et al. 2007). However, in terms of cancer mortality, lung cancer was by far the most significant, accounting for 20.2% of deaths (236 000). Prostate cancer was the most common form of cancer incidence in men in the EU (301 500 cases; 24.1% of the total for men), while lung cancer was the most common form of cancer death (171 900; 26.3% of the total for men). Among women, breast cancer was the most common incident form (319 900 cases; 30.9% of all incident cases). Breast cancer was also the leading cause of cancer

**Fig. 3.4** *Cancer incidence per 100 000, selected European countries, 1990 and 2005 or latest available year*




*Source:* WHO Regional Office for Europe 2008b.

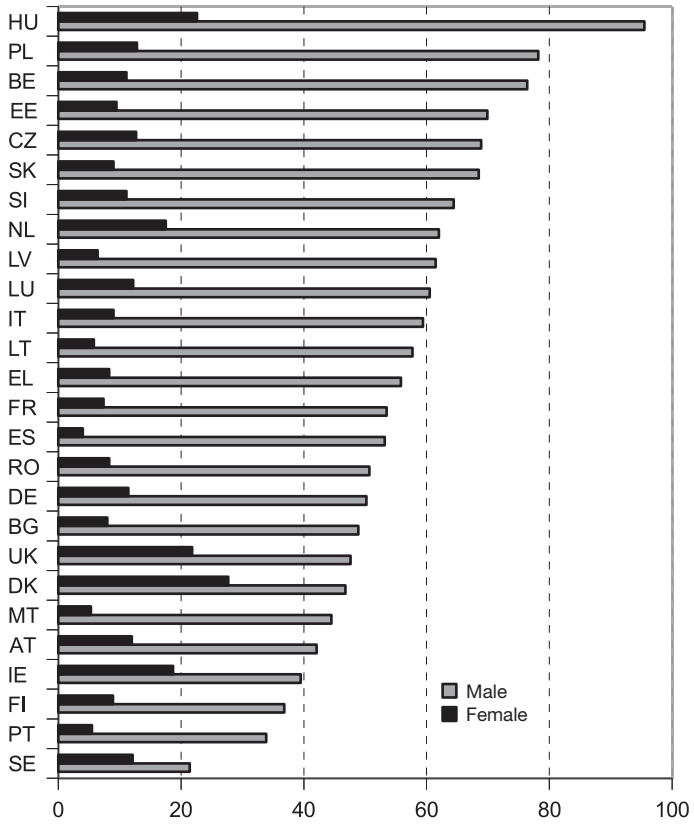
mortality in women in the EU in 2006 (85 300; 16.7% of total) (Ferlay et al. 2007).

Between 1985 and 2000 the number of cancer deaths increased in both men (+12%) and women (+9%) in the EU. However, there was a 10% reduction in the number of deaths expected in men and 8% in women, along with an 11% reduction in risk of cancer death in men and a 10% reduction in women. Hence, although cancer deaths in the EU were expected to rise from 850 194 in 1985 to 1 033 083 in 2000, there were in fact an estimated 940 510 cancer deaths that year, due to the decline in risk observed since 1985 (Boyle et al. 2003). Using population projections, if the age-specific death rates remain constant, the absolute number of cancer deaths in 2015 will increase to 1 405 000. There are significantly higher rates of cancer among men than women in almost all countries (Fig. 3.5, see colour section), although the increase in deaths due to lung cancer among women is leading to a narrowing of the gender gap.

Lung cancer was the most common cause of death after CVD in more than half the EU and CCs in 2002, making it an important public health challenge

for Europe. In Belgium, Croatia, the Czech Republic, France, Germany, Greece, Hungary, Italy, Luxembourg, the Netherlands, Poland, Slovenia and Spain lung cancer accounted for more than 5% of total mortality (WHO Regional Office for Europe 2005b). As shown in Fig. 3.6, Hungary has the highest rates of male lung cancer in Europe and in the world (Novotny et al. 2001), followed in western Europe by Belgium. The lowest rates for men are observed in Sweden and Portugal. For women, the highest rates are registered in Denmark, Hungary and the United Kingdom, while the lowest incidence rates are found in Spain, Malta and Portugal. Age-standardized incidence rates of lung cancer are markedly higher in the East than in the West.

**Fig. 3.6** *Standardized lung cancer incidence rates per 100 000, in selected European countries, 2000*




*Source:* Reproduced from Tyczynski, Bray and Parkin 2002.

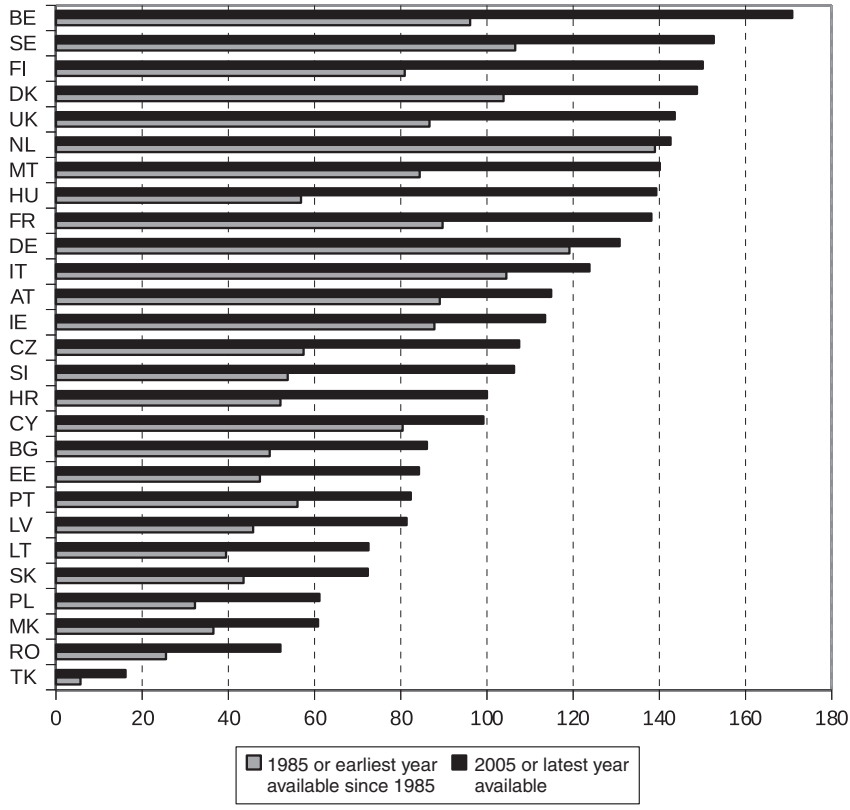
*Note:* Lung cancer incidence data from the above-mentioned source are used in this case because they are more complete than WHO Health for All data which lack data for Greece and Spain.

Age-standardized death rates for lung cancer among men have been steadily decreasing in most western European countries in the last 25 years, except in France, Spain and Portugal where they remained largely stable or even rose slightly during that period (Fig. 3.5, see colour section). The new Member States except for Hungary have also experienced overall decreases in male lung cancer deaths over the last 20 years, albeit with temporary increases in the late 1980s and early 1990s. Of the NACs/CCs, the former Yugoslav Republic of Macedonia, Romania and Bulgaria reported markedly increasing lung cancer mortality rates for men aged 0–64 years in the last two decades, although these have begun to plateau in recent years. Data are unavailable for Turkey. Unfortunately, mortality for lung cancer among women is increasing almost everywhere, except in the United Kingdom and, to some extent, in Ireland and Denmark (Didkowska et al. 2005). The leading contributors to lung cancer are the number of cigarettes smoked per day, the degree of inhalation and the initial age at which individuals start smoking (see section 7.1 for European smoking trends) (Didkowska et al 2005; Tyczynski, Bray and Parkin 2002). The relative risk of developing lung cancer is 20–30 times higher for smokers than for non-smokers.

There is a great deal of variation between the EU countries in terms of breast cancer incidence (Fig. 3.7). In most countries incidence is rising and in some cases quite dramatically; for example, Finland, Sweden, the United Kingdom and Poland have experienced 30% or greater increases in the last 25 years (Boyle 2005). It is thought that this unfavourable trend is due in part to increases in risk factors: decreased childbearing and breastfeeding; increased exogenous hormone exposure; and detrimental dietary and lifestyle changes, including obesity and less physical activity (Parkin and Fernandez 2006). Other countries, such as Italy, Germany and the Netherlands reported a stabilization or even slight decrease in breast cancer incidence during that time. There continues to be uncertainty on the causes of breast cancer; it has been argued that the failure to prevent the incidence from continuing to rise represents the failure to understand the precise mechanisms of breast carcinogenesis and the role of risk determinants, the alteration of which in society could lead to a reduced risk of developing the disease (Boyle 2005).

Until the mid-1980s, breast cancer mortality rates were increasing or stable in Europe, except for Sweden, where they have been decreasing since the 1960s. Since then, rates have plateaued or decreased (Fig. 3.8, see colour section). The United Kingdom, which reported particularly high rates of breast cancer mortality, achieved dramatic decreases in the late 1980s and is approaching the EU average at the time of writing. This favourable trend has been associated with increased breast awareness; earlier detection, for example through the

**Fig. 3.7** *Breast cancer incidence per 100 000, selected European countries, 1985 and 2005 or latest available year*




*Source:* WHO Regional Office for Europe 2008b.

introduction of screening; and the delivery of the most appropriate therapy to women with the disease (Boyle 2005; Sant et al. 2006). Other countries, such as Slovakia and Spain also experienced declines from the mid-1980s but did not introduce screening, highlighting the importance of improvements in treatment (Boyle et al. 2003; Sant et al. 2006). In Finland (with high survival), the Netherlands and Denmark, increasing mortality and incidence indicate increasing breast cancer risk in the last 40 years, probably related to lifestyle factors. In Estonia, continually low survival rates in the context of increasing incidence suggest inadequate care (Sant et al. 2006).

Hungary has breast cancer mortality rates higher than the EU average; Latvia and Estonia had low rates of breast cancer mortality but have experienced increases and are approaching the EU average at the time of writing, while in Poland, mortality rates have remained comparatively low and are nearly 20% lower than the European average. As well as earlier diagnosis and

improved treatment, changes in levels of fertility have been proposed as possible explanations for the trends observed in eastern Europe (Tyczynski et al. 2004).

Information on the survival of all patients after a cancer diagnosis is a key indicator of cancer control. The European Alcohol Policy Alliance EUROCARE-3 study measured survival up to five years after diagnosis for 1.8 million adults and 24 000 children who were diagnosed with cancer during the period 1990–1994 and followed up to the end of 1999. The 20 participating countries included 11 of the EU15 countries and 6 of the new Member States (Malta, the Czech Republic, Estonia, Poland, Slovakia and Slovenia). Overall, there was considerable variation in survival rates between countries. Survival was generally below the European average in the five eastern European countries, and in Denmark, England, Scotland, Wales, Malta and Portugal among the western European countries. For the United Kingdom and Denmark, melanoma of the skin, testicular cancer and Hodgkin's disease were notable exceptions to this pattern. Sweden tended to have the highest survival rates among the five Nordic countries, and Poland the lowest among the five eastern European countries, whilst French and Swiss populations often had the highest survival rates among western European countries (Coleman et al. 2003).

Among the most lethal and common cancer, lung cancer survival varied by more than 2-fold across Europe (Austria had the highest rate, Poland the lowest), but the highest 5-year survival rate for men diagnosed during the period 1990–1994 was still less than 15%. The patterns for women were similar. The poor survival rate is thought to be because most patients were diagnosed with metastatic disease, for which treatment of curative intent is rarely possible. The reported low survival rate in Denmark may be due to the particularly late stage at the time of diagnosis (Coleman et al. 2003).

For breast cancer, differences in survival at five years from diagnosis were narrower. Survival was highest in the Nordic countries and in most southern and central European countries (approximately 80%), and lowest in all five eastern European countries (60–70%). Survival was below the European average in Denmark, England, Scotland and Wales. Differences in western Europe are likely to be due to an advanced stage of disease at diagnosis in the countries with lower survival rates, while in eastern Europe, differences in treatment are also likely to play a role. Relative survival from breast cancer improved steadily in all European countries in the 1980s and 1990s, but at different rates. Improvements were more substantial for countries in western Europe than in the Nordic countries and, as a result, the range of breast cancer survival rates between the Nordic countries and western Europe was greatly

reduced. There is some evidence of a more rapid improvement in survival in the United Kingdom, with a gradual reduction of the survival deficit relative to other western European countries. This is reflected by a fall in mortality of some 20% among women aged 20–69 years in the 10 years up to 1997; better treatment and mammographic screening probably both contributed to this. Conversely, improvements in survival were less significant for eastern European countries, and the gap between eastern and western European countries increased (Coleman et al. 2003).

Some evidence that health care affects cancer survival is provided by analyses of EUROCARE data. Analyses suggest that, although survival was related to wealth (gross domestic product (GDP)), this was only up to a certain level, after which survival continued to be related to level of health investment (both total national expenditure on health (including public and private) and total public expenditure on health). The study concluded that cancer survival depends on the widespread application of effective diagnosis and treatment modalities, but that the availability of these depends on macroeconomic determinants, including health and public health investment. However, analysis of the relationship between health system organization and cancer outcome is complicated and requires more information than is available at the time of writing (Micheli et al. 2003).

Cancer is rare in people under the age of 20 years. In European populations, approximately 1% of all malignant neoplasms arise in patients under 20 years of age. In the last 35 years, overall incidence increased by 1.0% per year in children and by 1.5% in adolescents (15–19 years). Overall 5-year survival for children in the 1990s was 64% in eastern Europe and 75% in western European countries and it was much the same in adolescents. Survival has improved dramatically since the 1970s in children and adolescents, more so in the West than in the East. Differences between the two regions of Europe are present for virtually all tumour types, and the rate of improvement in survival is slower in the East than in the West. The explanation could lie in earlier presentation of patients, better referral, or greater availability of complex and expensive treatment regimens for childhood cancer cases in western Europe (Steliarova-Foucher et al. 2004).

Information collected by the cancer registries and countries participating in the EUROCARE-3 programme found that middle-aged patients experienced better prognosis than elderly patients, for both sexes. Genito-urinary and gynaecological cancer showed the highest relative excess risks. High mortality could be due to barriers to health care access and late diagnosis (Quaglia et al. 2007).

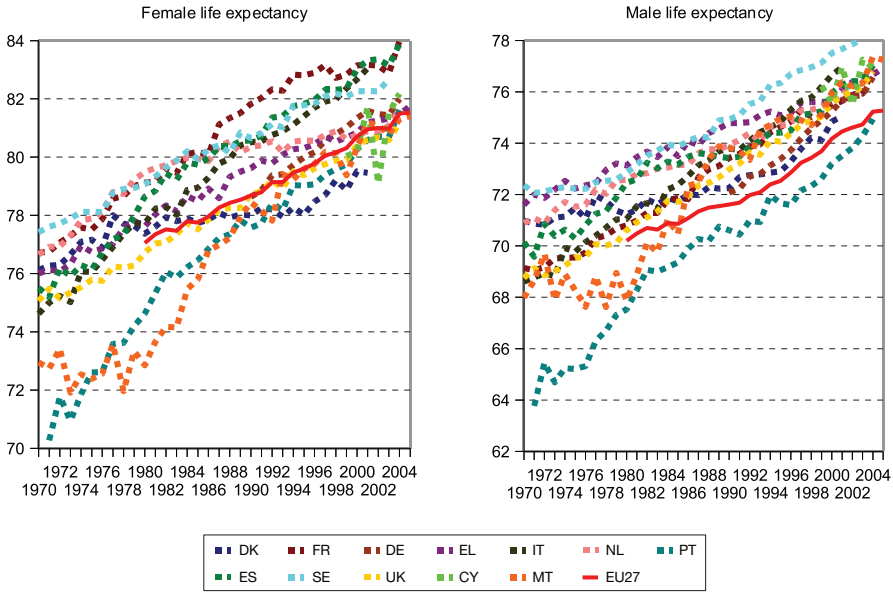
## 3.3 Trends in diabetes

Diabetes has been estimated to be the fourth leading cause of death in Europe (International Diabetes Federation 2004), as well as being a risk factor for other diseases, notably CVD (Franco et al. 2007). The INTERHEART case-control study estimated that 15% of heart attacks in western Europe and 9% of heart attacks in CEE countries were due to diabetes (Yusuf et al. 2004). The burden is expected to increase from an estimated 7.8% of the population between 20 and 79 years in 2003 to 9.1% in 2025 (TFMCD 2008). On average, those with type 2 diabetes will die 5–10 years before those without diabetes (International Diabetes Federation 2004); 70–80% of people with diabetes die of CVD. A history of diabetes is associated with a long-term mortality rate that is approximately twice that of non-diabetics following acute myocardial infarction (Svensson et al. 2007). Diabetes is also a leading cause of kidney failure and neuropathy (International Diabetes Federation 2004). The contribution of diabetes to mortality rates is probably underestimated because, although people may live for years with diabetes, their deaths are usually recorded as being caused by heart disease or kidney failure (WHO 2005a). Type 2 diabetes constitutes approximately 85–95% of all diabetes in developed countries. Type 2 diabetes has become a common and serious global health problem, which, for most countries, has evolved in association with rapid cultural and social changes, ageing populations, increasing urbanization, dietary changes, reduced physical activity and other unhealthy lifestyle and behavioural patterns (International Diabetes Federation 2004).

An EU web portal is under development at the time of writing by the European Commission's DG SANCO, called Best Information through Regional Outcomes (BIRO) (TFMCD 2008). BIRO commenced in 2005 and is a 3-year project aiming to build a common European infrastructure for standardized information exchange in diabetes care. Unfortunately, in Europe at the time of writing, no national registry is available to establish the numbers of patients with type 1 or type 2 diabetes. It is therefore difficult to definitively describe diabetes trends in Europe. However, approximate estimations of diabetes trends may be made using data available from the following sources: population-based studies on small or large cohorts representative of the general population in a particular country; European cooperative studies obtaining data from diabetes centres; and sales figures for insulin and oral hypoglycaemic agents that allow extrapolation of the number of pharmacologically treated diabetic patients (Passa 2002).

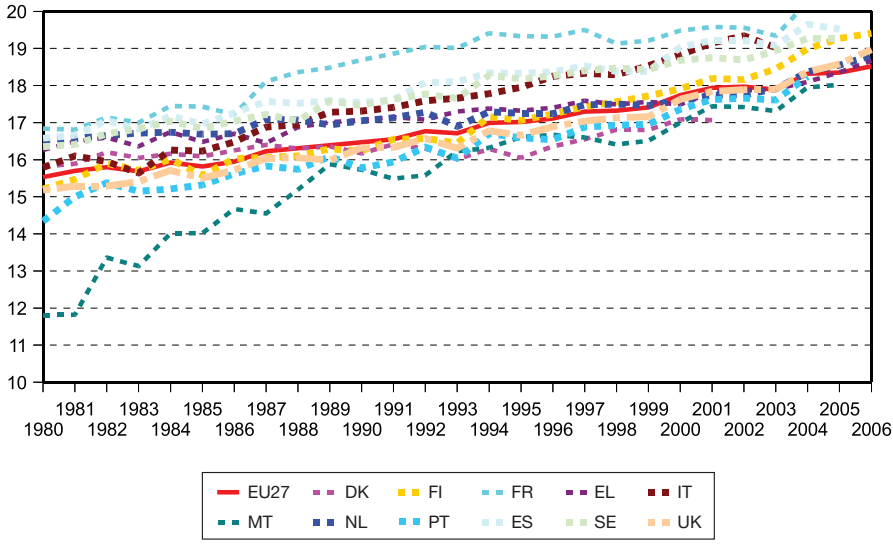
There are over 31 million people living with diabetes within the 27 EU Member States. The EU average prevalence rate at the time of writing is estimated to

**Fig. 2.2** *Life expectancy at birth, EU average and selected western European countries*



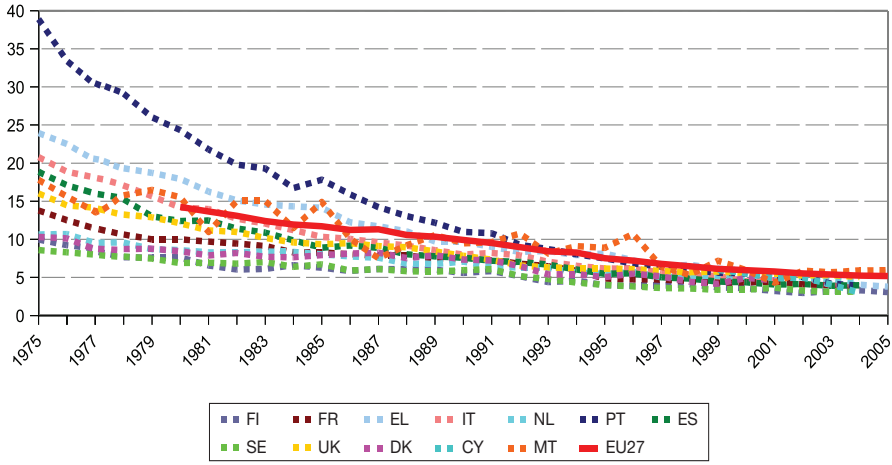

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.3** *Life expectancy at age 65, EU average and selected western EU countries*



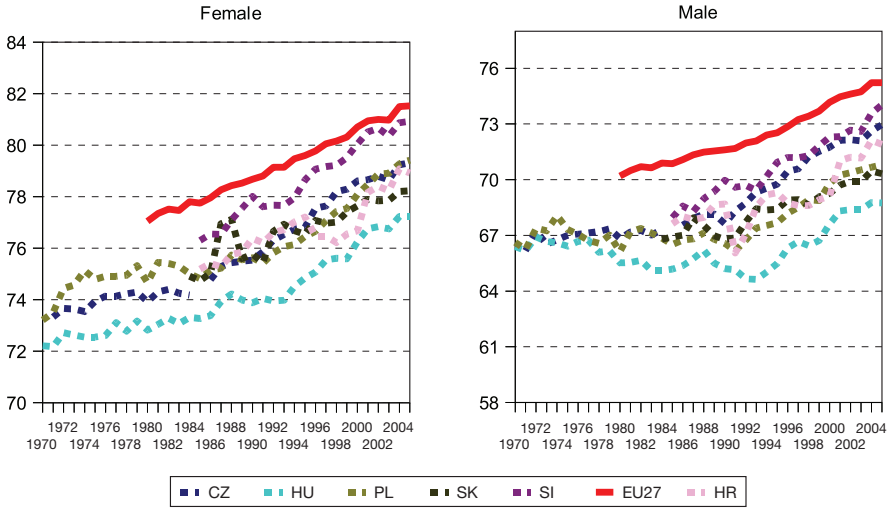

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.6** *Infant deaths per 1000 live births, EU average and selected western EU countries*



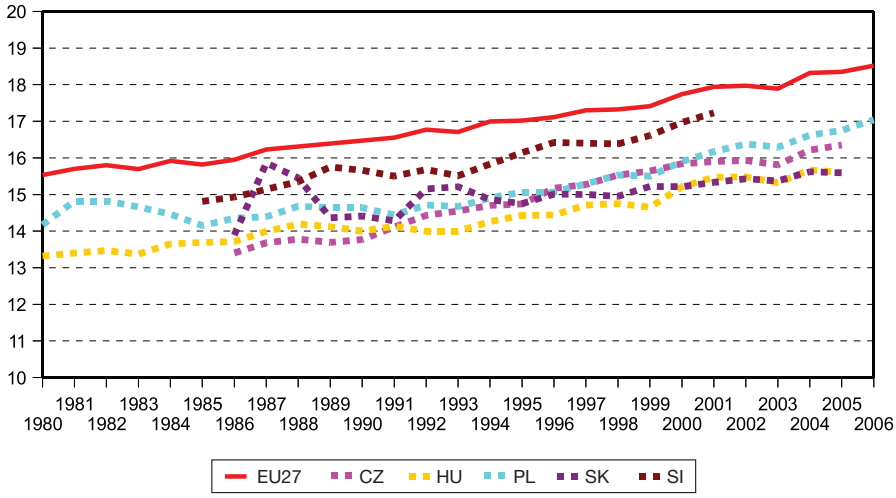

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.7** *Life expectancy at birth, EU average and selected CEE countries*



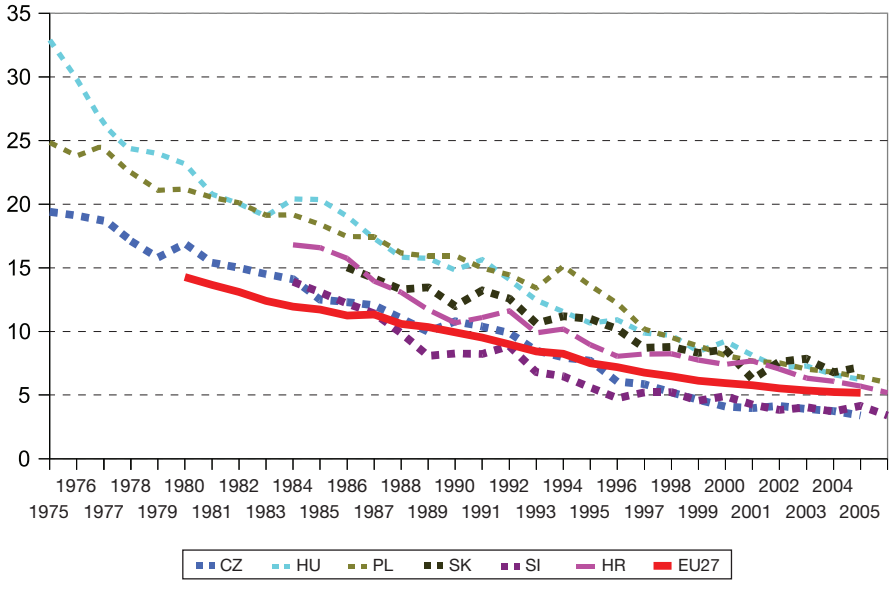

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.8** *Life expectancy at age 65, EU average and selected CEE countries*



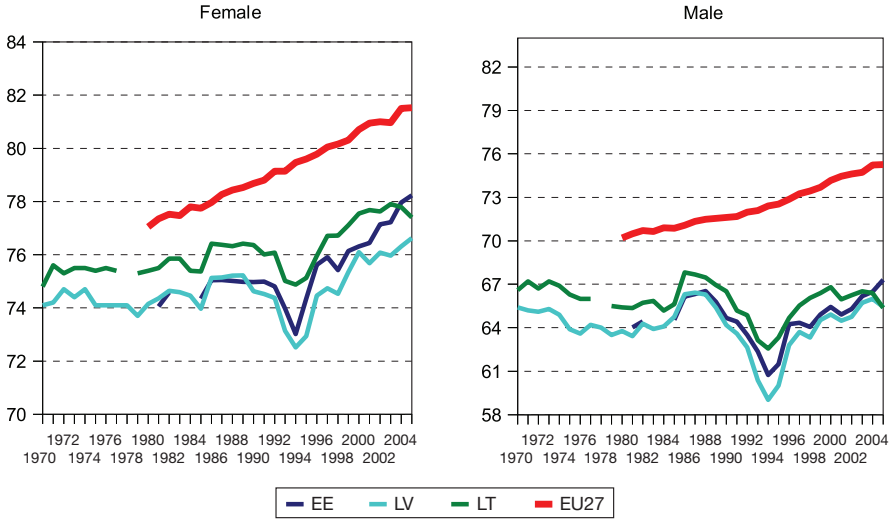

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.9** *Infant deaths per 1000 live births, EU average and selected CEE countries*



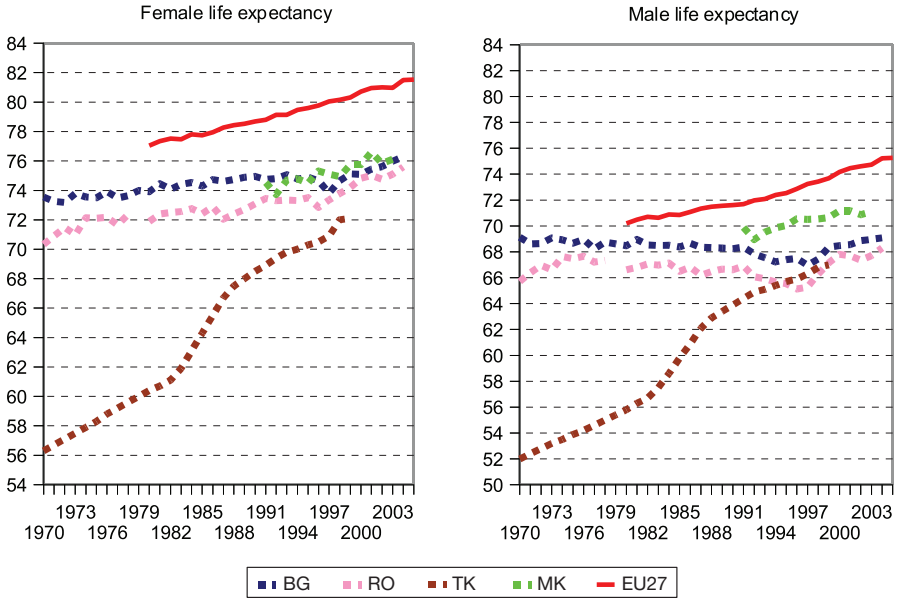

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.10** *Life expectancy at birth, EU average, Estonia, Latvia and Lithuania*



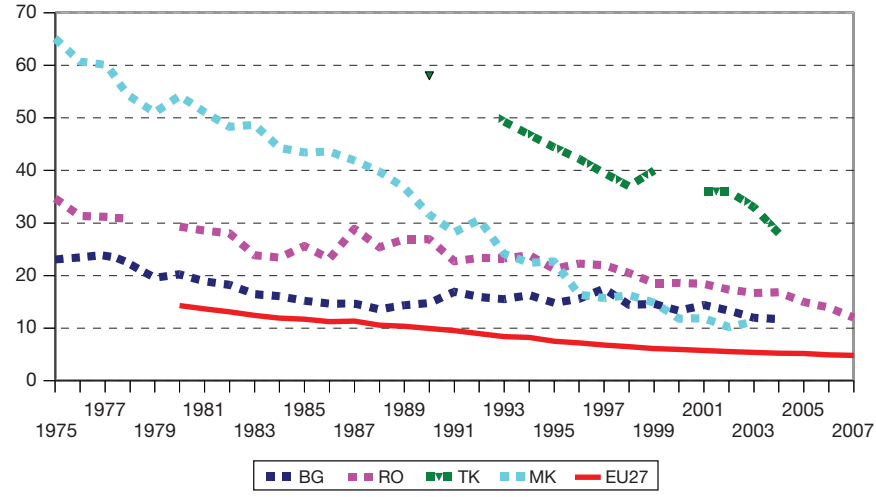

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.13** *Life expectancy at birth, EU average, Turkey, the former Yugoslav Republic of Macedonia, Romania and Bulgaria*



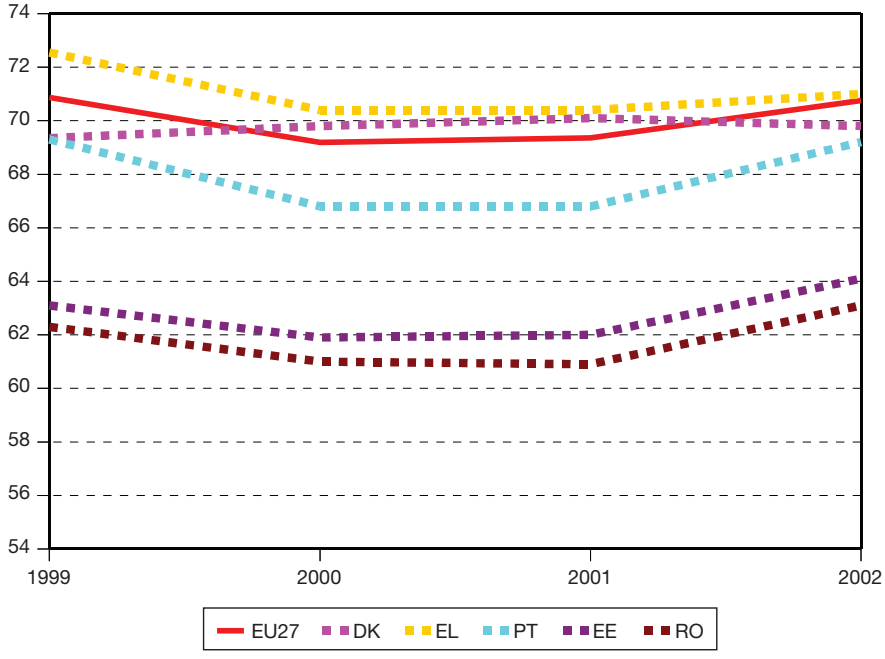

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.14** *Infant deaths per 1000 live births, EU average, Turkey, the former Yugoslav Republic of Macedonia, Romania and Bulgaria*



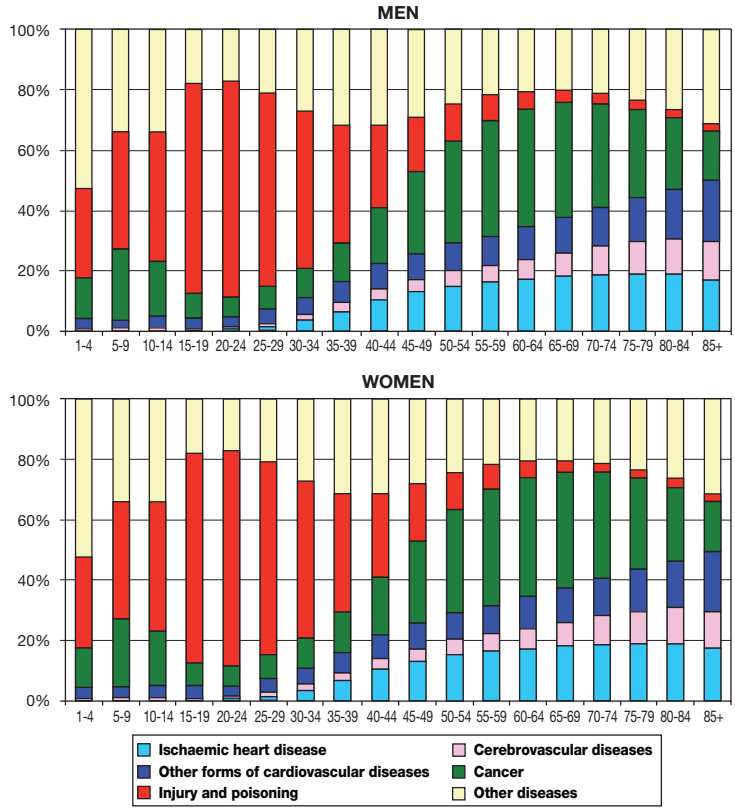

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 2.18** *Disability-adjusted life expectancy, EU average and selected EU countries, 1999–2002*




*Source:* WHO Regional Office for Europe 2008b.

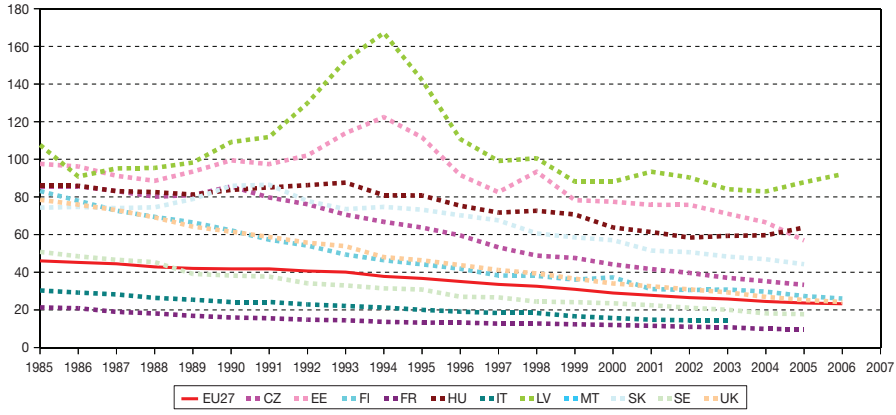
**Fig. 3.1** *Mortality rate of CVD, cancer and violence (injury and poisoning) in the EU, 3-year average (2001–2003), by gender*




*Source:* TFMCD 2008.

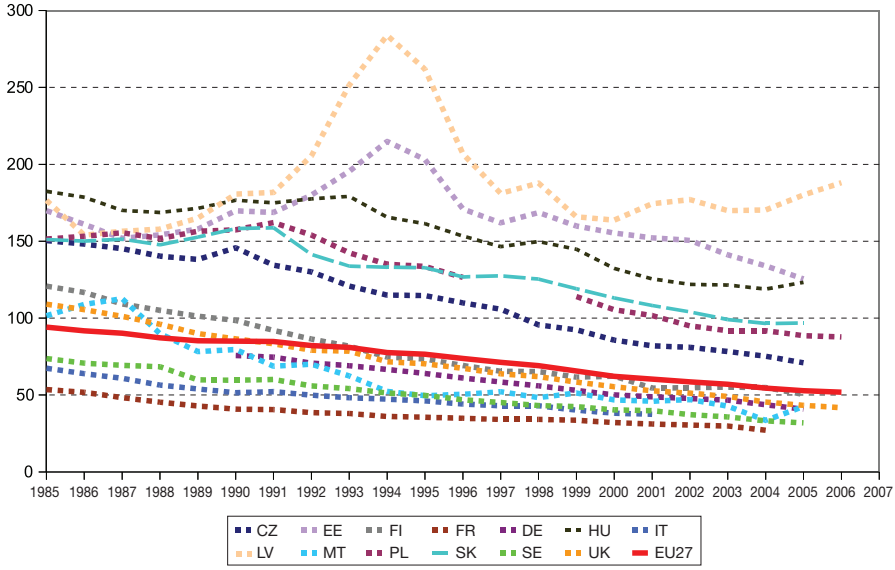
*Note:* TFMCD: Task Force on Major and Chronic Diseases.

**Fig. 3.2** *Standardized death rates due to IHD per 100 000 population aged 0–65 years, EU average and selected countries*



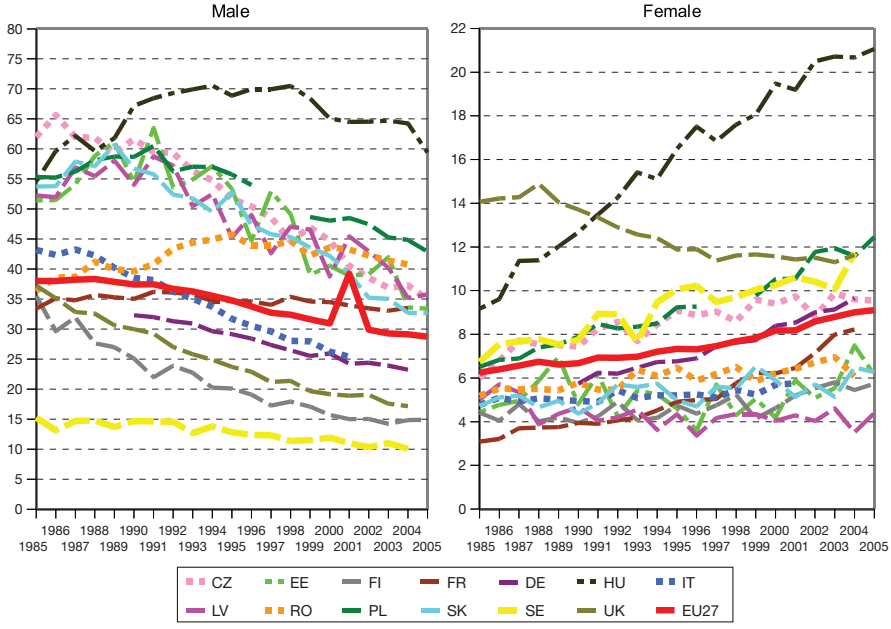

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 3.3** *Standardized death rates attributed to diseases of the circulatory system per 100 000 population aged 0–65 years, EU average and selected countries*



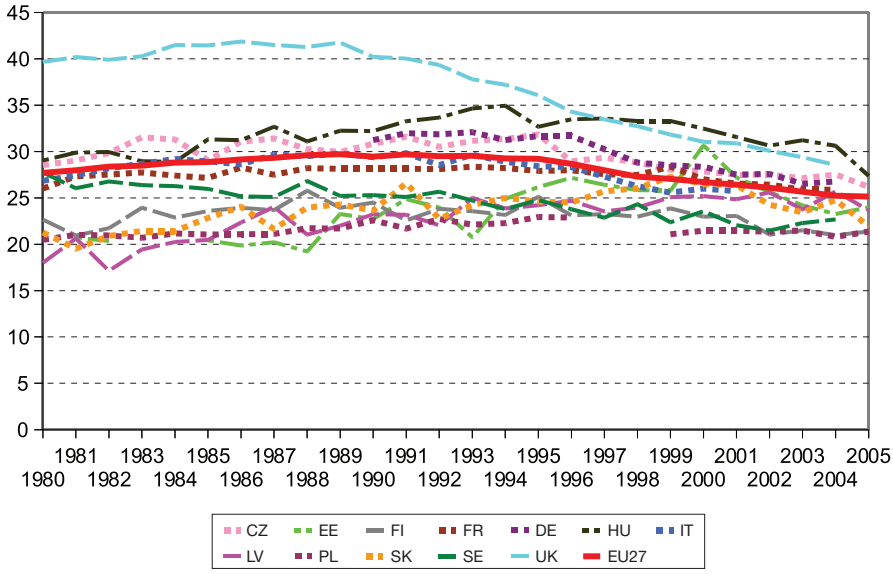

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 3.5** *Standardized death rates due to trachea/bronchus/lung cancer per 100 000 population aged 0–65 years, EU average and selected countries*



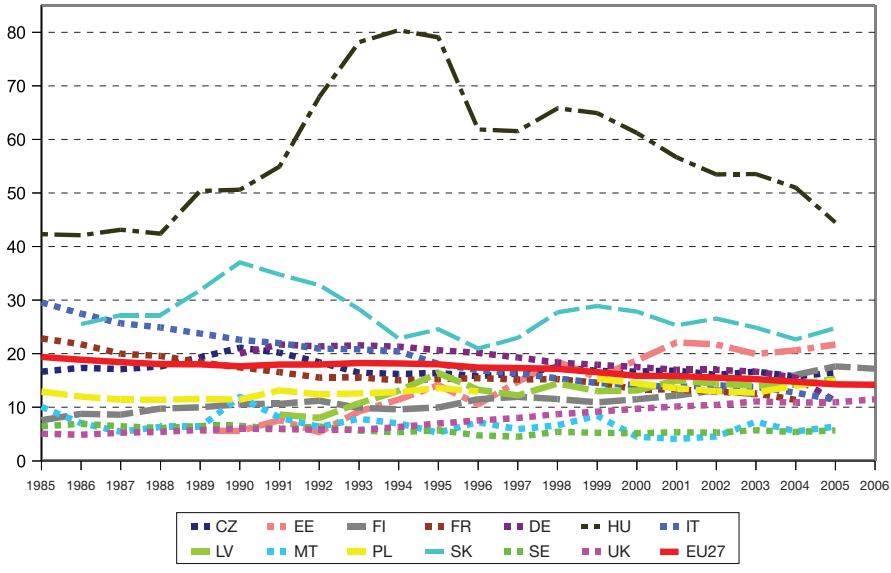

*Source:* WHO Regional Office for Europe 2008b.

**Fig. 3.8** *Standardized death rates due to female breast cancer per 100 000, all ages, EU average and selected countries*




*Source:* WHO Regional Office for Europe 2008b.

**Fig. 3.11** *Standardized death rates attributed to chronic liver disease and cirrhosis per 100 000, all ages, EU average and selected countries*




*Source:* WHO Regional Office for Europe 2008b.

be 8.7% of the total population aged 20 years and above with indications pointing to an increase of 10.3% in the next 20 years. Prevalence rates in the new Member States lie at approximately 10% and beyond (International Diabetes Federation 2008). Diabetes mainly affects the elderly population, and the risk of developing the disease increases with age (Fagot-Campagna, Bourdel-Marchasson and Simon 2005). However, a great concern is that whereas type 2 diabetes has traditionally been an adult-onset disease, children and adolescents are developing it due to increasing levels of childhood and adolescent obesity among Caucasian and ethnic minority groups (Wiegand et al. 2004) (see Section 7.3). For example, a United Kingdom-based study found that 40% of children diagnosed with diabetes have type 2 diabetes (Haines et al. 2007).

It is estimated that more than 50% are unaware of their condition. This means that evidence compiled from national diabetes registers only is likely to underestimate the true burden of the disease. The International Diabetes Federation publishes an atlas of diabetes, with estimated prevalence rates that are not age standardized combining data from registers and specific studies. According to this, the highest rates in the EU are in Germany (11.8%) and the lowest are in the United Kingdom (4%). CEE and Baltic countries tend to have higher rates than those in western Europe (International Diabetes Federation 2008).

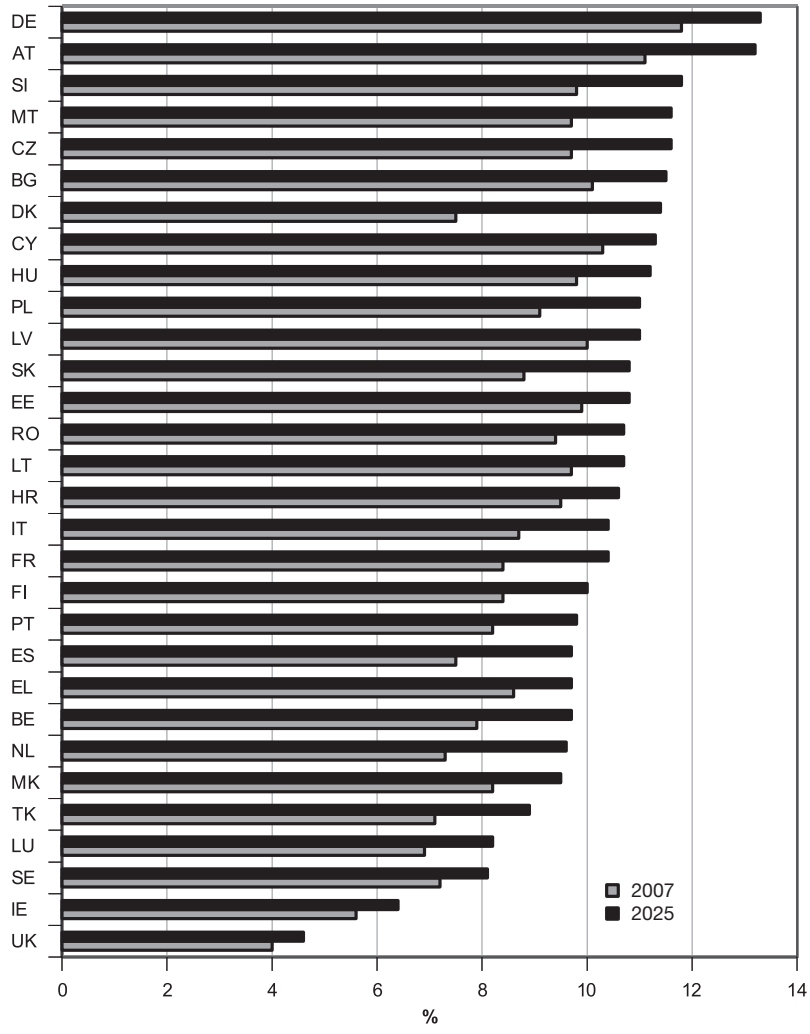
A review of the literature in 1997 estimated the prevalence of type 2 diabetes for the years 1995 and 2000 for seven European countries. The authors predicted a moderate decrease in diabetes prevalence in Finland and moderate increases in prevalence in Denmark and Spain. A very significant increase in type 2 diabetes prevalence was predicted for the United Kingdom, Germany, Italy and France (Amos, McCarty and Zimmet 1997). More recent studies performed in England and Wales (Harvey, Craney and Kelly 2002; Lusignan et al. 2005), France (Ricordeau et al. 2003), the Netherlands (Ubink-Veltmaat et al. 2003), Norway and Germany (Hauner, Koster and Ferber 2003) confirm that type 2 diabetes prevalence is increasing in Europe. Studies from CEE countries are less common but one from Poland also reports an increasing trend (Fabian et al 2005).

Estimates and projections suggest an epidemic expansion of diabetes incidence and prevalence in Europe (Fig. 3.9). This has been calculated by applying current age- and gender-specific prevalence rates to age and urban/rural distribution of the populations estimated for 2025. However, since it is likely that the age-specific prevalence rates (the prevalence at any given age) will rise due to increasing obesity, these figures are probably underestimates.

## 3.4 Trends in respiratory diseases

In Europe, respiratory diseases rank second (after CVDs) in terms of mortality, incidence, prevalence and costs. Lung cancer, pneumonia and COPD are the main respiratory causes of death in western Europe, as well as in CEE countries. In both regions of Europe, lung cancer ranked third in 1990 (after IHD and cerebrovascular disease), followed by pneumonia in the fourth position, and COPD in positions five and eight, respectively (Loddenkemper, Gibson and Sibille 2004). COPD is typically underreported and underdiagnosed, despite being the fifth most common cause of death in England and Wales,

**Fig. 3.9** *Prevalence estimates and projections of diabetes mellitus, selected European countries, 2007 and 2025*




*Source:* International Diabetes Federation 2008.

accounting for nearly 28 000 deaths each year (Berjon-Aparicio 2007). A sign of the recognition of the continuing significance of lung disease in the region is the launch of *The European lung white book* by the European Respiratory Society in 2003. This is the first comprehensive survey of respiratory health in Europe.

Overall, there is considerable variation among European countries in the age-standardized death rates from respiratory diseases per 100 000 population. Death rates range between 30 and 165 for the WHO European Region, with an EU average of approximately 57 per 100 000. Ireland and the United Kingdom are among the leading countries, with 120 and 105 deaths per 100 000, respectively, whereas other western European countries, as well as most in central Europe, remain below the EU average. The reasons for these discrepancies are not clear (Loddenkemper, Gibson and Sibille 2004).

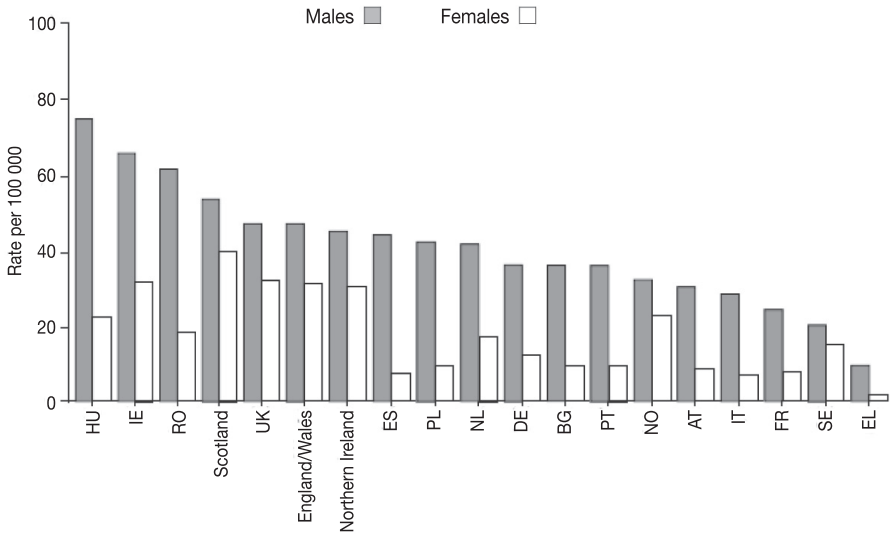
This section proceeds with a discussion of COPD, as well as one other important cause of morbidity – asthma. Data on pneumonia and influenza – communicable diseases – are presented in the following sections. Information on lung cancer can be found in Section 3.2.

### Chronic obstructive pulmonary disease (COPD)

COPD – along with chronic bronchitis, emphysema and asthma – is a chronic lower respiratory infection. The main cause for developing COPD is tobacco smoking. Worldwide, chronic respiratory diseases caused over 4 million deaths in 2005, including over 3 million deaths from COPD. This number is predicted to increase, as COPD is still one of the main causes of mortality in western Europe. The countries worst affected by COPD in 2002 were Denmark (7% of total mortality), the Netherlands (5.2%) and Ireland (5%). In Austria, Belgium, France, Italy, Spain and the United Kingdom COPD accounted for between 3% and 5% of total mortality. Eastern and south-eastern European countries are less affected, with the exception of Turkey, where COPD accounted for 4.2% of deaths in the same year (WHO Regional Office for Europe 2005b).

Mortality rates for COPD are two to three times higher for males than for females (Fig. 3.10). According to data published by the European Respiratory Society on 19 EU and candidate countries, the countries with the highest age-adjusted rates for men (more than 60 deaths per 100 000) are Hungary, Ireland and Romania, while the highest for females (more than 20 per 100 000) are Hungary, Ireland, the United Kingdom and Norway. The least affected for men are Greece, Sweden and France; and Greece, Italy and Spain are least affected for women (European Respiratory Society 2003).

**Fig. 3.10** *Standardized death rates per 100 000, all ages, for COPD for males and females, selected European countries, 2000*




*Sources:* Reproduced from European Respiratory Society 2003.

There were considerable differences in mortality trends from 1980 to 1990 among European countries. While there has been an overall moderate decrease in mortality from COPD in most western European countries, including France, Finland, Italy and Portugal, there has been a considerable increase in mortality among females aged over 55 years in some northern European countries, such as Denmark and the United Kingdom. For example, in the United Kingdom the age-adjusted death rate for women rose from 155 per million in 1981 to 214 per million in 2004, while the death rate for men fell from 606 to 363 per million in the same period (Office for National Statistics 2006). In CEE countries such as Bulgaria, Hungary and Romania there was a dramatic decrease in COPD during that time, although the rate in those countries started from a higher base (European Respiratory Society 2003).

## Asthma

Over the last three decades the prevalence of allergic diseases and asthma has risen throughout the WHO European Region. Asthma is the most frequent chronic disease in children at the time of writing, although prevalence varies widely. It varies from <1% to >15% in children, while in adults, prevalence ranges from <5 % to >10%, with a wide range of variation of reported mortality rates (Loddenkemper, Gibson and Sibille 2004). Rates of asthma symptoms in western countries are 10 times those in eastern countries. However, a recent

global survey on the prevalence of asthma symptoms in children found that in most high-prevalence countries, particularly in English-speaking countries, the rise in the prevalence of asthma symptoms has peaked and may even have begun to decline, although this was not the case in Germany and Finland (Pearce et al. 2007).

Prevalence estimates in children aged 13–14 years range from under 5% in countries such as Greece and Romania to over 30% in the United Kingdom (Masoli et al. 2004). Part of the difference is likely to be attributable to environmental factors. Exposure to indoor air pollutants, environmental tobacco smoke (ETS), outdoor air pollution and suboptimal immune responses are all believed to increase the risk of asthma attacks and to have an adverse impact on respiratory health. The influence of many environmental factors on the natural history of asthma and allergies is not well understood, however, and this makes it difficult to select preventive measures (WHO Regional Office for Europe 2005b).

## 3.5 Trends in chronic liver disease and cirrhosis

Cirrhosis mortality rates are related significantly to population drinking. A recent study found that across nine European countries a 1-litre increase in per capita consumption can on average be estimated to cause three to four additional cirrhosis deaths per 100 000 for men and one additional death per 100 000 for women (Ramstedt 2007). While the EU as a whole has experienced declines in mortality from chronic liver disease and cirrhosis, eastern European countries report a steady increase, peaking during the early post-communist period (Fig. 3.11, see colour section). While some countries, such as the Czech Republic, have returned to pre-transition rates, others, such as Hungary, Romania and to some extent Slovakia experienced very large peaks in alcohol-related liver disease mortality and continue to be particularly badly affected. Data from the 1980s are unreliable for the Baltic states, but since 1990 they have reported dramatic increases that are almost as sharp for women as they are for men.

In western Europe, the United Kingdom and Finland report nearly 2-fold increases in death rates from chronic liver disease and cirrhosis in men and women in the last 10 years, while Italy and France have experienced a steady decline since 1980. This could be explained by the culture of light drinking, integrated into everyday life in the Mediterranean countries and heavier, episodic drinking connected with weekends and celebrations in the northern European countries (Mäkelä et al. 2006), the latter being considered to have a particularly bad effect on health.

In all countries men experience much higher rates of alcohol-related diseases of the liver than women, reflecting their greater consumption rate. Cirrhosis is the most frequently used and reported indicator of alcohol-related harm at the individual level. Research shows that it is a reasonably reliable indicator and that it usually varies with the level of alcohol consumption, although often with a time lag (WHO Regional Office for Europe 2001). Information on alcohol consumption can be found in Section 7.2.

# Chapter 4
# Mental health

**Box 4.1** *Summary of Chapter 4*

- Mental health problems account for 20% of the total burden of ill health across Europe.
- Unipolar depressive disorders accounted for the highest proportion of total DALYs in Austria (9.8% of the total), Belgium (9.7%), Cyprus (6.9%), Denmark (8.1%), Finland (10.8%), France (10.3%), Ireland (8.3%), Italy (6.8%), the Netherlands (7.8%), Norway (8.9%), Slovenia (9.5%), Spain (5.6%) and Sweden (9.7%).
- There are, however, substantial gaps in our knowledge on the prevalence of mental health disorders and steps to encourage the collection of such data would be helpful to future European comparative analysis.
- CEE has seen a decline in population mental health, with increasing rates of alcohol-use disorders, violence and suicide.
- Data show increasing absenteeism and early retirement due to mental illness (particularly depression) across Europe, for both men and women.

## 4.1 Trends in mental health problems

Mental health problems have been estimated to account for approximately 20% of the total burden of ill health across Europe (WHO 2004a). Unipolar depressive disorders accounted for the highest proportion of total DALYs in Austria (9.8% of the total), Belgium (9.7%), Cyprus (6.9%), Denmark (8.1%), Finland (10.8%), France (10.3%), Ireland (8.3%), Italy (6.8%), the Netherlands (7.8%), Norway (8.9%), Slovenia (9.5%), Spain (5.6%) and Sweden (9.7%). In Finland and Sweden the most prevalent cause of death after CVD was Alzheimer's disease and other dementia (WHO Regional Office for Europe 2005b). Mental health problems affect a great many people;

one in four experience a significant episode of mental illness during their lifetime. Data from the Global Burden of Disease Study indicate that four of the six leading causes of years lived with disability are attributable to mental health problems: depression, schizophrenia, bipolar disorders and alcohol-use disorders (WHO 2004a). Depressive disorders are most common, making up nearly one third of all mental health problems. According to this study, only CVD contributes more to the burden of illness in Europe.

Although there have been many epidemiological studies on the prevalence of mental disorders across Europe, there has been little work undertaken to synthesize such information at EU level. Moreover, there is little tradition in most EU countries, unlike the United States, of national epidemiological studies. Nor is there any standardization of approaches used in the conduct of such studies, whether carried out at national or regional levels across Europe. Such information is vital to the development of EU-wide policy on the promotion of mental well-being and preventative strategies to reduce the level of mental health disorders.

One recent attempt to address this deficit was a systematic review of all available epidemiological studies on a variety of mental disorders affecting individuals aged between 18 and 65 years, conducted at a community level across the EU27, plus Norway, Iceland and Switzerland (Wittchen and Jacobi 2005) (Table 4.1). The review identified 24 country-specific and 3 cross-national studies; one striking finding being that no population-based data at all were available from 12 countries (Cyprus, Estonia, Greece, Ireland, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Slovakia and Slovenia), representing 54.8 million inhabitants (17.5%) in the age range under scrutiny. The most commonly found specific 12-month diagnostic conditions were major depression, specific phobias and somatoform disorders. Six studies looked at psychotic disorders reporting a 12-month prevalence ranging between 0.2% and 2.6% (median 0.8%), while for 12 studies looking at alcohol abuse these figures ranged from 0.1% to 6.6% (median 2.4%). Using these data the study estimated that 82.7 million people (27% of the population) across Europe (including Iceland, Norway and Switzerland) are affected by a mental disorder during any 12-month period.

Suicide is one of the top-10 leading causes of premature death in Europe, contributing an additional 2% to the overall burden of illness (WHO 2004a). In itself it is not a mental disorder, but as much as 90% of all suicides are linked to mental health problems, with key risk factors including social isolation and a lack of self-worth. The rate of suicide is much higher in men than in women and, after traffic accidents, it is the principle cause of mortality among males aged 15–35 years in the region.

**Table 4.1** *European prevalence rates for mental disorders and estimated number of individuals affected annually*

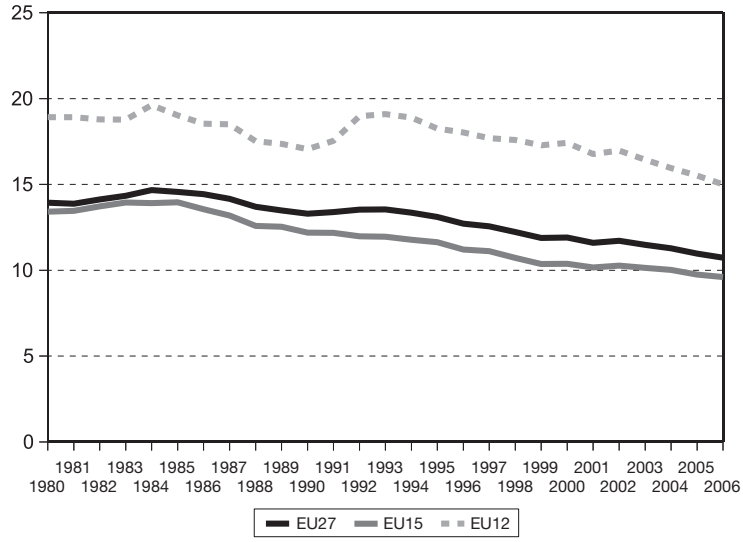
| *Diagnosis* | *12-month prevalence median and range (%)* | *Number of EU individuals affected in any one year (millions)* |
|---|---|---|
| Alcohol dependence | 2.4 (0.1–6.6) | 7.2 |
| Illicit substance dependence | 0.5 (0.1–2.2) | 2.0 |
| Psychotic disorders | 0.8 (0.2–2.6) | 3.7 |
| Major depression | 6.9 (3.1–10.0) | 18.4 |
| Bipolar disorder | 0.9 (0.2–1.1) | 2.4 |
| Panic disorder | 1.8 (0.7–3.1) | 5.3 |
| Agoraphobia | 1.3 (0.1–10.5) | 4.0 |
| Social phobia | 2.3 (0.6–7.9) | 6.7 |
| General anxiety disorder | 1.7 (0.2–4.3) | 5.9 |
| Specific phobias | 6.4 (0.8–11.1) | 18.5 |
| Obsessive compulsive disorder | 0.7 (0.1–2.3) | 2.7 |
| Somatoform disorders | 6.3 (1.1–11.0) | 18.9 |
| Eating disorders | 0.4 (0.2–0.7) | 1.2 |
| **Any mental disorder** | **27.0** | **82.7** |

*Source:* Wittchen and Jacobi 2005.

Suicide rates have generally been falling in the last 30 years, as indicated in Fig. 4.1, but there remains a marked difference in the rates found in most of the new EU countries (Malta and Cyprus are exceptions). In the EU15, rates have generally been falling for both men and women in most countries, although rates at the time of writing in Ireland and Spain remain above their 1980 levels.

The five highest suicide rates per 100 000 population are still found in the new Member States of Lithuania (28.94), Hungary (23.20), Slovenia (22.79), Latvia (19.27) and Estonia (18.74), respectively. However, this masks the progress made in reducing suicide in some countries: the suicide rates in Lithuania, Estonia and Latvia have all fallen markedly from levels of 43.98, 26.01 and 24.08 deaths per 100 000 in 2002, respectively. Among the EU15, high rates can be found in Finland (19.00), France (15.87) and Austria (13.40). The lowest death rates are reported in Cyprus (2.39) Greece (3.05), Malta (4.23) and Italy (5.85), but it is possible that cultural factors and reluctance to record deaths as suicides may mean that underreporting occurs in some countries.

**Fig. 4.1** *Standardized death rates per 100 000, all ages, for suicide and self-inflicted injury in the EU*



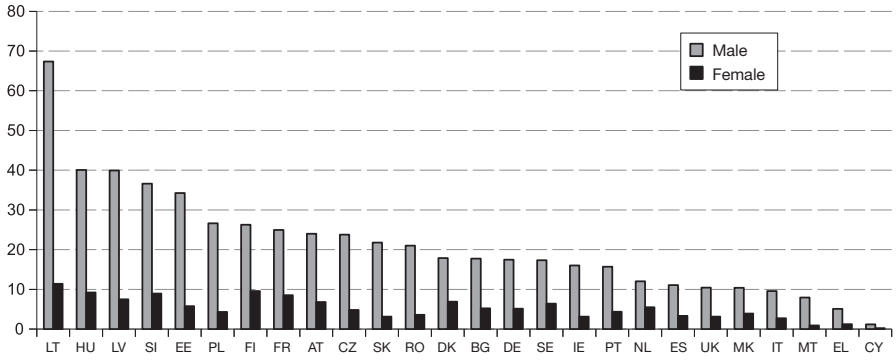

*Source:* WHO Regional Office for Europe 2008b.

Fig. 4.2 provides suicide rates by gender. While the rates of suicide are much lower for women than for men, similar patterns can be seen, with the majority of high rates found in new Member States. With the exception of Belarus, Lithuania had the highest reported suicide rates for men in the world in 2006 at 52.7 suicides per 100 000 population. It also had the highest suicide rate for women, albeit much lower, at 9.3 suicides per 100 000 population.

Age-standardized suicide rates have fallen in the majority of western European countries over the last 30 years, but there are some exceptions. One country for which the overall suicide rate appears at first glance to be low is Ireland; however, suicide rates have continued to rise steadily over the last 45 years, both before and during the current period of rapid economic growth (Lucey et al. 2005). Young men have been most affected by rising suicide rates in the country; between 1980 and 2000 alone the suicide rate for the 15–34 age group increased 4-fold from 6.4 to 25.3 per 100 000.

National statistics can also mask important regional variations. One good example of this can be seen in the United Kingdom. As Fig. 4.3 illustrates, suicide rates among men aged over 15 years in Scotland are almost twice as high as those in England. The burden of suicide is of course further compounded by deliberate self-harm events which do not end in death.

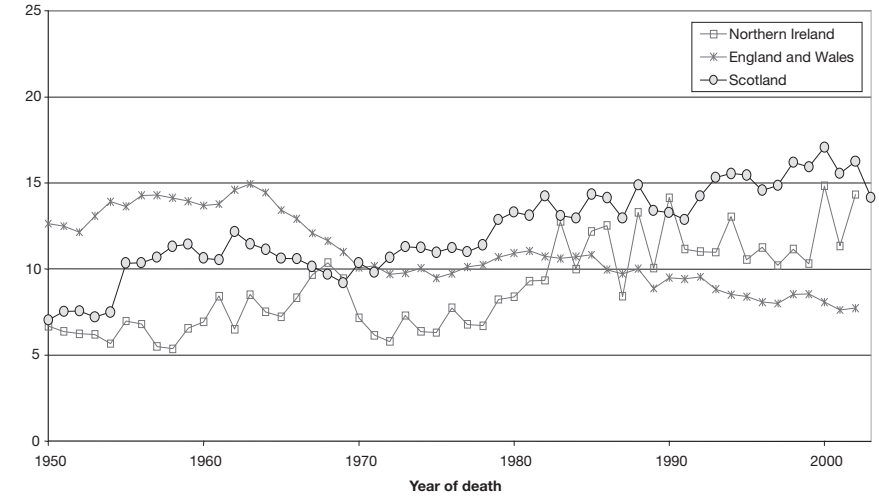
**Fig. 4.2** *Standardized death rates per 100 000, all ages, from suicide and self-inflicted injury for males and females, selected European countries, 2006 or latest available year*




*Source:* WHO Regional Office for Europe 2008b.

In tackling mental health problems in Europe, there are both continuing and new challenges to face, including the consequences of rapid economic and societal change which, as observed in CEE countries, have been accompanied by a decline in population mental health, with increasing rates of alcohol-use disorders, violence and suicide. Another challenge is to meet the needs of those displaced through conflict or persecution and economic migration. As the population ages, the incidence of both dementia and other mental health problems, most notably depression, are likely to increase yet further.

**Fig. 4.3** *Standardized death rates per 100 000 for suicide and self-inflicted injury, men aged 15 years and over: an example of regional variation from the United Kingdom*




*Source:* Reproduced from Office for National Statistics 2007.

# Chapter 5
# Communicable diseases

**Box 5.1** *Summary of Chapter 5*

- In spite of the eradication of many communicable diseases, they remain a significant health threat due to the high rates of TB and growing rates of HIV infection in several Member States and bordering countries (particularly in the CIS), as well as the continuing threat from other (mainly epidemic-prone) communicable diseases and the emergence of new diseases.

**Section 5.1 Trends in sexually transmitted infections**

- Of increasing concern is the recent rise in STIs, HIV and TB, particularly in the Baltic states; the high rate of drug-resistant disease; and the coexistence of HIV and resistant TB.
- Chlamydial infection is the most commonly diagnosed STI, with substantial increases in western Europe since 1995.
- Rates of gonorrhoea and syphilis had either declined or disappeared in the late 1980s but many countries indicate that rates have been increasing again since the mid-1990s.
- In the EU, newly diagnosed cases of HIV infection are increasing and rose to 24 184 in 2004 in 23 countries (excluding Italy and Spain), representing a rate of 68 HIV infections per million population.

**Section 5.2 Trends in tuberculosis**

- Rates of TB declined throughout the 20th century, but TB has re-emerged in many countries.
- Estonia, Latvia, Lithuania and Romania are considered to be high-burden countries with high priority for TB control.

**Box 5.1** *cont.*

**Section 5.3 Trends in pneumonia and influenza**

- Deaths under five years of age from acute respiratory infection, pneumonia and influenza have declined considerably in CEE countries and the Baltic states, as well as Portugal, over the last 30 years; rates have almost converged with the EU average.

Communicable diseases account for 9% of the disease burden in the WHO European Region measured in DALYs, a little over half of which is related to HIV and TB. Communicable diseases remain an important issue in the EU, due to the high rates of TB and growing rates of HIV infection in several Member States and bordering countries, particularly in the CIS; the continuing threat from other (mainly epidemic-prone) communicable diseases; and the emergence of new diseases (WHO Regional Office for Europe 2005b). In eastern Europe infectious diseases were effectively tackled as part of the Soviet model of monitoring and compulsion. However, the breakdown of control systems in these areas may threaten this success (Markina et al. 2000).

Of increasing concern is the recent rise in STIs, HIV and TB, particularly in the Baltic states (Stern 1999). This trend has important implications for increasing fertility rates in the context of an ageing population. A particular concern is the high rate of drug-resistant disease and the coexistence of HIV and resistant TB, with no effective policy responses to date (Farmer et al. 1999). Multidrug-resistant TB is of particular concern in the Baltic states (Estonia, Lithuania and Latvia), being more common among previously treated individuals and foreigners, especially those from the former Soviet Union (Falzon, Infuso and Aït-Belghiti 2006). Cervical cancer is relatively common among the new Member States, reflecting high rates of STIs; infrequent use of barrier contraceptives; and ineffective, mostly opportunistic screening (Levi et al. 2000; McKee, Adany and MacLehose 2004).

## 5.1 Trends in sexually transmitted infections[5]

This section focuses on presenting data on four important STIs seen in the EU: chlamydial and gonococcal infections, syphilis and HIV/AIDS. Other infections, such as genital warts and herpes are not covered but the trends are similar to those relevant to the diseases discussed here. Data for a limited selection of countries are provided, since clear trends can be seen from

[5] This section is based on the research note by Adler (2006).

those selected and adequate data are not available for many countries. The availability of data also varies across diseases in any given country, precluding the use of one set of countries in this section. The availability of services and surveillance/notification systems also varies between European countries and thus affects our understanding of the epidemiology. There is no comprehensive information and surveillance system or uniform service provision within the EU. These differences in service provision and data capture make it difficult and unwise to compare figures and rates related to STIs between countries within the EU. For this reason, data are not age standardized. At best, the data give some indication of trends within countries.

In most countries genital chlamydial infection is the most commonly diagnosed STI, with very marked increases in western Europe (Table 5.1). This increase reflects changing sexual behaviour and increased partner change. However, importantly, some countries are implementing national screening programmes and using non-invasive, more acceptable urinary-based assays, which will give rise to increased prevalence but not necessarily incidence, even though most experts feel that both are occurring. Even in Sweden, credited with having the most extensive chlamydia screening in the world, incidence is rising (Low 2004). Chlamydia has declined in eastern Europe, albeit from a very high rate.

In the early-to-mid-1970s most European countries saw a peak in cases of gonorrhoea. It is thought that the advent of HIV infection in 1980 led to safer sex and accelerated the reduction in gonorrhoea. However, this has not been sustained in all countries. Since the mid-1990s most western European countries have seen an increase in gonorrhoea rates and numbers of cases (Nicoll and Hamers 2002) (Table 5.2), causing concerns about antimicrobial resistance (Martin 2006). Meanwhile, CEE countries and the Baltic states have witnessed a reduction.

Syphilis was a major problem during the first half of the 20th century, but declined dramatically with the wide-scale use and availability of penicillin in the late 1940s and 1950s. In many EU countries it virtually disappeared in the late 1980s and mid-1990s. It was thought that this was largely due to the advent of HIV infections and changed sexual behaviour. However, this has not been maintained and many EU countries have shown an increase since the mid-1990s, particularly in men who have sex with men (MSM) (Nicoll and Hamers 2002)(Table 5.3).

There are concerns that the reported declining number of cases of STIs in CEE countries and the Baltic states may not reflect a true reduction in incidence, but rather a decline in notification, as treatment is increasingly being provided privately (Platt and McKee 2000). In fact, a survey of European STI policies concluded that there is a lack of availability of affordable high-quality STI

**Table 5.1** *Chlamydia incidence per 100 000 in selected European countries*

| | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| **Country** | **1995** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** |
| Belgium | 10 | 10 | 14 | 16 | 20 | 20 | – |
| Croatia | 3 | 3 | – | 19 | 3 | 5 | 9 |
| Denmark | 266 | 303 | 344 | 404 | 444 | 456 | 472 |
| Estonia | 287 | 302 | 156 | 201 | 192 | 190 | 183 |
| Finland | 163 | 264 | 248 | 258 | 245 | 263 | 265 |
| Poland | 8 | 1 | 5 | 1 | 1 | 0 | – |
| Sweden | 155 | 280 | 304 | 364 | 376 | 359 | 518 |
| United Kingdom | 49 | 146 | 161 | 175 | 182 | 190 | 203 |

*Source:* WHO Regional Office for Europe 2008a.

**Table 5.2** *Gonorrhoea incidence per 100 000 in selected European countries*

| | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| **Country** | **1995** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** |
| Czech Republic | 20 | 9 | 10 | 9 | 7 | 11 | – |
| Denmark | 6 | 4 | 3 | 8 | 8 | 8 | 6 |
| Estonia | 194 | 39 | 40 | 36 | 22 | 21 | 13 |
| Ireland | 3 | 6 | 5 | 7 | 9 | 10 | – |
| Romania | 25 | 17 | 11 | 10 | 8 | 6 | 2 |
| Spain | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Sweden | 3 | 6 | 7 | 6 | 8 | 7 | 7 |
| United Kingdom | 17 | 43 | 42 | 37 | 32 | 32 | 31 |

*Source:* WHO Regional Office for Europe 2008a.

services, including STI treatment and condoms in these parts of Europe (Dehne et al. 2002).

The high level of stigmatization attached to HIV/AIDS has created a challenge to the traditional name-based system of infectious disease surveillance and case reporting. Unlike HIV diagnosis, AIDS treatment and care precluded anonymity, thus AIDS case reporting was introduced in almost all European countries early on. However, HIV case reporting remained incomplete until recently in many countries. For example, Greece introduced national HIV case reporting only in 1999, Portugal in 2000, the Netherlands in 2002 and

**Table 5.3** *Number of cases of syphilis in selected European countries*

| | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| **Country** | **1995** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** |
| Denmark | 42 | 35 | 79 | 114 | 117 | 76 | 93 |
| Finland | 169 | 128 | 133 | 109 | 144 | 128 | 186 |
| Germany | 1138 | 2275 | 2932 | 3351 | 3207 | 3146 | 3247 |
| Ireland | 11 | 276 | 196 | 336 | 229 | 102 | – |
| Latvia | 2357 | 679 | 784 | 584 | 443 | 483 | 301 |
| Poland | 1566 | 1165 | 969 | 860 | 828 | 933 | – |
| Spain | 202 | 211 | 245 | 373 | 516 | 749 | 264 |
| Sweden | 69 | 128 | 178 | 194 | 109 | 172 | 240 |

*Source:* WHO Regional Office for Europe 2008a.

France in 2003, while two of the most affected western European countries – Italy and Spain – still do not have such a system in place (Matic 2006). Table 5.4 shows the number of reported cases of HIV infection in 1995 and for the period 2001–2006.

In the EU, 24 184 newly diagnosed cases of HIV infection were reported in 2004 in 23 countries (excluding Italy and Spain), representing a rate of 68 HIV infections per million population. Over a third of cases (36%) were reported among females and 13% among young people aged 15–24 years. The highest rates were reported in Estonia and Portugal, but rates of between

**Table 5.4** *Number of cases of HIV infection in selected European countries*

| | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| **Country** | **1995** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** |
| Belgium | 768 | 966 | 992 | 1 052 | 1 002 | 1 074 | 995 |
| Estonia | 11 | 1474 | 899 | 840 | 743 | 621 | 668 |
| Germany | 2 174 | 1 308 | 1 867 | 1 902 | 2 237 | 2 433 | 2 718 |
| Poland | 539 | 564 | 574 | 610 | 656 | 654 | 750 |
| Portugal | – | 2 383 | 2 474 | 2 243 | 2 785 | 2 612 | 2 162 |
| Russian Federation | 199 | 87 144 | 47 715 | 36 379 | 33 969 | 35 379 | 39 207 |
| Sweden | 248 | 270 | 278 | 363 | 431 | 391 | 377 |
| United Kingdom | 2 843 | 4 152 | 5 919 | 6 902 | 7 211 | 8 431 | 8 925 |

*Source:* WHO Regional Office for Europe 2008a.

100 and 200 new diagnoses of HIV infection per million population were reported by three EU countries: Latvia (141); Luxembourg (131); and the United Kingdom (126) (EuroHIV 2005).

In the region WHO classifies as "eastern Europe" (mostly the countries of the former Soviet Union, including the Baltic states), the HIV epidemic has been concentrated amongst intravenous drug users (IDUs), although in 2004 the number of new diagnoses amongst drug users had declined. For example, in Latvia it declined from 665 in 2001 to 145 in 2004. In contrast, the number of infections in the former Soviet Union that were reported as having been heterosexually acquired has nearly doubled across the same period (EuroHIV 2005). However, the slowly decreasing proportion of IDUs among all new HIV cases reported could be the result of changing testing patterns among IDUs, rather than any real decline in incidence. Furthermore, even among heterosexually transmitted infections in the former Soviet Union, at least 35% occurred in the sexual partners of HIV-positive IDUs (Matic 2006). While the prevalence of heroin use is estimated at less than 0.6% in most western European countries, it has been estimated that between 0.9% and 2.3% of the adult populations in Estonia, Kazakhstan, Kyrgyzstan, Latvia, the Russian Federation, Tajikistan and Ukraine inject heroin (UNODC 2005). The extremely high prevalence of injecting drug use in the area, the widespread sharing of injecting equipment there and the high efficacy of HIV transmission through such sharing made the HIV epidemic in the former Soviet Union in the late 1990s the fastest growing the world had yet seen (Matic 2006) (see section 7.4 for further information on European drug use trends).

In central Europe the epidemic remains at a relatively low level, with only 1585 new cases of HIV infection being reported in 2004, representing a rate of 8.5 per million population. A total of 30% of newly diagnosed cases were female, with 21% among young people (aged 15–24 years). The epidemic is characterized in central Europe by its heterogeneity, with various transmission modes predominating in different countries, for example, homosexual contact in Hungary, injecting drug use in Poland and heterosexual contact in Romania (EuroHIV 2005).

In western Europe, 23 246 new cases of HIV infection were reported in 2004 – a rate of 77.9 per million population. Over a third (36%) of new cases of HIV infection in 2004 were among females, but the proportion among young people (15–24 years old) was very low (10%). The predominant transmission mode is heterosexual contact. The number of cases in this transmission group nearly doubled from 2001 (5968 cases) to 2004 (11 126).

Of the 14 countries with complete data, increases of more than 50% in heterosexual transmission in the period 2001–2004 were reported in four

countries, each with more than 50 cases in 2000: the United Kingdom (from 2342 to 4369), Portugal (from 921 to 1411), Switzerland (from 276 to 433) and Sweden (from 143 to 259). The proportion of heterosexually acquired cases of infection in individuals known to originate from countries with generalized HIV epidemics is high in many countries, but varies across Europe – from 22% in Portugal to 71% in Belgium and Sweden. Although this reinforces the need to ensure that prevention and care services are adapted to reach migrant populations in affected countries, targeting these populations only would be by no means sufficient. The number of HIV reports among MSM from the 14 western European countries also increased, so that by 2004 the level was 56% higher than in 2001 (3148 in 2001 to 4914 in 2004) (EuroHIV 2005). Furthermore, the number of diagnoses of HIV infection in people who are thought to have acquired their infection through heterosexual intercourse in the autochthonous European population may also be rising. For example, heterosexually transmitted infections among people born in the United Kingdom continued to rise steadily, from 227 in 2000 to at least 498 reported in 2004 (de Souza-Thomas et al. 2005). In three countries, HIV prevalence levels of higher than 20% among drug users have been found in at least one city or region: 38% in Catalonia, Spain, with the highest reported HIV prevalence in western Europe; 28% in Sardinia, Italy; and 32% in Marseille, France (EuroHIV 2007).

The explanation for the increases in STIs are multifactorial and include changing attitudes towards sex and sexual behaviour, as well as social and economic factors. For example, populations are now more mobile nationally and internationally, and structural factors are also involved, such as a failure to provide adequate services. Despite the increase in several significant STIs over the last 15 years, there continues to be no comprehensive information and surveillance system or uniform service provision within the EU. Failure to diagnose and treat STIs results in further complications and deleterious consequences at both the individual and population levels. Potential effects of untreated STIs include: reduced fertility; increased risk of HIV transmission; and increased costs to the health system.

## 5.2 Trends in tuberculosis

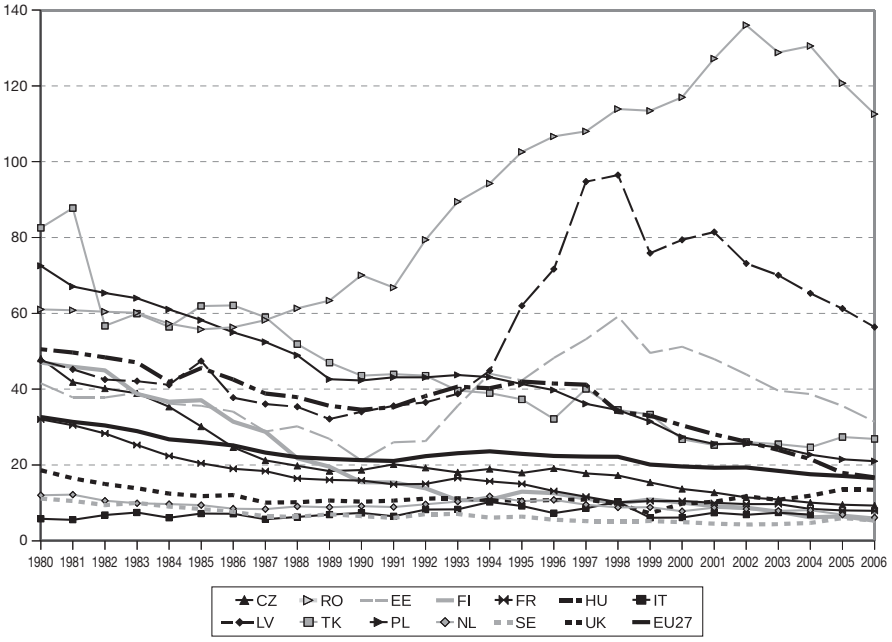
In most European countries, TB morbidity among the native population has declined dramatically in the 20th century, although notification data indicate that the regular decline previously observed slowed down or halted in several low-incidence countries in Europe in the 1990s, such as the Netherlands (Broekmans et al. 2002) (Fig. 5.1).

In the EU25, and in Andorra, Iceland, Israel, Norway, San Marino and Switzerland, 60 266 TB cases were notified in 2004, with an overall notification rate of 12.6 per 100 000, being highest in the Baltic states (44–73). Of all cases, 23% were in individuals over 64 years of age, 63% were in men and at least 29% were in individuals of foreign origin, reaching 40% or more in 16 countries. Of these, 30% were from Africa, 21% from Asia and 37% from CEE or former Soviet Union countries. In 2004, 81% of the cases had no history of anti-TB treatment (they were new cases). The overall notification rate in 2004 was 26% lower than in 1997. Average annual rates decreased between 2000 and 2004 in all the countries surveyed, except Greece, Ireland, Norway and the United Kingdom. In Greece, rates increased in all age groups, most likely as a result of improved reporting. In Norway and the United Kingdom, notification rates have been increasing progressively in cases involving individuals aged 15–44 years, most of whom were of foreign origin, in 2004. In most countries, trends in notifications over time differed markedly between nationals and non-nationals. In 16 countries with consistent data, between 1998 and 2004 the average annual decrease in the number of cases was more marked in nationals (-7.6%) than in cases of foreign origin (-0.2%), resulting in an increase in the proportion of cases of foreign origin from 30% to 40% (EuroTB 2006).

Resurging TB in low-incidence countries can be explained by the gradually increasing relative and absolute importance of the importation of latent TB infection and TB from other countries; the emergence of groups at particularly high risk of TB (such as HIV-positive patients, homeless individuals, prisoners in certain settings and so on); and the importation of drug-resistant and, particularly, multidrug-resistant TB from eastern European countries (Broekmans et al 2002).

Estonia, Latvia, Lithuania and Romania are considered to be high-burden countries and a high priority for TB prevention and control by the WHO Regional Office for Europe (Veen and Godinho 2006). In the region WHO classifies as “eastern Europe” (mostly the countries of the former Soviet Union), the rate of increase reached nearly 14% annually by 1995, but the increase appears to have halted around the year 2000, and incidence is once again in decline at the time of writing. The resurgence of TB in eastern Europe during the 1990s has been associated with (but primarily not caused by) relatively high rates of multidrug-resistant TB among new and previously treated patients (WHO 2006). Poland, Portugal, Spain, Turkey, Croatia, Hungary and the former Yugoslav Republic of Macedonia are considered to be of intermediate priority (Veen and Godinho 2006).

**Fig. 5.1** *Tuberculosis incidence per 100 000, EU average and selected countries*




*Source:* WHO Regional Office for Europe 2008b.

Almost 3% of all new TB cases that occurred in Europe in the year 2000 were also co-infected with HIV. Approximately 28% of people living with AIDS in the WHO European Region in 2004 were also co-infected with TB. However, cases of dual infection are unevenly distributed through Europe. As an AIDS indicator disease among adolescent and adult cases, the TB rate among people living with HIV/AIDS was 24% in western Europe, 19% in central Europe and 56% in the former Soviet Union (Veen and Godinho 2006).

## 5.3 Trends in pneumonia and influenza

Pneumonia and influenza present significant health challenges in the EU. In Cyprus, Ireland, Malta, Portugal and the United Kingdom the second or third most common cause of death was lower respiratory infection (excluding COPD), such as influenza, pneumonia and acute bronchitis, accounting for 6.6%, 8.5%, 7.8%, 5.7% and 10.9% of all cause of mortality, respectively, for each of the above-mentioned countries (WHO Regional Office for Europe 2008b).

Crude mortality from pneumonia ranges from <15 to >45 per 100 000 and its incidence ranges from <250 to >1000 per 100 000 inhabitants. The United Kingdom and Ireland have the highest overall mortality rates in the EU, while the former Yugoslav Republic of Macedonia, Greece and Hungary have the lowest. However, the large variation in mortality rates suggests that underreporting may be a problem. In addition, the age structure of populations in different countries may vary. The incidence of pneumonia is higher at the extremes of age, both in very young children and in elderly adults. Disaggregated by age, limited data suggest that eastern European countries have much higher rates of pneumonia mortality in children aged under one year than western European countries (European Respiratory Society 2003).

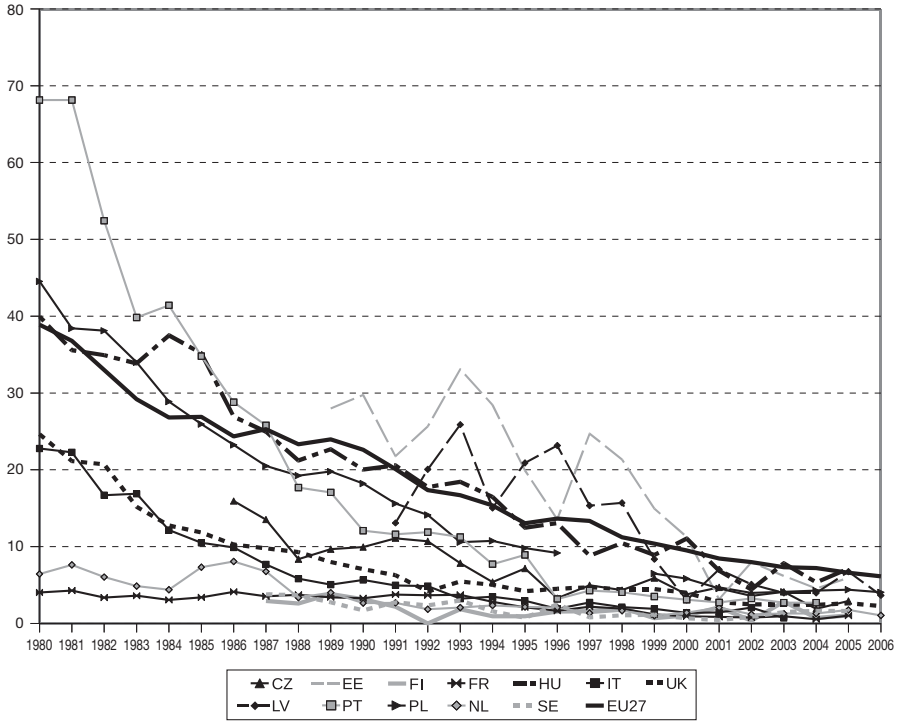
Influenza is an important public health problem in Europe. Children are efficient transmitters of influenza viruses and those aged 5–9 years typically manifest the highest rates of infection and illness. However, severe morbidity and mortality are more common among elderly people and in specific high-risk groups (WHO 2005b). Influenza is associated with increased hospital admissions and excess deaths in the winter influenza season (Fleming 2000). Since influenza may be confused with other respiratory infections and its most common complication is pneumonia, the mortality of influenza is often expressed as excess deaths caused by pneumonia.

Influenza outbreaks occur every year and in Europe are monitored by influenza surveillance networks that have cooperated and shared information since the mid-1980s. In 2004/2005 a total of 15 295 specimens tested positive for influenza virus across the 26 European countries participating in the surveillance network (EISS 2006).

Recorded since the middle of the 18th century, new influenza virus subtypes have caused major global outbreaks at unpredictable intervals. Of these pandemics, the "Spanish flu" in 1918 was the most severe, causing upwards of an estimated 20–40 million deaths worldwide. Less severe pandemics occurred in 1957 and 1968 (WHO 2005b). Therefore, another important aspect of influenza is the threat of the emergence of potentially high-pathogenic novel virus subtypes capable of causing influenza pandemics, such as the avian influenza virus named H5N1 (WHO 2005b) and the pandemic (H1N1) 2009.

WHO reports combined mortality data for acute respiratory infections, pneumonia and influenza in children under 5 years of age (Fig. 5.2). From this it is evident that CEE countries and the Baltic states, as well as Portugal, have made significant progress in dramatically lowering death rates from these diseases in the last 30 years, so that the rate for the new Member States almost

**Fig. 5.2** *Standardized death rates from acute respiratory infection, pneumonia and influenza per 100 000 in children under 5 years, EU average and selected countries*




*Source:* WHO Regional Office for Europe 2008b.

converges with the EU average at the time of writing. Romania, Bulgaria and the former Yugoslav Republic of Macedonia have also experienced falling trends although, particularly in the first two countries, death rates from these diseases remain incredibly high (111.67, 47.55 and 13.66 per 100 000, respectively).

# Chapter 6
# Injuries and accidents

**Box 6.1** *Summary of Chapter 6*

- In the EU, injuries have been ranked as the fourth most common cause of death, after cardiovascular diseases, cancer and respiratory ailments. Approximately 251 000 injury-related deaths occur annually, with a great degree of disparities across Member States. Two areas of particular importance are road traffic accidents and domestic accidents.

**Section 6.1 Trends in road traffic accidents**

- There is an ever-increasing growth of road traffic in the EU. However, road traffic fatalities are decreasing in several EU countries, including Germany, the Netherlands, Sweden and the United Kingdom.
- However, in 2002 Poland, Slovakia, Latvia, Estonia and the Czech Republic experienced levels of road traffic accidents worse than those in 1985.
- A total of 75% of the people involved in vehicle crashes in the WHO European Region were male. This gender difference is especially pronounced among people aged 15–29 years.
- Road traffic accidents particularly affect young people; they are the third leading cause of death for individuals under 25 years of age in the WHO European Region.

**Section 6.2 Trends in domestic accidents**

- A total of 63% of all unintentional injuries occur in the home, during sports or leisure time.
- The fatality rate in the EU due to home and leisure/sport accidents is twice that of road traffic accidents, and more than 10 times that of workplace accidents, at 22 per 100 000 inhabitants. Over half of all home and leisure accidents occur in and around the home.

**Box 6.1** *cont.*

- Domestic accidents are more common in the very old and very young age groups, among females and in disadvantaged socioeconomic groups.
- There is great variability in rates of domestic accidents in the EU, with especially high rates of injury mortality in eastern Europe. This indicates that high rates of injury can be avoided.

In the WHO European Region, injuries are the leading cause of death in people aged 1–44 years of age. When all age groups are taken together, injuries rank third after CVDs and lung cancer, and in 2002 injuries caused an estimated 800 000 deaths (8.3% of the total) (Sethi et al. 2006). The three leading causes of injury death in the Region were road traffic accidents, poisoning and self-inflicted injuries (Angermann et al. 2007; Sethi et al. 2006). Among all deaths and DALYs lost due to injuries, road traffic accidents accounted for 16% of deaths and 17% of DALYs lost; self-inflicted injuries accounted for 21% of deaths and 16% of DALYs; while poisoning caused 14% of deaths and 10% of DALYs (Sethi et al. 2006). In total, injuries in the Region cause 9% of mortality and 14% of ill health.

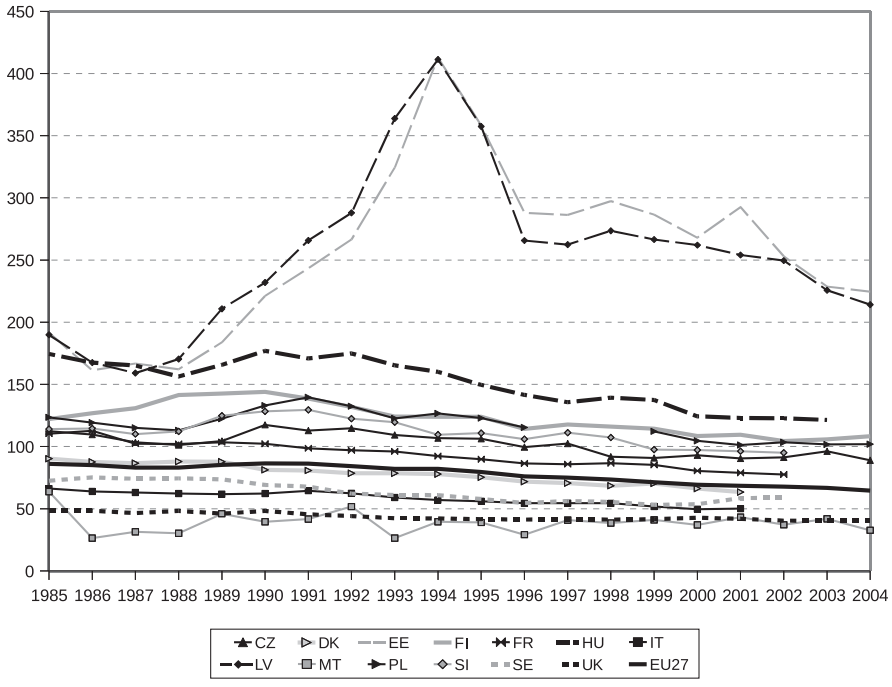
Within the EU, injuries have been ranked as the fourth most common cause of death after CVDs, cancer and respiratory ailments. Approximately 251 000 injury-related deaths occur annually, with a great degree of disparities in Member States (Angermann et al 2007). Indeed, even though the EU is one of the safest places to live in the world, the recent enlargement has led to a 20% increase in recorded injuries in the region. Also of concern is the number of non-fatal injuries which result in hospital admission, outpatient or other medical treatment, consuming a substantial amount of health resources and resulting in a significant burden to most health and welfare systems. Statistics show that approximately 12% of the European population is treated for injuries annually (60 million in total) (EU Injury Database 2008), with approximately 11% of those cases (6.8 million) leading to hospitalization across all EU Member States. Consequently, this results in reduced productivity, as many people suffer from injuries that may prevent them from taking part in economic activities for a significant period. Many people who survive severe injuries suffer lifelong disabilities, which often lead to high loss of life years in good health, especially for young people.

Injuries disproportionately affect males and younger people, with males in Europe being at a higher risk of dying from injuries compared to females. Fig. 6.1 shows the standardized death rates per 100 000 men in the EU.

The burden of injury has been found to be greater in young and elderly populations, but is also skewed towards those residing in the most deprived conditions (Petridou et al. 2007). Injuries are the leading cause of death in children aged 0–14 years, accounting for 36% of the total. In the EU, mortality rates for children aged 1–14 years are lowest in the Nordic countries, with Sweden reporting the lowest rate (approximately 4 per 100 000) and highest in the Baltic countries, with Latvia reporting the highest rate (approximately 24 per 100 000). Deprived children are 3–4 times more likely to die from injuries; this is associated with single parenthood, low maternal education, low maternal age at birth, poor housing, large family size and parental drug or alcohol use (Sethi et al. 2006).

Although people over 60 years of age constitute 18.6% of the population of the WHO European Region, they account for 28.2% of injury deaths. Estimates indicate that 28% of the European population will be aged 65 years or more by 2050, which implies that the injury problem and the associated costs are likely to increase (Sethi et al. 2006). Falls are by far the most significant cause of mortality for people over 65 years of age, accounting for 35 deaths per

**Fig. 6.1** *Standardized death rates due to injury and poisoning, per 100 000, men of all ages, EU average and selected countries*




*Source:* WHO Regional Office for Europe 2008b.

100 000 population (Sethi et al. 2006). Older people are most likely to be injured because of various medical conditions, such as vision impairment, pace and imbalance, as well as frailty. These conditions and many others increase the severity of injuries in the elderly, which could result in longer hospital stay or end in a fatality. This problem requires systematic strategies and policies which are aligned with other services for the elderly, such as long-term care.

Injuries accounted for 20% of the burden of disease in the former Soviet Union; 11% in the rest of the CEE countries; and 8% in western Europe (Nolte, McKee and Gilmore 2005). The Russian Federation in particular stands out, with death rates from injury among the highest anywhere recorded in the world (Chervyakov et al. 2002). If the CEE countries and Baltic states that are now EU Member States had childhood injury rates at the level of the EU average, 2000 deaths among children aged 1–14 years would have been prevented between 1991 and 1995 (McKee, Adany and MacLehose 2004). As with many of the other leading causes of mortality in Europe, injuries and poisoning rose sharply in CEE countries and Baltic states in the years following 1989.

Latvia, Estonia and Lithuania have the highest prevalence of fatal injuries in Europe. Injuries have been found to be the third common cause of death in Lithuania, where approximately 5000 adults and 400 children and adolescents become involved in fatal injuries. This could be due to the low levels of living standards in those countries, resulting from socioeconomic and gender inequality. The United Kingdom seems to have the lowest injury mortality rate and this could be attributed to the multisectoral approach the country has adopted in dealing with domestic accidents and related injuries.

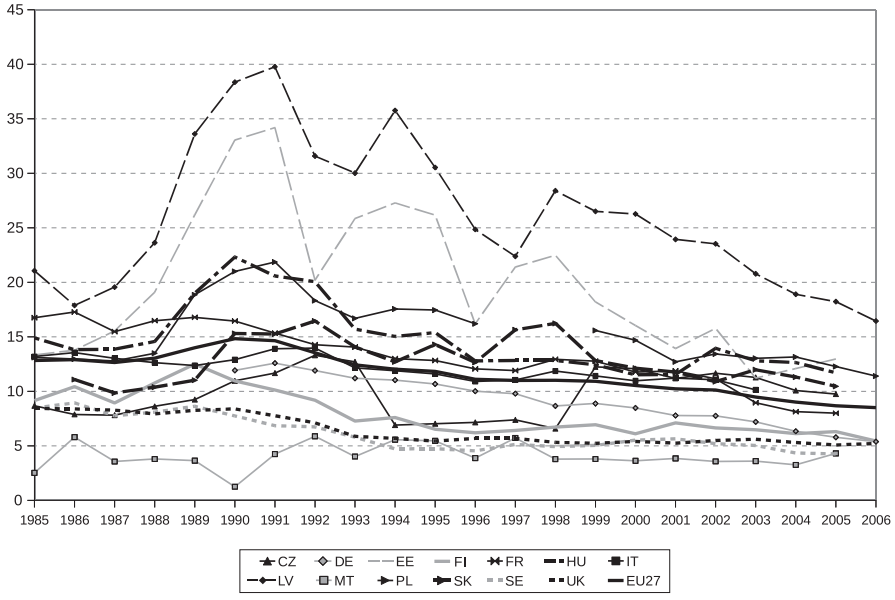
One study found that if all EU Member States had matched the country with the lowest unintentional rate for all causes of injury combined, over 73 000 lives could have been saved in the EU25 in a single year, notably nearly half (47.4%) as many unintentional injury deaths could have been avoided in children, over half in adults (54%), and two fifths (38%) in the elderly (Petridou et al. 2007).

## 6.1 Trends in road traffic accidents

Road traffic accidents constitute a large part of total mortality due to accidents. According to the transport-related database of the United Nations Economic Commission for Europe, 1.9 million road crashes resulted in non-fatal or fatal injury in the WHO European Region in 2001, with the overall number of injuries reaching 2.4 million.

In the EU, passenger and freight transport by road increased by 18% and 40%, respectively, between 1990 and 2000 (WHO Regional Office for Europe 2004). However, since the 1960s and 1970s there has been a decrease in the number and rates of road traffic fatalities in high-income countries in Europe, including Germany, the Netherlands, Sweden and the United Kingdom (Fig. 6.2). In the 1990s death rates within the EU from road traffic accidents were highest in Ireland, Spain, Greece and Portugal (McCarthy and Blumenthal 2006). In 2002 Greece and Portugal still had much higher mortality rates (14.04 and 17.88 per 100 000, respectively) than the EU average (10.13 per 100 000), but mortality rates in Ireland and Spain fell closer to the EU average (8.22 and 11.85 per 100 000, respectively). The reductions in road traffic fatalities in high-income countries are attributed largely to the implementation of a wide range of road safety measures, including seat-belt use, vehicle crash protection, traffic-calming interventions and traffic law enforcement. However, fatality rates are stagnating at the time of writing in several countries (see Fig. 6.2) and new initiatives are therefore needed (WHO Regional Office for Europe 2004). Furthermore, although rates of fatality have fallen, the rates of accidents and casualties appeared to have declined only marginally between 1970 and 2000 in western European

**Fig. 6.2** *Standardized death rates attributable to motor vehicle traffic accidents, per 100 000 population aged under 65 years, EU average and selected countries*




*Source:* WHO Regional Office for Europe 2008b.

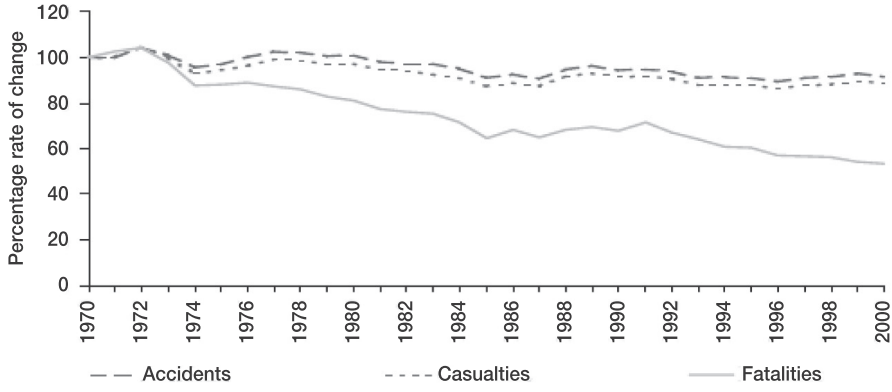
countries (Fig. 6.3) (Short 2001). Cycling and walking still have a fatality risk per distance travelled that is 7–9 times higher than car travel (European Transport Safety Council 2003).

While mortality from road traffic accidents has been falling in western Europe, in the rest of the world there has been a pronounced rise in numbers and rates in many low-income and middle-income countries. In Europe, all the countries of new Members States, especially the Baltic states, experienced a significant – although transient – increase in deaths from injuries in the late 1980s and early 1990s. Road traffic accidents, in addition to homicide and suicide, constitute a large part of this increase in deaths from injuries in the new Members States, in particular in Latvia and Estonia.

Lithuania, Latvia, Portugal and Greece have the highest mortality rates due to road traffic accidents among people aged under 24 years. On the other hand, the United Kingdom, the Netherlands and Sweden have relatively high rates of traffic in conjunction with the fewest deaths on the roads, indicating better safety practices (Sethi, Racioppi and Mitis 2007).

Using European Conference of Ministers of Transport (ECMT) transport statistics, one report divides the developments in the CEE countries into three periods since 1985. In the first period, 1985–1990, the number of fatalities rose in all the countries – by almost 50% in the EU10, with the smallest increase in Slovenia and the greatest in Estonia. It is worth noting that even among the then EU Member States, the number of fatalities rose in the same

**Fig. 6.3** *Road traffic accident trends*, selected European countries***




*Source:* Reproduced from Short 2001.

*Notes:* * 1970 = 100; ** Austria, Germany, France, Iceland, Norway, Portugal, Spain, Switzerland, Sweden, United Kingdom.

period by 7%. The second period, 1990–1995, shows a clear decrease of 12% in the EU10 and of 18% in the EU15. Hungary and the Baltic states benefited from the greatest decreases. The third period, 1995–2000, is likewise marked by a general decrease (with the exception of Latvia) – a 14% decline in the EU10 countries and a 16% decline in the EU as a whole. Thus, the EU10 and the EU15 countries exhibit similar trends, although the CEE countries are far more extreme. However, when considering the entire period, from 1985 to 2002, it becomes clear that while the total number of fatalities in the EU15 declined by 36%, those in the EU10 rose by 11%. In 2002 Poland, Slovakia, Latvia, Estonia and the Czech Republic experienced figures worse than those of 1985. In the same year, Slovenia achieved the greatest success by reducing road fatalities by 45% (Mikulík 2004).

Poor quality roads, lax enforcement of speed limits and alcohol all contribute to the high level of road traffic incidents in CEE countries, with alcohol also playing a significant role in the other "external causes of death" (McKee, Adany and MacLehose 2004). Transport volume in the CEE countries and the CIS countries declined sharply after 1989 following economic recession and therefore probably does not account for the sudden increase in deaths. However, in the CEE countries, freight volume and passenger transport have been rising again since the mid-1990s, following economic recovery (WHO Regional Office for Europe 2004).

Approximately 75% of the people involved in crashes in the WHO European Region are male. This gender difference is especially pronounced among people aged 15–29 years: males represent 80% of the total number of victims in that age group (WHO Regional Office for Europe 2004). This has been attributed to a combination of differences in exposure and in risk-taking attitudes. Men have greater access to motor vehicles on average than women, including those with the highest fatality rates, such as motorbikes. Further, they are more likely to engage in risky behaviour, such as speeding and driving under the influence of alcohol, which increase both the likelihood of crashes and their severity (Twisk and Stacey 2007; WHO Regional Office for Europe 2004). Research suggests that in general males take more risks than females in many aspects of the traffic environment; this has been found among children (Vagero and Ostberg 1989), cyclists (Davies et al. 1997) and car drivers (DeJoy 1992).

Road traffic accidents particularly affect young people; they are the third leading cause of death for individuals aged under 25 years in the WHO European Region, killing 3200 children and young adults every year. While half the children younger than 15 years killed in accidents are pedestrians, those aged 15–24 years are more likely to die while driving (Sethi, Racioppi and Mitis 2007). Road traffic accidents are also the main reason for youths

attending hospitals. Risky behaviour, such as speeding, alcohol consumption and lack of safety precautions (helmets and seat-belts) has led to the high level of youth death and injuries related to road traffic. Inexperience is also a factor. All countries appear to follow Smeed's law (Adams 1985). That is to say, all countries start with high accident rates per new driver, regardless of age, falling as drivers become more experienced. Socioeconomic factors are a further determinant. Many countries have steep social class gradients in child pedestrian injury rates, and children belonging to ethnic minorities have an increased risk of pedestrian injuries (WHO Regional Office for Europe 2004).

In some European countries, elderly people are also at increased risk, with the age group over 60 years old accounting for a higher proportion of all road traffic deaths than the global average. For example, an OECD study found that in 1997, pedestrian fatalities among those aged 65 years and above accounted for 49% of all road traffic fatalities in Norway and 48.8% in the United Kingdom (OECD 2001). However, in the Netherlands the figure was only 5.5%.

The risk of accidents varies, depending on the type of road, the traffic mix, the time of the day and climatic conditions, and the speed and mass of vehicles involved. On average, approximately 65% of road accidents occur in residential areas; 30% outside residential areas; and 4–5% on motorways. In most countries, the risk of dying in accidents occurring on motorways is two to three times higher than those on other roads (UNECE 1997).

Roads near houses and schools are high-risk areas for children, and restrict their activity, including cycling and walking. The areas of highest risk for vulnerable road users such as pedestrians and cyclists are minor roads and their intersections with arterial roads (OECD 1999).

Speed is an important factor in road traffic accidents. There is an exponential rise in risk to pedestrians with increase in traffic speed. At 30 km/h, only 5% of pedestrians involved in road accidents are killed and most injuries are slight. At 40 km/h, 45% of pedestrians are killed, while in crashes at more than 50 km/h up to 85% of pedestrians struck by a car are killed (McCarthy 1999).

There are differences in estimates of mortality and morbidity from road traffic accidents between WHO and other organizations such as the United Nations Economic Commission for Europe and the EU. These result from the original sources of data. WHO uses mortality and health statistics records, while other organizations use transport and road police authorities' records (WHO Regional Office for Europe 2004). Police reports provide little information on health effects because their purpose is legal, not medical.

In particular, systematic misinformation about mild injuries underestimates the real burden of road accidents. The underestimate has been calculated to be between four and five times lower than the incidence estimated through health-based statistics. Police data on injuries also suffer from conflicting definitions of injury severity. The information gathered on mortality suffers from conflicting definitions; in particular, the lack of distinction between road users. Mortality records, on the other hand, may be hampered by differences in the classification of the cause of death, depending on the amount of time after which death occurs following the accident (Farchi et al. 2006).

Furthermore, efforts to analyse the determinants of differences in road traffic accidents are hampered by limited international comparability among "risk exposure data". There are incompatibilities among the national definitions (road network, vehicle categories, and so on) and/or characteristics (different uses of various transport modes in various countries, for example mopeds and motorcycles). Consequently, the different definitions between travel surveys and accident databases often create problems when travel surveys are used for the purpose of road safety analyses.

## 6.2 Trends in domestic accidents

When addressing rates of accidents and injuries, many countries have traditionally concentrated on road traffic and workplace accidents, but the 2007 report on injuries in Europe shows that domestic accidents are much more prevalent than was previously estimated (the term "domestic accidents" refers to accidents that occur in or around the home – this mainly defines accidents not connected to traffic, vehicles or sport). The report found that the fatality rate in the EU due to home and leisure/sport accidents is twice that of road traffic accidents, and more than 10 times that of workplace accidents, at 22 per 100 000 inhabitants (Angermann et al. 2007). Home and leisure accidents account for approximately 63% of all unintentional injuries in Europe (33% are transport related and 4% occur in the workplace) (Angermann et al. 2007). There are huge disparities in home and leisure accident mortality rates between EU Member States (Table 6.1), caused in part by the varying poverty situations within and between European countries. The Baltic states have the highest injuries and corresponding mortality, while Ireland appears to have the lowest rate.

It is difficult to obtain disaggregated figures relating to home and leisure accidents, as there are variations in data-collection systems, with places such as the United Kingdom having disaggregated data on place of occurrence of an accident, while other countries do not record the place of occurrence

**Table 6.1** *Deaths caused by home and leisure accidents per country in the EU, 2003–2005 or latest available 3-year average*

| ***Country*** | ***Fatally injured in home and leisure accidents*** | ***Deaths per 100 000 inhabitants*** |
|---|---|---|
| Austria | 1 723 | 21 |
| Belgium | 2 156 | 21 |
| Bulgaria | 1 402 | 18 |
| Czech Republic | 3 285 | 32 |
| Denmark | 1 748 | 32 |
| Estonia | 967 | 72 |
| Finland | 2 340 | 45 |
| France | 21 685 | 35 |
| Germany | 12 214 | 15 |
| Greece | 1 623 | 15 |
| Hungary | 4 421 | 44 |
| Ireland | 469 | 12 |
| Italy | 12 579 | 22 |
| Latvia | 1 654 | 72 |
| Lithuania | 2 192 | 64 |
| Luxembourg | 111 | 25 |
| Malta | 77 | 19 |
| Netherlands | 2 406 | 15 |
| Poland | 9 204 | 24 |
| Portugal | 1 431 | 14 |
| Romania | 6 255 | 29 |
| Slovakia | 1 097 | 20 |
| Slovenia | 521 | 26 |
| Spain | 6 060 | 14 |
| Sweden | 2 310 | 26 |
| United Kingdom | 9 594 | 16 |
| **EU average** | **109 512** | **22** |

*Source:* Reproduced from Angermann et al. 2007.

*Note:* Data for Cyprus not available.

and combine figures for domestic and leisure accidents. In the EU15 Member States, an estimated 20 million home and leisure injuries required medical attention, and 2 million led to hospital admission, with approximately 83 000 deaths per year (Sethi et al. 2006). Over half of these injuries occurred in or around the home (Sethi et al. 2006) but the ratio between domestic and leisure accidents is likely to vary between countries.

# Chapter 7
# Preventable risk factors

**Box 7.1** *Summary of Chapter 7*

**Section 7.1 Tobacco smoking trends**

- Smoking is the largest cause of avoidable death and disease in the EU, killing over 650 000 people every year.
- The prevalence and consumption of tobacco is not equally distributed across the EU. The prevalence among Turkish, Latvian and Greek men is the highest in Europe, at over 45%.
- Sweden is the only EU country with data available where more women now smoke than men.
- Youth smoking is a significant problem, with many countries showing increasing rates.

**Section 7.2 Alcohol consumption trends**

- Alcohol is the third most important cause of premature death and ill health in the EU, ahead of overweight/obesity and behind only smoking and high blood pressure.
- Despite the variations in recorded levels of consumption, there has been a harmonization of average alcohol consumption levels across the EU.

**Section 7.3 Diet, overweight and obesity trends**

- Over 50% of the adult population in the EU are overweight or obese.
- Obesity prevalence has tripled in the last two decades and, if current trends continue, there will be an estimated 150 million obese adults (20% of the population) and 15 million obese children and adolescents (10% of the population) in the WHO European Region by the year 2010.
- Obesity is caused by high caloric intake and low levels of physical activity. It is associated with several important causes of mortality and morbidity.

**Box 7.1** *cont.*

**Section 7.4 Illicit drug consumption trends**

- Drug use in the EU remains at a historically high – but overall stabilized – level: cannabis's popularity may have peaked and heroin, Ecstasy and amphetamine use seems roughly stable over recent years, but most recent data suggests an increase in cocaine use.
- As drug use is stigmatized and possession and trafficking can be prosecuted by law, household surveys are affected by underreporting, with high non-response rates among drug users. Furthermore, the most severe drug users might be institutionalized.
- Although the situation in the Baltic states remains of concern, HIV incidence related to intravenous drug use seems to have fallen, but prevalence of hepatitis C in Europe is high, with 1 million injectors infected.

The causes of the main chronic disease epidemics are well established and well known. The most significant preventable risk factors are:

- tobacco use
- unhealthy diet, including excessive alcohol consumption and excessive caloric intake
- physical inactivity.

These causes are expressed through the intermediate risk factors of raised blood pressure, raised glucose and cholesterol levels, and overweight and obesity. The major modifiable risk factors – in conjunction with the non-modifiable risk factors of age and heredity – explain the majority of new events related to heart disease, stroke, chronic respiratory diseases and some significant cancer (WHO 2005a). Illicit drug use is also a significant risk factor for several diseases, including mental illness and HIV/AIDS.

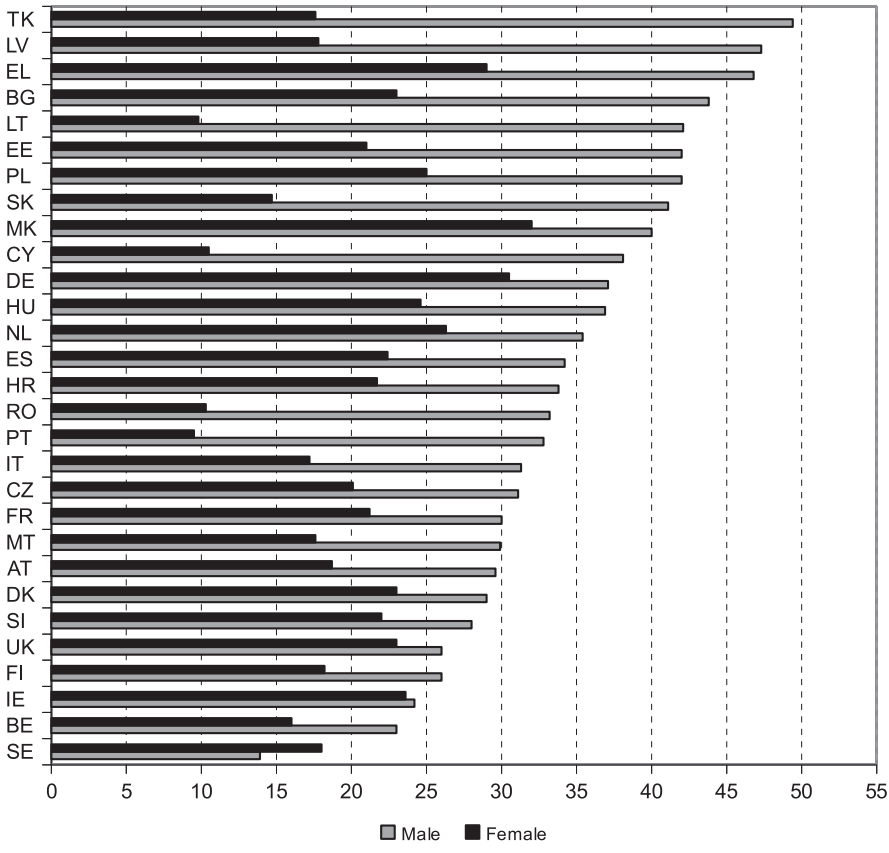
## 7.1 Tobacco smoking trends

In industrialized countries, approximately 80–90% of deaths from COPD and 80–85% of lung cancer deaths are attributable to tobacco smoking. Smokers have a 10 times greater risk of suffering from lung cancer than non-smokers (European Respiratory Society 2003). Tobacco use continues to be the single largest cause of death and disease in the EU, killing over 650 000 people every year. Moreover, a further 13 million people suffer from a chronic disease caused by smoking. Tobacco use is conservatively estimated

to cost €98–130 billion annually, or 1.04–1.39% of GDP for the year 2000 (ASPECT Consortium 2004).

The prevalence and consumption of tobacco is not equally distributed across the EU. The prevalence among Turkish, Latvian and Greek men is the highest in Europe, at over 45%. In western Europe, Spain has particularly high rates of male smokers (see Fig. 7.1). The former Yugoslav Republic of Macedonia, Greece, Hungary, Poland, the Netherlands and France have the highest rates of smoking among females. Sweden is the only EU country with data available where more women smoke than men at the time of writing. In Ireland the rates are nearly equal (Pudule et al. 1999). While the policy response to tobacco was initially weak, more recently several countries, particularly Poland, Hungary and the Baltic states, have enacted tobacco programmes that are stricter than in many other EU countries (Fagerstrom et al. 2001).

**Fig. 7.1** *Regular daily smokers in the population (%), age 15+, 2004 or latest available year*




*Source:* WHO Regional Office for Europe 2008b.

Smoking habits usually spread through populations in four stages (Mackenbach and Kunst 2004). In stage 1, smoking is exceptional and mainly a habit of men in higher socioeconomic groups. In stage 2, prevalence rates peak at 50–80%; the difference among socioeconomic groups tends to disappear; and a gender lag of approximately 10–20 years is observed in smoking behaviour. In stage 3, prevalence among men decreases and individuals in higher socioeconomic groups gradually stop smoking; and women reach their peak in this stage. In stage 4, prevalence rates for both men and women continue decreasing and smoking becomes mainly a habit of lower socioeconomic classes. Different countries are at varying stages.

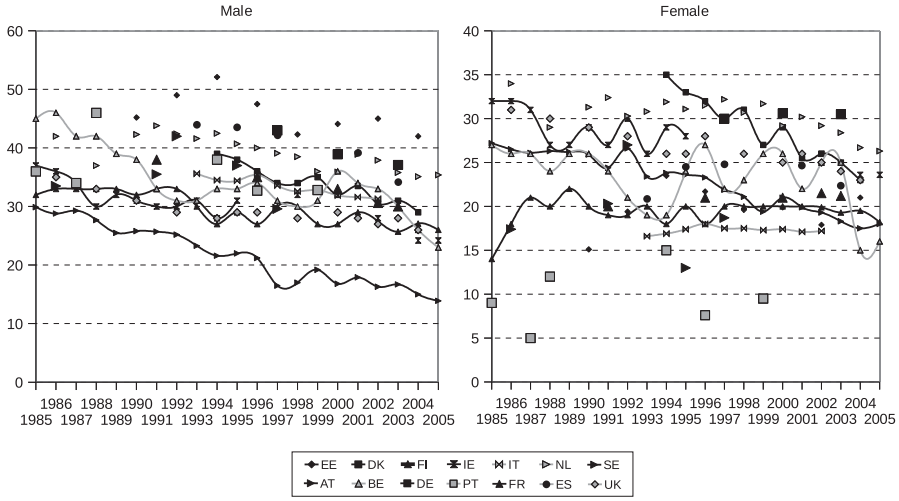
Northern European countries are already in stage 4; both men and women in lower socioeconomic groups (education and income) are more likely to smoke (Huisman, Kunst and Mackenbach 2005). Indeed, the probability of being a smoker is between 2- and 3-fold higher among men and women with a low educational level than among those with higher educational attainment in Denmark, Finland and Ireland.

On the contrary, southern European countries such as Italy, Greece and Portugal are still in stage 3. Greece has the highest adult smoking prevalence in the EU. A total of 63% of households had at least one parent who smoked and in 26% of homes both parents smoked. Prevalence of parents smoking who had preschool aged children was also high (44%), which means Greek children are at risk, either in terms of second-hand smoke complications or beginning to smoke at a young age (Vardavas et al. 2007). Education- and income-related inequality in smoking favours the better off among men but not among women; and the social gradient is larger for people in the age groups 25–34 years for both men and women.

In western Europe, smoking prevalence tends to be highest in urban areas. Inequalities between urban and non-urban smoking can also be observed among individuals with low education levels and among females (Idris et al. 2007). All EU countries (no data for Latvia) experienced declines in the percentage of men smoking in the last 25 years, except Lithuania, Malta and Slovakia; while in Austria, Cyprus, Estonia, Finland, Germany, Greece, Hungary, Lithuania, Luxembourg, Malta and Spain the percentage of women smoking rose during this time (Joossens 2004). In Italy the smoking rate has remained level. In many other EU10 countries, such as Belgium, Ireland and Denmark, the rate has also declined in women (Fig. 7.2).

Although the vast majority of tobacco-related death and disability occurs in middle-aged and older adults, smoking behaviour is most commonly established in childhood and adolescence. Worryingly, smoking among young

**Fig. 7.2** *Regular daily smokers in the population (%), age 15+, in selected EU15 countries*




*Source:* WHO Regional Office for Europe 2008b.

people is increasing in many countries, both among boys and girls, and in western Europe and CEE countries (Table 7.1). The 2000–2001 Health Behaviour in School-aged Children (HBSC) survey found that the percentage of EU youths who have smoked rises significantly with age, from 15% for 11-year-olds to 40% for 13-year-olds and 62% for 15-year-olds (Currie et al. 2004). Estonia, Latvia, Lithuania and the United Kingdom had the highest proportion of children who ever smoked across all age groups, while Greece and Malta reported lower use among youths. Gender differences in the prevalence of smoking among children were also noted, as rates of smoking are substantially higher for boys than for girls among younger age groups in most countries. However, among older age groups of children, more girls than boys have smoked, with differences being particularly marked in Scotland and Wales. Pierce and Gilpin (1996) found that half of all adolescent smokers will smoke for at least 16 years.

The reasons for tobacco use among youths are vast and complex, but predominately relate to the behaviour, attitudes and expectations of parents, peers and broader society (Tyas and Pederson 1998). Young people are more likely to become smokers if they have parents, older siblings and/or friends who smoke (Eiser et al. 1989; Tyas and Pederson 1998). While parents serve as important models of smoking behaviour, peers are particularly influential, with peer pressure or peer bonding considered a major reason for adolescent smoking (Engels et al. 1998). Other determinants for youth tobacco use include cultural and religious norms; availability of tobacco products; tobacco

**Table 7.1** *Percentage of 15-year-olds who smoke at least once a week, selected European countries*

| | *Girls* | | | *Boys* | | |
|---|---|---|---|---|---|---|
| ***Country/ region*** | ***1993/ 1994*** | ***1997/ 1998*** | ***2001/ 2002*** | ***1993/ 1994*** | ***1997/ 1998*** | ***2001/ 2002*** |
| **Austria** | 31 | 36 | 37 | 29 | 30 | 26 |
| **Belgium (Flemish)** | 18 | 28 | 23 | 32 | 28 | 23 |
| **Belgium (French)** | 21 | – | 24 | 23 | – | 22 |
| **Czech Republic** | 12 | 18 | 31 | 16 | 22 | 29 |
| **Denmark** | 24 | 28 | 21 | 14 | 20 | 17 |
| **England** | – | 33 | 28 | – | 25 | 21 |
| **Estonia** | 6 | 12 | 18 | 22 | 24 | 30 |
| **Finland** | 26 | 29 | 32 | 30 | 25 | 28 |
| **France** | 25 | 31 | 27 | 23 | 28 | 26 |
| **Germany** | 29 | 33 | 34 | 21 | 28 | 32 |
| **Greece** | – | 19 | 14 | – | 18 | 14 |
| **Hungary** | 19 | 28 | 26 | 25 | 36 | 28 |
| **Ireland** | – | 25 | 21 | – | 25 | 20 |
| **Italy** | – | – | 25 | – | – | 22 |
| **Latvia** | 14 | 19 | 21 | 33 | 37 | 29 |
| **Lithuania** | 4 | 10 | 18 | 15 | 24 | 35 |
| **Malta** | – | – | 17 | – | – | 17 |
| **Netherlands** | – | – | 24 | – | – | 23 |
| **Northern Ireland** | 25 | 28 | – | 23 | 20 | – |
| **Norway** | 21 | 28 | 27 | 20 | 23 | 20 |
| **Poland** | 13 | 20 | 17 | 23 | 27 | 26 |
| **Portugal** | – | 14 | 26 | – | 19 | 18 |
| **Scotland** | 26 | 28 | 23 | 21 | 22 | 16 |
| **Slovakia** | 5 | 18 | – | 19 | 28 | – |
| **Slovenia** | – | – | 30 | – | – | 30 |
| **Spain** | 27 | – | 32 | 20 | – | 24 |
| **Switzerland** | 18 | 25 | 24 | 17 | 25 | 25 |
| **Sweden** | 19 | 24 | 19 | 15 | 18 | 11 |
| **Wales** | 27 | 29 | 27 | 18 | 22 | 16 |

*Source:* Reproduced from Joossens 2004.

control policies and strategies (such as pricing of cigarettes); and tobacco advertising, promotion and marketing efforts (Hastings and Aitken 1995; WHO 2000).

Second-hand or passive smoking is also dangerous, although it appears that there is a linear dose–response relationship (European Commission 2007). Second-hand smoke indeed has been found to be related with higher risk of lung cancer, CVDs and childhood diseases. Non-smokers living with a smoker, according to recent reviews, have a 20–30% greater risk of developing lung cancer than those not exposed to smoking environments; and a 25–30% greater risk of developing CHD. Passive smoking is particularly dangerous for children and infants, since it is associated with a higher risk of sudden infant death, pneumonia, bronchitis, asthma and respiratory symptoms, and middle-ear disease. Every year exposure to ETS causes more than 79 000 adult deaths in the EU25, of which passive smoking at work accounted for more than 7000 deaths and the remaining toll was attributable to ETS at home (European Commission 2007).

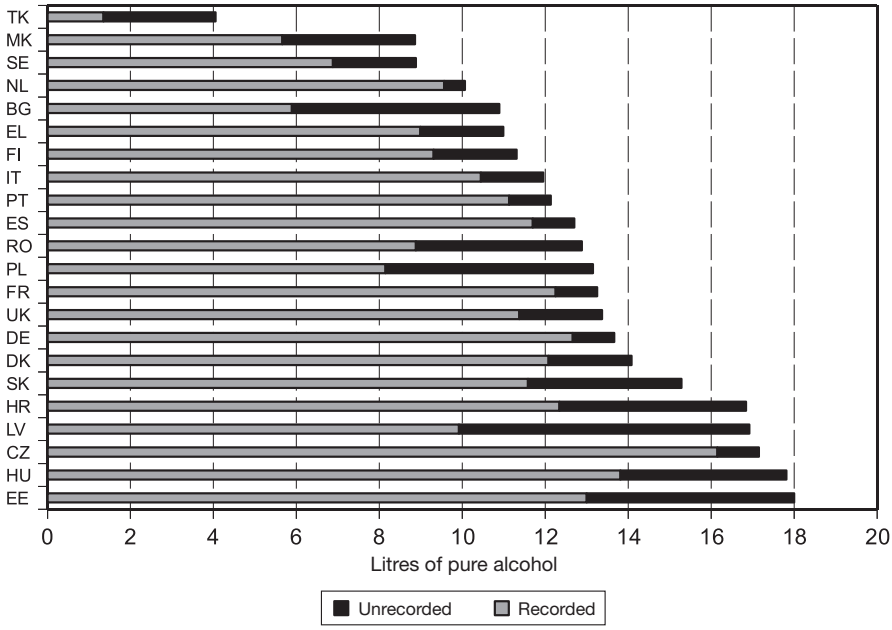
## 7.2 Alcohol consumption trends

From a public health perspective, there are two particularly important dimensions of alcohol consumption to be aware of: how much people drink (total consumption) and how they drink it (drinking patterns). This change from the earlier focus exclusively on total consumption originates from increasing evidence over the decades that *both* drinking patterns and total consumption had substantial consequences for many health conditions (Anderson and Baumberg 2006). This section therefore briefly reviews total consumption and drinking patterns in the EU and CCs.

### Total consumption

While the EU has the highest alcohol consumption in the world, the average level of 11 litres of pure alcohol per adult per year represents a considerable fall from a peak of 15 litres in the 1970s (Anderson and Baumberg 2006). Within the EU there is considerable variation in alcohol consumption levels, as shown in Fig. 7.3. Recorded consumption levels (that is, those derived from sales/tax figures) show that Turkey has by far the lowest consumption, but otherwise there is no strong pattern across Europe. When we take into account unrecorded consumption, however – accounting for smuggling, home production and cross-border shopping (Leifman 2001; Trolldall 2001) – we find that the highest levels of consumption are nearly all in the more recently acceded European Member States (CEE countries).

**Fig. 7.3** *Recorded and unrecorded pure alcohol consumption, litres per adult (aged 15+), selected European countries, 2003*




*Sources:* WHO Regional Office for Europe 2008b; Rehm et al. 2004.

Accurate comparative data are not available regarding how this average consumption at population level is split among drinkers within a country. Nevertheless, using WHO figures it has been crudely estimated that 53 million Europeans (in the EU25) do not drink, while the remaining drinkers are split as according to the data in Table 7.2 (Anderson and Baumberg 2006). The same study also estimates that 5% of adult men and 1% of adult women are dependent on alcohol in any one year, equivalent to approximately 23 million people.

Despite the variations in levels of recorded consumption, it is evident that there has been a harmonization of average alcohol consumption levels across the EU (Fig. 7.4), between western and eastern Europe as well as within these groups of countries, so that the average national consumption levels are far more similar in 2003 than 1970.

## Drinking patterns

As a term, "drinking patterns" can mean anything from what types of beverages people drink to where they drink (Simpura et al. 2001). This section focuses on the aspect of patterns that is most linked to health – heavy episodic

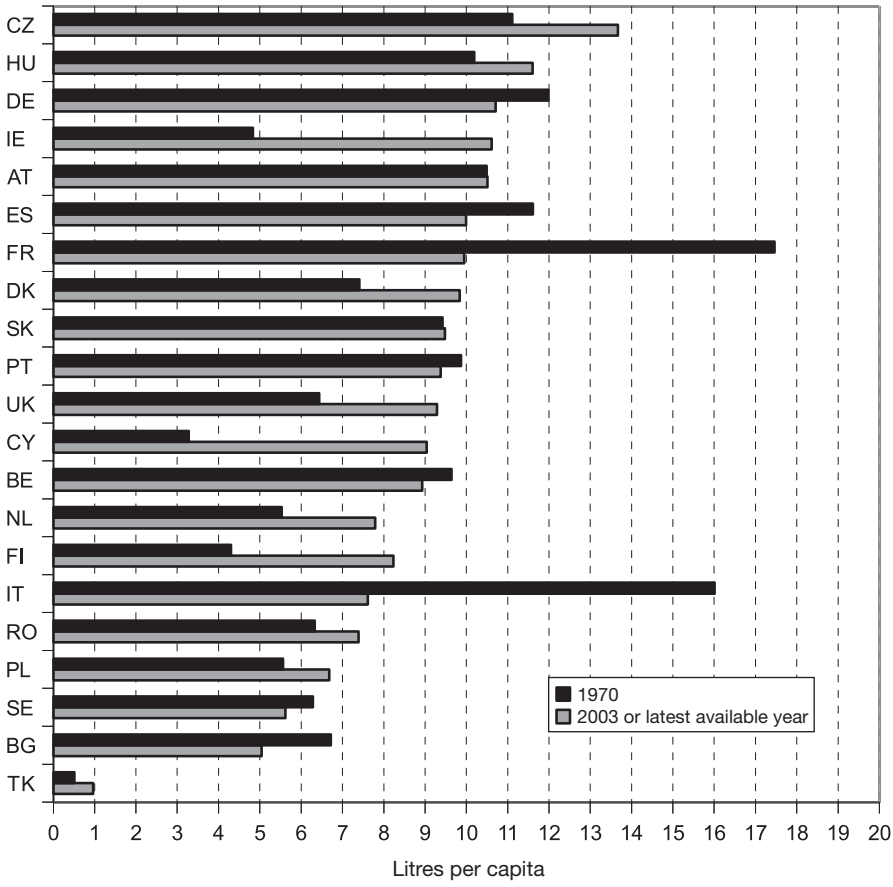
**Table 7.2** *Number of adult Europeans (16+ years) at different drinking levels, 2001*

| | *Definition (g/day)* | | *Adults* |
|---|---|---|---|
| | ***Men*** | ***Women*** | ***EU25 (m)*** |
| **Abstinent** | 0 | 0 | **53** |
| **Level I** | >0–40g | >0–20g | **263** |
| **Level II** | >40–60g | >20–40g | **36** |
| **Level III** | >60g | >40g | **22** |

*Source:* Rehm et al. 2004.

*Notes:* g/day: Grams per day; (m): million.

**Fig. 7.4** *Pure alcohol consumption, selected European countries, 1970 and 2003 or latest available year*




*Source:* WHO Regional Office for Europe 2008b.

consumption, often known as "binge drinking".[6] While the data comparing binge drinking across countries are relatively thin, there are enough data from elsewhere to draw a tentative picture of the situation.

Looking first at western Europe, a Eurobarometer study (European Commission 2003) showed that significantly fewer southern Europeans reported monthly binge drinking than elsewhere (24% compared to 40%), with Finland and Ireland reaching three times the level of Italy. Although this suggests a north–south divide in binge drinking, Sweden appears to contradict this – the level there was lower than any other country except Italy, and was less than two thirds the level of Portugal. A separate six-country study confirms the low result for Sweden, although in contrast suggests a higher level of binge drinking in Italy than Finland.[7]

The above-mentioned Eurobarometer did not include the newer Member States, with more recent surveys having severe problems that make them not worth considering here.[8] Nevertheless, it seems that binge drinking rates are similar in Latvia and Lithuania; they are similar for men but lower for women in Estonia (Helasoja et al. 2007); and are lower in Poland than in the Czech Republic (Bobak et al. 2004). There are also signs that the levels of binge drinking in eastern Europe are similar to the higher levels in western Europe. One study reported that binge drinking levels in the Baltic states were similar to those in Finland (Helasoja et al. 2007) and the limited comparable data in the WHO Global Status Report on Alcohol (WHO 2004b) suggests a lower rate among men in Spain than in eastern Europe (although not dissimilar rates among women).

Finally, it is worth noting that these are studies on the *absolute* frequency of binge drinking. Other studies have looked at how likely people are to binge drink *given that they are drinking that day* – or, in other words, the frequency of binge drinking compared to the frequency of drinking alcohol at all (what we

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[6] For a summary of other aspects of drinking patterns, including drinking with meals, beverage preferences and drinking frequency, see Anderson and Baumberg (2006, chapter 4).

[7] The difference relates to how "binge drinking" is measured – Italy had a greater number of people who reported rare binge drinking compared to Finland and Sweden, but also a greater number stating that they were frequent binge drinkers. It is therefore important to consider whether we are looking at the "average number of binge drinking occasions per month", or the "percentage of people who binge drink more than a certain amount". Other studies are conflicting in terms of whether Sweden really does have a particularly low level of binge drinking (Mäkelä et al. 2005) or whether it is the same as other Nordic countries (Mäkelä et al. 1999).

[8] The GENACIS surveys do not include many nationally representative samples in eastern Europe or southern Europe, while the more recent Eurobarometer does not ask about binge drinking, as discussed in this chapter.

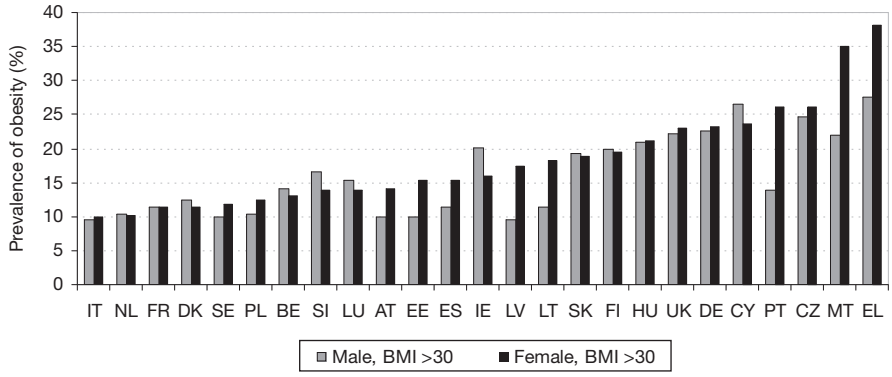
call here a "relative frequency"). Results show that the United Kingdom and Ireland, along with the Nordic countries have the highest relative frequency of binge drinking and southern European countries have the lowest, reflecting the much higher frequency of non-binge drinking in southern Europe (TNS Opinion & Social 2007).

## 7.3 Diet, overweight and obesity trends

Obesity is defined as having a BMI greater than 30, while a person with a BMI greater than 25 is considered overweight. Individuals with a BMI of 25 and above are at elevated risk for debilitating noncommunicable diseases: type 2 diabetes, CVD, ischaemic heart attack, dyslipidemia, metabolic syndrome (cluster of abdominal obesity with hypertension, dyslipidemia and impaired insulin resistance), hypertension, osteoarthritis, gallstones, narcolepsy, impaired reproductive performance, asthma, cataracts, non-alcoholic steatohepatitis and cancer. It has been estimated that excess weight gain accounts for 75% of type 2 diabetes and IHD cases, 50% of hypertensive cases, 33.3% of stroke cases, and 25% of osteoarthritis cases (WHO Regional Office for Europe 2007). The INTERHEART case-control study estimated that 63.4% of heart attacks in western Europe and 28% of heart attacks in CEE countries were due to abdominal obesity (Yusuf et al. 2004). In Europe, 78 000 new cases of cancer each year are estimated to be caused by overweight (International Obesity Task Force 2002). If current trends continue, life expectancy for males will decrease by five years by 2050 (WHO Regional Office for Europe 2007). The rise of obesity prevalence among children has resulted in early onset of diseases associated with old age, such as type 2 diabetes.

The prevalence of obesity has tripled in the last 25 years and if no action is taken there will be an estimated 150 million obese adults (20% of the population) and 15 million obese children and adolescents (10% of the population) in the WHO European Region by 2010 (WHO Regional Office for Europe 2006b). Rates of obesity range between 9.5% and 27.0% among men and reach 35.0% among women (Fig. 7.5). It is important to highlight the difficulties in drawing comparisons across countries in terms of obesity, due to potential differences in measurement and lack of standardized methodology. Italy has the lowest prevalence of obesity both among men and women. Moreover, among men, low rates of obesity can also be found in Latvia, Estonia, Austria and Sweden. Obesity is more common among women than men in the majority of countries. Obesity rates have increased in all countries (International Obesity Task Force 2005). CEE countries have experienced a dramatic increase in obesity rates in the last decade (Spritzer 2004). In Hungary, the obesity rate has doubled since 1989. Four fifths of

**Fig. 7.5** *Obesity prevalence in selected European countries*




*Source:* International Obesity Task Force 2005.

Latvian women and Czech men have a BMI greater than 25 and are therefore classified as overweight. Compared to the EU average, the prevalence of obesity, particularly among women, is significantly higher in Greece, Malta and Cyprus. A significant cause of obesity has been the arrival of fast food and the decrease in physical activity in these countries where the traditional diet is based on meat, fat and non-vegetables.

Germany, the United Kingdom and Finland are particularly affected; one in five people in these countries are obese. In France, obesity rates rose from 8.0% to 11.3% among men and 8.4% to 11.4% among women from 1997 to 2002; in the Netherlands, the rate almost doubled among men from the late 1970s to the mid-1990s; and in the United Kingdom it increased from 13.2% to 22.2% among men and from 16.4% to 23% among women between 1993 and 2003.

Obesity represents a major public health concern. A study of almost 25 000 individuals in Turkey found that 22% of individuals were obese and 7.2% had diabetes, while diabetes prevalence increased with BMI score, waist-to-hip ratio and waist girth (Satman et al. 2002). This study was one of the largest population-based diabetes studies ever performed and looked at both previously diagnosed and undiagnosed cases. In Bulgaria the 2004 National Nutrition Habits Survey revealed that among those aged 19–60 years, 22% of the males and 17% of the females were obese. For women aged 60–75 years, those percentages are even higher: 39% are overweight and 32% are obese. The figures of child and adolescent overweight and obesity are also very worrying. The highest percentages are observed for children in the beginning of the puberty – 13 years old for boys (25.6% are overweight and 6.9% are

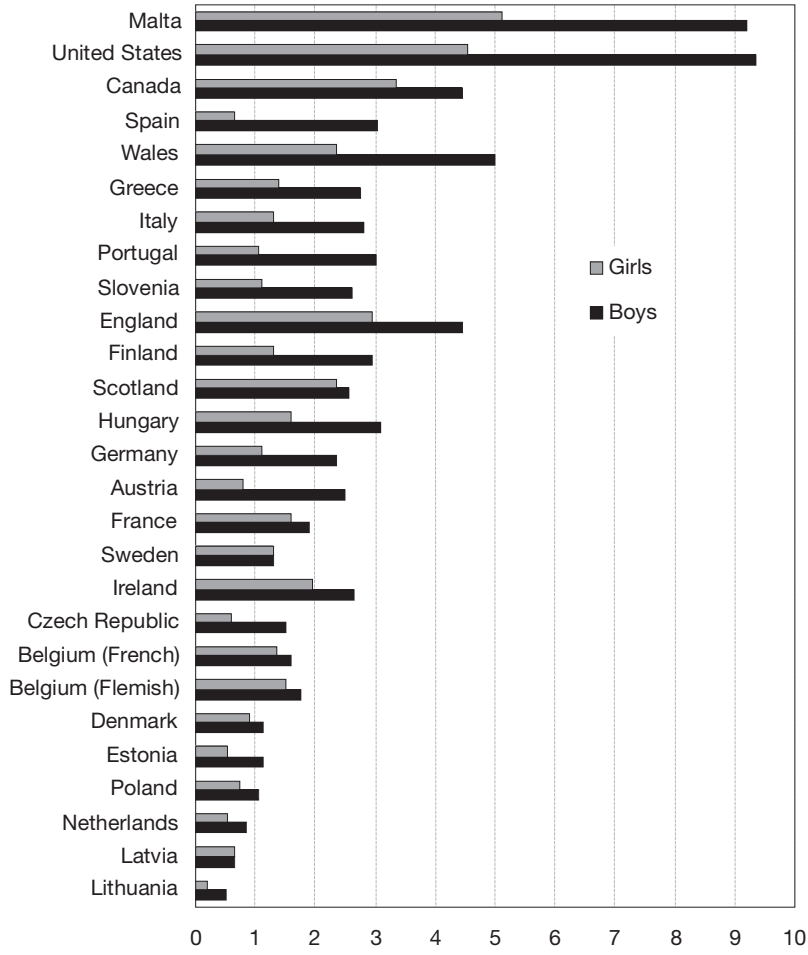
obese) and 10 years old for girls (20.5% and 4.6%, respectively). Moreover, obesity and its related conditions are unevenly distributed in society. People with lower income tend to consume more meat, fat and sugar; while people with the highest education levels consume more fruit and vegetables (WHO Regional Office for Europe 2005c).

Obesity among children is rapidly reaching an epidemic level in many European and North American countries. Countries with the highest percentage of overweight boys and girls (25<BMI<30) are the United States, Malta, Canada and Wales; while the lowest percentages are observed in Scandinavian countries and central European countries (Currie et al. 2004). Countries with high prevalence of overweight children tend also to have high rates of obesity (BMI>30). In fact, obesity rates are highest in Malta and the United States, followed by Canada, England and Wales (Fig. 7.6). In contrast, the lowest rates of obesity are observed in Lithuania, Latvia, the Netherlands, Estonia and Poland. Everywhere, the rate of obesity is higher among boys than among girls, but the difference between genders varies across countries. The prevalence of childhood obesity and overweight is even larger among the younger population: children aged 7–11 years. This reaches 30% in Malta, Sicily, Spain, Portugal and Italy; and over 20% in England, Ireland and Cyprus (International Obesity Task Force 2005).

Overweight children are at greater risk of becoming overweight adults with a higher risk of CVD, diabetes, hypertension and cancer (Parsons et al. 1999). Type 2 diabetes which, until recently, was considered to be a weight-related disease among adults, is now becoming a childhood disease in various European countries such as the United Kingdom, Portugal and Sweden (International Obesity Task Force 2002).

Although there are genetic predispositions, an estimated 99% of the factors behind the significant increase in obesity rates among adults and children are environmental. Children are more likely to become overweight if their parents are obese and if they grow up in low-income households (International Obesity Task Force 2002). The principal causes of obesity are increased availability and consumption of fast food and decrease in physical activity. A balanced diet and appropriate eating patterns reduce the risk of becoming obese. Children who skip breakfast are more likely to consume snacks during the day and tend to have a less nutritious diet. The high consumption of snacks, low consumption of fruit and vegetables, and large intake of sweets and soft drinks are all leading risk factors of childhood and adolescent obesity. Large variations are observed across countries. Eating vegetables among young people is more common in Belgium, France and the Netherlands; and less common in Spain, Hungary, Estonia and Malta. Countries with the highest proportion of young people

**Fig. 7.6** *Percentage of obese male and female schoolchildren (aged 13 and 15) in 2001–2002 in selected European countries, the United States and Canada*




*Source:* Reproduced from Currie et al. 2004.

eating fruit daily are Portugal, Malta and Poland, while eating fruit is less common among young people in northern European countries. In terms of the consumption of soft drinks and sweets, variations across countries are even greater. In Malta, Scotland and the Netherlands over 40% of young people drink soft drinks and eat sweets, while in Finland and Sweden the proportion is less than 15% (Currie et al. 2004).

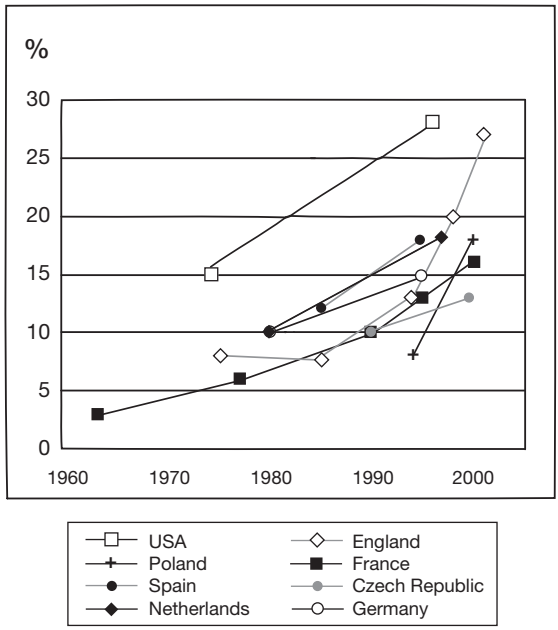
Childhood obesity prevalence appears more alarming in southern European countries than in those of northern Europe. Over 30% of children aged 7–11 years are overweight or obese in Malta, Spain, Portugal and Italy, while 20% of the same population subset are overweight or obese in England,

Ireland, Cyprus, Sweden and Greece (International Obesity Task Force 2005). Fig. 7.7 illustrates the rising prevalence rates that create a sense of urgency in addressing the state of childhood health in Europe.

England and Poland exhibit the sharpest rates of increase but the rest of Europe is also facing growing prevalence rates of overweight children. Although the United States remains the country with the highest rates of childhood obesity and has traditionally been 10–15 years ahead of Europe in this public health trend, England has almost caught up with the United States in percentage prevalence of overweight children aged 5–11 years (International Obesity Task Force 2005). Annual increases in the percentage of European children becoming overweight were 0.6% in the 1980s, 0.8% in the early 1990s and approximately 2.0% by the 2000s (International Obesity Task Force 2005).

It is important to note that several issues should be borne in mind when interpreting data on BMI. Measures of weight and height are self-assessed in the HBSC survey, and underestimation of real BMI is therefore possible due to subjective perception of overweight, dissatisfaction with body size and feelings of insecurity. Moreover, a large proportion of BMI data is missing, in particular among countries with the highest proportion of obese young people, and these

**Fig. 7.7** *Prevalence of overweight children in selected European countries and the United States*




*Source:* Reproduced from International Obesity Task Force 2005.

missing data are more likely to relate to children from higher socioeconomic groups, who are usually more physically active, consume more fruit and vegetables; and are more likely to feel the need to lose weight (Currie et al. 2004).

### Physical inactivity

Although the effects of diet and physical activity on health are strongly correlated, physical activity can also be beneficial independently from nutrition and dietary habits (WHO 2004c). Physical activity reduces the risk of CVDs (Franco et al. 2005). It reduces blood pressure and high concentration of cholesterol in the blood, and reduces the risk of colon cancer and breast cancer among women. Moreover, physical exercise reduces the risk of depression and improves psychological well-being. It has recently been identified as being integral to healthy ageing (Nusselder et al. 2008).

Levels of physical activity vary across the EU. On average, in 2004, 47% of citizens of the EU25 countries reported exercising or participating in sport at least one to three times a month, while 38% reported doing so at least once a week. Across the EU, the prevalence of individuals who report no physical activity within any monthly period ranges from 4% in Finland to 66% in Portugal. Scandinavian countries are the most physically active in Europe: more than 90% of Finnish and Swedish citizens reported exercising at least once a month. Relatively high rates of physical activity are also found in Denmark, Slovenia and Ireland. On the contrary, Italians, Hungarians, Greeks and Portuguese individuals lead a more sedentary lifestyle, with 58%, 60%, 57% and 66% of respondents in these countries – respectively – claiming to never play sport or exercise (European Commission 2004). Men tend to exercise more often than women. Time spent exercising is inversely correlated with age: 60% of individuals aged 15–25 years declared that they do sport at least once a week; the proportion decreases to 41% among individuals aged 25–39 years; to 34% among those aged 40–54 years; and then to only 28% of individuals over 55 years old. Physical activity may consist of planned and structural movements or competitive sports, but also routine activities such as household jobs, shopping and work. It is possible to distinguish four kinds of physical activity: leisure time, work, commuting and home.

The HBSC study measures the number of days in which young people (11, 13 and 15 years old) are physically active for at least one hour (the recommended minimum for young people (Biddle, Sallis and Cavill 1998)). On average, young people undertake at least one hour of moderate physical activity for 3.86 days per week but large variations are found between boys and girls and across countries (Table 7.3). In all countries, boys are more physically active than girls. The most active countries are Ireland, the Czech Republic and

England, while the less active are France, Belgium (Flemish) and Portugal. Moreover, physical activity tends to decline with age, but in some countries more than in others (Currie et al. 2004).

The causes of physical inactivity are varied. The amount of automobile passenger kilometres has risen, whereas other methods of transport have remained at low levels. The number of people who either walk or cycle to schools or offices has dramatically decreased in the last decade. Computers and televisions have also changed peoples' lifestyles by encouraging more sedentary behaviours.

The HBSC study is the main source of data for analysing trends in physical activity, sedentary behaviours, eating habits and obesity at the international level in young populations. However, measuring physical activity among children is not straightforward and comparison across countries is complicated by the role that physical activity plays at school and the amount of free time during the school day that is dedicated to non-organized activities. Moreover, environmental characteristics, such as patterns of travelling to school, availability of leisure facilities and difference in climate might cause geographical variations and different interpretations of the questions (Currie et al. 2004).

## 7.4 Illicit drug consumption trends

Use of illicit drugs in Europe is of public health concern and evidence-based drug policies at regional, national and international levels require reliable estimates of prevalence and trends. When conducting cross-national comparisons, methodological and data challenges are being faced. Direct estimates of drug use are typically based on population surveys that allow for diagnosis of "harmful use" (according to International Classification of Diseases (ICD-10) criteria) (WHO 1992), "drug abuse" (Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria) (American Psychiatric Association 2000), or "drug dependence". But as drug use is stigmatized and possession and trafficking can be prosecuted by law, household surveys are affected by underreporting, high non-response rates among drug users, and the fact that most severe drug users might be institutionalized (for example, in prison, involved in inpatient treatment (Kraus et al. 2003; Rehm et al. 2005)), resulting in an underestimation. Indirect estimates – based on police, treatment and hospital statistics, death and HIV/AIDS registers – are able to reach the "hidden population" but have limited generalizability and comparability (Kraus et al. 2003; Rehm et al. 2005). "Problem drug use" (PDU) indicators can act as an approximation to diagnostic criteria and aim

**Table 7.3** *Physical activity and sedentary behaviour during weekdays among young people, 2000–2001, selected European countries*

| Country/ region | *Days PA >1 hour* | | *TV >= 4 hours weekdays* | | *Computer >= 3 hours weekdays* | |
|---|---|---|---|---|---|---|
| | **Boys (%)** | **Girls (%)** | **Boys (%)** | **Girls (%)** | **Boys (%)** | **Girls (%)** |
| Austria | 4.50 | 3.87 | 16.8 | 13.2 | 17.07 | 7.27 |
| Belgium (Flemish) | 3.40 | 2.83 | 26.4 | 18.3 | 18.60 | 8.83 |
| Belgium (French) | – | – | 21.1 | 17.1 | 17.47 | 5.97 |
| Czech Republic | 4.57 | 4.00 | 29.3 | 22.9 | 23.40 | 5.20 |
| Denmark | 3.93 | 3.63 | 25.5 | 21.1 | 27.93 | 4.63 |
| England | 4.63 | 3.83 | 31.3 | 29.7 | – | – |
| Estonia | 3.63 | 3.27 | 43.3 | 33.6 | 28.33 | 7.17 |
| Finland | 3.93 | 3.67 | 18.6 | 19.6 | 18.27 | 2.97 |
| France | 3.50 | 2.70 | 21.4 | 16.9 | 11.53 | 3.90 |
| Germany | 3.87 | 3.33 | 22.6 | 18.3 | 19.07 | 5.20 |
| Greece | 4.33 | 3.53 | 21.7 | 14.5 | 15.00 | 3.30 |
| Hungary | 4.03 | 3.37 | 22.0 | 18.8 | 18.63 | 5.73 |
| Ireland | 4.83 | 4.10 | 21.5 | 17.3 | – | – |
| Italy | 3.70 | 3.20 | 21.1 | 24.4 | 11.03 | 4.53 |
| Latvia | 4.07 | 3.43 | 43.1 | 37.1 | 21.77 | 7.90 |
| Lithuania | 4.63 | 2.73 | 38.4 | 29.3 | 18.37 | 5.37 |
| Malta | 4.20 | 3.17 | 19.4 | 16.2 | 20.37 | 8.37 |
| Netherlands | 4.17 | 3.93 | 27.0 | 20.4 | 23.50 | 8.93 |
| Poland | 4.27 | 3.80 | 34.2 | 24.4 | 24.70 | 8.03 |
| Portugal | 3.80 | 3.00 | 31.5 | 33.9 | 23.20 | 6.57 |
| Scotland | 4.47 | 3.77 | 31.6 | 29.7 | 32.30 | 13.03 |
| Slovenia | 4.53 | 3.77 | 20.9 | 16.9 | 17.37 | 3.60 |
| Spain | 4.07 | 3.53 | 22.8 | 21.9 | 13.43 | 6.63 |
| Sweden | 4.03 | 3.80 | 18.7 | 17.0 | 27.17 | 7.87 |
| Wales | 4.37 | 3.70 | 31.1 | 32.3 | 22.70 | 9.97 |

*Source:* Reproduced from Currie et al. 2004.

*Notes:* PA: Physical activity; Physical activity is defined as "any activity that increases your heart rate and makes you get out of breath some of the time. Physical activity can be done in sports, school activities, playing with friends, or walking to school."

to provide estimates of more severe drug use patterns that cannot reliably measured by surveys. PDU, according to the European Monitoring Centre on Drug and Drug Addiction (EMCDDA) is defined as injecting drug use or regular use of opiates, cocaine or amphetamines during a 1-year period.

An overview of the European drug situation is reported yearly in the EMCDDA's annual reports that cover the EU Member States and CCs (Turkey and Croatia, plus Norway), accompanied by the Statistical Bulletin (EMCDDA 2007b). Further information is available from the school survey of the European schools project on alcohol and other drugs (ESPAD), the annual *World Drugs Report* by the United Nations Office on Drugs and Crime (UNODC 2008) and the EMCDDA's national reports (EMCDDA 2003).

Drug policies and strategies in the field of public health have to take into account that drug use is associated with a range of health and social needs that require adequate responses. Besides having potentially severe consequences of drug use for one's physical health, the prevalence of psychiatric disorders among those with (illicit) substance use disorders is high (Regier et al. 1990). Among drug users, personality disorders range between 65% and 85%, depression and anxiety states between 30% and 50% and psychotic disorders at 15%, but these figures vary greatly between studies (EMCDDA 2004). Co-morbid patients show a more severe manifestation of the disorder and require coordinated and more intensive treatment (Gouzoulis-Mayfrank 2008). Likewise, the very young (under 15 years old) require special attention as they frequently experience family, school and other social and psychological problems, and are at higher risk of experiencing future drug problems and behavioural disorders (such as attention deficit hyperactivity disorder (ADHD), conduct disorders) that call for treatments targeted to their age group and linked with education and social services (Cullen 2006; Gfroerer, Wu and Penn 2002; Prinz et al. 2000).

## Prevalence and trends according to the type of drugs

### *Cannabis*

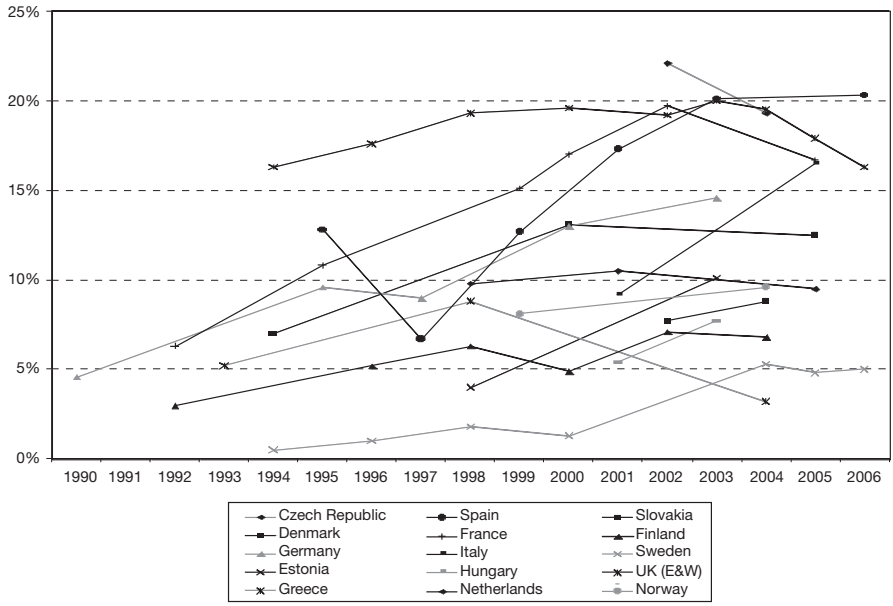
Cannabis is the most commonly used illicit drug in Europe (EMCDDA 2007b). Lifetime prevalence ranges widely from 2% to 37%, with the lowest figures in south-eastern Europe and the highest in EU15 countries. However, where "lifetime" prevalence may be useful to assess characteristics of users and non-users, 1-year (7%) and 1-month prevalence (4%) better describes current and potentially regular use. Cannabis consumption tends to be discontinued after time, as rates decline when individuals grow older. Approximately 1% of

Europeans may be "daily or almost daily" users, the vast majority being young males (EMCDDA 2007b; Vincente, Olszewski and Matias 2008).

A rise in use among the young has occurred, especially in the new Member States (EU10), reaching roughly the rates of the rest of Europe at the time of writing (EMCDDA 2007a; Hibell and Andersson 2008; Moskalewicz, Allaste and Demetrovics 2008). Survey data suggests that cannabis use, after a distinct increase in the 1990s, may be approaching its peak at the time of writing, especially in high-prevalence EU15 countries, such as the United Kingdom, France, Spain and Italy. The middle- and low-prevalence countries depict a mixed scenario, with slight falls or still some increases of 1-year prevalence among younger adults (EMCDDA 2007b; Vincente, Olszewski and Matias 2008) (Fig. 7.8).

While not representative, treatment data provide useful information about characteristics of cannabis users who are mostly young, male, in education and living with their parents (EMCDDA 2007b). A gender convergence among the young has only taken place in the high-prevalence countries, but in the remaining countries, particularly those that are more religious (Cyprus,

**Fig. 7.8** *Trends in cannabis use, 1-year prevalence among young adults (15–34 years), selected EU countries plus Norway*




*Source:* EMCDDA 2008.

*Notes:* Age range: Denmark, United Kingdom (UK) from 16; Germany, Estonia and Hungary from 18; France from 25 in 1992, and 18–39 in 1995; E&W: England and Wales.

Lithuania, Malta, Poland), the male-to-female ratio ranges between 5:1 and 2:1 (Vincente, Olszewski and Matias 2008; Moskalewicz, Allaste and Demetrovics 2008). As far as health effects are concerned, most evidence suggests that chronic use increases the risk for respiratory diseases and cancer; is associated with a higher prevalence and a worse course of schizophrenia; and has prolonged adverse effects on neuropsychological performance (Witton 2008).

### *Amphetamines and Ecstasy*

The use of amphetamines (amphetamine and methamphetamine) and Ecstasy-type substances (Ecstasy, MDMA, MDA, MDE) is most common in recreational settings such as so-called raves (EMCDDA 2007b; Gowing et al. 2008). Highest rates are found in the Czech Republic, the Baltic states and the United Kingdom. Where amphetamines are available across Europe, the more harmful methamphetamines play a significant role only in the Czech Republic and Slovakia (Griffiths et al. 2008); 1-year prevalence is 0.7% in adults and 1.5% among young adults. The 1-year prevalence of Ecstasy is almost 1% in adults and ranges between 0.3% and 12.0% in young adults (EMCDDA 2007b).

According to the UNODC (2008), use of amphetamines, as perceived by experts, has increased between 1992 and 2006 in the Baltic states of Latvia and Estonia, as well as in the Czech Republic and Bulgaria. However, the increasing use of the drug in the 1990s is slowing at the time of writing, and recent data from the EMCDDA suggests a stabilizing or even decreasing trend. Likewise, expert opinion in 2006 (UNOCD 2008) indicated an increase in Ecstasy use in south-eastern European countries (Bulgaria, Turkey) and Cyprus, but following the increases of its use since the 1990s (UNODC 2003), several EU countries have recently shown some stabilization or even moderate decreases among younger users, indicating a possible replacement of amphetamines and Ecstasy by cocaine (EMCDDA 2007b).

Clients of amphetamine and Ecstasy are young individuals and a relatively high proportion are women (EMCDDA 2007b); and Ecstasy users are usually well educated and socially integrated. However, some users progress to problematic use, and some even inject amphetamines. Health hazards include short-term mood changes and impairment of short-term memory function.

### *Cocaine and crack cocaine*

Cocaine is the second most commonly used illicit drug in the EU as a whole; 1-year prevalence is estimated at 1.3%. Data on prevalence of problem cocaine use ranges – where available – between 0.3% and 0.6%. Increases in 1-year prevalence among young adults have been seen in all countries providing

recent survey data, suggesting a "replacement" of other stimulants in some western European countries, especially in Italy, the United Kingdom and Spain (EMCDDA 2007a; 2007b).

Cocaine is consumed by different social groups with greatly varying patterns. The young, mostly male, socially integrated and well-educated users usually inhale it and also use other substances, such as cannabis and alcohol, in recreational settings. A small group of crack cocaine users is concentrated among highly marginalized subpopulations in cities (such as the homeless and sex workers), but the largest presumed group is the current or former heroin users that increasingly inject cocaine (EMCDDA 2007b; 2007c; Haasen et al. 2004). Injecting bears the risk of transmitting various infections, for example, hepatitis C and B, as well as HIV. Cocaine-related deaths are mostly the result of chronic toxicity in people with pre-existing conditions and concomitant use of heroin, and some of the most common hazards of acute and chronic cocaine use are CVDs (such as arrhythmia, myocarditis), cerebrovascular disease (such as stroke, seizures) and psychiatric disorders (such as depression).[9]

### *Opiates*

Prevalence of opioid use is estimated at 0.5%. However, data are often based on estimates from large cities (Kraus et al. 2003), or are available only from PDU indicators that increasingly include amphetamine, cocaine and poly-drug use. Current estimates of PDU prevalence range between 0.1% and 0.8% (EMCDDA 2007b).

Heroin use accelerated in the 1990s in all new Member States and especially the Baltic states (EMCDDA 2003), but has stabilized in western and central Europe in recent years (EMCDDA 2003; 2007b; UNODC 2008). However, there are sources that report an increase of heroin seizures; a rise in incidence based on treatment data, increased injecting of buprenorphine and illicit use of methadone. While injecting seems to have become less popular in EU15 countries, it remains the predominant mode of heroin administration in several of the newer Member States, with the highest rates witnessed in Estonia (EMCDDA 2007b).

Opioids are the main drug leading to physical, psychological and social harm (Rehm et al. 2005), resulting in excess all-cause mortality. It is of concern that the downward trend in drug overdose death in recent years did not continue into 2004/2005. In Europe, 200 000 IDUs are living with HIV and 1 million with hepatitis C, with infections due to injection being especially high in prison populations. Recent data suggest that transmission of HIV among

[9] For more information, see overview in EMCDDA (2007a; 2007d).

IDUs is low at the time of writing in the EU, but up-to-date data are missing from several high-prevalence countries (Estonia, Spain, Italy, Austria). At the end of the 1990s, dramatic increases in HIV infections – peaking around the year 2001 – occurred in all Baltic states that had faced sharp increases in heroin use (EMCDDA 2003). Rates of new infections related to injecting drug use have strongly declined since the epidemic, but they are still high compared to most other countries. Hepatitis C infections are more evenly distributed, but also more prevalent across Member States, and hepatitis C antibody levels were found in over 60% of IDUs in samples from 17 countries (EMCDDA 2007b).

Opioid users seeking treatment are mostly male (75%) and relatively old (30 years or over), having started use on average at 22 years of age. They are regularly poly-drug users and – compared to clients entering treatment due to other drugs – report worse social conditions, have high unemployment and low education levels, with 10–18% being homeless (EMCDDA 2007b).

# Chapter 8
# Socioeconomic inequalities in health and health care

**Box 8.1** *Summary of Chapter 8*

**Section 8.1 Trends in socioeconomic inequalities in health**

- Reducing inequalities in health and ensuring an equitable distribution of health services are key priorities among EU countries.
- Evidence from national and international studies shows clear inequalities in mortality and health status across socioeconomic groups in all countries and over time, as health has improved but inequalities do not appear to have been reduced.
- Income, education and occupational status affect risk factors (such as smoking and obesity), health status and mortality both directly and indirectly through psychosocial and environmental factors.
- Poverty and unemployment are important contributors to inequalities, although a gradient in health is present all along the socioeconomic spectrum.
- Migrants are also subject to health inequalities in certain diseases and among certain groups.

**Section 8.2 Inequalities in access to health services**

- Access to health care may be reduced for lower income individuals because of financial barriers in the form of out-of-pocket payments. In some countries, such payments constitute over 40% of total health costs (for example in Cyprus, Bulgaria, Greece and Latvia). Informal payments may also compromise access for those who cannot afford to pay.
- Geographical barriers to access may also be important and, in some countries, higher income individuals are significantly more likely to report closer proximity to hospitals.

**Box 8.1** *cont.*

- There is evidence of inequity in access to health services across socioeconomic groups in all countries and among migrants in some countries, in particular with regard to specialist care and in some cases also GP and hospital care.
- Some studies also find that lower income individuals are more likely to report an unmet need for health care in most countries.

## 8.1 Trends in socioeconomic inequalities in health

As the populations of Europe continue to become more diverse, policy-makers face increasing challenges related to reducing health inequalities and improving equity in access to health care. The EU remains committed to achieving these goals, as reflected, for example, in the 2000 Lisbon European Council meeting's resolution to "promote a better understanding of social exclusion through continued dialogue and exchanges of information and best practice, on the basis of commonly agreed indicators" and subsequent publication of the Atkinson Report (Atkinson et al. 2002), setting out recommendations for the development of indicators of social inclusion in the EU. There is growing recognition, therefore, of the importance of cross-country comparative research and collection of comparable indicators in order to monitor the progress towards these goals.

There is growing evidence demonstrating significant inequalities in both health and health care use, favouring groups with socioeconomic advantage across Europe. Among the countries of western Europe, research suggests that the degree of inequality is associated with the way each society treats its population in terms of both income and health protection (van Doorslaer and Jones 2004). In particular, the association between income and health is a consequence of (1) the impact of health and ageing on income; (2) the reverse effects of income protection on health and health care use; and (3) the joint determination of life-cycle profiles of income and health by social and other factors. Socioeconomic factors, such as education, income and job status, have a substantial protective effect on the health of individuals and this effect has been quantified in the available literature at the European level (Hernández-Quevedo et al. 2008). This section summarizes the literature on socioeconomic inequalities in health and access to care.

## Socioeconomic inequalities in health: national analyses

Income, occupational status and education, together with behavioural and psychosocial factors affect the distribution of morbidity within countries. This section provides a summary of some national studies of health inequalities and the following section reviews the results of cross-comparative research.

The Whitehall Study of civil servants in England has significantly contributed to the evidence base on the determinants of health and health inequalities (Asthana and Halliday 2006; Chandola et al. 2003). In Phase III of the Whitehall Study, a clear relation between employment grade and SF-36 physical functioning score was found for both men and women (Marmot 2005). Recently, Chandola and colleagues draw on the Whitehall II Study to show that physical health deteriorates more rapidly with age among men and women from the lower occupational grades, concluding that social inequalities in self-reported health increase in early old age. People from lower occupational grades age faster in terms of a quicker deterioration in physical health compared with people from higher grades (Chandola, Ferrie and Sacker 2007). This widening gap suggests that health inequalities will become an increasingly important public health issue, especially as the population continues to age.

Studies from other European countries show similar associations between health and socioeconomic status. The relative risk of CHD for non-skilled workers was found to be nearly twice that of high-level non-manual workers (Hemmingsson and Lundberg 2005). A similar association with CHD was shown with education in Finland (Silventoinem et al. 2005) and with employment status and education in Northern Ireland and France (the PRIME study) (Yarnell et al. 2005). Inequalities across occupational classes were found in self-rated health, pain, limiting long-standing illness, physical health functioning and circulatory diseases in Finland (Lahelma et al. 2005). Socioeconomic inequalities in self-rated health were consistent across three indicators of socioeconomic status (education, disposable income and income adequacy) and three communities in southern Finland with different degrees of "urbanness" (Nummela et al. 2007). Significant inequalities in self-rated health across occupational groups are also found in Barcelona (Borrel et al. 2004), by income and education in Latvia and Bulgaria (Balabanova and McKee 2002; Monden 2004), and by education (controlling for community affluence) in Ireland (Kelleher, Friel and Gabhainn 2003). In Spain, Costa-Font and Gil use data for 2001 and show that inequalities in self-reported health in Spain are associated with income inequalities and regional health care capacity (Costa-Font and Gil 2008). In Estonia, education has the strongest effect on self-rated health, with over twice the odds of poor health for men with less than upper secondary-level education compared to university

education and four times the odds for women, although Russian nationality, low personal income and residence in rural areas (for men) were also significant (Leinsalu, Vagero and Kunst 2004b). A study from Hungary found education and income were not as important in explaining poor self-reported health as smoking and perceived control in work for men, and depression and anxiety for women (Kopp, Csoboth and Rethelyi 2004).

### International comparison of socioeconomic determinants of health

International studies in socioeconomic determinants of health are helpful to determine the patterns of socioeconomic health inequalities in Europe. Large education-related inequalities in self-assessed health were observed in Austria, Denmark, England, Italy, the Netherlands, Norway, West Germany, Spain and Sweden (Table 8.1), although with variations in magnitude (Kunst et al. 2005). Between the 1980s and the 1990s, socioeconomic inequalities in self-reported general health remained, on average, stable for men but increased slightly for women. Increasing inequalities were observed in Italy, the Netherlands and Spain, but this trend was not seen in the northern European countries. This suggests that welfare states in the northern European countries had in place mechanisms to better protect people at a socioeconomic disadvantage from the health effects of the economic crises in the 1990s. However, large socioeconomic inequalities in reported health status still persist in all of the 10 western European countries analysed.

Education-related inequalities in common chronic diseases were found in Belgium, Denmark, Finland, France, England, Italy, the Netherlands and Spain (Dalstra et al. 2005). Most diseases showed higher prevalence among people with low educational levels; only allergy was more common in the high-education group (Table 8.2). Large inequalities favouring the better educated are observed for stroke, diseases of the nervous system, diabetes and arthritis. No statistically significant inequality was found for cancer, or for kidney and skin diseases. The size of socioeconomic disparities in chronic diseases varied between men and women: for diabetes, hypertension and heart diseases, inequalities were higher among women, while for back and spinal cord disorders, inequality was higher among men. By comparing the working-age and elderly population groups, it is evident that on average education-related inequalities decreased when age increased. The only exceptions were chronic respiratory diseases, headache and migraine. Among the working-age group, cancer was more prevalent in the lower educated group but in old age the pattern reversed; among older people cancer appears to affect the better educated (Dalstra et al. 2005). Another comparison of 11 European countries found that women with higher education had a greater risk of mortality

**Table 8.1** *Educational differences in fair/poor self-assessed health, men and women aged 25–69 years (odds ratios, 95% confidence intervals), 1980s and 1990s, selected European countries*

| | *Men* | | *Women* | |
|---|---|---|---|---|
| ***Country*** | ***1980s*** | ***1990s*** | ***1980s*** | ***1990s*** |
| Finland | 3.15 (2.55–3.88) | 2.99 (2.44–3.66) | 2.86 (2.28–3.58) | 3.29 (2.60–4.18) |
| Norway | 2.37 (1.71–3.29) | 2.37 (1.70–3.30) | 3.32 (2.37–4.66) | 3.06 (2.22–4.23) |
| Denmark | 2.93 (2.16–3.90) | 2.30 (1.73–3.04) | 3.10 (2.13–4.50) | 2.84 (2.10–3.82) |
| England | 3.11 (2.27–4.25) | 3.08 (2.57–3.68) | 2.08 (1.59–2.71) | 2.66 (2.21–3.19) |
| Netherlands | 2.95 (2.46–3.52) | 2.81 (2.39–3.30) | 1.95 (1.63–2.35) | 2.12 (1.81–2.49) |
| West Germany | 1.50 (1.20–1.88) | 1.76 (1.44–2.14) | 1.89 (1.43–2.50) | 1.91 (1.50–2.44) |
| Austria | 3.39 (2.92–3.93) | 3.22 (2.79–3.71) | 2.75 (2.37–3.19) | 2.67 (2.31–3.07) |
| Italy | 2.05 (1.79–2.34) | 2.94 (2.54–3.40) | 1.86 (1.62–2.15) | 2.55 (2.20–2.95) |
| Spain | 1.86 (1.56–2.17) | 2.58 (1.81–3.67) | 1.97 (1.63–2.37) | 3.10 (2.18–4.41) |
| Total (excl. Italy) | 2.61 (2.41–2.83) | 2.54 (2.35–2.75) | 2.48 (2.28–2.69) | 2.70 (2.50–2.92) |

*Source:* Reproduced from Kunst et al. 2005.

*Note:* The reference category in all countries is higher educational level.

from breast cancer, something the authors termed a "reversed social gradient" (Strand et al. 2007).

In a more recent study, Eikemo and colleagues investigate variations in education-related health inequalities across 23 European countries, grouped as Scandinavian, Anglo-Saxon, Bismarckian, Southern and Eastern countries (Eikemo et al. 2008). They use self-reported general health and limiting long-standing illness as indicators of health and the analysis is based on 2002 and 2004 European Social Survey (ESS) data. They find differences in both the prevalence of ill health and the level of inequalities across countries. Eastern European countries have the highest prevalence of both ill health indicators, while southern European countries have the second highest prevalence of self-assessed poor general health, as well as the lowest prevalence of limiting long-standing illness. Ireland and the United Kingdom have the lowest prevalence

**Table 8.2** *Education differences for chronic disease groups, men and women aged 25–59 years and 60–79 years, selected European countries* (odds ratios, 95% confidence intervals)*

| *Chronic disease group* | *Total* | *Men* | *Women* | *Men and women (25–59 years)* | *Men and women (60–79 years)* |
|---|---|---|---|---|---|
| Stroke | 1.64 (1.40–1.93) | 1.70 (1.35–2.14) | 1.56 (1.25–1.96) | 1.89 (1.25–2.51) | 1.53 (1.27–1.86) |
| Diseases nervous system | 1.63 (1.51–1.77) | 1.57 (1.40–1.77) | 1.57 (1.41–1.75) | 1.81 (1.64–1.99) | 1.33 (1.17–1.52) |
| Diabetes mellitus | 1.60 (1.43–1.80) | 1.30 (1.11–1.51) | 2.19 (1.82–2.63) | 1.64 (1.38–1.94) | 1.57 (1.34–1.84) |
| Arthritis | 1.56 (1.40–1.73) | 1.50 (1.27–1.77) | 1.46 (1.26–1.68) | 2.04 (1.76–2.36) | 1.17 (1.01–1.36) |
| Hypertension | 1.42 (1.34–1.50) | 1.10 (1.00–1.22) | 1.52 (1.42–1.62) | 1.55 (1.43–1.67) | 1.30 (1.20–1.40) |
| Stomach/ duodenum ulcer | 1.40 (1.22–1.60) | 1.41 (1.19–1.67) | 1.56 (1.25–1.95) | 1.37 (1.15–1.62) | 1.46 (1.16–1.83) |
| Genito-urinary diseases | 1.35 (1.24–1.47) | 1.29 (1.13–1.48) | 1.53 (1.36–1.72) | 1.51 (1.36–1.69) | 1.15 (1.00–1.31) |
| Headache/ migraine | 1.35 (1.27–1.43) | 1.18 (1.06–1.32) | 1.29 (1.20–1.30) | 1.28 (1.20–1.37) | 1.62 (1.42–1.84) |
| Osteoarthritis | 1.34 (1.21–1.49) | 1.32 (1.12–1.55) | 1.29 (1.12–1.48) | 1.51 (1.30–1.75) | 1.20 (1.03–1.38) |
| Liver/ gall diseases | 1.26 (1.08–1.46) | 1.10 (0.87–1.40) | 1.30 (1.07–1.58) | 1.31 (1.07–1.60) | 1.19 (0.95–1.49) |
| Chronic respiratory diseases | 1.24 (1.15–1.33) | 1.33 (1.20–1.48) | 1.19 (1.07–1.33) | 1.13 (1.03–1.25) | 1.42 (1.26–1.61) |
| Heart diseases | 1.22 (1.10–1.35) | 1.18 (1.04–1.34) | 1.51 (1.28–1.79) | 1.29 (1.09–1.53) | 1.18 (1.04–1.33) |
| Back and spinal cord disorders | 1.19 (1.11–1.29) | 1.33 (1.19–1.49) | 1.05 (0.94–1.16) | 1.29 (1.18–1.41) | 0.98 (0.86–1.13) |
| Cancer | 1.13 (0.098–1.30) | 0.96 (0.78–1.20) | 1.22 (1.02–1.46) | 1.64 (1.02–1.46) | 0.77 (0.64–0.93) |
| Kidney diseases | 1.11 (0.95–1.31) | 1.03 (0.83–1.27) | 1.34 (1.04–1.72) | 1.17 (0.95–1.45) | 1.03 (0.80–1.33) |
| Skin diseases | 0.99 (0.91–1.08) | 0.99 (0.86–1.14) | 0.98 (0.87–1.11) | 0.98 (0.88–1.09) | 1.03 (0.86–1.23) |
| Allergy | 0.73 (0.66–0.81) | 0.67 (0.57–0.79) | 0.72 (0.63–0.82) | 0.69 (0.61–0.78) | 0.82 (0.68–0.99) |

*Source:* Dalstra et al. 2005.

*Note*: *Belgium, Denmark, Finland, France, England, Italy, the Netherlands and Spain. The reference category is higher educational level.

for both health indicators and for both sexes. With regard to inequalities, southern European countries have the largest health inequalities, while countries with Bismarckian welfare regimes tend to have the smallest, and Sweden has the least inequality.

An increase in income is associated with improvements in self-assessed health status at the individual level (Mackenbach et al. 2005). Higher household income is associated with better health conditions for both men and women, particularly in the middle-income range in seven European countries (Belgium, Denmark, England, Finland, France, the Netherlands and Norway). In the highest income group, the relationship between income and self-assessed health is curvilinear; higher income is associated with less-than-proportional increases in self-assessed health in all countries analysed. A curvilinear association was also found for the lowest income groups in Belgium, Finland, Norway and the Netherlands, where the relationship reverses, in particular among women. However, for these four countries, net instead of gross income was measured. If the relationship between household income and morbidity is curvilinear, then it is likely that direct effects of material circumstances and poverty on health status are the most important. However, if the relationship is linear, indirect effects of income through psychosocial factors are more likely to explain health inequalities.

Dalstra and colleagues assess the strength of various socioeconomic indicators for predicting less-than-good health among individuals aged 60–79 years, drawing on data from national health surveys from 10 countries (Dalstra, Kunst and Mackenbach 2006). The results reveal substantial health disparities according to education and income in each country. Both education and income (with men) showed a strong independent relationship with health status. Health differences according to home ownership were generally somewhat smaller, except in England and the Netherlands.

Hyde and colleagues measure the associations between socioeconomic position in childhood and in adulthood and poor self-rated health among men and women at midlife, which are tested in four European studies from England, France, Germany and the Netherlands (Hyde et al. 2006). The results show that for women, there were significant associations between poor self-rated health and low socioeconomic position in both childhood and adulthood in England and the Netherlands; only low childhood socioeconomic position in Germany; and neither childhood nor adulthood socioeconomic position in France. For men, there were significant associations between poor self-rated health and low socioeconomic position in both childhood and adulthood in France and the Netherlands; only with adult socioeconomic position in England; and only with childhood socioeconomic position in Germany.

Hyde and colleagues conclude that in most countries, adult socioeconomic position showed stronger associations with self-rated health than childhood socioeconomic position, with variations in the strength of the associations across countries (Hyde et al. 2006).

Von dem Knesebeck and colleagues examine associations between quality of life and multiple socioeconomic indicators among people aged 50 years and above in 10 European countries, and analyse whether the importance of the socioeconomic measures vary by age (von dem Knesebeck et al. 2007). The data are from the Survey of Health, Ageing and Retirement in Europe (SHARE) in 2004. Quality of life is associated with socioeconomic status, but the associations vary by country. Relatively small socioeconomic disparities in quality of life are seen in Switzerland, but comparatively large disparities in Germany. Education, income, net worth and car ownership were consistently related to quality of life, but the association of home ownership was less consistent. There was no indication that the socioeconomic inequalities in quality of life diminished after retirement (that is from 65+ years).

Socioeconomic inequalities in self-reported health are found also in CEE countries. Education and material deprivation are important determinants of health status: people with higher education are less likely to report poor health (the odds are approximately one third of those with lower education) in the Russian Federation, Estonia, Lithuania, Latvia, Hungary, Poland and the Czech Republic (these findings are not dissimilar to the rest of Europe; Bobak et al. 2000). Low perceived control in work was also significantly associated with poor health, even after adjusting not only for age and gender but also for education, deprivation and inequality (Bobak et al. 2000). Studying trends in educational inequalities in health in Estonia, Latvia, Lithuania and Finland from 1994 to 2004, Helasoja and colleagues found that prevalence of reported health and inequalities by education are relatively stable across that decade (Helasoja et al. 2006). However, some improvement in general health is seen among the higher educated population in Estonia and Latvia, as well as an increase in the prevalence of reported symptoms among higher educated women in Estonia and Finland.

Olsen and Dahl examine self-reported health among individuals in 21 European countries to analyse how both individual- and country-level characteristics influence health (Olsen and Dahl 2007). The study is based on data from the ESS conducted in 2003. They present three main findings. First, individual-level characteristics, such as age, education, economic satisfaction, social network, unemployment and occupational status, are related to the health of individuals, both for women and men. These characteristics explain approximately 60% of the variation across countries. Second, societal features,

such as public expenditure on health, socioeconomic development, lifestyle and social capital (social trust), are related to subjective health and explain 40% of the variation in health across countries. Among the country-level characteristics, socioeconomic development – measured as GDP per capita – is strongly associated with better health, after controlling for individual-level characteristics. Third, the eastern European countries stand out as the countries in which individuals report the poorest health.

Hernández-Quevedo and colleagues found that long-run[10] income inequalities[11] (between 1994 and 2001) in health (defined as hampered in daily activity by any physical or mental health problem, illness or disability) are higher than short-run inequalities in 14 countries (Table 8.3) (Hernández Quevedo et al. 2006).[12] The short- and long-run inequalities are negative in all countries, implying that income-related inequality in ill health is pro-rich. In other words, poorer people are more likely to be hampered to some extent in daily activity in all 14 countries. Larger long-run inequalities are observed in Ireland, Spain and Portugal, and smaller in Germany and Finland. Although inequality varies widely across the years in all countries, only in Germany, Greece and Spain is inequality in absolute terms greater at the beginning of the reference period than at the end. The largest increase in inequalities across time is seen in Austria, Finland and Luxembourg, while in the United Kingdom and Germany inequality is quite stable (over the three years for which data are available). In all countries the mobility indices are negative, meaning income-related inequalities in ill health are larger in the long-run than in the short-run. Downwardly mobile individuals (in terms of income) are more likely to suffer any limitation in daily activity due to their health status than upwardly mobile individuals.

## Socioeconomic determinants of mortality

The association between socioeconomic status and mortality has received considerable attention in Europe. Studies investigate disparities in life expectancy across countries and regions as well as the disparities within

[10] Eight waves (from 1994 to 2001) of the ECHP were used to construct a long-run measure of health inequality (Jones and López-Nicolás 2004).

[11] Health inequalities are measured by using concentration indices (short-run $CI^S$ and long-run $CI^T$). The concentration index (CI) is a derivation of the Gini index. If the CI equals zero there is no inequality, while if the index is negative (positive), the poor (rich) are more likely to report ill health and the inequality in ill health is pro-rich (pro-poor).

[12] Austria (wave 2–8), Belgium (1–8), Denmark (1–8), Finland (1–8), France (1–8), Germany (1–3), Greece (1–8), Ireland (1–8), Italy (1–8), Luxembourg (1–3), the Netherlands (1–8), Portugal (1–8), Spain (1–8), United Kingdom (1–3).

**Table 8.3** *Inequality and mobility indices for health limitations in adults (15+ years), selected European countries*

| | *1994* | *1995* | *1996* | *1997* | *1998* | *1999* | *2000* | *2001* | *CIT* | *MIT* |
|---|---|---|---|---|---|---|---|---|---|---|
| **DE** | -.090 | -.076 | -.089 | – | – | – | – | – | -.089 | -.040 |
| **DK** | -.149 | -.187 | -.165 | -.183 | -.155 | -.189 | -.224 | -.175 | -.198 | -.104 |
| **NL** | -.064 | -.112 | -.108 | -.103 | -.104 | -.125 | -.113 | -.092 | -.114 | -.120 |
| **BE** | -.133 | -.160 | -.118 | -.167 | -.110 | -.163 | -.179 | -.152 | -.163 | -.116 |
| **LU** | -.083 | -.138 | -.200 | – | – | – | – | – | -.155 | -.126 |
| **FR** | -.129 | -.139 | -.146 | -.146 | -.141 | -.159 | -.155 | -.168 | -.166 | -.110 |
| **UK** | -.167 | -.173 | -.182 | – | – | – | – | – | -.185 | -.062 |
| **IE** | -.153 | -.193 | -.237 | -.250 | -.278 | -.273 | -.275 | -.269 | -.299 | -.240 |
| **IT** | -.090 | -.106 | -.107 | -.098 | -.075 | -.087 | -.119 | -.117 | -.119 | -.202 |
| **EL** | -.202 | -.218 | -.162 | -.206 | -.197 | -.220 | -.217 | -.167 | -.224 | -.126 |
| **ES** | -.188 | -.182 | -.141 | -.131 | -.144 | -.178 | -.174 | -.178 | -.182 | -.100 |
| **PT** | -.112 | -.163 | -.194 | -.188 | -.187 | -.172 | -.161 | -.182 | -.190 | -.122 |
| **AT** | – | -.116 | -.129 | -.136 | -.146 | -.160 | -.163 | -.181 | -.153 | -.038 |
| **FI** | – | – | -.067 | -.093 | -.114 | -.108 | -.108 | -.114 | -.108 | -.061 |

*Source:* Hernández-Quevedo et al. 2006.

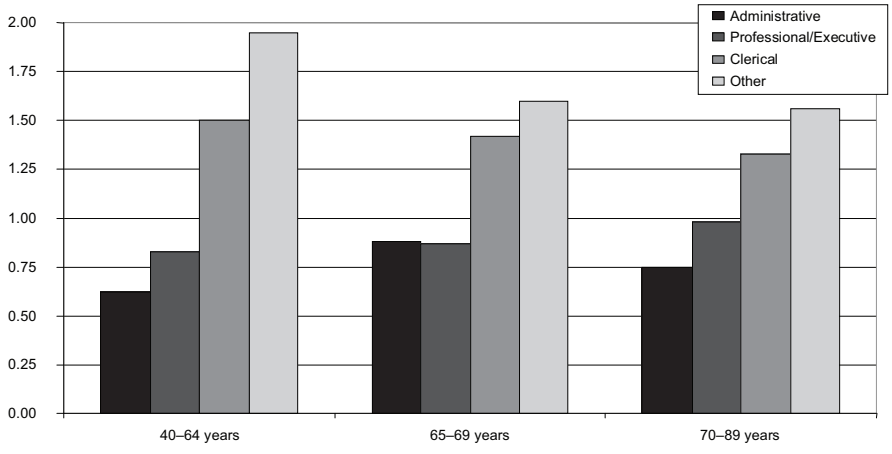
*Notes*: CIT: Long-run concentration index; MIT: mobility index.

countries across population groups. In its 1995 report, WHO analysed the contribution of individual causes of death at different ages to the life expectancy gap between eastern and western Europe. Though there was a large difference in infant mortality between the west and the east, only 15% of the total difference was explained by the pattern of diseases in children under 1 year old. A total of 43% of the gap originated in the 35–64 years age group and 23% in the age group 65 years and over (Bobak and Marmot 1996). CVD was the main explanatory factor (54%), followed by external causes (23%) and respiratory diseases (16%).

## Socioeconomic inequalities in mortality: national analyses

Several national studies provide evidence of socioeconomic inequalities in mortality. The Whitehall studies of British civil servants showed that English men in the lowest employment grades had four times higher mortality rate than those in the highest administrative grade in the age group 40–64 years (Marmot 1999). Position in the social hierarchy was strongly correlated with mortality risk (Fig. 8.1). Men second from the top had higher mortality than top-grade civil servants; clerical officers had higher mortality than men above them in the hierarchy, but lower than men in the lowest employment grades. A social gradient in mortality that runs from the least- to the most-deprived class was present, not only for all causes of death but also for CHD and neoplasms (van Rossum et al. 2000).

**Fig. 8.1** *Mortality relative rates by grade of employment, Whitehall study (men, 25 years of follow-up)*




*Source:* Reproduced from Marmot 1999.

The relative effect of social factors may help to explain the differential impact of economic transformation on male and female mortality in CEE countries. Skrabski and colleagues show that in Hungary, education, social capital and religious involvement are significantly associated with middle-age mortality, collectively explaining 68% of the subregional variation in mortality rates among men and 30% among women. A protective effect of social capital has also been shown elsewhere (Skrabski, Kopp and Kawachi 2004). In Lithuania, between 1989 and 2001, education inequalities in mortality have increased, in particular among women, because mortality rates decreased among people with high education but increased among people with low education (Kalediene and Petrauskiene 2005).

Disparities have also been analysed in relation to the economic transition in Estonia. Leinsalu and colleagues analyse disparities in mortality by education from 1989 to 2000 and find a steep increase during this period in overall and cause-specific mortality (Leinsalu, Vagero and Kunst 2003). In 2000 the gap in life expectancy between men aged 25 years with a university degree and those with low education was 13.1 years; among women, the gap was 8.6 years – nearly 5 years larger than in 1989. Disparities increased for deaths due to infectious diseases, transport accident, chronic respiratory disease and lung cancer, but decreased (albeit not significantly) for alcohol poisoning, suicide and homicide. Leinsalu and colleagues examined the change in differences in mortality between ethnic Estonians and Russians between 1989 and 2000 and found that differences in ethnic life expectancy increased from 0.4 years to 6.1 years among men and from 0.6 years to 3.5 years among women. In 2000, Russians had a higher mortality than Estonians in all age groups and for almost all selected causes of death. The largest differences are found for some alcohol-related causes of death, especially in 2000. The authors conclude that political and economic upheaval, increasing poverty, and alcohol consumption can be considered to be the main underlying causes of the widening ethnic mortality gap (Leinsalu, Vagero and Kunst 2004a).

Inequalities in deaths relating to CVD can be seen in Denmark, Sweden, Norway and Hungary. Rasmussen and colleagues (2006) studied how income and educational level influence mortality after acute myocardial infarction in Denmark. The study includes patients 30–74 years old, hospitalized for the first time with acute myocardial infarction in Denmark in 1995–2002, and it shows that both educational level and income substantially and independently affect mortality. In Sweden the relative risks of all-cause mortality among non-skilled workers and skilled workers in comparison with high-level non-manual workers were 2.24 and 1.81, respectively; for CVD mortality the relative risks were 2.38 and 1.77 (Hemmingsson and Lundberg 2005). For Norway, Strand and Kunst used registry data for all Norwegians born in 1955–1965 and

found that childhood socioeconomic status had a direct association with early adult cardiovascular mortality in men and with suicide in women (Strand and Kunst 2007). Childhood socioeconomic status is only indirectly associated with other causes of death, mostly through individuals' own educational level. Kopp and colleagues show low education and income constitute the most important determinant of cardiovascular mortality differences among the middle-aged population across the 150 subregions of Hungary (Kopp, Csoboth and Rethelyi 2004). Moreover, high weekend workload, low levels of control at work, job insecurity (for women) and low social support at work (for men) account for a large part of the variation in mortality rates. Kopp and colleagues conclude that the variations in middle-aged cardiovascular mortality rates in a rapidly changing society in CEE countries are largely accounted for by distinct unfavourable working and other psychosocial stress conditions (Kopp, Skrabski and Szanto 2006).

Disparities in mortality favouring individuals with higher education could be seen in Norway between 1980 and 1990 and appear higher on average among men (Mackenbach 2006). Inequalities favouring the better educated were recorded for almost all causes of death except breast cancer, which was more common among women with higher education; no inequality was found for neoplasm between genders; nor among women for cerebrovascular disease and external causes of disease. Among men, the largest inequalities were recorded for respiratory diseases, lung cancer and external causes; among women, education-related inequality was largest for IHD and CVDs, and in both cases the level of inequality was even higher than among men.

Education-related inequalities can also be found in Slovenia and the Czech Republic. The effect of education on mortality varies across causes of death. Among individuals aged 25–64 years in Slovenia, the main causes of death are injuries (Artnik, Vidmar and Premik 2004). Women with the lowest levels of education are more likely to die from CVDs, although a reverse association is seen for breast cancer mortality. Among men, the probability of dying from respiratory and digestive diseases is larger for those who have not completed primary school. On the contrary, men with higher education levels were more likely to die of circulatory diseases. The study also shows a protective effect of marriage. In the Czech Republic, mortality is significantly higher among men with a low level of education but no inequality is seen among women in the period 1988–1992 (Mackenbach et al. 1999). Inequalities favouring the better educated are recorded for several causes of death (the largest inequality is for respiratory diseases) except breast cancer and lung cancer, which are more common among women with high education; no inequality was found for external causes of disease among women. Among men, education-related inequalities are particularly large for respiratory diseases, lung cancer,

gastrointestinal diseases and external causes. Educational differences in specific causes of mortality are, on average, smaller among women than among men.

One study assesses the relation between life expectancy and both average income and measures of income inequality in 1980 and 1990, using the 17 Spanish regions as units of analysis (Regidor, Calle and Navarro 2003). No significant correlation is found between life expectancy and average household income for men. The association between life expectancy and average household income for women – adjusted for any of the measures of income inequality – was significant in 1980, although this association decreased or disappeared in 1990 after adjusting for measures of poverty. In both men and women, the partial correlation coefficients between life expectancy and the measures of relative income adjusted for average income were positive in 1980 and negative in 1990, although neither to any significant level. This research adds to the current debate on the role of absolute versus relative income as a determinant of health.

### International comparisons of socioeconomic inequalities in mortality

Income inequality as a determinant of health inequality is also studied in an international context. Higher income inequality is strongly associated with higher mortality among infants, and to a lesser extent with mortality among those aged 1–14 years in Austria, Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, the Netherlands, Spain, Sweden, the United Kingdom and other OECD countries (Lynch et al. 2001). The association between income inequality and mortality declines with age and becomes negative – although not significantly – for those aged 65 years or older. The correlation between income inequality and mortality is higher for men than for women in all age categories. Among women, income inequality is positively and significantly associated with chronic obstructive diseases, infectious diseases, and unintentional death under the age of 1 year; but is negatively associated with suicide and stroke. Among men, higher inequality is related to higher probability of homicide, infectious diseases and unintentional death under the age of 14 years; but is related to lower stroke mortality. The two most striking findings are the correlation of 0.63 (weighted for population size) between income inequality and lung cancer among women, and 0.21 among men; and correlation for homicide of 0.65 (men) and 0.66 (women) (Lynch et al. 2001).

Education and occupation-related inequalities in mortality favouring those that are better off increased between 1981 and 1985, and between 1991 and 1995 in Denmark, the United Kingdom (England and Wales), Norway, Sweden, Italy (Turin) and – in particular – among Finnish men (Mackenbach

et al. 2003). The main cause of this widening gap was the proportionally faster relative decline of mortality in the higher socioeconomic groups, although the decrease in absolute mortality has been similar both in the lower and upper groups.

A similar decline in cardiovascular mortality was recorded for all six countries and in all socioeconomic groups but, again, the relative decline was greater among the rich (Mackenbach et al. 2003). Socioeconomic disparities in cardiovascular mortality explain almost half of the widening relative gap in mortality in all populations except that of Italy. Changes in other causes of death also contributed to the widening gap. In addition, the authors considered the socioeconomic change in three further causes of mortality: neoplasms, other diseases and injuries. The occupation gap for neoplasms between the 1980s and 1990s increased in Sweden, the United Kingdom (England and Wales) and Italy; for other diseases, an increase was seen in Finland and Sweden; and for injuries, in Finland and Italy. The widening inequality in total mortality was also caused by increasing rates of mortality in the lower socioeconomic groups for lung cancer, breast cancer, respiratory diseases and gastrointestinal diseases among both men and women in all countries except Italy.

Avendano and colleagues assessed the association between socioeconomic status and IHD mortality in 10 western European populations during the 1990s (Avendano et al. 2006). They used a longitudinal study for 10 European populations: Finland, Norway, Denmark, England and Wales (the United Kingdom), Belgium, Switzerland, Austria, Turin (Italy), Barcelona (Spain) and Madrid (Spain). The results show that IHD mortality is higher among those with lower socioeconomic status than higher socioeconomic status among men aged 30–59 years, and among women aged 30–59 and 60 years and over. Socioeconomic disparities in IHD mortality are larger in the Scandinavian countries and England and Wales; of moderate size in Belgium, Switzerland, and Austria; and smaller in southern European populations among men and younger women. For elderly women, the north–south gradient is smaller and there is less variation between populations. No socioeconomic disparities in IHD mortality can be seen among elderly men in southern Europe. Socioeconomic disparities in IHD mortality were larger in northern than in southern European populations during the 1990s. This partly reflects the pattern of socioeconomic disparities in cardiovascular risk factors in Europe. Population-wide strategies to reduce risk factor prevalence combined with interventions targeted at the lower socioeconomic groups can contribute to a reduction in IHD mortality in Europe.

Mackenbach and colleagues analysed socioeconomic inequalities in mortality and self-assessed health in 22 European countries (Mackenbach et al. 2008).

In almost all countries, death rates and poorer self-assessments of health are substantially higher in lower socioeconomic groups, but the magnitude of the inequalities between higher and lower socioeconomic groups is much larger in some countries than in others. Inequalities in mortality are small in some southern European countries and very large in the eastern European countries and Baltic states. The magnitude of inequalities in self-reported health also varied substantially among countries, but in a different pattern. The main determinants of the inequalities are related to occupational opportunities, income distribution and health-related behaviour. Inequalities in mortality from selected causes suggest that some variations may be attributable to socioeconomic differences in smoking, excessive alcohol consumption and access to health care.

## Socioeconomic determinants of obesity

The previous section documents the disparities in health found across social groups, and this section reviews social determinants of one of the major risk factors for ill health: obesity.[13] Obesity is strongly associated with socioeconomic status, in particular in wealthy countries (Cavalaars et al. 1997). Wilkinson (1999) suggests three factors that contribute to this relationship: (1) diets that conform to nutritional recommendations generally cost more; (2) the amount of physical exercise is influenced not only by individual choices, but also by the amount of leisure time, social transport policies and indoor activities that are not usually free; (3) among people in the lower socioeconomic groups, the greater tendency to eat "for comfort" may be related to higher prevalence of depression.

The prevalence of obese individuals in the EU15 varies with age, education, socioeconomic level, marital status and smoking behaviour (Martinez et al. 1999). The probability of being obese increases with age and peaks between the ages of 55 and 64 (Table 8.4). People in lower socioeconomic groups are more likely to be obese and a strong association between education and obesity is evident: people with low educational attainments are more likely to be obese. Single individuals are less prone to becoming obese than couples or widow/divorced people but this relationship is no more significant after standardizing for age and gender. The amount of time spent sitting down per week, the lack of interest in physical activity, and low levels of participation in sports are also strong predictors of obesity.

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[13] In a study of Finland, Italy, the Netherlands, the United Kingdom and the United States the population-attributable risk percentage of hypertension among the obese ranges from 11% in Italy to 25% in the United States (Geleijnse, Kok and Grobbee 2004).

**Table 8.4** *Prevalence of obesity in the EU15 (odds ratios with 95% confidence intervals)*

| | *Crude* | | *Adjusted by age and gender* | |
|---|---|---|---|---|
| | ***OR*** | ***95% CI*** | ***OR*** | ***95% CI*** |
| **Sex (women versus men)** | 1.20 | 1.00–1.25 | 1.10 | 0.98-1.23 |
| **Age** | | | | |
| 15–24 (reference) | 1.00 | | 1.00 | |
| 25–34 | 2.76 | 2.07–3.68 | 2.75 | 2.06–3.67 |
| 35–44 | 3.89 | 2.94–5.15 | 3.87 | 2.92–5.15 |
| 45–54 | 6.23 | 4.73–8.20 | 6.20 | 4.71–8.16 |
| 55–64 | 7.31 | 5.55–9.64 | 7.31 | 5.54–9.63 |
| 65+ | 5.68 | 4.27–7.56 | 5.67 | 4.27–7.54 |
| **Socioeconomic level** | | | | |
| Middle–upper | 1.00 | | 1.00 | |
| Middle | 1.05 | 0.87–1.21 | 1.04 | 0.86–1.27 |
| Middle–lower | 1.41 | 1.18–1.69 | 1.38 | 1.15–1.66 |
| Lower | 1.65 | 1.37–1.99 | 1.56 | 1.28–1.89 |
| **Educational level** | | | | |
| Tertiary | 1.00 | | 1.00 | |
| Secondary | 1.56 | 1.29–1.88 | 1.54 | 1.28–1.86 |
| Primary | 2.66 | 2.21–3.22 | 2.12 | 1.75–2.58 |
| **Marital status** | | | | |
| Single | 1.00 | | 1.00 | |
| Married | 1.95 | 1.70–2.24 | 1.13 | 0.97–1.31 |
| Widow/divorced/separated | 2.23 | 1.49–3.32 | 1.07 | 0.87–1.32 |
| **Smoking status** | | | | |
| Never (reference) | 1.00 | | 1.00 | |
| Current | 0.71 | 0.63–0.81 | 0.76 | 0.67–0.87 |
| Ex (<1) | 0.73 | 0.48–1.10 | 0.82 | 0.54–1.24 |
| Ex (>1 year) | 1.41 | 1.20–1.66 | 1.19 | 1.01–1.40 |

*Source:* Reproduced from Martinez et al. 1999.

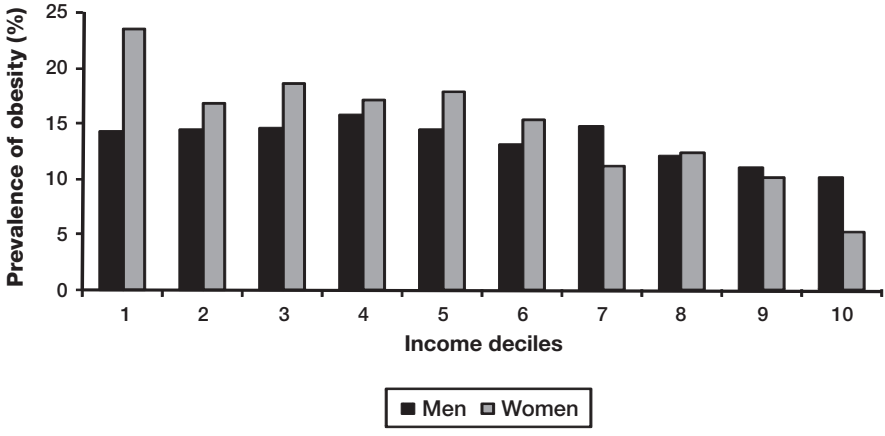
*Notes:* OR: Odds ratio; CI: Confidence interval; Ex: Ex-smoker.

Costa-Font and Gil (2008) examined the existence of income-related inequalities in the probability of being obese as measured by BMI in Spain (Fig. 8.2). The situation in Spain is of particular interest given that it is a Mediterranean country, and accordingly certain healthy foods (related to the so-called "Mediterranean diet") are more readily available at a lower price than in other countries. Their findings indicate that there are significant income-related inequalities associated with the probability of being obese. Furthermore, these inequalities are explained by education and demographics, and the role of income (the "pure income" effect) is rather small.

Another study focusing on the region of Catalonia in Spain evaluates the trends of overweight and obesity prevalence and the influence of socioeconomic determinants on these prevalence trends (García-Álvarez et al. 2007). For that purpose, García-Álvarez and colleagues used data from two Evaluations of Nutritional Status surveys in Catalonia for 1992–1993 and 2002–2003. They found that the socioeconomic and education variables exerted an influence on BMI and waist circumference measures of overweight and obesity rates, mainly on females in both surveys and on only the youngest men in the 1992–1993 survey.

Laaksonen and colleagues examined socioeconomic disparities in obesity in Finland using several different socioeconomic indicators: childhood socioeconomic environment, parental education, household income, material resources and economic satisfaction (Laaksonen, Sarlio-Lahteenkorva and Lahelma 2004). They draw on the Helsinki Health Study baseline surveys

**Fig. 8.2** *Obesity prevalence in men and women in Spain by income, 2003*




*Source:* Reproduced from Costa-Font and Gil 2008.

in 2000 and 2001, postal surveys of middle-aged employees of the City of Helsinki (4975 women and 1252 men, with a response rate of 68%). Results show that, for women, all socioeconomic indicators except household income and economic satisfaction were associated with obesity. Parental education and poorer socioeconomic conditions in childhood remain associated with obesity after adjusting for all indicators of current socioeconomic position. Home ownership and economic difficulties are associated with obesity after the full spectrum of adjustments has been carried out. The authors conclude that obesity is clearly associated with several dimensions of socioeconomic position.

### Socioeconomic determinants of smoking

Another important risk factor for health and mortality is cigarette smoking. Education and income are strong predictors of smoking in Finland, Denmark, Ireland, the United Kingdom, Belgium, Germany, Austria, Italy, Spain, Portugal and Greece (Huisman, Kunst and Mackenbach 2005). Smoking is a leading risk factor of mortality for lung cancer and, therefore, socioeconomic differences in smoking behaviours influence inequality in lung cancer and total mortality. The non-homogeneous development of the smoking epidemic across countries affects the dissimilar contribution of tobacco consumption to total mortality in the lowest socioeconomic groups. Among men the proportion of total mortality attributed to tobacco consumption ranges from 5% in Madrid to 30% in England and Wales, and among women from -14% in Madrid to 35% in England and Wales (Mackenbach et al. 2004).[14]

Another comparative study investigates time trends in smoking prevalence, as well as the sociodemographic and psychosocial background of smoking in the Baltic states (Estonia, Latvia and Lithuania) in comparison with Finland, from 1994 to 2002 (Helasoja et al. 2006). Differences in daily smoking according to age, education, urbanization and psychological distress in the Baltic countries and Finland were studied using postal surveys. Smoking increased among Lithuanian women from 6% in 1994 to 13% in 2002, but decreased among Estonian men and women. Smoking tends to be more common among younger individuals, less-educated people, and those experiencing distress in all four countries. Significantly higher odds of smoking are found for those with low education compared to high education across all countries, for men and women (with the exception of Lithuanian women).

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[14] The authors analysed education-related differences in lung cancer and total mortality in 10 populations: Belgium, Switzerland, Austria, England and Wales, Norway, Denmark, Finland, Barcelona, Madrid and Turin. The follow-up period varies across countries but ranges from 1990 to 1997.

Huisman and colleagues compare the relative role of education and income in smoking rates in 11 EU Member States in 1998 (Huisman, Kunst and Mackenbach 2005). Both education and income are related to smoking. After adjustment for the other socioeconomic indicators, education remains related to smoking in the EU, but income only remained significantly associated among men. Educational inequalities are larger than income-related inequalities among younger and middle-aged men and women. Educational inequalities are larger than income-related inequalities among men in all countries, and among women in northern European countries. For women from southern European countries, the magnitude of education- and income-related inequalities is similar.

### Socioeconomic determinants of mental health

There is a growing body of literature documenting socioeconomic disparities in mental health. This section presents some of the recent national and international studies, going on to address the link between unemployment and mental health.

Lahelma and colleagues aim to clarify the associations and pathways between measures of socioeconomic circumstances and common mental disorders in Finland by simultaneously analysing several past and present socioeconomic measures (Lahelma et al. 2006). The study includes middle-aged women and men employed by the City of Helsinki and finds that past and present economic difficulties are strongly associated with common mental disorders, whereas conventional past and present socioeconomic status measures showed weak or slightly reverse associations.

Also in Finland, Harkonmaki and colleagues examine the associations of mental health functioning with intentions to retire early among ageing municipal employees (Harkonmaki et al. 2006). They base their study on cross-sectional survey data from the Helsinki Health Study in 2000, 2001 and 2002. The results show that employees with the poorest mental health functioning are much more likely to report strong intentions to retire early than those with the best mental health functioning. Adjustments for physical health, socioeconomic status and spouse's employment status do not substantially affect this association.

Relatively little is known about depression in countries that were formerly part of the Soviet Union, especially the Russian Federation. Bobak and colleagues investigate the rates and distribution of depressive symptoms in urban population samples in the Russian Federation, Poland and the Czech Republic, drawing on cross-sectional data from randomly selected men and women

aged 45–64 years in Novosibirsk (Russian Federation), Krakow (Poland) and Karvina (Czech Republic) (Bobak et al. 2006). The prevalence of depressive symptoms is 23% in the Russian Federation, 21% in Poland and 19% in the Czech Republic; in women the rates were 44%, 40% and 34%, respectively. Depressive symptoms are positively associated with material deprivation and being unmarried. The association between education and depression is inverse in Poland and the Czech Republic but positive in the Russian Federation. The authors conclude that the prevalence of depressive symptoms in these eastern European urban populations is relatively high and, as in other countries, it is associated with alcohol use and several sociodemographic factors.

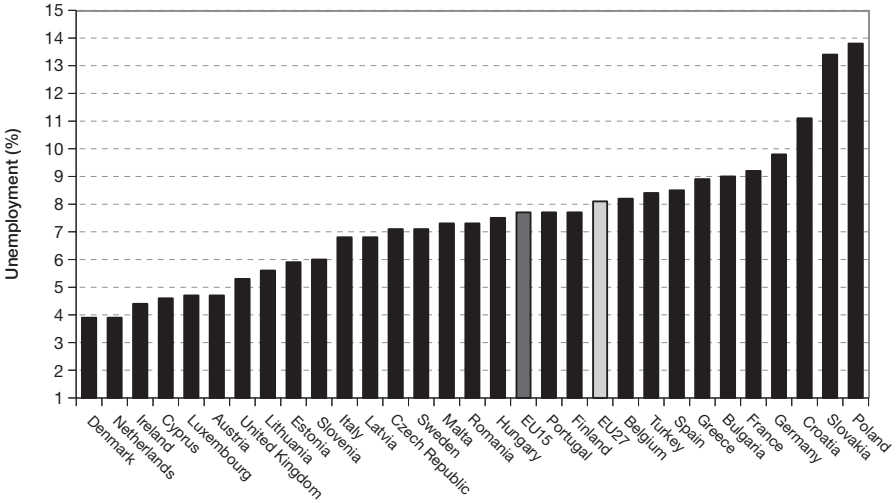
In Estonia, Kull assesses the prevalence of depression and the related sociodemographic factors among women aged 18–45 years using the Beck Depression Inventory (Kull 2005). The study shows 3.3% of the participants with severe depressiveness, 13.3% with moderate depressiveness and 31.7% with mild depressiveness. A further finding suggests that lower educational level and lower income are the most influential factors underlying depressiveness.

### Unemployment and mental health

The most significant social determinants of health include unemployment, stress and work. There is broad consensus that unemployment contributes to a significant decline in health and well-being. Similarly, a plethora of literature supports the strong link between stress (typically prolonged periods) and mental and physical health problems. Work, on the other hand – while most often associated with positive characteristics such as income, structure and feelings of accomplishment – can also lead to stress, anxiety and other mental and physical health problems (Artazcoz, Benach and Borrell 2005; Godin et al. 2005). Rates of unemployment vary across the EU and the three CCs (see Fig. 8.3). In 2006 the unemployment rate in the EU was just over 8%. The highest rates of unemployment are found in Poland (13.8%), Slovakia (13.4%) and Croatia (11%), though higher-than-average rates are seen in Germany, France, Bulgaria, Spain, Turkey and Belgium. In countries with high levels of unemployment, it is much more difficult for individuals who suffer from physical or mental health problems to find employment. Therefore, with high levels of competition for available jobs, it is less likely that individuals with any limitation – particularly mental health problems that are often associated with social stigma – will find work (Whiteside 1988).

Unemployment is associated with poor health status and increased chance of poor mental health, social exclusion (Kessler, House and Turner 1987; Warr 1987) and suicide (Blakely, Collings and Atkinson 2003). Unemployment may often result from both mental and physical disabilities. In Europe,

**Fig. 8.3** *Unemployment rate in Europe, 2006*




*Source:* WHO Regional Office for Europe 2008b.

approximately 25% of individuals newly relying on disability benefits do so due to mental conditions (Grammenos 2003). Furthermore, the unemployment rate of people with moderate illness or disability is twice that among those with no disability, while those with several illnesses or disabilities have three times the unemployment rate (Grammenos 2003).

Unemployment represents just one risk factor for poor mental and physical health. Absolute levels of deprivation and poverty are of course fundamental to overall health and well-being, with inequalities in health being driven in large part by the substantially poorer health status of those living in deprived living conditions (Mackenbach and Bekker 2002).

## Migrant health inequalities[15]

The 35 to 40 million foreign-born people in Europe continue to face difficulties in becoming a full part of the economic, cultural, social and political lives of their adopted societies (Papademetriou 2006). Unlike in North America and Australia, European countries rarely collect health data by ethnic group (the United Kingdom, Sweden and the Netherlands being exceptions). One difficulty in studying migrant health is defining the subject. At least five subcategories of "migrants" have been identified: students,

[15] This section draws on a research note by Mladovsky (2007).

economic migrants, asylum seekers, irregular migrants (or undocumented or clandestine) and displaced persons (Health Protection Agency 2006). However, it is still unclear how long it takes for a group of people thought of as "migrants" to begin to simply constitute a socially or culturally distinct or ethnic group of residents (Landman and Cruickshank 2001). In addition, different understandings of what it means to be a "migrant" exist across Europe. Another difficulty is lack of data, and the data that are available give rise to a complex and dynamic picture.

Measurement of migrant health and health care utilization is challenging for a variety of technical and political reasons (Ingleby et al. 2005): medical research favours homogenous samples, resulting in ignorance about the effectiveness of treatments on ethnic minorities; recording ethnicity in clinical records can be perceived as discriminatory; ethnic minorities often have low response rates in epidemiological surveys; monitoring undocumented immigrants is difficult; information is not validated, and thus its accuracy is unknown; and immigrant mortality in the population may be underestimated in register-based studies because sizeable numbers of immigrants who subsequently leave their new homeland (the host country) fail to register this fact with the national registration authorities.

Several techniques have been developed to counter a lack of data on migrant health, for example linking data sets and developing algorithms to identify individuals of ethnic origin by surname in registries.

If surveys do include migration variables, they mostly depend on a broad "social science" definition of immigrant status, employing country of birth, parental country of birth and length of stay in the host country as indicators to identify this population. Conceptually, there are two main problems with this. First, the paradigm incorporates important subcategories of individuals, such as refugees, who may experience specific non-random patterns of health and health care that differ to those of non-refugee immigrants. Second, the paradigm does not capture legal status, which may affect access to and utilization of health services, and which in turn may also affect patterns of disease in a non-random manner (Loue and Bunce 1999). To make these indicators relevant to health research, an understanding of the way immigration law relates to eligibility in accessing public services is important. This may become complex when legal criteria for the eligibility of immigration subcategories change over time (Loue and Bunce 1999).

Reflecting these technical difficulties, and also due to political concerns, in most European countries there are very few – if any – national or European surveys available at the time of writing to measure the health of first- and

second-generation migrants relative to the health of the native population. There are also generally low levels of reporting on migrant health. Exceptions include the Netherlands and to some extent Sweden and the United Kingdom. Countries such as Belgium, Spain and Germany have only very recently started to introduce questions on migration in health surveys. New Member States, reflecting their relatively low levels of immigration, hardly include indicators of immigration in health surveys, but this may change in the future as number of immigrants are increasing at the time of writing.

A review of the literature (Mladovsky 2007) suggests that infectious diseases (including STIs), accidents, injuries, musculoskeletal disorders, violence and drug abuse all appear to disproportionately affect certain migrant groups compared to autochthonous European populations. These patterns are likely to be linked to increased exposure to risk factors, either in the country of origin and/or in European countries where migrants are forced to live and work in poor conditions.

Migrants are not necessarily disadvantaged in all areas of health, however. Relatively low rates of low birth weight have long been observed in migrant groups in the United States and Europe. Many studies have shown that chronic diseases are less prevalent in some – though by no means all – migrant groups compared to autochthonous European (and North American) populations. This is known as the "healthy migrant effect". It has been suggested that (self-)selective migration may play a role; such findings may also be explained by a difference in timing between the health benefits and the health risks of migration (Mackenbach et al. 2005). However, the relative advantage does not translate across all countries and across all migrant groups. Also, research suggests that the advantage may diminish over time (length of stay) or in subsequent generations. In short, the literature suggests that it is not useful to make generalizations about the health of migrants, since mortality and morbidity patterns vary across space, time, age, gender, disease, country of origin and type of migration. Disaggregating mortality and morbidity data by cause, and by country of origin, is crucial.

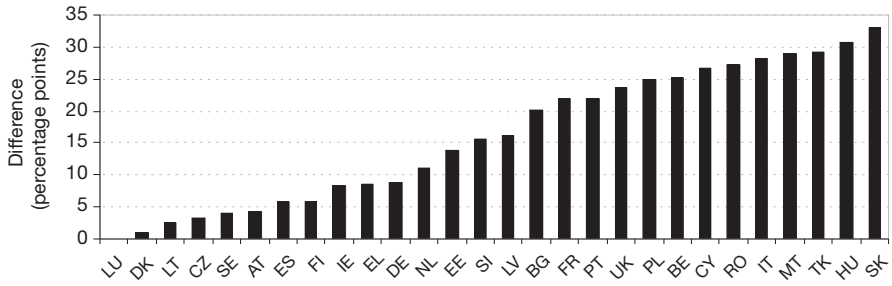
Five explanations for the differences in health between ethnic groups have been identified (Ingleby et al. 2005): genetic differences, cultural differences, as well as differences in socioeconomic position, short-term migration history and ethnic identity. Some of these factors may affect health through the pathway of varying patterns in risk factor prevalence (smoking, inactivity, alcohol consumption and so on). In addition, it seems that access to and utilization of health services also play a role. This is discussed at the end of the next subsection (8.2).

## 8.2 Inequalities in access to health care services

In light of persistent social inequalities in health, there is growing interest in assessing the extent to which the health care system ensures equitable access to health services. Differences in access to health services across socioeconomic groups may exacerbate existing health inequalities. Therefore, consideration of the extent of inequalities in accessing health care services is essential to understanding the broader goal of health equity. The objective of this section is to analyse to what extent equity in access to health care is achieved in Europe. An equitable system of health care delivery appears to remain a core objective in most EU Member States with comprehensive and universal coverage and with proposed health system reforms that usually quote equity preservation or improvement as an important goal (European Commission 2006a). Because in many countries horizontal equity is being interpreted as the principle of equal treatment for equal need, health economists have typically approached the measurement of inequity using inequality measures (Wagstaff and van Doorslaer 2000). In most empirical work, horizontal inequity is measured as the degree to which utilization is still related to income, after differences in needs across the income distribution have been appropriately standardized. Several cross-country comparisons have adopted variants of these methods to compare across countries in the EU (van Doorslaer, Koolman and Jones 2004), in the OECD (van Doorslaer and Masseria 2004) and in Asia (Lu et al. 2007).

Equitable access may be compromised by geographical barriers. In some countries, people with higher income report easier access to hospitals. The accessibility gap in the EU15 between the highest and lowest income quartiles is larger than 20% in Belgium, France, Italy, Portugal and the United Kingdom; in the new Member States the difference is only less than 20% in the Czech Republic, Slovenia, Estonia, Lithuania and Latvia; and in Hungary and Slovakia it is even larger than 30% (see Fig. 8.4). Unemployed and retired people have on average greater difficulty in reaching hospitals than the employed population in all European countries, but the difference is more marked in the new Member States and the three CCs (Alber and Kohler 2004). In terms of proximity to general practitioners (GPs), the level of income-related inequalities is lower in all countries. The average difference between the lowest and highest income quartiles is 2.7% in the EU15 and 11.9% in the new Member States; however, considerable heterogeneity is observed across the EU15 countries. Individuals with lower income have significantly easier access in Austria (17.9% difference favouring lower income groups), but the reverse is true in Greece (14.9%), Finland (14.4%), Belgium (13.4%) and the United Kingdom (12.3%). In the new Member States and

**Fig. 8.4** *Perceptions of proximity to hospitals: difference in percentage points between lowest and highest income quartile in the EU and Turkey, 2002*



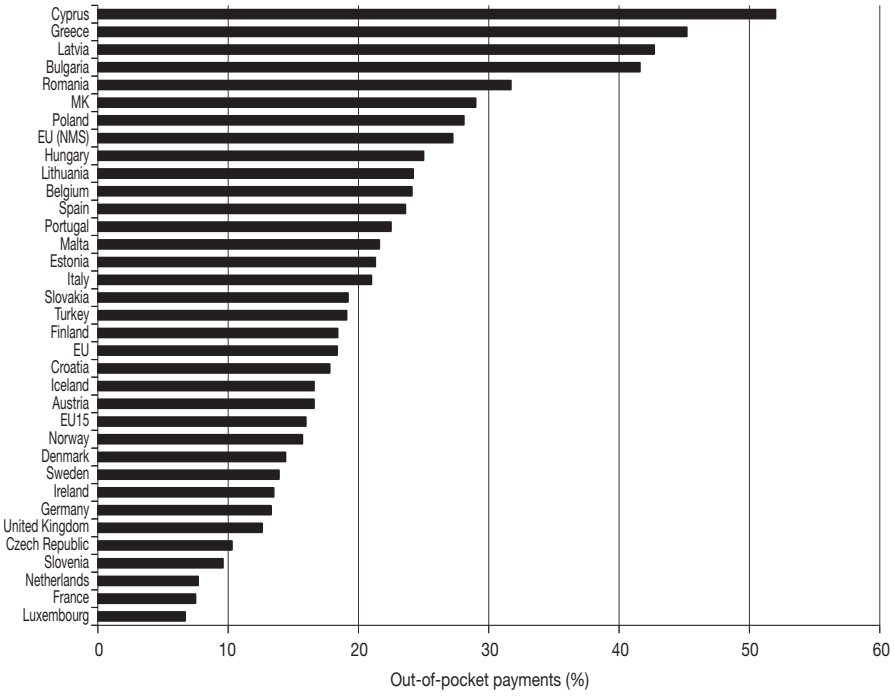

*Source:* Reproduced from Alber and Kohler 2004. © European Foundation for the Improvement of Living and Working Conditions 2004. Wyattville Road, Loughlinstown, Dublin 18, Ireland (www.eurofound.europa.eu).

*Note*: Proximity defined as having access to a hospital in less than 20 minutes.

the three CCs, people with higher income live closer to a doctor, in particular in Cyprus (21.2%), Hungary (15.5%), Slovakia (14.6%) and Poland (12.9%). Unemployment does not seem to be related to greater difficulties in reaching a GP, but working people have on average easier access to a doctor than the retired population in almost all European countries. The gap tends to be larger among the new Member States but differences are significant almost everywhere (Alber and Kohler 2004).

The accessibility of health services also depends on the system of financing in place, in particular the extent to which patients bear the responsibility for costs at the point of service. Patient cost sharing for public services in general constitutes a relatively small component of financing for health care, but the combination of cost sharing in the public system (that is, co-payments for publicly insured services) and direct payments for services by private providers (or for services that are not included in the public insurance benefits package) is substantial in many countries. In general, the levels of cost sharing have increased in most countries in recent years. Out-of-pocket payments for health services represent an average of 18% of total spending on health care in the EU (Fig. 8.5), although this varies widely across countries. Heavy reliance on household payments for health care can be found in Cyprus, Greece, Latvia and Bulgaria, constituting over 40% of total health expenditure. These figures may be underestimated in those countries where patients also pay informally, or "under the table", for health care services. Such informal payments are especially prevalent in CEE countries (Allin, Davaki and Mossialos 2006). A wide body of literature documents the deleterious effects of such user charges on the accessibility of health services for people with lower income,

**Fig. 8.5** *Out-of-pocket payments for health care as a proportion of total health spending, 2004*




*Source:* WHO Regional Office for Europe 2008b.

*Note:* MK: The former Yugoslav Republic of Macedonia (ISO country code); NMS: New Member States.

and on health outcomes; however, in countries that rely on prepayment methods such as taxation and insurance to finance health care and that use cost sharing as an attempt to reduce utilization have in place a wide range of exemption mechanisms to protect the vulnerable populations (Mossialos and Thomson 2003). In countries that rely more heavily on private payments to finance health care, however, these costs are likely to be an important cause of inequity in access.

## Inequity in the use of health services

European countries finance the majority of their health services from public sources and embrace the equity principle that health care should be allocated according to need, and not on the basis of willingness or ability to pay for the services. Yet, notable differences can be observed in the characteristics of each health care system. The increasing tension between affordability and equity has encouraged many countries to re-examine their public–private mix and

implement reforms that aim to improve efficiency while maintaining equity. At national level, several studies have been carried out, analysing equity in access to the health care services by measuring the patterns of utilization across income and other socioeconomic groups.

For the United Kingdom, many studies have reviewed and analysed the level of inequity in the use of health services (Dixon et al. 2007; Goddard and Smith 2001; Morris, Sutton and Gravelle 2005; O'Donnell and Propper 1991; Propper 1998). Bago d'Uva (2005) analyses access to primary care using data from the British Household Panel Survey for the period 1991–2001. Analysis by gender shows that men and women respond differently to some factors, in particular to age and income. There is evidence of a positive impact of income on the probability of seeking primary care, and this effect is especially significant in the case of women. For both genders, the marginal effect of income on the propensity to visit a GP is greater for individuals who are less likely to seek primary care. Recently, a study confirmed the finding of pro-poor inequality in GP visits in most of the 10 European countries analysed, and pro-rich inequality in specialist visits in all countries, across waves (Bago d'Uva, Jones and van Doorslaer 2007). Portugal shows the highest long-run pro-rich inequity in specialist visits, while Finland presents the second highest level of pro-rich long-run inequity in specialist visits.

A further study analysed the evolution of equity in access to health care in Spain over the period 1987–2001, a time span covering the development of the modern Spanish National Health System (García-Gómez and López-Nicólas 2007). The measures of access used were the probabilities of visiting a doctor, using emergency services and being hospitalized. For these three measures, indices of horizontal inequity were obtained, based on the Spanish National Health Surveys of 1987 and 2001. Findings showed that by 2001 the system had improved in the sense that differences in income no longer lead to different access patterns, given the same level of need. However, the tenure of private health insurance leads to differences in access, and its contribution to inequity has increased over time, both because insurance is more concentrated among the rich and also because the elasticity of utilization for the three types of service has increased.

For Italy, Atella and colleagues examined access to GPs and specialists based both in the public and private sectors in Italy (Atella et al. 2004). Their analysis is based on the Multipurpose Household Survey, conducted by the Italian National Institute of Statistics. Their findings show that the probability of seeking some form of care is not influenced by income and, hence, there is no evidence of inequity in access to the Italian health care system, characterized as being a system of universal access. However, income strongly influences the

mix of services: richer individuals are less likely to seek care from GPs and more likely to seek care from specialists, in particular private specialists, while richer individuals often opt out of the national health system.

Socioeconomic inequalities in health care use were detected in Estonia in 1999 (Habicht and Kunst 2005). Individuals living in rural areas were more likely to visit a GP or to engage in telephone consultations but were less likely to seek specialist care. Women used all health services, except hospital care, more intensively than men. Education, income and economic activity were important determinants of health use, even after controlling for health needs. People with more favourable socioeconomic status were more likely to use all services except hospitals. In Bulgaria, there is no income-related inequality in the total number of doctor consultations, after adjusting for illness; the only exceptions are worse-off women who tend to consult doctors more often. In terms of the probability of seeking medical care, it emerges that rich people, especially men, seek secondary-level care more often than poorer individuals.

An international study of equity in the use of health services provides comparative estimates of equity across 21 OECD countries (van Doorslaer and Masseria 2004). Inequity is measured using concentration indices of need-standardized distributions for total doctor visits and separately for GP and medical specialist visits, inpatient care and dentist visits in the 21 countries concerned: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Mexico, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States. The study found that the probability of visiting a doctor is higher among richer groups, after standardizing for population needs (as indicated by positive HI (horizontal inequity)[16] index values for most countries; Table 8.5). In approximately half of the countries studied, given the same need, the rich are more likely to see a doctor than the poor. The level of income-related inequity in the total number of doctor visits seems to be less pro-rich than when the probability of a doctor visit is measured. Inequity was found to be statistically significant only in Finland, Portugal, Sweden and Austria, while the reverse is seen in Belgium and Ireland (pro-poor).

Access to GPs appears to be relatively equitable; however, specialist services are more concentrated among the rich (Table 8.5). The probability of contacting a GP is fairly equitably distributed by income, with a few pro-rich

[16] HI is defined as the difference between the degree of income-related inequality in *actual* hospital admissions and the income-related inequality in *need-expected* use. HI is pro-rich and favours those that are better off, when the horizontal inequity index – $HI_{WV}$ – is positive, and pro-poor when it is negative.

**Table 8.5** *Horizontal inequity indices for annual probability of a doctor, GP and specialist visit, 21 OECD countries, 2000**

| | ***Probability, total visits*** | | ***Probability, GP visits*** | | ***Probability, specialist visits*** | |
|---|---|---|---|---|---|---|
| | *HI* | *t value* | *HI* | *t value* | *HI* | *t value* |
| Australia | 0.00 | 1.36 | – | – | – | – |
| Austria | 0.01 | 1.78 | -0.01 | -1.08 | 0.04 | 5.44 |
| Belgium | 0.00 | 0.55 | 0.00 | -0.87 | 0.05 | 5.28 |
| Canada | 0.02 | 14.72 | 0.02 | 11.48 | 0.04 | 18.75 |
| Denmark | 0.01 | 1.54 | 0.00 | -0.21 | 0.04 | 2.18 |
| Finland | 0.00 | -0.01 | 0.03 | 5.29 | 0.12 | 9.92 |
| France | 0.01 | 1.15 | 0.01 | 1.25 | 0.05 | 5.96 |
| Germany | 0.04 | 7.07 | -0.01 | -2.65 | 0.03 | 5.41 |
| Greece | 0.01 | 1.85 | -0.02 | -3.49 | 0.05 | 6.38 |
| Hungary | 0.01 | 1.11 | 0.00 | 0.35 | 0.04 | 4.92 |
| Ireland | 0.01 | 1.25 | 0.01 | 0.77 | 0.10 | 4.95 |
| Italy | 0.01 | 1.33 | 0.01 | 1.70 | 0.09 | 13.08 |
| Mexico | 0.01 | 3.85 | – | – | – | – |
| Netherlands | 0.04 | 13.81 | 0.01 | 1.26 | 0.02 | 2.07 |
| Norway | 0.01 | 2.19 | 0.01 | 1.21 | 0.06 | 3.99 |
| Portugal | 0.01 | 2.15 | 0.02 | 3.51 | 0.13 | 12.19 |
| Spain | 0.03 | 6.59 | -0.01 | -2.39 | 0.06 | 7.43 |
| Sweden | 0.00 | 0.65 | – | – | – | – |
| Switzerland | 0.03 | 2.87 | 0.01 | 1.51 | 0.05 | 7.51 |
| United Kingdom | 0.00 | 1.08 | 0.00 | 0.22 | 0.01 | 1.84 |
| United States | 0.04 | 12.82 | – | – | – | – |

*Source:* Adapted from van Doorslaer and Masseria 2004.

*Notes:* Countries ranked by HI for doctor visits; HI indices are estimated concentration indices for need-standardized use; Positive (negative) index indicates pro-rich (pro-poor) distribution; *German GP and specialist indices for ECHP 1996.

exceptions (Finland and Portugal). Pro-poor inequalities occur in countries in which the access to a medical specialist is direct (such as Greece, Spain and Germany, where there are no gatekeeping systems). However, on the whole, the likelihood of visiting a GP appears to be distributed according to need and is not influenced by income. The need-standardized distributions of total GP visits are significantly "pro-poor" in 10 countries. In only one country (Finland), there is pro-rich inequity (see further discussion of this result in the

discussion that follows). Therefore, given that the probability of seeking GP care is equitably distributed, most of the pro-poor distributional pattern in mean visits must be due to pro-poor conditional use. In almost every OECD country, the probability of seeing a GP is fairly equally distributed across income, but once people initially visit, the poor are more likely to consult the doctor more often. The pattern is very different for specialist visits; in all countries, those that are better off have a significantly higher probability of visiting a specialist. Although there are important differences between countries in the degree to which this occurs, access to specialist services seems to be unevenly distributed across income groups. In all countries, controlling for need, the rich are more likely to seek specialist care than the poor, and especially so in countries that offer options to seek private care, such as Finland, Portugal, Ireland, Italy and Spain. Pro-rich inequity in specialist visits was also observed in countries without such private options, and with GP gatekeepers, such as Denmark, Norway, Sweden and – to a lesser extent – in the Netherlands and the United Kingdom. The level of inequity is even higher when the total number of specialist visits is measured (van Doorslaer and Masseria 2004; van Doorslaer, Masseria and Koolman 2006). Therefore, in this case, conditional use reinforces the pro-rich patterns induced by the inequitable probability distribution. In virtually all countries, distributions fall significantly in favour of the higher income groups. The only exceptions are Norway, the Netherlands and the United Kingdom, where the HI indices are positive but not significantly different from zero.

Recent literature confirms these trends. A study by Lostao and colleagues examines the association between social class and health services use in three countries with universal health coverage: France, Germany and Spain (Lostao et al. 2007). They found that those individuals that belong to a lower social class made fewer visits to a physician than those belonging to a higher social class in France. The opposite occurred in Germany and Spain. Individuals of lower social class experienced more hospital admissions than those of higher social class in France and in Spain, while no statistically different differences were observed in Germany. No significant differences were seen after adjusting for need in any of the countries analysed.

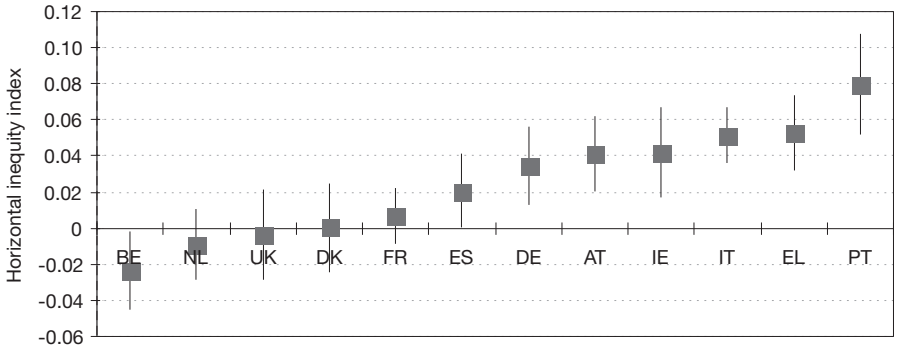
Using recent data from the European SILC, Huber and colleagues analysed unmet need for medical care by age groups and income level (Huber, Stanciole and HealthQUEST Project Team 2008). They provided some analysis of the proportion of respondents answering unmet need for medical examination due to problems related to access, which could include several causes: the person could not afford the examination; there were long waiting lists; or the place was too far away to travel. A total of 14 European countries are included

for the year 2005 by income quintiles and age groups, respectively. Evidence suggests that there is an association between unmet need and age and income. The authors find a significant variation across countries for the proportion of individuals that report unmet need. Countries such as Denmark and the Netherlands present a very small proportion of the overall population (below 1%) perceiving an unmet need for medical examination. However, in other countries, such as Germany, more than 5% of the population have reported unmet need. Regarding the results by income quintiles, important differences can be seen in unmet needs across the income distribution; findings show that those individuals at the bottom of the income distribution scale report more unmet needs than the richest individuals for each country. The United Kingdom presents the lowest difference between the two quintiles. In terms of age groups, they show that there is a trend towards more pronounced access problems among people in the older age groups, with the exception of Sweden and the United Kingdom. The incidence of access problems is relatively more common among the younger age groups. In this crude analysis, an association is found between self-reported unmet need and socioeconomic indicators.

One study on equity in inpatient care found that in most countries people with lower income are more likely to be admitted to hospitals in almost all countries and, once admitted, they also spend more nights in hospitals. After controlling for needs, however, there is little evidence of inequity (van Doorslaer and Masseria 2004). Another study, which used several waves of the ECHP Survey for 12 countries, found that in almost all these countries, the index of horizontal inequity for the probability of hospital admission is positive, indicating income-related inequity in favour of better-off individuals (Masseria, Koolman and van Doorslaer 2004). The level of inequity is particularly significant in Portugal, Greece, Italy, Austria and Ireland (Fig. 8.6). All these countries, except Austria, offer hospital physicians some method of practising privately alongside the public sector. Belgium is the only country with a negative and statistically significant index, indicating horizontal inequity favouring the poor.

Various analyses have attempted to understand the drivers of income-related inequity in health care use (van Doorslaer and Masseria 2004). Education is an important socioeconomic factor that is related to both income and health. Indeed, differences in medical care use by level of education often reflect utilization patterns by income. The higher educated population – *ceteris paribus* – are more inclined to visit specialists in almost all countries. Differences in employment status might also affect access to medical care, for example by impacting on the time costs of using the health system. Again – *ceteris paribus* – not being in paid employment seems to influence the degree

**Fig. 8.6** *Horizontal inequity index for the probability of hospital admission in 12 European countries, 1994–1998*




*Source:* European Commission 2000.

*Note:* For the United Kingdom and Germany data were only available from 1994 to 1996.

to which utilization patterns vary by income, and the contribution of this factor is generally negative. Individuals receiving a retirement or disability pension – holding everything else constant (for example, self-reported health and age) – have lower income levels and are less healthy than their working counterparts. Activity status might, therefore, operate as an (imperfect) need proxy. However, the difference between needed use and actual use distributions might be driven by the different time costs that people that are out of work face in comparison with their counterparts. The impact of activity status on inequalities varies a great deal across countries. To understand and interpret the contributions of education and activity status, a thorough understanding of health care policies, as well as labour markets and social policies, is necessary in each of the countries.

### *Inequality in access to health care among the older population*

A number of country-specific studies have been carried out relating to inequalities in access to health care among older people (Allin, Masseria and Mossialos 2009; Fernández-Mayoralas, Rodriguez and Rojo 2000; Nelson et al. 2002; Santana 2000). In England, the effect of age on the use of health care (GP, outpatient and inpatient care) is not linear (that is, the probability of accessing health care does not increase with age) and the pattern varies between men and women (Morris, Sutton and Gravelle 2005). Men over 60 years of age have a higher probability of using health care (especially inpatient and outpatient care) than women. In Spain, retirees, pensioners and housewives have a higher probability of consulting a doctor than employed individuals

(Fernández-Mayoralas, Rodriguez and Rojo 2000). Hospital care is mainly associated with population need, but it is more frequent in urban settings and among people with a lower level of education.

Two studies in Europe investigate patterns of utilization across countries among older people. In nine European countries (Sweden, Denmark, Germany, the Netherlands, Switzerland, Austria, Italy, Spain and Greece) the average number of consultations with physicians (within the last 12 months) is associated with age: 82% of the people in the age category 50–52 years made at least one visit, but the proportion increases to 94% at the age of 85+ years (Santos-Eggimann, Junod and Cornaz 2005). Allin and colleagues (2009) compare the level of inequity in physician and dental care utilization, focusing on adults aged 50 years or over in 12 countries (Austria, Belgium, France, Denmark, Greece, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland and the United States). The data considered are those acquired through the SHARE survey, together with the United States Health and Retirement Study, both from the year 2004. The results show significant pro-rich inequity in the likelihood of a physician visit in half of the countries concerned, with the highest levels in Europe corresponding to Sweden and Greece. When physician visits are split into GP and specialist visits, consistent pro-rich inequity can be seen in specialist care, but there is little evidence of inequity in GP care. Further, significant pro-rich inequity in the probability of visiting a dentist was found for all countries considered in the study (Allin, Masseria and Mossialos 2009). Overall, it appears that inequity remains in access to care for older populations, who are the heaviest users of health care services.

### *Inequalities in health care utilization among migrants*[17]

Most countries grant full equality of treatment to immigrants from non-EU Member States after awarding them long-term or permanent residence status (cross-border health care within the EU is a separate issue and is not specifically dealt with here). So, is access to health care still an issue? Data on this topic are relatively sparse, but a review of the literature (Mladovsky 2007) suggests that migrants do experience unequal access to health care. One issue is that requirements for permanent status vary across Europe and obtaining this status can take several years (Holzmann, Koettl and Chernetsky 2005). Second, undocumented migrants in many countries are not granted equality of treatment. Besides the legal barriers, migrants also face other specific difficulties in accessing health care. In clinical encounters, language

[17] This section draws on a research note by Mladovsky (2007).

and literacy are the most obvious cultural obstacles to providing good-quality care. In addition to this, miscommunication and dissatisfaction stemming from cultural differences and expectations can also contribute to suboptimal care. Categories and concepts used by migrants to explain health problems may differ significantly from Western understandings, as the field of medical anthropology has long demonstrated. This suggests that there is a major role for user involvement in the design of effective services for migrants.

A lack of knowledge about the health care system may also be a serious obstacle to access, sometimes even despite tailored publications and orientation services. Mistrust of service providers may be an important issue for some, particularly undocumented migrants fearing detection. In countries with complex registration systems for social health insurance, administration and bureaucracy is a major barrier. Barriers to health care may result in worse health outcomes, as is suggested by the relatively higher rate of avoidable mortality found among migrants in some studies. Such barriers may also result in increased consumption of more expensive emergency treatments.

Certainly, migrants are likely to face different barriers and inequalities in different European countries. There are also difficulties involved in measuring utilization. In addition, immigration may not always be the primary explanatory factor for differences in health care utilization, with income being an important confounding variable. Nevertheless, in countries with immigrant populations, it does seem that language-adapted and culture-sensitive programmes are needed in order to decrease inequality in access for ethnic minority groups.

# Chapter 9
# **Conclusions**

Population health has improved considerably over recent decades; however, many challenges remain in the context of an increasingly diverse and ageing population in Europe. This report aims to provide a resource for policy-makers and researchers interested in gaining an understanding of some of the key challenges that governments face in their efforts to ensure a healthy, productive and equitable society.

Trends in chronic diseases, mental health, communicable diseases, injuries and accidents, and preventable risk factors, such as tobacco smoking, alcohol consumption and obesity, present a mixed picture of progress and challenges across Europe. Throughout the life-course, individuals are exposed to various risks, and face different threats to their health and well-being. Efforts are needed to protect the health of children and to reduce preventable risks, such as smoking and obesity among young people. The working-age population also face considerable threats due to accidents and injuries, as well as mental health problems, which in part relate to their working conditions. Also of concern among the working-age population is reduced fertility, due to lifestyle choices, or – of more policy concern to ministries of health – due to infertility from STIs. Reproductive health policies are thus needed to address the rise in infertility, as well as to prevent the spread of diseases.

The majority of diseases and deaths occur at older ages. One of the drivers of the continuing ageing population is the reduction in old-age mortality. Chronic disease is the leading cause of death in the EU at the time of writing, and such diseases mostly affect older people. The challenges associated with multiple diagnoses (or co-morbidity) are some of the most acutely felt by the health care system. Changes in the organization and delivery of health care will be required to address the prevalence of chronic as opposed to acute

conditions. Population ageing presents particular policy challenges associated with reducing the dependency ratio by increasing fertility rates, in addition to presenting new health challenges such as Alzheimer's disease and dementia.

There has been considerable activity and attention paid by governments to increasing harmonization of health policies, with support from the European Commission. However, more research is needed to evaluate the existing policies and to assess their effectiveness, not only on the population but also on population subgroups, such as different age, socioeconomic and ethnic groups. Such an evidence base, based on cross-country learning, will help to identify best practice that can then be shared across Europe. Increasing diversity challenges efforts to reduce inequalities in health, and the ageing population underscores the need for effective policies to promote healthy ageing, and to prevent disease and disability. Continual monitoring of inequalities – in addition to evaluation of policies that aim to reduce inequality – is vital to ensure that the improvements in health are shared across populations.

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Good health is one of the most fundamental resources for social and economic prosperity. Europe has seen improvements over the past few decades in both health status and living and working conditions but, even so, many challenges remain. This study investigates differences in health status within and between European countries and examines some of the challenges faced by those seeking a healthier and more equitable society.

Within the context of the European Union, the range of living conditions has widened tremendously in recent years and will continue to do so as the Union goes through the enlargement process. This diversity has translated into varied patterns of health across the region. Inequalities in income, education, housing and employment have directly or indirectly affected public health. In addition, certain diseases and causes of death are more likely to affect young people, whereas most are associated with older ages. All these factors need to be taken into account, and this study addresses some of the complexities involved.

This book discusses and analyses the relationship between living conditions, socioeconomic factors and health with the objective of framing a debate and policy action to create a healthier and fairer society across Europe. This study will serve to stimulate focused discussion by offering an essential overview of key issues affecting European nations and the health and well-being of their peoples.

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