

# European cardiovascular disease statistics

## 2005 edition

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# Foreword

The first edition of *European cardiovascular disease statistics* was published in 2000. This publication was the first to bring together all the available sources of information about how much death and illness is caused by cardiovascular disease (CVD) and its underlying risk factors. It has proved an indispensable tool for anybody working on reducing the burden from CVD or working in public health generally.

Since the first edition the European landscape has changed dramatically with the enlargement of the European Union (EU) from 15 to 25 member states. This has a considerable impact on the burden of CVD. CVD remains the main cause of death and of years of life lost from early death in Europe and in the EU. But the burden is not shared equally by the various geographical parts and individual countries in the EU and Europe at large.

The 2005 *European cardiovascular disease statistics* provides information on lifestyle risk factors: smoking, diet, physical inactivity and alcohol consumption, as well as information on the prevalence of overweight and obesity, raised blood pressure, blood cholesterol and diabetes in Europe and the EU.

A new section on economic costs of CVD has been included in this second edition of *European cardiovascular disease statistics*. It reveals a staggering figure. Total costs of CVD amount to €169 billion, of which €105 billion are for treating CVD in the EU and €64 billion are due to lost productivity and the cost of informal care.

However, the availability and quality of data vary widely from county to country. We must therefore continue to emphasise the need for the collection of good quality comparable data throughout Europe.

The second edition of the *European cardiovascular disease statistics* is a joint publication by the European Heart Network and the British Heart Foundation. We believe that it will continue to be a valuable tool for policy makers, health professionals, researchers and all those working to improve the health and quality of life for people living in Europe.

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# Summary

- Each year cardiovascular disease (CVD) causes over 4.35 million deaths in Europe and over 1.9 million deaths in the European Union (EU).
- CVD causes nearly half of all deaths in Europe (49%) and in the EU (42%).
- CVD is the main cause of death in women in all countries of Europe and is the main cause of death in men in all countries except France and San Marino.
- CVD is the main cause of years of life lost from early death in Europe and the EU – around a third of years of life lost from early death are due to CVD.
- CVD is the main cause of the disease burden (illness and death) in Europe (23% of all the disease burden) and the second main cause of the disease burden in the EU (18%).
- CVD mortality, incidence and case fatality are falling in most Northern, Southern and Western European Countries but either not falling as fast or rising in Central and Eastern European countries.
- Each year smoking kills over 1.2 million people in Europe (450,000 from CVD) and about 650,000 people in the EU (185,000 from CVD). The numbers dying in Europe from CVD due to smoking rose by 13% between 1990 and 2000.
- Smoking has been declining in many European countries but the rate of decline is now slowing. Women are now smoking nearly as much as men in many European countries and girls often smoke more than boys.
- Dietary patterns across Europe - once very different - are now converging.
- Diets are generally improving in Northern and Western European countries but deteriorating in Southern, Central and Eastern European countries.
- Levels of physical inactivity are high in many European countries.
- Levels of obesity are increasing across Europe in both adults and children.
- Over 48 million adults in Europe and 23 million adults in the EU have diabetes and the prevalence is increasing.
- Overall CVD is estimated to cost the EU economy €169 billion a year.
- Of the total cost of CVD in the EU, around 62% is due to health care costs, 21% due to productivity losses and 17% due to the informal care of people with CVD.

# Introduction

## *The aim of the publication*

This is the second edition of *European cardiovascular disease statistics* published by the British Heart Foundation and the European Heart Network. *European cardiovascular disease statistics* is designed for policy makers, health professionals, medical researchers and anyone else with an interest in cardiovascular disease (CVD). It provides the most recent statistics related to the incidence, prevalence, causes and effects of the disease.

The aim of *European cardiovascular disease statistics* is to show:

- (i) the extent to which CVD is a major health problem in Europe;
- (ii) where, in Europe, this problem is greatest;
- (iii) the variability in efforts to treat and prevent CVD across Europe as shown by differences in levels of treatment and in levels of risk factors for the disease;
- (iv) trends in CVD mortality, morbidity, treatment and risk factors over time;
- (vi) the economic costs of CVD in the European Union.

*European cardiovascular disease statistics* is divided into 12 sections. The first two sections on mortality and morbidity deal with the burden of CVD in Europe. Next there is a section on treatment. Then there are four sections on the main aspects of lifestyle which affect the risk of the disease: smoking, diet, physical activity and alcohol consumption. These are followed by four sections on the main pathophysiological risk factors for the disease: raised blood pressure, raised blood cholesterol, overweight/obesity and diabetes. The final section, new to this edition, provides information about the economic costs of CVD in the European Union (EU)<sup>1</sup>. Each section contains a set of tables and graphs and a brief description of the data presented.

In *European cardiovascular disease statistics* we aim only to describe and not to explain. So, although there may be relationships between the various geographical and temporal patterns observed, we have made no attempt to draw any conclusions about the strength of these relationships or about causality.

## *Sources and scope of the data*

In compiling the first 11 sections of *European cardiovascular disease statistics* we have only consulted international sources: that is the World Health Organization (WHO), the WHO MONICA (monitoring trends and determinants in cardiovascular disease) Project, the Food and Agriculture Organization of the United Nations, the EU, the European Society of Cardiology etc. In the final section on economic costs, we have also consulted national sources. It should be noted that the data presented are extremely variable in quality and are only a selection of those available. The original sources need to be consulted for further information.



We also investigated several sources of data from which we have not extracted statistics: either because the data provided were similar, but less comprehensive or less recent than those we have included, or were not directly relevant to the focus of the publication.

There are many different definitions of 'Europe'. We have chosen to use the member states of the World Health Organization's European Region as our definition of 'Europe'. (An Appendix lists the member states of the World Health Organization's European Region and of the EU and has a map.) The number of European countries covered in the tables and graphs varies considerably. We have, where possible, given an overall figure for Europe and also for the EU.

## *Previous publications*

There have been several previous attempts to characterise the burden of CVD in Europe and to examine geographical and temporal patterns in the disease and its prevention and treatment. Notable in this regard is the 1997 report of a Task Force of the European Society of Cardiology on *Cardiovascular Mortality and Morbidity Statistics in Europe*<sup>2</sup> and a report, recently published by the European Society of Cardiology entitled *Cardiovascular diseases in Europe* from which we draw data on rates of procedures in Europe<sup>3</sup>. *European cardiovascular disease statistics*, complements these publications. It is less detailed but more up-to-date than the European Society of Cardiology Task Force report and, in contrast to both previous publications, includes data on the prevalence of risk factors for CVD and the economic costs of CVD.

This publication is also designed to complement the work of the European Commission on monitoring health in the EU. Since the mid-1990's health status reports have been prepared for the European Commission on a regular basis. The most recent, *The health status of the European Union: narrowing the health gap*, was published in 2003<sup>4</sup>. This report- like *European cardiovascular disease statistics* - shows that CVD is the main health problem in the EU.

1. Because of a paucity of published economic data in many countries, the economic costs section of this publication relates only to the EU.
2. Task Force of the European Society of Cardiology on Cardiovascular Mortality and Morbidity Statistics in Europe (1997) *The burden of cardiovascular diseases mortality in Europe*. *European Heart Journal* 18; 1231-48.
3. European Society of Cardiology (2004) *Cardiovascular Diseases in Europe*. Nice: ESC.
4. European Commission (2003) *The health status of the European Union: narrowing the health gap*. Luxembourg: Office for Official Publications of the European Union.

# 1. Mortality

## *Total mortality*

Diseases of the heart and circulatory system (cardiovascular disease or CVD) are the main cause of death in Europe: accounting for over 4.35 million deaths each year<sup>1</sup>. Nearly half (49%) of all deaths are from CVD (55% of deaths in women and 43% deaths in men). The main forms of CVD are coronary heart disease (CHD) and stroke. Just under half of all deaths from CVD are from CHD and nearly a third are from stroke (Table 1.1, Figures 1.1a and 1.1b).

CVD is also the main cause of death in the European Union (EU): accounting for over 1.9 million deaths each year. Nearly half (42%)<sup>2</sup> of all deaths in the EU (46% deaths in women and 39% deaths in men) are from CVD - slightly less than for Europe as a whole. Between a third and a half of deaths from CVD are from CHD and around a quarter are from stroke (Table 1.1, Figures 1.1c and 1.1d).

CHD by itself is the single most common cause of death in Europe: accounting for 1.95 million deaths in Europe each year. Over one in five women (23%) and over one in five men (21%) die from the disease (Table 1.1).

CHD by itself is also the single most common cause of death in the EU: accounting for over 744,000 deaths in the EU each year. Around one in six men (17%) and over one in seven women (16%) die from the disease (Table 1.1).

Stroke by itself is the second single most common cause of death in Europe: accounting for 1.28 million deaths in Europe each year. Over one in six women (18%) and one in ten men (11%) die from the disease (Table 1.1)

Stroke by itself is also the second single most common cause of death in the EU: accounting for just under 490,000 deaths in the EU each year. Around one in ten men (9%) and one in eight women (13%) die from the disease (Table 1.1).

CVD is the main cause of death for women in all 49 countries of Europe for which we have mortality data and it is the main cause of death for men in all these countries except France and San Marino. CVD causes more than 50% of deaths in women in 27 countries. These countries are mostly in Central and Eastern Europe but they also include some Southern and Western European countries such as Greece and Germany. CVD causes more than 50% of deaths in men in eight countries: Armenia, Azerbaijan, Bulgaria, Georgia, FYR Macedonia, Romania, and Ukraine (Table 1.1).

CVD is the main cause of death for women in all 25 countries of the EU and it is the main cause of death for men in all these countries except France<sup>3</sup>. For men living in EU countries CVD causes between 48% (Czech Republic, Latvia and Slovakia) and 28% of deaths (France)<sup>3</sup> and for women between 64% (Lithuania) and 34% of deaths (France)<sup>3</sup> (Table 1.1).

## *Deaths before the age of 75*

CVD is the main cause of deaths before the age of 75 in Europe: accounting for over 1.88 million deaths each year. 44% of deaths before the age of 75 in women and 38% of deaths before the age

of 75 in men are from CVD. One in four of all men (26%) and one in six of all women (17%) die from CVD before the age of 75 (Tables 1.1 and 1.2, Figures 1.2a and 1.2b).

CVD is the second main cause of death before the age of 75 in the EU: accounting for over 586,000 deaths. CVD causes 32% of deaths but cancer causes 36% of deaths. 32% of deaths before the age 75 in men and 30% of deaths before the age of 75 in women are from CVD. One in six of all men (17%) and one in 12 of all women (9%) die from CVD before the ages of 75 (Tables 1.1 and 1.2, Figures 1.2c and 1.2d).

CHD by itself is the single most common cause of death before the age of 75 in Europe: accounting for over 936,000 deaths. 20% of deaths before the age of 75 in men and 19% of deaths before the age of 75 in women are from CHD (Table 1.2, Figures 1.2a and 1.2b).

CHD by itself is the single most common cause of death before the age of 75 in the EU: accounting for over 277,000 deaths. In the EU CHD causes 17% of deaths before the age of 75 in men - more than the most common form of cancer in men - lung cancer - which causes 10% of deaths. CHD causes 12% of deaths before the age of 75 in women - more than the most common form of cancer in women - breast cancer - which causes 8% of deaths (Table 1.2, Figures 1.2c and 1.2d).

CVD is the main cause of death before the age of 75 for men in 35 of the 49 countries of Europe for which we have mortality data and for women in 25 countries. The countries where CVD is the main cause of death before the age of 75 are generally Central and Eastern European countries but, for men in particular, they also include many Northern, Southern and Western countries. CVD causes between 61% (Georgia) and 21% (France)<sup>3</sup> of deaths before the age of 75 in men, and between 65% (Georgia) and 18% (France)<sup>3</sup> of deaths before the age of 75 in women (Table 1.2).

CVD is the main cause of death before the age of 75 for men in 15 countries out of 25 in the EU (Austria, Czech Republic, Estonia, Finland, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Malta, Poland, Slovakia, Sweden and the UK). For women it is the main cause in seven countries: Estonia, Greece, Hungary, Latvia, Lithuania, Poland and Slovakia (Table 1.2).

## *Deaths before the age of 65*

CVD is the main cause of death before the age of 65 in Europe: accounting for over 810,000 deaths each year. 31% of deaths before the age of 65 in men and 30% of deaths before the age of 65 in women are from CVD. One in eight of all men (13%) and one in 17 of all women (6%) die from CVD before the age of 65 (Tables 1.1 and 1.3, Figures 1.3a and 1.3b).

CVD is the second main cause of death before the age of 65 in the EU: accounting for over 225,000 deaths. CVD causes 24% of deaths but cancer causes 35% of deaths. 26% of deaths before the age 65 in men and 20% of deaths before the age of 65 in women are from CVD. 7% of all men and 3% of all women die from CVD before the age of 65 (Tables 1.1 and 1.3, Figures 1.3c and 1.3d).

CHD by itself is the single most common cause of death before the age of 65 in Europe: accounting for just under 407,000 deaths. 14% of deaths before the age of 65 in men and 17% of deaths before the age of 65 in women are from CHD (Table 1.3, Figures 1.3a and 1.3b).

CHD by itself is the single most common cause of death before the age of 65 in the EU: accounting for almost 110,000 deaths. In the EU, CHD causes 14% of deaths before the age of 65 in men - more than the most common form of cancer in men - lung cancer - which causes 9% of deaths. CHD causes 7% of deaths before the age of 65 in women - which is less than the most common form of cancer in women - breast cancer - which causes 11% of deaths (Table 1.3, Figures 1.3c and 1.3d).

CVD is the main cause of death before the age of 65 for men in 28 of the 49 countries of Europe for which we have mortality data and for women in 17 countries. In women, the countries where CVD is the main cause of death before the age of 65 are all Central and Eastern European countries. In men, however, they also include some Northern, Southern and Western countries, for example Finland, Greece and United Kingdom. CVD causes between 50% (Georgia) and 16% (France)<sup>3</sup> of deaths before the age of 65 in men, and between 47% (Georgia) and 12% (France)<sup>3</sup> of deaths before the age of 65 in women (Table 1.3).

CVD is the main cause of death before the age of 65 for men in ten countries in the EU (Estonia, Finland, Greece, Ireland, Latvia, Lithuania, Poland, Slovakia, Sweden and the UK). For women it is the main cause of death before the age of 65 in one country in the EU: Latvia (Table 1.3).

## *Death rates*

Death rates from CHD are generally higher in Central and Eastern Europe than in Northern, Southern and Western Europe. For example the death rate for men aged 35-74 living in Ukraine is ten times higher than in France and for women it is nineteen times higher. Western European countries generally have higher rates than Southern European Countries. For example the death rate for men aged 35-74 living in Ireland is over twice as high as in Italy and for women it is almost three times as high (Table 1.4, Figures 1.4a and 1.4b).

Death rates from stroke are higher in Central and Eastern Europe than in Northern, Southern and Western Europe. For example the death rate in men aged 35-74 living in the Russian Federation is fifteen times higher than in Switzerland and for women of the same age it is fourteen times higher (Table 1.5, Figures 1.5a and 1.5b).

Over the past 30 years death rates from CHD have been falling rapidly in most Northern and Western European countries but rising rapidly in most Central and Eastern European countries. For example death rates for men aged 35-74 living in Finland and the United Kingdom fell by 41% and 39% respectively between 1989 and 1999, but rose by 35% for men of the same age living in Romania and by 33% for men living in the Russian Federation. For women aged 35-74 living in Finland and the United Kingdom death rates fell by 46% and 43% respectively, but rose by 21% for women living in Romania and by 25% for women living in Russia. Death rates in some Southern European countries are falling but in others (such as Greece and Albania) they are stable or possibly rising (Table 1.4, Figures 1.4c and 1.4d).

Death rates from stroke are falling rapidly in most Northern, Southern and Western European countries but they are rising in many Central and Eastern European countries. For example death rates for men aged 35-74 living in Italy and UK fell by 38% and 32% respectively between 1989 and 1999 but rose by 37% for men of the same age living in the Russian Federation. For women aged 35-74 living in Italy and UK death rates fell by 41% and 30% respectively but rose by 25% for women living in the Russian Federation (Table 1.5, Figure 1.5c and 1.5d).

A recent publication by the Institute des Sciences de la Sante, describes changes in CHD mortality in under 75's in the EU over a decade, between 1990/91 and 2000/02. Age-standardized death rates fell in all countries, but not equally across the EU. Death rates almost halved in four countries - the Czech Republic, the UK, Ireland and Finland. Elsewhere rates fell by about one-fifth to one-third, the only exceptions being Latvia (men) and Poland (women) where there were improvements of just over 10%<sup>4</sup>.

The WHO MONICA Project measured trends in CHD mortality between the early 1980's and 1990's, in 37 populations worldwide, including 29 populations in Europe. Results showed that around two-thirds of the decline in CHD mortality during this period was due to a decline in CHD incidence rates and the remaining one-third of the decline was due to improvements in survival because of better treatments. This highlights the importance of improvements in cardiovascular risk factors such as smoking<sup>5</sup>.

This conclusion was also found in a recent study looking at the decline in CHD mortality over a 20-year period in the UK. The authors found that between 1981 and 2000 in England and Wales, 58% of the decline was attributable to reductions in major risk factors, principally smoking, whereas treatment of individuals, including secondary prevention, explained the remaining 42% of the mortality decline<sup>6</sup>.

## *Years of life lost due to an early death*

CVD is not only the main cause of death in Europe and the EU but is also the main cause of years lost due to an early death.

The WHO Global Burden of Disease Study found that in 1990 on average 31% of years of life lost were due to CVD in 'Established Market Economies' (mostly Northern, Southern and Western countries in Europe and all the member states of the EU(15)). This was more than any other cause. On average 16% of years of life lost were due to CHD in Established Market Economies, so by itself CHD was the most important cause of years of life lost in these countries<sup>7</sup>.

In 'Formerly Socialist Economies of Europe' (Central and Eastern European countries) 35% of years of life lost were due to CVD - again more than from any other cause - and 18% were lost due to CHD<sup>7</sup>.

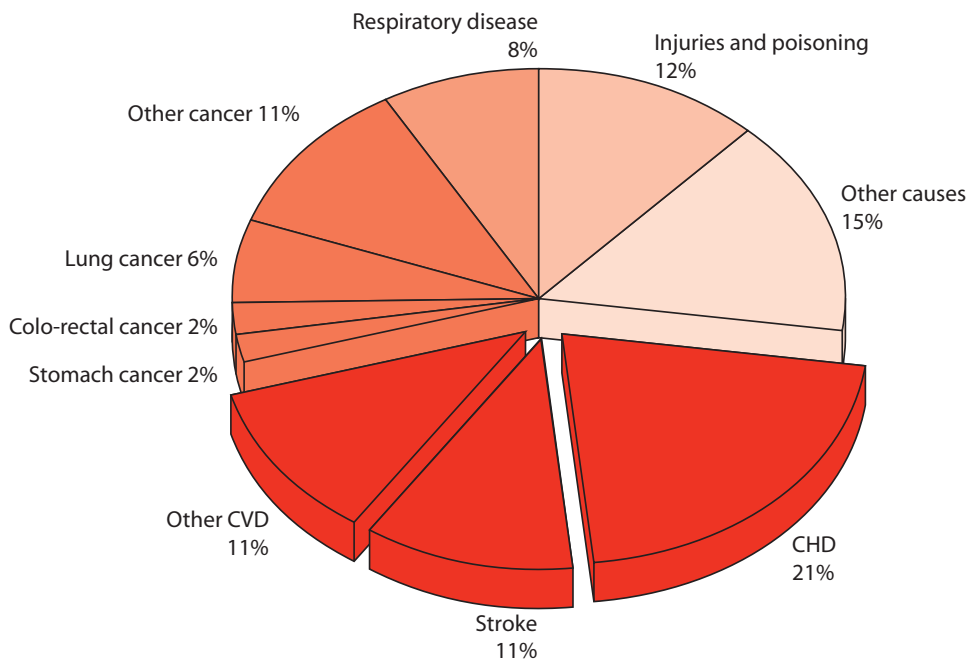
1. When we state, in this section, that CVD is the main cause of death we are comparing "Diseases of the circulatory system" (Chapter VII 9th Revision/Chapter IX 10th Revision) of the International Classification of Diseases, with other chapters (e.g. Chapter II "Neoplasms"). When we state that CHD is the most common cause of death we are comparing CHD (Chapter VII, ICD code 410-414, 9th Revision/Chapter IX, I20-I25, 10th Revision) with all diseases within all chapters (e.g. with lung cancer, Chapter II, 162 9th Revision/Chapter II, C33-C34, 10th Revision).
2. This figure and similar figures in the text are calculated from the tables rather than the graphs. Figures in the text may not seem to correspond exactly to figures in graphs because of rounding.
3. Data from the WHO MONICA project suggest that official mortality statistics in France under-report deaths from CVD compared to other countries. MONICA data from the French populations included in the MONICA Project (Lille, Strasbourg and Toulouse) show an underestimate of CHD deaths of over 75%. (See WHO Monica Project (2003) MONICA Monograph and Multimedia Sourcebook: World's largest study of heart disease stroke, risk factors and population trends 1979-2002. Edited by Hugh Tunstall-Pedoe for the WHO MONICA Project. WHO: Geneva). Table 1.1 also highlights that doctors in France have a much higher rate of reporting deaths from "all other causes". Together these suggest that the true numbers and proportions of deaths from CVD and CHD in France are likely to be higher than those reported in Table and Figures 1.1.
4. Newey C, Nolte E, Mckee M and Mossialos E (2004) Avoidable mortality in the Enlarged European Union. ISS Statistics 2. Brussels:ISS.
5. Tunstall-Pedoe H, Kuulasmaa K, Mahonen M, Tolonen H, Ruokokoski E, Amouyel P, for the WHO MONICA Project (1999) Contribution of trends in survival and coronary event rates to changes in coronary heart disease mortality: 10 year results from 37 WHO MONICA Project populations. Monitoring trends and determinants in cardiovascular disease. *The Lancet*; 353: 1547-1557.
6. Unal B, Critchley J and Capewell S (2004) Explaining the decline in coronary heart disease mortality in England and Wales between 1981 and 2000. *Circulation*; 109:1101-1107.
7. Murray JL and Lopez AD (1996) *The global burden of disease*. WHO: Geneva.

**Table 1.1 Total number of deaths by cause and sex, latest available year**

	All causes	Coronary heart disease	Stroke	Other CVD	Stomach cancer	Colo-rectal cancer	Lung cancer	Breast cancer	Other cancer	Respiratory disease	Injuries and poisoning	All other causes
<b>MEN</b>												
Albania (00)	9,493	1,203	1,399	1,625	240	39	480	0	980	641	1,120	1,766
Armenia (00)	12,277	4,385	1,454	420	245	132	701	0	1,084	937	856	2,063
Austria (00)	35,211	7,724	3,136	5,399	637	1,240	2,285	0	5,523	2,007	2,966	4,294
Azerbaijan (00)	24,516	8,887	2,285	1,598	607	146	592	0	1,587	2,266	1,573	4,975
Belarus (00)	70,202	22,718	7,848	3,029	1,863	3,319	3,319	0	5,344	4,544	12,421	7,991
Belgium (96)	52,514	6,732	3,892	7,125	647	1,526	5,538	0	8,342	6,382	4,008	8,322
Bulgaria (00)	61,520	10,893	10,501	17,298	993	1,169	2,383	0	4,250	2,740	3,469	7,824
Croatia(00)	23,477	4,537	3,548	3,653	610	841	2,000	16	3,385	1,188	2,037	3,642
Czech Republic (00)	54,882	12,034	6,991	7,443	905	2,517	4,480	18	8,028	2,637	4,694	3,133
Denmark (98)	28,750	5,379	2,090	2,939	232	1,026	1,913	6	4,735	2,567	1,948	5,895
Estonia (00)	9,265	2,576	1,112	608	206	159	556	2	895	433	1,609	1,109
Finland (00)	24,042	6,512	1,858	1,555	317	462	1,392	3	3,138	2,296	2,853	3,656
France (99)	274,764	24,969	16,537	34,569	3,291	8,748	20,867	0	56,236	22,425	25,919	61,203
Georgia (00)	20,318	7,659	4,369	1,580	333	176	655	0	1,236	605	964	2,741
Germany (99)	390,742	82,209	31,126	53,592	6,902	13,453	28,214	182	61,836	26,647	21,338	63,023
Greece (99)	54,212	7,951	7,699	9,030	853	1,077	4,678	0	7,820	3,885	3,301	7,898
Hungary (00)	70,475	14,636	8,359	8,612	1,256	2,514	5,727	40	9,377	3,019	6,151	10,564
Iceland (97)	986	236	74	72	29	33	66	1	165	87	77	126
Ireland (99)	16,961	3,989	1,163	1,705	204	561	917	0	2,433	2,590	1,125	2,274
Israel (98)	18,853	3,568	1,219	1,712	301	589	843	11	2,959	1,153	1,372	5,126
Italy (99)	285,901	40,041	27,711	42,645	6,636	8,707	25,977	0	80,895	22,590	16,360	44,339
Kazakhstan (99)	79,448	18,102	8,816	6,976	1,667	678	3,128	0	5,268	6,317	13,727	14,769
Kyrgyzstan (99)	17,623	3,328	2,521	647	362	87	335	2	813	2,603	2,738	4,191
Latvia (00)	16,155	4,492	2,271	947	315	263	1,578	2	1,578	534	2,847	2,016
Lithuania (00)	20,408	5,685	1,764	1,628	502	423	1,178	5	2,254	1,048	3,945	1,976
Luxembourg (00)	9,327	2,63	158	230	22	60	157	2	313	160	194	298
Macedonia, Fmr Yug Rep of (00)	1,543	1,230	1,563	2,087	234	166	495	0	920	367	532	1,733
Malta (99)	395	108	108	164	32	43	101	0	237	179	73	211
Moldova, Rep of (00)	21,162	6,989	2,809	581	336	291	589	4	1,338	1,601	2,588	4,036
Netherlands (99)	68,872	10,432	4,811	8,754	1,040	2,207	6,589	38	11,545	7,447	3,015	12,994
Norway (99)	22,416	4,771	1,976	2,480	347	734	1,160	7	3,539	2,087	1,474	3,841
Poland (00)	193,390	30,972	17,867	34,839	3,874	4,373	15,984	37	24,618	10,491	19,032	33,303
Portugal (00)	55,346	4,914	9,110	4,651	1,577	1,598	2,337	0	7,462	5,393	3,467	14,637
Romania (00)	136,325	28,051	23,848	23,613	2,570	2,028	6,959	45	12,335	8,913	10,963	17,000
Russian Federation (00)	1,179,775	284,284	172,083	88,795	25,035	15,375	30,087	287	73,302	72,230	250,009	148,288
San Marino (00)	105	3	9	30	8	2	10	0	22	5	5	11
Serbia and Montenegro (00)	61,656	7,763	8,616	15,188	904	1,276	3,586	31	5,795	3,191	3,401	11,905
Slovakia (00)	28,157	7,476	2,140	3,942	517	1,009	1,887	12	3,590	1,638	2,451	3,495
Slovenia (99)	9,671	1,361	879	1,168	241	335	746	2	1,361	862	1,153	1,563
Spain (98)	190,218	22,929	15,744	22,516	3,767	6,099	15,437	0	32,403	23,113	12,187	36,023
Sweden (99)	46,782	11,675	4,236	5,706	554	1,235	1,834	18	7,893	3,452	2,663	7,516
Switzerland (99)	30,430	5,442	1,882	3,944	351	866	1,913	10	5,501	2,524	2,178	5,819
Tajikistan (99)	13,721	2,422	649	2,410	261	53	99	0	536	1,796	1,306	4,189
Turkmenistan (98)	16,517	3,648	626	2,861	167	40	151	0	742	2,543	1,842	3,897
Ukraine (00)	382,260	130,474	44,612	21,450	7,539	5,771	15,887	0	26,272	26,113	58,079	46,063
UK - England and Wales (99)	264,299	63,317	20,711	21,092	3,821	7,496	18,342	0	40,812	43,776	10,466	34,466
UK - Northern Ireland (99)	7,464	1,936	619	475	113	203	478	0	1,047	1,339	410	844
UK - Scotland (99)	28,605	7,122	2,494	1,990	368	883	2,305	0	3,985	3,804	1,507	4,147
Uzbekistan (98)	72,508	18,884	6,814	6,686	820	238	817	0	3,153	11,105	7,777	16,214
<b>Total EU</b>	<b>2,232,486</b>	<b>387,741</b>	<b>194,786</b>	<b>283,344</b>	<b>38,829</b>	<b>68,217</b>	<b>170,789</b>	<b>367</b>	<b>358,396</b>	<b>200,934</b>	<b>155,882</b>	<b>373,201</b>
<b>Total Europe</b>	<b>4,519,403</b>	<b>967,258</b>	<b>504,307</b>	<b>492,079</b>	<b>84,651</b>	<b>100,072</b>	<b>267,044</b>	<b>779</b>	<b>518,922</b>	<b>356,490</b>	<b>536,390</b>	<b>691,411</b>



*Figure 1.1a Deaths by cause, men, latest available year, Europe*



*Figure 1.1b Deaths by cause, women, latest available year, Europe*

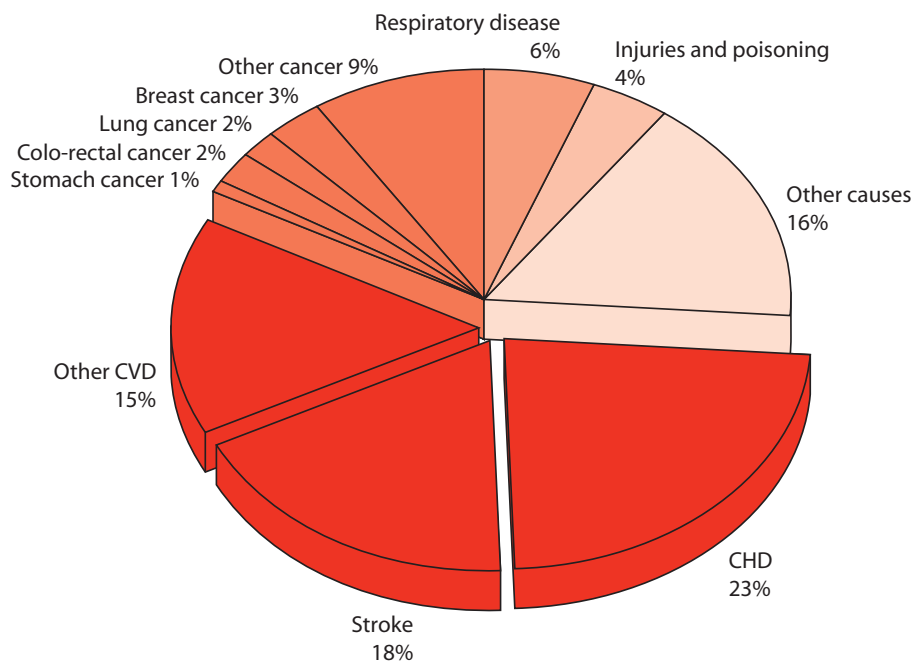




Figure 1.1c Deaths by cause, men, latest available year, EU

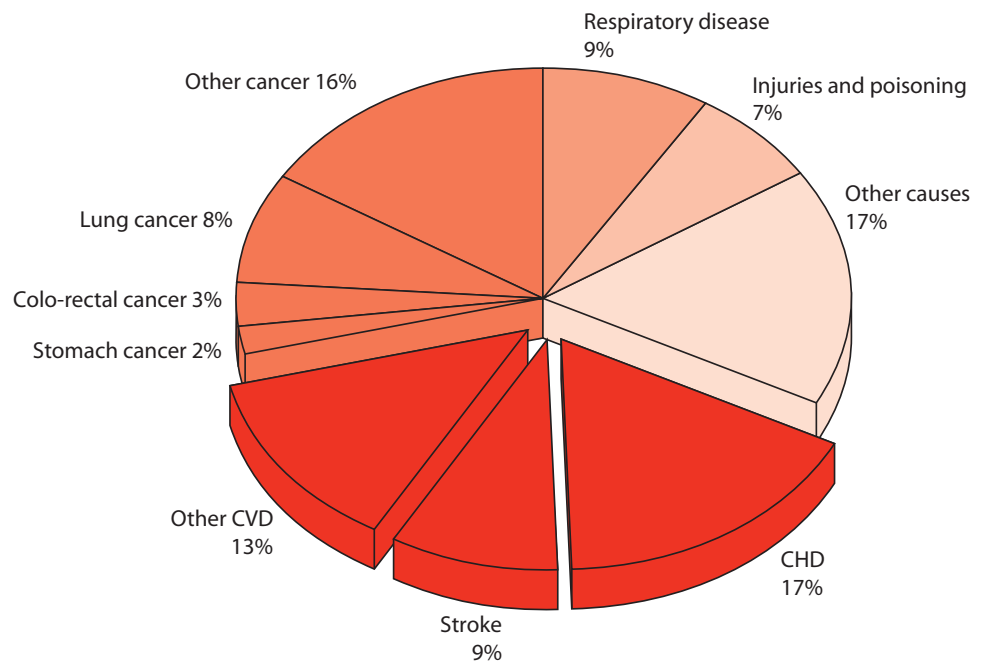


Figure 1.1d Deaths by cause, women, latest available year, EU

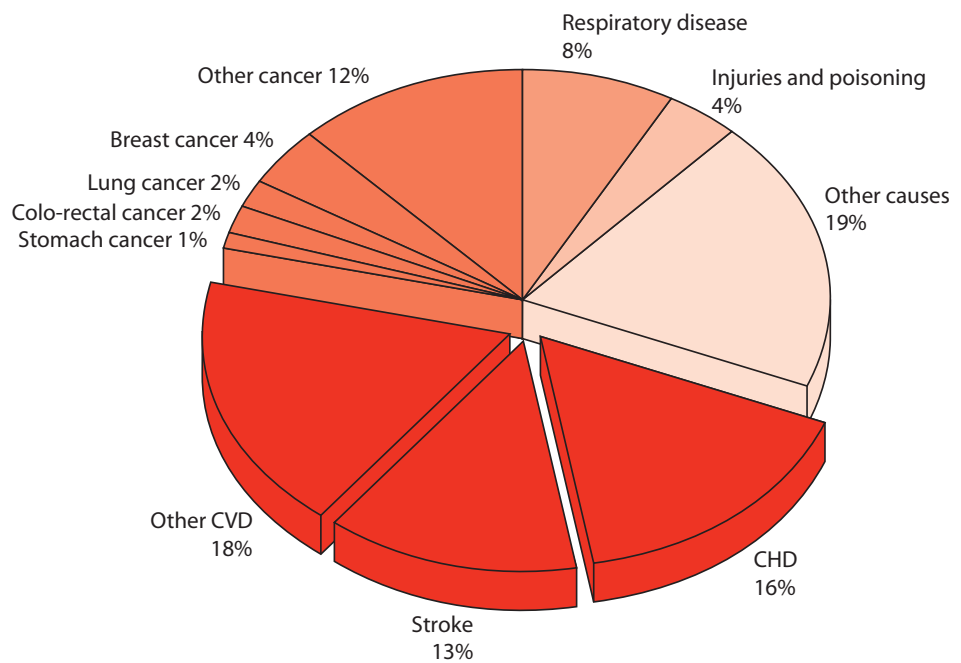


Table 1.2 Deaths under 75 by cause and sex, latest available year

	All causes	Coronary heart disease	Stroke	Other CVD	Stomach cancer	Colo-rectal cancer	Lung cancer	Breast cancer	Other cancer	Respiratory disease	Injuries and poisoning	All other causes
MEN												
Albania (00)	5841	757	651	752	177	29	370	0	714	406	1099	886
Armenia (00)	9,538	3,069	1,005	345	211	114	646	0	945	701	815	1,687
Austria (00)	18,377	3,703	1,022	1,877	333	678	1,669	0	3,261	810	2,486	2,738
Azerbaijan (00)	20,575	6,824	1,750	2,658	551	131	555	0	1,462	2,008	1,544	4,482
Belarus (00)	55,187	15,985	5,838	2,543	1,833	875	2,987	0	4,603	3,376	12,014	5,383
Belgium (96)	27,993	3,738	1,397	2,793	370	846	3,860	0	4,966	2,556	3,293	4,174
Bulgaria (00)	37,795	6,395	5,811	8,937	741	824	2,060	0	3,229	1,665	3,072	3,061
Croatia (00)	17,117	2,833	2,024	1,872	450	608	1,699	10	2,344	651	1,755	2,671
Czech Republic (00)	33,598	6,867	2,801	3,560	573	1,630	3,554	14	5,483	1,412	3,971	3,733
Denmark (98)	13,881	2,151	692	1,089	135	558	1,227	4	2,566	912	1,364	3,183
Estonia (00)	6,857	1,572	697	1,182	165	481	1,165	1	673	365	1,458	824
Finland (00)	13,458	3,306	789	852	184	916	1,916	2	1,835	757	2,467	2,081
France (99)	140,402	11,325	5,728	11,987	1,812	4,303	15,304	0	33,869	6,738	19,060	30,076
Georgia (00)	14,664	5,021	2,851	1,053	274	144	589	0	1,065	490	908	2,269
Germany (99)	219,746	40,869	11,493	22,781	4,220	8,318	21,027	107	38,908	11,230	17,898	42,895
Greece (99)	26,761	4,877	2,396	2,826	560	558	3,337	0	4,466	1,375	2,976	3,390
Hungary (00)	46,995	8,739	4,602	4,388	827	1,390	4,684	25	6,693	1,715	5,086	8,646
Iceland (97)	483	109	22	12	21	43	114	1	107	23	65	59
Ireland (99)	8,410	1,992	423	659	129	336	586	0	1,386	757	946	1,196
Israel (98)	9,300	1,383	446	711	168	268	589	7	1,543	394	1,091	2,700
Italy (99)	135,899	18,058	7,914	14,280	3,685	4,729	17,660	0	29,084	6,300	11,891	22,298
Kazakhstan (99)	68,052	13,862	6,689	5,493	1,467	565	2,912	0	4,996	5,296	13,419	13,653
Kyrgyzstan (99)	14,865	2,341	1,957	564	323	77	312	0	731	2,148	2,681	3,729
Latvia (00)	12,164	2,969	1,300	734	253	189	754	2	1,238	453	2,720	1,552
Lithuania (00)	14,752	3,153	932	1,146	365	296	979	4	1,700	659	3,817	1,701
Luxembourg (00)	1,041	149	59	88	13	32	114	1	184	77	158	166
Macedonia, Fmr Yug Rep of (00)	5,952	953	817	851	178	125	432	0	704	209	476	1,207
Malta (99)	782	186	40	64	20	29	72	0	144	56	56	115
Moldova, Rep of (00)	15,849	3,946	1,953	473	306	256	544	4	1,209	1,246	2,509	3,403
Netherlands (99)	33,934	5,379	1,646	3,677	592	1,243	4,166	21	6,459	2,026	2,385	6,340
Norway (99)	9,071	1,808	483	680	173	339	738	1	1,615	444	999	1,791
Poland (00)	134,498	21,124	10,399	17,759	2,828	3,006	13,178	28	18,286	5,715	17,490	24,685
Portugal (00)	28,558	2,541	3,095	1,565	978	907	1,733	0	4,348	1,910	2,884	8,597
Romania (00)	93,438	17,213	13,827	11,391	2,055	1,524	6,284	33	9,826	6,058	10,337	14,890
Russian Federation (00)	989,471	221,012	120,873	72,175	21,664	12,363	45,238	229	63,985	61,098	241,823	129,011
San Marino (00)	48	2	2	10	5	1	6	0	13	3	5	1
Serbia and Montenegro (00)	42,065	5,746	5,344	7,655	713	982	3,168	21	4,690	2,033	3,028	8,685
Slovakia (00)	18,556	3,990	1,121	2,272	363	669	1,511	8	2,640	821	2,292	2,869
Slovenia (99)	6,388	759	459	602	136	240	623	0	996	372	1,007	1,174
Spain (98)	94,933	11,668	5,131	8,155	2,306	3,391	10,791	0	19,137	7,271	10,423	16,660
Sweden (99)	17,353	4,065	1,083	1,347	272	609	1,108	11	3,373	753	1,851	2,881
Switzerland (99)	13,512	2,005	463	1,194	177	451	1,247	4	2,838	695	1,644	2,794
Tajikistan (99)	11,275	1,731	443	1,644	237	48	91	0	476	1,521	1,272	3,812
Turkmenistan (98)	14,551	2,705	487	2,373	150	38	145	0	699	2,435	1,806	3,713
Ukraine (00)	297,249	88,099	30,647	15,318	6,517	4,646	14,271	0	23,037	19,900	55,573	39,241
UK - England and Wales (99)	121,531	30,007	6,665	8,306	2,013	4,118	10,706	0	22,078	12,593	8,599	16,444
UK - Northern Ireland (99)	3,716	993	216	184	68	112	310	0	626	381	346	480
UK - Scotland (99)	15,126	3,844	847	1,216	216	509	1,441	0	2,340	1,303	1,263	2,490
Uzbekistan (98)	60,180	11,955	4,826	5,564	744	211	774	0	2,905	10,371	7,684	15,146
Total EU	1,195,909	198,024	72,947	114,376	23,436	39,474	121,791	228	216,739	69,319	128,187	211,388
Total Europe	3,001,985	613,778	282,156	257,263	62,312	64,114	207,491	538	350,375	192,490	493,806	477,662

Table 1.2 continued

	All causes	Coronary heart disease	Stroke	Other CVD	Stomach cancer	Colo-rectal cancer	Lung cancer	Breast cancer	Other cancer	Respiratory disease	Injuries and poisoning	All other causes
<b>WOMEN</b>												
Albania (00)	2956	330	453	443	81	27	68	104	376	208	251	615
Armenia (00)	6,601	1,682	1,085	1,211	117	151	125	402	752	276	188	1,513
Austria (00)	13,884	4,085	1,780	1,120	256	120	122	296	1,051	1,451	809	1,526
Azerbaijan (00)	30,210	9,952	5,701	1,470	897	775	268	1,095	3,040	963	2,956	3,093
Belarus (00)	15,419	1,465	1,055	1,554	171	641	658	1,622	2,982	981	1,332	2,958
Belgium (96)	22,778	3,166	4,449	5,856	393	628	406	885	2,368	755	910	2,962
Bulgaria (00)	9,897	1,395	1,647	1,441	202	373	356	579	1,558	283	490	1,573
Croatia (00)	19,223	3,180	2,103	2,258	335	939	862	1,193	4,112	701	1,179	2,361
Czech Republic (00)	9,764	879	557	577	71	425	917	821	1,955	983	559	2,020
Denmark (98)	3,799	926	867	389	94	115	76	224	538	90	393	487
Estonia (00)	6,844	1,017	591	398	109	247	257	531	1,433	311	758	1,192
Finland (99)	67,415	3,258	3,486	5,686	690	2,812	2,755	7,049	15,460	2,869	7,190	16,160
France (00)	9,451	3,076	2,365	676	145	122	131	446	813	290	214	1,173
Germany (99)	124,401	16,509	8,187	13,607	2,401	5,960	5,819	10,796	25,887	5,322	6,276	23,637
Greece (99)	14,734	1,599	1,982	2,020	237	468	479	1,016	2,894	763	918	2,358
Hungary (00)	27,166	4,729	3,263	3,006	441	1,212	1,535	1,590	4,235	842	1,623	4,670
Iceland (97)	5,014	24	25	10	7	9	34	31	56	13	19	46
Ireland (99)	6,575	736	354	370	66	174	290	456	933	507	289	851
Israel (98)	74,345	6,487	5,361	8,360	101	264	185	586	1,359	264	331	1,898
Italy (99)	39,740	8,030	6,526	4,065	1,729	3,288	3,211	6,226	17,714	2,242	3,614	15,213
Kazakhstan (99)	1,473	9,368	1,796	500	176	648	582	1,130	3,845	2,535	3,697	7,812
Kyrgyzstan (99)	6,549	1,489	1,218	392	151	183	603	165	661	1,368	777	2,314
Latvia (00)	1,583	680	7,784	680	422	223	113	422	1,371	220	990	1,022
Lithuania (00)	5,588	44	56	47	4	19	29	59	130	33	54	113
Luxembourg (00)	4,167	484	832	777	93	102	88	204	504	125	141	817
Macedonia, Fmr Yug Rep of (00)	350	95	49	42	4	29	12	53	100	37	23	86
Moldova, Rep of (00)	11,310	3,311	2,099	344	153	226	120	359	917	559	707	2,515
Netherlands (99)	21,327	2,019	1,410	1,905	257	917	1,560	2,267	4,398	1,298	964	4,332
Norway (99)	5,358	627	321	331	98	299	368	404	1,170	380	338	1,022
Poland (00)	71,251	8,770	8,186	10,338	1,242	2,307	3,022	3,483	14,739	2,599	4,024	12,561
Portugal (00)	15,510	1,165	2,139	1,090	513	605	347	999	2,619	900	814	4,319
Romania (00)	56,579	9,889	11,478	7,803	898	1,138	1,188	2,356	7,491	2,859	2,943	8,536
Russian Federation (00)	517,690	119,026	113,128	44,713	13,021	13,126	6,185	17,510	49,148	17,695	60,554	63,584
San Marino (00)	23	2	3	5	0	1	1	2	7	1	0	1
Serbia and Montenegro (00)	28,746	3,023	3,261	6,162	370	622	794	1,302	3,457	1,083	984	5,688
Slovakia (00)	9,867	2,217	714	1,466	150	381	120	562	1,811	364	507	1,454
Slovenia (99)	3,592	307	368	397	96	147	148	282	678	179	303	687
Spain (98)	44,445	3,749	3,291	4,711	986	2,156	1,024	3,753	9,736	2,334	2,944	9,761
Sweden (99)	10,755	1,396	754	732	141	458	749	826	2,681	594	719	1,705
Switzerland (99)	7,700	711	350	645	93	283	457	721	1,730	335	607	1,768
Tajikistan (99)	8,236	1,071	381	1,610	123	35	36	76	389	1,309	377	2,829
Turkmenistan (98)	9,693	1,633	433	2,034	82	57	42	92	513	1,813	702	2,292
Ukraine (00)	168,925	61,066	28,952	8,767	3,675	4,145	2,197	6,762	16,663	5,345	13,281	17,872
UK - England and Wales (99)	80,698	11,953	5,831	5,525	845	2,835	6,234	6,744	16,281	9,356	2,960	12,134
UK - Northern Ireland (99)	2,474	420	192	137	28	79	166	187	499	319	110	337
UK - Scotland (99)	10,365	1,761	789	630	117	327	990	702	1,757	1,189	433	1,670
Uzbekistan (98)	44,470	9,122	4,395	4,740	410	216	263	537	2,576	8,301	2,960	10,950
Total EU	664,316	79,108	54,430	67,638	11,309	27,407	32,185	53,600	138,064	35,555	40,485	124,535
Total Europe	1,678,947	323,022	248,244	161,977	33,570	50,852	46,261	89,644	238,488	83,966	134,400	268,523

ICD codes (9th Revision, 10th Revision): CHD (410-414, I20-I25); stroke (430-438, I60-I69); other CVD (390-459, I00-I99 minus CHD and stroke); stomach cancer (151, C16); colo-rectal cancer (153-154, C18-C21); lung cancer (162, C33-C34); breast cancer (174, C50); other cancer (140-239, C00-C97 minus stomach, colo-rectal, lung and breast cancer); respiratory disease (460-519, J00-J99) and injuries and poisoning (800-999, V01-V98).

NB: No national mortality data is available for Andorra, Bosnia and Herzegovina, Cyprus, Monaco and Turkey.

Source: World Health Organization (2004) [www3.who.int/tubohismort/table1\\_process.cfm](http://www3.who.int/tubohismort/table1_process.cfm)

Figure 1.2a Deaths under 75 by cause, men, latest available year, Europe

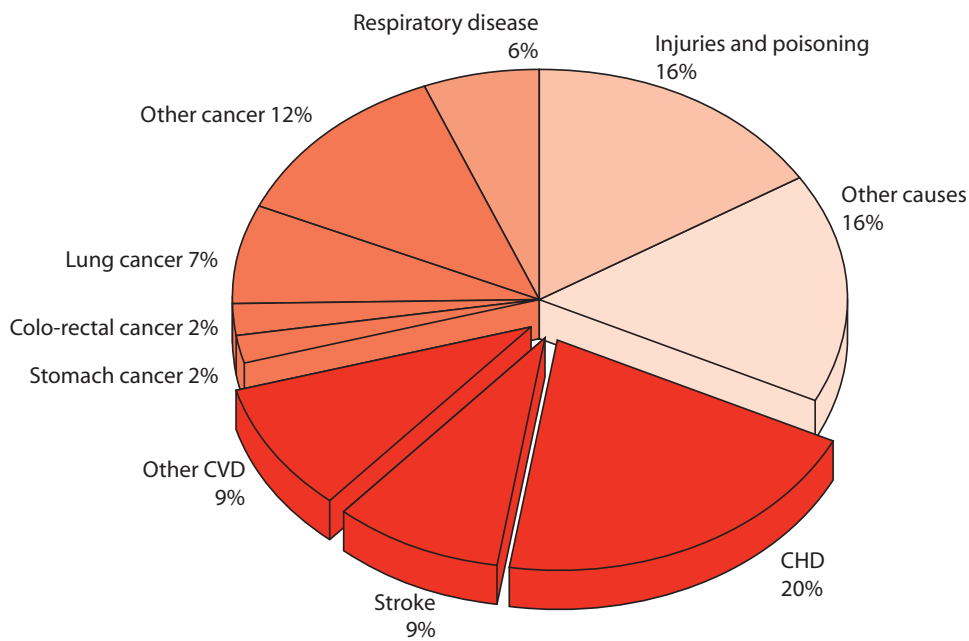


Figure 1.2b Deaths under 75 by cause, women, latest available year, Europe

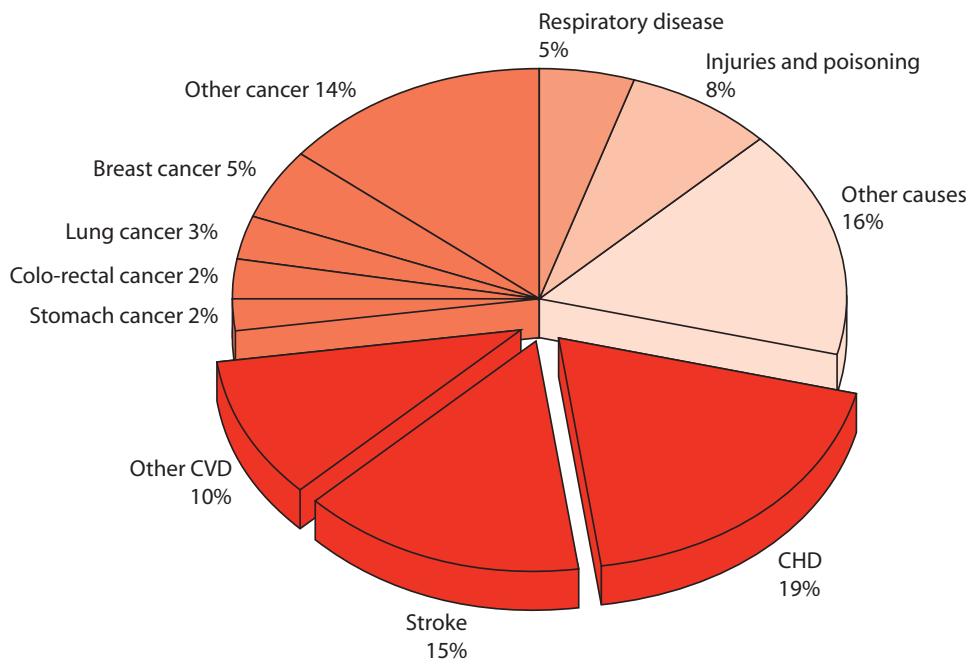


Figure 1.2c Deaths under 75 by cause, men, latest available year, EU

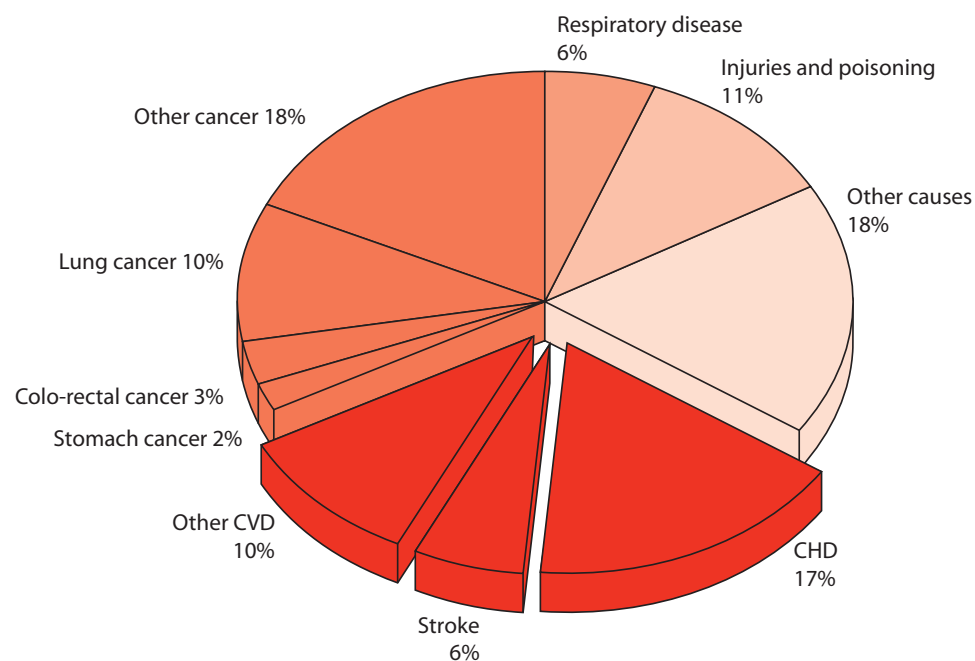


Figure 1.2d Deaths under 75 by cause, women, latest available year, EU

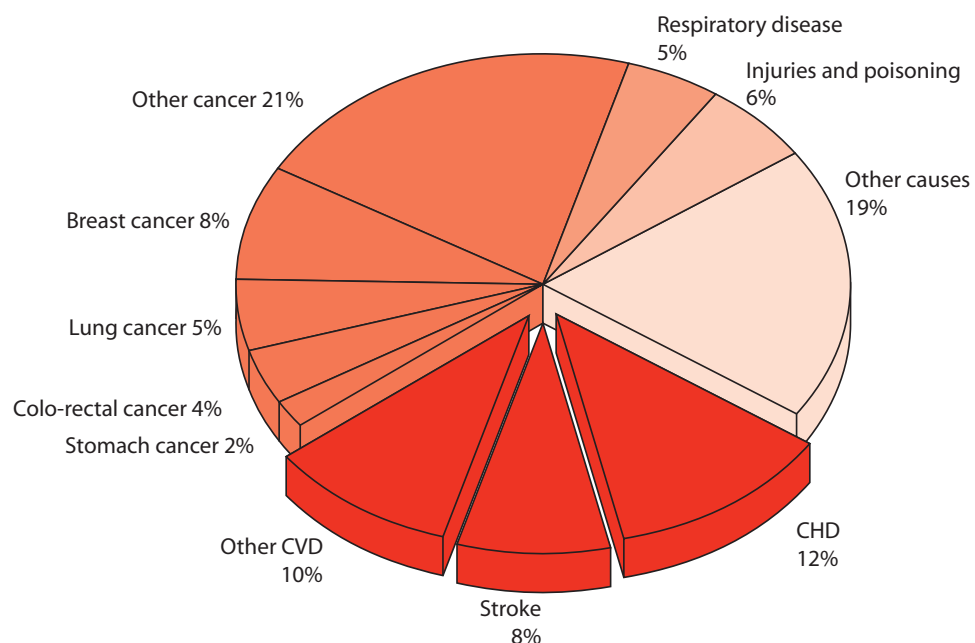


Table 1.3 Deaths under 65 by cause and sex, latest available year

	All causes	Coronary heart disease	Stroke	Other CVD	Stomach cancer	Colo-rectal cancer	Lung cancer	Breast cancer	Other cancer	Respiratory disease	Injuries and poisoning	All other causes
<b>MEN</b>												
Albania (00)	3588	403	229	323	101	18	191	0	403	263	950	707
Armenia (00)	5,076	1,358	342	168	99	56	354	0	538	299	707	1,155
Austria (00)	10,078	1,639	371	781	155	277	858	0	1,682	330	2,137	1,848
Azerbaijan (00)	13,246	3,509	812	771	309	74	342	0	983	1,487	1,452	3,507
Belarus (00)	13,470	7,791	2,755	1,780	826	413	1,655	0	2,739	1,696	10,982	4,320
Belgium (96)	13,470	1,579	461	994	155	335	1,617	0	2,351	733	2,814	2,431
Bulgaria (00)	19,565	3,013	2,266	3,909	354	370	1,203	0	1,809	849	2,603	3,189
Croatia (00)	8,683	1,240	734	734	210	253	856	5	1,307	238	1,439	1,647
Czech Republic (00)	12,921	3,176	975	1,604	280	772	1,958	5	2,996	707	3,453	2,600
Denmark (98)	4,306	878	282	439	63	247	499	0	1,266	259	1,195	2,083
Estonia (00)	7,555	755	308	343	75	44	214	0	376	245	1,340	606
Finland (00)	7,627	1,515	316	476	90	118	365	2	884	294	2,132	1,435
France (99)	76,649	5,059	2,293	4,849	817	1,782	8,035	0	17,224	2,315	15,735	18,540
Georgia (00)	7,544	2,151	1,133	505	111	71	325	0	566	306	789	1,587
Germany (99)	117,235	17,335	4,156	10,646	2,045	3,864	10,394	49	20,454	4,042	15,394	28,856
Greece (99)	12,921	2,495	729	909	254	219	1,522	0	1,990	563	2,559	1,681
Hungary (00)	28,508	4,449	2,018	2,223	396	747	2,764	17	4,179	874	4,294	6,547
Iceland (97)	239	41	8	21	7	10	14	1	44	8	59	26
Ireland (99)	4,289	833	151	290	58	171	221	0	712	230	856	767
Israel (98)	5,143	579	164	381	79	97	301	4	772	160	979	1,627
Italy (99)	63,217	7,266	2,520	5,632	1,977	1,977	7,246	0	13,202	1,803	9,647	12,358
Kazakhstan (99)	50,194	8,380	3,723	3,729	920	310	1,859	0	3,114	3,555	12,704	11,898
Kyrgyzstan (99)	10,952	1,227	1,052	422	198	38	194	0	495	1,561	2,553	3,232
Latvia (00)	7,714	1,520	543	494	78	78	378	2	654	305	2,437	1,160
Lithuania (00)	9,464	1,512	394	705	194	133	498	2	960	311	3,427	1,328
Luxembourg (00)	549	64	19	41	5	11	48	0	82	27	144	108
Macedonia, Fmr Yug Rep of (00)	3,211	536	300	303	83	60	255	0	412	77	411	774
Malta (99)	397	75	13	27	15	13	32	0	74	18	51	79
Moldova, Rep of (00)	10,261	1,573	970	326	210	144	378	2	839	796	2,279	2,744
Netherlands (99)	16,811	2,351	585	1,516	270	574	1,818	7	3,152	539	2,077	3,922
Norway (99)	4,481	704	157	256	62	143	309	1	735	111	840	1,163
Poland (00)	79,243	11,156	4,636	8,037	1,406	1,317	6,718	16	10,108	2,280	15,673	17,896
Portugal (00)	15,257	1,095	1,054	605	492	361	851	0	2,168	647	2,379	5,605
Romania (00)	54,592	8,658	5,597	4,791	1,025	712	3,889	19	5,889	3,753	9,098	11,151
Russian Federation (00)	687,185	125,688	54,201	49,243	12,193	5,906	25,867	139	39,778	38,959	225,116	110,095
San Marino (00)	27	1	1	6	3	0	3	0	6	2	5	0
Serbia and Montenegro (00)	21,150	2,944	1,984	2,746	352	437	1,712	11	2,494	773	2,372	5,325
Slovakia (00)	10,917	1,754	455	1,203	188	301	786	4	1,621	422	2,028	2,155
Slovenia (99)	3,607	374	172	274	76	118	312	0	507	122	846	806
Spain (98)	47,605	5,082	1,758	3,441	1,015	1,350	5,083	0	9475	2,192	8,964	9,245
Sweden (99)	8,292	1,494	374	551	120	244	451	5	1,490	256	1,548	1,759
Switzerland (99)	7,215	896	165	535	83	205	600	4	1,373	208	1,409	1,737
Tajikistan (99)	8,198	875	189	757	123	36	58	0	339	1,215	1,235	3,371
Turkmenistan (98)	11,487	1,523	262	1,593	89	28	99	0	498	2,241	1,772	3,382
Ukraine (00)	194,963	42,746	14,971	10,719	3,871	2,326	8,458	0	15,066	11,751	50,988	34,067
UK - England and Wales (99)	572,335	12,152	2,353	3,256	771	1,717	4,123	0	10,433	4,044	7,728	10,658
UK - Northern Ireland (99)	1,845	442	69	64	27	48	117	0	318	111	319	330
UK - Scotland (99)	7,557	1,659	305	342	92	226	569	0	1,119	449	1,105	1,691
Uzbekistan (98)	44,838	5,689	2,487	3,669	458	150	513	0	2,085	9,202	7,415	13,170
Total EU	630,530	87,709	27,310	49,742	10,768	17,044	57,477	109	109,477	24,118	110,282	136,494
Total Europe	1,837,325	309,234	121,814	137,449	32,534	28,901	106,912	295	191,771	103,628	448,419	356,368

Table 1.3 continued

	All causes	Coronary heart disease	Stroke	Other CVD	Stomach cancer	Colo-rectal cancer	Lung cancer	Breast cancer	Other cancer	Respiratory disease	Injuries and poisoning	All other causes
Albania (00)	1766	134	168	191	43	18	38	82	258	142	232	460
Armenia (00)	2833	394	284	146	56	78	57	295	473	142	138	770
Austria (00)	5011	368	250	341	104	216	341	579	1082	141	643	875
Azerbaijan (00)	7790	1527	692	585	116	77	77	246	744	1121	439	2166
Belarus (00)	13438	2584	1815	799	400	339	121	717	1698	387	2475	2103
Belgium (96)	6907	334	334	417	82	278	312	990	1354	301	1029	1432
Bulgaria (00)	9254	911	1193	1918	166	267	208	590	1385	367	680	1569
Croatia (00)	3814	386	409	381	84	163	172	330	725	83	340	741
Czech Republic (00)	8321	842	497	703	149	180	448	705	2094	285	873	1285
Denmark (98)	4356	242	198	192	421	440	421	504	975	289	421	1103
Estonia (00)	1767	216	163	151	38	42	28	161	293	50	328	297
Finland (00)	3346	256	234	167	55	111	112	368	673	115	612	643
France (99)	33821	858	1198	1868	307	1198	1526	4391	7563	1011	5347	8554
Georgia (00)	3653	843	646	238	65	60	73	285	477	194	150	622
Germany (99)	57269	4344	2457	4567	1122	2495	3069	6833	12657	1870	4916	12939
Greece (99)	5851	461	439	439	101	199	231	600	1335	228	704	1001
Hungary (00)	13013	1464	1069	1038	200	345	971	986	2230	397	1106	2987
Iceland (97)	142	7	8	5	3	4	22	22	30	4	15	22
Ireland (99)	2381	189	134	145	25	84	119	316	510	147	219	493
Israel (98)	3048	172	90	196	43	116	86	357	668	108	248	964
Italy (99)	31495	1584	1558	2704	731	1466	1415	4101	8068	507	2508	6853
Kazakhstan (99)	23838	3052	2839	2256	472	349	315	846	2430	1723	3287	6249
Kyrgyzstan (99)	5880	465	806	336	105	38	28	122	438	984	691	1857
Latvia (00)	3144	444	381	232	72	72	48	211	448	94	360	582
Lithuania (00)	380	3774	265	298	94	97	47	785	735	101	795	670
Luxembourg (00)	291	10	25	12	1	9	19	39	58	12	41	65
Macedonia, Fmr Yug Rep of (00)	1885	179	272	211	42	51	51	144	325	50	103	457
Malta (99)	235	27	8	12	2	16	7	39	44	15	18	47
Moldova, Rep of (00)	947	947	858	230	96	115	77	284	628	320	588	1724
Netherlands (99)	10693	686	504	682	122	432	891	1510	2282	394	778	2412
Norway (99)	2340	182	94	85	45	136	191	251	602	116	272	566
Poland (00)	33129	2777	2677	3112	537	966	1709	2301	7918	998	3196	6938
Portugal (00)	7020	327	570	342	249	287	181	667	1299	273	587	2238
Romania (00)	26481	3212	3604	2379	407	523	620	1544	4496	1687	2362	5647
Russian Federation (00)	256432	38006	35016	21779	5982	5922	2829	11920	27957	9862	51645	45514
San Marino (00)	10	1	2	0	0	0	0	2	4	0	0	1
Serbia and Montenegro (00)	11665	1029	1535	1613	167	268	449	882	1840	434	679	2769
Slovakia (00)	4406	579	180	491	58	182	135	339	986	158	410	888
Slovenia (99)	1351	75	84	110	41	57	77	180	306	44	223	354
Spain (98)	19403	928	901	1472	441	922	560	2372	4640	744	2227	4196
Sweden (99)	4361	384	249	248	82	176	393	521	1271	207	859	1724
Switzerland (99)	3867	195	139	236	46	128	272	454	823	122	472	980
Tajikistan (99)	5647	643	180	685	64	27	25	280	280	1066	353	2471
Turkmenistan (98)	6943	633	185	1213	52	47	26	73	361	1691	672	1990
Ukraine (00)	79496	17582	10178	4507	1880	2019	1106	4689	10229	2723	11099	13484
UK - England and Wales (99)	35598	3260	1964	1927	326	1170	2473	4271	8052	2869	2353	6933
UK - Northern Ireland (99)	1171	134	66	48	16	34	80	125	235	108	84	221
UK - Scotland (99)	4528	514	250	223	36	144	379	439	846	362	347	988
Uzbekistan (98)	29762	3017	1799	2848	249	140	169	439	1872	7280	2807	9142
Total EU	303,642	21,818	16,677	22,012	5,022	11,818	15,992	33,820	68,014	11,720	30,896	65,853
Total Europe	809,693	97,713	79,489	64,849	15,605	22,703	23,004	58,453	126,777	42,336	110,643	168,121

ICD codes (9th Revision, 10th Revision): CHD (I10-I14, I20-I25); stroke (I60-I69); other CVD (390-459, I00-199 minus CHD and stroke); stomach cancer (151, C16); colo-rectal cancer (153-154, C18-C21); lung cancer (162, C33-C34); breast cancer (174, C50); other cancer (140-239, C00-C97 minus stomach, colo-rectal, lung and breast cancer); respiratory disease (460-519, J00-199) and injuries and poisoning (800-999, V01-Y98).

NB: No national mortality data is available for Andorra, Bosnia and Herzegovina, Cyprus, Monaco and Turkey.

Source: World Health Organization (2004) [www3.who.int/whosis/morttable1\\_process.cfm](http://www3.who.int/whosis/morttable1_process.cfm)

Figure 1.3a Deaths under 65 by cause, men, latest available year, Europe

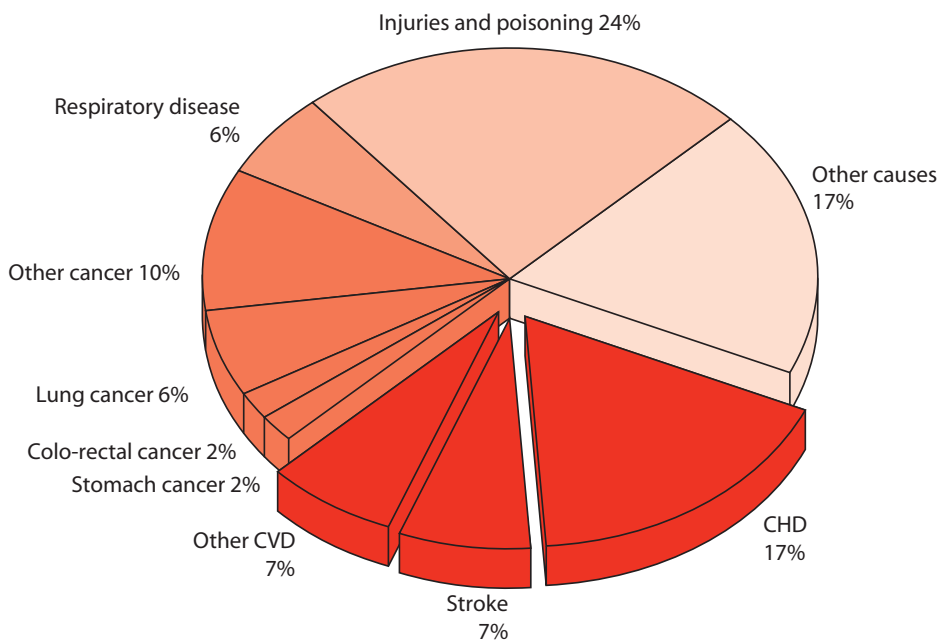


Figure 1.3b Deaths under 65 by cause, women, latest available year, Europe

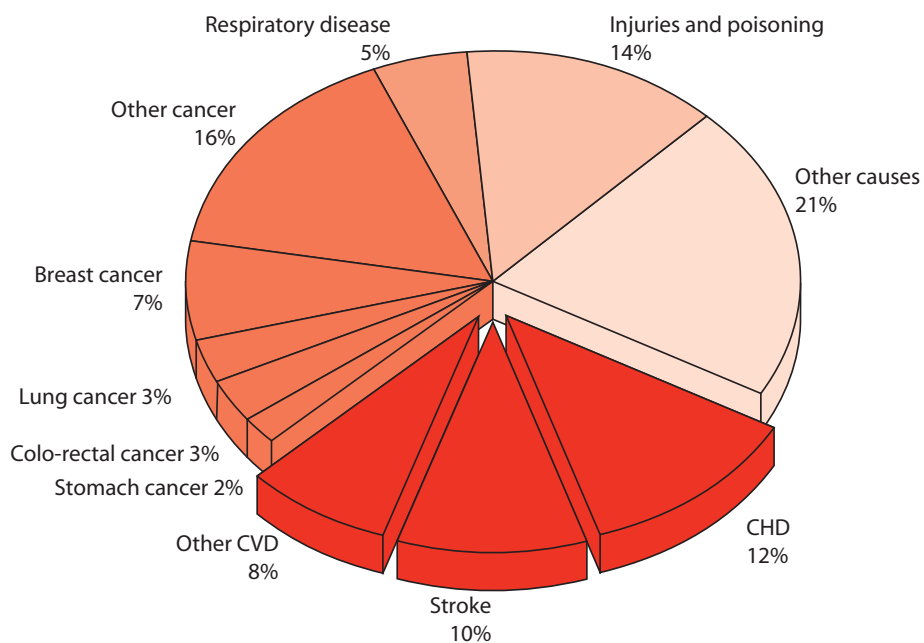




Figure 1.3c Deaths under 65 by cause, men, latest available year EU

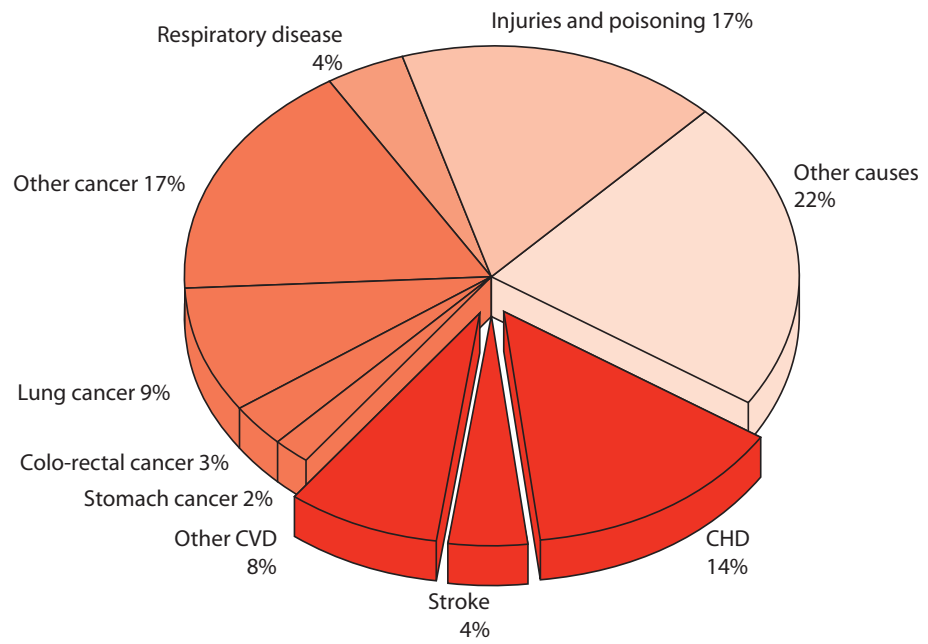


Figure 1.3d Deaths under 65 by cause, women, latest available year, EU

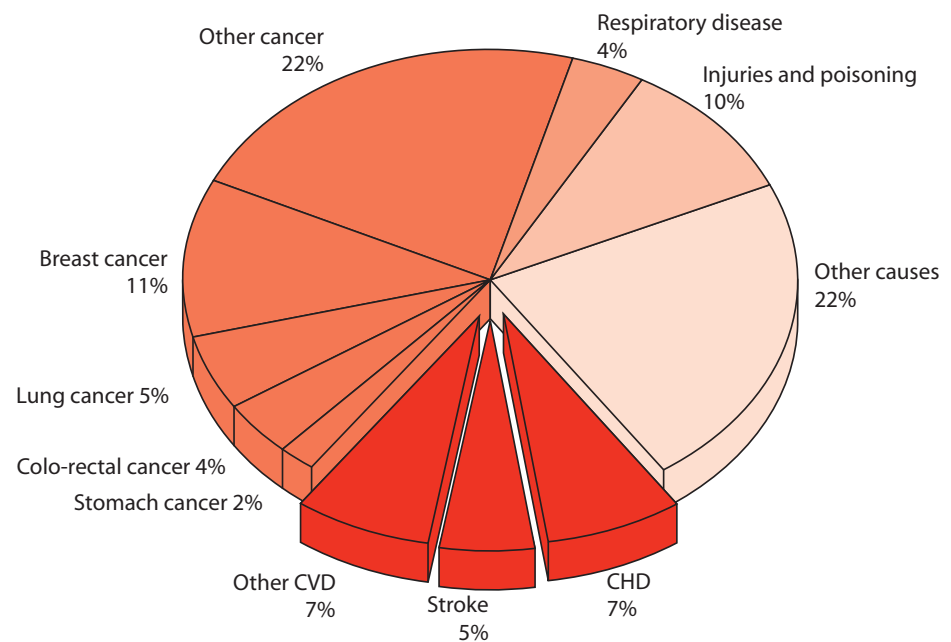






Figure 1.4a Age-standardized death rates from CHD, men aged 35-74, latest available year

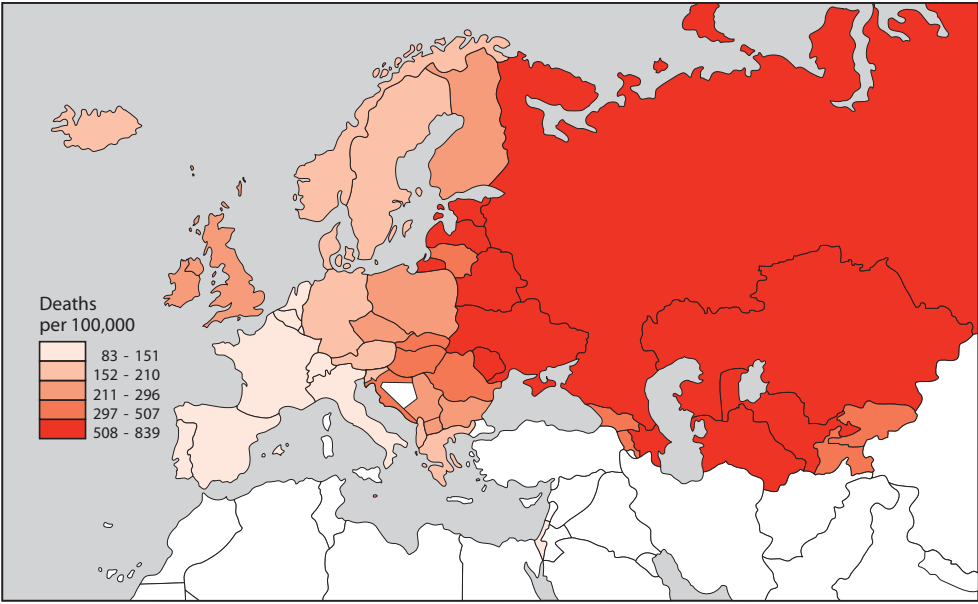


Figure 1.4b Age-standardized death rates from CHD, women aged 35-74, latest available year

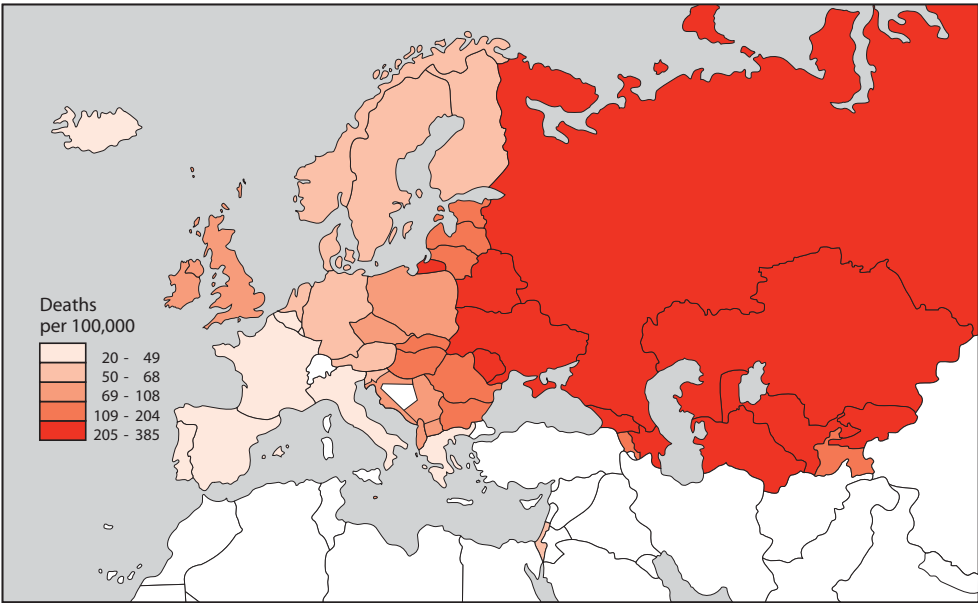


Figure 1.4c Death rates from CHD, men aged 35-74, 1968-2001, selected countries

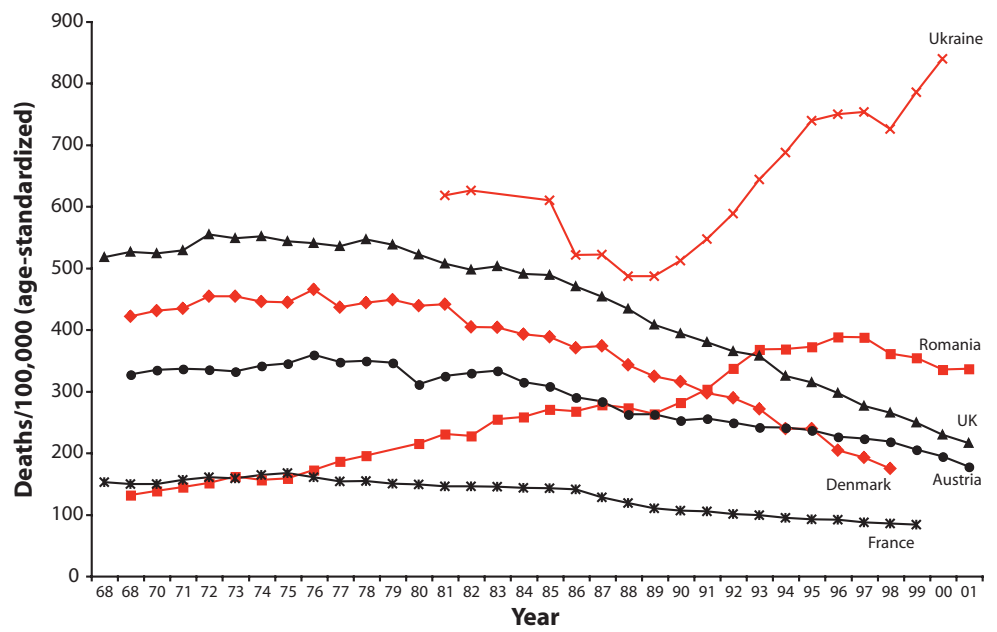


Figure 1.4d Death rates from CHD, women aged 35-74, 1968-2001, selected countries

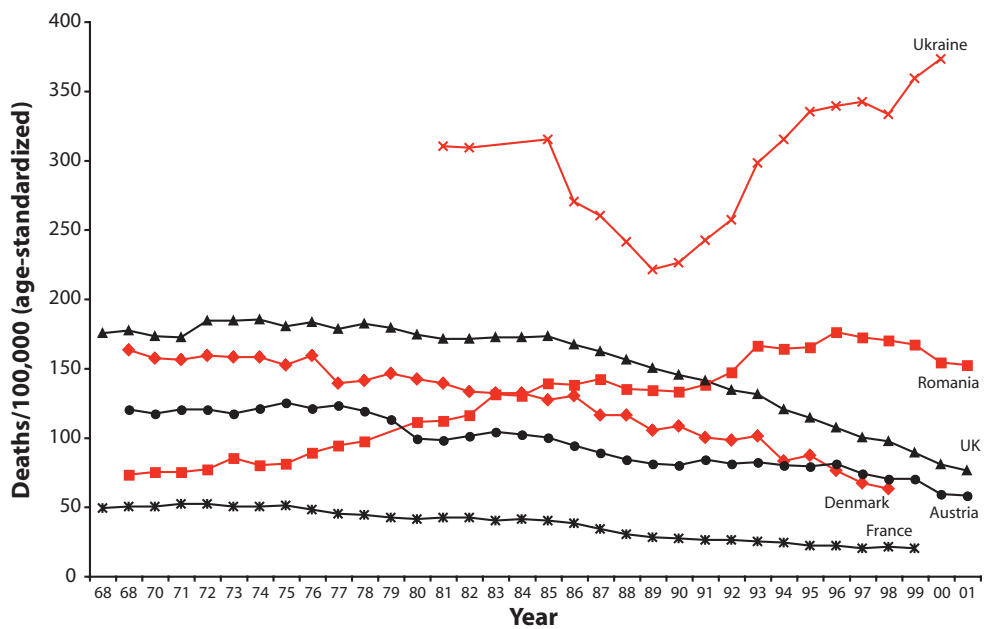






Figure 1.5a Age-standardized death rates from stroke, men aged 35-74, latest available year

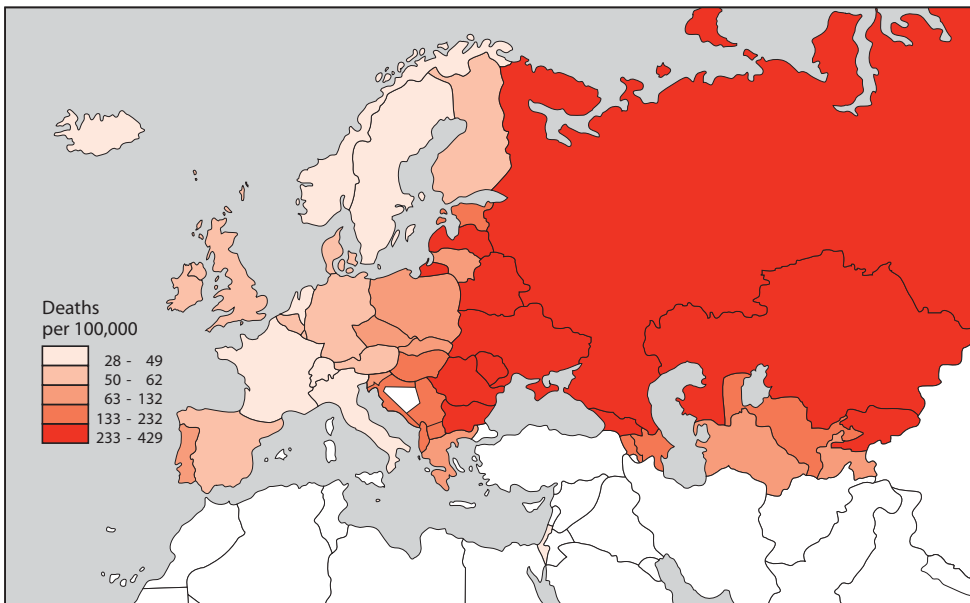


Figure 1.5b Age-standardized death rates from stroke, women aged 35-74, latest available year

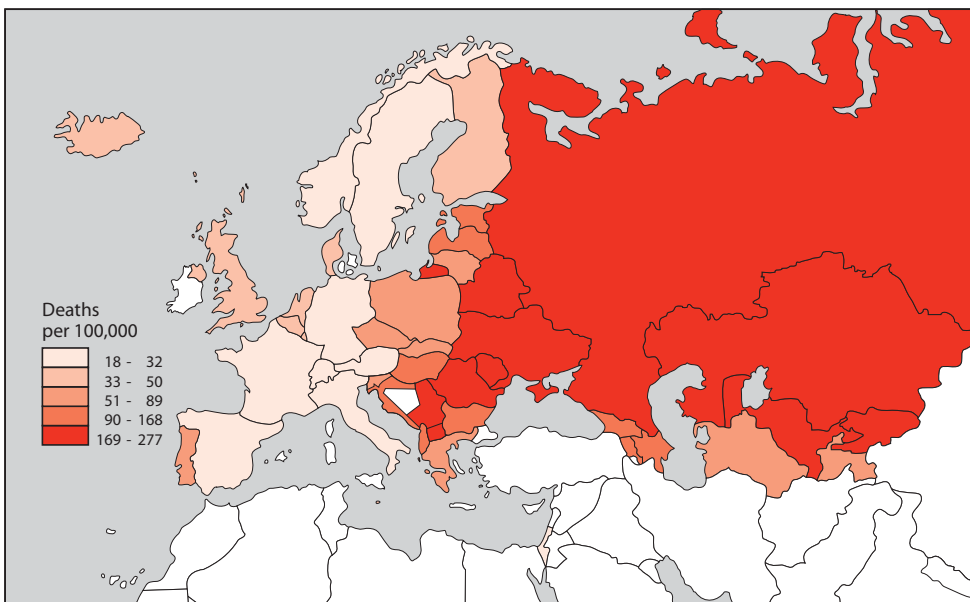




Figure 1.5c Death rates from stroke, men aged 35-74, 1968-2001, selected countries

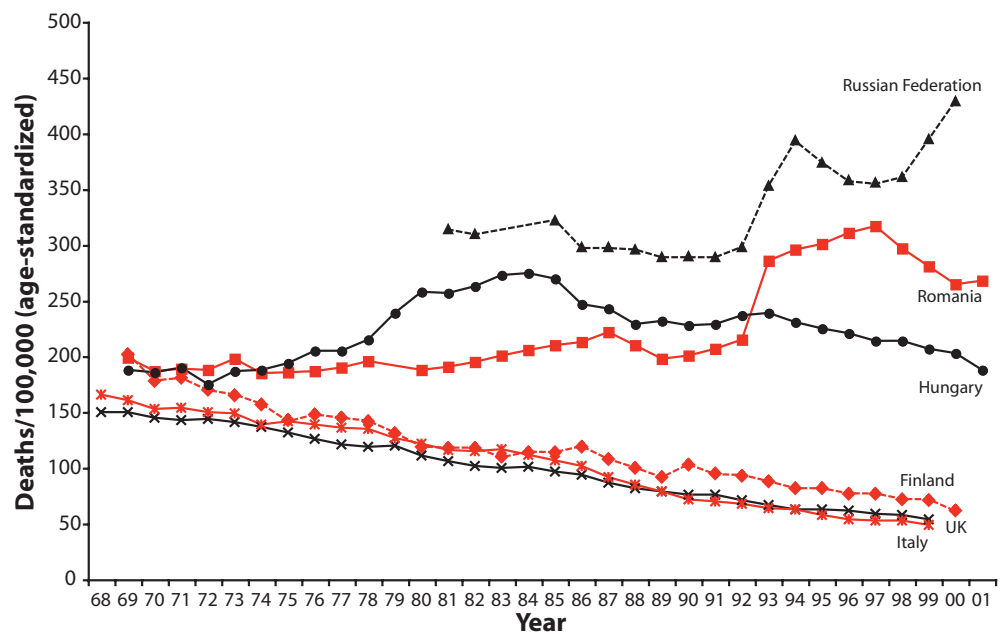
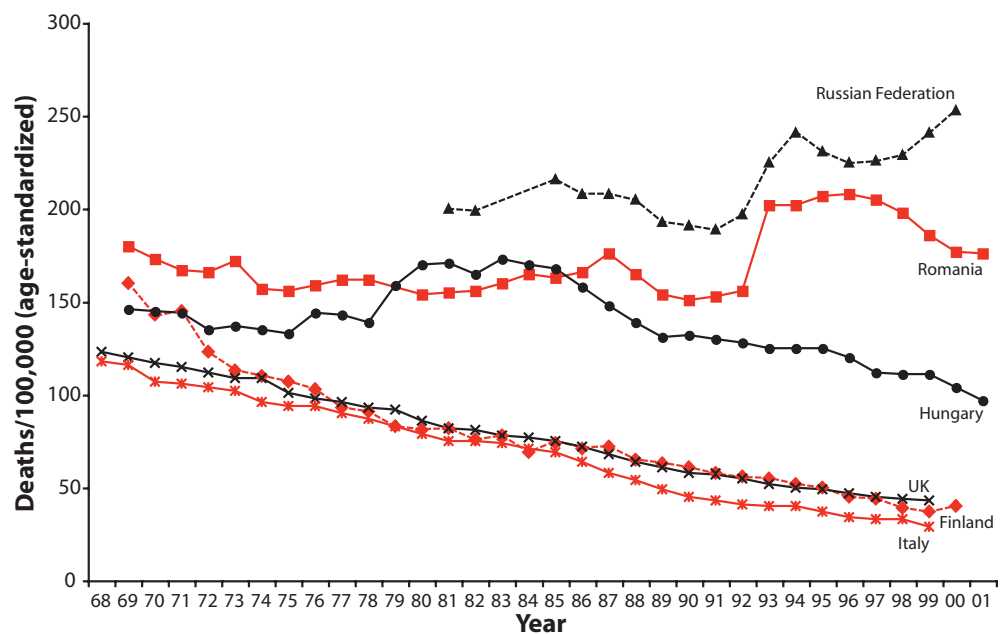


Figure 1.5d Death rates from stroke, women aged 35-74, 1968-2001, selected countries



# 2. Morbidity

## *Incidence rates*

Comparable data on morbidity are not collected on a country-wide basis across Europe<sup>1</sup>. The World Health Organization MONICA (monitoring trends and determinants in cardiovascular disease) Project<sup>2</sup> has examined the incidence of CHD in 37 different populations in 21 countries (including 29 populations in 16 European countries) but these populations are not necessarily representative of the countries in which they are located.

Nevertheless the Project has shown that the incidence of coronary events (a definite or likely myocardial infarction - heart attack) is higher in MONICA Project populations in Northern, Central and Eastern Europe than in Southern and Western Europe (with the exception of the United Kingdom). For example the incidence rate for men aged 35-64 living in Warsaw (Poland) is three times higher than it is in Catalonia (Spain) and for women it is four times higher. The highest incidence rates at the end of the Project were found in Glasgow (United Kingdom) in both men and women. The geographical pattern in incidence rates is therefore similar to the geographical pattern in death rates (Table 2.1).

The results of the MONICA Project also show that incidence of coronary events is falling rapidly in most of the MONICA Project populations in Northern and Western Europe but is not falling as fast in the populations in Southern, Central and Eastern Europe and in some cases is rising in these populations. For example incidence rates for men aged 35-64 living in North Karelia (Finland) fell by 6.5% per year over the study period (1983-1996) but rose by 1.2% for men of the same age living in Kaunas (Lithuania). For women aged 35-64 living in North Karelia the incidence rate fell by 5.1% per year but rose by 2.7% per year for women living in Kaunas. Again the geographical pattern in trends in incidence rates is similar to the geographical pattern in trends in death rates (Table 2.1)<sup>3</sup>.

## *Case fatality*

The MONICA Project has also investigated patterns and trends in case fatality. Case fatality is defined by the MONICA Project as dying within 28 days of a coronary event. Case fatality rates are affected by many factors including the accuracy of diagnosis, the severity of the disease and the impact of treatment.

The MONICA Project shows that case fatality from CHD is higher in many populations in Central and Eastern Europe than in most populations in Northern, Southern and Western Europe. For example case fatality for both men and women (aged 35-64) living in Moscow (Russia) is 50% higher than in Belfast (United Kingdom) or in Catalonia (Spain) (Table 2.1).

The results of the MONICA Project also show that case fatality is falling in most of the MONICA Project populations in Southern, Northern and Western Europe but is not falling as fast in the populations in Central and Eastern Europe and in some cases is rising in these populations. For example case fatality for men aged 35-64 living in Toulouse (France) fell by 3.8% per year over the study period but rose by 3.0% for men of the same age living in Moscow (Russia). For women

aged 35-64 living in Toulouse the case fatality rate fell by 3.6% per year but rose by 1.5% per year for women living in Moscow (Table 2.1).

The MONICA Project was partly established to investigate how much of reported declines in CHD mortality are attributable to improvements in case fatality and how much to declines in incidence. The Project concludes that the 'contribution to changing CHD mortality varied, but in populations in which mortality decreased, coronary-event rates contributed two thirds and case fatality one third'<sup>2</sup>.

It is important to note, however, that the MONICA project data are now 10 years out of date and the patterns of CHD incidence and case fatality across Europe may have changed since the mid 1990's. Furthermore, the definition of myocardial infarction (heart attack) has changed following the introduction of troponin estimations which have increased the ability to detect myocardial infarction.

### *Years of life lost in disability and disability-adjusted life years lost*

Data from the World Health Organization's Global Burden of Disease Study have shown that while CVD is not the major cause of years of life lost in disability - compared with neuropsychiatric disorders and injuries - it is still a significant cause. The study estimated that in 1990, 6% of years of life lost in disability were due to CVD in 'Established Market Economies' (mostly Northern, Southern and Western countries in Europe and all the member states of the EU-15) compared with 4% due to cancer. In 'Formerly Socialist Economies of Europe' (Central and Eastern European countries), 7% of years of life lost in disability were due to CVD compared with 2% due to cancer<sup>4</sup>.

The Global Burden of Disease Study has developed a measure to quantify the burden of disease in different populations which takes into account time lost due to premature mortality and time lived with disability. This measure is called the Disability-Adjusted Life Year (DALY). The 2004 WHO World Health Report described the overall burden of disease in Europe in terms of DALY's lost due to different diseases. It showed that CVD is the major cause of DALY's lost in Europe, responsible in 2002 for 23% overall (Table 2.2 and Figure 2.2a). CVD is the second main cause of DALY's lost in the EU, responsible in 2002 for 18% overall (exceeded only by neuropsychiatric disorders, responsible for 25% overall) (Table 2.2 and Figure 2.2b).

In the EU alone over 11 million DALY's were lost due to CVD in 2002, of which nearly 5 million were lost due to CHD and over 3 million due to stroke. In Europe as a whole over 150 million DALY's were lost due to CVD in 2002 of which nearly 16 million were lost due to CHD and over 7 million were lost due to stroke (Table 2.2).

1. *The lack of comparable data on CVD morbidity has been discussed recently by the EUROCISS Project (Cardiovascular Indicators Surveillance Set). This project, co-funded by the European Commission, has developed a set of indicators to improve the future monitoring of CVD in the EU (see [www.cuore.iss.it/eurociss/en/eurociss.htm](http://www.cuore.iss.it/eurociss/en/eurociss.htm)) and will be working over the next three years with Member States to improve the quality and comparability of CVD morbidity data in Europe.*
2. *Tunstall-Pedoe H, Kuulasmaa K, Mahonen M, Tolonen H, Ruokokoski E, Amouyel P, for the WHO MONICA Project (1999) Contribution of trends in survival and coronary-event rates to changes in coronary heart disease mortality: 10 year results from 37 MONICA Project populations. Lancet 353; 1547-57.*
3. *For more details see WHO Monica Project (2003) MONICA Monograph and Multimedia Sourcebook: World's largest study of heart disease stroke, risk factors and population trends 1979-2002. Edited by Hugh Tunstall-Pedoe for the WHO MONICA Project. WHO: Geneva.*
4. *Murray JL and Lopez AD (1996) The global burden of disease. WHO: Geneva.*

**Table 2.1** Coronary event rates, coronary case fatality, annual change in coronary event rates and annual change in coronary case fatality, adults aged 35-64, by sex, latest available data, MONICA Project populations

MONICA population	MONICA population code	Survey years	MEN				WOMEN			
			Coronary event rate	Coronary case fatality	Annual change in coronary event rate	Annual change in coronary case fatality	Coronary event rate	Coronary case fatality	Annual change in coronary event rate	Annual change in coronary case fatality
			Events per 100,000	% of fatalities within 28 days	%	%	Events per 100,000	% of fatalities within 28 days	%	%
Belgium-Charleroi	BEL-CHA	1983/92	487	50.1	0.3	-1.8	118	59.3	1.1	-1.8
Belgium-Ghent	BEL-GHE	1983/92	346	47.4	-3.2	-1.6	77	58.0	-3.0	-1.8
Czech Republic	CZE-CZE	1984/93	515	52.8	-0.4	0.7	101	53.9	2.1	-1.2
Denmark-Glostrup	DEN-GLO	1982/91	517	52.5	-4.2	1.5	140	38.0	-2.5	2.5
Finland-Kuopio Province	FIN-KUO	1983/92	718	45.7	-6.0	1.0	124	38.7	-4.5	1.0
Finland-North Karelia	FIN-NKA	1983/92	835	48.1	-6.5	-0.5	145	41.3	-5.1	-1.9
Finland-Turku/Loimaa	FIN-TUL	1983/92	549	48.5	-4.2	-0.2	94	48.9	-4.5	-1.9
France-Lille	FRA-LIL	1985/94	298	58.7	-1.1	-0.3	64	69.5	-1.6	0.8
France-Strasbourg	FRA-STR	1985/93	292	49.0	-3.9	-1.7	64	57.1	-6.6	-2.3
France-Toulouse	FRA-TOU	1985/93	233	40.0	-2.1	-3.8	36	59.8	-1.7	-3.6
Germany-Augsburg	GER-AUG	1985/94	286	55.1	-3.2	1.3	63	64.6	0.9	-0.4
Germany-Bremen	GER-BRE	1985/92	361	49.6	-3.4	-0.9	81	52.0	0.7	-2.9
Germany-East Germany	GER-EGE	1985/93	370	50.0	-0.5	1.7	78	62.8	2.5	-2.2
Iceland	ICE-ICE	1981/94	486	36.9	-4.7	-2.1	99	34.1	-3.7	-1.0
Italy-Area Brianza	ITA-BRI	1985/94	279	40.7	-2.3	-0.8	42	52.5	-3.5	-4.8
Italy-Friuli	ITA-FRI	1984/93	253	45.1	-0.9	-2.0	47	49.9	-0.8	-2.0
Lithuania-Kaunas	LIT-KAU	1983/92	498	54.8	1.2	1.0	80	53.7	2.7	-1.2
Poland-Tarnobrzeg	POL-TAR	1984/93	461	82.7	1.1	1.2	110	88.4	-0.1	-0.7
Poland-Warsaw	POL-WAR	1984/94	586	59.9	0.8	-0.4	133	59.2	1.0	-2.1
Russia-Moscow (control)	RUS-MOC	1985/93	477	60.7	-1.0	3.0	92	60.2	-6.7	1.5
Russia-Novosibirsk (control)	RUS-NOC	1984/92	464	59.9	0.9	-0.1	111	66.5	2.3	0.3
Spain-Catalonia	SPA-CAT	1985/94	210	36.7	1.8	-1.7	35	45.5	2.0	1.5
Sweden-Gothenburg	SWE-GOT	1984/94	363	43.6	-4.2	0.3	84	45.4	-3.7	1.2
Sweden-Northern Sweden	SWE-NSW	1985/95	509	36.1	-5.1	-2.9	119	34.4	-2.4	0.4
Switzerland-Ticino	SWI-TIC	1985/93	290	33.5	-2.6	-4.2				
Switzerland-Vaud/Fribourg	SWI-VAF	1985/93	231	38.4	-3.6	-3.0				
United Kingdom-Belfast	UNK-BEL	1983/93	695	41.0	-4.6	-1.5	188	41.5	-2.4	-1.7
United Kingdom-Glasgow	UNK-GLA	1985/94	777	48.2	-1.4	-1.3	265	46.4	0.2	-2.1
Yugoslavia-Novi Sad	YUG-NOS	1984/95	422	51.9	0.4	-0.4	101	49.9	2.8	0.5

Age-standardized rates: see source for definitions, details of age-standardization and how trends were calculated.

Source: Tunstall-Pedoe H, Kuusasmaa K, Mahonen M, Tolonen H, Ruokokoski E, Amonei P, for the WHO MONICA Project (1999). Contribution of trends in survival and coronary-event rates to changes in coronary heart disease mortality: 10-year results from 37 MONICA Project populations. *Lancet* 353; 1547-57.

Table 2.2 Disability-adjusted life years (DALYs) by cause, 2002, WHO Mortality Sub-Region, EU and Europe

	WHO Mortality Sub-Region				EU				EUROPE			
	EUR-A		EUR-B		EUR-C		EU		EUROPE		EUROPE	
	Very low child, very low adult mortality	DALYs lost (1000s)	% of total DALYs lost	Low child, low adult mortality	DALYs lost (1000s)	% of total DALYs lost	Low child, high adult mortality	DALYs lost (1000s)	% of total DALYs lost	DALYs lost (1000s)	% of total DALYs lost	DALYs lost (1000s)
Cardiovascular disease	8,838	17.1	21.7	8,175	17,405	28.6	11,108	18.4	34,418	22.9		
Coronary heart disease	3,569	6.9	9.0	3,382	8,800	14.4	4,618	7.7	15,751	10.5		
Stroke	2,654	5.1	6.7	2,522	5,618	9.2	3,375	5.6	10,794	7.2		
Diabetes	1,105	2.1	1.5	566	522	0.9	1,190	2.0	2,193	1.5		
Cancer	8,549	16.5	8.7	3,289	5,322	8.7	9,078	15.0	17,160	11.4		
Lung cancer	1,668	3.2	1.6	620	956	1.6	1,761	2.9	3,244	2.2		
Cancer of the colon and rectum	1,027	2.0	0.8	285	550	0.9	1,063	1.8	1,862	1.2		
Breast cancer	939	1.8	0.7	277	487	0.8	974	1.6	1,703	1.1		
Infectious diseases	891	1.7	5.4	2,040	2,734	4.5	1,424	2.4	5,665	3.8		
Diarrhoeal diseases	110	0.2	1.3	485	97	0.2	206	0.3	692	0.5		
Sexually transmitted diseases incl. HIV	280	0.5	0.5	188	1,274	2.1	385	0.6	1,742	1.2		
Respiratory infections	690	1.3	4.0	1,524	901	1.5	1,012	1.7	3,115	2.1		
Neuropsychiatric disorders	13,732	26.5	18.7	7,055	8,562	14.1	14,932	24.8	29,349	19.5		
Alcohol use disorders	2,227	4.3	1.7	636	1,799	3.0	2,348	3.9	4,662	3.1		
Alzheimer and other dementias	1,989	3.8	1.1	398	549	0.9	1,994	3.3	2,936	2.0		
Depression	4,117	8.0	7.0	2,626	2,598	4.3	4,580	7.6	9,341	6.2		
Respiratory diseases	3,406	6.6	4.1	1,547	1,782	2.9	3,641	6.0	6,735	4.5		
Digestive diseases	2,414	4.7	5.0	1,900	3,082	5.1	2,859	4.7	7,396	4.9		
Musculo-skeletal (non-rheumatic) disease	2,197	4.2	4.0	1,513	1,924	3.2	2,501	4.1	5,634	3.7		
Injuries	4,081	7.9	10.8	4,058	12,806	21.0	5,498	9.1	20,945	13.9		
Road traffic injuries	1,233	2.4	1.7	641	1,732	2.8	1,405	2.3	3,606	2.4		
Other unintentional injuries	1,809	3.5	6.6	2,482	6,585	10.8	2,632	4.4	10,876	7.2		
Suicide	890	1.7	1.4	532	1,969	3.2	1,075	1.8	3,391	2.3		
<b>Total</b>	<b>51,725</b>	<b>100.0</b>	<b>100.0</b>	<b>37,697</b>	<b>60,900</b>	<b>100.0</b>	<b>60,320</b>	<b>100.0</b>	<b>150,322</b>	<b>100.0</b>		

Figures for EUR-A, EUR-B and EUR-C from WHO World Health Report 2004. Figures for the EU calculated from these. See Appendix for a list of countries in each WHO mortality sub-region.

Source: World Health Organization (2004) The World Health Report 2004. WHO: Geneva.

Figure 2.2a Disability-adjusted life years lost by cause, 2002, Europe

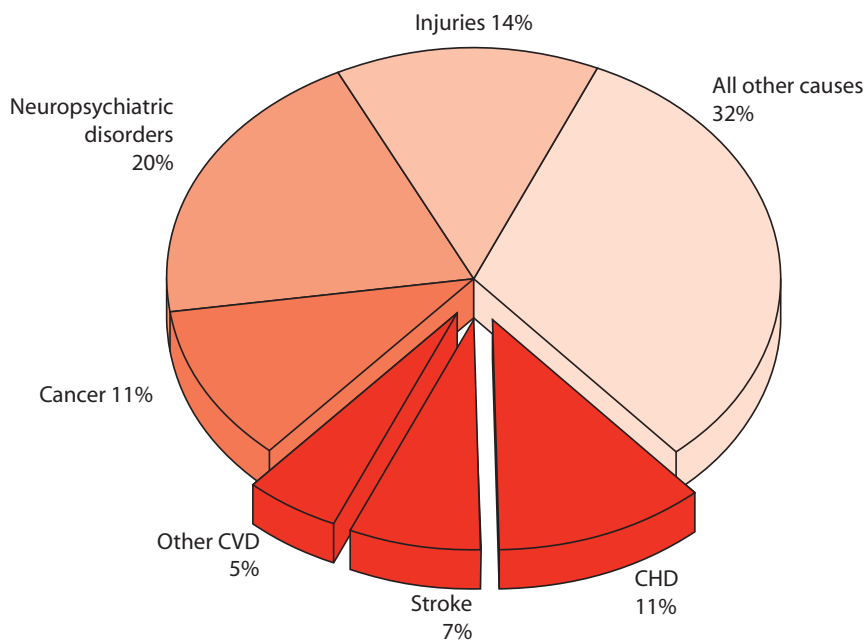
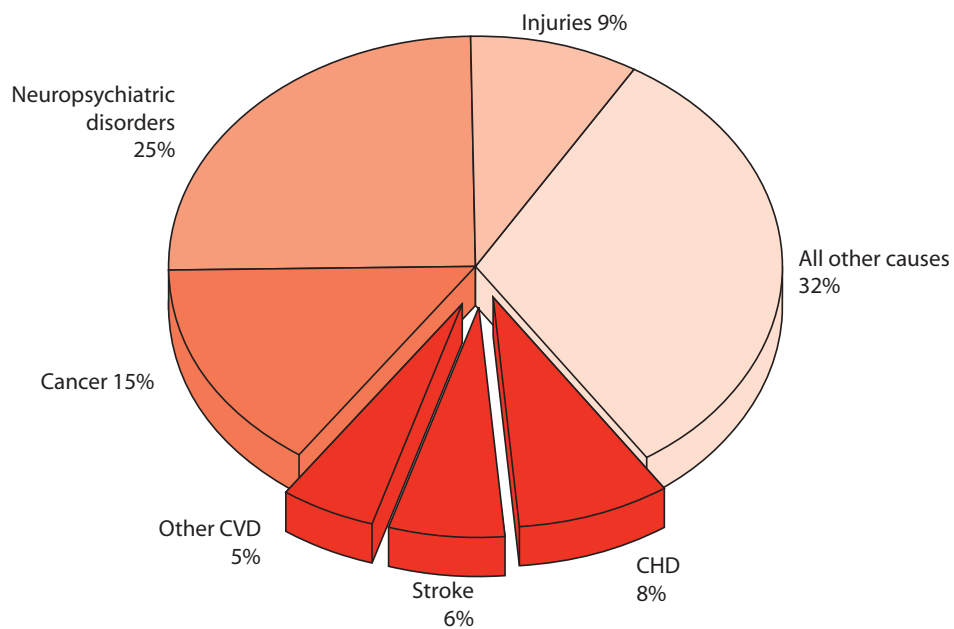


Figure 2.2b Disability-adjusted life years lost by cause, 2002, EU



# 3. Treatment

## *Hospital admissions*

Rates of admissions (or more technically discharges) for CVD vary considerably across Europe. For example, the hospital admission rate is over four times higher in Belarus than in Portugal. In general there are higher admission rates in Northern, Central and Eastern European countries than in Southern and Western countries (although rates are very low in some Eastern European countries). The geographical pattern in rates of admissions for CHD and stroke is similar to the geographical pattern in admissions for CVD (Table 3.1 and Figure 3.1).

There are likely to be many reasons for these differences but one possible reason could be that incidence of CVD in Northern, Central and Eastern European countries is generally higher than in Southern and Western countries (see Section 2). If admission rates for CHD are adjusted for standardized mortality rates from CHD in adults aged 35-74 (as a surrogate for incidence rates) we can see that some countries have higher rates of admissions than might be expected and some lower. Countries which have lower rates than might be expected given their incidence rates are generally countries of the former USSR – Azerbaijan, Turkmenistan, Uzbekistan, Republic of Moldova, Kyrgyzstan and Kazakhstan have particularly low rates. Countries with higher rates than expected are generally countries of Western, Northern and Southern Europe – Germany, Finland, Austria, Norway and Belarus have particularly high rates (Figure 3.1).

## *Coronary revascularisation and other procedures for CVD*

Rates of coronary revascularisation and other procedures for CVD vary widely across Europe. In general Central and Eastern European countries have lower rates than Northern, Southern and Western Countries. Within Northern, Southern and Western European countries there is no consistent geographical pattern but some countries, for example France, have high rates for all procedures (Table 3.2).

Again there are likely to be many reasons for these differences. If revascularisation rates are adjusted to take account of incidence we find that some countries have lower rates and other countries higher rates than might be expected. For example if rates of coronary artery bypass surgery are adjusted (as above) for incidence of CHD we can see that in 2000 Finland, Israel and Sweden have much higher rates than might be expected whilst Latvia, Estonia and Romania have much lower rates (Figure 3.2a). If rates of percutaneous coronary interventions (PCI) are adjusted in a similar way, it shows that Israel, Germany and France have much higher rates than expected and Latvia, Estonia and Romania have much lower rates. This analysis also shows that a number EU member states - including, Finland, Ireland and the UK - also have lower rates of PCI than would be expected (Figure 3.2b).

While rates of revascularisation vary widely across Europe, all countries have seen rates increase significantly since the 1990's. For example, since 1990 rates of PCI have increased twenty-fold in Hungary, fifteen-fold in Italy and twelve-fold in Finland. Most recently, the biggest increase in

rates of PCI have been in Eastern European countries and Baltic States, including, for example, a twelve fold increase in Latvia between 1995 and 2000 (Table and Figure 3.3).

## Drugs

Data on the use of drugs in the treatment and prevention of CVD in different countries can be obtained from pharmaceutical market research companies but the data we have obtained from this source are difficult to interpret and we have not included any in this edition of *European cardiovascular disease statistics*.

The European Society of Cardiology's EUROASPIRE studies have investigated one aspect of drug use – that is, in relation to the secondary prevention of CHD - in fifteen different countries. The results, which derive from surveys in a number of key hospitals in each country, while not necessarily representative of prescribing patterns nationally, do give some idea of the scale of drug use across Europe. The EUROASPIRE II survey showed that the use of drugs for secondary prevention in CHD patients varied considerably across survey populations, except in the case of anti-platelet drugs where over 80% of patients took this form of drug (mostly aspirin) in all the countries studied. The use of beta-blockers varied two-fold (from 44% in Hull and London, UK to 88% of patients in Lille, France), as did the use of lipid lowering drugs (from 42% in Cracow, Poland to 77% in Malmo, Sweden). The use of ACE inhibitors varied three-fold (from 19% in Malmo, Sweden to 69% in Ljubljana, Slovenia) (Table 3.4).

Nine countries were surveyed in both the 1995 and 1999/2000 EUROASPIRE studies. Results show a general increase over this period in the use of beta-blockers, ACE inhibitors, and, most notably, lipid-lowering drugs for the secondary prevention of CHD. The use of lipid-lowering drugs (including statins) almost doubled in all but one of the study populations<sup>1,2</sup>.

This general increase in the use of drugs for secondary prevention noted by EUROASPIRE, has also been found in more representative studies carried out at a national level. For example, data from the Myocardial Infarction National Audit Project (MINAP) in the UK show a rapid increase in the use of beta blockers, lipid-lowering drugs (namely statins) and aspirin in people discharged from hospital in England and Wales following a heart attack during over the past five years<sup>3</sup>.

1. EUROASPIRE Study Group (1997) EUROASPIRE. A European Society of Cardiology survey of secondary prevention of coronary heart disease. Principal results. *European Heart Journal*; 18: 1569-1582.
2. EUROASPIRE II Study Group (2001) Lifestyle and risk factor management and use of drug therapies in coronary patients from 15 countries. Principal results from EUROASPIRE II Euro heart Survey Programme. *European Heart Journal*; 22: 554-572.
3. Royal College of Physicians (2003) *How Hospitals Manage Heart Attacks. Second Public Report of the Myocardial Infarction National Audit Project*. London: Royal College of Physicians. See [www.rcplondon.ac.uk/pubs/books/minap/index.htm](http://www.rcplondon.ac.uk/pubs/books/minap/index.htm)



**Table 3.1** Rates of hospital discharges from CVD, CHD and stroke, latest available year

Discharges per 100,000		CVD	CHD	Stroke
Albania	2002	509	153	78
Andorra	2002	799	142	123
Armenia	2002	677	288	147
Austria	2001	3895	950	632
Azerbaijan	2002	515	155	53
Belarus	2002	5049	2278	949
Belgium	1998	2609	778	389
Bulgaria	2002	2292	489	586
Croatia	2002	1730	458	396
Cyprus	2001	927	360	149
Czech Republic	2002	3495	1087	639
Denmark	2002	2598	865	424
Estonia	2002	3168	1033	535
Finland	2002	3645	1128	644
France	2001	2249	503	212
Georgia	2002	494	224	75
Germany	2000	3362	1094	477
Greece	1999	2268	776	400
Hungary	2002	4248	879	969
Iceland	1998	1012	829	168
Ireland	2002	1478	493	250
Israel	2000	2043	862	290
Italy	2001	2570	593	494
Kazakhstan	2002	1519	521	278
Kyrgyzstan	2002	975	307	142
Latvia	2002	3175	1269	695
Lithuania	2002	4231	1374	912
Luxembourg	2000	2607		
Malta	2002	592	185	65
Macedonia, Fmr Yug Rep of	2000	1267	480	251
Moldova, Rep of	2002	1558	444	328
Netherlands	2002	1416	523	193
Norway	2001	2358	941	319
Poland	1996	2122	625	245
Portugal	2002	1213	285	350
Romania	2002	2965	848	442
Russian Federation	2002	3020	1178	668
Slovakia	2002	2539	917	475
Slovenia	2002	1718	394	222
Spain	1999	1364	313 *	221 *
Sweden	2002	2538	878	422
Switzerland	2002	1910	576	218
Tajikistan	2002	622	169	51
Turkey	2001	972	218	251
Turkmenistan	1997	875	304	77
Ukraine	2002	2964	1380	629
Uzbekistan	2002	1178	392	99
<b>EU average</b>	<b>2002</b>	<b>2419</b>	<b>849</b>	<b>457</b>
<b>European average</b>	<b>2002</b>	<b>2557</b>	<b>695</b>	<b>375</b>

\* 1997

Source: World Health Organization (2004) *European Health for All* statistical database. <http://www.who.dk/>

Figure 3.1 Rates of hospital discharges from CHD, crude and adjusted for standardized mortality rates from CHD in adults aged 35-74, latest available year

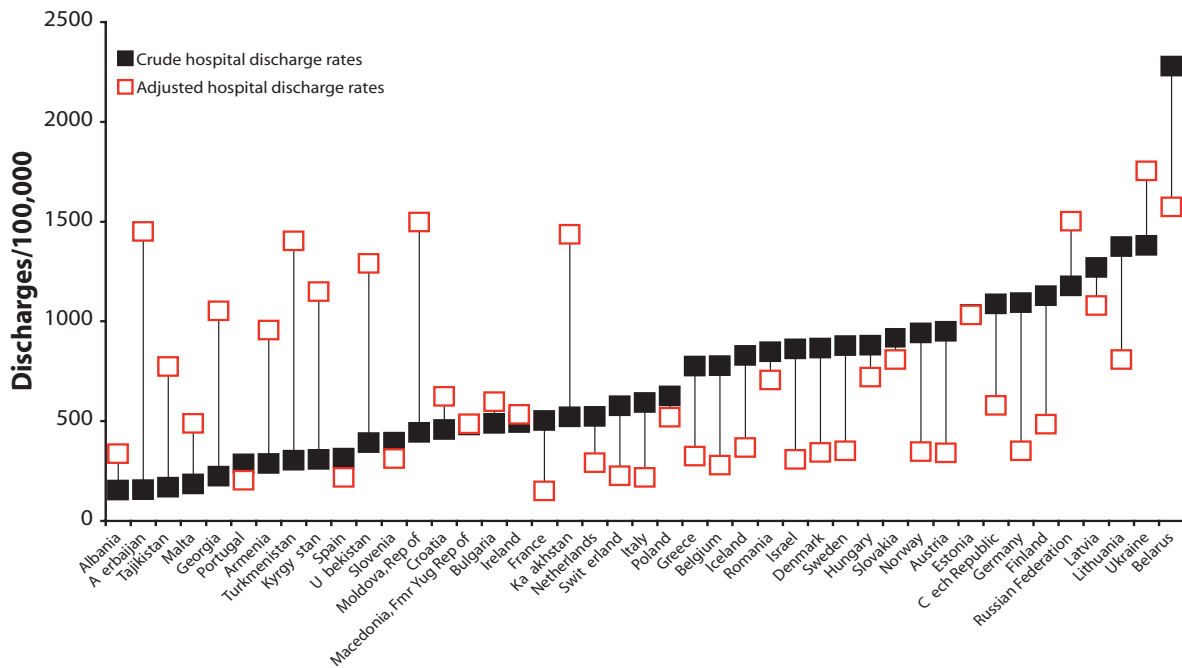


Table 3.2 Rates of various procedures for treating CVD, per million population, around 2000

	Coronary Angiograms	Percutaneous coronary interventions	Coronary stents	Open heart surgery	Valve surgery	Coronary artery bypass surgery	Pacemakers	Implantable cardioverter defibrillators
	Procedures per million population							
Austria	4,061	1,146	848	815		468		
Belgium	4,798	1,536	931	1,230			857	48
Bugaria	397	126	38	171	56	78	169	0
Croatia		443		305				
Czech Republic	2,265	724	504	551	127	469	508	12
Denmark		825		993				
Estonia	1,530	388	237	475	111	323	364	0
Finland	2,522	607	365	1,054	183	921	361	19
France	4,009	1,560	1,501	679	214	408	798	18
Germany		2,194		1,191				
Greece	1,660	382	322				442	15
Hungary	1,667	249	191	525	119	281	368	14
Iceland	4,098	1,670	1,241	599	141	404	520	
Ireland		537		718				
Israel	4,719	2,377		1,266	156	879		
Italy	2,846	962						
Latvia	1,120	365	260	317	97	237	253	3
Lithuania	1,622	523	127	396	127	241	249	3
Macedonia	967	415	385	151	21	115	80	1
Netherlands		1,091		904				
Norway				954				
Poland	1,520	527	298	438	66	303	358	7
Portugal	2,058	538	458	550	156	297	390	9
Romania	531	77	75	119	48	49	53	0
San Marino	2,253	789	789	113	188	413		
Spain	1,646	581	449	435	174	162	371	38
Sweden		857		1,061		659		
Switzerland	3,907	1,358	991	907		565	447	27
Turkey	1,348	249	150				24	
United Kingdom		564	473	645	79	444	326	18

Data represent crude, non-standardized numbers per 1 million population. Rates for coronary artery bypass grafting include operations with and without valve surgery. Data collated by the European Society of Cardiology from national registries and reports from national cardiology societies.

Source: European Society of Cardiology (2004) Personal communication.

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Figure 3.2a Rates of coronary artery bypass surgery, crude and adjusted for standardized mortality rates from CHD in adults aged 35-74, around 2000

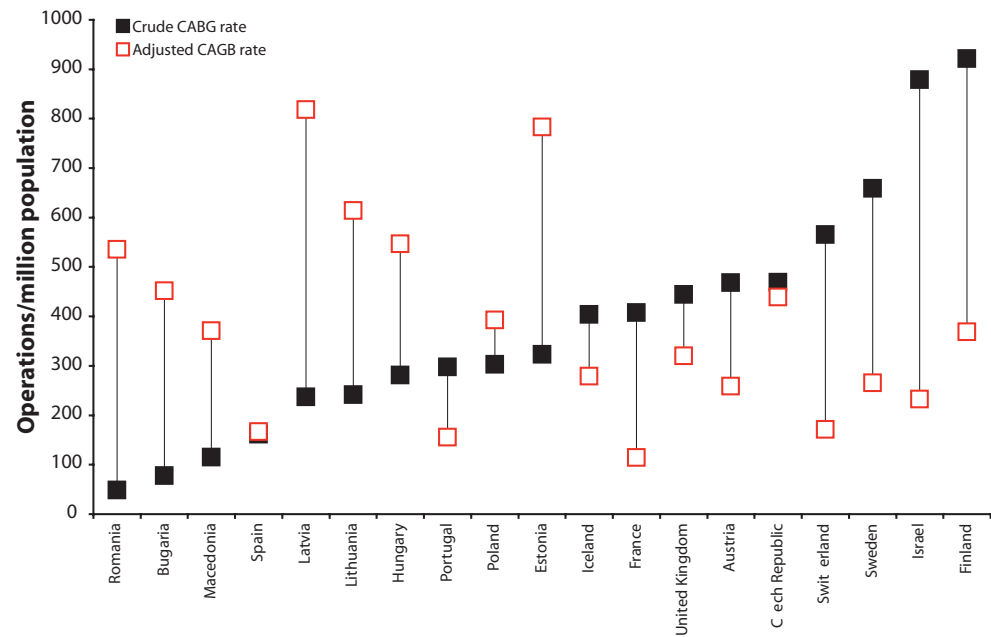
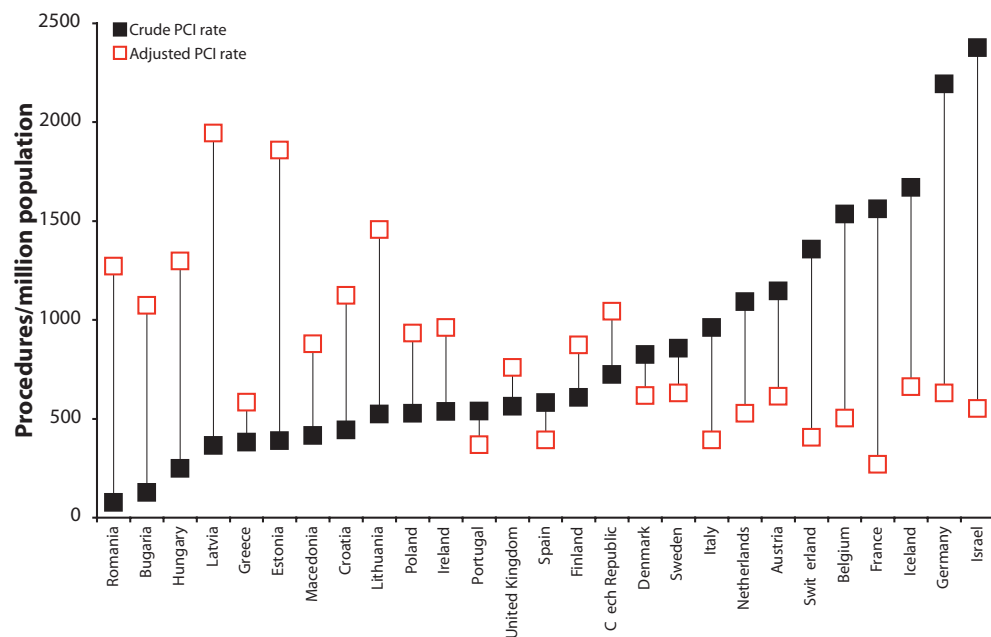


Figure 3.2b Rates of percutaneous coronary interventions, crude and adjusted for standardized mortality rates from CHD in adults aged 35-74, around 2000



**Table 3.3 Rates of percutaneous coronary interventions, per million population, 1990-2003**

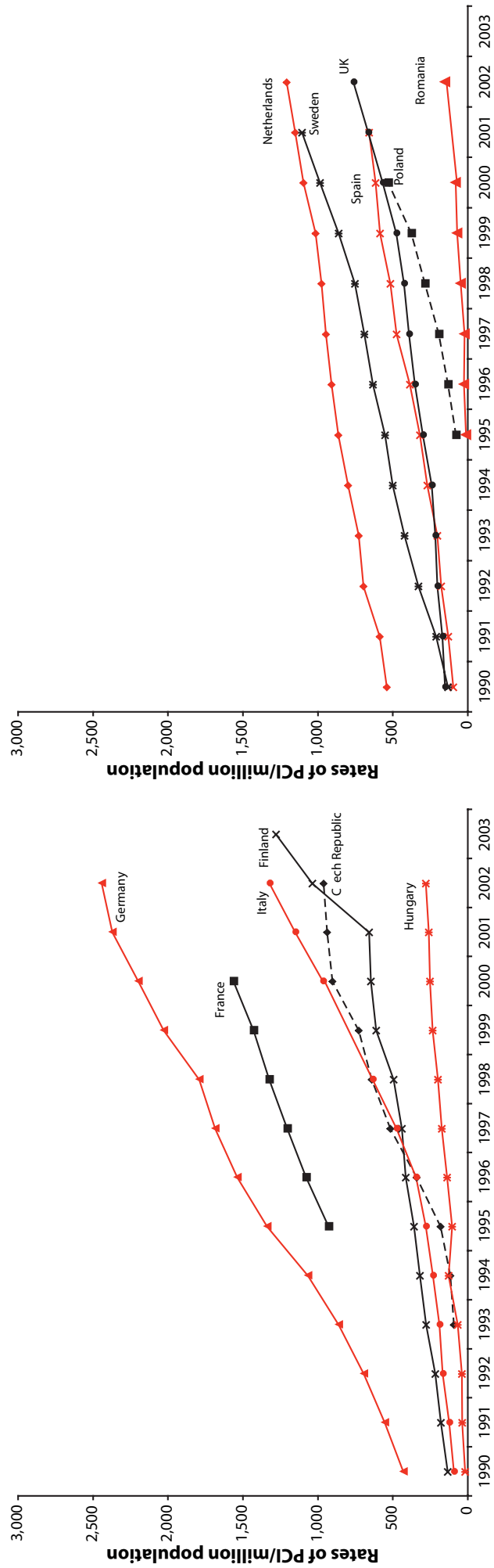
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Austria						733	832	942	1,059	1,040	1,291	1,482	1,686	
Belgium					1,133	1,375	1,375	1,291	1,459	1,536	1,647			
Croatia					55	58	82	82	260	443				
Czech Republic				89	112	177	338	513	637	724	899	935	958	
Denmark						293	429	535	730	825				
Estonia						155	236	261	321	430	388			
Finland	131	175	212	274	315	354	410	436	490	607	643	655	1,032	1,276
France	426	550	690	857	1,062	924	1,074	1,200	1,321	1,426	1,560			
Germany						1,335	1,533	1,682	1,788	2,024	2,194	2,368	2,439	
Greece				218	216	308	397	477	359	382				
Hungary	14	34	36	64	124	100	134	170	195	231	249	256	276	
Iceland	424	407	617	830	891	1,272	1,290	1,377	1,655	1,670	1,608			
Israel		464	622	999	1,207	1,299	1,402	1,502	2,006	2,377				
Italy	89	121	164	185	228	275	341	471	630		962	1,148	1,319	681
Latvia					21	31	45	135	193	315	365	448	520	
Lithuania						111	147	203	341	424	523			
Macedonia				6	26	36	113	154	157	193	415			
Netherlands	537	583	691	723	795	859	904	943	972	1,012	1,091	1,147	1,205	
Poland						75	129	190	281	373	527			
Portugal		49	72	69	116	176	234	303	370	459	538			
Romania						8	21	18	43	68	77		148	
San Marino	174	261	174	332		678	549	347	648	789				
Spain	92	127	173	200	266	315	382	472	512	581	612	654		
Sweden	128	206	325	418	497	547	628	686	750	857	981	1,102		
Switzerland						953	1,092	1,248	1,341	1,358	1,537			
Turkey				80	117	157	197	242	252					
UK	147	165	200	213	237	296	349	388	421	473	563	660	758	

Data represent crude, non-standardized numbers per 1 million population.

Data collated by the European Society of Cardiology from national registries and reports from national cardiology societies.

Source: European Society of Cardiology (2004) Personal communication.

Figure 3.3 Rates of percutaneous coronary interventions, per million population, 1990-2003



**Table 3.4** *Reported medication, hospital patients with established CHD, around 1999/2000, EUROASPIRE II Survey populations*

	Anti-platelets	Beta-blockers	ACE inhibitors	Lipid-lowering	Anti-coagulants
	%	%	%	%	%
Belgium-Ghent	89.6	76.9	29.6	48.9	3.1
Czech Republic-Pilsen and Prague	87.6	73.7	47.1	57.3	3.7
Finland-Kuopio	81.9	87.9	24.4	64.4	10.9
France-Lille	85.7	60.4	38.5	68.1	3.3
Germany-Munster	86.3	68.1	44.6	67.6	5.0
Greece-Athens, Thessaloniki, Crete and Ioannina	91.8	55.2	32.0	46.6	3.8
Hungary-Budapest	75.1	84.3	56.8	51.4	10.8
Ireland-Dublin	92.5	47.3	26.7	61.5	4.1
Italy-Treviso and Verona	91.5	61.2	51.9	59.7	1.2
Netherlands - Great Rotterdam	81.0	48.2	38.1	76.2	16.0
Poland-Cracow	87.1	61.6	47.8	41.9	6.3
Slovenia-Ljubljana	82.3	65.7	59.4	58.3	9.0
Spain-Barcelona and Province	85.6	47.3	21.8	64.6	6.2
Sweden-Malmo	92.1	63.5	18.9	76.5	8.7
United Kingdom-Hull and London	80.9	43.8	27.4	69.0	4.2
<b>Total</b>	<b>85.9</b>	<b>62.9</b>	<b>38.0</b>	<b>60.8</b>	<b>6.6</b>

25% of the patients were women; 22% were <51 years, 34% were aged 51-60, 44% were aged 61-70.

24% had recently had their first coronary artery bypass graft operation, 27% had recently had their first percutaneous transluminal coronary angioplasty for CHD, 29% had a hospital diagnosis of acute myocardial infarction, 21% had a hospital diagnosis of acute myocardial ischaemia without evidence of infarction.

Source: EUROASPIRE II Study Group (2001) Lifestyle and risk factor management and use of drug therapies in coronary patients from 15 countries: Principal results from the EUROASPIRE II Euro Heart Survey Programme. *European Heart Journal* 22: 554-572.

# 4. Smoking

## *Smoking related mortality and morbidity*

The long-term risk of smoking to individuals has been quantified in a 50-year cohort study of British doctors. Observing deaths in smokers and non-smokers over a 50-year period, the study concluded “ about half of all regular smokers will eventually be killed by their habit”<sup>1,2</sup>.

In Europe, about 20% of deaths from CVD in men and about 3% of deaths from CVD in women are due to smoking. (The equivalent figures for the EU are 16% and 5% respectively). A higher proportion of premature deaths from CVD are due to smoking. In Europe, smoking causes 32% of CVD deaths in men aged 35-69 years and 6% of CVD deaths in women of the same age. In the EU the equivalent figures are 28% and 13% respectively<sup>3</sup>.

Smoking is a major risk factor for many other diseases other than CVD - notably cancer - which means that about 24% of all deaths in men living in Europe and about 7% of all deaths in women are due to smoking (25% and 5% in the EU) (Table 4.1). Over 1 million men and 200,000 women in Europe die from smoking each year (of which 375,000 men and 78,000 women die from CVD). In the EU 510,000 men and 149,000 women die from smoking each year (of which 135,000 men and 48,000 women die from CVD (Table 4.1).

Research from the World Health Organization has estimated the impact of smoking on total disease burden (both mortality and morbidity) in terms of disability-adjusted life years (DALY's) lost. The World Health Report 2002 estimates that in developed countries around 12% of all disease burden and over 20% of CVD is due to smoking<sup>4</sup>.

More recently the INTERHEART case-control study estimated that 29% of heart attacks in Western Europe and 30% in Central and Eastern Europe are due to smoking, and that smokers and former smokers are at almost twice the risk of a heart attack compared to never smokers<sup>5</sup>.

## *Prevalence of smoking*

Data from the World Health Organization's "Health for All" database show that in most of Europe the prevalence of smoking is higher in men than it is in women. In only one country - Sweden - do women smoke more than men (16% men versus 19% women). In general the largest sex differences in smoking rates are found in Eastern and Central European countries and the smallest in Northern and Western countries (Table 4.2).

The prevalence of smoking in men is generally higher in Central, Eastern and Southern European countries than in Northern and Western countries. For example 63% of men smoke in the Russian Federation compared with 16% in Sweden. For women the prevalence of smoking is generally higher in Northern, Western and Southern countries than in Central and Eastern European countries, although the highest rates are found in Serbia and Montenegro (42%). Rates are particularly low in a number of the Central Independent States, with just 1% of women smoking in Armenia and 2% in the Republic of Moldova (Table 4.2 and Figures 4.2a and 4.2b).

The data on smoking among 15 year olds show that the percentage of boys who smoke at least once a week ranges from 45% in the Ukraine to 11% in Sweden, while the corresponding range for girls is from 37% in Austria to 12% in Lithuania. The consistent difference between the sexes in smoking prevalence rates observed in adults is not found in children. In around half the populations, girls smoke more than boys (Table 4.3 and Figure 4.3).

## *Trends in smoking prevalence*

Over the past 20 years the prevalence of smoking amongst men has fallen in many Northern, Southern and Western European countries. The prevalence of smoking amongst women has also fallen in some, but not all, of these countries. In many countries where there has been a decline in the prevalence of smoking amongst women the decline has been less marked. For example between 1980 and 2002 the prevalence of smoking in Swedish men fell by over 55% but in Swedish women it fell by just under 35%. In men living in the Netherlands it fell by 29% but in women it fell by only 6%. This has meant that the difference in smoking prevalence between men and women has become less pronounced in recent years (Table 4.4, Table 4.5 and Figure 4.5).

In many Northern, Southern and Western European countries the decline in the prevalence of smoking, both among men and women, has been less steep in recent years, with rates in a number of countries now relatively stable. The data from Central and Eastern European countries are much more sparse than that from Northern, Southern and Western countries, but suggests that smoking is not generally declining in these countries and in some is increasing – both in men and women (Table 4.4).

In children in Northern, Southern and Western countries the prevalence of smoking seems to be generally rising especially amongst girls but the data are sparse (Table 4.3).

1. Doll R, Peto R, Boreham J and Sutherland I (2004) Mortality in relation to smoking: 50 years' observations on male British doctors. *BMJ*; 328: 1519-27.
2. For a detailed discussion of the health effects of tobacco use, see the recent European Commission publication prepared by the ASPECT (Analysis of the Science and Policy for European Control of Tobacco) consortium, European Commission (2004) *Tobacco or Health in the EU: past, present and future*. Luxembourg: Office for Official Publications of the European Union and [http://europa.eu.int/comm/health/ph\\_determinants/life\\_style/Tobacco/Documents/tobacco\\_fr\\_en.pdf](http://europa.eu.int/comm/health/ph_determinants/life_style/Tobacco/Documents/tobacco_fr_en.pdf)
3. For table see [www.heartstats.org](http://www.heartstats.org).
4. World Health Organization (2002) *The World Health Report 2002. Reducing Risks, Promoting Healthy Life*. World Health Organization: Geneva.
5. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, McQueen M, Budaj A, Pais P, Varigo J, Lisheng A, on behalf of the INTERHEART Study Investigators (2004) Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART Study): case-control study. *The Lancet*; 364: 937-952.



Table 4.1 Total numbers of deaths and numbers of deaths due to smoking by cause, adults aged 35 and over, by sex, 2000

	ALL DEATHS FROM:						DEATHS DUE TO SMOKING FROM:					
	All causes			CVD			All causes			CVD		
	Men	Women		Men	Women		Men	Women		Men	Women	
Armenia	11,267	11,234		6,199	1,727	2,075	2,714	1,727	1,034	168	875	65
Austria	33,777	40,940		16,182	23,798	9,423	9,423	9,139	1,958	988	3,069	835
Azerbaijan	20,521	19,540		12,405	13,187	2,698	2,727	1,920	1,219	0	715	0
Belarus	64,945	62,901		33,177	38,675	11,357	17,852	7,661	8,139	0	5,155	0
Belgium	50,306	51,618		17,153	21,261	15,994	15,917	2,731	3,480	709	7,763	850
Bulgaria	59,257	52,301		38,377	37,264	8,620	10,127	1,219	5,228	702	3,116	257
Croatia	24,504	24,347		11,700	14,920	6,756	6,966	4,783	2,618	717	3,118	395
Czech Republic	52,911	53,289		26,361	31,673	15,693	14,137	12,516	3,589	1,744	6,626	1,136
Denmark	27,372	29,273		10,177	11,175	7,487	6,303	5,279	1,446	1,379	2,663	1,549
Estonia	8,719	8,936		4,272	5,676	1,780	2,341	1,537	1,067	266	828	90
Finland	23,096	24,856		9,862	11,445	5,150	4,130	4,973	1,273	330	1,711	309
France	262,798	253,386		75,508	87,865	83,876	57,788	6,897	10,241	1,276	31,185	2,416
Georgia	19,003	20,380		13,406	16,015	2,271	2,116	16	1,127	8	698	6
Germany	376,881	444,003		160,625	233,251	108,666	84,765	23,839	23,335	8,923	39,772	8,140
Greece	53,224	48,903		25,221	27,805	14,546	11,970	8,875	3,897	632	5,939	424
Hungary	67,986	63,967		31,616	36,970	18,524	21,689	7,438	8,429	3,389	9,530	2,304
Ireland	15,213	14,767		6,408	6,191	4,018	3,285	3,533	870	714	1,364	670
Italy	271,618	275,296		106,773	132,681	87,397	66,666	13,395	15,963	4,199	34,265	4,288
Kazakhstan	69,337	59,830		34,467	38,433	10,107	18,932	2,954	8,534	1,364	4,688	534
Kyrgyzstan	14,425	13,002		7,143	7,832	1,478	2,038	139	721	55	369	18
Latvia	15,067	15,677		7,624	10,138	2,950	3,711	413	1,731	240	1,293	86
Lithuania	18,798	17,943		8,989	11,828	4,261	4,602	1,819	1,819	0	1,787	0
Luxembourg	1,761	1,813		649	788	550	430	123	103	39	220	37
Macedonia, The Former Yug. Rep	8,767	7,597		4,844	4,762	1,726	1,789	240	713	119	662	60
Malta	1,464	1,428		683	702	360	346	51	66	21	107	15
Moldova, Rep of	19,407	19,213		10,306	12,584	2,448	3,096	211	1,192	115	844	37
Netherlands	66,474	70,338		23,505	25,450	20,478	18,759	6,966	4,175	1,686	8,613	2,304
Norway	20,791	21,953		8,629	9,513	5,473	3,428	2,116	855	600	1,467	640
Poland	185,385	168,603		83,083	91,501	47,345	36,879	11,784	20,570	5,007	23,060	3,571
Portugal	52,144	49,287		18,529	22,250	12,524	7,874	531	1,733	146	3,356	156
Romania	127,616	114,781		74,975	81,679	23,097	27,535	4,893	12,114	2,655	9,689	1,005
Russian Federation	1,055,602	1,006,275		535,892	683,565	159,571	301,095	29,075	146,962	16,364	76,821	4,687
Serbia and Montenegro	58,773	54,772		31,391	34,304	11,271	14,159	3,753	5,623	1,844	4,918	797
Slovakia	26,733	23,991		13,474	15,290	6,879	7,162	853	2,855	423	3,074	234
Slovenia	9,158	8,867		3,380	4,102	2,643	2,059	459	651	149	1,082	153
Spain	181,496	167,599		56,640	68,481	56,902	45,252	406	8,339	68	21,768	227
Sweden	44,633	47,316		20,827	22,373	10,913	4,702	3,503	1,101	450	2,102	1,122
Switzerland	29,203	31,563		11,197	14,167	8,323	5,096	1,637	1,102	450	2,464	559
Tajikistan	9,852	8,896		5,481	5,481	834	190	0	65	0	44	0
Turkmenistan	11,462	9,735		7,037	6,906	991	941	0	439	0	198	0
Ukraine	354,644	366,144		194,355	266,663	53,871	91,421	8,208	41,703	4,335	24,136	1,222
United Kingdom	280,177	312,907		113,175	122,554	77,212	63,208	50,772	15,652	14,740	28,018	15,111
Uzbekistan	52,659	52,544		32,614	37,336	4,314	3,418	0	1,369	0	721	0
Total EU	2,127,191	2,197,003		840,716	1,025,248	617,571	510,520	148,900	134,547	48,169	239,195	46,027
Total Europe	4,159,286	4,154,011		1,914,512	2,355,445	934,852	1,026,140	205,191	375,304	77,665	379,893	56,309
Total EU (% of all deaths from all causes)				24%	25%	24%	24%	7%	6%	2%	11%	2%
Total Europe (% of all deaths from all causes)				25%	25%	25%	25%	5%	9%	2%	9%	1%

Figures are indirect estimates from projected National Vital Statistics. See source for details.

Source: Peto R, Lopez A D, Boreham J, and Thun M. Mortality from smoking in developed countries 1950-2000. (2nd edition: data updated 15 July 2003) Oxford University Press. <http://rum.ctstx.ox.ac.uk/~tobacco/FINALAPP34.PDF>

*Table 4.2 Prevalence of smoking, adults aged 15 and over, by sex, latest available year*

		Men	Women	Total
	Year	%	%	%
Albania	2000	60	18	39
Andorra	1997	44	28	36
Armenia	1998	61	1	29
Austria	2000			29
Azerbaijan	1997			27
Belarus	2002	53	6	27
Belgium	2001	34	22	28
Bosnia and Herzegovina	1995			48
Bulgaria	1996	49	24	36
Croatia	2000	34	27	30
Czech Republic	2002	31	18	24
Denmark	2002	31	26	28
Estonia	2002	45	18	29
Finland	2002	28	20	23
France	2000	33	21	27
Georgia	1998	53	12	33
Germany	1997	43	30	37
Greece	2000	47	29	38
Hungary	2000	38	23	31
Iceland	2002	22	21	22
Ireland	1998	32	31	31
Israel	2000	30	24	27
Italy	2001	32	17	24
Kazakhstan	2001	47	8	24
Kyrgyzstan	1999	60	12	30
Latvia	1999	49	13	29
Lithuania	2000	52	16	32
Luxembourg	2002	35	25	30
Macedonia, Fmr Yug Rep	1999	40	32	36
Malta	1995			9
Moldova, Rep of	2002	36	2	17
Netherlands	2002	38	29	34
Norway	2002	30	30	30
Poland	2002	40	25	32
Portugal	1999	33	10	21
Romania	2000	32	10	21
Russian Federation	1998	63	10	36
San Marino				
Serbia and Montenegro	2000	52	42	47
Slovakia	1998	44	15	29
Slovenia	2001	28	20	24
Spain	2001	42	27	34
Sweden	2002	16	19	18
Switzerland	2002	34	25	29
Turkey	1993			35
Turkmenistan	1990			14
Ukraine	2000	58	14	34
United Kingdom	2002	27	25	26
Europe average	2000			30
EU(25) average	2000			30

*"Smoking" defined as regular daily smoking.*

Source: World Health Organization (2004) *European Health for All statistical database*. <http://www.who.dk/>

Figure 4.2a Prevalence of smoking, men aged 15 and over, latest available year

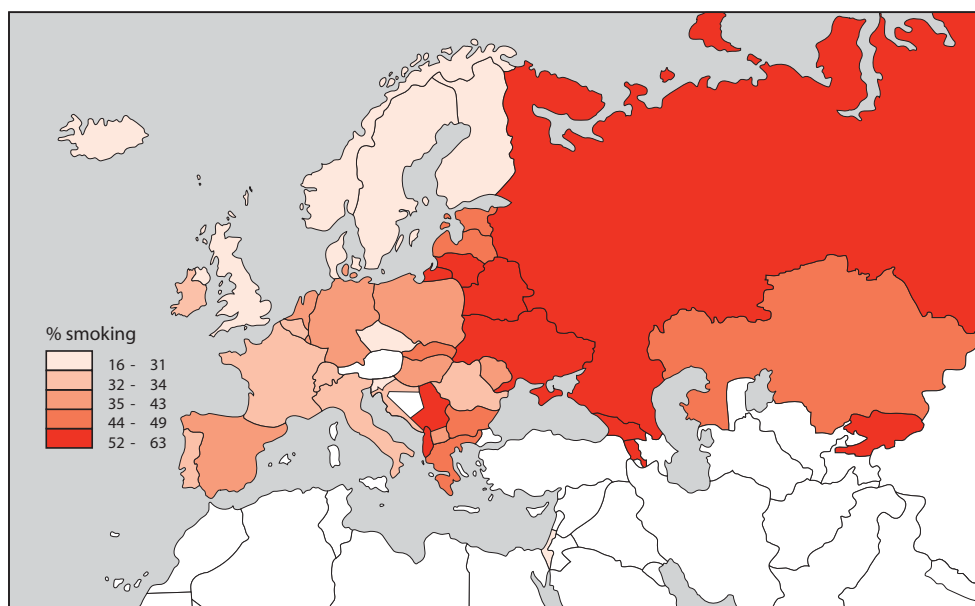
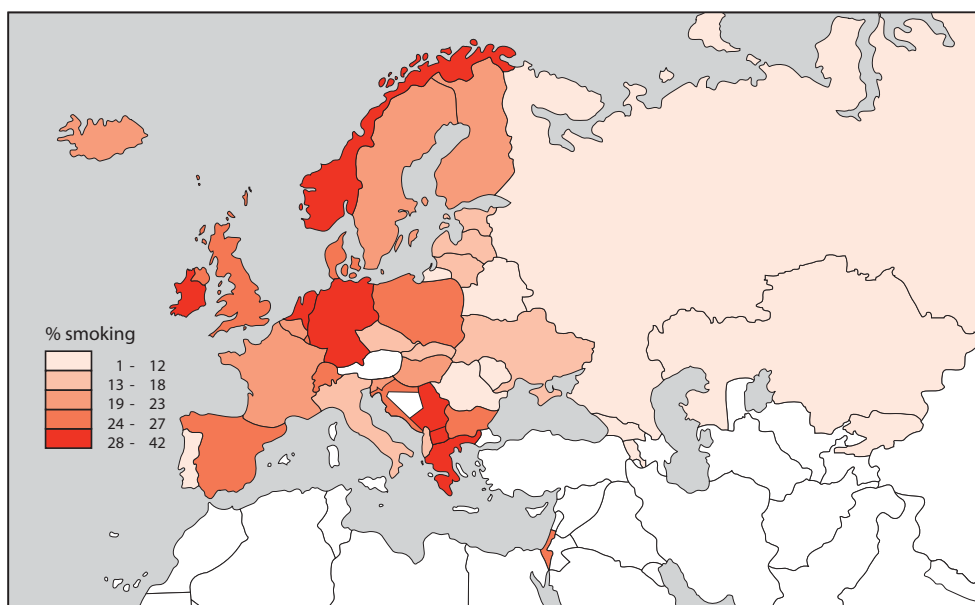


Figure 4.2b Prevalence of smoking, women aged 15 and over, latest available year



**Table 4.3** *Prevalence of smoking, by sex, 15 year olds, 1989/90, 1993/94 and 2000/01*

	Boys			Girls		
	1989/90	1993/94	2000/01	1989/90	1993/94	2000/01
	%	%	%	%	%	%
Austria	23	29	26	20	31	37
Belgium - Flemish speaking	15	32	23	17	18	23
Belgium - French speaking		23	22		21	22
Croatia			23			25
Czech Republic		16	29		12	31
Denmark		14	17		24	21
Estonia		22	30		6	18
Finland	33	30	28	32	26	32
France - Nancy and Toulouse		23			25	
France			26			27
Germany - Nordrhein Westfalen		21			29	
Germany - Berlin, Hessen, North Rhine-Westphalia and Saxony			32			34
Greece			14			14
Hungary	31	25	28	20	19	26
Ireland			20			21
Israel		9	17		9	12
Italy			22			25
Latvia		33	29		14	21
Lithuania		15	35		4	18
Macedonia, FYR			15			13
Malta			17			17
Netherlands			23			24
Norway	21	20	20	23	21	27
Poland	20	23	26	10	13	17
Portugal			18			26
Russian Federation - St. Petersburg		19			10	
Russian Federation			27			19
Slovakia		19			5	
Slovenia			30			30
Spain	18	20	24	27	27	32
Sweden	15	15	11	20	19	19
Switzerland			25			24
Ukraine			45			23
United Kingdom - England			21			28
United Kingdom - Northern Ireland		23			25	
United Kingdom - Scotland	16	21	16	18	26	23
United Kingdom - Wales	14	18	16	22	27	27

*"Smoking" defined as smoking at least once a week.*

Sources: World Health Organization (1997) *Smoking drinking and drug taking in the European Region*. WHO: Copenhagen;

World Health Organization (2003) *Young people's health in context. Health Behaviour in School-aged Children (HBSC) study: international report from the 2001/02 survey*. WHO: Copenhagen.

Figure 4.3 Prevalence of smoking in 15 year olds, by sex, 2000/01

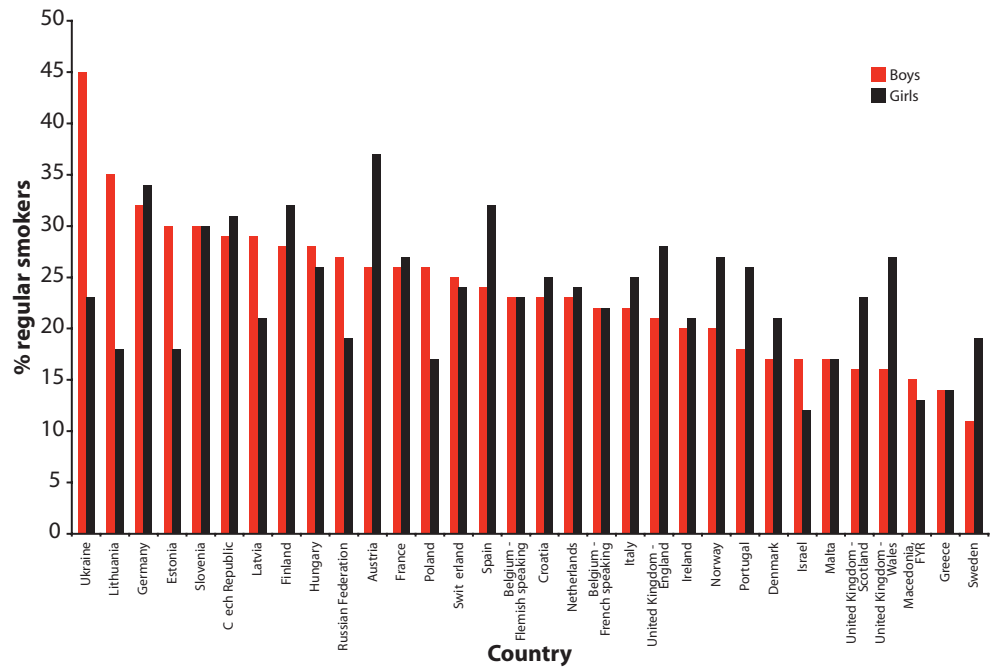


Table 4.4 Prevalence of smoking, adults aged 15 and over, by sex, 1980-2002

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
MEN																							
Albania											50												
Andorra																							
Armenia							34					36	42					44					
Austria																				64			
Belarus																							
Belgium			53	47	47	45	46	42	42	39	38	33	31	31	33	33	34	31	30	55	54	53	53
Bulgaria							49			49													
Croatia																							
Czech Republic														32	43								
Denmark																							
Estonia			35	36	32	34	33	33	33	33	45		49										
Finland																							
France			46																				
Germany																							
Greece												60											
Hungary																							
Iceland								36	33	31	31	31	28	26	28	28	28	28	25	44	38	25	22
Ireland			39			37	36	34	30	32	31	30	30	31	28	31	31	32	32	32	32	30	30
Israel			47	44				38	40	40	39	39	38	33	33	31	32	31	33	33	30	32	32
Italy																							
Kazakhstan																							
Kyrgyzstan																							
Latvia																							
Luxembourg																							
Lithuania																							
Macedonia, FYR								41															
Malta																							
Moldova, Rep of																							
Netherlands	52		41		44		42		37		42	44	42	42	43	41	40	39	39	36	36	39	38
Norway	42	41	41	41	42	41	40	40	39	38	37	37	37	37	38	34	34	34	34	32	31	30	30
Portugal	46																						
Poland																							
Romania										44													
Russia Federation																							
Serbia and Montenegro																							
Slovakia																							
Slovenia																							
Spain																							
Sweden	36	34	34	32	33	30	29	29	28	26	26	26	25	23	22	22	21	17	17	19	17	18	16
Turkey																							
Turkey																							
Ukraine																							
United Kingdom	42		38		36		35		33		31		29		28	29	29	28	28	28	29	28	27

Table 4.4 continued

WOMEN	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Albania											8							28			18		
Andorra													27							1			
Armenia							17					20				13							
Austria																	5						
Belarus			28	27	26	27	26	26	24	26	26	24	21	19	19	24	27	22	23	5	5	7	6
Belgium																							
Bulgaria							17									17	24						
Croatia																							
Czech Republic														21	31	32	20						
Denmark															35	33	32	30					
Estonia	17	19	16	19	17	14	18	21	20	19	20	22	19	19	24	22	22	18	20	20	20	20	18
Finland	17											20	20	19	19	20	18	20	20	20	20	20	20
France																	21						
Georgia																							
Germany																		30					
Greece											32				28	29							29
Hungary															27	28							23
Iceland															26	27	28						21
Ireland	32				32	32		31	32	33	30	30	30	27	26	27	28	26	25	26	23	23	21
Israel	29														29	28							
Italy															24	25	25	25					
Kazakhstan															17	17	18	18	18	17	17	17	8
Kyrgyzstan																							
Latvia																							
Luxembourg																							
Lithuania																							
Maccedonia, FYR																							
Malta																							
Moldova, Rep of	34																						
Netherlands	31	32	32	33	33	32	32	32	29	34	33	31	30	31	32	31	32	32	31	32	29	30	29
Norway																							
Poland																							
Portugal	1																						
Romania																							
Russia Federation																							
Serbia and Montenegro																							
Slovakia																							
Slovenia																							
Spain																							
Sweden	29	27	28	26	28	27	27	26	26	26	26	24	27	23	24	24	23	22	21	19	21	20	19
Turkey																							
Ukraine																							
United Kingdom	37		33		32		31		30		29		28		26		28		26		25		25

"Smoking" defined as regular daily smoking.

Source: World Health Organization (2004) European Health for All statistical database. <http://www.euro.who.int>

*Table 4.5 Prevalence of smoking, adults aged 15 and over, by sex, 1974-2002*

		1970s	1980s	1990s	2000s
		%	%	%	%
Austria	<i>Survey year</i>	1979	1986	1997	
	Men	41	34	30	
	Women	17	17	19	
Denmark	<i>Survey year</i>	1975	1985	1994	2002
	Men	60	51	39	31
	Women	46	42	35	26
Finland	<i>Survey year</i>	1978	1983	1994	2002
	Men	36	32	27	28
	Women	18	19	19	20
France	<i>Survey year</i>	1980	1986	1996	2000
	Men	46	44	35	33
	Women	17	20	21	21
Germany	<i>Survey year</i>	1978	1989	1997	
	Men	42	33	43	
	Women	16	18	30	
Ireland	<i>Survey year</i>	1974	1985	1998	
	Men	45	37	32	
	Women	37	32	31	
Italy	<i>Survey year</i>	1980	1983	1994	2001
	Men	54	46	35	32
	Women	17	18	17	17
Netherlands	<i>Survey year</i>	1975	1984	1994	2002
	Men	65	44	43	38
	Women	40	33	32	29
Norway	<i>Survey year</i>	1975	1985	1995	2000
	Men	48	41	34	30
	Women	33	32	32	30
Sweden	<i>Survey year</i>	1977	1984	1994	2002
	Men	41	33	22	16
	Women	32	28	24	19
United Kingdom	<i>Survey year</i>	1974	1984	1994	2002
	Men	51	36	28	27
	Women	41	32	26	25

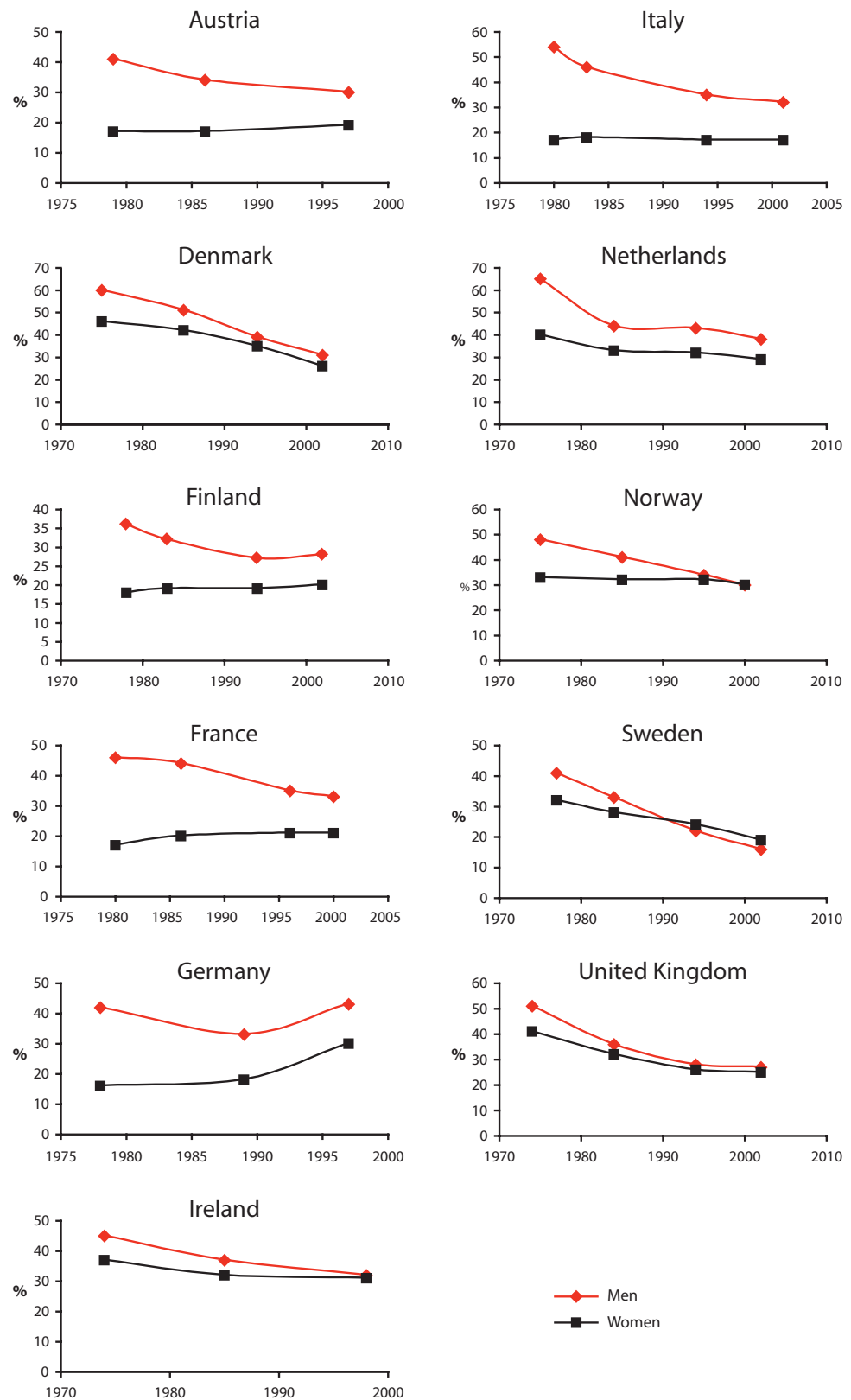
*For smoking definitions see source.*

*Sources: World Health Organization (2004) Health for All statistical database. [www.who.dk](http://www.who.dk);*

*Statistics Sweden (1997) Tobacco consumption 1970-1994 in the Member States of the European Union and in Norway and Iceland. Statistics Sweden: Stockholm.*



Figure 4.5 Prevalence of smoking, adults aged 15 years and over, by sex, 1974-2002



# 5. Diet

## *Mortality and morbidity attributable to poor diets*

It is now universally recognised that a diet which is high in fat, salt and free sugars, and low in complex carbohydrates, fruit and vegetables increases the risk of chronic diseases – particularly CVD and cancer. These risks are outlined in the World Health Organization's report on *Diet, nutrition and the prevention of chronic diseases*<sup>1</sup>. The more recent World Health Organization *Global strategy on diet, physical activity and health* outlined the need to improve diets in individuals and populations across the world<sup>2</sup>.

While there are no properly worked out estimates of the overall mortality or morbidity attributable to a poor diet, there has been work on the impact of one element of an unhealthy diet - low fruit and vegetable intake. The World Health Report 2002 estimates that around 4% of all disease burden in developed countries is caused by low fruit and vegetable consumption, and that just under 30% of CHD and almost 20% of stroke in developed countries is due to fruit and vegetable consumption levels below 600g/day<sup>3</sup>.

## *Prevalence of poor diets*

The data on diets in Europe presented here comes from two sources: a questionnaire based survey carried out by the World Health Organization (WHO) Regional Office for Europe and food supply data published by the Food and Agriculture Organization of the United Nations (FAO). Both sources have deficiencies.

The WHO requested data from dietary surveys but these surveys were carried out in different ways, in different years and with different age groups. The data published by the FAO is calculated from the food produced in and imported into countries minus the food exported, fed to animals, or otherwise not available for human consumption, divided by the population size. The FAO data thus provide information about average availability per person rather than about actual food consumption. It is therefore likely to give figures which are higher than actual food consumption in wealthy countries where substantial amounts of food are wasted, and to give figures which are lower than actual consumption in countries where people grow crops or raise animals in their back gardens or small holdings.

However both sources of data suggest that diets in many countries in Europe are poor. For example the WHO recommends that average fruit and vegetable intake should be at least 400g of fruit and vegetables per person per day<sup>4</sup>. But their survey shows that adult intake of fruit and vegetables is less than 400g of fruit and vegetables per day in 20 of the 25 countries for which data are available (Table 5.1). The WHO also recommend that fat intake should be less than 30% of total energy but their survey shows that 21 out of 26 countries fail to meet this goal (Table 5.3).

In general both the WHO survey and the FAO<sup>5</sup> data show that fruit and vegetable intake is higher in Southern European countries than it is in Northern, Western, Central and Eastern European countries. For example both sets of data indicate that people in Greece eat more than twice as

much fruit and vegetables as in the UK and three times as much as in Kazakhstan (Table 5.1, Table 5.2 and Figure 5.2a).

In general the two sets of data also show that fat intake is higher in most Northern, Western and Southern European countries than in Central and Eastern European countries (Table 5.3, Table 5.4 and Figure 5.4a). For example both the WHO and the FAO data indicate that fat intake is about 40% lower in Romania than it is in Switzerland (Table 5.4). However, the FAO data do indicate generally lower levels of fat intake than the WHO data - with 21 out of 48 European countries for which FAO data is available meeting the goal of less than 30% of total energy from fat (Table 5.4).

The level of saturated fat intake is likely to be a better indicator of a poor diet than the level of total fat intake, as total fat also includes healthy vegetable fats. A secondary analysis of FAO food intake data has estimated the intake of saturated fat across Europe. This shows that the highest levels of saturated fat intake are in France, Switzerland, the Netherlands, Iceland, Belgium and Finland. Of the 46 European countries included in this analysis, less than half (22) meet the population goal of less than 10% of energy from saturated fats (Table and Figure 5.5).

### *Trends in diets*

Only the FAO data show trends in diet. They show for example that there have been slight reductions in fat intake and increases in fruit and vegetable consumption over the past 20 years in many Northern and Western European countries. In Southern, Central and Eastern European countries where fat intake was historically low, intakes are currently rising. Conversely fruit and vegetable consumption is now declining in these countries (or at least not increasing). In other words the differences in the diets between countries described above were greater in the past and dietary patterns across Europe are now converging (Figure 5.2b and Figure 5.4b).

1. World Health Organization (2003) *Diet, Nutrition and the prevention of chronic diseases. Report of a Joint AHO/FAO Expert Consultation.* Geneva: World Health Organization.
2. World Health Organization (2004) *Global strategy on diet and physical activity.* Geneva: World Health Organization. See [www.who.int/gb/ebwha/pdf\\_files/WHA57/A57\\_9-en.pdf](http://www.who.int/gb/ebwha/pdf_files/WHA57/A57_9-en.pdf)
3. World Health Organization (2002) *The World Health Report 2002. Reducing Risks, Promoting Healthy Life.* Geneva: World Health Organization.
4. Study group on diet, nutrition and prevention of chronic disease: report of a World Health Organization Study group. *Technical Report Series: 797.* Geneva: World Health Organization.
5. FAO data for the availability of fruit and vegetable are expressed as a percentage of total available energy, because expressing the data in this way reduces the effects of differences in wastage or loss when comparing the food availability in different countries, or food availability with published dietary goals. 400g of fruit and vegetables per day is equivalent to about 7% of total energy (World Cancer Research Fund and American Institute for Cancer Research (1997) *Food, nutrition and the prevention of cancer: a global perspective.* Washington: AICR.)

Table 5.1 Fruit and vegetable consumption, adults, by sex, latest available year

	Year of survey	Age group surveyed	Vegetables g/person/day			Fruit g/person/day			Fruit and vegetables g/person/day		
			Men	Women	Total	Men	Women	Total	Men	Women	Total
Austria*	Early 1990's	19 and above			145			183			328
Azerbaijan	1994/95	18 and above			121			46			166
Belgium*	1980/84	25-74	139	172	155	207	205	206	346	377	360
Croatia	1990	18 and above			157			142			299
Denmark	1995	19-64	109	119	115	142	174	159	251	293	273
Estonia	1997	18 and above	241	209	225	249	270	259	380	377	378
Finland*	1992	25-64									433
France*	1993/94	19-64	93	109	202	189	184	187	282	293	288
Germany - West*	1987/88	18-88							231	257	244
Germany - East*	1991/92	18-80							338	359	349
Hungary	1992/94	19 and above			201			159			360
Iceland	1990	18 and above	72	71	72	134	169	152	206	240	224
Ireland	1990	18 and above	121	114	118	93	129	111	214	243	229
Italy*	1994/96	18-60							431	434	433
Kazakhstan	1996	18 and above	129	130	130	31	39	35	163	172	168
Latvia	1997	19-64	201	167	183	66	97	83	267	264	266
Lithuania	1997	18 and above	211	168	189	138	202	170	349	369	359
Macedonia, Fmr Yug Rep	1996	18 and above			230			144			374
Norway	1993/94	16-79	125	134	130	209	212	211	334	346	341
Portugal	1980	19-64	233	219	226	172	174	173	405	393	399
Slovenia	1997	18 and above			337			179			516
Spain - Catalonia*	1992	18-60							455	500	480
Sweden*	1989	15-74							240	290	265
Ukraine	1997	18 and above				190		87			285
United Kingdom*	1986/87	16-64							253	242	248
Uzbekistan	1984	18 and above	352	309	330	79	78	78	431	386	408

\*Vegetables\* does not include potatoes except in Italy and Germany.

Sources: World Health Organization (1999), personal communication;

\*British Journal of Nutrition (1999) Food-based Dietary Guidelines - A Staged Approach, Volume 81 Supplement Number 2.

Table 5.2 Percentage of total energy from fruit and vegetables, 1971-2001

	1971	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
Albania	4.62	4.73	4.52	4.35	4.55	4.29	4.81	4.29	4.14	4.21	4.06	4.13	5.47	6.01	6.31	8.06
Armenia												6.12	9.24	5.88	5.88	6.80
Austria	5.69	6.09	6.24	5.93	6.42	5.33	5.57	5.50	5.85	6.68	6.23	7.06	5.47	5.71	5.59	5.77
Azerbaijan, Republic of												5.79	5.37	5.30	5.52	5.78
Belarus	5.35	5.06	4.67	4.91	4.71	4.59	4.55	4.47	4.67	5.68	6.44	3.16	2.96	2.67	2.67	2.92
Belgium-Luxembourg												6.20	6.16	6.84	7.07	6.28
Bosnia and Herzegovina	6.96	6.19	5.88	5.50	5.32	5.23	5.21	5.07	5.15	5.08	5.16	4.44	4.38	5.55	5.53	5.20
Bulgaria												5.78	5.30	5.62	5.61	5.81
Croatia	13.71	9.63	15.74	11.73	13.54	16.68	15.30	15.56	8.18	7.16	6.62	7.01	6.19	6.63	7.23	6.49
Cyprus												4.02	7.07	7.26	8.32	7.44
Czech Republic	3.54	3.80	3.48	4.06	4.14	3.51	3.77	4.10	4.45	4.64	4.89	4.02	4.11	4.24	4.56	4.29
Denmark												3.23	3.49	4.07	4.20	4.65
Estonia	2.57	2.59	3.59	3.40	3.96	3.90	4.07	3.48	4.23	4.19	4.18	4.20	3.61	4.25	4.35	4.37
Finland	5.83	5.34	4.95	4.59	4.61	4.44	4.55	4.86	4.74	5.02	4.95	5.01	5.40	4.72	4.90	5.19
France												6.00	5.31	5.22	3.84	3.69
Germany	5.48	5.65	5.40	5.20	5.32	4.67	4.98	5.21	5.41	5.69	5.65	5.80	5.56	5.82	6.14	6.00
Greece	9.35	9.14	9.24	7.89	8.44	10.65	9.50	9.64	8.42	9.64	9.86	10.34	9.38	9.24	9.68	8.99
Hungary	4.69	4.74	4.53	4.76	4.69	4.44	4.36	4.20	4.20	4.29	4.57	4.82	4.60	4.83	4.94	4.93
Iceland	2.52	2.83	2.67	2.80	2.75	2.71	2.80	2.80	3.33	3.77	3.90	4.07	4.10	4.15	4.15	4.48
Ireland	2.99	2.92	3.09	3.19	3.52	3.63	3.30	3.49	3.70	3.82	3.95	4.19	3.81	3.69	3.74	4.44
Israel	8.98	8.85	8.33	7.97	7.88	7.83	8.87	7.95	8.09	8.55	7.86	9.20	8.90	9.13	8.45	8.85
Italy	7.59	6.97	7.08	6.66	6.23	6.72	7.47	7.08	7.20	7.46	7.28	7.55	7.18	6.90	7.45	7.56
Kazakhstan												1.26	1.38	1.36	2.49	3.16
Kyrgyzstan												2.05	1.90	2.14	3.01	4.02
Latvia												3.91	3.11	4.15	4.23	4.67
Lithuania												4.01	3.11	4.60	4.69	4.66
Macedonia, The Fmr Yug Rp	4.65	4.84	4.98	4.83	4.64	5.10	5.14	5.41	5.64	5.62	6.22	7.23	8.23	6.90	8.79	8.00
Moldova, Republic of												6.97	7.60	7.09	6.51	5.17
Netherlands	5.56	5.15	4.96	5.25	5.92	5.09	5.42	5.06	5.74	5.76	5.55	5.65	5.51	6.38	6.27	5.85
Norway	4.51	4.36	4.43	4.44	4.34	4.57	4.58	4.83	4.84	5.24	4.41	6.13	6.20	5.03	6.56	6.36
Poland	2.69	2.83	2.92	3.31	3.46	3.46	3.43	3.19	2.80	3.31	3.98	4.04	4.53	4.47	4.64	4.64
Portugal	6.26	5.95	6.75	5.00	5.16	4.57	5.13	5.31	6.13	6.49	6.72	6.96	7.74	7.28	8.01	4.42
Romania	3.55	3.89	3.73	4.36	5.00	5.13	6.52	6.50	5.20	5.58	4.39	5.37	4.88	4.67	4.79	5.19
Russian Federation												2.95	3.12	3.53	3.39	3.79
Serbia and Montenegro												6.10	4.98	6.91	5.65	6.12
Slovakia												3.66	3.71	4.57	4.68	4.00
Slovenia	7.23	8.12	7.57	7.21	7.67	7.57	7.61	7.67	7.70	8.56	7.73	4.81	5.60	6.09	6.48	6.16
Spain	4.24	4.19	4.30	4.25	4.44	4.40	4.19	4.52	4.76	4.73	4.88	7.76	6.37	7.48	7.67	7.45
Sweden	6.20	6.42	6.91	6.01	6.69	5.91	6.12	6.23	6.04	5.79	5.79	5.91	4.40	4.73	4.88	4.83
Switzerland												5.91	5.98	5.93	5.41	4.99
Tajikistan												4.32	4.24	3.95	3.20	4.48
Turkey	9.95	8.83	8.67	8.51	9.34	9.17	8.83	8.52	7.97	7.81	8.10	8.08	8.44	8.21	8.57	7.89
Turkmenistan												4.01	4.03	3.20	3.25	3.37
Ukraine												3.59	3.44	3.89	3.18	3.56
United Kingdom	4.04	4.20	3.79	4.14	4.03	4.02	4.12	4.15	4.23	4.67	4.62	4.89	4.69	4.64	4.77	5.00
Uzbekistan												3.68	4.09	3.54	3.72	4.58

FAO codes: (2919+2918)/2901

Source: Food and Agriculture Organization of the United Nations (2004) <http://faostat.fao.org>

Figure 5.2a Percentage of total energy from fruit and vegetables, 2001

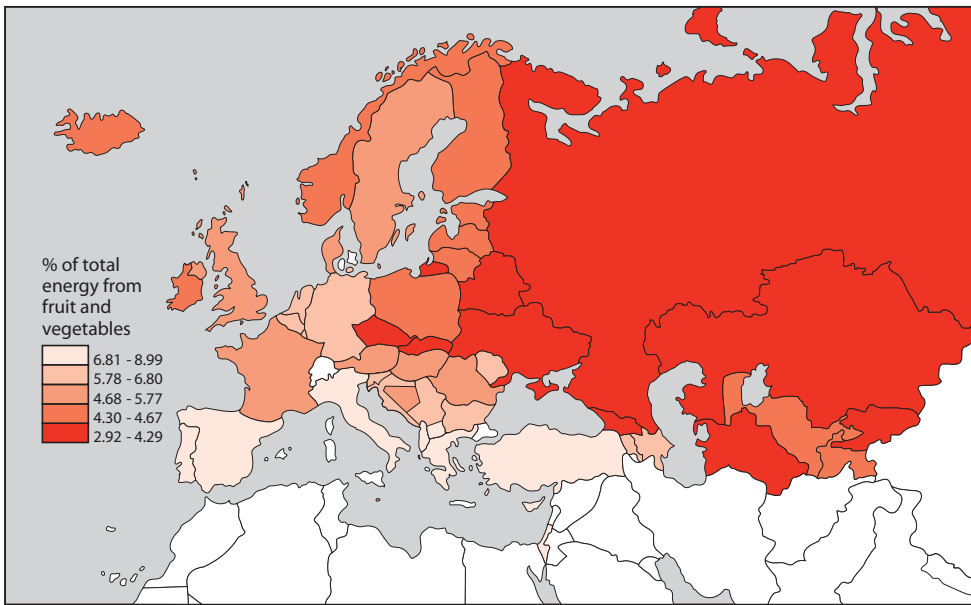
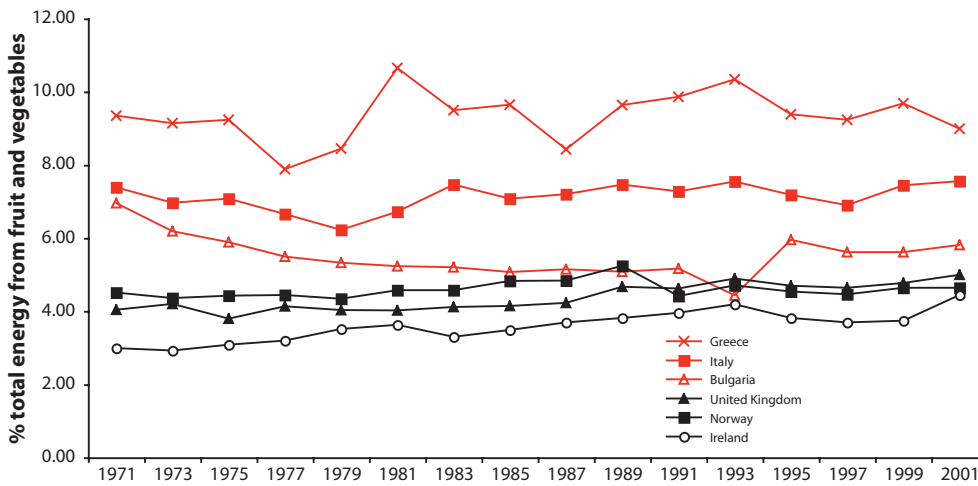


Figure 5.2b Percentage of total energy from fruit and vegetables, 1971-2001, selected countries



**Table 5.3** *Percentage of total energy from fat, adults, by sex, latest available year*

	Year of survey	Age group surveyed	Men	Women	Total
Austria*	Early 1990's	19 and above			38.2
Azerbaijan	1994/95	18 and above			16.4
Belgium*	1980/84	18 and above	41.8	42.6	42.2
Croatia	1990	18 and above			36.0
Denmark*	1995	15-80	37.0	37.0	37.0
Estonia	1997	18 and above	36.4	36.2	36.3
Finland*	1992	25-64			33.8
France*	1993/94	19-64	37.7	40.0	38.9
Germany - West*	1987/88	18-88	38.4	39.2	38.8
Germany - East*	1991/92	18-80	41.3	43.9	42.6
Hungary	1992/94	19 and above	38.1	38.0	38.1
Iceland	1990	18 and above	42.6	40.3	41.5
Ireland	1990	18 and above	34.8	35.0	34.9
Italy*	1994/96	18-60	31.7	33.3	32.6
Kazakstan	1996	18 and above			28.0
Latvia	1997	19-64	42.7	41.2	42.0
Lithuania	1997	18 and above	45.4	42.6	44.0
Netherlands	1997/98	22-64			35.9
Norway	1993/94	16-79	31.0	30.0	30.5
Portugal	1980	19-64	37.5	31.5	34.5
Slovenia	1997	18 and above	43.7	44.9	44.3
Spain - Catalonia*	1992	18-60	37.5	38.4	38.0
Sweden*	1989	15-74	37.0	36.0	36.5
Ukraine	1997	18 and above			25.1
Turkey	1984	18 and above			24.0
United Kingdom*	1986/87	16-64	38.0	39.0	38.5
Uzbekistan	1984	18 and above	29.0	28.3	28.7

Sources: World Health Organization (1999), personal communication;

\*British Journal of Nutrition (1999) Food-based Dietary Guidelines - A Staged Approach. Volume 81 Supplement Number 2.

Table 5.4 Percentage of total energy from fat, 1971-2001

	1971	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
Albania	18.61	18.08	19.53	19.25	21.07	20.34	20.65	20.29	20.99	21.81	26.29	25.02	26.80	25.98	24.73	27.44
Armenia	35.37	36.07	36.75	37.98	38.91	40.15	40.58	41.11	40.60	40.27	40.28	14.49	16.75	19.64	17.15	17.22
Austria												14.21	15.12	14.87	39.59	38.00
Azerbaijan, Republic of												27.94	27.36	27.45	29.19	14.26
Belarus	38.13	38.41	36.77	36.46	37.92	37.84	39.16	39.60	39.69	40.23	39.88	39.69	40.44	39.58	29.17	39.64
Belgium-Luxembourg	22.11	23.32	25.19	25.80	26.58	27.07	28.22	29.20	29.71	30.38	29.71	13.33	14.42	16.67	18.05	23.60
Bosnia and Herzegovina												26.45	28.28	29.29	31.44	32.08
Bulgaria												26.45	25.67	25.70	29.80	29.74
Croatia	31.97	34.80	33.47	32.17	34.41	32.27	32.20	34.57	36.29	37.51	38.00	34.22	34.91	37.26	36.11	36.79
Cyprus	41.12	38.30	38.66	38.74	39.34	38.63	36.67	37.04	36.16	37.79	36.06	37.00	30.10	30.74	32.57	34.06
Czech Republic												28.65	28.17	27.97	29.87	28.64
Denmark												37.18	38.08	36.68	35.56	35.30
Estonia	36.73	36.93	38.30	38.70	38.68	38.13	38.86	37.57	37.64	36.66	36.05	41.65	41.67	42.02	41.32	41.74
Finland	34.91	35.26	36.17	37.39	38.83	39.71	39.08	39.77	40.93	41.48	41.57	13.85	14.95	13.22	16.09	18.54
France	36.48	35.98	36.21	36.59	36.49	37.24	36.35	36.63	36.64	36.64	38.37	38.47	37.84	40.19	38.54	39.54
Germany	33.61	33.38	32.67	33.30	33.33	32.96	34.60	35.39	35.67	35.17	35.90	35.82	37.16	37.75	36.94	36.61
Greece	31.20	31.62	32.42	33.11	33.86	34.62	35.77	36.89	36.64	36.74	37.30	36.89	37.09	36.25	35.43	37.05
Hungary	34.89	36.92	38.81	36.55	37.23	40.47	37.98	38.19	35.89	35.75	34.51	34.24	33.96	34.87	36.24	35.82
Iceland	32.65	32.37	33.00	33.42	34.19	36.68	35.54	35.45	35.68	35.09	33.02	32.24	34.15	34.15	33.57	32.34
Ireland	30.09	31.53	31.05	30.99	30.97	31.22	31.59	32.45	31.36	31.40	33.18	31.98	32.39	31.49	31.52	31.91
Israel	29.71	29.56	30.65	29.98	32.14	33.04	34.94	36.24	37.71	37.58	37.67	37.44	37.59	37.68	38.30	38.28
Italy												22.86	21.61	18.30	25.67	26.19
Kazakhstan												20.12	22.97	18.38	17.08	16.05
Kyrgyzstan												25.52	30.29	28.33	28.00	34.10
Latvia												25.51	24.04	21.88	23.86	26.54
Lithuania												24.33	24.12	24.50	30.24	29.76
Macedonia, The Fmr Yug Rp	28.43	26.12	27.78	30.02	30.84	30.67	31.20	32.89	32.67	31.93	31.55	18.16	19.10	16.88	29.00	27.60
Malta												38.68	40.86	39.39	17.24	16.69
Moldova, Republic of	39.11	38.61	38.61	37.76	37.66	39.22	38.01	38.45	38.24	38.37	37.30	37.02	38.68	39.39	39.07	38.69
Netherlands	40.10	40.86	42.45	39.94	39.24	38.13	38.48	38.20	37.88	36.73	37.04	37.35	37.35	36.36	36.09	36.33
Norway	27.76	28.64	29.54	29.76	29.87	30.33	28.56	30.00	30.32	30.57	30.31	29.70	30.01	29.67	30.21	30.89
Poland	23.66	24.80	25.75	27.83	28.80	28.46	28.64	28.28	28.03	30.14	31.97	32.01	31.79	32.91	32.95	32.99
Portugal	22.58	23.93	25.06	26.92	27.65	25.85	26.88	27.18	27.16	25.62	27.56	23.77	24.33	22.98	23.99	24.12
Romania												24.96	24.92	24.67	23.56	24.19
Russian Federation												34.49	36.77	36.98	38.56	36.45
Sarbia and Montenegro												32.78	33.20	31.35	33.92	33.81
Slovakia												33.45	32.02	32.06	31.97	33.70
Slovenia	30.07	29.65	30.75	31.51	32.17	34.67	35.32	35.52	36.67	37.70	39.64	39.58	39.61	39.54	40.21	40.50
Spain	36.00	35.78	36.25	37.12	37.21	37.84	37.01	37.00	37.99	37.34	37.35	36.72	38.26	38.01	36.68	35.93
Sweden	38.93	40.04	41.89	39.73	41.28	40.64	40.83	41.25	41.18	40.95	41.19	40.42	40.79	39.77	39.94	40.32
Switzerland												20.25	18.44	19.19	18.15	17.98
Taiikistan												23.79	23.80	25.01	23.15	23.96
Turkey	21.59	20.75	23.03	21.07	20.71	21.20	20.04	21.82	22.62	24.15	23.14	26.27	26.25	23.61	25.19	22.45
Turkmenistan												23.24	23.46	23.20	23.65	22.65
Ukraine												39.54	38.79	38.12	37.91	37.81
United Kingdom	39.12	38.27	38.24	37.26	38.73	38.97	38.87	38.49	38.60	37.87	38.29	23.24	23.46	23.20	23.65	22.65
United States												25.15	25.29	25.21	24.81	23.11
Uzbekistan																

Source: Food and Agriculture Organization of the United Nations (2004). <http://faostat.fao.org/faostat/collections/version=ext&subset=nutrition>: Crops Primary Equivalent.



Figure 5.4a Percentage total energy from fat, 2001

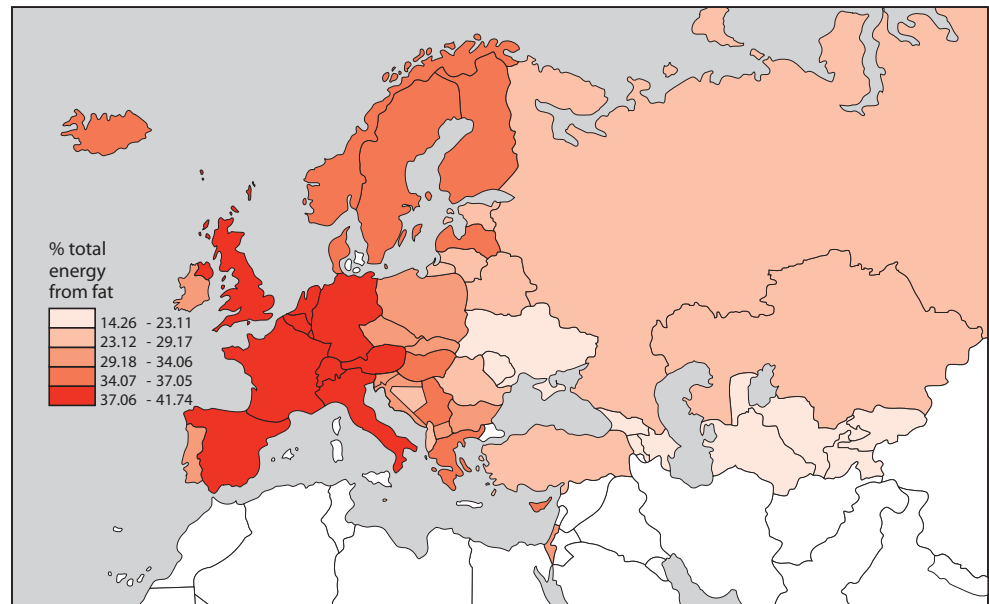
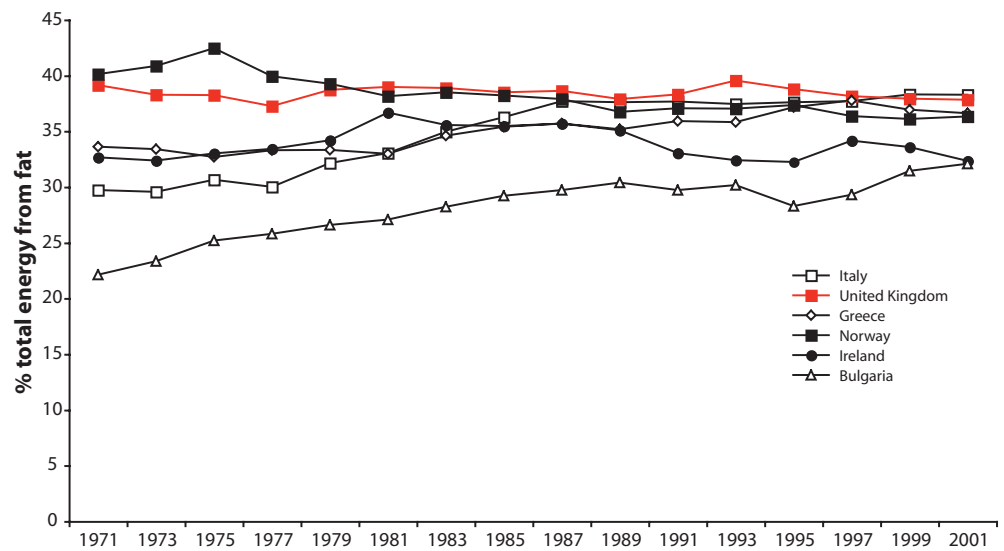


Figure 5.4b Percentage total energy from fat, 1971-2001, selected countries

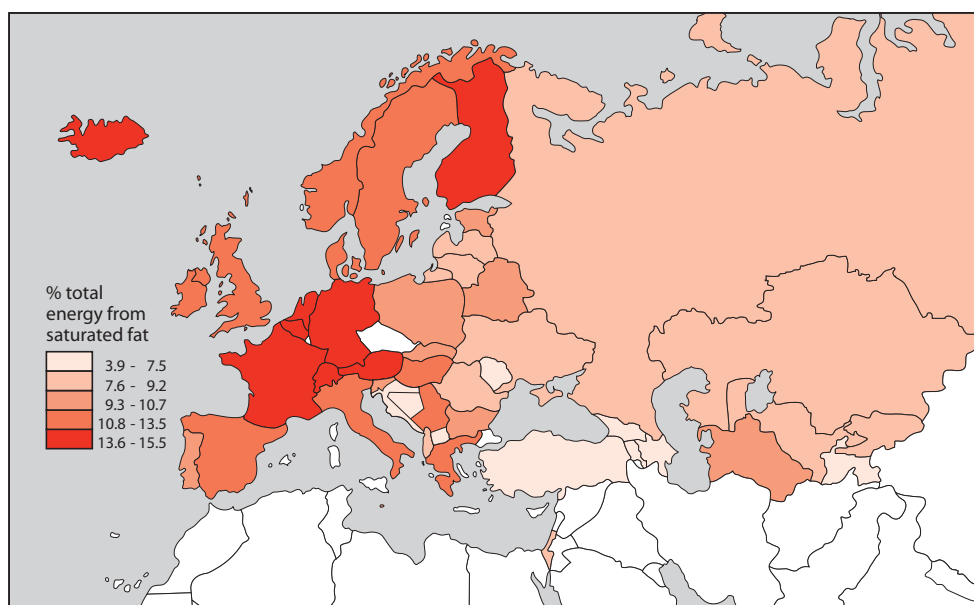


*Table 5.5 Percentage of total energy from saturated fat, 1998*

	%		%
Albania	9.2	Latvia	9.1
Armenia	7.3	Lithuania	7.7
Austria	13.9	FYR Macedonia	7.5
Azerbaijan	5.7	Malta	9.5
Belarus	10.2	Republic of Moldova	5.8
Belgium	14.5	Netherlands	14.6
Bosnia and Herzegovina	3.9	Norway	13.1
Bulgaria	9.8	Poland	10.7
Croatia	7.1	Portugal	10.6
Denmark	12.6	Romania	8.3
Estonia	10.6	Russian Federation	8.3
Finland	14.4	Slovakia	10.7
France	15.5	Slovenia	10.0
Georgia	5.2	Spain	10.9
Germany	13.7	Sweden	12.8
Greece	11.1	Switzerland	15.3
Hungary	11.8	Tajikistan	5.4
Iceland	14.6	Turkey	7.0
Ireland	13.5	Turkmenistan	10.1
Israel	8.8	UK	13.5
Italy	11.8	Ukraine	7.6
Kazakhstan	8.1	Uzbekistan	9.2
Kyrgyzstan	7.8	Yugoslavia	12.8

Source: A Ferro-Luzzi, National Institute for Food and Nutrition Research, Rome, using data from Food and Agriculture Organization of the United Nations, personal communication.

*Figure 5.5 Percentage of total energy from saturated fat, 1998*



# 6. Physical activity

## *Mortality and morbidity attributable to physical inactivity*

A lack of physical activity increases the risk of CVD and other chronic diseases. The recent World Health Organization *Global strategy on diet, physical activity and health* outlined the urgent need to increase physical activity in individuals and populations across the world. To reduce the risk of CVD, the report recommends at least 30 minutes of regular moderate-intensity physical activity on most days<sup>1</sup>.

The World Health Report 2002 estimates that over 3% of all disease burden in developed countries is caused by physical inactivity, and that over 20% of CHD and 10% of stroke in developed countries is due to physical inactivity (less than 2.5 hours per week of moderate exercise or 1 hour per week of vigorous exercise)<sup>2</sup>.

## *Prevalence of physical inactivity*

The data on levels of physical inactivity across Europe are poor. There have only been two multinational surveys which have looked at levels of physical activity in Europe<sup>3,4</sup>, and both were carried out only in member states of the EU-15<sup>5</sup>. The most recent was the 2002 Eurobarometer survey on physical activity, which asked a series of questions on the frequency and duration of vigorous activity, moderate activity and walking. While the results of the survey, designed to explore the prevalence of physical activity, are difficult to interpret, they show that the proportion of adults who regularly undertake physical activity is low.

For example, in 2002, over 40% of adults in EU-15 countries reported no moderate level physical activity in the past week, 17% no episodes of walking for 10 minutes or more, and 49% spent in excess of 4.5 hours each day sitting. Only 15% reported daily moderate level physical activity, the frequency WHO suggests is required to reduce CVD<sup>6</sup> (Table 6.1). The Eurobarometer survey also investigated work-related physical activity and showed that almost half (49%) of the EU population get little or none physical activity at work<sup>4</sup>.

Levels of physical activity vary across the member states of EU-15. In general Southern countries of the EU-15 have lower levels of physical activity than Northern and Western countries (Table and Figure 6.1).

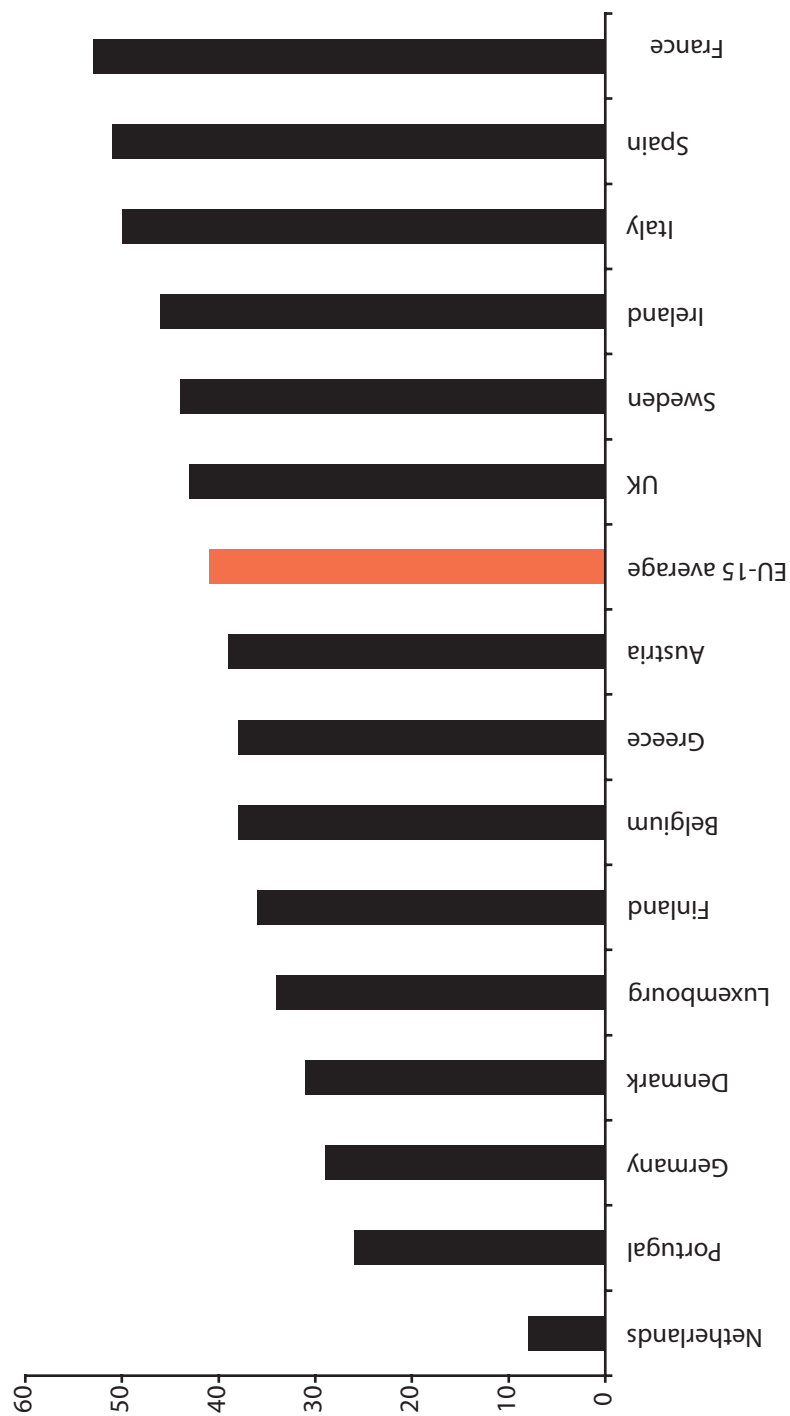
1. World Health Organization (2004) *Global strategy on diet and physical activity*. WHO: Geneva. See [www.who.int/lgb/ebwhal/pdf\\_files/WHA57/A57\\_9-en.pdf](http://www.who.int/lgb/ebwhal/pdf_files/WHA57/A57_9-en.pdf)
2. World Health Organization (2002) *The World Health Report 2002. Reducing Risks, Promoting Healthy Life*. World Health Organization: Geneva.
3. Institute of European Food Studies, Trinity College Dublin (1999) *A Pan-EU Survey on Consumer Attitudes to Physical Activity, Body-weight and Health*. IEFS.
4. European Commission (2003) *Physical Activity. Special Eurobarometer 183-6/ Wave 58.2- European Opinion Research Group EEIG*. [http://europa.eu.int/comm/public\\_opinion/archives/ebs/ebs\\_183\\_6\\_en.pdf](http://europa.eu.int/comm/public_opinion/archives/ebs/ebs_183_6_en.pdf)
5. EU-15 are the 15 Member States of the EU prior to the expansion in 2004.
6. The Eurobarometer survey does not report how many of those who undertook daily moderate-intensity physical activity were active for 30 minutes or more. This means the proportion of the adult EU-15 population achieving the overall recommended level of physical activity required to reduce CVD remains unclear.

Table 6.1 Self-reported physical activity levels, 2002, EU-15 countries

	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	Sweden	UK	Total EU-15
<b>Number of days in last week walked for 10 minutes or more</b>																
None	19	27	11	10	22	13	19	18	16	14	23	17	15	13	19	17
1-3	22	26	18	25	25	23	23	19	23	24	28	15	14	30	22	22
4-6	24	18	13	23	18	26	14	27	17	17	17	19	16	22	19	20
7 days	31	27	51	42	34	37	43	35	41	39	30	47	53	34	41	39
Don't know	5	2	2	1	1	2	1	1	3	6	2	3	2	1	<1	2
<b>Number of days in last week undertook moderate physical activity</b>																
None	39	38	31	36	53	29	38	46	50	34	8	26	51	44	43	41
1-3	27	24	28	33	27	30	23	22	26	27	19	19	20	30	28	26
4-6	20	18	20	16	9	24	12	17	10	14	23	18	14	13	14	16
7 days	8	18	22	15	10	15	27	14	12	21	49	31	13	12	15	15
Don't know	5	3	<1	1	1	3	<1	2	2	4	2	6	2	1	<1	2
<b>Number of hours spent sitting on a usual day</b>																
Less than 2.5	18	16	6	14	20	13	20	21	13	15	11	36	20	10	20	17
2.5-4.5	26	27	22	22	31	27	29	32	26	27	26	27	29	27	33	28
More than 4.5	42	49	68	61	44	50	49	44	56	50	58	32	45	59	44	49
Don't know	14	8	4	3	5	10	2	3	5	7	6	5	6	4	3	6
<b>Average number of hours</b>	7.9	6.9	7.3	6.6	5.8	7.6	5.5	5.4	6.6	6.9	7.0	5.0	6.2	6.7	5.6	6.5

Source: European Commission (2003) Physical Activity. Special Eurobarometer 183-6/Wave 58.2 - European Opinion Research Group EEIG. [http://europa.eu.int/comm/public\\_opinion/archives/ebs/ebs\\_183\\_6\\_en.pdf](http://europa.eu.int/comm/public_opinion/archives/ebs/ebs_183_6_en.pdf)

Figure 6.1 Percentage of adults who do no moderate-intensity physical activity in a typical week, 2002, EU-15 countries



# 7. Alcohol

## *Mortality and morbidity attributable to alcohol consumption*

While moderate alcohol consumption (one or two drinks a day) reduces the risk of CVD, at high levels of intake – particularly in ‘binges’ - the risk of CVD is increased. Alcohol consumption also increases the risk of liver cirrhosis, injuries and some forms of cancer. On balance, the positive effects of alcohol on the health of populations are generally outweighed by its negative effects.

The World Health Report 2002 estimates that over 9% of all disease burden in developed countries is caused by alcohol consumption and that 2% of CHD and almost 5% of stroke in men in developed countries is due to alcohol. However, the impact of alcohol consumption in women in developed countries is estimated to be positive – if no alcohol were consumed, there would be a 3% increase in CHD and a 16% increase in stroke<sup>1</sup>.

## *Levels of and trends in alcohol consumption*

Levels of recorded alcohol consumption vary considerably across Europe<sup>2</sup>. The amount of recorded alcohol consumption ranges from 0.4 litres (Tajikistan) to 17.5 litres (Luxembourg) per adult per year. There is a wide regional spread of countries with an above average level of alcohol consumption, including Northern (Latvia and Lithuania), Western (Ireland and Germany), Southern (France and Spain), Central (Czech Republic and Hungary) and Eastern (Republic of Moldova) countries (Table 7.1, Figure 7.1).

Levels of alcohol consumption are falling in many Northern, Southern and Western European countries but rising in a few. For example alcohol consumption in Italy, Germany and France fell by 20%, 15% and 13% respectively between 1992 and 2001, but rose by 27% in Ireland. In Central and Eastern European countries alcohol consumption generally fell rapidly in the mid-to-late 1980s but has risen markedly again since then. Between 1992 and 2001 alcohol consumption in Kyrgyzstan, Lithuania and the Russian Federation rose by 128%, 124% and 60% respectively (Table 7.1).

1. World Health Organization (2002) *The World Health Report 2002. Reducing Risks, Promoting Healthy Life*. World Health Organization: Geneva.
2. *Levels of actual alcohol consumption may vary less than levels of recorded consumption because there is probably much unrecorded consumption in countries with low recorded rates. For example, estimates from WHO suggest that unrecorded alcohol consumption is twice that of recorded consumption in Latvia and, is four times that of recorded consumption in FYR Macedonia. For more details see: Rehm N, with Room R and Edwards G (2001) Alcohol in the European Region – consumption, harm and policies. [www.who.dk/document/E76240.pdf](http://www.who.dk/document/E76240.pdf)*

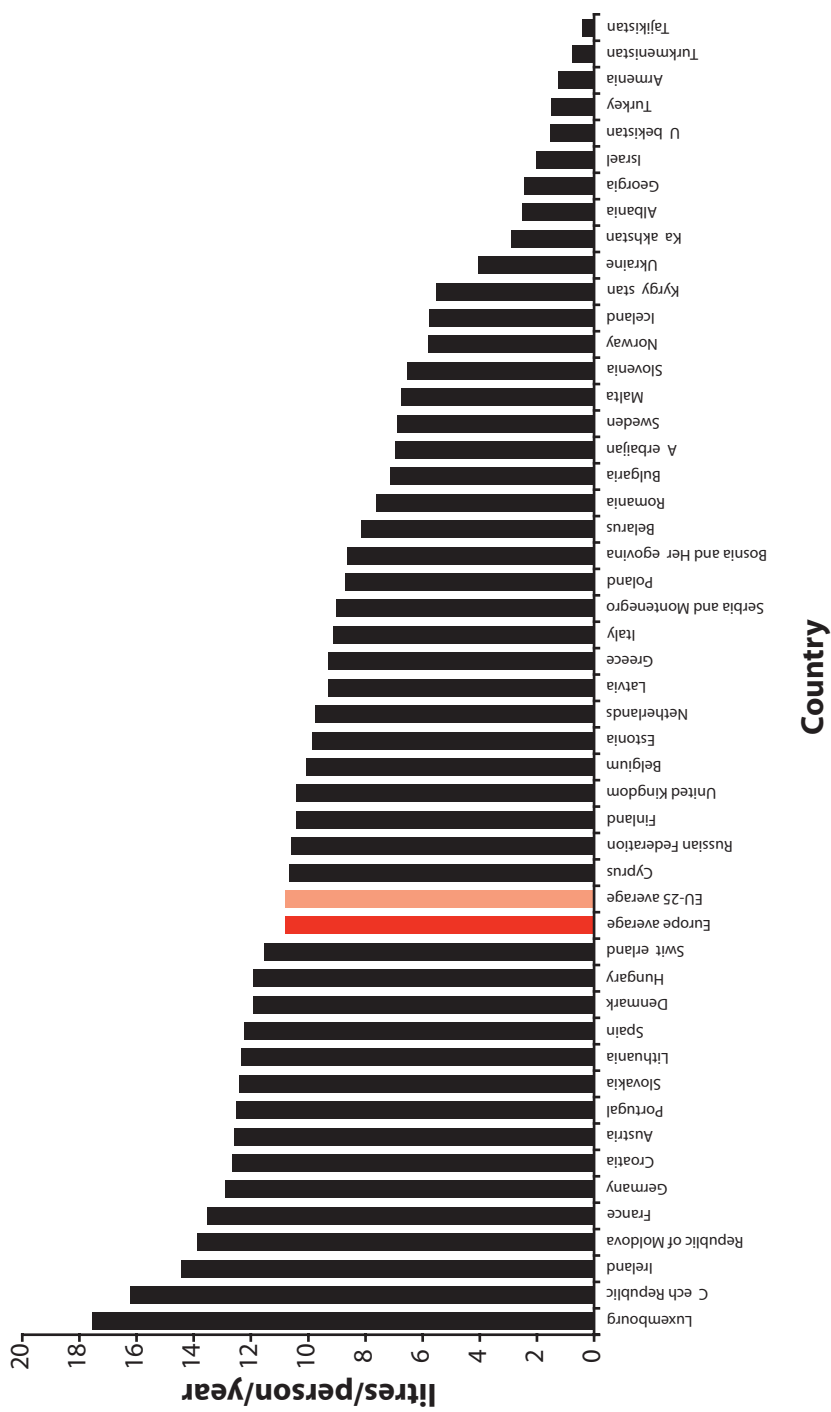
Table 7.1 Alcohol consumption, adults aged 15 years and above, 1970-2001

	1970	1972	1974	1976	1978	1980	1982	1984	1986	1988	1990	1992	1994	1996	1998	1999	2000	2001
Albania	1.8	1.6	1.6	1.3	1.7	1.5	1.5	1.6	1.4	1.7	2.0	1.3	2.7	3.4	1.5	2.0	1.8	2.5
Armenia												2.4	3.8	2.4	1.6	1.6	1.5	1.2
Austria	13.9	15.6	15.0	14.4	13.5	13.8	13.9	13.8	13.8	13.9	14.2	13.8	13.5	13.3	12.8	12.8	12.9	12.6
Azerbaijan												4.9	1.4	2.7	0.9	4.8	7.9	6.9
Belarus												8.5	9.4	10.2	9.8	9.7	8.4	8.1
Belgium	12.6	13.2	13.6	13.8	13.6	14.3	14.0	13.5	13.0	12.5	12.5	11.9	11.4	11.2	10.1	10.2	10.2	10.1
Bosnia and Herzegovina												10.0	8.3	10.9	12.4	13.6	8.1	8.6
Bulgaria	8.7	9.5	10.6	11.2	11.6	11.1	11.5	11.7	11.8	11.5	11.8	10.4	10.1	9.6	8.3	8.2	7.8	7.1
Croatia												11.6	11.8	11.2	13.8	12.0	12.4	12.7
Cyprus	4.8	5.3	4.1	4.8	5.7	6.3	7.0	7.6	8.4	9.7	9.5	8.2	9.6	8.8	9.2	9.6	10.0	10.7
Czech Republic	14.1	14.7	14.9	15.5	15.8	16.0	16.6	15.9	15.1	14.8	16.3	16.5	15.9	16.1	16.4	16.5	16.3	16.2
Denmark	9.7	10.2	10.8	12.0	11.1	11.9	12.6	12.6	12.5	12.3	12.3	12.2	12.5	12.6	12.0	11.9	12.0	11.9
Estonia												7.7	8.0	6.4	8.6	8.0	9.0	9.9
Finland	6.0	7.0	8.5	8.2	8.0	8.1	8.0	8.3	8.7	9.3	9.9	8.8	8.8	9.2	9.8	10.0	10.0	10.4
France	23.2	22.6	22.5	22.2	21.1	20.1	19.4	17.9	17.1	16.8	16.7	15.3	14.9	14.5	14.0	13.8	13.4	13.5
Georgia												6.6	5.1	6.7	4.0	4.4	3.5	2.4
Germany												15.1	14.3	13.7	13.2	13.2	13.0	12.9
Greece												10.4	10.9	10.1	9.5	9.9	9.4	9.3
Hungary	12.9	13.2	13.3	15.2	16.5	17.0	16.7	16.8	16.6	15.3	16.1	14.8	13.8	12.7	12.6	12.0	11.9	11.9
Iceland	4.6	5.1	5.3	4.8	4.9	5.1	5.1	5.5	5.6	5.7	5.2	4.7	4.6	4.9	5.5	5.5	5.5	5.7
Ireland	7.0	7.7	9.3	9.0	9.8	9.6	8.8	9.6	9.6	9.9	11.2	11.4	11.2	12.2	13.2	13.8	14.2	14.5
Israel	4.3	4.7	4.5	4.7	3.3	2.8	2.5	2.5	2.3	2.2	1.8	1.8	1.7	1.6	2.1	2.0	2.1	2.0
Italy	21.2	21.0	21.1	18.9	17.7	17.9	15.6	15.0	13.2	12.2	11.7	11.4	10.8	9.9	9.6	9.4	9.3	9.1
Kazakhstan												10.7	8.5	2.9	3.6	3.2	3.3	2.9
Kyrgyzstan												2.4	3.1	3.3	3.6	3.6	3.6	3.5
Latvia												10.1	10.1	8.7	8.9	9.6	9.4	9.3
Lithuania												5.5	5.5	11.8	10.8	11.3	12.2	12.3
Luxembourg	16.0	16.5	18.0	17.6	16.0	16.3	16.5	18.4	17.2	17.3	17.6	17.9	17.8	16.9	18.9	18.4	18.6	17.5
Malta												7.0	7.0	7.1	6.6	6.7	7.0	6.7
Netherlands	7.6	8.9	10.5	10.7	11.4	11.7	10.6	10.4	10.3	9.9	9.9	10.2	9.7	9.9	9.9	9.9	9.8	9.7
Norway	4.9	5.4	5.8	5.9	5.5	6.2	3.1	5.2	5.5	5.6	5.4	5.1	5.2	5.4	5.6	5.8	5.9	5.8
Poland	7.4	8.6	8.7	10.7	10.9	11.5	8.5	8.7	9.6	9.5	8.3	8.4	8.4	8.1	8.5	8.6	8.5	8.7
Portugal	14.4	16.9	19.6	19.5	14.2	14.9	16.1	16.5	14.7	13.5	15.9	15.2	14.7	13.9	13.3	13.0	12.8	12.5
Republic of Moldova												10.1	16.3	16.4	17.0	19.2	14.0	13.9
Romania	8.6	9.0	10.3	11.7	12.5	12.4	12.8	12.8	11.8	10.3	9.0	8.9	8.2	8.2	7.3	7.7	7.5	7.6
Russian Federation												6.6	8.7	9.3	10.0	10.9	10.8	10.6
Serbia and Montenegro												8.2	9.9	11.4	9.0	7.5	9.3	9.0
Slovakia	12.9	13.9	13.7	13.9	13.9	15.2	15.4	14.6	13.5	13.0	13.7	12.8	13.2	13.0	12.3	12.6	12.4	12.4
Slovenia												13.4	13.2	11.9	8.3	7.9	11.6	6.6
Slovenia												12.5	11.6	11.1	11.9	11.8	11.9	12.3
Spain	16.1	17.3	19.5	18.9	19.2	18.6	17.0	15.1	13.0	14.0	13.4	7.6	7.6	7.0	7.0	7.1	7.0	6.9
Sweden	7.9	8.1	8.6	8.9	8.2	7.8	7.4	7.0	7.3	7.4	7.5	7.6	7.6	7.0	7.0	7.1	7.0	6.9
Switzerland	14.3	14.6	14.8	13.6	13.8	13.9	14.4	14.0	13.7	13.7	13.5	12.7	12.2	11.8	11.8	11.8	11.9	11.5
Tajikistan												2.3	1.4	1.8	0.4	0.3	0.3	0.4
FYR Macedonia												4.8	5.4	4.6	3.5	4.1	4.1	4.1
Turkey	0.9	1.0	1.0	1.2	1.3	1.3	1.2	1.1	1.1	1.3	1.4	1.4	1.5	1.7	1.7	1.6	1.5	1.5
Turkmenistan												0.7	1.7	1.3	1.2	1.1	1.1	0.8
Ukraine												5.5	4.2	3.1	3.6	3.8	4.3	4.0
United Kingdom	8.5	9.2	10.5	10.9	11.0	10.8	10.0	10.3	10.4	10.8	10.8	10.1	10.2	9.9	9.9	10.2	10.2	10.4
Uzbekistan												1.3	1.5	0.9	0.9	0.9	1.4	1.5
Europe average												10.7	10.9	10.7	10.7	10.9	10.9	10.8
EU average*	15.4	15.8	16.6	16.2	15.6	15.4	14.4	13.8	11.5	12.8	11.2	12.1	11.7	11.2	11.1	11.1	11.1	10.8

\*EU-15 average 1970-2000. EU-25 average 2001.

Source: World Health Organization (2004) European Health for All database. <http://www.who.dk/hfad>

Figure 7.1 Alcohol consumption, adults aged 15 years and above, 2001





# 8. Blood pressure

Risk of CVD is directly related to both systolic and diastolic blood pressure levels<sup>1</sup>. Both drug treatment and lifestyle changes - particularly weight loss, an increase in physical activity, and a reduction in salt and alcohol intake - can effectively lower blood pressure.

Research from the World Health Organization suggests that the cardiovascular burden due to raised blood pressure may be greater than previously suggested. The World Health Report 2002 estimates that around 11% of all disease burden in developed countries is caused by raised blood pressure, and that over 50% of CHD and almost 75% of stroke in developed countries is due to systolic blood pressure levels in excess of the theoretical minimum (115 mmHg)<sup>2</sup>.

More recently the INTERHEART case-control study estimated that 22% of heart attacks in Western Europe and 25% of heart attacks in Central and Eastern Europe are due to a history of high blood pressure, and that those with a history of hypertension are at just under twice the risk of a heart attack compared to those with no history of hypertension<sup>3</sup>.

The only reliable data on the prevalence of raised blood pressure across Europe comes from the MONICA Project. These data were collected using standardized methods between 1989 and 1997 for the 35-64 year age range in 29 populations in 16 European countries. The results of this project show that the prevalence of systolic blood pressure levels of 160mmHg and above varies markedly across the populations sampled: from 2% (Toulouse, France) to 21% (North Karelia, Finland) in men and from 2% (Catalonia, Spain) to 17% (former East Germany) in women (Table and Figure 8.1).

Trend data from the MONICA Project show that between the mid-1980's and mid-1990's the majority of European populations included in the study experienced a decline in average systolic blood pressure<sup>4</sup>.

1. For example, a recent meta-analysis of prospective data on over one million adults has shown that for adults aged 40-69 years, each 20mmHg increase in usual systolic blood pressure, or 10 mmHg increase in usual diastolic blood pressure, doubles the risk of death from CHD. Prospective Studies Collaboration (2002) Age-specific relevance of usual blood pressure to vascular mortality: a meta analysis of individual data for one million adults in 61 prospective studies. *The Lancet*; 360: 1903-1913.
2. World Health Organization (2002) *The World Health Report 2002. Reducing Risks, Promoting Healthy Life*. World Health Organization: Geneva.
3. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, McQueen M, Budaj A, Pais P, Varigo J, Lisheng A, on behalf of the INTERHEART Study Investigators (2004) Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART Study): case-control study. *The Lancet*; 364: 937-952.
4. WHO Monica Project (2003) *MONICA Monograph and Multimedia Sourcebook: World's largest study of heart disease stroke, risk factors and population trends 1979-2002*. Edited by Hugh Tunstall-Pedoe for the WHO MONICA Project. WHO: Geneva.

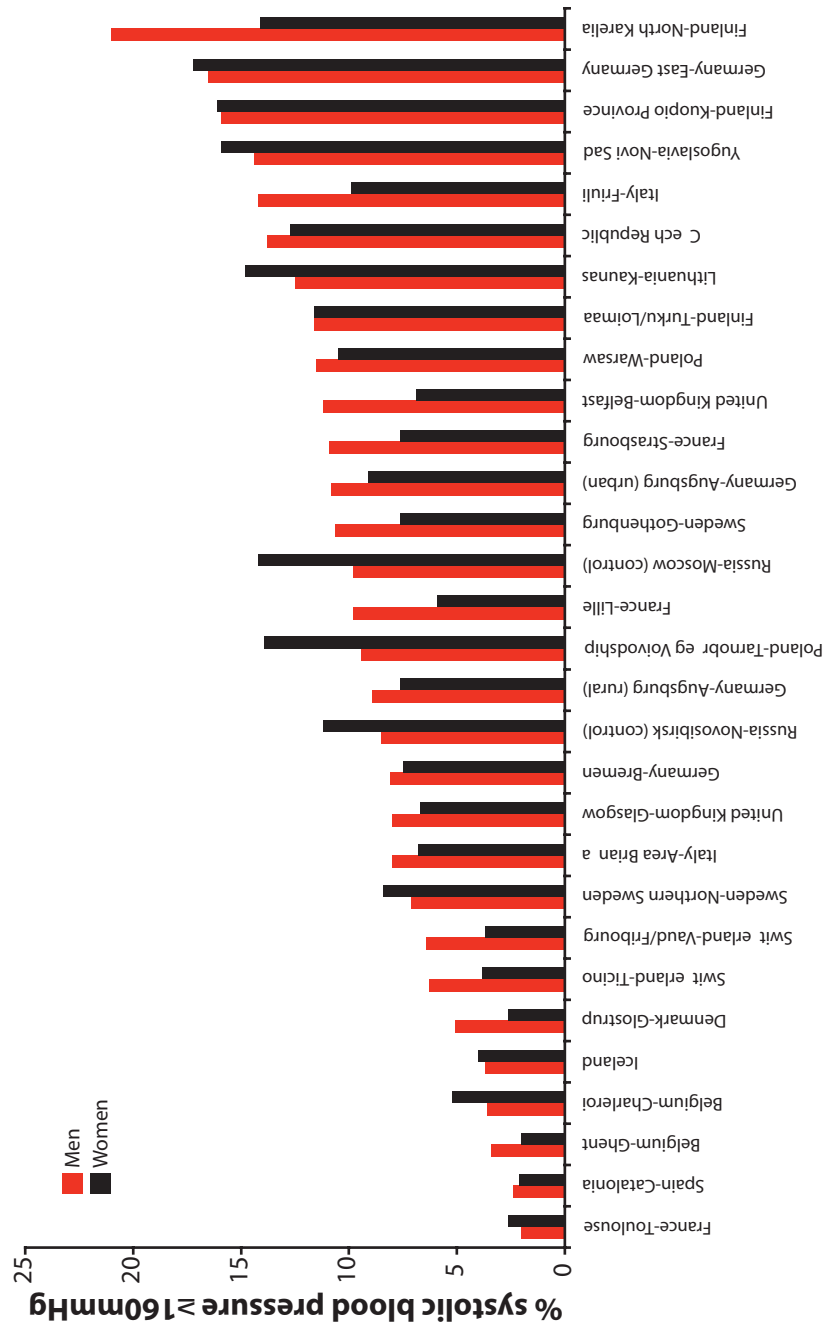
**Table 8.1** *Systolic blood pressure levels, adults aged 35-64, by sex, latest available data, MONICA Project populations*

MONICA population	MONICA population code	Year of survey	MEN			WOMEN		
			Systolic blood pressure (mmHg)			Systolic blood pressure (mmHg)		
			120 - <160	≥160	Mean	120 - <160	≥160	Mean
			%	%	mmHg	%	%	mmHg
Belgium-Charleroi	BEL-CHA	1990/93	73	4	131	50	5	125
Belgium-Ghent	BEL-GHE	1990/92	70	3	129	49	2	122
Czech Republic	CZE-CZE	1992	68	14	137	60	13	134
Denmark-Glostrup	DEN-GLO	1991/92	55	5	126	46	3	121
Finland-Kuopio Province	FIN-KUO	1992	73	16	140	64	16	139
Finland-North Karelia	FIN-NKA	1992	69	21	142	63	14	137
Finland-Turku/Loimaa	FIN-TUL	1992	78	12	139	69	12	135
France-Lille	FRA-LIL	1995/96	73	10	135	62	6	129
France-Strasbourg	FRA-STR	1995/97	70	11	135	52	8	127
France-Toulouse	FRA-TOU	1994/96	57	2	125	34	3	117
Germany-Augsburg (rural)	GER-AUR	1994/95	74	9	136	56	8	129
Germany-Augsburg (urban)	GER-AUU	1995/95	74	11	137	58	9	131
Germany-Bremen	GER-BRE	1991/92	68	8	132	59	8	128
Germany-East Germany	GER-EGE	1993/94	75	17	141	63	17	137
Iceland	ICE-ICE	1993/94	57	4	125	44	4	121
Italy-Area Brianza	ITA-BRI	1993/94	61	8	131	53	7	127
Italy-Friuli	ITA-FRI	1994	73	14	140	67	10	134
Lithuania-Kaunas	LTU-KAU	1992/93	71	13	137	58	15	134
Poland-Tarnobrzeg Voivodship	POL-TAR	1992/93	68	9	134	57	14	134
Poland-Warsaw	POL-WAR	1993	58	12	132	49	11	128
Russia-Moscow (control)	RUS-MOC	1992/95	54	10	130	48	14	133
Russia-Novosibirsk (control)	RUS-NOC	1995	65	9	132	56	11	131
Spain-Catalonia	SPA-CAT	1994/96	47	2	121	38	2	118
Sweden-Gothenburg	SWE-GOT	1994/96	68	11	134	60	8	129
Sweden-Northern Sweden	SWE-NSW	1994	63	7	130	49	8	126
Switzerland-Ticino	SWI-TIC	1993/93	69	6	132	52	4	124
Switzerland-Vaud/Fribourg	SWI-VAF	1992/93	75	6	132	53	4	124
United Kingdom-Belfast	UNK-BEL	1991/92	67	11	135	60	7	130
United Kingdom-Glasgow	UNK-GLA	1995	69	8	133	52	7	126
Yugoslavia-Novi Sad	YUG-NOS	1994/95	62	14	136	56	16	137

*Age-standardized levels derived from means of two readings; consult WHO MONICA Project for details of measurement and age-standardization.*

*Source: Evans A, Tolonen H, Hense HW, Ferrario M, Sans S, Kuulasmaa K, for the WHO MONICA Project (2004) Trends in coronary risk factors in the WHO MONICA Project. International Journal of Epidemiology, 30 (Suppl 1): S35-S40.*

**Figure 8.1** Percentage of adults aged 35-64 with systolic blood pressure levels  $\geq 160$  mmHg, latest available data, MONICA Project populations.



# 9. Blood cholesterol

Risk of CVD is directly related to blood cholesterol levels. Blood cholesterol levels can be reduced by drugs, physical activity and by dietary changes, in particular a reduction in the consumption of saturated fat.

Research from the World Health Organization highlights the importance of raised blood cholesterol as a risk factor for CHD. The World Health Report 2002 estimates that around 8% of all disease burden in developed countries is caused by raised blood cholesterol, and that over 60% of CHD and around 40% of ischaemic stroke in developed countries is due to total blood cholesterol levels in excess of the theoretical minimum (3.8 mmol/l)<sup>1</sup>.

More recently the INTERHEART case-control study estimated that 45% of heart attacks in Western Europe and 35% of heart attacks in Central and Eastern Europe are due to abnormal blood lipids, and that those with abnormal lipids are at over three times the risk of a heart attack compared those with normal lipids<sup>2</sup>.

As with raised blood pressure, the only reliable information on the prevalence of raised cholesterol levels in Europe comes from the MONICA Project. These data were collected using standardized methods between 1989 and 1997 for the 35-64 year age range in 25 populations in 15 European countries. The results show that the prevalence of cholesterol levels of 6.5mmol/l and above varies substantially across the populations sampled: from 8% (Novosibirsk, Russia) to 53% (Ticino, Switzerland) in men and from 15% (Novosibirsk, Russia) to 40% (Kaunas, Lithuania and Novi Sad, Yugoslavia) in women (Table and Figure 9.1).

Trend data from the MONICA project show that between the mid-1980's and mid 1990's around half of the European populations included in the study experienced a decline in average blood cholesterol levels<sup>3</sup>.

1. World Health Organization (2002) *The World Health Report 2002. Reducing Risks, Promoting Healthy Life*. World Health Organization: Geneva.
2. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, McQueen M, Budaj A, Pais P, Varigo J, Lisheng A, on behalf of the INTERHEART Study Investigators (2004) *Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART Study): case-control study*. *The Lancet*; 364: 937-952.
3. WHO Monica Project (2003) *MONICA Monograph and Multimedia Sourcebook: World's largest study of heart disease stroke, risk factors and population trends 1979-2002*. Edited by Hugh Tunstall-Pedoe for the WHO MONICA Project. WHO: Geneva.

**Table 9.1** Mean total blood cholesterol and percentage with levels of 6.5mmol/l and above, adults aged 35-64, by sex, latest available data, MONICA Project populations

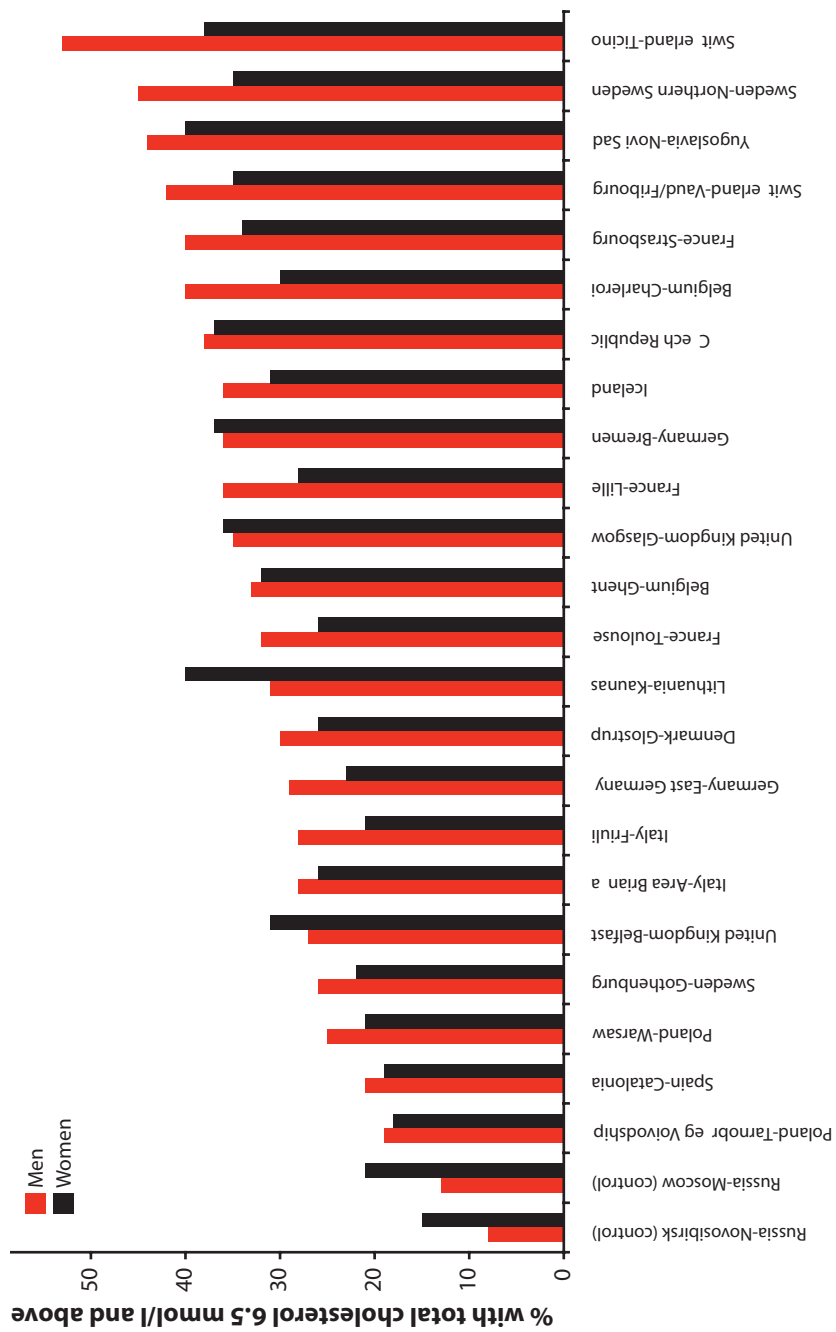
MONICA population	MONICA population code	Year of survey	MEN		WOMEN	
			Mean total cholesterol mmol/l	Prevalence of levels 6.5 mmol/l and above*	Mean total cholesterol mmol/l	Prevalence of levels 6.5 mmol/l and above*
Belgium-Charleroi	BEL-CHA	1990/93	6.2	40	6.1	30
Belgium-Ghent	BEL-GHE	1990/92	6.0	33	6.0	32
Czech Republic	CZE-CZE	1992	6.2	38	6.1	37
Denmark-Glostrup	DEN-GLO	1991/92	6.0	30	5.8	26
France-Lille	FRA-LIL	1995/96	5.4	36	5.8	28
France-Strasbourg	FRA-STR	1995/97	6.0	40	5.9	34
France-Toulouse	FRA-TOU	1994/96	5.8	32	5.7	26
Germany-Bremen	GER-BRE	1991/92	6.2	36	6.2	37
Germany-East Germany	GER-EGE	1993/94	6.1	29	5.9	23
Iceland	ICE-ICE	1993/94	6.2	36	6.0	31
Italy-Area Brianza	ITA-BRI	1993/94	5.9	28	5.9	26
Italy-Friuli	ITA-FRI	1994	5.9	28	5.7	21
Lithuania-Kaunas	LTU-KAU	1992/93	6.0	31	6.2	40
Poland-Tarnobrzeg Voivodship	POL-TAR	1992/93	5.6	19	5.5	18
Poland-Warsaw	POL-WAR	1993	5.8	25	5.7	21
Russia-Moscow (control)	RUS-MOC	1992/95	5.3	13	5.6	21
Russia-Novosibirsk (control)	RUS-NOC	1995	5.0	8	5.3	15
Spain-Catalonia	SPA-CAT	1994/96	5.6	21	5.5	19
Sweden-Gothenburg	SWE-GOT	1994/96	5.6	26	5.4	22
Sweden-Northern Sweden	SWE-NSW	1994	6.3	45	6.1	35
Switzerland-Ticino	SWI-TIC	1993/93	6.5	53	5.2	38
Switzerland-Vaud/Fribourg	SWI-VAF	1992/93	6.3	42	6.1	35
United Kingdom-Belfast	UNK-BEL	1991/92	5.9	27	5.9	31
United Kingdom-Glasgow	UNK-GLA	1995	6.1	35	6.1	36
Yugoslavia-Novı Sad	YUG-NOS	1994/95	6.4	44	6.2	40

Age-standardised levels; consult WHO MONICA Project for details of measurement and age-standardization.

\*Total cholesterol 6.5mmol/l and above and/or using lipid lowering drugs

Source: Tolonen H, Keil U, Ferrario M and Evans A (2004) Prevalence, awareness and treatment of hypercholesterolaemia in 32 populations: results from the WHO MONICA Project. *International Journal of Epidemiology* (Advance Access published August 27, 2004).

Figure 9.1 Percentage of adults aged 35-64 with blood cholesterol levels of 6.5mmol/l and above, latest available data, MONICA Project populations



# 10. Overweight and obesity

Overweight and obesity increase the risk of CVD. As well as being an independent risk factor, obesity is also a major risk factor for high blood pressure, raised blood cholesterol, diabetes and impaired glucose tolerance<sup>1</sup>.

The World Health Organization's World Health Report 2002 estimates that over 7% of all disease burden in developed countries is caused by raised Body Mass Index (BMI), and that around a third of CHD and ischaemic stroke and almost 60% of hypertensive disease in developed countries is due to levels of BMI in excess of the theoretical minimum (21 kg/m<sup>2</sup>)<sup>2</sup>.

More recently the INTERHEART case-control study estimated that 63% of heart attacks in Western Europe and 28% of heart attacks in Central and Eastern Europe are due to abdominal obesity (a high waist to hip ratio), and those with abdominal obesity are at over twice the risk of a heart attack compared to those without<sup>3</sup>. This study also found that abdominal obesity was a much more significant risk factor for heart attack than simple BMI.

## *Prevalence of and trends in overweight and obesity*

The most reliable comparative data on the prevalence of overweight and obesity across Europe come from the MONICA Project. The latest results of this project showed that in the mid-1990's between 8% (Moscow, Russia) and 24% (Kuopio Province, Finland) of men aged 35-64 were obese. For women aged 35-64 between 10% (Vaud/Fribourg, Switzerland) and 36% (Tanobrzeg Vovoidship, Poland) were obese (Table 10.1).

Professor Boyd Swinburn and his colleagues at Deakin University in Victoria, Australia have compiled prevalence data from national surveys on adult overweight and obesity. Like the MONICA data these show that while there are no clear geographical patterns, prevalence rates for overweight and obesity vary widely across Europe. They also show that in most of the countries for which we have data the prevalence of overweight and obesity is increasing. In some countries this increase is rapid: for example, in the United Kingdom obesity rates doubled during the 1980's and 1990's (Table 10.2 and Figures 10.2a and 10.2b).

Trend data from the MONICA Project show that between the mid-1980's and mid-1990's the majority of European populations included in the study experienced an increase in average BMI<sup>4</sup>.

## *Overweight and obesity in children*

The classification of overweight and obesity in children and adolescents is more problematic than in adults. Constant changes in body composition during growth mean that the relationship between BMI and adiposity during childhood is age dependent, and further complicated by race

and gender. While there is no clear agreement on the best way to define overweight and obesity in children, the International Obesity Task Force (IOTF) has developed a new international classification based on age and sex-specific BMI cut-off points.

The International Association for the Study of Obesity has recently published data on the prevalence of overweight and obesity in children and young people. In Europe the highest prevalence levels are found in Southern Europe. Using the IOTF classification, survey data show that around one-third of young children in Italy, Greece and Portugal are overweight or obese (Table 10.3 and Figure 10.3). Although there are complex patterns in prevalence and trends, these data also suggest that childhood obesity in Europe has increased steadily over the past two or three decades<sup>5</sup>. In England, for example, the prevalence of obesity in children aged 4-11 years increased by over 50% between 1974 and 1994 (Table 10.3)

1. World Health Organization (2000) *Obesity – preventing and managing the global epidemic. Report of a WHO Consultation on Obesity*. Geneva: World Health Organization.
2. World Health Organization (2002) *The World Health Report 2002. Reducing Risks, Promoting Healthy Life*. Geneva: World Health Organization.
3. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, McQueen M, Budaj A, Pais P, Varigo J, Lisheng A, on behalf of the INTERHEART Study Investigators (2004) *Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART Study): case-control study*. *The Lancet*; 364: 937-952.
4. WHO Monica Project (2003) *MONICA Monograph and Multimedia Sourcebook: World's largest study of heart disease stroke, risk factors and population trends 1979-2002*. Edited by Hugh Tunstall-Pedoe for the WHO MONICA Project. WHO: Geneva
5. For a discussion on childhood obesity in Europe and further details of the IOTF classification system see Lobstein T, Baur L and Uauy R, for the IASO International Obesity TaskForce (2004) *Obesity in children and young people: A crisis in public health. Report to the World Health Organization. Obesity Reviews*; 5 (suppl 1): 4-104.



**Table 10.1** Prevalence of overweight and obesity, adults aged 35-64, by sex, latest available data, MONICA Project populations

MONICA population	MONICA population code	Year of survey	MEN			WOMEN			Mean kg/m <sup>2</sup>
			25 - <30 kg/m <sup>2</sup> Overweight %	>=30 kg/m <sup>2</sup> Obese %	Mean kg/m <sup>2</sup>	25 - <30 kg/m <sup>2</sup> Overweight %	>=30 kg/m <sup>2</sup> Obese %	Mean kg/m <sup>2</sup>	
Belgium-Charleroi	BEL-GHA	1990/93	47	19	27.1	33	24	26.8	
Belgium-Ghent	BEL-GHE	1990/92	52	13	26.4	40	16	26.1	
Czech Republic	CZE-CZE	1992	52	23	27.6	35	30	27.8	
Denmark-Glostrup	DEN-GLO	1991/92	41	13	26.0	26	12	24.7	
Finland-Kuopio Province	FIN-KUO	1992	46	24	27.3	34	26	27.1	
Finland-North Karelia	FIN-NKA	1992	49	23	27.5	37	24	27.1	
Finland-Turku/Loumaa	FIN-TUL	1992	46	22	27.1	35	19	26.2	
France-Lille	FRA-LIL	1995/96	40	17	26.4	30	22	26.4	
France-Strasbourg	FRA-STB	1995/97	51	22	27.3	31	19	26.2	
France-Toulouse	FRA-TOU	1994/96	49	13	26.1	24	10	24.5	
Germany-Augsburg (rural)	GER-AUR	1994/95	55	24	27.8	33	23	26.8	
Germany-Augsburg (urban)	GER-AUU	1995/95	54	17	27.1	36	21	26.5	
Germany-Bremen	GER-BRE	1991/92	50	16	26.8	36	19	26.3	
Germany-East Germany	GER-EGE	1993/94	51	18	26.9	37	18	26.4	
Iceland	ICE-ICE	1993/94	50	16	26.8	36	18	26.3	
Italy-Area Brianza	ITA-BRI	1993/94	50	14	26.4	29	18	25.5	
Italy-Friuli	ITA-FRI	1994	51	17	26.9	31	19	25.8	
Lithuania-Kaunas	LIT-KAU	1992/93	47	20	27.1	34	32	28.0	
Poland-Tarnobrzeg Voivodship	POL-TAR	1992/93	41	15	25.9	36	36	28.5	
Poland-Warsaw	POL-WAR	1993	45	22	27.1	35	29	27.5	
Russia-Moscow (control)	RUS-MOC	1992/95	38	8	25.2	33	22	26.5	
Russia-Novosibirsk (control)	RUS-NOC	1995	35	17	25.9	33	35	28.5	
Spain-Catalonia	SPA-CAT	1994/96	53	16	26.7	42	25	27.4	
Sweden-Gothenburg	SWE-GOT	1994/96	47	13	26.2	31	10	24.9	
Sweden-Northern Sweden	SWE-NSW	1994	50	14	26.4	34	14	25.7	
Switzerland-Ticino	SWI-TIC	1993/93	53	13	26.5	27	16	25.3	
Switzerland-Vaud/Fribourg	SWI-VAF	1992/93	47	16	26.5	31	10	24.7	
United Kingdom-Belfast	UNK-BEL	1991/92	49	14	26.3	30	16	25.6	
United Kingdom-Glasgow	UNK-GLA	1995	42	23	26.8	36	23	26.9	
Yugoslavia-Novi Sad	YUG-NOS	1994/95	49	20	27.3	36	32	27.8	

Age-standardized levels; consult WHO MONICA Project for details of measurement and age-standardization.

Source: Evans A, Tolonen H, Hense HW, Ferrario M, Sans S, Kuulaasmaa K, for the WHO MONICA Project (2001) Trends in coronary risk factors in the WHO Monica Project. *International Journal of Epidemiology*; 30 (Suppl 1): S35-S40.

*Table 10.2 Body Mass Index by sex, 1960-1999, all available countries*

Country	Year	Base	Age (y)	BMI - Men			BMI - Women			Notes
				Mean (kg/m <sup>2</sup> )	>25 (%)	>30 (%)	Mean (kg/m <sup>2</sup> )	>25 (%)	>30 (%)	
Austria	1991	NR	20+	25.0		8.3	24.1		9.0	8 regions
Belgium	1979-84	11302	25-74	25.9	58.6	12.1	26.0	53.6	18.4	
Denmark	1994	4668	16+	24.9	44.2	8.2	23.3	28.0	7.0	
Finland	1966-72	17294	15+	24.6		8.3	25.3		17.4	
	1978-80	4225	15-64	24.7	42.0		24.3	36.0		
	1982	9111	25-64	26.3	61.0	15.4	25.8	50.0	16.6	3 regions
	1985-7	4125	15-64	24.8	43.0		24.3	36.0		
	1987	6025	25-64	26.7	65.4	17.5	26.2	52.3	20.3	3 regions
	1988-90	3850	15-64	25.0	45.0		24.5	38.0		
	1992	4618	25-64	26.8	64.9	19.9	26.1	51.9	20.0	3 regions
	1994-6	3575	15-64	25.4	50.0		25.1	43.0		
	1997	4329	25-64	27.1	67.4	20.1	26.2	52.4	19.2	3 regions
France	1999	3371	15-64	25.4	50.0		25.0	42.0		
	1980-81	13942	20+	24.6	39.4	6.4	23.2	26.8	6.3	
	1988	1941	16-50	23.5			22.1			1272 men, 669 women
Germany	1991-2	15106	20+	24.7	40.8	6.5	23.3	27.5	7.0	
	1984-5	4790	25-69	26.5		15.1	25.8		16.5	
	1987-8	5335	25-69	26.5		14.7	25.8		17.2	
Greece	1990-1	5311	25-69	26.8		17.2	26.2		19.3	
	1992	7410	25-69	26.8			26.3			
	1998	7124	18-79	26.9			26.3			
	1993-9	14281	30-82	27.9			28.0			Baseline of cohort study
Hungary	1986-8	16113	18+	26.0	57.2	16.5	27.3	61.7	19.6	
Italy	1983	72284	15+	24.6	41.2	7.1	23.4	28.9	7.6	
Kyrgyzstan	1993	4053	18-59	23.6	30.6	4.2	24.2	35.0	10.7	
Netherlands	1981	~9000	20+	23.7		3.9	23.4		6.2	
	1982	~9000	20+	23.6		3.5	23.3		5.9	
	1982-4	~9000	20+	24.3	37.0	3.7	23.5	29.4	6.0	
	1984	~9000	20+	23.7		3.9	23.4		6.2	
	1985	~9000	20+	23.6		3.6	23.3		6.0	
	1985-7	~9000	20+	24.3	38.3	3.8	23.6	30.0	6.3	
	1987	~9000	20+	23.8		4.1	23.4		6.3	
	1988	~9000	20+	24.0		4.6	23.5		6.8	
	1987-91	36266	20-59	24.9		7.4	24.3		9.0	3 municipalities
	1989-91	~9000	20+	24.5	39.3	5.1	23.8	31.3	7.1	
	1993-5	12905	20-59	25.8		8.0	25.0		10.0	3 municipalities
	1993-5	~9000	20+	24.7	42.0	5.9	24.0	33.3	7.4	
	1995	4601	20-59	25.5	53.3	10.0	24.8	38.9	10.3	3 municipalities
1996-8	21764	20+	24.8	43.5	6.5	24.3	36.5	9.1		
Norway	1994	3144	16-79	24.6	42.0	5.0	23.4	26.0	5.0	
Spain	1989-94	5388	25-60	25.6		11.5	25.3		15.2	4 regions
Sweden	1980-1	14474	16-84	24.2	35.7	4.7	23.4	27.6	5.4	
	1988-9	12387	16-84	24.4	38.2	5.2	23.4	27.9	5.6	
	1996-7	11417	16-84	25.0	45.9	6.8	24.0	33.6	7.2	
Switzerland	1992-3	15288	15+	24.5	39.2	6.1	22.4	21.8	4.7	
	1997	79311	15+	24.7	42.1	6.7	23.3	28.0	6.9	
Turkey	1990	3689	20+	25.1		9.0	26.3		21.7	
United Kingdom	1980	8434	20-64	24.8	43.0	8.0	24.0	34.0	9.0	
	1986	2319	16-64	24.9	45.0	8.0	24.6	36.0	12.0	
	1988	1747	16-50	23.8			23.2			Men oversampled
	1991	NR	16-64	25.7		12.7	25.3		15.0	
	1993	15284	16+	25.9	57.6	13.2	25.7	48.6	16.4	
	1994	14679	16+	26.0	58.1	13.8	25.8	48.7	17.3	
	1995	14436	16+	26.1	59.3	15.3	25.9	50.4	17.5	
	1996	15061	16+	26.3	61.0	16.4	26.0	52.0	18.4	
	1997	7939	16+	26.5	62.2	17.0	26.2	52.5	19.7	
	1998	14330	16+	26.5	62.8	17.3	26.4	53.3	21.2	

For references to the original studies from which these data are extracted contact the authors of this supplement or Professor Boyd Swinburn (swinburn@deakin.edu.au)

Source: Extracted from a draft World Health Organization report on the impact of rapid transitions on the increasing public health problem of obesity prepared by Swinburn B et al.

Figure 10.2a Prevalence of obesity, adults, 1990's, all available countries

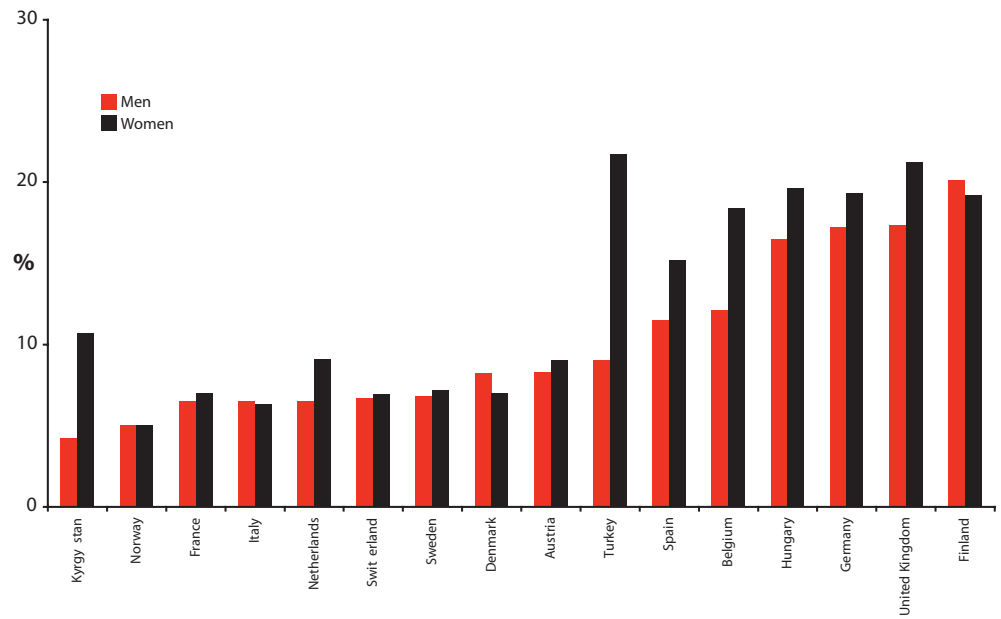
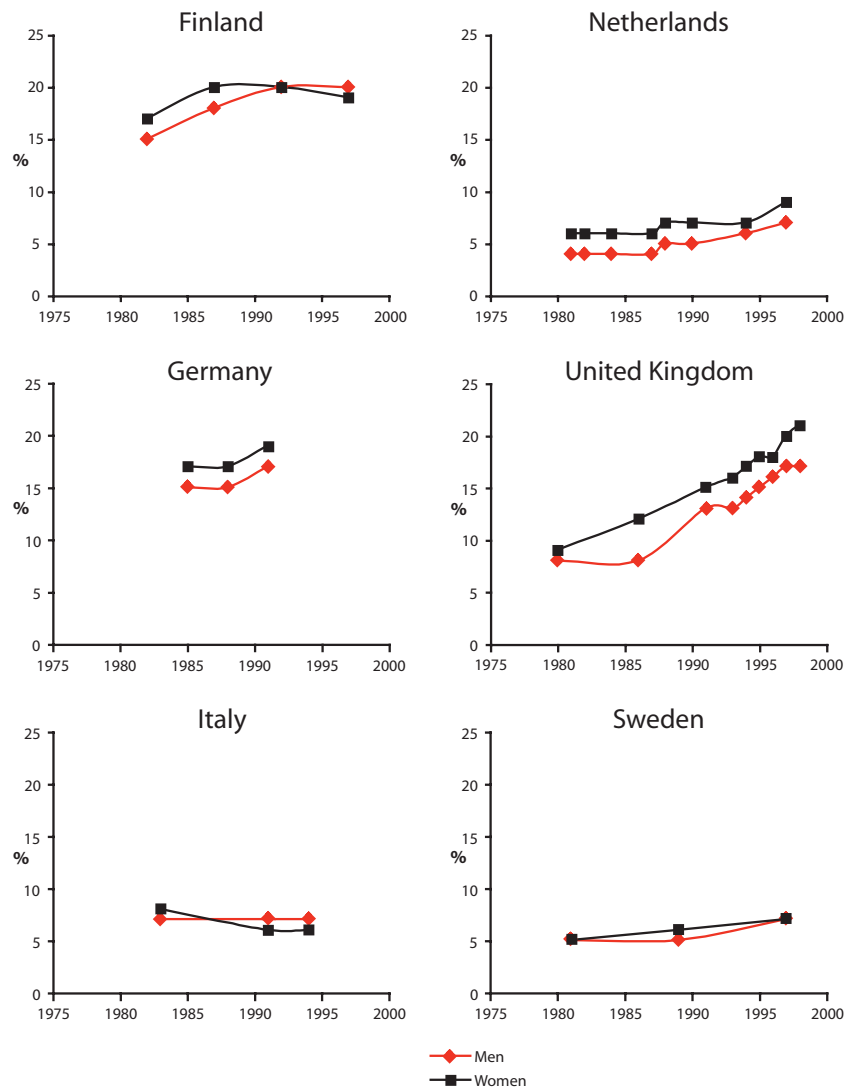


Figure 10.2b Prevalence of obesity, adults, by sex, 1981-1998

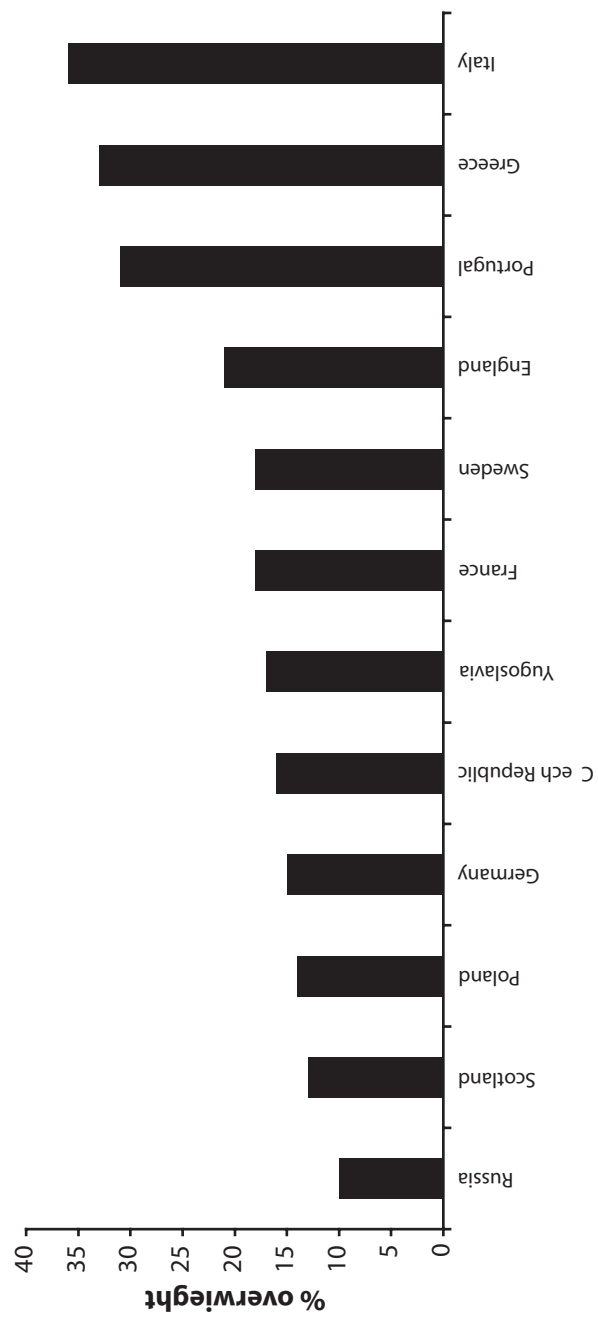


**Table 10.3** *Prevalence of overweight and obesity in children, 1974-2003, all available countries*

Country	Year	Sample size	Age (y)	Classification of obesity	Prevalence	
					Obesity (%)	Overweight (%)
Austria	2002-03	1,537	10-15	>97th/>90th local reference centiles	9 (males) 5 (females)	18 (males) 16 (females)
Bosnia & Herzegovina	2000	2,569	0-5	WHZ>3, WHZ>2	4 (males) 5 (females) 6 (urban) 4 (rural)	12 (males) 15 (females) 14 (urban) 13 (rural)
Croatia	1993-94 1995-96	N/A 26,036	1-6 1-6	WHZ>2	4 6	
Czech Republic	2000	3,345	7-11	IOTF	4	16
Finland	1977-1999	66,211	12-18	IOTF (Height and weight self-assessed)	1 (males 1977) <1 (females 1977) 3 (males 1999) 1 (females 1999)	8 (males 1977) 5 (females 1977) 19 (males 1999) 11 (females 1999)
France	1980 1990 2000	6,697 5,795 1,582	4-17 4-17 7-9	>97th and >90th 1980 French BMI centiles IOTF	3 3 4	10 12 18
Germany	1975 1995	2,002 1,901	7-14 7-14	>97th and >90th French BMI centiles	5 (males) 5 (females) 8 (males) 10 (females)	10 (males) 12 (females) 16 (males) 21 (females)
	1982 1997	95,806	5-6	IOTF	2 3	10 15
Greece	1992 1995 1998 2002	1,046 579 831 N/A	6 9 12 15	IOTF	10 (males) 7 (females) 10 (males) 9 (females) 14 (males) 9 (females) 13 (males) 9 (females)	22 (males) 28 (females) 30 (males) 36 (females) 40 (males) 37 (females) 44 (males) 27 (females)
Italy	2000	2,458	6-17	IOTF	4	22
Italy	2001	41,149	9	IOTF	12	36
Netherlands	1980	14,500	0-21	> 90th 1980 Dutch centile	10	
Poland	1996-99	1,333	5-10	IOTF	4 (males) 4 (females) 8 (males) 1 (females) 3	20 (males) 20 (females) 25 (males) 12 (females) 14
Portugal	2000 2002-03	2,957 4,503	7-9 7-10	IOTF	9 (males) 12 (females)	28 (males) 33 (females)
Russia	1992 1998	6,883 2,152	6-18 6-18	IOTF (overweight incl. obese)		26 (6-10yrs) 12 (10-18yrs) 10 (6-10yrs) 9 (10-18yrs)
Spain	1980 1995	2,864 1,360	6-14 6-14	IOTF	2 (males) 1 (females) 2 (males) 3 (females)	12 (males) 14 (females) 20 (males) 18 (females)
Sweden	1997	2,747	12-18	>98th and >91st centiles on an international BMI reference curve	8 (males 12 yrs) 5 (females 12yrs) 9 (males 15yrs) 4 (females 15yrs) 7 (males 18yrs) 4 (females 18yrs)	20 (males 12 yrs) 12 (females 12yrs) 21 (males 15yrs) 10 (females 15yrs) 19 (males 18yrs) 9 (females 18yrs) 18
Switzerland	2000-01 1980 1990 1999	6,700 1,866 1,212 595	10 15-16 15-16 6-12	IOTF >97th centile on French BMI reference curve >95th and >85th NCHS BMI centiles	4 (males) 3 (females) 9 (males) 5 (females) 9 (males) 10 (females)	23 (males) 25 (females)
England	1974 1984 1994 1998	8,010 6,267 5,874 1,198	4-11 4-11 4-11 7-11	IOTF	1 (males) 2 (females) 1 (males) 1 (females) 2 (males) 3 (females) 5 (males) 4 (females)	6 (males) 9 (females) 5 (males) 9 (females) 9 (males) 14 (females) 17 (males) 24 (females)
Scotland	1974 1984 1994	2,250 4,246 4,108	4-11 4-11 4-11	IOTF	2 (males) 2 (females) 1 (males) 2 (females) 2 (males) 3 (females)	5 (males) 9 (females) 6 (males) 10 (females) 10 (males) 16 (females)
Yugoslavia	Pre 1988 1996 2000 1998	N/A 3,228 1,647 6,288	0-5 0-5 0-5 9-10	WHZ>2 WHZ>2 IOTF	3 13 14	17 (males) 16 (females)

Source: Lobstein T, Baur L and Uauy R, for the IASO International Obesity Task Force (2004) *Obesity in children and young people: A crisis in public health. Report to the World Health Organization. Obesity Reviews*; 5 (suppl 1): 4-104.

Figure 10.3 Prevalence of overweight in children aged between 4-11 years,  
latest available year



# 11. Diabetes

Diabetes not only substantially increases the risk of CVD but also magnifies the effect of other risk factors for CVD such as raised cholesterol levels, raised blood pressure, smoking and obesity. There are two main types of diabetes: Type 1 and Type 2 diabetes<sup>1</sup>.

The recent INTERHEART case-control study estimated that 15% of heart attacks in Western Europe and 9% of heart attacks in Central and Eastern Europe are due to abnormal blood lipids, and that people with a diagnosed diabetes are at three times the risk of a heart attack compared to those without<sup>2</sup>.

There are two data sources on the prevalence of diabetes in Europe. *The WHO European Health for All database* compiles data from national diabetes registers, where available, or from routine reporting systems. These data show the prevalence of diagnosed diabetes is increasing in nearly all countries of Europe (Table 11.1).

The WHO data, however, greatly underestimate the true prevalence of diabetes in the population as around 50% of diabetes is undiagnosed. The *International Diabetes Federation's Diabetes Atlas* collates population-based prevalence studies across Europe, and reports data on diagnosed and undiagnosed diabetes combined (Table 11.2). This study estimates an overall European prevalence of 7.8%, with over 48 million adults aged 20-79 years in Europe living with diabetes in 2003. Rates are generally highest in countries of Central and Eastern Europe (Fig 11.2).

1. Diabetes is characterized by high blood glucose levels. It arises when the pancreas fails to make enough insulin or when the body cannot effectively make use of the insulin produced or both. The chronic high blood glucose levels (hyperglycaemia) that result are associated with long-term damage, dysfunction and failure of various organs, especially the eyes, kidneys, nerves, heart and blood vessels. Type 1 diabetes results from an autoimmune destruction of the cells in the pancreas which produce insulin. People with Type 1 diabetes must take daily injections of insulin for survival. Type 2 diabetes, which accounts for about 90% of all diabetes, is characterized by an inability on the part of the body to respond to insulin (insulin resistance) and/or abnormal insulin secretion. People with Type 2 diabetes are not usually treated with insulin. There are a number of other less common types of diabetes including gestational diabetes. This occasionally occurs during pregnancy in women not previously diagnosed with diabetes and is a marker of greater risk of developing Type 2 diabetes in later life.
2. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, McQueen M, Budaj A, Pais P, Varigo J, Lisheng A, on behalf of the INTERHEART Study Investigators (2004) Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART Study): case-control study. *The Lancet*; 364: 937-952.

Table 11.1 Prevalence of diabetes, 1980-2002

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Armenia	0.45	0.54	0.55	0.64	0.66	0.72	0.76	0.83	0.90	0.95	1.07	1.05	1.00	1.05	1.09	0.97	0.95	0.92	0.92	0.90	0.90	0.90	1.27	
Azerbaijan											0.63	0.62	0.61	0.56	0.55	0.52	0.55	0.54	0.51	0.51	0.53	0.55	0.57	
Belarus											1.19	1.17	1.14	1.14	1.14	1.14	1.14	1.04	1.18	1.30	1.29	1.37	1.45	
Belgium											3.45							2.30			3.24	2.65		
Bosnia and Herzegovina	0.44	0.51	0.47	0.50	0.57	0.49	0.57	0.55	0.62	0.72	0.73	0.73	1.15	1.30	1.31	1.32	1.51	1.58	1.62	1.73	1.72	1.11	1.00	
Bulgaria	0.83	0.95	1.02	1.08	1.07	1.10	1.19	1.20	1.19	1.13	1.14	1.12	1.15	4.89	4.78	4.86	5.65	5.83	5.92	6.07	6.37	6.39	6.54	
Czech Republic	3.07	3.27	3.42	3.64	3.78	3.83	3.93	4.06	4.24	4.46	4.62	4.76	4.89	4.78	2.40	2.40	2.44	2.44	2.44	2.44	2.44	2.44	2.44	
Denmark																								
Finland	1.77	1.77	1.80	1.78	1.79	1.80	1.86	1.88	1.90	1.94	2.01	2.08	2.15	2.23	2.21	2.21	2.25	2.32	2.38	2.45	2.56	2.68	2.80	
France													0.60	0.60					2.76		2.99			
Georgia													0.87	1.04	1.12	1.19	1.13	1.25	1.10	1.24	0.97	1.02	1.03	
Greece	0.16	0.18	0.18	0.19	0.19	0.20	0.19	0.19	0.20	0.18	0.17	0.17	0.17	0.18				0.16	0.17	0.17				
Hungary																								
Iceland									4.35															
Israel										0.14														
Italy														2.57		0.17	2.98				3.20		0.18	
Kazakhstan																3.70								
Kyrgyzstan																0.63								
Latvia	0.19	0.24	0.27	0.27	0.29	0.31	0.33	0.35	0.38	0.39	0.39	0.39	0.40	0.37	0.39	0.40	0.39	0.42	0.40	0.47	0.41	0.41	0.46	
Lithuania																								
Lithuania																								
Malta																								
Netherlands																								
Norway																								
Portugal																								
Republic of Moldova																								
Romania	0.55	0.57	0.60	0.65	0.70	0.75	0.80	0.86	0.90	0.97	1.01	1.03	1.02	0.98	0.97	0.94	0.93	0.91	0.94	0.92	0.91	0.73	0.78	
Russian Federation																								
Serbia and Montenegro																								
Slovakia	2.45	2.78	2.78	3.06	3.13	3.21	3.21	3.29	3.43	3.55	3.70	3.76	3.82	3.89	3.97	3.75	4.03	4.18	4.41	4.44	4.74	4.90	5.07	
Slovenia	2.42	2.58	2.58	2.68	2.68	2.68	2.68	2.76	2.87	2.95	3.14	3.30	3.45	3.52		2.90								
Sweden																								
Switzerland																								
Tajikistan																								
The former Yugoslav Republic of Macedonia																								
Turkey																								
Turkmenistan																								
Ukraine	0.86	0.91	0.97	1.04	1.11	1.18	1.27	1.35	1.42	1.48	1.56	1.68	1.69	1.71	1.73	1.74	1.76	1.76	1.78	1.83	1.85	1.87	1.92	
Uzbekistan																								

Source: World Health Organization (2004) European health for all database. <http://fadb.wbo.dk/ifa/>

Table 11.2 Estimated prevalence of diabetes, 2003 and 2025

2003

2025

	Population Aged 20-79 (000s)		Numbers with diabetes		Crude prevalence		Population Aged 20-79 (000s)		Numbers with diabetes		Crude prevalence	
	Men (000s)	Women (000s)	Men (000s)	Women (000s)	Total (000s)	%	Men (000s)	Women (000s)	Total (000s)	%	Men (000s)	Women (000s)
Albania	1,966	35	40	75	3.8	3.8	2,559	61	70	131	5.1	5.1
Andorra	50	2	2	4	7.7	7.7	52	3	3	5	9.5	9.5
Austria	5,991	259	318	576	9.6	9.6	5,887	338	365	703	11.9	11.9
Azerbaijan	5,154	144	214	358	6.9	6.9	6,793	259	377	636	9.4	9.4
Belarus	7,336	309	374	683	6.9	6.9	7,233	357	417	773	10.7	10.7
Belgium	7,531	141	175	315	4.2	4.2	7,658	180	214	395	5.2	5.2
Bosnia and Herzegovina	3,074	117	178	295	9.6	9.6	3,270	166	237	402	12.3	12.3
Bulgaria	5,894	236	356	591	10.0	10.0	4,871	223	342	565	11.6	11.6
Croatia	3,412	82	117	199	5.8	5.8	3,304	97	124	221	6.7	6.7
Cyprus	541	15	15	28	2.8	2.8	637	18	22	40	6.3	6.3
Czech Republic	7,734	365	370	735	9.5	9.5	7,599	442	446	887	11.7	11.7
Denmark	3,863	121	144	265	6.9	6.9	3,988	148	182	330	8.3	8.3
Estonia	991	43	53	96	9.7	9.7	814	42	48	89	11.0	11.0
Finland	3,775	130	143	274	7.2	7.2	3,822	186	198	384	10.0	10.0
France	42,546	1,306	1,347	2,654	6.2	6.2	45,141	1,610	1,676	3,285	7.3	7.3
Georgia	3,681	129	203	332	9.0	9.0	3,341	143	215	358	10.7	10.7
Germany	61,895	2,879	3,415	6,294	10.2	10.2	60,030	3,459	3,685	7,144	11.9	11.9
Greece	8,069	217	276	493	6.1	6.1	7,767	254	312	566	7.3	7.3
Hungary	7,350	336	375	711	9.7	9.7	6,807	365	397	762	11.2	11.2
Iceland	192	2	2	4	2.0	2.0	229	3	3	6	2.5	2.5
Ireland	2,674	44	46	90	3.4	3.4	3,290	66	69	135	4.1	4.1
Israel	3,959	141	141	282	7.1	7.1	5,776	243	225	468	8.1	8.1
Italy	43,925	1,480	1,480	2,880	6.6	6.6	40,482	1,584	1,615	3,198	7.9	7.9
Kazakhstan	10,235	305	254	559	5.5	5.5	11,358	430	367	797	7.0	7.0
Kyrgyzstan	2,896	71	54	125	4.3	4.3	4,355	144	108	252	5.8	5.8
Latvia	1,758	78	96	174	9.9	9.9	1,610	84	94	178	11.1	11.1
Lithuania	2,648	115	134	249	9.4	9.4	2,626	136	148	284	10.8	10.8
Luxembourg	327	6	7	13	3.8	3.8	415	8	10	18	4.4	4.4
Malta	1,428	31	39	70	4.9	4.9	1,598	44	53	97	6.1	6.1
Moldova, Republic of	280	11	15	26	9.2	9.2	304	15	20	35	11.6	11.6
Monaco	2,915	117	125	242	9.3	9.3	3,095	148	154	302	9.8	9.8
Netherlands	11,678	203	229	432	1.6	1.6	24	1	1	2	7.2	7.2
Norway	3,154	96	116	212	6.7	6.7	3,534	129	159	289	8.2	8.2
Poland	27,852	1,239	1,268	2,507	9.0	9.0	28,567	1,546	1,607	3,153	11.0	11.0
Portugal	7,471	279	306	585	7.8	7.8	7,456	344	362	706	9.5	9.5
Romania	16,392	760	739	1,519	9.3	9.3	15,860	834	843	1,677	10.6	10.6
Russian Federation	105,244	4,418	5,276	9,694	9.2	9.2	98,969	4,909	5,838	10,747	10.9	10.9
San Marino	20	1	1	1	6.1	6.1	21	1	1	2	7.2	7.2
Serbia and Montenegro	7,542	182	240	422	5.6	5.6	7,597	215	268	483	6.4	6.4
Slovakia	3,903	168	171	339	8.7	8.7	4,127	219	224	443	10.7	10.7
Slovenia	1,511	72	73	145	9.6	9.6	1,451	87	87	174	12.0	12.0
Spain	30,329	1,210	1,795	3,004	9.9	9.9	29,155	1,479	1,466	2,945	10.1	10.1
Sweden	6,290	206	251	457	7.3	7.3	6,373	246	303	548	8.6	8.6
Switzerland	5,310	235	270	505	9.5	9.5	5,114	308	339	647	12.6	12.6
Tajikistan	3,174	70	46	117	3.7	3.7	5,305	158	110	268	5.1	5.1
Turkey	42,411	1,254	1,704	2,959	7.0	7.0	59,689	2,285	3,145	5,430	9.1	9.1
Turkmenistan	2,648	62	43	105	4.0	4.0	4,537	143	105	248	5.5	5.5
Ukraine	35,625	1,532	1,901	3,453	9.7	9.7	31,102	1,558	1,800	3,358	10.8	10.8
United Kingdom	42,423	814	858	1,672	3.9	3.9	45,322	1,080	1,062	2,141	4.7	4.7
Uzbekistan	14,144	333	228	561	4.0	4.0	22,883	754	544	1,297	5.7	5.7
EUROPE	621,235	22,337	26,041	48,378	7.8	7.8	646,334	27,842	30,796	58,638	9.1	9.1

Source: International Diabetes Federation (2003) *The Diabetes Atlas (Second edition)* International Diabetes Federation: Brussels.



Figure 11.2 Estimated prevalence of diabetes, 2003



# 12. Economic costs

CVD has major economic costs as well as human costs for Europe.

## *Health care costs*

CVD cost the health care systems of the EU just under €105 billion in 2003<sup>1,2</sup>. This represents a cost per capita of €230 per annum, around 12% of the total health care expenditure across the EU. The cost of inpatient hospital care for people who have CVD accounted for about 57% of these costs, and that of drugs for about 27% (Table and Figure 12.1).

The amount spent on health care for people with CVD varies widely across the EU. Cost per capita varied almost 18 fold in 2003, from €22 in Malta to €423 in Germany. Percentage of total health care expenditure spent on CVD varied from 2% in Malta to 18% in the UK (Table 12.1).

Around one-fifth (22%) of health care expenditure on CVD in the EU is due to CHD (Tables 12.1 and 12.2). CHD cost the health care systems of the EU just under €23 billion in 2003. Inpatient hospital care for people who have CHD accounted for about 63% of these costs, and that of drugs for about 22% (Table 12.2).

A further one-fifth (20%) of health care expenditure on CVD in the EU is due to stroke (Tables 12.1 and 12.3). Stroke cost the health care systems of the EU over €21 billion in 2003. Inpatient hospital care for people who have strokes accounted for about 81% of these costs, and that of drugs for about 5% (Table 12.3).

## *Non health-care costs*

Looking only at the cost of CVD to the health care systems of the EU grossly underestimates the true cost of CVD. Production losses from death and illness in those of working age and from the informal care of people with the disease contribute greatly to the overall financial burden.

In 2003, production losses due to mortality and morbidity associated with CVD cost the EU over €35 billion, with around two-thirds of this cost due to death (€24.4 billion) and one-third due to illness (€10.8 billion) in those of working age (Table 12.4).

Just under half the cost of production losses due to mortality from CVD and one-third of the cost of production losses due to morbidity from CVD were due to morbidity. In 2003, production losses due to mortality and morbidity associated with CHD cost the EU just over €15 billion (Table 12.4).

Just under one-fifth the cost of production losses due to mortality from CVD and one-sixth of the cost of production losses due to morbidity were due to stroke. In 2003, production losses due to mortality and morbidity associated with stroke cost the EU over €6 billion (Table 12.4).

The cost of informal care for people with CVD in the EU is another important non-health care cost. In 2003, the total cost of providing this care was over €29 billion. Just under one-quarter of these costs were due to CHD (€6.9 billion) and another quarter were due to stroke (€6.8 billion) (Table 12.4).

## *Total costs*

Overall CVD is estimated to cost the EU economy €169 billion a year. This represents a total annual cost per capita of €372<sup>4</sup>. Per capita costs vary over 10 fold between Member States – from around under €50/capita/year in Malta to over €600/capita/year in Germany and the UK<sup>4</sup>. Of the total cost of CVD in the EU, around 62% is due to direct health care costs, 21% to productivity losses and 17% to the informal care of people with CVD (Table 12.5).

CHD is estimated to cost the EU economy over €45 billion a year: just over one-quarter of the overall cost of CVD. Of the total cost of CHD in the EU, around 51% is due to direct health care costs, 34% to productivity losses and 15% to the informal care of people with CHD (Table 12.5).

Stroke is estimated to cost the EU economy over €34 billion a year: around one-fifth of the overall cost of CVD. Of the total cost of stroke in the EU, around 62% is due to direct health care costs, 18% to productivity losses and 20% to the informal care of people with stroke (Table 12.5).

1. *The figures for this section are from a new cost of illness study by researchers at the Health Economics Research Centre, Department of Public Health, University of Oxford. The analysis was carried out for the year 2003, and costs calculated for individual Member States and the EU as a whole. Details of the methods and data used can be found at [www.heartstats.org/eucosts](http://www.heartstats.org/eucosts)*
2. *Due to lack of data across the EU, this figure does not include the money spent on non-clinical activities concerned with the primary prevention of CVD, for example, public anti-smoking campaigns, nutrition education etc. However, the cost of drugs prescribed in primary care for both primary and secondary prevention are included.*
3. *The cost of informal care is equivalent to the opportunity costs of unpaid care. It is a measure of the amount of money that carers forgo to provide unpaid care for their spouse, friend or relative living with CVD. For more details of the methods used see [www.heartstats.org/eucosts](http://www.heartstats.org/eucosts).*
4. *For data on total costs per capita (for individual Member States and the EU as a whole) see table at [www.heartstats.org/eucosts](http://www.heartstats.org/eucosts)*

Table 12.1 Health care costs of CVD, by country, 2003, EU

Country	Primary care	Outpatient care	Accident and emergency care	Inpatient care	Medications	Total health care costs of CVD	Cost per capita	Percentage of total health care expenditure
Austria	€ 54,548,684	€ 88,806,484	€ 13,538,786	€ 1,255,929,643	€ 576,019,048	€ 1,988,842,645	€ 246.53	11%
Belgium	€ 151,796,330	€ 88,996,559	€ 39,330,427	€ 1,100,976,434	€ 696,269,264	€ 2,077,369,015	€ 200.60	8%
Cyprus	€ 1,312,985	€ 3,462,818	€ 2,818,602	€ 17,926,756	€ 22,411,608	€ 47,932,770	€ 67.03	7%
Czech Rep.	€ 14,041,840	€ 82,397,515	€ 64,374,318	€ 383,598,813	€ 302,712,693	€ 847,125,178	€ 83.03	14%
Denmark	€ 20,267,382	€ 66,194,979	€ 13,483,919	€ 785,250,979	€ 274,681,855	€ 1,159,879,114	€ 215.45	7%
Estonia	€ 2,406,667	€ 11,682,317	€ 1,676,823	€ 34,605,825	€ 23,993,492	€ 74,365,124	€ 54.84	17%
Finland	€ 24,835,636	€ 14,986,058	€ 8,122,200	€ 749,373,665	€ 425,892,800	€ 1,223,210,360	€ 234.95	12%
France	€ 1,713,092,522	€ 619,034,688	€ 143,297,933	€ 4,974,485,373	€ 4,136,570,337	€ 11,586,480,853	€ 194.31	8%
Germany	€ 5,558,529,848	€ 2,013,328,778	€ 1,045,965,319	€ 17,519,032,508	€ 8,772,385,500	€ 34,909,241,951	€ 422.95	15%
Greece	€ 11,252,242	€ 21,320,037	€ 56,992,692	€ 651,358,178	€ 800,113,500	€ 1,541,036,648	€ 139.86	11%
Hungary	€ 18,207,869	€ 53,433,724	€ 6,132,589	€ 193,664,957	€ 258,989,294	€ 530,428,433	€ 52.30	9%
Ireland	€ 26,782,677	€ 31,813,007	€ 14,719,441	€ 287,889,759	€ 67,568,286	€ 428,773,170	€ 108.18	4%
Italy	€ 534,946,277	€ 319,200,692	€ 100,157,876	€ 6,238,616,362	€ 4,499,000,000	€ 11,691,921,206	€ 203.97	11%
Latvia	€ 1,645,610	€ 6,103,703	€ 623,564	€ 38,594,093	€ 8,416,776	€ 55,383,746	€ 23.75	11%
Lithuania	€ 10,598,329	€ 2,732,684	€ 2,059,764	€ 83,312,643	€ 51,738,657	€ 150,442,076	€ 43.45	16%
Luxembourg	€ 3,400,631	€ 3,971,831	€ 1,738,996	€ 68,189,050	€ 37,200,000	€ 114,500,508	€ 255.41	8%
Malta	€ 610,979	€ 428,907	€ 260,904	€ 3,400,672	€ 3,899,485	€ 8,600,948	€ 21.65	2%
Netherlands	€ 360,037,654	€ 161,331,580	€ 58,187,904	€ 2,884,629,612	€ 955,335,023	€ 4,419,521,773	€ 272.93	11%
Poland	€ 151,920,808	€ 275,717,456	€ 13,849,278	€ 1,130,812,054	€ 191,550,270	€ 1,763,849,867	€ 46.15	16%
Portugal	€ 31,889,253	€ 9,691,738	€ 46,503,443	€ 375,260,328	€ 506,070,288	€ 969,415,050	€ 93.15	8%
Slovakia	€ 20,398,605	€ 65,489,841	€ 3,245,171	€ 94,817,676	€ 94,817,676	€ 278,768,966	€ 51.82	18%
Slovenia	€ 4,382,411	€ 8,366,886	€ 5,197,210	€ 81,507,842	€ 59,333,196	€ 158,787,544	€ 79.59	8%
Spain	€ 160,877,884	€ 466,411,173	€ 193,542,474	€ 1,625,456,945	€ 1,569,895,923	€ 4,016,184,399	€ 96.66	7%
Sweden	€ 155,376,134	€ 505,875,818	€ 80,045,822	€ 1,743,809,730	€ 356,620,000	€ 2,841,727,504	€ 317.84	12%
UK	€ 905,403,337	€ 261,587,292	€ 72,009,086	€ 16,891,211,826	€ 3,724,517,990	€ 21,854,729,531	€ 368.37	18%
TOTAL EU	€ 9,938,562,593	€ 5,182,366,563	€ 1,987,874,538	€ 59,213,711,725	€ 28,416,002,962	€ 104,738,518,381	€ 230.42	12%

Sources: For details of methods and sources used, see [www.heartstats.org/leucost](http://www.heartstats.org/leucost)

Figure 12.1 Costs of CVD to the health care system, 2003, EU

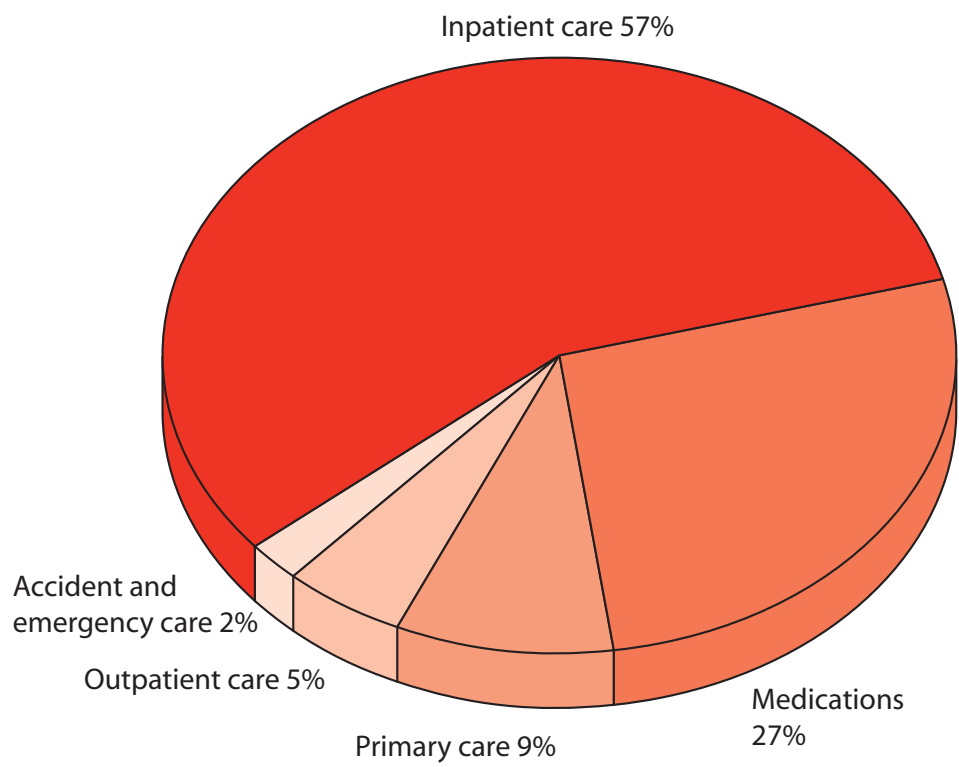


Table 12.2 Health care costs of CHD by country, 2003, EU

Country	Primary care	Outpatient care	Accident and emergency care	Inpatient care	Medications	Total health care costs of CHD	Cost per capita
Austria	€ 13,244,185	€ 21,561,831	€ 3,287,159	€ 278,313,048	€ 126,724,191	€ 443,130,414	€ 54.93
Belgium	€ 51,238,567	€ 30,040,622	€ 13,275,912	€ 278,724,401	€ 153,179,238	€ 526,458,741	€ 50.84
Cyprus	€ 509,484	€ 1,343,693	€ 1,093,715	€ 5,962,456	€ 4,930,554	€ 13,839,901	€ 19.35
Czech Rep.	€ 4,369,025	€ 25,637,438	€ 20,029,640	€ 94,996,211	€ 66,596,792	€ 211,629,106	€ 20.74
Denmark	€ 6,642,968	€ 21,696,493	€ 4,235,195	€ 189,869,700	€ 60,430,008	€ 282,874,365	€ 52.54
Estonia	€ 784,812	€ 3,809,593	€ 546,810	€ 9,438,303	€ 855,848	€ 15,435,366	€ 11.38
Finland	€ 7,842,543	€ 4,732,265	€ 2,564,811	€ 177,277,643	€ 93,696,416	€ 286,113,677	€ 54.96
France	€ 155,833,385	€ 153,309,078	€ 51,965,922	€ 1,215,495,586	€ 463,201,303	€ 2,039,805,274	€ 34.21
Germany	€ 812,470,376	€ 128,863,249	€ 464,136,750	€ 4,229,410,973	€ 1,299,984,750	€ 6,934,866,098	€ 84.02
Greece	€ 3,088,062	€ 5,851,065	€ 1,564,059	€ 153,221,630	€ 176,024,970	€ 353,826,787	€ 32.11
Hungary	€ 4,017,833	€ 11,790,934	€ 1,353,246	€ 37,288,392	€ 56,977,645	€ 111,428,050	€ 10.99
Ireland	€ 8,950,438	€ 10,631,512	€ 4,919,054	€ 80,784,053	€ 14,865,023	€ 120,150,080	€ 30.31
Italy	€ 127,098,726	€ 75,839,393	€ 19,732,061	€ 1,515,365,142	€ 989,780,000	€ 2,727,815,323	€ 47.59
Latvia	€ 657,473	€ 2,438,621	€ 249,133	€ 12,849,625	€ 1,851,691	€ 18,046,543	€ 7.74
Lithuania	€ 3,440,871	€ 887,198	€ 668,726	€ 30,701,485	€ 11,382,505	€ 47,080,785	€ 13.60
Luxembourg	€ 1,264,505	€ 1,476,902	€ 646,635	€ 17,006,870	€ 8,184,000	€ 28,578,913	€ 63.75
Malta	€ 272,306	€ 191,158	€ 81,296	€ 963,169	€ 857,887	€ 2,365,815	€ 5.95
Netherlands	€ 19,288,976	€ 47,638,508	€ 24,745,725	€ 655,774,594	€ 385,872,539	€ 1,133,320,341	€ 69.99
Poland	€ 48,667,089	€ 88,324,741	€ 4,436,549	€ 340,006,693	€ 42,141,059	€ 523,576,132	€ 13.70
Portugal	€ 6,211,464	€ 2,282,184	€ 10,950,504	€ 75,971,953	€ 111,335,463	€ 206,751,568	€ 19.87
Slovakia	€ 7,347,397	€ 23,588,862	€ 1,168,882	€ 34,152,489	€ 29,947,404	€ 96,205,034	€ 17.88
Slovenia	€ 1,005,093	€ 1,918,921	€ 1,191,965	€ 15,483,577	€ 13,053,303	€ 32,652,859	€ 16.37
Spain	€ 41,903,859	€ 121,486,109	€ 50,412,004	€ 395,157,222	€ 345,377,103	€ 954,336,297	€ 22.97
Sweden	€ 53,098,243	€ 172,878,011	€ 27,354,861	€ 301,216,274	€ 78,456,400	€ 633,003,788	€ 70.80
UK	€ 143,606,913	€ 79,795,811	€ 26,507,889	€ 4,143,027,953	€ 819,393,958	€ 5,212,332,524	€ 87.85
<b>Total EU</b>	<b>€ 1,522,854,592</b>	<b>€ 1,038,014,191</b>	<b>€ 751,195,504</b>	<b>€ 14,288,459,445</b>	<b>€ 5,355,100,050</b>	<b>€ 22,955,623,781</b>	<b>€ 50.50</b>

Sources: For details of methods and sources used, see [www.heartstats.org/en/costs](http://www.heartstats.org/en/costs)

Table 12.3 Health care costs of stroke by country, 2003, EU

Country	Primary care	Outpatient care	Accident and emergency care	Inpatient care	Medications	Total health care costs of stroke	Cost per capita
Austria	€ 8,840,092	€ 14,391,869	€ 2,194,079	€ 268,148,495	€ 20,546,599	€ 314,121,134	€ 38.94
Belgium	€ 24,436,689	€ 14,326,968	€ 6,331,546	€ 285,123,489	€ 24,835,925	€ 355,054,617	€ 34.29
Cyprus	€ 210,417	€ 554,946	€ 451,705	€ 4,924,994	€ 799,422	€ 6,941,483	€ 9.71
Czech Rep.	€ 2,566,882	€ 15,062,465	€ 11,767,781	€ 100,890,957	€ 10,797,762	€ 141,085,848	€ 13.83
Denmark	€ 3,341,265	€ 10,912,854	€ 2,793,856	€ 254,667,300	€ 9,797,902	€ 281,513,177	€ 52.29
Estonia	€ 406,666	€ 1,974,017	€ 283,341	€ 9,621,816	€ 855,848	€ 13,141,689	€ 9.69
Finland	€ 4,390,026	€ 2,648,984	€ 1,435,706	€ 163,587,646	€ 15,191,596	€ 187,253,959	€ 35.97
France	€ 126,816,134	€ 122,345,747	€ 17,195,100	€ 994,281,368	€ 169,804,654	€ 1,430,443,003	€ 23.99
Germany	€ 555,467,209	€ 1,168,469,291	€ 4,535,882	€ 5,677,135,875	€ 368,195,063	€ 7,773,803,319	€ 94.19
Greece	€ 1,437,533	€ 2,723,747	€ 7,281,117	€ 142,653,332	€ 28,540,049	€ 182,635,779	€ 16.58
Hungary	€ 4,051,339	€ 11,889,263	€ 1,364,531	€ 48,583,433	€ 9,238,148	€ 75,126,714	€ 7.41
Ireland	€ 4,561,968	€ 5,418,799	€ 2,507,204	€ 79,657,752	€ 2,410,161	€ 94,555,883	€ 23.86
Italy	€ 105,389,543	€ 62,885,595	€ 23,796,667	€ 1,137,675,560	€ 160,479,330	€ 1,490,226,694	€ 26.00
Latvia	€ 360,205	€ 1,336,030	€ 136,491	€ 13,831,204	€ 300,226	€ 15,964,157	€ 6.85
Lithuania	€ 2,285,586	€ 589,318	€ 444,199	€ 30,517,546	€ 1,845,518	€ 35,682,166	€ 10.31
Luxembourg	€ 228,948	€ 267,405	€ 117,078	€ 8,285,919	€ 1,326,924	€ 10,226,275	€ 22.81
Malta	€ 86,864	€ 60,979	€ 28,693	€ 640,637	€ 139,095	€ 936,267	€ 2.41
Netherlands	€ 5,309,146	€ 41,355,851	€ 10,371,355	€ 1,157,276,483	€ 22,635,362	€ 1,236,948,197	€ 76.39
Poland	€ 19,667,284	€ 35,693,685	€ 1,792,893	€ 199,041,849	€ 6,832,598	€ 263,028,308	€ 6.88
Portugal	€ 1,637,086	€ 2,878,974	€ 13,814,055	€ 105,791,565	€ 18,051,527	€ 142,173,208	€ 13.66
Slovakia	€ 4,029,570	€ 12,936,958	€ 641,056	€ 20,543,043	€ 4,855,563	€ 45,886,614	€ 7.99
Slovenia	€ 567,274	€ 1,083,038	€ 672,744	€ 17,264,694	€ 2,116,415	€ 21,704,164	€ 10.88
Spain	€ 30,266,008	€ 87,746,085	€ 36,411,208	€ 411,128,076	€ 55,998,188	€ 621,549,566	€ 14.96
Sweden	€ 27,532,326	€ 89,640,138	€ 14,183,952	€ 329,429,154	€ 12,720,635	€ 473,506,206	€ 52.96
UK	€ 61,369,671	€ 29,927,892	€ 11,931,269	€ 5,833,673,475	€ 132,853,557	€ 6,069,755,863	€ 102.31
<b>Total EU</b>	<b>€ 995,255,733</b>	<b>€ 1,737,120,897</b>	<b>€ 172,483,507</b>	<b>€ 17,294,375,664</b>	<b>€ 1,081,168,066</b>	<b>€ 21,280,403,867</b>	<b>€ 46.82</b>

Sources: For details of methods and sources used, see [www.heartstats.org/encosts](http://www.heartstats.org/encosts)

Table 12.4 Non health-care costs of CVD, CHD and stroke, by country, 2003, EU

Country	CVD			CHD			Stroke		
	Production losses due to mortality	Production losses due to morbidity	Informal care	Production losses due to mortality	Production losses due to morbidity	Informal care	Production losses due to mortality	Production losses due to morbidity	Informal care
Austria	€ 500,233,400	€ 84,163,362	€ 579,045,975	€ 252,615,973	€ 31,651,807	€ 128,145,507	€ 83,382,055	€ 10,041,998	€ 123,825,059
Belgium	€ 563,200,436	€ 162,005,957	€ 585,218,578	€ 257,454,332	€ 62,011,295	€ 149,014,484	€ 112,959,291	€ 32,577,198	€ 151,166,992
Cyprus	€ 39,082,349	€ 5,102,180	€ 13,351,426	€ 22,804,989	€ 3,886,521	€ 4,803,112	€ 7,234,425	€ 804,015	€ 3,570,263
Czech Rep.	€ 218,044,108	€ 136,486,057	€ 175,864,696	€ 110,564,764	€ 43,412,332	€ 43,699,137	€ 36,144,175	€ 22,728,225	€ 46,066,515
Denmark	€ 537,102,840	€ 152,341,173	€ 360,855,337	€ 256,030,497	€ 39,558,304	€ 87,163,238	€ 121,906,334	€ 44,855,231	€ 118,228,282
Estonia	€ 42,149,264	€ 5,509,264	€ 20,938,509	€ 19,034,747	€ 1,256,878	€ 5,791,029	€ 9,137,842	€ 1,236,693	€ 5,915,741
Finland	€ 462,319,182	€ 147,872,950	€ 742,907,494	€ 244,951,882	€ 34,737,908	€ 175,815,797	€ 90,913,929	€ 25,547,688	€ 162,469,260
France	€ 2,418,292,637	€ 519,234,048	€ 3,419,612,174	€ 866,802,824	€ 122,865,176	€ 599,934,655	€ 538,882,033	€ 71,582,156	€ 526,783,541
Germany	€ 7,347,130,149	€ 2,993,105,748	€ 8,533,142,063	€ 3,426,444,876	€ 805,116,093	€ 1,978,831,085	€ 1,117,033,331	€ 435,087,182	€ 1,721,634,773
Greece	€ 453,860,080	€ 71,799,501	€ 305,686,844	€ 266,976,826	€ 38,681,502	€ 73,551,439	€ 82,119,191	€ 9,019,616	€ 66,449,304
Hungary	€ 186,421,531	€ 55,241,414	€ 155,941,301	€ 90,359,133	€ 11,904,236	€ 29,854,272	€ 42,843,707	€ 12,571,164	€ 39,287,802
Ireland	€ 248,317,984	€ 76,895,702	€ 112,210,434	€ 119,876,775	€ 23,486,355	€ 30,957,984	€ 39,109,474	€ 17,350,600	€ 32,103,008
Italy	€ 1,797,182,818	€ 477,799,046	€ 2,881,255,688	€ 690,275,327	€ 145,628,536	€ 635,289,153	€ 328,647,698	€ 78,658,675	€ 704,210,831
Latvia	€ 57,591,738	€ 5,724,370	€ 19,209,744	€ 29,128,790	€ 1,942,301	€ 6,393,936	€ 11,449,005	€ 1,386,520	€ 7,052,992
Lithuania	€ 52,938,493	€ 12,367,412	€ 39,400,639	€ 26,878,037	€ 3,262,272	€ 11,721,339	€ 7,863,235	€ 3,360,383	€ 14,757,712
Luxembourg	€ 23,589,320	€ 13,973,290	€ 34,445,405	€ 10,639,588	€ 4,663,609	€ 8,645,528	€ 4,898,750	€ 1,477,868	€ 4,175,404
Malta	€ 3,980,424	€ 632,507	€ 2,470,921	€ 2,147,928	€ 337,758	€ 713,031	€ 823,981	€ 145,207	€ 453,378
Netherlands	€ 1,101,927,478	€ 317,488,416	€ 1,119,796,091	€ 523,520,627	€ 122,366,653	€ 338,364,895	€ 172,394,468	€ 54,426,278	€ 272,684,532
Poland	€ 932,852,833	€ 328,821,031	€ 537,216,894	€ 414,157,960	€ 219,538,748	€ 160,145,745	€ 202,908,541	€ 86,802,859	€ 94,657,418
Portugal	€ 322,175,342	€ 77,621,900	€ 392,420,938	€ 116,990,784	€ 25,726,153	€ 80,259,862	€ 123,487,244	€ 23,069,137	€ 146,601,181
Slovakia	€ 66,692,455	€ 44,984,515	€ 39,958,386	€ 30,614,543	€ 14,850,591	€ 14,395,938	€ 9,007,679	€ 8,215,538	€ 8,650,283
Slovenia	€ 49,408,764	€ 14,905,106	€ 49,201,734	€ 20,232,340	€ 3,537,996	€ 9,318,566	€ 10,646,336	€ 2,486,755	€ 10,448,780
Spain	€ 1,142,000,561	€ 659,813,868	€ 1,178,646,130	€ 472,304,962	€ 239,129,674	€ 289,323,483	€ 204,957,826	€ 115,466,532	€ 296,514,730
Sweden	€ 588,506,878	€ 583,283,557	€ 901,813,960	€ 305,379,346	€ 183,294,528	€ 237,453,373	€ 117,564,387	€ 164,656,832	€ 309,059,307
UK	€ 5,208,694,775	€ 3,620,603,931	€ 6,849,582,328	€ 3,077,903,863	€ 1,361,461,881	€ 1,769,322,923	€ 888,341,420	€ 471,360,021	€ 1,893,339,055
<b>Total EU</b>	<b>€ 24,383,695,798</b>	<b>€ 10,767,776,306</b>	<b>€ 29,050,193,690</b>	<b>€ 11,654,093,914</b>	<b>€ 3,544,309,107</b>	<b>€ 6,868,909,512</b>	<b>€ 4,364,658,357</b>	<b>€ 1,694,914,370</b>	<b>€ 6,760,106,143</b>

Sources: For details of methods and sources used, see [www.heartstats.org/eucosts](http://www.heartstats.org/eucosts)



*Table 12.5 Total cost of CVD, CHD and stroke, 2003, EU*

	CVD		CHD		Stroke	
	€ million	% of total	€ million	% of total	€ million	% of total
Direct health care costs	104,739	62	22,956	51	21,280	62
Productivity loss due to mortality	24,384	14	11,654	26	4,365	13
Productivity loss due to morbidity	10,768	6	3,544	8	1,694	5
Informal care costs	29,050	17	6,869	15	6,760	20
<b>Total</b>	<b>168,941</b>	<b>100</b>	<b>45,023</b>	<b>100</b>	<b>34,099</b>	<b>100</b>

Sources: See Tables 12.1, 12.2, 12.3 and 12.4

# Appendix

## *Member states of the WHO European Region*

There are 52 member states in the WHO European region. These are listed below, with the 2003 mid-year population estimates for males and females. The 25 countries of the European Union are identified with an asterisk. A map follows, with countries identified by their three letter code.

Country	Code	WHO mortality strata sub-region	Male population 2003	Female population 2003
Albania	ALB	EUR-B	1,618,000	1,549,000
Andorra	AND	EUR-A	35,000	32,000
Armenia	ARM	EUR-B	1,487,000	1,574,000
Austria*	AUT	EUR-A	3,975,000	4,141,000
Azerbaijan	AZE	EUR-B	4,079,000	4,291,000
Belarus	BLR	EUR-C	4,624,000	5,250,000
Belgium*	BEL	EUR-A	5,059,000	5,260,000
Bosnia and Herzegovina	BIH	EUR-B	2,059,000	2,103,000
Bulgaria	BGR	EUR-B	3,827,000	4,069,000
Croatia	HRV	EUR-A	2,129,000	2,298,000
Cyprus*	CYP	EUR-A	400,000	402,000
Czech Republic*	CZE	EUR-A	4,981,000	5,254,000
Denmark*	DNK	EUR-A	2,658,000	2,706,000
Estonia*	EST	EUR-C	608,000	715,000
Finland*	FIN	EUR-A	2,543,000	2,664,000
France*	FRA	EUR-A	29,299,000	30,845,000
Georgia	GEO	EUR-B	2,448,000	2,678,000
Germany*	DEU	EUR-A	40,299,000	42,177,000
Greece*	GRC	EUR-A	5,409,000	5,567,000
Hungary*	HUN	EUR-C	4,706,000	5,171,000
Iceland	ISL	EUR-A	145,000	144,000
Ireland*	IRL	EUR-A	1,967,000	1,989,000
Israel	ISR	EUR-A	3,178,000	3,255,000
Italy*	ITA	EUR-A	27,845,000	29,578,000
Kazakhstan	KAZ	EUR-C	7,409,000	8,024,000
Kyrgyzstan	KYR	EUR-B	2,520,000	2,618,000
Latvia*	LVA	EUR-C	1,058,000	1,249,000
Lithuania*	LTU	EUR-C	1,605,000	1,838,000
Luxembourg*	LUX	EUR-A	223,000	230,000
Macedonia, Fmr Yug Rep	MKD	EUR-B	1,028,000	1,028,000
Malta*	MAL	EUR-A	195,000	199,000
Moldova, Rep of	MDA	EUR-C	2,042,000	2,225,000
Monaco	MON	EUR-A	16,000	16,000
Netherlands*	NLD	EUR-A	8,012,000	8,137,000
Norway	NOR	EUR-A	2,246,000	2,287,000
Poland*	POL	EUR-B	18,726,000	19,862,000
Portugal*	PRT	EUR-A	4,839,000	5,223,000
Romania	ROM	EUR-B	10,905,000	11,429,000
Russian Federation	RUS	EUR-C	66,947,000	76,300,000
San Marino	SMR	EUR-A	13,000	14,000
Serbia and Montenegro	SCG	EUR-B	5,237,000	5,290,000
Slovakia*	SVK	EUR-B	2,623,000	2,779,000
Slovenia*	SVN	EUR-A	964,000	1,020,000
Spain*	ESP	EUR-A	20,133,000	20,928,000
Sweden*	SWE	EUR-A	4,396,000	4,481,000
Switzerland	CHE	EUR-A	3,547,000	3,622,000
Tajikistan	TAJ	EUR-B	3,112,000	3,133,000
Turkey	TUR	EUR-B	35,929,000	35,396,000
Turkmenistan	TUK	EUR-B	2,409,000	2,458,000
Ukraine	UKR	EUR-C	22,529,000	25,994,000
United Kingdom*	GBR	EUR-A	28,863,000	30,388,000
Uzbekistan	UZB	EUR-B	12,970,000	13,123,000

\*Member state of the European Union

EUR-A – Very low child and very low adult mortality

EUR-B – Low child and low adult mortality

EUR-C – Low child and high adult mortality

