



Cardiovascular disease in Europe 2014: epidemiological update

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This paper provides an update for 2014 on the burden of cardiovascular disease (CVD), and in particular coronary heart disease (CHD) and stroke, across the countries of Europe. Cardiovascular disease causes more deaths among Europeans than any other condition, and in many countries still causes more than twice as many deaths as cancer. There is clear evidence in most countries with available data that mortality and case-fatality rates from CHD and stroke have decreased substantially over the last 5–10 years but at differing rates. The differing recent trends have therefore led to increasing inequalities in the burden of CVD between countries. For some Eastern European countries, including Russia and Ukraine, the mortality rate for CHD for 55–60 year olds is greater than the equivalent rate in France for people 20 years older.

Keywords

Cardiovascular disease • Epidemiology • Coronary heart disease • Mortality • Morbidity • Treatment

Introduction

Cardiovascular disease (CVD) remains the leading cause of death among Europeans and around the world. The Global Burden of Disease study estimated that 29.6% of all deaths worldwide (15 616.1 million deaths) were caused by CVD in 2010, more than all communicable, maternal, neonatal and nutritional disorders combined, and double the number of deaths caused by cancers.¹ This paper provides an update for 2014 on the burden of CVD, and in particular coronary heart disease (CHD) and stroke, across the countries of Europe. This overview updates the work published in this journal in 2013² and provides an up-to-date synopsis of the key data in relation to mortality and morbidity from CVD across Europe.

Methods

This overview brings together a number of European and international data sources to give an outline of comparable data for the region. In selecting the data sources for inclusion, the key considerations were data quality, sources with coverage of the greatest number of countries, and the most recently updated sources. The scope of this update covers the mortality, morbidity, and treatment data associated with CVD in Europe, with additional focus on the two most common forms of CVD, CHD, and stroke. These data are fundamental to our understanding of the burden and distribution of CVD in Europe, and sources are updated relatively frequently through routine and administrative data collections. Information on medical and behavioural risk factors and

co-morbidities, by comparison, tend to be less frequently updated and there are greater challenges to comparability across countries. Data reported in this paper have been sourced from the World Health Organization (WHO) mortality database,³ the WHO European Region's Health for All Database,⁴ and the Organisation for Economic Co-operation and Development (OECD) health statistics.⁵ Europe is here defined as the 53 member states of the WHO European region. Comparability and quality of the data vary by topic, and there were no 'ideal' data sources that provided complete, up-to-date, high-quality, and representative information for all 53 countries for any topic in this overview.

All mortality statistics, including estimates of mortality rates and proportions by cause, were calculated using age- and cause-specific data by country from the WHO Mortality Database,³ using the most recent (February 2014) update. All analyses, interpretations, and conclusions are those of the authors, not the WHO, which is responsible only for the provision of the original information. Age standardization was to the European Standard Population (ESP).⁶ Note that to maintain consistency and comparability with the previous epidemiological update published in 2013,² the same ESP has been used, in preference to the more recently updated standard population developed by the European Commission for the EU27+EFTA countries.⁷

The WHO database collates data reported by national authorities based on their civil registration systems and contains data for 52 of 53 European countries (no data available for Andorra). Where data are presented for the 'most recent year', this relates to the most recent data for which both mortality and population data were available in the WHO datasets, with the exceptions of Monaco, Montenegro, and Turkey, for which no population data were available. These countries are included in the calculations for total numbers of deaths and premature deaths,

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but could not be included in the section on age-standardized death rates. The data are relatively up-to-date, and data for 40 of the 52 countries were available up to 2010, 2011, or 2012; however, only 18 countries have provided updated numbers in the year since our previous report.² The years to which the data relate for each country are given in the tables. Consistent with our previous update, data are presented for mortality before both 65 and 75 years. In this report, all data are presented as age standardized, with the exception of the hospital discharge rates, for which this was not possible as no standardized or age-specific data are published.

Mortality

Cardiovascular disease is the leading cause of death in Europe, and despite recent decreases in mortality rates in many countries, it is still responsible for over 4 million deaths per year, close to half of all deaths in Europe (Table 1). The proportion of all deaths that are attributable to CVD is substantially greater among women (51%) than men (42%). Coronary heart disease, when considered separately, accounts for almost 1.8 million deaths, or 20% of all deaths in Europe annually. The gender differences in the proportional contribution of CVD to total mortality is driven far more by stroke and other CVD, and among both men and women, CHD causes one in five of all deaths.

Cardiovascular disease continues to cause a much greater mortality burden among Europeans than any other disease. Overall, CVD caused 51% of deaths among women and 42% among men in the last year of data, compared with 19 and 23%, respectively, for all cancers (Figure 1). In individual countries, however, the patterns vary widely. There are now 10 European countries in which cancer is the cause of more deaths than CVD among men (Belgium, Denmark, France, Israel, Luxembourg, Netherlands, Portugal, Slovenia, Spain, and San Marino). The latest data also show that for the first time, cancer has surpassed CVD as a cause of death among women in one country (Denmark). Conversely, in 32 of 52 countries, the most recent data show more than double the number of deaths from CVD compared with cancer in

women, and of those, 15 countries where CVD causes more than four times more deaths than cancer. Among men, there are 21 countries where CVD deaths are more than double cancer deaths, and 6 countries where they are more than four times greater.

Premature mortality

The proportion of all deaths that are caused by CVD increases with age, therefore, the proportion of premature deaths among Europeans caused by CVD was substantially lower than the overall rate. Three in every ten deaths of Europeans aged under 65 in the latest year of data were caused by CVD, as were 37% of all deaths occurring before age 75 (Table 1). In total, 1.48 million deaths before age 75 in Europe were caused by CVD, more than half of which were in people aged 65–74 years. In contrast to overall deaths ('all ages'), the proportion of premature deaths, either before age 65 or before age 75, that are caused by CVD shows limited gender differences.

Mortality rates across European countries

The most up-to-date data on CVD in Europe show that the burden of mortality continues to show large geographic inequalities. Updated data from Denmark and Norway show that they now have among the lowest rates of age-adjusted CVD mortality (<180 per 100 000 men at all ages, <120 per 100 000 women), and Denmark in particular has joined countries, including France, Portugal, the Netherlands, and Spain, with the lowest rates of CHD mortality (Table 2). Setting aside Turkmenistan, for which the latest available mortality data are from 1998, the highest rates of CVD mortality were found in the Russian Federation and Belarus for men (915 and 892 per 100 000, respectively), and Uzbekistan and Kyrgyzstan for women (662 and 588 per 100 000).

Table 1 Number and percentage of deaths from cardiovascular diseases in Europe—latest available year^a

	Cardiovascular disease (total)		Coronary heart disease		Cerebrovascular disease		Other cardiovascular diseases		
Males									
Total deaths (all ages)	1 862 774	42%	876 017	20%	429 756	10%	557 001	12%	
Premature deaths—before age 75	939 698	36%	473 501	18%	201 780	8%	264 417	10%	
Premature deaths—before age 65	508 132	31%	253 432	16%	95 249	6%	159 451	10%	
Females									
Total deaths (all ages)	2 219 326	51%	903 330	21%	627 227	14%	688 769	16%	
Premature deaths—before age 75	536 712	37%	232 683	16%	155 702	11%	148 327	10%	
Premature deaths—before age 65	201 492	27%	77 166	10%	54 470	7%	69 856	9%	
Total									
Total deaths (all ages)	4 082 100	46%	1 779 347	20%	1 056 983	12%	1 245 770	14%	
Premature deaths—before age 75	1 476 410	37%	706 184	18%	357 482	9%	412 744	10%	
Premature deaths—before age 65	709 624	30%	330 598	14%	149 719	6%	229 307	10%	

^aNo data available for Andorra. Source: World Health Organization Mortality Database.

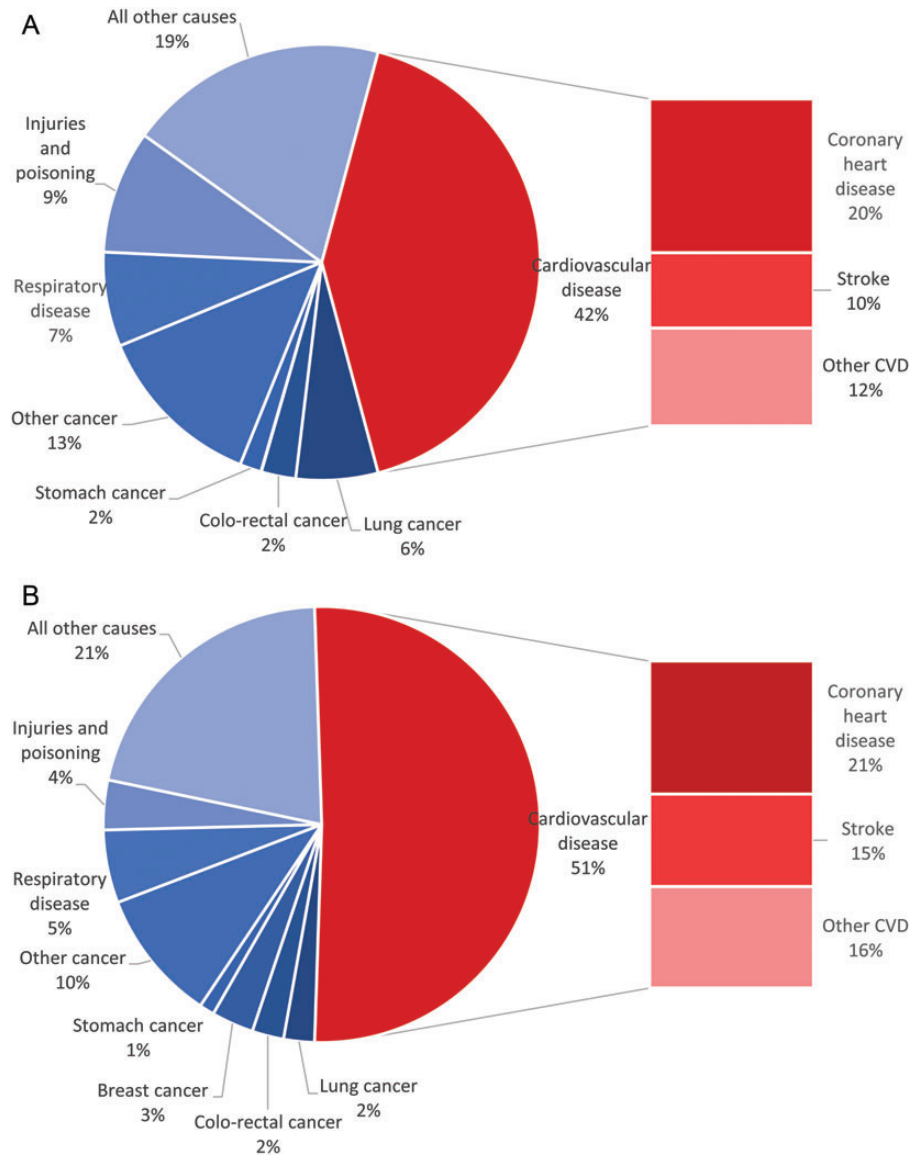


Figure 1 Proportion of all deaths due to major causes in Europe, latest available year, among men (A) and women (B). Note: no data available for Andorra. Source: World Health Organization Mortality Database.

Premature mortality from CVD among men varied almost 10-fold from <65 per 100 000 before age 75 (age standardized) in San Marino, France, Israel, and Switzerland, to over 560 per 100 000 in the Russian Federation and Belarus. Among women, the magnitude of variation between countries was similar, from five countries with fewer than 25 deaths per 100 000 before age 75 (France, Iceland, Switzerland, Israel, and Spain) to 10 countries with rates exceeding 200 per 100 000. Details of premature mortality rates are given in the Supplementary material online, *Table S1* (mortality rates before age 65 and before age 75).

Mortality rates increase with age in all countries; however, due to the wide variation between countries, there are many cases where the mortality rate among (for example) 65–69 year olds in one country may be equivalent to or higher than the mortality rate for 75–79 year olds in another country. Taking the most recent mortality

rates among 75–79 year olds in France as the reference (the first age group not considered a 'premature' death under usual definitions, and the country with the lowest mortality rates for that age group in both sexes), we calculated the age groups in all other countries for which the rates in the latest year were equal to or greater than the referent (*Figure 2*). Countries with no data within the last 5 years were excluded. This showed that among men, there were five countries where the CVD death rates among 55–59 year olds was higher than the referent, a further 5 countries where the CVD rate among 60–64 year olds was higher than the referent, and 10 countries where equivalent mortality rates were reached at ages at least 10 years younger than in France. This means that CVD mortality rates among 55–59-year-old men in Belarus, Kazakhstan, Kyrgyzstan, Russia, and Ukraine were higher than equivalent rates in French men 20 years older. The results were similar among women, although the

Table 2 Age-standardized death rates from cardiovascular disease and coronary heart disease by country and sex (per 100 000 population)

Country	Latest year	Males				Females			
		CVD—total		CHD		CVD—total		CHD	
		Age-standardized mortality rate	10-year change in mortality rate	Age-standardized mortality rate	10-year change in mortality rate	Age-standardized mortality rate	10-year change in mortality rate	Age-standardized mortality rate	10-year change in mortality rate
Albania	2004	490.7	10%	156.5	56%	354.8	42%	89.6	123%
Armenia	2012	524.5	−28%	351.8	−26%	356.5	−34%	211.4	−33%
Austria	2011	241.4	−36%	125.5	−29%	161.0	−36%	65.3	−30%
Azerbaijan	2007	616.8	−18%	149.3	−72%	488.9	0%	93.2	−70%
Belarus	2009	892.7	−5%	642.2	−1%	427.6	−21%	283.6	−16%
Belgium	2010	197.5	−32% ^a	72.9	−39% ^a	129.6	−31%	31.1	−41%
Bosnia and Herzegovina	2011	474.7	n/a	93.5	n/a	385.4	n/a	54.8	n/a
Bulgaria	2011	732.4	−14%	145.6	−40%	478.3	−19%	73.5	−49%
Croatia	2012	415.5	−30%	202.8	−4%	283.0	−30%	123.8	2%
Cyprus	2011	219.2	n/a	99.3	n/a	161.2	n/a	42.7	n/a
Czech Republic	2012	403.1	−28%	214.9	−11%	264.0	−30%	126.2	−6%
Denmark	2011	173.5	−46%	67.1	−57%	110.8	−43%	32.6	−59%
Estonia	2012	501.0	−33%	255.9	−44%	269.3	−38%	117.9	−51%
Finland	2011	275.8	−25%	165.5	−30%	146.1	−30%	71.4	−37%
France	2010	149.6	−33%	47.3	−37%	86.7	−32%	17.5	−41%
Georgia	2010	325.1	−62%	80.3	−84%	190.1	−66%	38.7	−87%
Germany	2012	229.6	−34%	101.7	−39%	162.4	−31%	51.3	−43%
Greece	2011	246.7	−32%	89.1	−28%	195.4	−34%	36.9	−34%
Hungary	2012	509.4	−20%	270.0	−8%	323.4	−21%	160.6	−6%
Iceland	2009	218.6	−31%	117.5	−41%	131.9	−34%	54.6	−44%
Ireland	2009	237.9	−45%	143.7	−43%	151.4	−42%	69.2	−44%
Israel	2011	140.5	−38%	67.7	−41%	98.7	−37%	34.7	−48%
Italy	2010	196.4	−33%	76.9	−27%	131.0	−33%	37.6	−28%
Kazakhstan	2010	809.8	−24%	264.9	−55%	485.3	−22%	124.3	−58%
Kyrgyzstan	2010	841.8	4%	534.2	23%	588.4	3%	373.4	35%

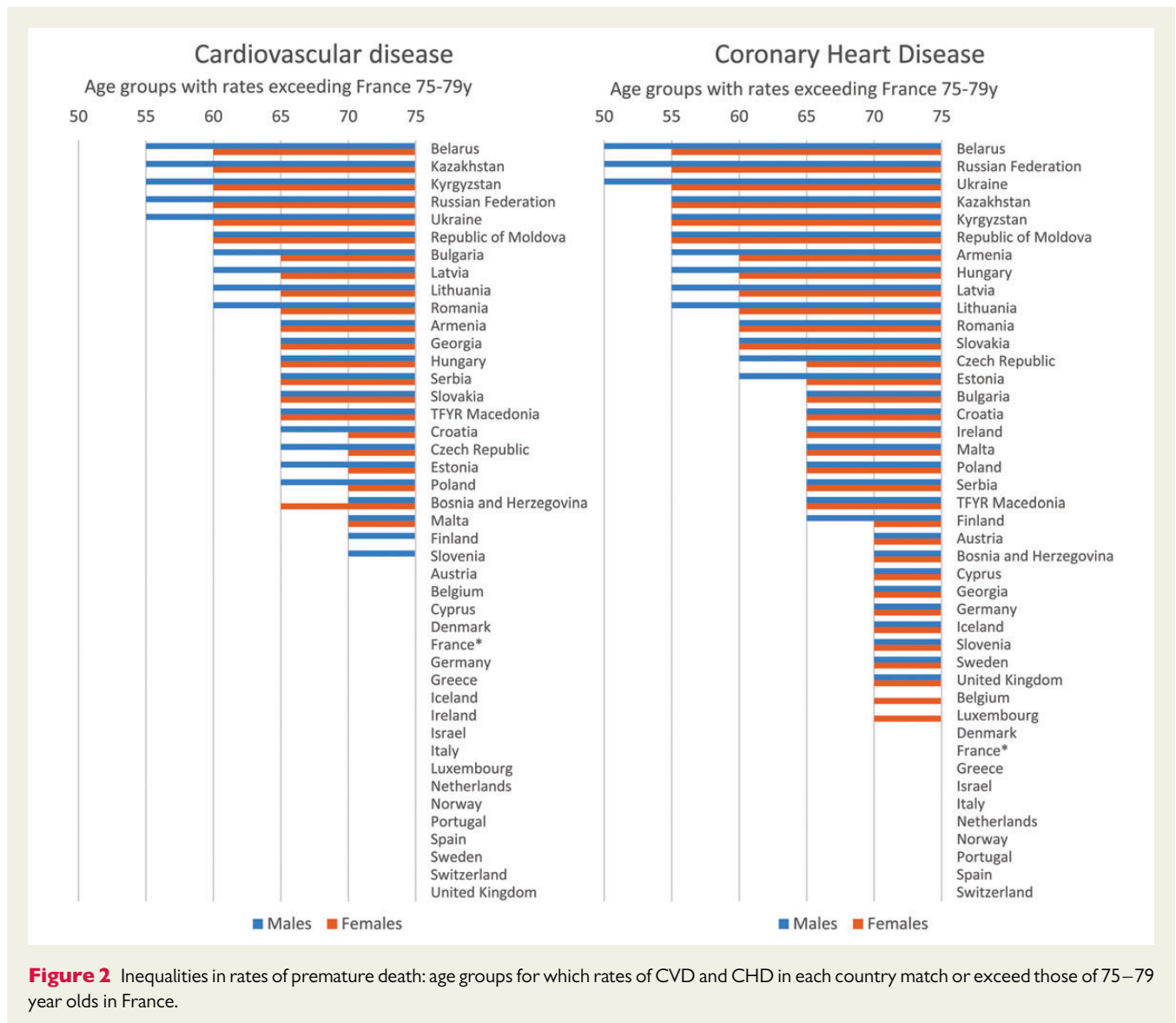
Latvia	2012	654.9	-19%	354.7	-19%	353.4	-24%	174.3	-16%
Lithuania	2010	667.0	1%	436.2	5%	383.0	-8%	238.8	-1%
Luxembourg	2011	204.1	-30%	65.7	-37%	134.4	-35%	32.7	-37%
Malta	2011	288.6	-14%	177.4	-13%	185.6	-25%	91.5	-27%
Netherlands	2011	170.9	-40%	54.6	-53%	113.4	-35%	24.5	-53%
Norway	2012	179.4	-40%	77.3	-50%	117.2	-34%	39.8	-44%
Poland	2011	415.3	-26%	128.2	-34%	244.8	-29%	59.5	-35%
Portugal	2011	174.7	-44%	49.1	-42%	126.8	-44%	24.2	-44%
Republic of Moldova	2012	790.3	-22%	527.5	-26%	564.2	-25%	365.4	-29%
Romania	2010	647.3	-16%	238.3	-16%	453.9	-22%	146.3	-22%
Russian Federation	2010	915.1	-13%	500.9	-7%	516.8	-18%	254.5	-5%
San Marino	2005	242.2	-30%	30.9	-46%	155.5	-6%	8.3	-73%
Serbia	2012	540.9	-21%	121.7	-24%	423.1	-25%	70.1	-30%
Slovakia	2010	551.8	-17%	333.8	-9%	360.2	-18%	209.5	-11%
Slovenia	2010	269.2	-34%	94.9	-36%	178.0	-29%	40.5	-46%
Spain	2011	162.0	-30%	62.0	-32%	106.5	-32%	25.7	-35%
Sweden	2010	227.5	-31%	111.4	-37%	144.9	-27%	54.4	-35%
Switzerland	2010	181.2	-31%	80.4	-38%	115.9	-31%	38.4	-41%
TFYR Macedonia	2010	626.9	-5%	112.9	-26%	490.6	-5%	56.9	-23%
Tajikistan	2004	710.3	-1%	303.6	-12%	503.9	-17%	185.6	-28%
Turkmenistan	1998	1017.4	19%	562.8	6%	716.9	17%	352.5	3%
Ukraine	2012	873.3	-16%	599.7	-14%	532.6	-18%	356.0	-13%
UK	2010	205.2	-42% ^a	111.1	-48% ^a	129.0	-40%	49.4	-51%
Uzbekistan	2005	858.0	-4%	453.6	-19%	662.3	-5%	320.9	-23%

Rate for most recent year of data and percentage change in rates over 10 years.

Rates not available for Monaco, Montenegro, or Turkey due to missing population data. No mortality data available for Andorra. Source: World Health Organization Mortality Database. Age standardized to the European Standard Population.

^aChange in rates for Belgium and UK is over 11 years due to missing data for the past 10 years.

n/a, not available.



disparities were slightly less marked. Coronary heart disease mortality rates showed even bigger differences in many countries. There were three countries (Belarus, the Russian Federation, and Ukraine) where men aged 50–54 years old had a higher risk of dying from CHD than 75–79-year-old men in France.

Trends in mortality

Mortality rates continue to fall in most but not all European countries, and the magnitude of change has varied dramatically between countries over the last 10 years (Table 2). The age-standardized mortality rate from CVD has decreased over the last 10 years of available data in all but five countries for men, and all but four countries for women, and has decreased by a third or more among men in 14 countries and among women in 15 countries. Decreases in CHD rates have been in many cases even more dramatic; the most recent mortality rates from CHD were less than half the rates 10 years earlier in eight countries for women and six countries for men, although again, there were a

small number of countries where the rates had increased over the same period.

Case-fatality rates

Among the 25 countries with data available, age- and sex-standardized admission-based case-fatality rates after acute myocardial infarction (AMI) for the most recent year (2011 for most countries) as documented by the OECD varied up to 5-fold between countries (Table 3). Most countries, however, have seen substantial reductions in these hospitalized case-fatality rates for AMI over the last 5 years. The median annual reduction was just over 5%, or a total median reduction in case-fatality rates over that period of around one-quarter. Although the absolute case-fatality rates varied widely, the documented reductions in case-fatality rates have been far more consistent across countries than other trends in CVD. Almost all countries with data available demonstrated clear reductions in case fatality after AMI, and most improvements (19 of 23) were in the

Table 3 Admission-based case-fatality rates after acute myocardial infarction and stroke, adults aged 45 years and over

Country	Year	Case fatality after acute myocardial infarction		Case fatality after haemorrhagic stroke		Case fatality after ischaemic stroke	
		Age- and sex-standardized rate per 100 discharges	Annual change in rate (%) over last 5 years ^a	Age- and sex-standardized rate per 100 discharges	Annual change in rate (%) over last 5 years ^a	Age- and sex-standardized rate per 100 discharges	Annual change in rate (%) over last 5 years ^a
Austria	2011	7.7	-5.0%	14.4	-1.5%	6.0	-4.0%
Belgium	2009	7.6	-5.9%	30.5	-0.4%	9.2	0.2%
Czech Republic	2011	6.8	-5.7% ^a	24.5	-4.6% ^a	9.5	-4.9% ^a
Denmark	2012	2.9	-8.2%	17.9	-3.8%	3.5	-7.7%
Finland	2011	7.0	-3.7%	13.1	-1.3%	5.4	-1.1%
France	2010	6.2	-4.3%	24.0	-1.2%	8.5	-4.0%
Germany	2011	8.9	-3.5%	17.5	-1.9%	6.7	-3.5%
Hungary	2009	13.9	-4.5%	40.5	-0.9%	9.6	-4.8%
Iceland	2011	5.7	-4.2%	16.7	0.4%	7.4	-7.9%
Ireland	2011	6.8	-5.4%	26.2	-2.6%	9.9	-2.3%
Israel	2010	7.1	-1.6%	24.7	-2.5%	6.3	-2.0%
Italy	2011	5.8	-3.2%	19.9	-0.6%	6.5	-1.7%
Latvia	2009	14.8	2.8% ^a	32.5	4.8% ^a	19.0	-1.0% ^a
Luxembourg	2011	8.8	-5.5%	18.3	-7.6%	10.7	0.6%
Netherlands	2010	6.8	-5.8%	25.9	-3.1%	7.5	-4.8%
Norway	2011	4.5	-5.7%	15.3	-3.7%	5.3	-3.7%
Poland	2011	5.2	-6.3%				
Portugal	2011	8.4	-5.5%	23.8	-2.1%	10.5	-1.7%
Slovak Republic	2011	7.6	-8.9% ^a	28.0	-4.2% ^a	11.0	-4.5% ^a
Slovenia	2011	7.0	-2.7% ^a	28.7	-6.5% ^a	12.8	-9.0% ^a
Spain	2011	8.5	-2.8%	26.4	-2.1%	10.2	-2.1%
Sweden	2011	4.5	-5.0%	15.8	-2.3%	6.4	-2.7%
Switzerland	2010	5.9	-7.0%	16.5	-3.5%	7.0	-3.9%
Turkey	2012	10.7	n/a	32.0	n/a	11.8	n/a
UK	2011	7.8	-5.7% ^a	29.6	-0.8% ^a	10.4	-9.9% ^a

Latest year and annual percentage change in rates over last 5 years, by country.

Source: OECDstat <http://stats.oecd.org>.

^aWhere data were not available for 5 years prior to most recent estimate, the closest available year was used. Exceptions and the span of data over which estimates were calculated were: Latvia—1 year; Slovenia—2 years; UK—3 years; Slovak Republic and Czech Republic—4 years. Only 1 year of data available for Turkey.

range of 3–6% per year on average over the last 5 years. Reported admission-based case-fatality rates for haemorrhagic stroke were as high as 40.5 per 100 patients in Hungary, while for ischaemic stroke the highest rate was in Latvia (19.0 per 100 patients). Clear reductions were apparent in case-fatality rates for both stroke types in most countries over the last 5 years, largely in the range of 1–4% per year on average for haemorrhagic stroke and 2–5% for ischaemic stroke.

Morbidity

The most comparable data available across European countries to track the burden of CVD morbidity are hospital discharge data. The most recent available data (Table 4) show that the population-based rates of hospitalization for CVD have tended to trend upward since the early 2000s. The median numbers of hospital

discharges per 100 000 population in 2012 (or most recent year) by country were 2097 for CVD, 608 for CHD, and 298 for stroke, up from 1829, 532 and 258 in 2001. In contrast to mortality rates, which have fallen significantly in almost all European countries in recent years, more countries (34) have experienced an increase in hospital discharge rates for CVD than have experienced decreases (15), and similarly for stroke there were 32 countries with an increase, and 18 with a decrease. For CHD, there have been an almost equal number of increases and decreases (24 vs. 26) and across all three disease categories the changes in rates of hospitalization vary between very small (<5% changes) and more than doubling. High variability between countries is also evident in hospitalization rates. Variations may reflect both true differences in incidence as well as differences in the rates at which incident cases result in death before or without hospitalization due to differences in health system organization and efficiency, coding practices, etc.

Table 4 Hospital discharges for cardiovascular disease, coronary heart disease, and cerebrovascular disease per 100 000 population, by country, 2001–2012

		Cardiovascular disease		Coronary heart disease		Cerebrovascular disease	
		2001 ^a	2012 ^a	2001 ^a	2012 ^a	2001 ^a	2012 ^a
Albania	(2001–2011)	520	776	146	247	82	199
Andorra	(2001–2012)	610	749	126	165	107	127
Armenia	(2001–2012)	599	1666	258	717	129	264
Austria	(2001–2009)	3615	3697	923	881	577	565
Azerbaijan	(2001–2012)	484	783	162	305	48	87
Belarus	(2001–2012)	4749	6401	2296	3206	912	1258
Belgium	(2001–2008)	2347	2173	719	616	393	353
Bulgaria	(2001–2010)	2013	3617	542	1196	468	589
Croatia	(2001–2010)	1692	1847	457	488	394	393
Cyprus	(2001–2008)	927	672	360	198	149	120
Czech Republic	(2001–2010)	3430	3086	1107	715	625	547
Denmark	(2001–2010)	2546	2634	803	720	435	363
Estonia	(2001–2009)	3245	3327	1094	900	499	714
Finland	(2001–2007)	3654	2913	1140	791	661	550
France	(2001–2009)	2303	2282	512	498	220	228
Georgia	(2001–2012)	427	1116	193	475	74	166
Germany	(2001–2009)	3305	3500	1011	890	464	530
Greece	(2001–2007)	2432	2786	829	951	424	449
Hungary	(2001–2010)	4039	3678	943	716	845	995
Iceland	(2001–2009)	1919	1440	763	525	228	179
Ireland	(2001–2010)	1492	1154	485	352	258	163
Israel	(2001–2008)	1925	1482	815	501	258	235
Italy	(2001–2009)	2572	2120	593	503	494	432
Kazakhstan	(2001–2012)	1389	2074	519	772	234	473
Kyrgyzstan	(2001–2011)	1036	1473	324	642	155	272
Latvia	(2001–2010)	3137	2884	1278	999	669	601
Lithuania	(2001–2010)	3890	4490	1374	1385	698	912
Luxembourg	(2001–2007)	2364	2172	868	606	184	168
Malta	(2001–2010)	665	1341	204	349	77	158
Monaco	2012		4004		385		338
Montenegro	(2001–2012)	1539	1732	487	610	185	249
Netherlands	(2001–2009)	1369	1694	510	528	185	239
Norway	(2001–2010)	2366	2368	944	880	321	306
Poland	(2003–2009)	2880	2885	2880	811	370	336
Portugal	(2001–2010)	1156	1307	272	299	342	290
Republic of Moldova	(2001–2012)	1311	2532	373	686	247	623
Romania	(2001–2010)	2741	2982	809	330	404	575
Russian Federation	(2001–2012)	3020	3693	1168	1373	653	858
San Marino	2011		1642		284		256
Serbia	(2001–2012)	1587	2199	423	670	360	439
Slovakia	(2001–2010)	2569	2689	954	749	473	461
Slovenia	(2001–2009)	1738	1976	381	411	230	232
Spain	(2001–2009)	1342	1295	361	289	221	221
Sweden	(2001–2009)	2556	2334	895	621	474	429
Switzerland	(2002–2009)	1699	1729	518	469	212	222
Tajikistan	(2001–2012)	561	1072	136	306	44	90
TFYR Macedonia	(2001–2007)	1398	1443	573	551	240	261

Continued

Table 4 Continued

		Cardiovascular disease		Coronary heart disease		Cerebrovascular disease	
		2001 ^a	2012 ^a	2001 ^a	2012 ^a	2001 ^a	2012 ^a
Turkey	(2001–2010)	1009	1502	226	666	166	149
Turkmenistan	(2001–2012)	1247	1933	54	16	134	244
Ukraine	(2001–2010)	2791	3854	1284	1860	585	901
UK	(2001–2010)	1405	1291	521	403	206	225
Uzbekistan	(2001–2012)	1059	1615	347	477	94	147

Source: World Health Organization European Regional Office, Health for All Database.

^aWhere data for 2001 and/or 2012 were not available, the closest available year was included. Years are given in the table for each country.

Summary and discussion

The burden of CVD in Europe remains high overall, and varies dramatically between countries. More than 4 million Europeans die of CVD every year, and many more are hospitalized after acute episodes or treated for chronic cardiovascular ill health.

Since our update published in 2013, which was based on the extensive data reported in *European Cardiovascular Disease Statistics*,⁸ the overall pattern of distribution and trends of CVD burden in Europe have been relatively stable, and there is evidence of continuing reductions in the burden of CVD. The proportion of all deaths in Europe caused by CVD, and specifically by CHD and stroke, has remained stable, whereas the total number of deaths caused by CVD has decreased slightly (2561 fewer CVD deaths overall). There have however been greater improvements in premature deaths, with 14 639 fewer deaths occurring before the age of 75 (~1% fewer deaths). In the 18 countries with updated mortality data since the last report, there was evidence in all of them of continued decreases among men in age-standardized death rates from CVD. Similarly, there were further decreases in death rates from CHD among men in 16 of these countries (rates stable in Estonia and Greece). Among women, however, the evidence in these 18 countries is more mixed; in Latvia and Luxembourg, CVD death rates among women were stable, whereas in Hungary, Israel, Norway, and Serbia, there were small increases. In CHD, death rates were stable since the last report in Israel, Latvia, and Norway, while there were small increases in Croatia, Hungary, Luxembourg, and Serbia. It will be important to continue to monitor the gender-specific trends in CVD and CHD mortality amid this and other evidence that decreases in mortality rates may have begun to slow or even reverse in some specific subpopulations.^{9,10} Updated data have also shown substantial reductions in admission-based case-fatality rates after AMI and stroke, in almost all countries over the last 5 years of available data.⁵ The most recent hospital morbidity data included in this update have shown that in contrast to ongoing decreases in mortality, hospitalizations for CVD have increased in the majority of countries. Given that these data are not age standardized, the overall increases likely reflect, at least to some extent, the impact of an ageing population. Despite this, increased rates of hospitalization are an important observation that emphasizes the continued high burden of CVD in European populations despite dramatic decreases in age-adjusted mortality rates.

Two years have now passed since the World Health Assembly adopted a global target of reducing mortality from non-communicable diseases (NCDs) by 25% by the year 2025.¹¹ Worldwide, there have been few moments in history during which NCDs have enjoyed such a prominent place in the world's attention, with CVD at the forefront of the activity. Despite this, there has been little commitment at the national or regional level to greater monitoring and reporting of risk factors and outcomes for CVD. It is clear that in many countries of Europe, CVD mortality has continued to decrease substantially in recent years and will make a large contribution to achieving this goal. In these (predominantly high income) countries, a 'tipping point' is rapidly approaching, when cancer deaths will outnumber CVD deaths, particularly among men. In many other countries, however, the CVD burden dwarfs that of cancer, and a large proportion of the populations will lose their lives prematurely to heart disease and stroke.

Supplementary material

Supplementary material is available at *European Heart Journal* online.

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