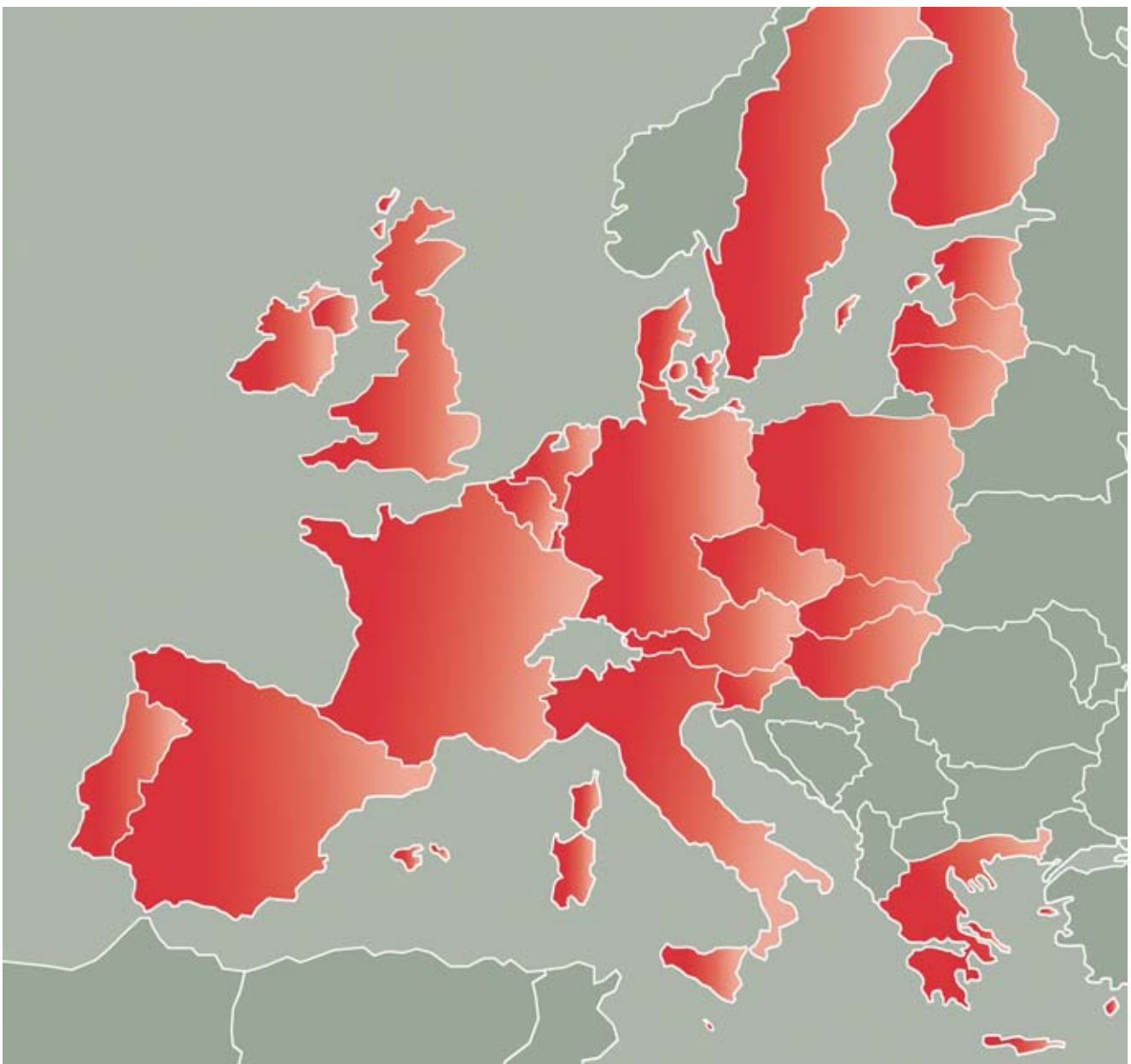


Health Inequalities: Europe in Profile

Prof. Dr Johan P. Mackenbach



An independent, expert report commissioned by the UK
Presidency of the EU (February 2006)



Health Inequalities: Europe in Profile

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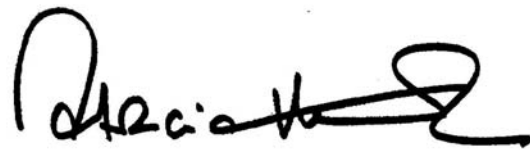
Foreword

Tackling health inequalities is an international issue and was a key health theme for the UK Presidency of the European Union in 2005. Almost all important health problems, and major causes of premature death such as cardiovascular disease and cancer, are more common among people with lower levels of education, income and occupational status. The health gap in life expectancy is typically 5 years or more. Narrowing this health gap within countries, and making good health a reality for everyone, is essential if we are to create a Europe of social justice as well as prosperity.

As part of the Presidency, the UK commissioned two new reports of which this is one. The primary aim of this independent report¹ is to review the evidence on the existence of socioeconomic inequalities in health in the EU and its immediate neighbours. It presents data on inequalities in mortality in 21 countries, on inequalities in self-assessed health in 19 countries, and on inequalities in smoking in 24 countries. The report makes clear that much progress has been achieved, but many challenges still remain.

Member states can learn from each other about different approaches to reducing health inequalities through systematic sharing of evidence, and EU and international support to member states in developing effective strategies and programmes could add value.

We believe that this document, and a matching report “Health Inequalities: a Challenge for Europe”, will inform the work of the European Commission and agencies such as WHO and OECD. Both reports build on the interim versions launched at the UK Presidency Summit: “Tackling Health Inequalities-Governing For Health” in October 2005. In developing these reports we have received invaluable assistance from member states. We are grateful for this, and hope that the reports will be useful in developing policy and action on health inequalities, for example through the Commission’s Expert Working Group on Social Determinants of Health Inequalities.



Rt. Hon. Patricia Hewitt MP
Secretary of State for Health, England

1 The views expressed in the report are those of the author and not necessarily those of the UK Government, other member states or the European Commission.

Executive Summary

At the start of the 21st century, all European countries are faced with substantial inequalities in health within their populations. People with a lower level of education, a lower occupational class, or a lower level of income tend to die at a younger age, and to have a higher prevalence of most types of health problems.

This report was written at the request of the UK Presidency of the European Union (EU), and aims to review the evidence on the existence of socio-economic inequalities in health in the EU and its immediate neighbours. It presents data on inequalities in mortality in 21 countries, on inequalities in self-assessed health in 19 countries, and on inequalities in smoking in 24 countries.

Rates of mortality are consistently higher among those with a lower, than among those with a higher socio-economic position. Not only is the size of these inequalities often substantial, but inequalities in mortality have also increased in many European countries in the past decades. Inequalities in mortality:

- start early in life and persist into old age,
- affect both men and women, but tend to be larger among men,
- are found for most but not all specific causes of death.

Inequalities in mortality from cardiovascular disease account for almost half of the excess mortality in lower socio-economic groups in most countries. Inequalities in cancer mortality are often less clear, particularly among women.

Rates of morbidity are also usually higher among those with a lower educational, occupational, or income level. No clear trends have been found in these inequalities. Inequalities in morbidity are found for many morbidity indicators:

- prevalence of less-than-‘good’ self-assessed health,

- incidence and prevalence of many chronic conditions,
- prevalence of most mental health problems, and
- prevalence of functional limitations and disabilities.

As a result, people with lower socio-economic positions not only live shorter lives, but also spend a larger number of years in ill-health.

During the past decade, great progress has been made in unravelling the determinants of health inequalities. This research has shown that health inequalities are mainly caused by a higher exposure of lower socio-economic groups to a wide range of unfavourable material, psychosocial and behavioural risk factors.

This report reviews the evidence on some behavioural risk factors, for which comparable data on social patterning are available from many European countries. Smoking is likely to be an important contributor to health inequalities in many European countries, because the prevalence of smoking tends to be higher in lower socio-economic groups, particularly among men. There are important differences between countries, however, in these inequalities.

According to many, socio-economic inequalities in health are unacceptable, and represent one of Europe’s greatest challenges for public health. The omnipresence and persistence of these inequalities should warn against unrealistic expectations of a substantial reduction within a short period of time, and by using conventional approaches. New and more powerful approaches need to be developed. Learning speed can be increased if countries would exchange their experiences with tackling health inequalities more systematically than in the past. The European Union can play an important role in facilitating these exchanges.

1. Introduction

- Inequalities in health between people with higher and lower educational level, occupational class and income level have been found in all European countries.
- The widening of some of these health inequalities during the last decades of the 20th century has increased the urgency of this public health problem.
- This independent report, commissioned by the UK Presidency of the European Union, gives a comprehensive overview of patterns and trends.

At the start of the 21st century, all European countries are faced with substantial inequalities in health within their populations. People with a lower level of education, a lower occupational class, or a lower level of income tend to die at a younger age, and to have, within their shorter lives, a higher prevalence of all kinds of health problems. This leads to truly tremendous differences between socio-economic groups in the number of years that people can expect to live in good health ('health expectancy'). In countries with available data, differences in health expectancy typically amount to 10 years or more, counted from birth.

Health inequalities have been found in countries in all European regions, and even if data for a particular country are not available, one can confidently expect similar inequalities in health to exist there as well. According to many, such differences in health are unacceptable, and represent one of Europe's greatest challenges for public health. It is for this reason that the UK Government chose Health Inequalities as one of the two main health themes for its Presidency of the EU in 2005.

Health inequalities were 'discovered' in the 19th century

Historical evidence suggests that socio-economic inequalities in health are not a recent phenomenon. However, it was only during the 19th century that

socio-economic inequalities in health were 'discovered'. Before that time, health inequalities simply went unrecognized because of lack of information.

In the 19th century great figures in public health, such as Villermé in France, Chadwick in England, and Virchow in Germany, devoted a large part of their scientific work to this issue. This was facilitated by national population statistics, which permitted the calculation of mortality rates by occupation or by city district. Louis René Villermé (1782–1863), for example, analysed inequalities in mortality between 'arrondissements' in Paris in 1817–21. He showed that districts with a lower socio-economic level, as indicated by the proportion of houses for which no tax was levied over the rents, tended to have systematically higher mortality rates than more well-to-do neighbourhoods. He concluded that life and death are not primarily biological phenomena, but are closely linked to social circumstances. Rudolf Virchow (1821–1902) went even further in his famous statement that "medicine is a social science, and politics nothing but medicine at a larger scale".

Unexpected widening of health inequalities has raised awareness

Since the 19th century, the magnitude of socio-economic inequalities in health has certainly

declined in absolute terms. There has been a marked decline in the average mortality rate in the population, leading to a doubling of life expectancy at birth. This was largely due to improvements in living standards and public health. As a result, the absolute difference in mortality rates and in life expectancy at birth between people with a high and a low socio-economic position has become smaller.

It is less clear, however, whether inequalities in mortality have also declined in relative terms, i.e. in terms of the percentage excess death rates in lower as compared to higher socio-economic groups. In the long run, the relative risks of dying for those with a low as compared to those with a high socio-economic position seem to have remained very stable, and have even unexpectedly increased during the last decades of the 20th century in many European countries. Particularly in Western Europe, with its high levels of prosperity and highly developed social security, public health and health care systems, this was a disturbing finding. These developments have contributed to a heightened awareness of health inequalities, and of the challenge they pose to public health policy, around the continent.

The start of the resurgence of an active interest in health inequalities in Europe can be linked to the publication of the Black report in England in 1980, which first highlighted the widening of health inequalities despite the rise of the welfare state in the decades after World War II. The Black report contributed to heightened awareness of health inequalities all around Europe. The publication of the Acheson report in 1998 also marked a new surge of interest in health inequalities in England and elsewhere. As a result, an enormous amount of descriptive data has been collected and analysed in many European countries, testifying to the existence of substantial inequalities in health in all countries with good data.

This paper aims at providing a comprehensive overview

This paper was written at the request of the UK Presidency of the European Union (EU), and aims to review the descriptive evidence on health inequalities around Europe, particularly in the EU and its immediate neighbours, including some candidate countries.

For the purpose of this paper, socio-economic inequalities in health will be defined as systematic differences in morbidity or mortality rates between people of higher and lower socio-economic status, as indicated by e.g. level of education, occupational class or income level. Where possible, we will draw upon a number of comparative studies which have recently been completed with financial support of the European Commission. These have looked at inequalities in mortality, self-reported morbidity and selected life-style factors during the 1990s in a number of EU member countries, and have taken care to make these data as comparable as possible. These data will, however, be supplemented by possibly less comparable data from other sources. In order to avoid over-interpretation of differences between countries which might in reality be due to artefacts of data collection, we will mainly focus on common patterns.

While all these descriptive studies were going on, the emphasis of academic research in this area has actually shifted largely from description to explanation in order to find target points for policies to tackle health inequalities. Reviewing progress with developing such policies around Europe is outside the scope of this paper. For this, we refer to an accompanying paper also commissioned by the UK Presidency of the EU (Judge et al, 2006).

2. Mortality

- In all countries with available data, rates of premature mortality are higher among those with lower levels of education, occupational class, or income.
- Inequalities in mortality exist from the youngest to the oldest ages and in both genders, but tend to be smaller among women than among men.
- Inequalities in mortality can also be found for many specific causes of death, including cardiovascular disease, many cancers, and injury.
- These inequalities in mortality lead to substantial inequalities in life expectancy at birth (4 to 6 years among men, 2 to 4 years among women).

2.1 Total mortality

Although no individual can escape death, important differences in mortality rates are typically found between men and women, city dwellers and inhabitants of rural areas, native people and immigrants, and population groups classified according to many other characteristics. Some of the largest inequalities are found when individuals are classified according to their socio-economic position. In all European countries with available data, mortality rates are higher among those in less advantaged socio-economic positions, regardless of whether socio-economic position is indicated by educational level, occupational class, or income level.

Inequalities in mortality are omnipresent

For this report, we have made an effort to collect information on socio-economic inequalities in mortality during a recent time-period (the 1980s or later) from as many countries in the European Union and its immediate neighbours as we could find. The results have been summarized in a large table (table 1).

Because of potential problems of comparability between countries (e.g. because of differences in socio-economic classification, measurement of

mortality, or inclusion and exclusion of specific subgroups of the population), it is important to focus on the overall picture. Data on inequalities in mortality are available for a wide range of European countries, from the North (all four Nordic countries) to the West (the United Kingdom and Ireland) to the South (several Mediterranean countries) to the East (e.g. the Baltic countries and Poland), including many countries in-between (such as the Netherlands, Belgium, France, Switzerland, Austria and the Czech republic).

The overall picture is extremely clear: the mortality rates are consistently higher in lower, than in higher socio-economic groups. This is indicated by the fact that all rate ratios (i.e. the ratio of the death rate in the lower as compared to the higher socio-economic groups) are clearly above 1. Many of the figures given in table 1 apply to middle-aged adults, and this implies that differences in mortality rates can be interpreted as differences in the risks of dying prematurely. Not only is the size of these inequalities often substantial, in the order of an excess risk of dying in the lowest socio-economic groups of 25 to 50 to even 150 per cent. But inequalities in mortality have also risen substantially in the past decades (box 1), without much evidence that the widening of the mortality gap will stop in the near future.

Mortality is always higher in the lower, than in the higher socio-economic groups.

Table 1.

Inequalities in mortality by socio-economic position in 21 European countries^a.

Country	Indicator of socio-economic position	Period	Age-group	Rate Ratio ^b		Source
				Men	Women	
Austria	Education ²	1991–1992	45+	1.43*	1.32*	National census-linked mortality follow-up
Belgium	Education ²	1991–1995	45+	1.34*	1.29*	National census-linked mortality follow-up
	Housing tenure ¹	1991–1995	60–69	1.44*	1.43*	
Czech Republic	Education ⁶	End 1990s	20–64	1.66*	1.09*	Unlinked cross-sectional study
Denmark	Education ¹	1991–1995	60–69	1.28*	1.26*	National census-linked mortality follow-up
	Housing tenure ¹	1991–1995	60–69	1.64*	1.47*	National census-linked mortality follow-up
	Occupation ³	1981–1990	45–59	1.33*	n.a.	
England/Wales	Education ²	1991–1996	45+	1.35*	1.22*	National census-linked mortality follow-up
	Housing tenure ¹	1991–1996	60–69	1.65*	1.58*	National census-linked mortality follow-up; representative sample
	Occupation ³	1981–1989	45–59	1.61*	n.a.	
Estonia	Education ¹¹	2000	20+	2.38*	2.23*	National cross-sectional study
	Education ⁶	1988	20–74	1.50*	1.31*	National cross-sectional study
Finland	Education ²	1991–1995	45+	1.33*	1.24*	National census-linked mortality follow-up
	Housing tenure ¹	1991–1995	60–69	1.90*	1.73*	
France	Education ¹	1990–1994	60–69	1.31*	1.14	National census-linked mortality follow-up
	Housing tenure ¹	1990–1994	60–69	1.27*	1.25*	National census-linked mortality follow-up; representative sample
	Occupation ³	1980–1989	45–59	2.15*	n.a.	
Hungary	Education ⁹	2002	45–64	1.97*	1.58*	Cross-sectional ecological analysis
	Occupation ¹⁰	1984–1985	45–64	1.61	1.33	National cross-sectional study
Ireland	Occupation ³	1980–1982	45–59	1.38*	n.a.	National cross-sectional study
Italy	Education ²	1991–1996	45+	1.22*	1.20*	Urban census-linked mortality follow-up (Turin)
	Housing tenure ¹	1991–1996	60–69	1.37*	1.33*	
	Education ⁴	1981–1982	18–54	1.85*	n.a.	National census-linked mortality follow-up
	Occupation ³	1981–1982	45–59	1.35*	n.a.	National census-linked mortality follow-up
Latvia	Education ⁷	1988–1989		1.50	1.20	National cross-sectional study
Lithuania	Education ⁵	2001	25+	2.40*	2.90*	Unlinked cross-sectional analysis
Netherlands	Education ²³	1991–1997	25–74	1.92*	1.28	GLOBE Longitudinal study (Eindhoven)
Norway	Education ²	1990–1995	45+	1.36*	1.27*	National census-linked mortality follow-up
	Housing tenure ¹	1990–1995	60–69	1.44*	1.36*	National census-linked mortality follow-up
	Occupation ³	1980–1990	45–59	1.47*	n.a.	
Poland	Education ⁸	1988–1989	50–64	2.24	1.78	National cross-sectional study
Portugal	Occupation ³	1980–1982	45–59	1.36*	n.a.	National cross-sectional study
Slovenia	Education	1991 & 2002	25–64	2.44	2.66	Unlinked cross-sectional study
Spain	Education ²	1992–1996	45+	1.24*	1.27*	Urban and regional census-linked mortality follow-up (Barcelona & Madrid)
	Occupation ³	1980–1982	45–59	1.37*	n.a.	National cross-sectional study
Sweden	Occupation ³	1980–1986	45–59	1.59*	n.a.	National census-linked mortality follow-up
Switzerland	Education ²	1991–1995	45+	1.33*	1.27*	National census-linked mortality follow-up
	Occupation ³	1979–1982	45–59	1.37*	n.a.	National cross-sectional study

a Because of differences in data collection and classification, the magnitude of inequalities in health cannot always directly be compared between countries.

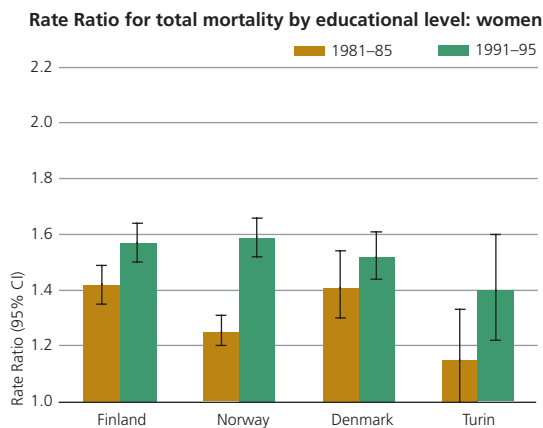
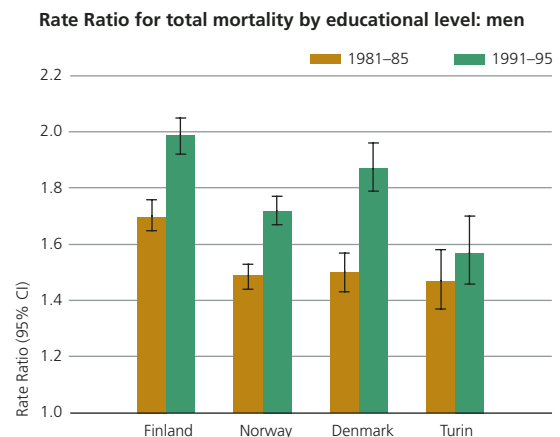
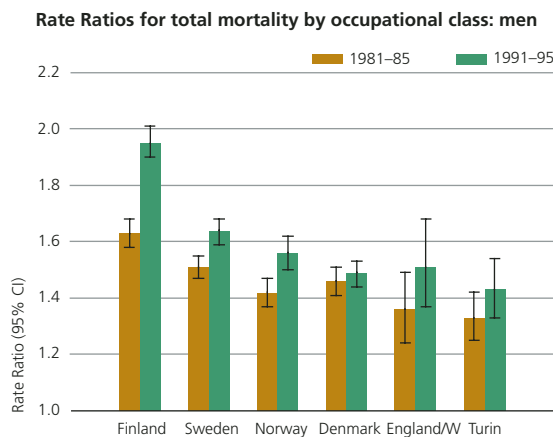
b Rate Ratio: ratio of mortality rate in lower socio-economic groups as compared to that in higher socio-economic groups. Asterisk (*) indicates that difference in mortality between socio-economic groups is statistically significant. Notes refer to references given in the back of this report. N.a. indicates 'not available'.

Box 1. Widening inequalities in mortality in Western Europe

To the surprise of many, mortality differences between socio-economic groups have widened in many Western European countries during the last three decades of the 20th century. This has continued into the 1990s, and has led to considerable increases of the relative excess risk of dying in the lowest socio-economic groups (figure).

Relative inequalities in mortality have increased in all countries.

Box figure. Inequalities in mortality by educational level and occupational class, 1981–1985 and 1991–1995. Finland, Sweden, Norway, Denmark, England/Wales, Turin.



Source: Mackenbach JP, Bos V, Andersen O, et al. Widening socio-economic inequalities in mortality in six Western European countries. *Int J Epidemiol* 2003; 32: 830–837.

NOTE: 95% CI = 95% Confidence Interval
This is an indication of the influence of random variation, and gives the range of values which, with 95% probability, contains the true value.

The explanation of this disturbing phenomenon is only partly known. One aspect which should certainly be taken into account, however, is that this widening of the relative gap in death rates is generally the result of a difference between socio-economic groups in the speed of mortality decline. While mortality declined in all socio-economic groups, the decline has been proportionally faster in the higher socio-economic groups than in the lower.

The faster mortality declines in higher socio-economic groups were in their turn mostly due to faster mortality declines for cardiovascular diseases. In many Western European countries, the 1980s and 1990s have been decades with substantial improvements in cardiovascular disease mortality. These have been due to improvements in health-related behaviours (less smoking, modest improvements in diet, more physical exercise ...), and to the introduction of effective health care interventions (hypertension detection and treatment, surgical interventions, thrombolytic therapy ...). Apparently, while these improvements have to some extent been taken up by all socio-economic groups, the higher socio-economic groups have tended to benefit more.

Another aspect which should be taken into account is that over time the size of the lower educational groups has decreased, due to the rise in educational achievement of subsequent generations. As a result, the mortality disadvantage of the lower educated applies to a diminishing section of the population.

Some comparative studies have tried to assess whether the magnitude of inequalities in mortality differs systematically between European countries. Most of these studies have been limited to Western Europe, and have found that the range of between-country variation in relative inequalities is rather small. For example, a comparative study of eight Western European populations in the 1990s found that the excess risk of mortality in people with lower education, as compared to those with higher education, ranged between 22 and 43 per cent in men, and 20 and 32 per cent in women.

Due to the fact that countries differ substantially in average mortality rates for the population as a whole, absolute differences in mortality between socio-economic groups usually do show clear between-country variations. For example, because of its low average death rates, Sweden has rather small absolute differences in mortality between socio-economic groups, although relative differences are not clearly smaller than elsewhere.

This is not to say that systematic differences between countries in the magnitude of relative inequalities in mortality do not exist within Europe. Although strictly comparable data have not yet been produced, there are some suggestions that relative inequalities in mortality are rather large in some Eastern European countries, perhaps as a result of the economic and social problems following the political changes around 1990 (box 2).

Health inequalities start early in life and persist into old age

Most studies of socio-economic inequalities in mortality have focused on adults, particularly on middle-aged men and women. There are important age-related differences in the magnitude of inequalities in mortality, however.

Socio-economic inequalities in mortality can already be seen at the very start of life, and this has led to the notion that health is unequally distributed 'from the cradle to the grave'. Children from lower social class families on average have lower birth-weights, and are more often born prematurely or with congenital anomalies. Death rates are higher from conception onwards, as shown by socio-economic inequalities in still-births, in neonatal mortality (deaths during the first month of life) and in infant mortality (deaths during the first year of life). This has been found in many European countries (figure 1). These inequalities in mortality then continue throughout childhood, as a result of higher death rates from many causes of death, including injuries and infections.

Inequalities in mortality persist into the highest age-groups, and because most of mortality occurs at older ages, inequality in mortality among the elderly is not less important than that in younger age-groups. Most studies show that, starting with young adults (e.g. 30–39 year olds), relative inequalities (rate ratios comparing a lower and a higher socio-economic group) decrease gradually with age. On the other hand, absolute inequalities (rate differences comparing a lower and a higher socio-economic group) increase consistently with advancing age, and reach their highest values among the oldest old (e.g. 90+) (figure 2).

Inequalities in mortality also exist among women

From studies that have included women, it has become clear that inequalities in mortality exist among women as they do among men, but inequalities are smaller among women than among men. This can also be seen in figure 2 which shows that, at least within Western Europe, inequalities in mortality are clearly smaller among women – but only until the age of 60. In the age group 30–59

Box 2. What do we know about inequalities in mortality in Eastern Europe?

Until the political changes at the end of the 1980s, there was little recognition in Eastern Europe that inequalities in health between socio-economic groups might exist there as they did in Western Europe. It was an inconvenient subject for policy makers, but researchers did occasionally study health inequalities.

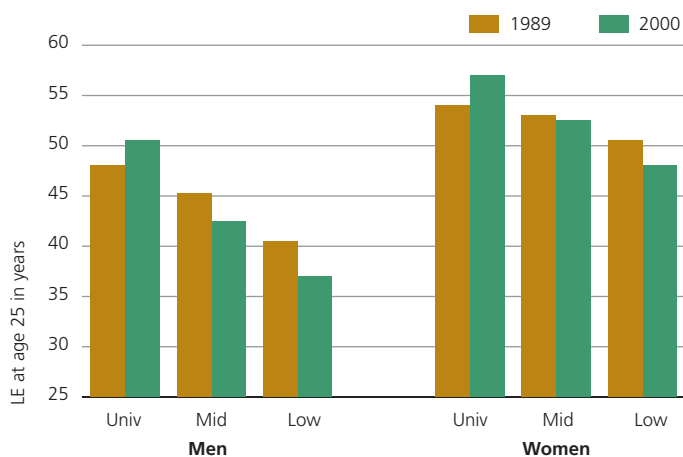
The available evidence suggests that during the late 1980s, inequalities in mortality in Eastern Europe were at least as big, and perhaps even bigger than in Western Europe. For example, a study looking at differences in mortality by level of education in Finland, Norway, Italy, Hungary, the Czech Republic and Estonia in the late 1980s showed substantial inequalities in mortality in all countries, both among men and among women. Among men, the excess mortality ranged between 50 and 78 per cent in the three Eastern European countries, as compared to between 25 and 41 per cent in the three Western European countries. Among women, however, relative inequalities in mortality were of similar magnitude in the East as compared to the West.

Since the political transition, mortality rates have changed dramatically in many countries in Eastern Europe, sometimes for the better (e.g. in the Czech Republic) but often for the worse (e.g. in Hungary and Estonia), particularly among men. This is probably due to a combination of (interlinked) factors: a rise in economic insecurity and poverty; a breakdown of protective social, public health and health care institutions; and a rise in excessive drinking and other risk factors for premature mortality.

The available evidence clearly shows that these changes in mortality have not been equally shared between socio-economic groups: in the countries with available data, mortality rates have generally improved less, or deteriorated more, in the lower socio-economic groups. Apparently, people with higher levels of education have been able to protect themselves better against increased health risks, and/or have been able to benefit more from new opportunities for health gains. An example is provided by Estonia where a tremendous rise of inequalities in mortality has occurred (figure). Evidence from some other Eastern European countries (Hungary, Russia) suggests a similar widening of the gap in death rates. The fact that this is not seen in some other countries (Czech Republic), however, suggests that a widening of the health gap in a period of important political and economic change is not inevitable.

Life expectancy is higher among those with higher education, and that the gap in life expectancy has increased over time.

Box figure: Average life expectancy (LE) at age 25 by educational level in Estonia 1989–2000.

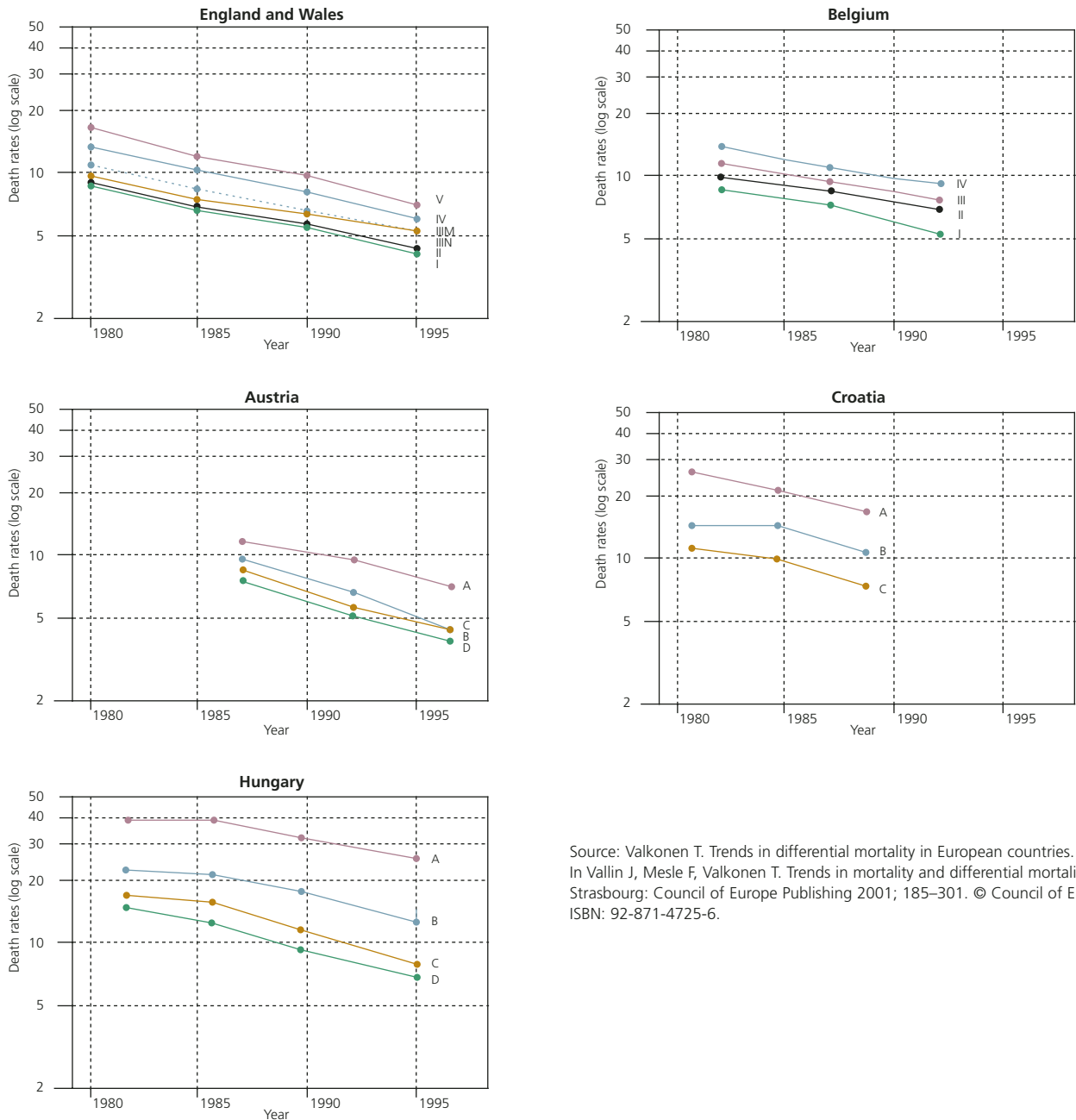


Source: Leinsalu M, Vågerö D, Kunst AE. Estonia 1989–2000: enormous increase in mortality differences by education. *Int J Epidemiol* 2003; 32: 1081–1087.

Despite substantial declines in infant mortality, risks of dying continue to be higher in the lower social classes.

Figure 1.

Inequalities in infant mortality by parental occupational class or educational level in England and Wales, Belgium, Austria, Croatia and Hungary, 1980–1995.

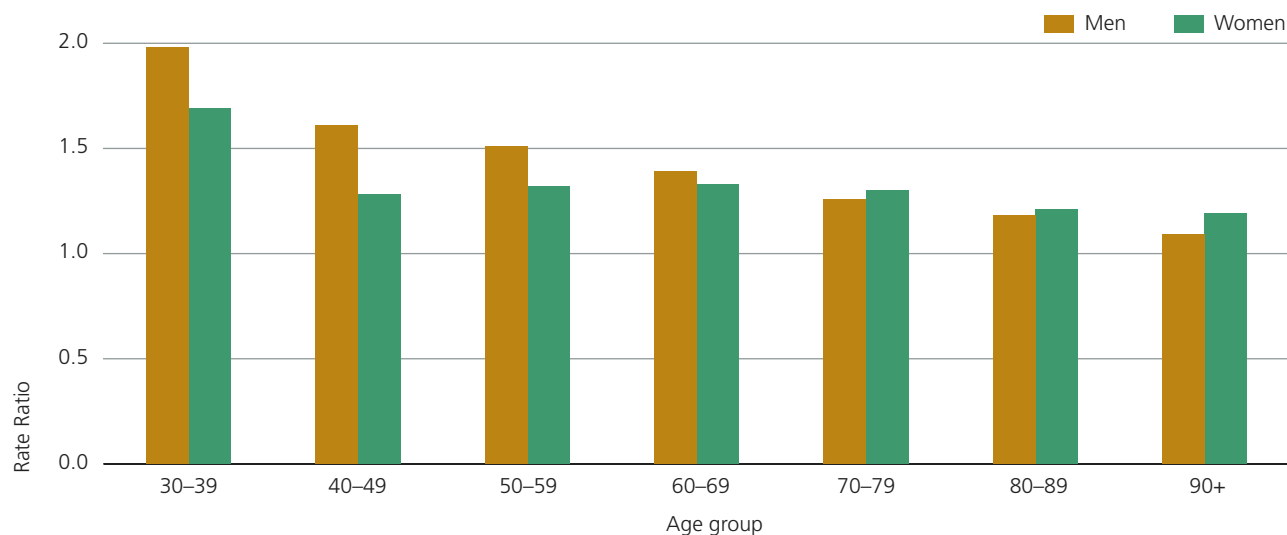


Source: Valkonen T. Trends in differential mortality in European countries. In Vallin J, Mesle F, Valkonen T. Trends in mortality and differential mortality. Strasbourg: Council of Europe Publishing 2001; 185–301. © Council of Europe ISBN: 92-871-4725-6.

Note: The following socio-economic groups were used.
 England and Wales: I = Professional occupations through to V = Unskilled occupations.
 Belgium: I = Professional occupations through to IV = Partly and unskilled manual occupations
 Austria: A = Primary education only through to D = Higher education
 Croatia: A = No/primary education through to C = Higher education
 Hungary: A = ≤7 years education through to D = ≥13 years education

Relative inequalities in mortality tend to become smaller at higher ages.**Figure 2.**

Inequalities in mortality by educational level among men and women, by age. Pooled dataset of 11 European populations (Finland, Norway, Denmark, England/Wales, Belgium, France, German speaking part of Switzerland, Austria, Turin, Barcelona, Madrid).



years, the rate ratio of dying is smaller among women than among men, but beyond that age the rate ratios become more similar. While the rate ratios among men decline rapidly at higher ages, they do not or much less so among women.

The difference between men and women in the size of inequalities in mortality is partly due to differences in cause-of-death pattern: women die more often of cancer than men, and inequalities in cancer mortality tend to be smaller than inequalities in mortality from other causes of death (see section 2.2). In addition, some risk factors for mortality tend to be more strongly associated with socio-economic position among men than among women, contributing to larger inequalities in cause-specific mortality among men (see section 4.2).

Whatever the explanation, however, these data suggest that socio-economic inequalities in mortality among men are a more pressing public health problem than those among women, but the latter should of course not be neglected either.

Life expectancy is shorter in lower socio-economic groups

As a result of these differences in the risk of dying as observed at various ages, people from lower socio-economic groups tend to live considerably shorter lives than those with more advantaged social positions. 'Life expectancy' is a summary measure of the age-specific mortality risks as observed in a particular period of time, and can be interpreted as the number of years that an average person could expect to live if he or she would experience these age-specific risks of dying throughout his or her life.

Differences in life expectancy at birth between the lowest and highest socio-economic groups (e.g. manual versus professional occupations, or primary school versus post-secondary education) are typically in the order of 4 to 6 years among men, and 2 to 4 years among women, but sometimes larger differences have been observed. In England and Wales, for example, inequalities in life expectancy at birth among men have increased from 5.4 years in the 1970s to more than 8 years in the 1990s (figure 3).

A similarly strong increase has been observed in Finland. An analysis of the contribution of various causes of death to the widening of the life expectancy gap in this country has shown that cardiovascular diseases and alcohol-related conditions (liver cirrhosis, suicides, accidents, violence ...) together account for most of the increase.

2.2. Cause-specific mortality

Variations in patterns of cause of death between socio-economic groups provide valuable clues for the explanation of disparities in mortality, because they point to the mechanisms that link lower socio-economic position to higher risk of premature mortality. We will therefore briefly review what is known about socio-economic inequalities in mortality from specific causes of death in Europe, starting with cardiovascular diseases which account for between 40 and 60 per cent of all deaths around Europe.

Cardiovascular disease mortality is higher in lower socio-economic groups

In all countries with available data, mortality from cardiovascular disease is higher among men and women with a lower socio-economic position.

This does not, however, apply to all specific diseases of the cardiovascular system. Of these, ischemic heart disease (myocardial infarction) and cerebrovascular disease (stroke) are the most important. Whereas mortality from stroke is always higher in the lower socio-economic groups, this is not the case for ischemic heart disease.

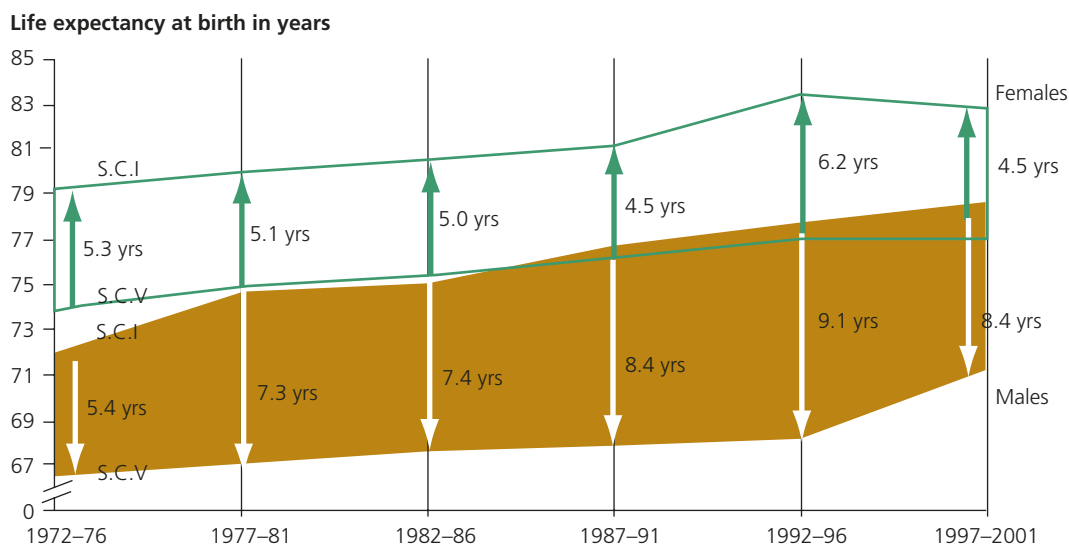
For ischemic heart disease, a North-South gradient has been found, with relative and absolute inequalities being larger in the North of Europe (e.g. the Nordic countries and the United Kingdom) than in the South (e.g. Portugal, Spain and Italy) (figure 4).

This international pattern for ischemic heart disease has been interpreted as an expression of differences between countries in how the epidemiology of this disease has developed. In many countries, particularly in the North of Europe, mortality from ischemic heart disease increased substantially after the Second World War, probably as a result of changes in health-related behaviours, such as smoking, diet and physical exercise. During the 1970s, however, a decline set in, and is still continuing. During this epidemiological development, important changes occurred in the association between socio-economic position and ischemic heart disease mortality. In the

The gap in life expectancy between the social classes widened until the early 1990s, and then started to decrease a little, both among men and women.

Figure 3.

Inequalities in life expectancy at birth by occupational class in England and Wales, 1972–2001.



North of Europe, during the 1950s and 1960s ischemic heart disease mortality was higher in the higher socio-economic groups, leading to the notion of ischemic heart disease being a ‘manager’s disease’. It was only during the 1970s, coinciding with the start of the decline of ischemic heart disease mortality in the population as a whole, that a reversal occurred, and the current association emerged. This is due to differences between socio-

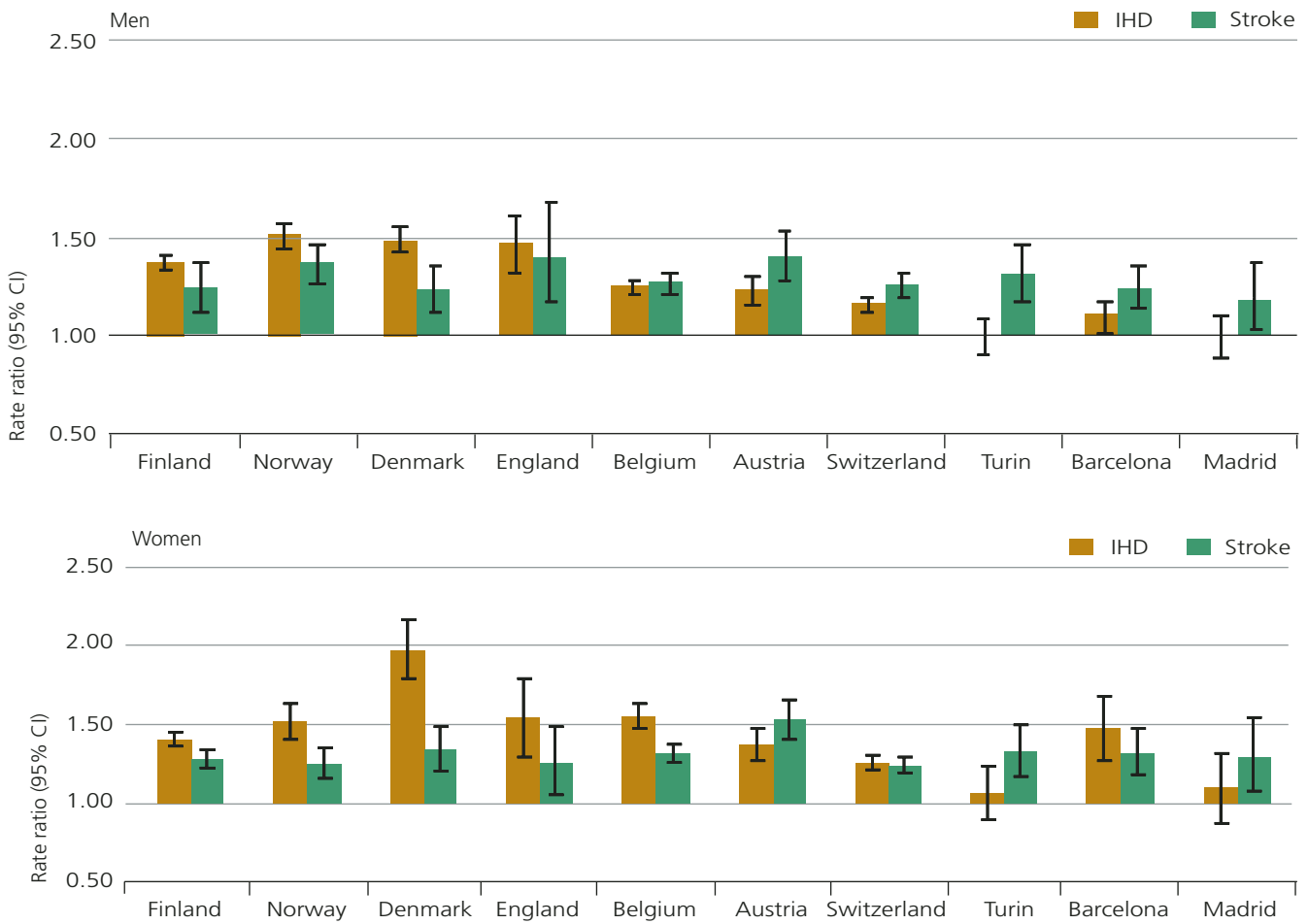
economic groups in both the timing and the speed of decline of ischemic heart disease mortality. As we have seen above, the widening of the gap in ischemic heart disease mortality was still continuing in the 1990s.

In the South of Europe, a similar ‘epidemic’ of ischemic heart disease mortality has not occurred, and inequalities in ischemic heart disease mortality

Mortality from stroke is always higher among those with lower than among those with higher education, but this is not true for ischemic heart disease, for which no clear differences between educational groups are found in some Southern European populations.

Figure 4.

Inequalities in mortality from ischemic heart disease and stroke mortality by level of education in 10 European populations, 1990s.



Source: Avendano M, Kunst AE, Huisman M et al. Socio-economic status and ischaemic heart disease mortality in 10 western European populations during the 1990s. Heart 2005 (accepted).

NOTE: 95% CI = Confidence Interval

have not undergone such clear-cut changes as in the North of Europe. It is possible that the lack of clear inequalities in ischemic heart disease mortality in some Southern European populations represents an earlier stage of epidemiological development, and will turn out to be a temporary phenomenon. The protection of Southern European populations against ischemic heart disease which their traditional living habits offered, is gradually eroding. As we will see later on, there is evidence for changes in the social patterning of health-related behaviours such as smoking in the South of Europe, which may in the future contribute to higher death rates from ischemic heart disease in the lower socio-economic groups in the South of Europe. The prevention of such a development should be a top priority for European public health.

In contrast to inequalities in ischemic heart disease mortality, inequalities in stroke mortality are largely similar in the North and in the South of Europe: mortality is higher in the lower socio-economic groups in all countries with available data (figure 4). This suggests that the social patterning of the main risk factor for stroke, hypertension, is also similar across Europe. The higher prevalence of hypertension in lower socio-economic groups may be due to differences in living habits (salt consumption, excessive alcohol consumption ...), and points to opportunities for reducing health inequalities by optimizing prevention, detection and treatment of hypertension.

Data on inequalities in mortality by cause of death are much more abundant for Western than for Eastern Europe. The few data for Eastern Europe that do exist, however, show that cardiovascular disease mortality is higher in the lower socio-economic groups there as well. This has been shown for a range of countries including the Czech Republic, Hungary and Estonia. Cardiovascular disease is also one of the main contributors to widening inequalities in total mortality in many Eastern European countries.

Cancer mortality is not always higher in lower socio-economic groups

Inequalities in cancer mortality tend to be smaller than those for cardiovascular disease mortality, both in Western and in Eastern Europe. Among women, inequalities in mortality from all cancers combined are even negligible in magnitude in many countries, with rate ratios just slightly above (or even clearly below) 1.00, indicating that women in lower socio-economic groups often do not have a higher risk of dying from cancer than women in higher socio-economic groups. Among men, however, the usual pattern of higher mortality in lower socio-economic groups applies to cancer as it does to most other diseases (figure 5).

These patterns for all cancers combined are the net result of strongly diverging patterns for specific forms of cancer. For some cancers, 'reverse' patterns (with higher death rates in the upper socio-economic groups) are seen in some countries. Examples include prostate cancer among men, and breast and lung cancer in women. For colorectal cancer, another important cause of death, inequalities in mortality tend to be small everywhere. The 'reverse' or absent gradients **and** large contributions to cancer mortality of breast, lung and colorectal cancer in women explain the lack of excess cancer mortality in lower socio-economic groups. In men, the excess cancer mortality in lower socio-economic groups is due to higher mortality from lung cancer, as well as from a number of other cancers including stomach cancer and oesophagus cancer.

Unfortunately, the favourable situation in women, with small or absent socio-economic inequalities in total cancer mortality, is likely to be a temporary phenomenon. In some countries in Western Europe, it has been found that in younger birth cohorts rates of breast cancer mortality now tend to be higher in lower socio-economic groups than in higher socio-economic groups. For lung cancer, there are similar indications for a future change in gradient among women. Prevention of the emergence of excess cancer mortality in lower socio-economic groups among women is another priority for European public health.

Cancer mortality is usually higher in lower educational groups among men, but not among women.

Figure 5.

Inequalities in mortality from all cancers combined and from selected specific cancers in nine European populations, 1990s.



Injury mortality is higher in lower socio-economic groups, but not among women

Injuries are also a major cause of death in all European countries. However, as with other causes of death, the injury burden is not shared equally among all groups in society. Traffic injuries provide a good illustration. Among men, those with a lower level of education have higher rates of traffic injury mortality than those with a higher level of education in all countries with available data, with the largest (relative) inequalities usually seen in the younger age-groups. Among women, however, no clear

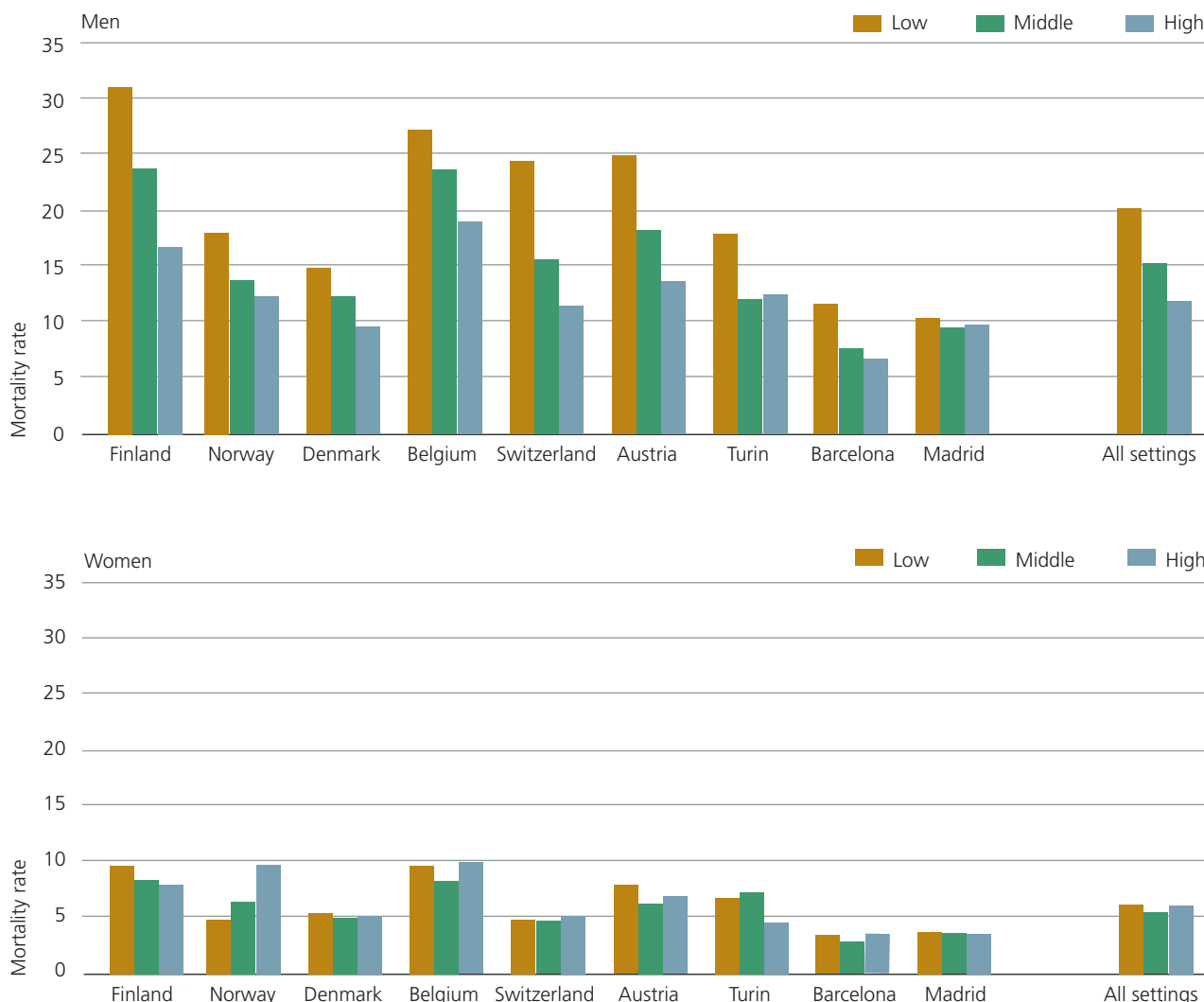
differences have been found, and in some countries even a 'reverse' pattern applies (figure 6).

Injuries are a heterogeneous group of causes of death, comprising various forms of accidental injury (traffic accidents, occupational accidents, home and leisure accidents ...) as well as intentional injury (suicide, homicide ...). It is beyond the scope of this report to review all these categories, but suicide has been singled out as a further illustration because of its link with mental health (box 3).

Traffic injury mortality tends to be higher in the lower educational groups among men, but not among women.

Figure 6.

Rates of mortality from transportation injury in nine European populations, by level of education, 1990s.



Source: Borrell C, Plasència A, Huisman M, et al. Education level inequalities and transportation injury mortality in the middle aged and elderly in European settings. *Inj Prev* 2005; 11: 138-142.

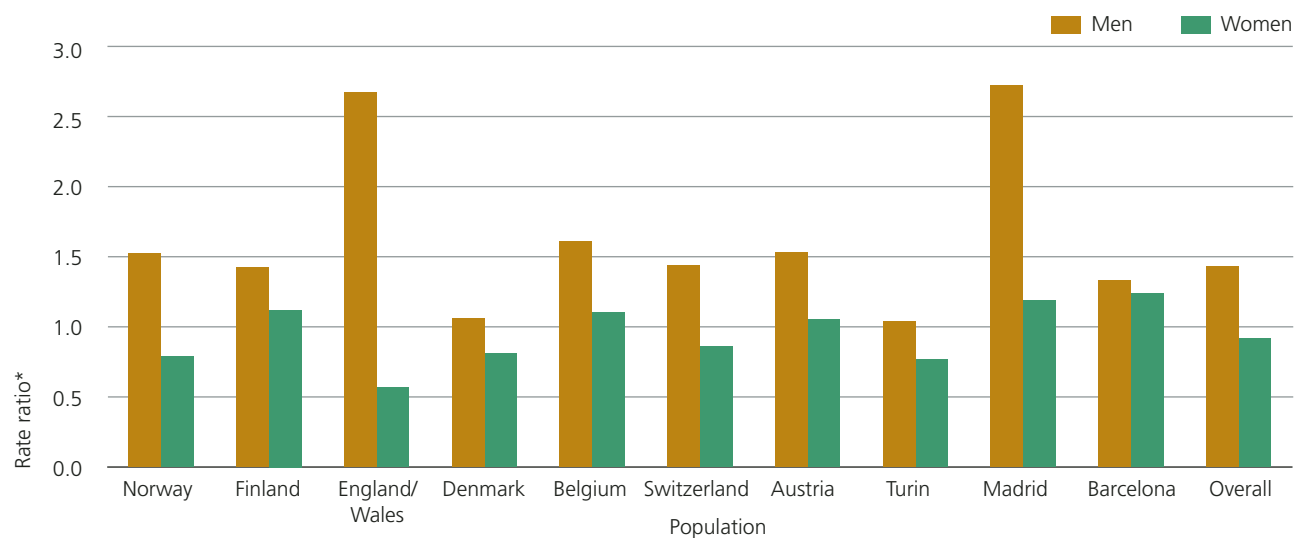
Box 3. Inequalities in suicide mortality

Social factors have been known to be important in suicide since at least the 19th century, when the great French sociologist Emile Durkheim developed his theory that suicide is the individual translation of social facts, particularly a lack of social integration. Many risk factors for suicide, such as living alone and being unemployed, can indeed be interpreted on the basis of this theoretical framework, and this may also to some extent be true for low socio-economic status.

Many studies have shown a higher risk of suicide in lower socio-economic groups, but the results have not been very consistent. A recent comparative study found clear indications for variations between European countries in how socio-economic status relates to suicide mortality (see figure).

Suicide rates are higher in lower socio-economic groups in most populations, but only among men.

Box figure. Inequalities in suicide by educational level in the 1990s in 10 European populations.



*Rate ratio = standard suicide rate for those with lower secondary education (ISCED 1 and 2)/standard suicide rate for those with upper secondary education or above (ISCED3+)

Source: Lorant V, Kunst AE, Huisman M, et al. Socio-economic inequalities in suicide: a European comparative study. *Br J Psychiatry* 2005; 187: 49–54.

Among men, suicide is more frequent in lower educational groups in many (but not all) populations. Even stronger associations are found with house ownership status: tenants tend to have considerably higher suicide rates than house owners. Among women, however, inequalities in suicide mortality are much less pronounced, and in some cases even 'reversed', particularly when educational level is used as an indicator of socio-economic position.

Many of the findings in this European-comparative study correspond with what has been found in other studies. For example, the stronger association with economic variables (such as housing tenure) than with education has been reported before. It has been suggested that this can be interpreted as an indication for the protective effect of accumulation of material resources – or as an indication for reverse causation: people at risk of suicide, e.g. because of mental health problems, may be more likely to become tenants instead of house owners.

Which diseases account for the excess mortality in lower socio-economic groups?

Not all diseases are equally important for the excess total mortality in lower socio-economic groups. Obviously, a rare cause of death will contribute much less than a common cause of death, even if relative inequalities in mortality rates are similar between the two. In Western Europe, and probably in Eastern Europe too, cardiovascular diseases contribute most to inequalities in mortality. In men, cardiovascular diseases account for almost 40 per cent of the difference in mortality rate between higher and lower educational groups, and the contribution of cardiovascular disease to excess mortality in the lower educational groups is even 60 per cent in women. The contributions of cancer are 24 per cent among men, and 11 per cent among women; of 'other diseases' 32 per cent among men, and 30 per cent among women; and of injury 5 per cent among men, and 0 per cent among women. This clearly shows that effective prevention and treatment of cardiovascular disease in lower socio-economic groups, and speeding up cardiovascular disease mortality decline in lower

socio-economic groups, should be a priority for public health policies to tackle inequalities in mortality.

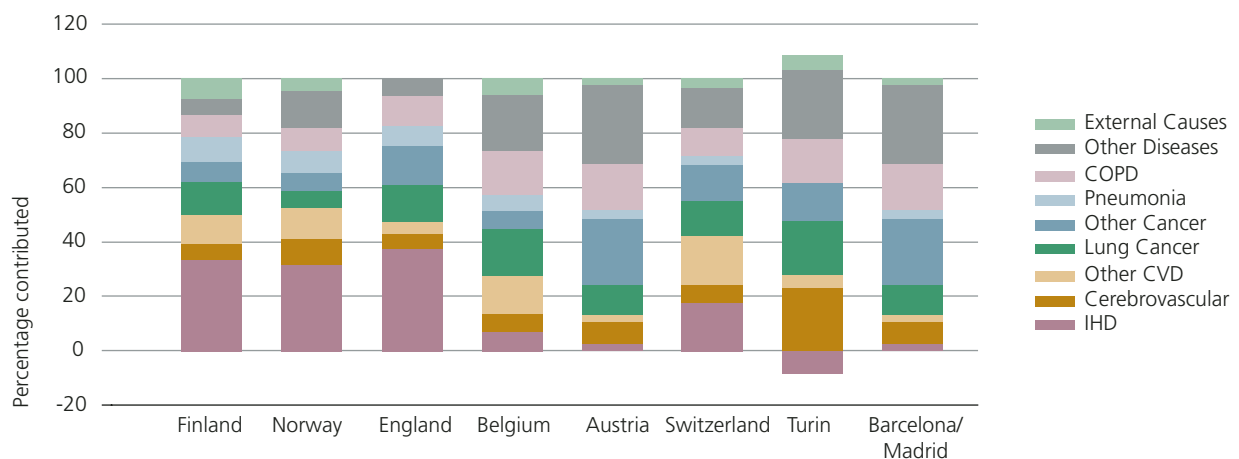
There are important differences between countries, however, in the share of specific causes of death in the excess mortality in lower socio-economic groups. The most important difference is for ischemic heart disease: due to the North-South gradient in ischemic heart disease inequalities mentioned above, ischemic heart disease is a major contributor to inequalities in mortality in the North, and much less important (sometimes even 'protecting' lower socio-economic groups against larger inequalities in mortality) in the South (figure 7).

Ischemic heart disease contributes very little to inequalities in mortality in some Southern European populations, but it is a major contributor in Northern Europe.

Figure 7.

Contribution (%) of specific causes of death to difference between low and high educational groups in total mortality in eight European populations, men and women aged 45 years and over, 1990s.

Contribution of specific causes of death to educational differences in total mortality among men aged 45+ of 8 Western European populations



Source: Huisman M, Kunst AE, Bopp M, et al. Educational inequalities in cause-specific mortality in middle-aged and older men and women in eight western European populations. *Lancet* 2005; 365: 493-500.

3. Morbidity

- As was the case with mortality, rates of morbidity are usually higher among those with a lower educational level, occupational class or income level.
- Substantial inequalities are also found in the prevalence of most specific diseases (including mental illness) and most specific forms of disability.
- Over the past decades, inequalities in morbidity by socio-economic position have been rather stable.
- Together with inequalities in mortality, inequalities in morbidity contribute to large inequalities in ‘healthy life expectancy’ (number of years lived in good health).

3.1 General indicators: self-reported morbidity

Many countries have nationally representative surveys with questions on both socio-economic status and self-reported morbidity (e.g. self-assessed health, chronic conditions, disability). Inequalities in the latter are substantial everywhere, and practically always in the same direction: persons with a lower socio-economic status have higher morbidity rates.

Inequalities in self-assessed health are omnipresent

For one indicator, self-assessed health (measured with a single question on an individual’s perception of his or her own health), the availability of these data is almost as great as that for inequalities in mortality (table 2). The overall pattern is clear again: prevalence rates of less-than-‘good’ self-assessed health are higher in lower socio-economic groups, as shown by the fact that almost all Odds Ratios in the table are higher than 1.

Studies of trends in inequalities in self-reported morbidity suggest a high degree of stability of these inequalities in many European countries.

This finding adds to the impression that socio-economic inequalities in health are highly persistent – and unlikely to disappear automatically, or on the basis of existing policies (box 4).

No clear patterns have emerged in the magnitude of socio-economic inequalities in self-assessed health between European countries. There is some evidence that inequalities in self-assessed health by income level are smaller in countries with smaller income inequalities, such as the Nordic countries.

Inequalities in self-assessed health in Eastern Europe tend to be large, although it is still difficult to say whether they are larger than in Western Europe. In view of the large political, economic and social changes which have occurred after 1990, it would be interesting to know whether inequalities in self-reported morbidity in Eastern Europe have changed over time during the last decades. Unfortunately, such studies are rare due to difficulties of data collection, and have not produced clearly interpretable findings. Some studies have suggested that psychosocial risk factors are important in generating health inequalities in Eastern Europe. A feeling of ‘lack of control’ over one’s life is highly

A less-than-'good' health status is almost always more prevalent in lower than in higher socio-economic groups.

Table 2.

Inequalities in self-assessed health by socio-economic position in 19 countries^a.

Country	Indicator of socio-economic position	Period	Age-group	Rate Ratio ^b		Source
				Men	Women	
Austria	Education ¹³	1991	25–69	3.22*	2.67*	Mikrozensus Fragen zur Gesundheit
Belgium	Education	1997	25–74	2.55*	2.36	Belgium Health Interview Survey
Bulgaria	Education ¹⁶ Income ¹⁶	1997	18+	2.19* 1.86	2.84* 1.50	National representative survey of the population of Bulgaria
Denmark	Education ¹³	1994	25–69	2.16*	3.00*	Danish Health and Morbidity Survey
	Occupation ¹²	1986–1987	25–69	2.19*	n.a.	Danish Health and Morbidity Survey
Estonia	Education ¹⁵ Income ¹⁵	1996	25–79	3.11* 2.37*	3.59* 1.66*	Estonian Health Interview Survey
Finland	Education ¹³ Income ¹³	1994	25–69	2.99* 3.09*	3.29* 2.43*	Finnish Survey on Living Conditions
France	Occupation ¹²	1991–1992	25–69	2.24*	n.a.	Enquête sur la Santé et les Soins Médicaux
Germany (West)	Education ¹³	1990–1991	25–69	1.76*	1.91*	National Health Survey
	Income ¹³			2.05*	2.40*	
	Occupation ¹²			1.63*	n.a.	
Great Britain	Income ¹³	1996	25–69	3.88*	3.92*	British General Household Survey
	Occupation ¹²	1991	25–69	2.32*	n.a.	General Household Survey
England	Education ¹³	1995	25–69	3.08*	2.66*	Health Survey for England
Italy	Education ¹³	1994	25–69	2.94*	2.55*	Health Interview Survey
Latvia	Education ¹⁴	1999	25–70	2.21*	2.48*	Norbalt-II Living Conditions Survey
	Income ¹⁴			5.10*	3.26*	
Malta	Education	2002	25–69	2.50*	4.55*	Health Interview Survey
	Income	2002		2.36*	4.42*	
Netherlands	Education ¹³	1997–1999	25–69	2.81*	2.12*	Permanent Survey on Living Conditions
	Income ¹³ Occupation ¹²	1991–1992	25–69	4.50* 2.40*	3.01* n.a.	
Norway	Education ¹³	1995	25–69	2.30*	2.84*	Health Survey
Poland	Education ²⁵	1993	35–64	1.27	1.72	Household Survey Pol-MONICA survey (Warsaw)
Poland	Education ²⁵	1993	35–64	2.08	0.93	Household Survey Pol-MONICA survey (Tarnobrzeg)
Spain	Education ¹³	1997	25–69	2.58*	3.10*	Spanish Health Survey
Sweden	Education ¹³	1997	25–69	2.37*	3.06*	Swedish Survey on Living Conditions
	Income ¹³ Occupation ¹²	1991	25–69	4.11* 2.79*	2.80* n.a.	
Switzerland	Occupation ¹²	1992–1993	25–69	2.12*	n.a.	Swiss Health Survey

a Because of differences in data collection and classification, the magnitude of inequalities in health cannot always directly be compared between countries.

b Odds ratio: ratio of odds (a measure of risk) of less-than-'good' self-assessed health in lower socio-economic groups as compared to that in higher socio-economic groups. Asterisk (*) indicates that difference in self-assessed health between socio-economic groups is statistically significant. Notes refer to references given in the back of this report. n.a. indicates 'not available'.

prevalent in Eastern Europe, and is associated with both self-reported morbidity and low socio-economic status. In multivariate analyses, perceived control indeed explains a large part of the social gradient in self-assessed health in Eastern Europe.

Inequalities in self-assessed health can be found at all ages

These inequalities in self-reported morbidity persist into old-age. From the viewpoint of ‘adding life to years’, inequalities in self-reported morbidity among elderly people are at least as important as the inequalities in mortality among elderly mentioned above. After the age of 60, relative and absolute

Box 4. Inequalities in self-assessed health

Until recently, trends in inequalities in health have mainly been documented on the basis of data on differences in premature mortality. As shown in box 1, a widening of relative inequalities in mortality was observed consistently for all European countries for which data were available. These observations prompt the question of what trends can be observed in data on inequalities in morbidity instead of mortality. The existence of national health interview (and similar) surveys in many countries since the 1980s offers an opportunity to answer this question (see table).

Inequalities in self-assessed health have remained stable or have slightly increased.

Box table: Magnitude of income-related differences in ‘fair/poor’ self-assessed health among men and women aged 25–69 years in the 1980s and 1990s in five European countries.

Country	Odds Ratio (95 % confidence interval)			
	Men		Women	
	1980s	1990s	1980s	1990s
Finland	2.92 (2.29–3.71)	3.09 (2.42–3.94)	2.65 (2.09–3.35)	2.43 (1.86–3.18)
Sweden	3.93 (3.45–7.15)	4.11 (2.82–6.04)	2.16 (1.48–3.16)	2.80 (1.92–4.09)
Great Britain	3.65 (2.83–4.70)	3.88 (3.09–4.88)	3.12 (2.49–3.92)	3.92 (3.21–4.79)
Netherlands	3.68 (3.00–4.50)	4.50 (3.66–5.52)	2.21 (1.84–2.67)	3.01 (2.49–3.63)
W. Germany	1.79 (1.33–2.39)	2.05 (1.55–2.72)	2.11 (1.53–2.91)	2.40 (1.81–3.18)

Source: Kunst AE, Bos V, Lahelma E, et al. Trends in socio-economic inequalities in self-assessed health in 10 European countries. *Int J Epidemiol* 2005; 34: 295–305.

The main finding is that socio-economic inequalities in self-assessed health show a high degree of stability in all countries for which the situation in the 1990s could be compared with the situation in the 1980s. In comparison with the findings for mortality, there is less evidence for a widening of the health gap. The only two countries for which a clear increase in educational differences in self-assessed health was observed are Italy and Spain. There is a tendency for income-related inequalities to increase in England/Wales and the Netherlands. For most other countries, differences between the two time-periods are small and/or statistically insignificant.

Overall the persistence of large health inequalities in all countries with available data underscores the fact that these inequalities must be deeply rooted in the social stratification systems of modern societies, and warns that it would not be realistic to expect a substantial reduction in health inequalities within a short period of time.

inequalities in e.g. self-assessed health, limitations in daily activities, and long-term disabilities by income level and level of education tend to decrease by age, but remain substantial until at least the seventh decade of life for all health indicators. This is shown in figure 8 for income-related health inequalities, but similar patterns apply to other aspects of socio-economic position, such as level of education.

Beyond early adulthood, socio-economic differences in self-reported morbidity have been found in all countries where this has been examined. For children and adolescents, however, the picture is more mixed. Some studies have suggested that in adolescence, the period between childhood and adulthood, there is a genuine narrowing of health inequalities, perhaps as a result of the transition between socio-economic position of family of origin and own socio-economic position. Among children the picture is more consistent: many studies find that parents in lower socio-economic groups report more ill-health for their children than parents in higher socio-economic groups. This is illustrated in table 3 for children aged 2–17 years in the Nordic countries, but probably applies around Europe.

Respondents to health interview surveys are unlikely to be perfect reporters of their health problems, and there may also be differences between socio-economic groups in the accuracy of reporting health problems. Where more objective data have been available for comparison, however, similar pictures of higher incidence and prevalence of health problems have been obtained. This is illustrated in table 4 for attained height. Although height is partly genetically determined, it is also strongly influenced by childhood living conditions, such as nutrition, occurrence of disease, psychosocial stress, and housing conditions. It is often used as a summary indicator of health during childhood and adolescence, and shows consistent differences between socio-economic groups. In all countries there are clear differences in average adult height between socio-economic groups: the higher educated are 1 to 3 cm taller.

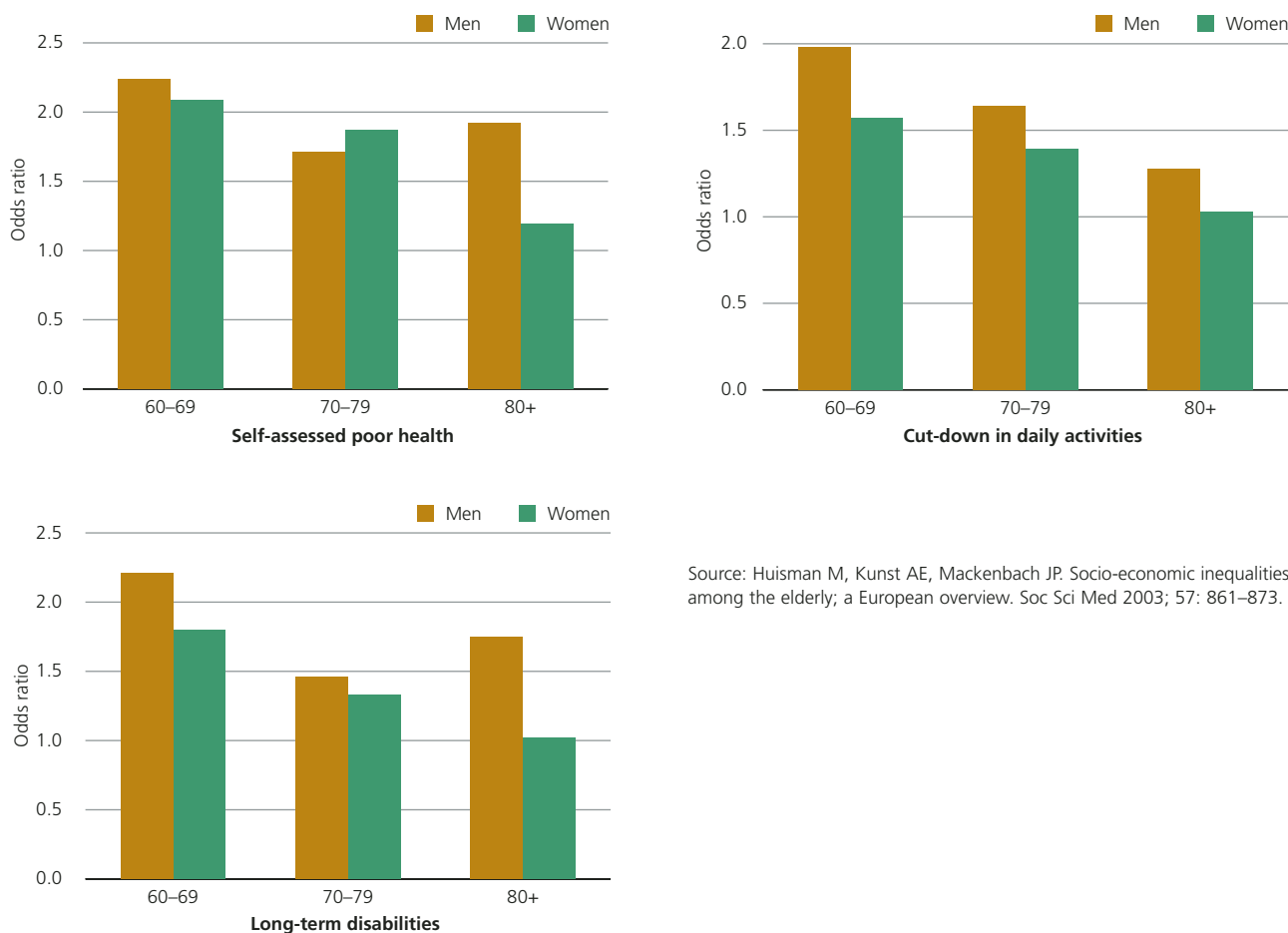
‘Healthy life expectancy’ is shorter in lower socio-economic groups

We have seen above that the higher mortality rates in lower socio-economic groups lead to substantial inequalities in life expectancy: people in lower socio-economic groups tend to live between 2 and 8 years less than people in higher socio-economic groups. The fact that morbidity rates (among those who are still alive) are higher too, contributes to even larger inequalities in ‘healthy life expectancy’ (the number of years which people can expect to live in good health). This is illustrated in table 5 for Norway. Inequalities in total life expectancy (between the ages of 25 and 75) amount to 2.8 years in men and 1.1 years in women. These are aggravated by inequalities in number of years lived with ill-health, which amount to 7.7 years in men and 3.5 years in women. As a result, inequalities in the number of years lived in good health are seen of more than 10 years in men and almost 5 years in women.

Inequalities in self-reported morbidity tend to be smaller at higher ages.

Figure 8.

Income inequalities in three health indicators, men and women aged 60 and over. Pooled dataset of 11 European countries (Belgium, Denmark, France, Germany, Great Britain, Greece, Ireland, Italy, Netherlands, Portugal, and Spain), 1994.



Source: Huisman M, Kunst AE, Mackenbach JP. Socio-economic inequalities among the elderly; a European overview. Soc Sci Med 2003; 57: 861-873.

Parents with lower socio-economic positions tend to report more chronic diseases in their children.

Table 3.

Inequalities in parent-reported chronic diseases of children 2-17 years by level of education, occupational class and income level in five Nordic countries, 1996.

	Sweden	Iceland	Odds Ratio Norway	Finland	Denmark
Mother					
Only primary school	1.38*	1.14	1.28	1.27	1.38
Manual worker	1.24	1.39*	0.75	1.59*	1.40*
Father					
Only primary school	1.03	1.31	1.16	1.08	1.03
Manual worker	1.00	1.46*	1.16	1.42*	1.53*
Parent(s)					
Lowest income quartile	0.94	1.38*	1.41*	1.95*	1.64*

People with higher educational level tend to be 1 to 3 cm taller.

Table 4.

Differences in average height (cm) between higher and lower educational groups in 10 European countries, around 1990.

	Men Differences (95% CI)	Women Differences (95% CI)
Norway	1.8 (0.7–3.0)	1.2 (0.1–2.2)
Sweden	2.5 (1.8–3.1)	1.5 (0.9–2.0)
Finland	1.6 (1.0–2.2)	1.5 (0.9–2.0)
Denmark	2.8 (2.0–3.7)	1.8 (1.0–2.6)
Netherlands	2.5 (2.1–3.0)	1.6 (1.2–1.9)
Germany	2.2 (1.7–2.6)	2.2 (1.8–2.6)
Switzerland	2.9 (2.4–3.4)	2.2 (1.8–2.6)
France	2.6 (2.2–3.0)	1.6 (1.2–2.0)
Italy	2.5 (2.2–2.7)	1.3 (1.1–1.5)
Spain	3.0 (2.7–3.3)	1.3 (1.0–1.7)

Source: Cavelaars AEJM, Kunst AE, Geurts JJM, et al. Persistent variations in average height between countries and between socio-economic groups: an overview of 10 European countries. *Ann Hum Biol* 2000; 27(4): 407–421.

People with lower education not only live shorter lives, but also spend a larger proportion of their life in poor health.

Table 5.

Life expectancy, life expectancy with ill health, healthy life expectancy (years) and healthy life percentage (%) between ages 25 and 75, calculated by using limiting long-standing illness as the indicator of morbidity, by level of education in Norway, ca. 1987.

Level of education	Life expectancy*	Life expectancy with ill health	Healthy life expectancy*	Healthy life %
<i>(a) men</i>				
higher	46.5	6.4	40.1	86.2
secondary	45.1	11.6	33.5	74.3
basic	43.7	14.1	29.6	67.8
<i>(b) women</i>				
higher	48.0	13.0	35.0	72.9
secondary	47.6	14.6	33.0	69.4
basic	46.9	16.5	30.4	64.8

* Maximum length of life expectancy and healthy life expectancy between exact ages 25 and 75 is 50 years

Source: Sihvonen A, Kunst AE, Lahelma E, et al. Socio-economic inequalities in health expectancy in Finland and Norway in the late 1980s. *Soc Sci Med* 1998; 47(3): 303–315.

3.2 Specific indicators: diseases and disabilities

Socio-economic inequalities have not only been found for general health indicators, which are usually measured on the basis of self-reports, but can also be found for many specific indicators, including objective measurements of the incidence or prevalence of diseases and disabilities. In the large majority of these studies, higher incidences or prevalences of health problems have been found in the lower socio-economic groups.

Most chronic conditions are more prevalent in lower socio-economic groups

Many health interview and similar surveys include questions on the prevalence of chronic conditions, for example using a checklist with between 10 and 30 named conditions for each of which the respondent can indicate whether or not he or she has been diagnosed with the condition, currently suffers from it, or has been treated for it in the past. While such self-reports may be inaccurate, e.g. because of differences between respondents in knowledge,

ability to recall, degree of interference with everyday life, and likelihood of contact with doctors, they do provide a reasonable first approximation.

A recent overview of results from eight European countries found large socio-economic disparities in the prevalence of stroke, diseases of the nervous system, diabetes mellitus, and arthritis. No socio-economic inequalities were found in the prevalence of self-reported cancer, kidney stones and other kidney diseases, and skin diseases. Allergy is one of the very few conditions that appeared to be more prevalent in the higher socio-economic groups (table 6).

In many European countries, epidemiological studies have found an increased incidence of (objectively

assessed) ischemic heart disease in lower socio-economic groups, and this is clearly reflected in these self-reported prevalence data. The prevalence of self-reported heart disease is, however, less strongly associated with level of education in the South of Europe (represented in this analysis by Italy and Spain) than in other parts of Europe. This finding mirrors the North-South gradient that was found for ischemic heart disease mortality (section 2.2).

Cancer: diverging patterns

No socio-economic inequalities in the prevalence of cancer are found (table 6), while many epidemiological studies have found an increased incidence of many cancers in lower socio-economic groups. Among men, lung, larynx, oropharyngeal,

Table 6.

Most chronic diseases have a higher prevalence in the lower educational groups.

Inequalities in the prevalence of self-reported chronic conditions by level of education among persons aged 25–79 years, 1990s, eight European countries.

Odds Ratio Chronic disease groups	Finland	Denmark	Great Britain	The Netherlands	Belgium	France	Italy	Spain
Stroke			2.23*	1.65*	1.38	1.30*	1.47*	1.31 ^a
Diseases of the nervous system	1.06	1.14	1.29*	1.39	1.99*	0.97	1.85*	
Diabetes mellitus		1.16	1.26	1.60*	1.98*	1.45*	1.59*	1.99*
Arthritis			1.73*	1.48*	1.44*			
Hypertension		1.03	1.33*	1.17*	1.22*	1.42*	1.26*	1.15
Stomach/duodenum ulcer		2.16*	1.46*	2.24*		1.73*	1.35*	1.45
Genitourinary diseases	0.84		0.91	1.27*	1.43*	0.86*	0.63*	1.23 ^a
Headache/migraine		1.72*	1.05	1.25*	1.34*	1.19*	1.37*	
Osteo-arthritis				1.61*	1.54*	1.43*		
Liver/gallbladder diseases				1.80*	1.55*	1.20	1.19*	
Chronic respiratory diseases	1.07	1.44*	1.34*	1.23*	1.70*	1.19	1.69*	1.82*
Heart disease			1.29*	1.20	1.63*	1.07	1.09	0.89
Back and spinal cord disorders		1.16	0.90	1.17*	1.53*	1.09		
Cancer	0.86		1.20	1.23	1.08	0.90	0.98	
Kidney stones and other kidney diseases			1.11	0.95	1.22	0.98	1.19*	
Skin diseases	0.96	0.85	0.89	1.12	1.09	0.95		1.14 ^a
Allergy		0.53*			0.79*		1.03	0.77

^a Because data from Spain were lacking, data from Cataluña were used.

Asterisk (*) indicates that difference between socio-economic groups is statistically significant.

Source: Dalstra JAA, Kunst AE, Borrell C, et al. Socio-economic differences in the prevalence of common chronic diseases: an overview of eight European countries. *Int J Epidemiol* 2005; 34: 316–326.

oesophageal, and stomach cancers are among those with consistently higher incidences in lower socio-economic groups. Among women, this applies to oesophageal, stomach and cervical cancer. Interestingly, some cancers have a higher incidence in higher socio-economic groups: colon and brain cancer and skin melanoma in men, and colon, breast and ovary cancer and skin melanoma in women. We already saw similar patterns on the basis of cancer mortality (section 2.2).

The fact that cancer prevalence is not higher in lower socio-economic groups can perhaps be explained by differences in cancer survival. Put simply, incident ('new') cases of cancer can either die or stay alive, and only those who stay alive contribute to the number of prevalent ('current') cases. There is extensive evidence for socio-economic inequalities in cancer survival: most studies show a survival advantage for patients with a higher socio-economic position. This is illustrated in table 7 for the Netherlands, but similar inequalities can be found around Europe.

The lower survival rates of cancer patients in lower socio-economic groups may to some extent numerically 'compensate' the higher incidence rates, and contribute to the lack of an excess prevalence of cancer in lower socio-economic groups. These data for cancer are illustrative for many other potentially fatal conditions: patients from higher

socio-economic groups are usually likely to have better survival, because of more favourable prognostic factors (e.g. less comorbidity, better psychosocial profiles ...), because of better treatment (better access, higher quality treatments, better compliance ...), or both. Although inequalities in health care utilisation are not among the most important contributors to the explanation of socio-economic inequalities in health, at least not in Western Europe, these data suggest that improvements in the health care system could still be of some help in tackling health inequalities.

Another interesting finding in table 6 relates to allergy: this displayed a positive relation with level of education, in contrast to the other self-reported conditions. While this may to some extent be due to differences in reporting, it is worthy of note that similar results have been found for, e.g. eczema in children. It has been speculated that aspects of the home environment (central heating, type of bedding, insulation ...) and hygienic behaviour (extensive house and body cleaning, contact with pets ...) may play a role. Clearly, although most health risks are concentrated in lower socio-economic groups, the social patterning of some others may be quite different, at least temporarily.

The probability of surviving the first five years after cancer diagnosis is slightly higher in the higher socio-economic groups.

Table 7.

Five-year Relative Survival Rate (RSR; indicating % of patients still alive five years after diagnosis) by cancer site and socio-economic status (SES), South-eastern Netherlands, 1980–1989.

Cancer site	SES				
	High	(2)	(3)	(4)	Low
Lung					
RSR %	15	17	14	12	11
95% CI	12–18	13–21	11–17	9–15	9–13
Breast					
RSR %	77	74	75	72	73
95% CI	73–81	69–79	71–79	68–76	70–76
Colorectum					
RSR %	55	54	50	48	49
95% CI	50–60	47–61	45–55	44–52	45–53

Source: Schrijvers CTM, Coebergh JW, Heijden LH van der, Mackenbach JP. Socio-economic variation in cancer survival in the South-eastern Netherlands, 1980–1989. *Cancer* 1995; 75(12): 2946–2953.

Most mental health problems are more prevalent in lower socio-economic groups

We have seen above that suicide tends to occur more frequently in lower socio-economic groups, particularly among men. One of the underlying risk factors, mental ill-health, also tends to be more prevalent in lower socio-economic groups. This is illustrated by figure 9 on the basis of data for neurotic disorders in Great Britain.

The higher prevalence of mental illness in lower socio-economic groups is likely to have a complex explanation. In psychiatric epidemiology, there is a long tradition of looking at the possible effects of mental health problems on downward social mobility. This ‘drift hypothesis’ has indeed found some support, for example in the case of schizophrenia, whose onset usually occurs in adolescence and young adulthood, and which may consequently interfere with school and early work careers. On the other hand, incidence studies have also found higher rates of many mental health problems among those who are currently in a lower socio-economic position. It seems likely that this at least partly reflects a causal effect, perhaps through a

higher exposure to psychosocial stressors and/or a lack of coping resources.

Disability is more prevalent in lower socio-economic groups

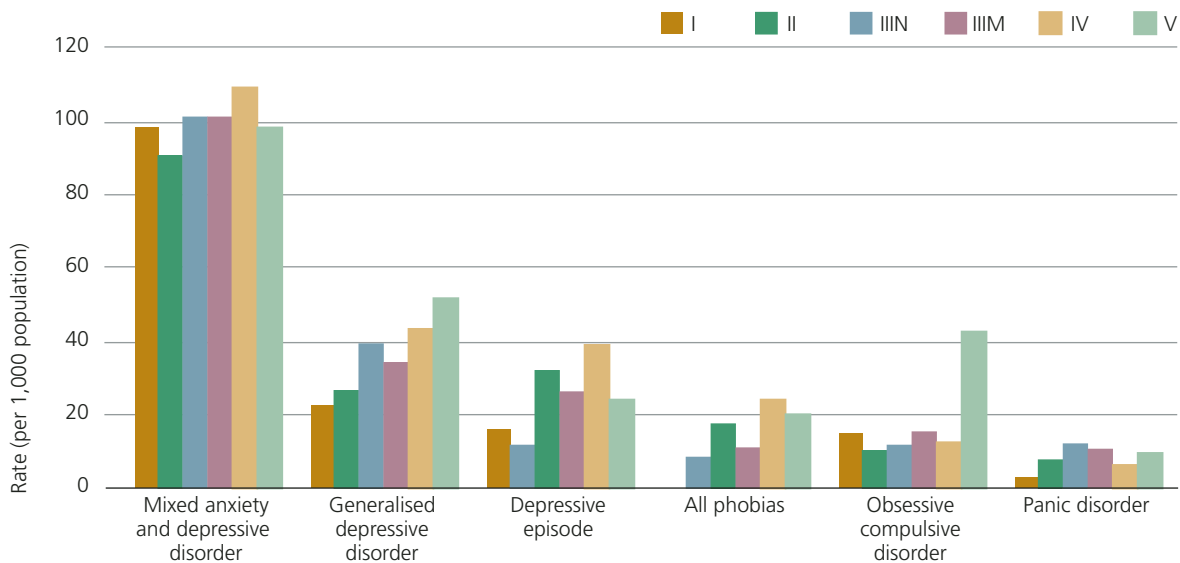
As a result of the higher frequency of physical and mental health problems in lower socio-economic groups, the prevalence of limitations in functioning and various forms of disability also tends to be higher. This applies to many aspects of functioning, and is particularly evident among the elderly, as shown by a recent study covering 10 European countries (figure 10).

In this study, limitations in functioning were measured by self-reports on mobility and sensory functioning, but also by measurements of grip strength (using a handheld dynamometer) and walking speed (time taken to walk 250 metres at usual walking pace, measured only among those aged 76 years and older). It will come as no surprise that limitations in functioning are highly prevalent among the elderly: around 50 per cent have one or more limitations in mobility and sensory functioning, and around 20 per cent have a

Neurotic disorders tend to be more prevalent in the lower social classes.

Figure 9.

Inequalities in the prevalence of neurotic disorders among women, by social class, Great Britain, 1990s.

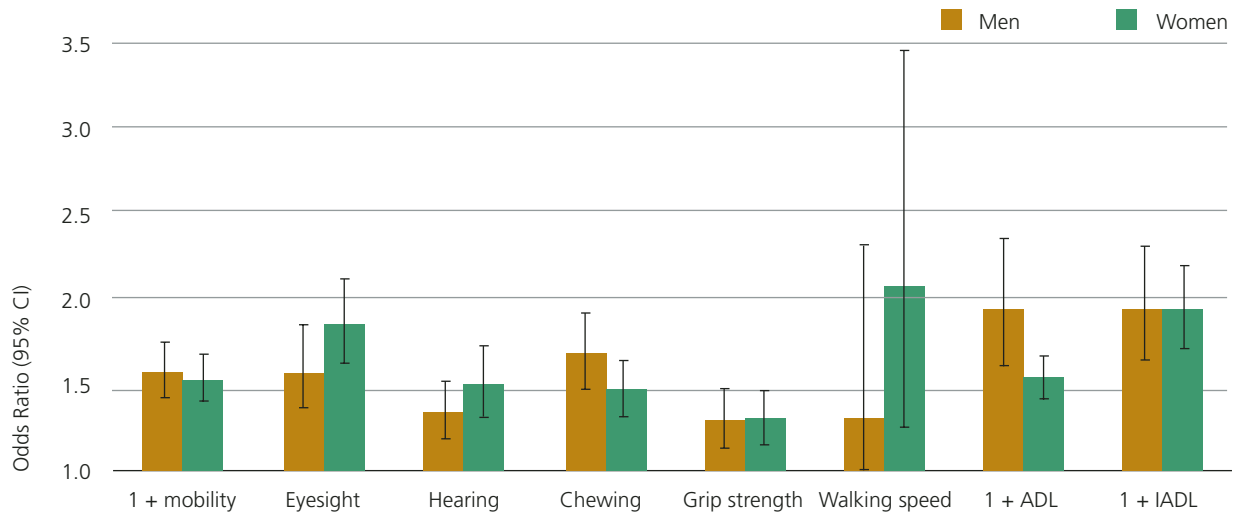


Source: Bunting J. Morbidity in health-related behaviour of adults – a review. In: Health Inequalities. Decennial supplement. Drever F, Whitehead M (ed) London: The Stationery Office 1997; 198–221. ISBN 0 11 620942 9.

Functioning limitations and disabilities are more prevalent in the lower educational groups.

Figure 10.

Inequalities by level of education and income level in various functioning limitations and forms of disability among the elderly (50+), in a pooled dataset of 10 European countries (Sweden, Denmark, Germany, Netherlands, France, Switzerland, Austria, Italy, Spain, Greece), 2004.



Source: Avendano M, Aro AR, Mackenbach JP. Socioeconomic disparities in physical health in 10 European countries. In: Boersch-Supan A, Brugiavini A, Juerges H, Mackenbach J, Siegrist J, Weber G. Health, ageing and retirement in Europe. Mannheim: Mannheim Research Institute for the Economics of Ageing, 2005: 89-94.

very low walking speed. All these measures also show great socio-economic inequalities. People with a lower educational or income level have substantially higher rates of impairment.

These inequalities in functioning also translate into inequalities in limitations with activities of daily living such as dressing and bathing (ADL), and limitations with instrumental activities of daily living such as preparing hot meals and making telephone calls (IADL) (figure 10). This illustrates the high burden of physical limitations among those with a lower socio-economic position, and is likely to contribute to substantially higher professional care needs, including institutionalised care (e.g. nursing homes). As suggested by the results for objective measures of grip strength and walking speed, inequalities in self-reported disability are real, and not a matter of reporting bias.

4. Determinants of mortality and morbidity

- During the past decade, great progress has been made in unravelling the determinants of health inequalities in European countries.
- Health inequalities are mainly caused by the higher exposure to material, psychosocial and behavioural risk factors in lower socio-economic groups.
- European data on determinants of health inequalities are limited to a few behavioural risk factors (smoking, alcohol consumption, nutrition ...).
- Reducing the prevalence of smoking in lower socio-economic groups is a key ingredient of any strategy to tackle health inequalities.

4.1 Some conclusions of explanatory research in various European countries

It is beyond the scope of this paper to review recent explanatory research into health inequalities in Europe. During the past decade, great progress has been made in unravelling the determinants of health inequalities, and although further research is certainly necessary, our understanding of what causes health inequalities has progressed to a stage when rational approaches to reduce health inequalities are becoming feasible.

For this report, we limit ourselves to describing a few basic mechanisms and factors in the explanation of health inequalities, which represent a common denominator of existing explanatory frameworks, and could serve as a starting point for trying to understand the patterns and trends described in the previous pages.

‘Selection’ is less important than ‘causation’

Early debates about the explanation of socio-economic inequalities in health focused on the

question whether ‘causation’ or ‘selection’ was the more important mechanism. Social selection explanations imply that health determines socio-economic position, instead of socio-economic position determining health. The term ‘selection’ here refers to the process of social mobility (changes in socio-economic position), during which a selection occurs on health or health-related characteristics.

The occurrence of health-related selection as such is undisputed: during social mobility, some degree of selection on (ill-)health does indeed occur, with people who are in poor health being more likely to move ‘downward’ (e.g. get a lower status job, or lose income) and less likely to move ‘upward’ (e.g. finish a high level education, or obtain a highly-paid job), than people who are in good health. It is less clear, however, what the contribution of health-related selection to the explanation of socio-economic inequalities in health is. The few studies which have investigated this, have concluded that this contribution is likely to be small.

Furthermore, longitudinal studies in which socio-economic status has been measured before health problems are present, and in which the incidence of

health problems has been measured during follow-up, show clearly higher risks of developing health problems in the lower socio-economic groups. These studies have demonstrated clearly that 'causation' instead of 'selection' is the main explanation for socio-economic inequalities in health.

The unspoken assumption in debates about the role of selection versus causation often was, that social selection is less of a problem for public policy than social causation. This assumption was incorrect, however, because limiting the social consequences of health problems is one of the classical objectives of social security and public health policies in many European countries.

Many specific determinants are involved in the explanation

The 'causal' effect of socio-economic status on health is likely to be largely indirect: through a number of more specific health determinants which are differentially distributed across socio-economic groups (figure 11). Many risk factors for morbidity and mortality are more prevalent in lower socio-economic groups, and it is these inequalities in exposure to specific health determinants which should be seen as the main explanation of health inequalities.

There is no doubt that 'material' factors, i.e. exposure to low income and to health risks in the physical environment, are part of the explanation. All European countries have large inequalities in income. According to Eurostat, the 20 per cent of the population with the highest income in the European Union (EU-25) received 4.5 times more than the 20 per cent of the population with the lowest income in 2001. The proportion of the population who are at risk of poverty (defined as having an income less than 60 per cent of the national average) was 15 per cent in the EU as a whole. Although income inequality and poverty rates differ between countries, partly as a result of differences in income taxation and social security benefit schemes, it is quite likely that inequalities in financial disadvantage play an important role in the

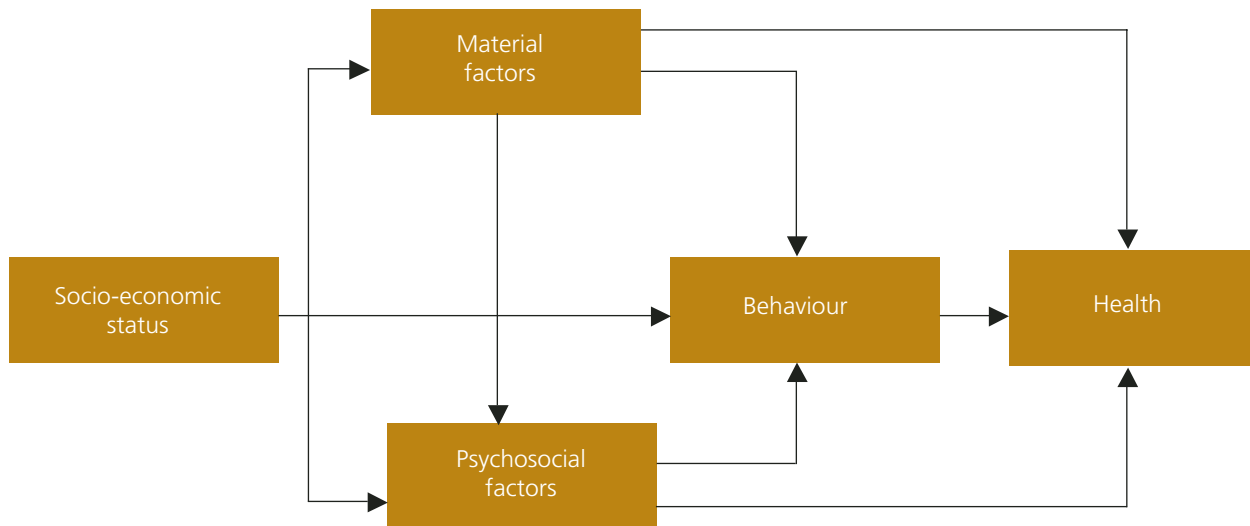
explanation of health inequalities in all European countries. Financial disadvantage may affect health through various mechanisms: psychosocial stress and subsequent risk-taking behaviours (smoking, excessive alcohol consumption ...), reduced access to health-promoting facilities and products (fruit and vegetables, sports, preventive health care services ...), etc. Occupational health risks (exposure to chemicals, accident risks, physically strenuous work ...) and health risks related to housing (crowding, dampness, accident risks ...) are other examples of 'material' factors which have been shown to make important contributions to the explanation of some health inequalities.

The second group of specific determinants which contribute to the explanation of health inequalities are psychosocial factors. Those who are in a low socio-economic position on average experience more psychosocial stress, in the form of negative life events (loss of beloved ones, financial difficulties ...), daily hassles, 'effort-reward imbalance' (high levels of effort without appropriate material and immaterial rewards), and a combination of high demands and low control. These forms of psychosocial stress can in their turn lead to ill-health, either through biological pathways (e.g. by affecting the endocrine or immune systems) or through behavioural pathways (e.g. by inducing risk-taking behaviours). Psychosocial factors related to work organisation, such as job strain, have been shown to play an important role in the explanation of socio-economic inequalities in cardiovascular health.

The third group of contributory factors are health-related behaviours, such as smoking, inadequate diet, excessive alcohol consumption, and lack of physical exercise. In many European countries one or more of these 'lifestyle' factors are more prevalent in the lower socio-economic groups, as will be discussed in the next section of this report. As we have seen above, many of the disease-specific patterns of health inequalities also suggest a substantial contribution of health-related behaviours to inequalities in mortality.

Figure 11.

Simple explanatory diagram: factors which have been shown to 'mediate' between low socio-economic position and risk of ill-health.



It is important to be aware of the fact that the three groups of explanatory factors are interlinked: for example, the higher frequency of material disadvantage in lower socio-economic groups may partly explain their higher frequency of psychosocial stress or lack of leisure time physical exercise. Unfortunately, even roughly comparable data on the social patterning of specific 'material' and psychosocial determinants of health inequalities is extremely scarce in Europe. The only data that are available on a sufficiently large scale to permit their inclusion in this report are health-related behaviours – and our presenting these should not be taken to imply that these are the only ones that matter!

4.2 Health-related behaviours

Smoking plays an important role

By far the most widely available data on a specific determinant of health inequalities relate to smoking. In many European countries, particularly in the North of Western Europe, cigarette smoking is the number 1 determinant of health problems. This is not only because of its role in lung cancer and some other specific diseases, for which smoking is the main cause. It is also because of its role in (premature) mortality in general, less-than-'good'

self-assessed health and disability, for which smoking is an important contributory factor. The prevalence of smoking differs strongly between socio-economic groups in many European countries, so one can safely assume that it plays an important role in generating health inequalities.

In general, the prevalence of smoking is higher in the lower socio-economic groups, but there are important differences between countries in the magnitude, and sometimes even the direction, of these inequalities (table 8).

The data in table 8 do not permit a direct comparison between countries, because of possible data problems. A number of comparative studies, however, have demonstrated a North-South gradient, with larger inequalities in current smoking in the North of Europe and smaller (sometimes even 'reverse') gradients in the South (figure 12). This is particularly clear in the case of women: higher educated women smoke less in the North of Europe (represented by the Nordic countries, Great Britain, the Netherlands, Belgium ...), but they smoke more than lower educated women in the South of Europe (represented by Italy, Spain, Greece, Portugal ...). Even in the North of Europe, elderly women (women from older birth cohorts) sometimes still show a 'reverse' pattern

Smoking prevalence is usually higher in lower socio-economic groups, particularly among men.

Table 8.

Inequalities in smoking by socio-economic position in 24 countries^a.

Country	SE Indicator	Period	Age	Odds Ratio ^b		Source ^c
				Men	Women	
Austria	Education ¹⁸ Income ¹⁸	1998	25–59	1.34* 1.06	1.05 1.59*	ECHP
Belgium	Education ¹⁸ Income ¹⁸	1998	25–59	2.23* 2.02*	2.15* 1.96*	ECHP
Bulgaria	Education ²¹ Income ²¹	1997	18+	1.12 0.84	0.62 0.80	Representative household survey
Czech Republic	Education ⁸ Income ⁸	1992	25–64	4.76* 1.85*	3.85* 1.75*	Household survey as part of MONICA study
Denmark	Education ¹⁸ Income ¹⁸	1998	25–59	2.48* 1.50*	2.92* 1.18	ECHP
Estonia	Education ²² Income ²²	1997	19–64	1.64* 1.92*	0.73 0.66	National survey on nutrition and smoking
Finland	Education ¹⁸ Income ¹⁸	1998	25–59	1.82* 1.72*	2.05* 1.51*	ECHP
France	Education ¹⁹	1991	45–74	1.19	0.61*	Enquete sur la sante et les soins medicaux
Germany	Education ¹⁸ Income ¹⁸	1998	25–59	2.07* 1.70*	1.45* 1.21*	ECHP
Greece	Education ¹⁸ Income ¹⁸	1998	25–59	1.40* 1.30*	0.49* 0.59*	ECHP
Hungary	Education	Late 1980s	35–54 45–54	1.36 1.50	1.12 0.58	MONICA study
Ireland	Education ¹⁸ Income ¹⁸	1998	25–59	1.75* 1.89*	2.39* 2.24*	ECHP
Italy	Education ¹⁸ Income ¹⁸	1998	25–59	1.82* 1.34*	0.85 0.66*	ECHP
Latvia	Education ²² Income ²²	1997	19–64	1.37 2.17*	1.52 0.85	National survey on nutrition and smoking
Lithuania	Education ²² Income ²²	1997	20–64	1.64 1.82*	1.67 1.49	National survey on nutrition and smoking
Malta	Education Income	2002	25–69	1.80* 1.83*	1.34 1.15	Health Interview Survey
Netherlands	Education ¹⁹	1991–1992	45–74	1.21*	1.37*	Netherlands Health Interview Survey
Norway	Education ¹⁹	1995	45–74	1.73*	2.73*	Multi purpose Survey
Poland	Education ²⁰ Income ²⁰	2001	65+	3.13* 6.67*	1.20 0.46	Survey conducted as part of CINDI program (Lodz)
Portugal	Education ¹⁸ Income ¹⁸	1998	25–59	1.90* 1.33*	0.37* 0.51*	ECHP
Spain	Education ¹⁸ Income ¹⁸	1998	25–59	1.88* 1.53*	0.92 0.83*	ECHP
Sweden	Education ¹⁹	1991	45–74	1.50*	1.41*	Swedish Level of Living Survey
Switzerland	Education ¹⁹	1992–1993	45–74	1.31*	1.16	Swiss Health Survey
UK	Education ¹⁸ Income ¹⁸	1998	25–59	1.89* 1.75*	2.30* 1.86	ECHP

^a Because of differences in data collection and classification, the magnitude of inequalities in health cannot always directly be compared between countries.

as well. In the case of men the differences between countries are less outspoken, although some indication of a North-South gradient, with larger inequalities in the North, can be found here as well.

Although comparable data for Eastern Europe have not yet been gathered and analysed, it appears from table 8 that patterns are not so very clear. While smoking prevalence is usually higher among men in lower socio-economic groups, the situation among women is less straightforward.

Current rates of smoking are the result of trends which have played out over the past decades: the habit of cigarette smoking started early in the twentieth century with the advent of industrially produced cigarettes, and in many European countries it was only after the Second World War that smoking became highly prevalent, first among men (with rates of up to 90 per cent smokers), then among women. In many countries, smoking prevalence has declined over the past decades, at least among men, as a result of health education

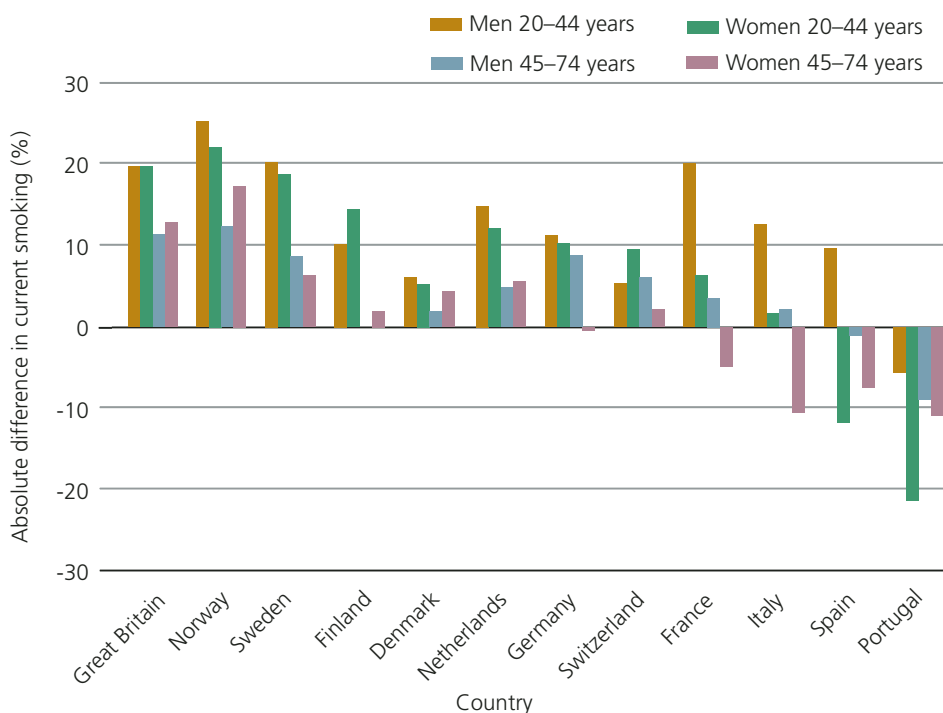
efforts and other anti-tobacco measures such as raising excise taxes and bans on smoking in public places. This decline in smoking is still continuing, but there have been, and still are, clear socio-economic differences in this decline.

Among Western European men, smoking prevalence is declining in all educational groups. Because this decline started earlier in the upper educational groups, however, smoking is still strongly socially patterned with higher prevalence rates in the lower educational groups. Among Western European women, there is a strong association between educational level and rate of decline of smoking prevalence: smoking prevalence is declining only among higher educated women, and increasing among lower educated women. This will tend to create (Southern Europe) or further widen (Northern Europe) the gap in smoking between higher and lower educated women. On a longer time-scale, these changes can also usefully be interpreted in the framework of the theory of the ‘smoking epidemic’ (box 5).

Smoking is more prevalent in the higher socio-economic groups in the North of Europe, while the reverse is true in the South, particularly among women.

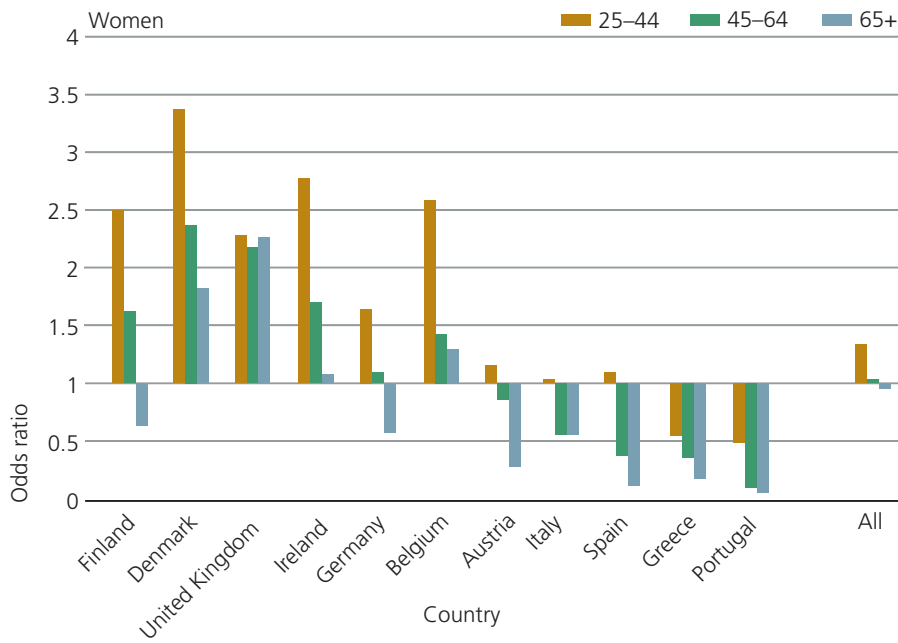
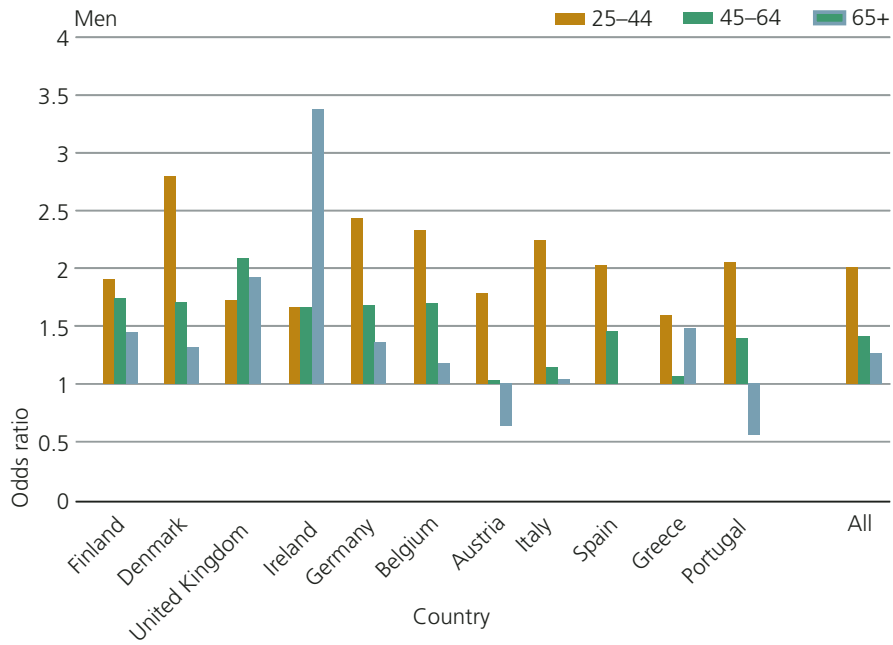
Figure 12.

(a) Inequalities in current smoking by level of education in 12 European countries, ca. 1990.



Source: Cavelaars A, Kunst A, Geurts J, et al. Educational differences in smoking: international comparison. *BMJ* 2000;320:1102-1107.

(b) Inequalities in current daily smoking by level of education in 11 European countries, 1998.



Source: Huisman M, Kunst AE, Mackenbach JP. Educational inequalities in smoking among men and women aged 16 years and older in 11 European countries. *Tob Control* 2005; 14: 106-113.

Box 5. The smoking ‘epidemic’

In order to understand the diffusion of the smoking habit (both smoking initiation and smoking cessation) through populations it may be useful to make a comparison with the diffusion of other ‘innovations’, which has been shown by Rogers to follow a typical trajectory with a considerable delay between ‘early adopters’ and ‘laggards’. In many countries a delay in adoption of the smoking habit (initiation and cessation) has been found between men and women, and between higher and lower socio-economic groups.

This typical trajectory has led to the formulation of the theory of the ‘smoking epidemic’ spreading through populations in four stages. In stage 1, smoking is an exceptional behaviour and mainly a habit of men and people in higher socio-economic groups. In stage 2, smoking becomes more common. Rates among men peak at 50 per cent to 80 per cent and are equal among socio-economic groups or higher among higher socio-economic groups. In women, these patterns usually lag 10–20 years behind those of men. Smoking is first adopted by women from higher socio-economic groups. In stage 3, prevalence rates among men decrease to approximately 40 per cent since many men stop smoking, especially those who are better off. Women reach their peak rate (35 per cent to 45 per cent) during this stage, and at the end of this stage their rates also start to decline. In stage 4, prevalence rates keep declining slowly for both men and women, and smoking becomes progressively more a habit of the lower socio-economic groups. As a result, during the smoking epidemic there is a reversal from a positive to a negative association between socio-economic status and smoking.

Different countries are in different stages of the smoking epidemic, as shown by international comparative studies of smoking prevalence rates by age, sex and socio-economic status. Around 1990, countries in Southern Europe appeared to be in stage 2 (Portugal) or at the beginning of stage 3 (Spain, Italy, France) of the smoking epidemic. Countries in Northern Europe were already in stage 4 (Great Britain, Norway, Sweden, the Netherlands) or at the end of stage 3 (West Germany, Finland).

There is an important caveat with this approach, however. The description of these trajectories in terms of a simple scheme with four stages may or may not be accurate, and if accurate may be used to predict future trends in smoking in different populations and population subgroups. However, the terminology of an ‘epidemic’ should not lead one to assume that this is a largely autonomous development, like the spread of micro-organisms through populations. Smoking is a man-made habit, which has been promoted by some and fought by others. The earlier and stronger decline of smoking in higher socio-economic groups can also be seen as an outcome of the success and failure of these activities, and the future course of this ‘epidemic’ is likely to be strongly determined by collective action. Incorporating a socio-economic dimension in policies to tackle smoking is a prerequisite for reducing (or preventing) the gap in smoking between socio-economic groups.

Excessive alcohol consumption may play a role too

While smoking is clearly bad for health, alcohol is a more complex risk factor: both abstinence and excessive alcohol consumption are bad for health (as compared to moderate drinking). Abstinence usually is more common in the lower socio-economic groups, both among men and among women, but the pattern for excessive alcohol consumption is more variable. Many studies report a higher prevalence in lower socio-economic groups, particularly among men, but the results for women are far from consistent. These inconsistencies may well be due to real differences between countries in the social patterning of excessive alcohol consumption. Eurobarometer data suggest that excessive alcohol consumption is more frequent in lower education groups among men in nearly all countries, and inequalities are sometimes substantial. Among women, inequalities are small and the direction of the association differs between countries, with excessive drinking being slightly more frequent in higher education groups in some countries, and in lower education groups in other countries.

Measures of excessive drinking as used in this European study are unlikely to capture the full extent of the alcohol problem, however. In some countries, such as the Nordic countries (e.g. Finland) and several Eastern European countries, 'binge drinking' (drinking more than, say, 8 units on a single occasion) is a more serious source of health problems than regular overconsumption of alcohol. In these countries, binge drinking tends to be more common in lower socio-economic groups, and is likely to contribute to the explanation of health inequalities, e.g. through a higher rate of ischemic heart disease, stroke and injury mortality.

Role of diet is not yet clear

Comparable data on dietary behaviour by socio-economic status are even more difficult to obtain. The measurement of diet is notoriously difficult, and collecting nationally representative data on diet by socio-economic position from a range of countries a costly exercise. Only a few comparative studies have been conducted, and these show that men and women in lower socio-economic groups tend to less frequently eat fresh vegetables, particularly in the North of Europe (figure 13). Differences in fresh vegetable consumption are smallest in the South of Europe, perhaps because of the larger availability and affordability of fruits and vegetables in Mediterranean countries. A similar North-South gradient has been found for the consumption of fruit.

Literature reviews have shown that it is likely that many other aspects of diet, such as consumption of meat, dairy products and various fats and oils, also are socially patterned in many European countries, and that these social patterns differ between countries. More standardised data collection and analysis will be necessary to elucidate these patterns and variations.

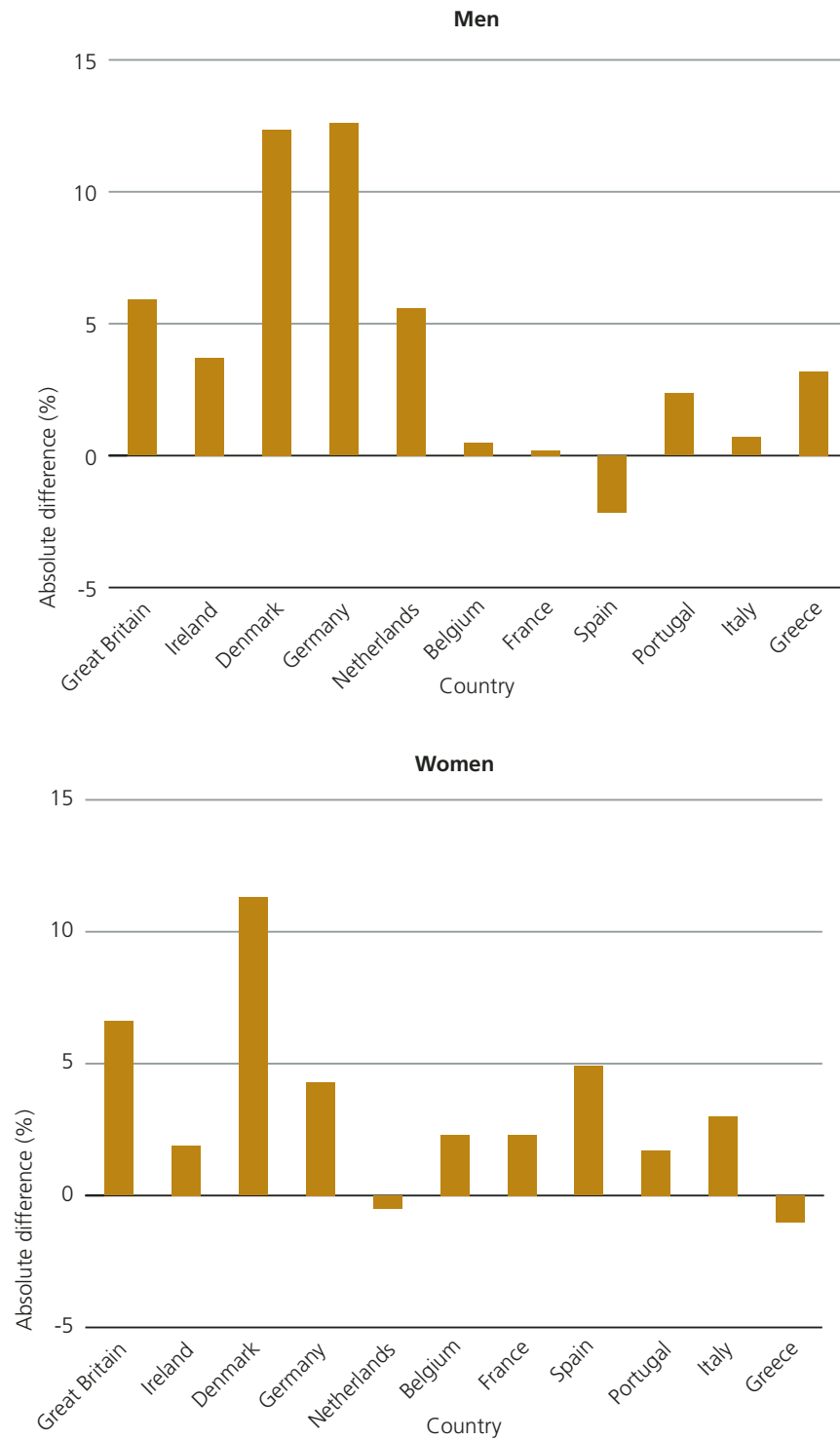
Obesity may become much more important in the future

Lack of leisure-time physical activity tends to be more common in the lower socio-economic groups, and so do overweight and obesity. Interestingly, this is one of the very few health aspects where patterns of social variation are clearer for women than for men. Among women overweight and obesity are more prevalent in lower socio-economic groups in all countries with available data, whereas the patterns are more variable among men (figure 14).

Infrequent consumption of fresh vegetables is much more prevalent in lower socio-economic groups in the North of Europe, but not, or less so, in the South.

Figure 13.

Educational differences in infrequent consumption of fresh vegetables (less than 3–4 days per week) in 10 European countries, men and women aged 20–74 years, ca. 1990.

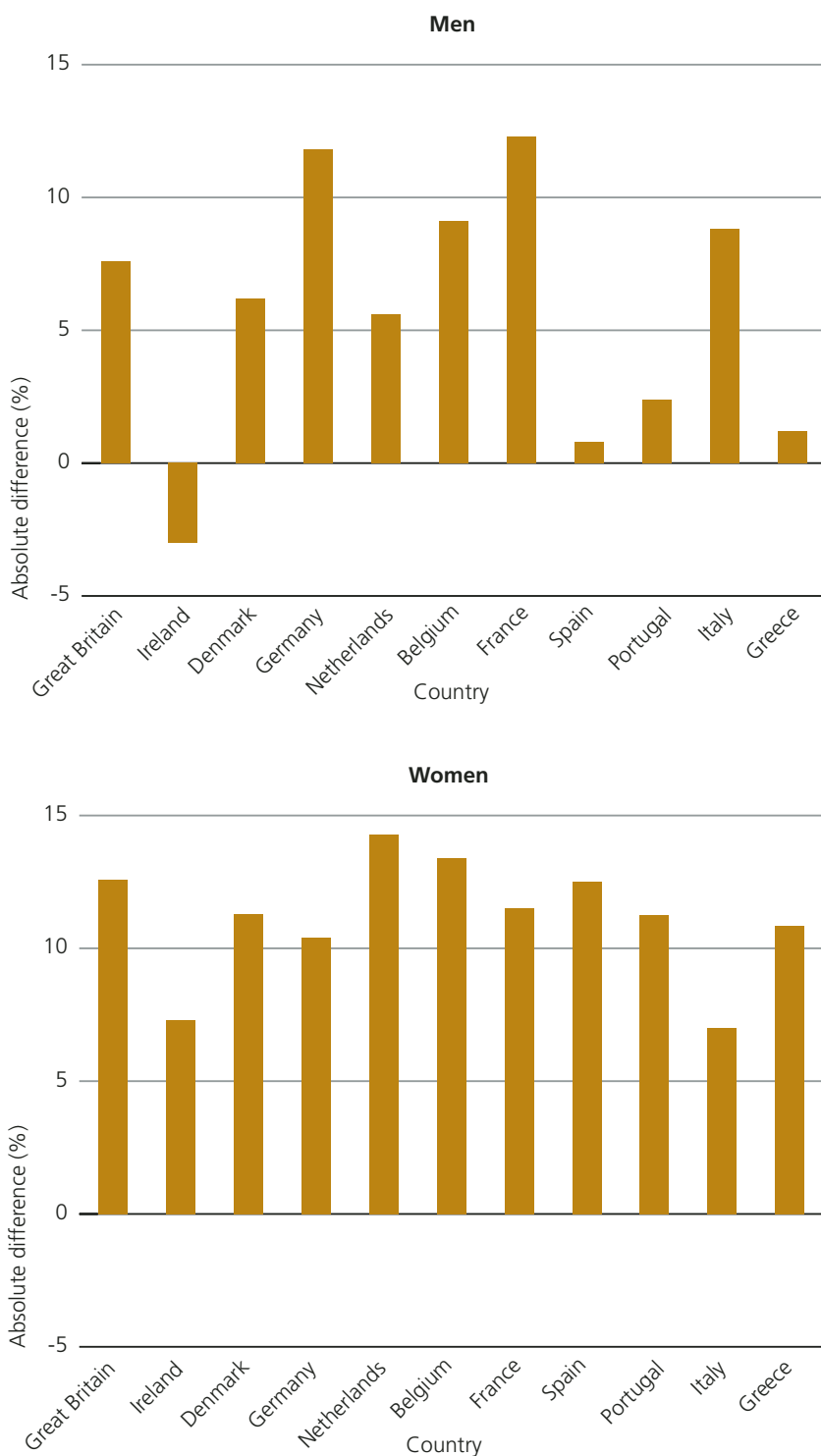


Source: Cavelaars AEJM, Kunst AE, Mackenbach JP. Socio-economic differences in risk factors for morbidity and mortality in the European Community. *J Health Psychology* 1997; 2(3): 353–372.

Overweight is more common among people with lower socio-economic status among women in all countries, whereas differences are sometimes small or even 'reversed' among men.

Figure 14.

Educational differences in overweight (% of individuals with Body Mass Index higher than or equal to 25 kg/m²) in 10 European countries, men and women aged 20–74 years, ca. 1990.



Source: Cavelaars AEJM, Kunst AE, Mackenbach JP. Socio-economic differences in risk factors for morbidity and mortality in the European Community. *J Health Psychology* 1997; 2(3): 353–372.

Obesity threatens to become epidemic in many European countries, and some have speculated that it may in the future replace smoking as the number 1 health risk. It is associated with severe losses of life expectancy (because it leads to a raised risk of heart disease and other fatal conditions), but it also leads to severe losses of health expectancy (due to the combined effect of higher death rates and higher prevalence rates of many disabling conditions). Combating the obesity epidemic is a priority for public health in the 21st century, and as these data show should have a clear focus on lower socio-economic groups.

A final word of caution

While it is obvious that the effect of low socio-economic position on health is mediated by health-related behaviours in many European countries, policies to tackle health inequalities cannot be limited to individual health improvement programmes. Individualised health messages may sometimes be useful, e.g. when there is a deficit in knowledge about the risks associated with the behaviour, but will seldom be sufficient to eliminate health inequalities.

There are many reasons why this is the case: perhaps the most straightforward is that people in lower socio-economic groups usually have a reasonable knowledge of the health risks associated with their behaviour, as in the case of smoking. Changing behaviour will only be possible if other determinants of health-damaging behaviour, both at the individual level (e.g. psychosocial stressors, financial problems ...) and at the group level (e.g. social norms, geographical barriers to healthy behaviour ...) are addressed.

Another reason is that not all of the excess risk of health problems in lower socio-economic groups is mediated by health-related behaviour. Studies trying to quantify this contribution have seldom produced estimates in excess of, say, 50 per cent, and it is therefore important also to address other determinants, e.g. the material and psychosocial factors for which internationally comparable data are much more scarce.

5. Conclusions

- At the start of the 21st century, all European countries are faced with substantial inequalities in health within their populations, particularly between people with higher and lower socio-economic positions. People with a lower level of education, a lower occupational class, or a lower level of income tend to die at a younger age, and to have, within their shorter lives, a higher prevalence of all kinds of health problems.
- While this report demonstrates a relative abundance of data from many countries, there are also important gaps in data on socio-economic inequalities in health for many other member states. Many countries do not have valid, nationally representative data on socio-economic inequalities in mortality by cause of death. Not all countries have good survey data on inequalities in self-reported morbidity, health-related behaviours, and other determinants of health problems. There is, above all, a serious lack of internationally comparable data. Analyses of policy developments in this field have shown that one of the determinants of policy progression towards firm action to tackle health inequalities, is the existence of convincing data to demonstrate that these inequalities are there. National and international authorities should therefore aim to strengthen data collection systems in order to fill these data gaps.
- According to many, current socio-economic inequalities in health are unacceptable, and represent one of Europe's greatest challenges for public health. There are indeed good ethical and public health arguments for this statement. Inequalities in level of education, occupational class and income may to some extent be unavoidable, e.g. because of differences in talent, individual needs for distinction, and collective needs for adequate economic incentives. But the effects of these inequalities on health may still need to be redressed, if only to create a level playing field. Those who are less well off in many spheres of life because of these inequalities should not be allowed to live shorter lives, and shorter in good health, as well. Also, further progress in average population health is to a large extent dependent on success in creating health gains in lower socio-economic groups.
- The persistence of large health inequalities in all countries with available data, including countries with long-standing social, health care and other policies aimed at creating more equality in welfare, underscores the fact that these inequalities must be deeply rooted in the social stratification systems of modern societies. It warns against unrealistic expectations of a substantial reduction in health inequalities within a short period of time, and using conventional policies and interventions. Still, the existence of substantial variations in patterns of health inequalities between European countries, particularly at the level of specific causes of death, diseases, and risk factors, suggest that health inequalities may not be unavoidable. The main challenge is to develop new and effective policies to address the determinants involved in these inequalities.

- It is beyond the scope of this report to list entry-points for policies to reduce health inequalities. Many possible entry-points have been mentioned in passing, however, including health-related behaviours (smoking, alcohol consumption, diet, obesity ...), psychosocial factors (psychosocial stressors, social support, social integration ...), material factors (housing conditions, working conditions, financial problems ...), health care factors (access to good quality services ...). From a European perspective, it is important to note that these entry-points probably differ somewhat between countries. Not all these determinants play an important role in all countries, as illustrated by the North-South gradient in the contribution to health inequalities of ischemic heart disease and its risk factors such as smoking – every country needs its own tailored strategy.
- That is not to say that countries cannot learn from each other. Learning speed can be increased substantially if countries would exchange their experiences with tackling health inequalities more systematically. Resources have been a constraint on this in the past for many member states, but the European Union can play an important role in facilitating these exchanges. The UK Presidency of the EU was a unique opportunity to encourage this, for example through the Expert Working Group on Social Determinants of Health Inequalities. There is also much to be gained by greater cooperation between the EU and other international bodies such as the World Health Organization (which has sponsored the Commission on Social Determinants of Health) and the Organisation for Economic Cooperation and Development.

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