

Regional and social differences in Coronary Heart Disease 2008

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Foreword

The British Heart Foundation is pleased to present the first edition of *Regional and social differences in coronary heart disease statistics*.

Over the past decade the UK has seen substantial improvements in national statistics for coronary heart disease for which all involved should feel rightly proud. However, national averages can hide as much as they reveal and the data provided in this issue point to major geographical and social differences in the likelihood of developing heart disease. The statistics do more than just provide numbers, they point to social deprivation as a primary driver of the continuing epidemic of coronary heart disease.

This is wholly consistent with clinical experience. 25 years ago our coronary care units were full of relatively young, wealthy, overweight, smoking, business executives. This is no longer the case. Today you are more likely to meet such people in the local, smoke-free gym or out jogging. The message is clear – the scourge of coronary heart disease can be beaten. The task now is to bring about the necessary changes to avoid heart disease in the rest of the UK population.

The data contained in *Regional and social differences in coronary heart disease statistics* will provide those responsible for improving the UK's heart health with the ammunition they need to target their resources to those who most need them. The data show that inequalities in heart health are falling, but we still have a very long way to go.

Prof Peter Weissberg
Medical Director

Introduction

This is the first edition of *Regional and social differences in coronary heart disease statistics* published by the British Heart Foundation. This supplement is designed for policy makers, health professionals, medical researchers and anyone else with an interest in cardiovascular disease (CVD). It aims to provide the most recent statistics on regional and social differences in coronary heart disease (CHD) mortality, morbidity, treatment and risk.

Regional and social differences in coronary heart disease statistics is divided into four sections, and each section provides statistics at small area level. The first chapter provides information on mortality and premature mortality by region, and by level of deprivation. The second chapter presents morbidity data on self reported CHD and hospital treatment by region and level of deprivation. The treatment chapter provides information on emergency services, rehabilitation and surgical interventions for CHD by region and level of deprivation. The final chapter provides prevalence of CHD risk factors by region and deprivation as well as providing synthetic estimates¹ of CHD risk factors at small area level.

There are a number of standard area level classifications used in the UK. These are detailed in the following table.

Standard area level categorisation used in this report

Area level categorisation	Number of units in UK	Average population	Median population
United Kingdom	1	59,107,000	-
National			
England	1	49,449,700	-
Scotland	1	5,062,000	-
Wales	1	2,910,200	-
Northern Ireland	1	1,685,000	-
Regional			
Government Office Regions (England only)	9	5,494,400	5,280,700
Small area categorisations			
Local Authorities	434	136,200	110,000
Standard Table Wards*	10,601	5,600	4,500

* Standard Table Wards are defined as wards in United Kingdom as of 31 December 2002, where wards with fewer than 1,000 residents or 400 households have been merged. They are used to display census outputs.

Various sources of information have been used in compiling this supplement and these sources are listed in the footnotes to each table. The sources of data can be divided into: routinely collected data, national studies and local studies. Each source has its strengths and weaknesses and not all sources provide data for all ages or even both sexes. Data are not always available for all regions of the United Kingdom and data are collected in different ways with different degrees of

validity and reliability. Sample sizes of studies vary considerably and so do sampling methods. Comparisons between these different data sets should be made with caution.

In compiling this document we have aimed to investigate and cite the most reliable and most recent data on regional and social differences in CHD. We have not included data from studies conducted outside the UK.

All the tables and figures in the *Regional and social differences in coronary heart disease statistics* are also available on the British Heart Foundation's www.heartstats.org website. Tables presenting regional data at the more detailed ward level can also be found at this web address. Further copies of this publication can be downloaded from the website, as well as copies of all recent *Coronary heart disease statistics* publications.

The www.heartstats.org website aims to be the most up-to-date source of statistics on cardiovascular disease in the UK. The website is updated on an ongoing basis, and contains a wider range of tables and figures than available in this supplement or the *Coronary heart disease statistics* publications.

1. For further information on synthetic estimates refer to chapter four

Summary

- Diseases of the heart and circulatory system (CVD) are the main cause of death in the UK and account for over 208,000 deaths each year.
- About half of all deaths from CVD are from coronary heart disease (CHD) and more than a quarter are from stroke.
- CVD is one of the main causes of premature death in the UK.
- The premature death rate for men living in Scotland is 69% higher than in the South East of England, and for women is 97% higher than in the South East of England.
- The premature death rate for men living in Wales is 42% higher than in the South East of England, and for women is 55% higher than in the South East of England.
- The premature death rate for men living in Northern Ireland is 39% higher than in the South East of England, and for women is 58% higher than in the South East of England.
- There are 2.7 times more deaths in men and 2.9 times more deaths in women from CVD among those in the most deprived twentieth when compared with the least deprived twentieth.
- Men in the most deprived twentieth have at least 50% greater risk of dying from stroke than those in the least deprived twentieth.
- Among men in England 14% report having some form of CVD confirmed by a doctor, 6% report CHD and 8% report a diagnosis of CHD or stroke. For women, 13% report CVD, 4% report CHD and 6% report CHD or stroke.
- Men and women in the most deprived fifth of the population are more than one and a half times more likely to have CHD than those in the least deprived fifth of the population.
- Among men the rate of operations for CHD is around a third greater in the most deprived group than in the least deprived group.
- Men and women in managerial professions are about half as likely to smoke as those in semi-routine or routine occupations.
- Women in semi-routine or routine occupations are 50% more likely to be obese than women in managerial professions.

1. Mortality

Overall mortality

Diseases of the heart and circulatory system (cardiovascular disease or CVD) are the main cause of death in the UK and account for over 208,000 deaths each year. More than one in three (36%) deaths in the UK is from CVD. The main forms of CVD are coronary heart disease (CHD) and stroke. About half (48%) of all deaths from CVD are from CHD and more than a quarter (28%) are from stroke (Table 1.2).

CHD by itself is the most common cause of death in the UK. Around one in five men and one in seven women die from the disease. CHD causes around 101,000 deaths in the UK each year. Other forms of heart disease cause around 32,000 deaths in the UK each year so in total there were just over 133,000 deaths from heart disease in the UK in 2005 (Table 1.2).

Premature mortality

CVD is one of the main causes of premature death in the UK (death before the age of 75). 31% of premature deaths in men and 23% of premature deaths in women were from CVD in 2005 (Table 1.2). CVD caused just under 57,000 premature deaths in the UK in 2005.

CHD by itself is the most common cause of premature death in the UK. About one fifth (20%) of premature deaths in men and one in ten (11%) premature deaths in women were from CHD. CHD caused almost 33,000 premature deaths in the UK in 2005. Other forms of heart disease cause almost 8,000 premature deaths in the UK each year. In total there were around 40,000 premature deaths from heart disease in the UK in 2005 – over one fifth of all premature deaths (Table 1.2).

Temporal trends

Death rates for those aged 75 and under in the UK have dropped by 72% in men and 74% in women between 1978 and 2005. Over the same period in England these changes were 70% and 71%, in Wales 72% and 70%, in Scotland 68% and 71% and in Northern Ireland 73% and 74% respectively (Table 1.3).

Long term trends at smaller geographic areas in England are difficult to interpret due to the changing of authority boundaries. Government Office Regions have been stable since 1997 providing a window to examine medium term trends.

Among men in England the rate of CHD death dropped by 41% between 1997 and 2005. The largest changes in this period were in the North East (45%) and the South West (44%) and the smallest changes were in London (37%) and the North West (39%).

Among women in England the rate of CHD death dropped by 46% between 1997 and 2005. The largest changes in this period were in the North East (52%) and the West Midlands (49%) and the smallest changes were in the East Midlands (42%) and the South West (42%) (Table 1.3).

Progress towards government inequalities targets

Inequality targets relating to CHD mortality have been set in England, Wales and Scotland (Table 1.1). Data from the Central Health Monitoring Unit show that in England there has been clear progress towards this target. The absolute gap between the fifth most deprived areas and the population as a whole has fallen by just over 20% since the mid-1990s in people aged under 75 (Figure 1.1a).

In Scotland, there appears to be progress towards a reduction in the rate of mortality in deprived groups by 27% between 2003 and 2008, from the 2003 baseline of 112.0 to 81.7 per 100,000 population. In 2006 the rate was 97.8 per 100,000 in the most deprived quartile (Figure 1.1b).

National and regional differences

For more than 25 years the rates of CHD death have been consistently highest in Scotland when compared to England, Wales or Northern Ireland (Table 1.3).

Among men aged 35 to 74 the rate of CHD death in 2005 was 161 per 100,000 population across the United Kingdom. At the national level rates were highest in Scotland (213), intermediate in Wales (179) and Northern Ireland (175) and lowest in England (155). The premature death rate for men living in Scotland was 70% higher than in the South West of England. Amongst women aged 35 to 74 in the United Kingdom CHD death rate was 52 per 100,000. National differences in rates were similar to the pattern found in men; higher in Scotland (75), intermediate in Northern Ireland (60) and Wales (59) and lower in England (49). The premature death rate for women living in Scotland was 88% higher than in the South West of England (Table 1.3).

At Government Office Region level within England CHD death rates per 100,000 were highest among men and women in the North West and the North East and lowest in the South East and the South West (Table 1.3).

Regional differences at a local level

Data from ward level spanning 2001 to 2006 have been aggregated to provide CHD death rates for men and women of all ages and for those aged under 75 at a local authority level (Table 1.4). In both sexes and for those of all ages and those aged under 75, rates of CHD are highest in Scotland, Wales, Northern Ireland and Northern England and lowest in the South of England (Figures 1.4a, 1.4b, 1.4c and 1.4d).

There is considerable variation in mortality rates within regions and countries of the UK. For example, male all ages CHD mortality rates for local authorities in Scotland range from 139 per 100,000 in East Dunbartonshire to 262 per 100,000 in Inverclyde: a difference of 88%. Female all ages mortality rates in Northern Ireland range from 71 per 100,000 in North Down to 109 per 100,000 in Derry: a difference of 55% (Table 1.4).

Despite this regional variation the pattern of higher rates of CHD mortality in Northern areas of England, Scotland, Wales and Northern Ireland is evident. Only 6% of wards in the South West and South East of England are in the highest quintile (i.e. top 20%) for male premature CHD mortality rates in the UK, compared with 32% in the North East and North West and over 40% in Scotland. The pattern is similar for women, where only 8% of wards in the South East and

South West are in the top quintile for premature CHD mortality rates, compared with 28% and 30% for Wales and Northern Ireland, and nearly 40% for Scotland¹.

The geographic variations in CHD mortality rates indicate that dramatic improvements in CHD mortality in the UK are still attainable. For example, if every local authority in the UK had the same CHD mortality rate as Kensington and Chelsea, then there would be at least 32,500 fewer deaths every year in England, almost 5,500 fewer deaths in Scotland, nearly 3,000 fewer deaths in Wales and more than 1,300 fewer deaths in Northern Ireland; a total of over 42,000 fewer deaths in the United Kingdom, nearly 15,000 of which happen before the age of 75.

Social differences - deprivation

Rates of cardiovascular disease vary by level of deprivation. At national level, those of any age in the most deprived group are around one and half times more likely to die of CHD than those in the least deprived group (Table 1.5). For premature death (death before the age of 75) the rate for men in the most deprived group is around twice that of those in the least deprived group. There is more variance in the ratios among women where the most deprived group of women in Wales are 2.3 times more likely to die of CHD than those in the least deprived group. The ratio of 2.9 in Scotland (Table 1.5).

Local authority areas within each UK country have been classified as having high or low deprivation rates and high or low CHD mortality rates, by splitting all local authorities at the median measure independently for each country (Figures 1.5a, 1.5b, 1.5c and 1.5d)².

For men and women of all ages in England there is a clear gradient from South to North between areas of low mortality and low deprivation through to areas of high mortality and high deprivation. This pattern is reversed in Scotland and Wales where areas of low mortality and low deprivation are in the North and areas of high deprivation and high mortality are in the South and West. In Northern Ireland high mortality, high deprivation areas are in the west of the country (Figure 1.5a).

Within England, most of the areas with high mortality but low deprivation are found in the North, whereas areas with low mortality but high deprivation are found in the South. This is the case for both men and women, and for premature and all ages mortality. (Figures 1.5c and 1.5d).

In England and Wales, death rates from CVD are lowest among the least deprived 5% of the population in men (94 deaths per 100,000) and women (40 deaths per 100,000) compared with those in the most deprived 5% of the population where the rates were 250 deaths per 100,000 for men and 115 per 100,000 for women. There are 2.7 times more deaths in men and 2.9 times more deaths in women from CVD among those in the most deprived group when compared with the least deprived group (Table 1.6 and Figure 1.6).

Death rates from CHD among those aged 15 to 64 follow a similar trend. There are 3.5 times more deaths in men and 5.5 more deaths in women from CHD among those in the most deprived group when compared with the least deprived group (Table 1.6 and Figure 1.6).

The ratio between those in the highest and lowest groups is less pronounced for death from stroke at any age (men 1.5; women 1.1). The ratio for premature death from stroke is more pronounced

where men (3.6 times) and women (2.6 times) are more likely to die from stroke if they are in the most deprived group when compared with the least deprived group (Table 1.6 and Figure 1.6).

Within Scotland death rates from CHD are lowest in the least deprived 10% of the population. Among people of all ages in Scotland those in the most deprived 10% are almost twice as likely to die from coronary heart disease as those in the least deprived 10%. Among those aged under 65 those in the most deprived group are almost five times more likely to die from CHD than those in the least deprived group³.

Looking across the Government Office Regions of England shows that those in the most deprived quintile are around twice as likely to die from CVD under the age of 75 as those in the least deprived quintile in the same region. These differences are more pronounced when comparing deaths from coronary heart disease among those aged 15 to 64 ranging from around twice as likely in the East of England compared to four times as likely among women in the South West (Table 1.7).

1. Detailed CHD mortality rate estimates at ward level are available at www.heartstats.org
2. Figures 1.5a, 1.5b, 1.5c and 1.5d present data that compares mortality rates within countries only. For this reason the colour coding cannot be used to compare rates between countries and should only be used to compare the regions with each country.
3. For detailed information on deprivation and CHD mortality in Scotland see <http://www.isdscotland.org/isd/2421.htm>

Table 1.1 *Inequality targets for CVD, England, Scotland and Wales*

England	
CVD	To reduce the inequalities gap in death rates from CHD, stroke and related diseases between the fifth of areas with the worst health and deprivation indicators and the population as a whole in people under 75 years by 40% by 2010
Scotland	
CHD	To reduce the rate of CHD mortality (for people aged under 75) for the most deprived communities, by 27% between 2003 and 2008, from the 2003 baseline of 112.0 to 81.7 per 100,000 population
Wales	
CHD	To improve CHD mortality in all groups and at the same time aim for a more rapid improvement in the most deprived groups
Northern Ireland	No target set

Source:

Department of Health (1999) Our Healthier Nation. DH: London.

Department of Health (2004) National Standards, Local Action: Health and Social Care Standards and Planning Framework 2005/06 and 2007/08. DH: London.

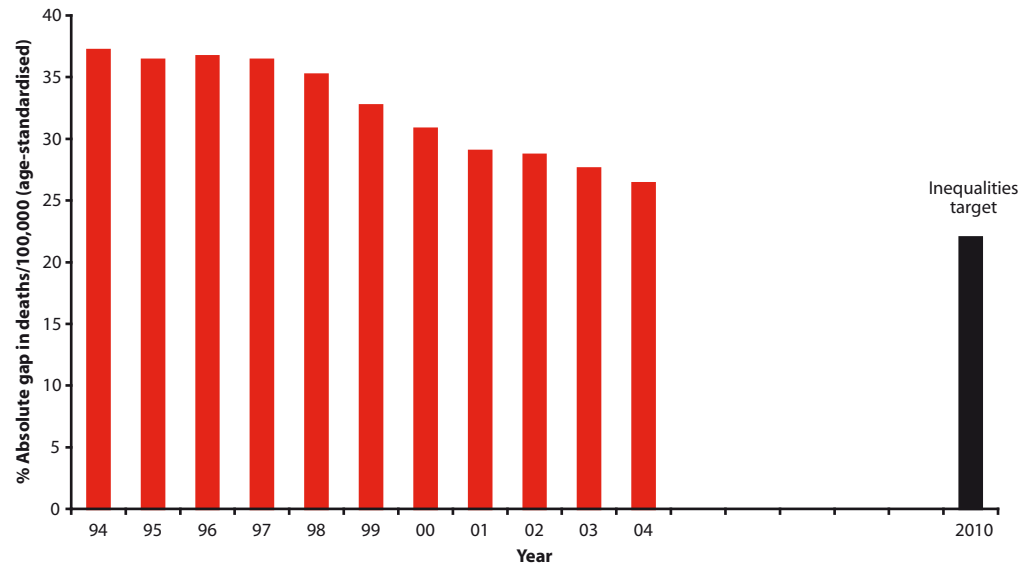
The Scottish Executive (2004) Building a Better Scotland. Spending Proposals 2005-2008: Enterprise, Opportunity, Fairness. The Scottish Executive: Edinburgh.

Welsh Assembly Government (2005) See Chief Medical Officer Wales website www.cmo.wales.gov.uk/content/work/health-gain-targets/the-targets-e.htm#chd

Welsh Assembly Government (2005) See Chief Medical Officer Wales website www.cmo.wales.gov.uk/content/work/health-gain-targets/the-targets-e.htm#olderpeople

New strategies for CVD in Northern Ireland are currently being developed by the Department of Health, Social Services and Public Safety.

Figure 1.1a Absolute gap in death rates from CHD, stroke and all other diseases of the circulatory system, between the fifth most deprived areas and the population as a whole, people aged under 75, 1993 to 2005, England, with inequalities target

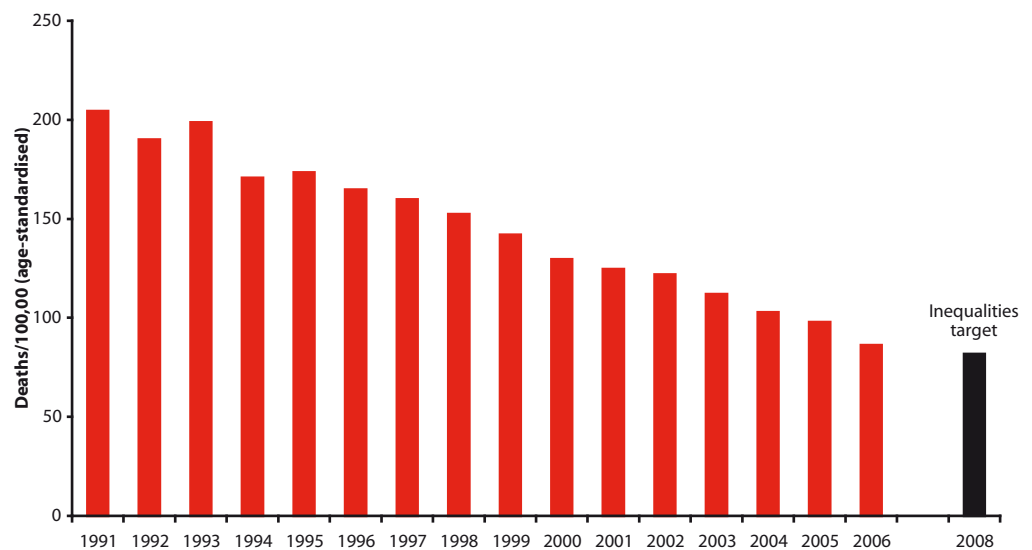


Notes: Data are three year moving averages plotted against middle year.

There is a discontinuity in the data around year 2000 due to the change to the 10th revision of the WHO International Classification of Diseases.

Source: Data from Office for National Statistics; analysis by Central Health Monitoring Unit, Department of Health.

Figure 1.1b CHD mortality in the most deprived quintile, adults aged under 75, 1991 to 2006, Scotland, with inequalities target



Source: Scottish Government - Health Analytical Services. Personal communication.

Table 1.2 *All deaths and deaths under 75 by cause and sex, 2005, England, Wales, Scotland, Northern Ireland and United Kingdom*

		All ages					Under 75				
		England	Wales	Scotland	Northern Ireland	United Kingdom	England	Wales	Scotland	Northern Ireland	United Kingdom
All causes	Men	227,956	15,209	26,522	6,957	276,644	97,528	6,582	13,248	3,351	120,709
	Women	251,722	16,953	29,225	7,267	305,167	65,148	4,502	9,193	2,152	80,995
	Total	479,678	32,162	55,747	14,224	581,811	162,676	11,084	22,441	5,503	201,704
All diseases of the circulatory system (I00-I99)	Men	81,977	5,773	9,434	2,430	99,614	30,555	2,218	4,123	970	37,866
	Women	89,044	6,373	10,626	2,572	108,615	14,874	1,107	2,207	502	18,690
	Total	171,021	12,146	20,060	5,002	208,229	45,429	3,325	6,330	1,472	56,556
All heart disease (I00-I52)	Men	56,554	4,090	6,655	1,781	69,080	23,019	1,671	3,207	754	28,651
	Women	52,259	3,943	6,335	1,625	64,162	9,420	720	1,473	346	11,959
	Total	108,813	8,033	12,990	3,406	133,242	32,439	2,391	4,680	1,100	40,610
Rheumatic heart disease (I00-I09)	Men	311	23	27	7	368	143	9	14	3	169
	Women	737	66	108	23	934	227	19	42	11	299
	Total	1,048	89	135	30	1,302	370	28	56	14	468
Hypertensive disease (I10-I15)	Men	1,450	117	151	28	1,746	604	47	71	13	735
	Women	2,012	147	219	45	2,423	370	31	45	15	461
	Total	3,462	264	370	73	4,169	974	78	116	28	1,196
Coronary heart disease (I20-I25)	Men	45,620	3,375	5,629	1,503	56,127	19,278	1,437	2,772	662	24,149
	Women	36,181	2,721	4,702	1,205	44,809	6,813	527	1,157	264	8,761
	Total	81,801	6,096	10,331	2,708	100,936	26,091	1,964	3,929	926	32,910
Other heart disease including heart failure (I26-I52)	Men	8,958	575	848	243	10,624	2,994	178	350	76	3,598
	Women	13,491	1,009	1,306	352	16,158	2,010	143	229	56	2,438
	Total	22,449	1,584	2,154	595	26,782	5,004	321	579	132	6,036
Stroke (I60-I69)	Men	18,013	1,215	2,134	499	21,861	4,759	332	627	149	5,867
	Women	29,379	1,943	3,655	808	35,785	3,924	278	580	112	4,894
	Total	47,392	3,158	5,789	1,307	57,646	8,683	610	1,207	261	10,761
Other diseases of the circulatory system (I70-I99)	Men	7,410	468	645	150	8,673	2,777	215	289	67	3,348
	Women	7,406	487	636	139	8,668	1,530	109	154	44	1,837
	Total	14,816	955	1,281	289	17,341	4,307	324	443	111	5,185
Diabetes (E10-E14)	Men	2,448	188	347	97	3,080	991	65	179	38	1,273
	Women	2,795	212	398	127	3,532	678	44	144	31	897
	Total	5,243	400	745	224	6,612	1,669	109	323	69	2,170
Cancer (C00-D48)	Men	67,196	4,389	7,782	1,946	81,313	34,088	2,265	4,328	1,047	41,728
	Women	62,057	4,186	7,626	1,880	75,749	29,122	1,999	3,799	914	35,834
	Total	129,253	8,575	15,408	3,826	157,062	63,210	4,264	8,127	1,961	77,562
Colo-rectal cancer (C18-C21)	Men	7,031	523	860	223	8,637	3,524	266	477	132	4,399
	Women	6,128	400	715	212	7,455	2,363	154	294	88	2,899
	Total	13,159	923	1,575	435	16,092	5,887	420	771	220	7,298
Lung cancer (C33,C34)	Men	15,692	1,065	2,195	505	19,457	8,562	596	1,301	293	10,752
	Women	11,119	756	1,814	319	14,008	5,593	433	978	179	7,183
	Total	26,811	1,821	4,009	824	33,465	14,155	1,029	2,279	472	17,935
Breast cancer (C50)	Women	10,297	672	1,144	304	12,417	5,702	356	660	169	6,887
	Total	10,297	672	1,144	304	12,417	5,702	356	660	169	6,887
Respiratory disease (J00-J99)	Men	30,689	1,962	3,190	866	36,707	8,302	530	1,047	268	10,147
	Women	37,216	2,459	3,903	1,055	44,633	6,101	445	902	184	7,632
	Total	67,905	4,421	7,093	1,921	81,340	14,403	975	1,949	452	17,779
Injuries and poisoning (V01-Y98)	Men	10,009	690	1,346	511	12,556	7,760	548	1,064	446	9,818
	Women	6,409	401	866	250	7,926	2,781	162	417	143	3,503
	Total	16,418	1,091	2,212	761	20,482	10,541	710	1,481	589	13,321
All other causes	Men	35,637	2,207	4,423	1,107	43,374	15,832	956	2,507	582	19,877
	Women	54,201	3,322	5,806	1,383	64,712	11,592	745	1,724	378	14,439
	Total	89,838	5,529	10,229	2,490	108,086	27,424	1,701	4,231	960	34,316

Notes: ICD codes (10th revision) in parentheses.

Source: England and Wales, Office for National Statistics (2006) Deaths registered by cause and area of residence, personal communication. Scotland, General Register Office (2006) Edinburgh, Deaths registered by cause and area of residence, personal communication. Northern Ireland, General Register Office (2006) Statistics and Research Agency: Northern Ireland, personal communication.

Table 1.3 Age-standardised death rates from CHD per 100,000 population by country and Standard Region, 1978 to 1996, and by country and Government Office Region, 1997 to 2005, United Kingdom

<i>Government Office Region 1997 to 2005</i>										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	
MEN AGED 35-74										
United Kingdom	295	260	244	226	213	199	189	173	161	
England	261	252	234	218	205	192	181	167	155	
North East	336	323	283	266	247	231	224	204	186	
Yorkshire and Humberside	291	288	253	240	236	212	201	176	172	
North West	314	307	279	262	250	231	220	210	192	
East Midlands	260	258	240	219	200	199	189	169	155	
West Midlands	285	262	259	234	225	211	195	179	170	
East	218	206	202	189	177	159	151	142	131	
South East	216	202	197	174	168	152	151	138	126	
London	249	246	231	224	201	198	189	168	158	
South West	223	219	198	192	174	164	146	141	125	
Wales	294	278	279	246	238	225	206	180	179	
Scotland	347	332	318	289	261	246	244	221	213	
Northern Ireland	323	302	290	250	228	216	195	194	175	
WOMEN AGED 35-74										
United Kingdom	98	93	85	78	76	69	65	58	52	
England	91	89	81	73	70	65	60	54	49	
North East	133	123	113	100	88	84	82	72	64	
Yorkshire and Humberside	112	100	89	87	82	75	66	61	58	
North West	115	120	104	93	90	84	72	70	62	
East Midlands	95	99	84	75	71	73	64	59	55	
West Midlands	103	95	91	76	79	70	69	57	52	
East	72	74	62	59	56	49	47	42	39	
South East	68	64	63	56	52	52	46	43	38	
London	83	81	79	73	70	63	61	54	47	
South West	69	68	65	56	54	50	49	40	40	
Wales	108	97	90	88	85	79	72	69	59	
Scotland	136	129	118	109	98	96	90	81	75	
Northern Ireland	115	107	101	89	83	78	65	66	60	
<i>Standard Region 1978 to 1996</i>										
	1978	1980	1982	1984	1986	1988	1990	1992	1994	1996
MEN AGED 35-74										
United Kingdom	578	521	497	490	470	434	393	364	325	292
England	523	501	478	471	449	414	377	349	307	281
North	613	594	562	576	539	517	468	448	375	337
Yorkshire and Humberside	603	559	545	532	528	490	438	395	342	310
North West	612	583	575	564	538	514	460	413	373	338
East Midlands	535	502	490	475	445	427	384	351	300	281
West Midlands	519	500	498	493	480	436	416	371	320	308
East Anglia	462	432	385	420	382	335	305	290	270	240
South East	464	450	421	410	385	349	319	303	272	250
South West	489	474	434	428	418	368	332	306	274	243
Wales	629	582	533	518	501	467	427	379	344	318
Scotland	656	616	606	595	581	538	481	458	408	371
Northern Ireland	653	658	571	598	602	562	483	437	380	338
WOMEN AGED 35-74										
United Kingdom	202	174	171	172	167	156	145	134	120	104
England	171	163	160	162	158	146	137	127	109	99
North	235	217	220	222	210	209	196	176	158	134
Yorkshire and Humberside	205	192	196	205	189	183	173	155	125	116
North West	220	210	205	210	205	194	178	167	143	129
East Midlands	170	165	161	171	167	151	141	127	105	99
West Midlands	177	167	167	175	167	161	146	134	115	110
East Anglia	145	134	124	127	123	104	100	94	84	76
South East	139	134	131	130	127	114	107	104	90	81
South West	147	136	126	137	133	112	113	97	86	77
Wales	195	204	184	187	182	166	154	142	127	112
Scotland	256	241	245	228	220	219	201	182	160	140
Northern Ireland	233	228	226	204	207	209	177	168	153	127

Notes: ICD-9 codes 410-414 for pre-2001 data, ICD-10 codes I20-25 thereafter.

Age-standardised using the European Standard Population. Government Office Regions replaced Standard regions in England in 1997.

Source: Pre 1997: Office for Population Censuses and Surveys (1994) Mortality Statistics 1992, DHS series, HMSO: London and previous editions; Office for National Statistics 1993-1996 figures, personal communication.

1997-2005: England and Wales: Office for National Statistics, personal communication.

Scotland and Northern Ireland: raw data from the General Register Office for Scotland, and the National Statistics and Research Agency Northern Ireland.

Map reference	Local authority name	Men		Women	
		Age-standardised death rate per 100,000	Age-standardised under 75 death rate per 100,000	Age-standardised death rate per 100,000	Age-standardised under 75 death rate per 100,000
372	Highland	197.40	99.59	87.10	31.28
373	Inverclyde	262.40	152.56	121.82	51.13
374	Midlothian	185.06	88.43	100.41	38.83
375	Moray	179.21	76.29	87.60	26.53
376	North Ayrshire	228.16	127.39	114.54	44.58
377	North Lanarkshire	247.29	138.97	127.32	54.51
378	Orkney Islands	216.39	91.76	104.57	35.54
379	Perth & Kinross	178.97	83.14	86.42	28.71
380	Renfrewshire	224.19	116.44	108.17	42.78
381	Scottish Borders	192.76	94.94	83.97	28.10
382	Shetland Islands	175.85	87.62	84.17	23.93
383	South Ayrshire	197.20	100.61	100.04	40.94
384	South Lanarkshire	231.73	114.38	115.92	43.63
385	Stirling	192.60	93.77	90.30	35.31
386	West Dunbartonshire	250.66	135.20	120.85	51.49
387	West Lothian	218.49	116.50	115.14	48.37
WALES		188.31	95.05	88.94	32.58
388	Blaenau Gwent UA	225.20	129.01	107.40	47.61
389	Bridgend UA	202.25	99.92	96.72	32.76
390	Caerphilly UA	218.16	118.24	106.75	46.99
391	Cardiff UA	170.34	89.92	75.16	27.09
392	Carmarthenshire UA	197.40	93.06	88.00	31.22
393	Ceredigion UA	155.38	72.40	77.46	25.09
394	Conwy UA	177.21	88.60	77.87	23.95
395	Denbighshire UA	184.71	87.74	81.55	25.05
396	Flintshire UA	194.94	90.10	101.01	36.97
397	Gwynedd UA	169.84	79.52	81.51	25.15
398	Isle of Anglesey UA	164.28	78.58	78.27	23.61
399	Merthyr Tydfil UA	213.12	116.28	107.76	44.03
400	Monmouthshire UA	163.09	84.30	74.74	27.35
401	Neath Port Talbot UA	207.27	106.83	94.45	34.60
402	Newport UA	184.48	105.64	88.67	34.14
403	Pembrokeshire UA	181.10	89.39	79.48	26.77
404	Powys UA	170.19	77.37	87.69	31.24
405	Rhondda, Cynon, Taff UA	212.03	117.93	101.40	43.61
406	Swansea UA	181.95	90.97	83.29	29.62
407	The Vale of Glamorgan UA	179.14	84.76	74.16	26.42
408	Torfaen UA	181.04	93.87	91.21	36.94
409	Wrexham UA	204.92	89.33	112.59	39.66
NORTHERN IRELAND		190.43	94.06	91.58	32.19
410	Ards	171.24	91.32	93.76	32.55
411	Belfast	199.81	108.04	85.53	35.04
412	Castlereagh	147.65	65.23	77.03	24.24
413	Down	179.45	90.20	94.99	35.10
414	Lisburn	185.66	84.81	86.49	26.64
415	North Down	156.35	77.04	70.50	25.17
416	Antrim	199.02	98.42	98.42	38.43
417	Ballymena	181.03	89.22	80.39	24.61
418	Ballymoney	188.31	81.95	95.28	27.13
419	Carrickfergus	182.43	80.29	92.68	32.57
420	Coleraine	189.48	84.95	97.03	29.78
421	Cookstown	226.14	106.08	103.87	32.32
422	Larne	180.92	86.77	89.21	29.03
423	Magherafelt	201.90	103.52	106.57	43.28
424	Moyle	202.91	108.28	93.18	28.72
425	Newtownabbey	183.48	86.78	75.16	22.05
426	Armagh	209.10	102.68	105.72	37.94
427	Banbridge	186.87	87.57	107.75	33.85
428	Craigavon	214.59	106.96	98.56	35.50
429	Dungannon	214.66	108.29	107.04	33.51
430	Newry and Mourne	195.33	93.73	103.32	37.17
431	Fermanagh	199.78	102.26	97.16	32.05
432	Limavady	196.23	95.24	108.30	29.96
433	Derry	198.51	97.89	109.27	41.64
434	Omagh	224.61	97.05	103.33	29.33
435	Strabane	211.07	102.53	108.77	41.49

Notes: ICD (10th revision) codes I20-25. Rates are directly standardised to the European Standard Population. The reported rates are average annual rates calculated using data from 2001 to 2006 inclusive.

Source: England and Wales: data provided by Office for National Statistics.
Scotland: data provided by General Register Office for Scotland.
Northern Ireland: data provided by Northern Ireland Statistics and Research Agency.

Table 1.5 *Age-standardised death rates and premature death rates from CHD by sex and quintile of deprivation, 2001/06, England, Scotland and Wales*

	Age-standardised all ages mortality per 100,000					Age-standardised under 75 mortality per 100,000				
	Least deprived		Most deprived			Least deprived		Most deprived		
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
MEN										
England	128.9	142.2	157.2	174.9	205.0	52.7	62.4	72.9	87.8	115.7
Scotland	154.0	185.1	203.7	230.5	260.6	67.1	88.7	105.3	123.0	155.5
Wales	146.8	173.2	185.7	203.2	222.7	63.8	80.7	92.4	104.6	125.8
WOMEN										
England	59.3	64.0	71.3	79.9	93.8	14.9	18.2	22.8	29.2	40.0
Scotland	74.3	90.8	98.2	111.4	125.2	20.8	30.0	36.7	46.7	60.1
Wales	68.6	79.3	87.5	92.8	110.0	20.8	24.2	31.0	34.5	48.6

Notes: Estimates are based on deprivation measured at the ward level. The deprivation indices used were: England and Wales, Carstairs; Scotland, Scottish Index of Multiple Deprivation 2003. Due to differences in the deprivation variable, comparisons between countries are not possible. Estimates are not available for Northern Ireland as there is no ward level deprivation index.

Source: England and Wales: deprivation indices, mortality estimates and population estimates provided by the Office for National Statistics. Scotland: deprivation index, mortality estimates and population estimates provided by the General Register Office for Scotland.

Table 1.6 Age-standardised death rates for CVD by deprivation twentieth, sex and age, 1999 to 2003, England and Wales

	Deprivation twentieth																				Total	Ratio
	Least deprived					Deprivation twentieth										Most deprived						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
All circulatory diseases, ages 0-74																						
MEN	94	104	108	116	119	122	129	136	142	146	152	165	171	177	184	193	200	206	227	250	152	2.7
WOMEN	40	44	47	50	52	52	57	60	63	66	69	73	78	84	88	89	94	94	106	115	69	2.9
Coronary heart disease, ages 15-64																						
MEN	35	40	42	48	49	50	52	58	60	62	67	74	75	80	83	90	93	98	108	123	67	3.5
WOMEN	7	8	10	11	11	11	13	13	15	15	18	19	19	22	24	25	26	27	33	37	17	5.5
Stroke, all ages																						
MEN	63	62	61	64	63	65	66	66	67	69	72	71	72	72	75	76	77	78	84	91	70	1.5
WOMEN	61	58	60	60	60	60	57	62	61	63	63	64	64	65	67	67	65	65	70	69	63	1.1
Stroke, ages 15-64																						
MEN	8	9	9	9	10	11	11	12	11	13	13	14	14	15	16	19	19	19	23	29	14	3.6
WOMEN	6	6	7	8	7	8	9	10	10	10	10	10	11	12	14	14	14	15	17	17	11	2.6

Notes: Data for all circulatory diseases from 1999 and 2001 to 2003.

Data for coronary heart disease from 1999 to 2003.

Ratio is between most deprived and least deprived twentieths.

Death rate is calculated for deaths per 100,000 population.

Deprivation is measured on the Carstairs Deprivation Index.

Source: Office for National Statistics (2006) Health Statistics Quarterly (32) Winter.
http://new.statistics.gov.uk/downloads/theme_health/HSQ32.pdf

Figure 1.6 Age-standardised death rates for CHD and stroke by deprivation twentieth, adults aged 15 to 64, 1993 to 2003, England and Wales

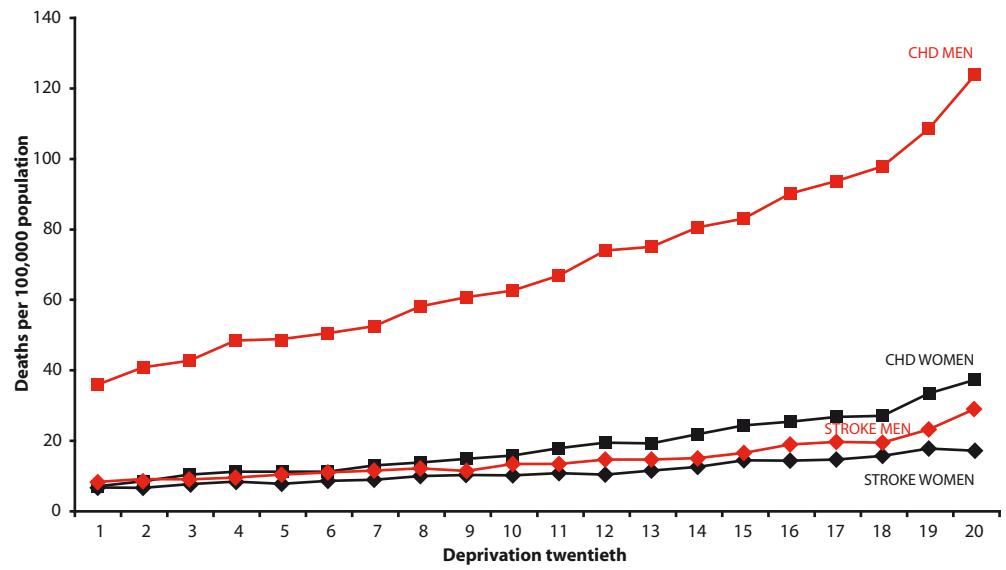


Table 1.7 *Age-standardised death rates for CVD and CHD by Government Office Region, by deprivation quintile, sex and age group, 1999/2003, England and Wales*

	Men aged 0-74						Women aged 0-74					
	Least deprived			Most deprived			Least deprived			Most deprived		
	Q1	Q2	Q3	Q4	Q5	Ratio	Q1	Q2	Q3	Q4	Q5	Ratio
Cardiovascular disease												
North East	98.5	126.3	154.8	183.1	223.2	2.3	48.3	57.6	73.0	87.7	109.0	2.3
North West	116.5	144.6	168.1	203.1	250.6	2.2	49.0	64.3	77.8	96.0	116.9	2.4
Yorkshire and the Humber	109.2	125.3	153.4	179.2	214.3	2.0	45.3	55.5	67.0	86.0	98.1	2.2
East Midlands	107.0	131.3	153.4	181.1	219.0	2.0	48.0	57.1	69.1	88.8	102.6	2.1
West Midlands	109.7	130.3	155.0	184.9	223.0	2.0	46.6	57.7	68.1	86.1	103.4	2.2
East of England	106.0	120.2	141.2	167.6	201.2	1.9	44.7	52.4	64.0	73.1	92.3	2.1
London	99.9	118.4	137.1	159.0	200.8	2.0	41.1	53.9	61.0	73.2	88.2	2.1
South East	100.9	123.3	146.3	176.7	210.4	2.1	43.7	54.0	65.3	82.6	93.2	2.1
South West	97.0	114.0	138.8	168.3	206.8	2.1	40.9	49.3	61.8	73.4	96.6	2.4
Wales	118.9	144.5	169.2	193.6	222.5	1.9	48.8	58.0	75.0	91.4	112.2	2.3
England	104.6	125.1	149.4	179.5	219.3	2.1	44.8	55.0	67.1	83.9	101.0	2.3
Coronary heart disease												
	Men aged 15-64						Women aged 15-64					
	Least deprived			Most deprived			Least deprived			Most deprived		
	Q1	Q2	Q3	Q4	Q5	Ratio	Q1	Q2	Q3	Q4	Q5	Ratio
North East	41.5	52.8	70.0	83.6	109.1	2.6	11.0	12.1	17.9	22.8	33.1	3.0
North West	47.4	62.3	72.2	93.9	124.3	2.6	10.0	14.7	19.8	27.1	37.8	3.8
Yorkshire and the Humber	45.8	53.4	69.0	83.2	105.2	2.3	9.6	11.9	17.5	24.4	29.6	3.1
East Midlands	42.4	53.8	65.3	82.9	107.5	2.5	10.2	11.8	17.2	24.0	33.8	3.3
West Midlands	43.1	51.6	69.0	82.2	109.6	2.5	9.3	11.8	16.1	24.1	32.8	3.5
East of England	43.0	47.9	61.4	75.8	91.3	2.1	8.8	11.3	15.3	18.1	20.1	2.3
London	35.8	48.5	56.5	67.4	89.9	2.5	7.7	10.6	13.2	16.1	24.0	3.1
South East	37.8	50.4	63.8	80.8	95.4	2.5	8.2	12.3	15.4	21.1	25.4	3.1
South West	39.1	47.9	62.8	76.5	88.0	2.3	7.2	10.6	15.5	17.8	29.1	4.0
Wales	48.2	60.3	69.1	87.4	111.7	2.3	11.3	12.3	19.6	24.6	35.9	3.2
England	41.2	51.6	65.3	81.1	104.4	2.5	8.8	11.9	16.4	22.1	30.2	3.4

Notes: Cardiovascular disease data relates to 1991 and 2001-2003.
Coronary heart disease data relates to 1999-2003.

Source: Office for National Statistics (2006). *Health Statistics Quarterly* (32) Winter.

2. Morbidity

Morbidity statistics are much harder to collect than mortality statistics. Sources of morbidity data include routinely collected national data, national studies and local studies. Each source has its pros and cons. Most sources only provide data on one or two aspects of morbidity from CHD and related conditions. Not all sources supply data for all ages or even both sexes. Data are collected in different ways with different degrees of validity and reliability. Sample sizes may vary as do sampling methods.

In this section we present data and calculate UK and other estimates from studies which give the widest coverage in terms of age, sex, geographical location, and social deprivation and which use validated and reliable methods of data collection. Much of the data presented here have not been presented elsewhere. More detailed statistics on CHD morbidity and explanations of the strengths and weaknesses of the data sources on which estimates are calculated can be found in the *Coronary heart disease statistics: Morbidity supplement*¹.

There are no morbidity targets for England, Wales, Scotland or Northern Ireland.

National and regional differences

The 2003 Health Surveys for England and Scotland collected data on cardiovascular conditions in representative surveys of the general population. Part of the data collected by the Health Surveys relates to doctor diagnosed illness.

Among men in England 14% report having some form of CVD confirmed by a doctor, 6% report CHD and 8% report a diagnosis of CHD or stroke. For women, 13% report CVD, 4% report CHD and 6% report CHD or stroke. Overall we estimate that, in England, 2.8 million men and 2.8 million women have had a diagnosis of CVD, 1.3 million men and 900,000 women have had a diagnosis of CHD and 1.6 million men and 1.3 million women have had a diagnosis of either CHD or stroke².

In Scotland 15% of men report a diagnosis of any CVD, 8% report a diagnosis of CHD and 10% a diagnosis of CHD or stroke. For women, 15% report CVD, 7% report CHD and 8% report CHD or stroke. Overall we estimate that, in Scotland, 300,000 men and 320,000 women have had a diagnosis of any CVD, 170,000 men and 140,000 women have had a diagnosis of CHD and 200,000 men and 180,000 women have had a diagnosis of CHD or stroke² (Table 2.1).

There is some geographic variation in prevalence rates of CVD reported by the Health Survey for England 2003; one in five men in Yorkshire and the Humber (20%) and the West Midlands (19%) report ever having some form of CVD diagnosed compared to 15% of men in the South West and 16% in London and the East of England. The prevalence of CHD in men is nearly twice as high in Yorkshire and the Humber (12%) than in the South West (7%) and East (7%) of England. For women, CVD prevalence rates range from 14% in London to 20% in the West Midlands. CHD varies more dramatically; only 4% of women in the South West and East of England report a doctor diagnosis of CHD compared with 10% of women in the North East (Table 2.1).

The Quality and Outcome Framework reports the number of patients suffering from particular conditions as registered by General Practitioners. These prevalence rates should be interpreted with caution as they do not include any adjustment for the age or gender profile of the relevant population. These data suggest that more than 2.2 million adults in England, Scotland and Wales are living with coronary heart disease, over 900,000 are living with stroke, almost 7 million people are living with hypertension and more than 2 million are living with diabetes (Table 2.2).

Coronary heart disease prevalence in 2004/05 was 3.6% in England, 4.6% in Scotland and 4.3% in Wales. In England the prevalence of CHD ranged from 2.2% (North Central London) to 5.0% (County Durham and Tees Valley) and tended to be higher in the North of the country. Prevalence rates tended to be higher in Scotland, ranging from 4.0% (Orkney; Lothian) to 8.4% (Shetland). Similar geographical patterns were seen for stroke (Table 2.2).

Regional differences at a local level

The ward level morbidity data used for this chapter were provided by Hospital Episode Statistics measured in Finished Consultant Episodes (FCEs) for CHD³. A Finished Consultant Episode refers to a completed period of care of a patient using a NHS hospital bed, under one consultant within one NHS Trust. The rate of FCEs gives some basis for comparison of the prevalence and incidence of different diseases. This data source only provides data at ward level for England.

Geographic variations in CHD morbidity are not as clear as those for mortality. For example, although morbidity rates tend to be higher in the North than the South, higher rates also tend to be found in urban areas. Over 27% of the wards in London are in the top quintile (i.e. top 20%) of morbidity rates for men under 75s in England. This rises to 35% for wards in the North East, and is as low as 9% for wards in the South East. For women of all ages this range is even larger: 44% of wards in the North East are among the top quintile for female morbidity rates compared to only 7% of wards in the South East⁴.

There is considerable variation within regions for CHD morbidity rates. For men of all ages, the FCE rate for South Shropshire in the West Midlands is 624 per 100,000 whereas the equivalent rate in Wolverhampton is 1,216 per 100,000, nearly 95% higher. For women in the North West there is a greater range of FCE rates: 280 per 100,000 in Congleton compared to 918 per 100,000 in Knowsley, nearly 330% higher (Table 2.3).

Deprivation

Among men in England the prevalence of heart disease increases markedly with deprivation. The rate of CHD among men in the most deprived group is one third higher than among men in the least deprived group. This pattern is even more marked among women where those in the most deprived group have a rate of CHD at least 50% greater than those in the least deprived group (Table 2.4).

Similar patterns are seen in the prevalence of stroke. Men in the most deprived group have at least 60% greater risk of stroke than those in the least deprived group. Among women the difference is just under 50% (Table 2.4).

These graduated patterns are not as clear for hypertension or raised blood pressure (Table 2.4).

Regional and social interactions

In England, men and women of any age in the most deprived group (worst 20%) are more than one and half times more likely to have CHD than those in the least deprived group (best 20%). For men aged under 75 the rate in the most deprived group is nearly twice that of men in the least deprived group. For women aged under 75 the most deprived group experience morbidity rates nearly two and a half times higher than the least deprived group (Table 2.5).

All English local authorities have been classified as high or low deprivation and high or low CHD morbidity rates. The resulting maps show that, for both sexes, areas of high morbidity and high deprivation tend to be found in urban areas (e.g. Leeds, Manchester, Newcastle), and in some rural areas in the North and South West. The geographic patterns in areas with high morbidity but low deprivation are not as clear as the patterns for mortality. There appears to be some grouping of these areas in the East of England for all age morbidity rates, but this pattern is not as apparent for under 75s (Figures 2.5a, 2.5b, 2.5c and 2.5d).

1. Rayner M, Petersen S, Mober M, Wright L, Lampe F (2001) *Coronary heart disease statistics: Morbidity supplement*. British Heart Foundation: London. See also www.heartstats.org
2. Prevalence estimates are calculated by applying age-standardised rates to the 2006 mid-year population.
3. Department of Health (2006) *Hospital Episode Statistics 2005/06*. www.hesonline.nhs.uk
4. Detailed CHD morbidity rate estimates at ward level are available at www.heartstats.org

Table 2.1 Prevalence of CVD, CHD, and CHD or stroke by Government Office Region, 2003, England, and Scotland

	ENGLAND (adults aged 35 and over)										ENGLAND (adults aged 16 and over)		SCOTLAND (adults aged 16 and over)	
	North East	North West	Yorkshire and the Humber	East Midlands	West Midlands	East of England	London	South East	South West	South	England	England	Scotland	
Men	%	%	%	%	%	%	%	%	%	%	%	%	%	
Age-standardised														
Any CVD	16.3	16.4	19.6	16.7	19.3	15.5	15.5	17.7	15.1	17.7	15.5	17.7	13.6	14.9
CHD	7.5	9.4	11.6	9.2	10.5	7.3	8.1	8.2	6.6	8.2	7.3	8.2	6.4	8.2
CHD or stroke	10.4	11.4	13.5	10.8	12.7	9.1	9.8	10.1	7.8	10.1	9.8	10.1	7.9	9.6
Women														
Age-standardised														
Any CVD	18.7	16.1	17.5	20.1	17.5	15.7	14.2	15.7	14.9	15.7	14.2	15.7	13.0	14.5
CHD	9.9	6.6	7.9	7.1	7.4	3.9	4.6	4.3	3.9	4.3	4.6	4.3	4.1	6.5
CHD or stroke	11.8	8.7	10.1	9.8	9.3	6.7	7.4	6.1	6.2	6.1	7.4	6.1	5.8	8.0
Unweighted bases														
Men	302	700	467	447	521	565	550	756	523	756	550	756	6,602	3,610
Women	384	846	575	575	686	691	691	968	643	968	691	968	8,234	4,538

Notes: For England and Scotland, adults aged 16 and over; for Government Region Offices, adults aged 35 and over
 CVD: angina, heart attack, stroke, heart murmur, irregular heart rhythm, or 'other heart trouble' confirmed by a doctor.
 CHD: angina or heart attack confirmed by a doctor.
 CHD or stroke: angina, heart attack or stroke confirmed by a doctor.

Source: Department of Health (2004) Health Survey for England 2003. The Stationery Office: London.
 The Scottish Executive (2005) The Scottish Health Survey 2003. The Stationery Office: Edinburgh.
<http://news.scotland.gov.uk/Publications/2005/12/02160336/03388> Table 2.

Table 2.2 Prevalence of CVD, 2004/05, England, Scotland and Wales

	Number of Practices	List Size	Coronary Heart Disease Register count	Coronary Heart Disease Prevalence (%)	Stroke Register count	Stroke Prevalence (%)	Hypertension Register count	Hypertension Prevalence (%)	Diabetes Register count	Diabetes Prevalence (%)
England, Scotland and Wales	10,011	60,738,878	2,245,521	3.7	923,196	1.5	6,913,851	11.4	2,039,982	3.4
England	8,486	52,833,584	1,893,184	3.6	782,733	1.5	5,973,062	11.3	1,766,391	3.3
Norfolk, Suffolk and Cambridgeshire	296	2,286,910	84,327	3.7	36,009	1.6	277,009	12.1	73,633	3.3
Bedfordshire and Hertfordshire	227	1,740,631	50,534	2.9	21,844	1.3	186,411	10.7	53,188	3.1
Essex	284	1,700,729	56,620	3.3	21,723	1.3	188,074	11.1	53,107	3.1
North West London	432	2,070,039	47,774	2.3	17,229	0.9	197,240	9.5	73,501	3.6
North Central London	283	1,399,893	30,921	2.2	12,322	0.9	123,697	8.8	42,615	3.0
North East London	360	1,714,774	41,892	2.4	15,050	0.9	159,734	9.3	66,488	3.9
South East London	286	1,699,834	38,849	2.3	16,658	1.0	162,177	9.5	52,257	3.1
South West London	231	1,437,592	31,908	2.2	13,349	0.9	135,376	9.4	43,666	3.0
Northumberland, Tyne & Wear	234	1,439,601	72,361	5.0	30,109	2.1	189,598	13.2	51,408	3.6
County Durham and Tees Valley	171	1,193,033	59,307	5.0	21,823	1.8	145,927	12.2	39,552	3.3
North & East Yorkshire & Northern Lincolnshire	252	1,701,802	72,141	4.2	29,401	1.7	204,047	12.0	54,403	3.2
West Yorkshire	348	2,225,624	91,815	4.1	34,098	1.5	230,345	10.3	74,826	3.4
Cumbria and Lancashire	355	1,996,096	95,329	4.8	36,221	1.8	235,599	11.8	70,346	3.5
Greater Manchester	543	2,707,508	110,577	4.1	40,617	1.5	290,927	10.7	94,291	3.5
Cheshire & Merseyside	423	2,472,566	108,108	4.4	42,482	1.7	293,084	11.9	85,639	3.5
Thames Valley	282	2,286,051	61,863	2.7	29,734	1.3	229,678	10.0	63,347	2.8
Hampshire and Isle Of Wight	231	1,858,334	63,552	3.4	26,969	1.3	212,834	11.5	59,185	3.2
Kent and Medway	291	1,684,553	54,033	3.2	22,975	1.4	192,049	11.4	56,092	3.3
Surrey and Sussex	363	2,706,936	93,835	3.5	41,530	1.5	314,372	11.6	81,279	3.0
Avon, Gloucestershire and Wiltshire	318	2,312,826	74,398	3.2	36,610	1.6	265,893	11.5	70,602	3.1
South West Peninsula	246	1,661,169	68,325	4.1	32,710	2.0	214,461	12.9	56,335	3.4
Dorset and Somerset	178	1,254,494	52,369	4.2	24,677	2.0	173,515	13.8	43,193	3.4
South Yorkshire	222	1,333,632	63,469	4.8	25,111	1.9	156,671	11.7	47,463	3.6
Trent	411	2,752,584	112,986	4.1	46,397	1.7	333,085	12.1	98,366	3.6
Leicestershire, Northamptonshire and Rutland	228	1,605,308	52,110	3.2	21,198	1.3	186,206	11.6	56,910	3.5
Shropshire and Staffordshire	256	1,520,157	60,637	4.0	25,902	1.7	186,906	12.3	54,026	3.6
Birmingham and the Black Country	505	2,464,027	88,392	3.6	33,686	1.4	293,257	11.9	95,344	3.3
West Midlands South	230	1,606,881	54,752	3.4	25,599	1.6	194,846	12.1	53,329	3.3
Scotland	1,025	4,840,757	221,581	4.6	86,432	1.8	558,376	11.5	155,921	3.2
Argyll & Clyde	95	407,007	19,830	4.9	7,756	1.9	48,709	12.0	12,888	3.2
Argyllshire & Arran	61	353,369	19,163	5.4	7,133	2.0	42,615	12.1	11,617	3.3
Borders	24	101,008	4,964	4.9	2,206	2.2	12,769	12.6	3,492	3.5
Dumfries & Galloway	55	146,100	7,913	5.4	3,008	2.1	19,171	13.1	5,559	3.8
Highland	37	318,660	14,924	4.7	5,974	1.9	38,569	12.1	11,276	3.5
North Ayrshire	57	274,843	14,008	5.1	4,587	1.7	33,184	12.1	9,530	3.5
North East Ayrshire	84	444,755	18,170	4.1	7,065	1.6	48,695	10.9	13,383	3.0
Greater Glasgow	210	939,079	41,300	4.4	16,764	1.8	105,568	11.2	29,411	3.1
Highland	70	213,318	9,242	4.3	3,679	1.7	26,275	12.3	6,714	3.1
Lanarkshire	100	544,881	25,055	4.6	8,521	1.6	60,325	11.1	17,789	3.3
Lothian	126	668,850	26,640	4.0	11,221	1.7	70,200	10.5	20,020	3.0
Orkney	13	14,322	569	4.0	174	1.2	1,451	10.1	473	3.3
Shetland	10	1,019	86	8.4	32	3.1	247	24.2	53	5.2
Fife	71	406,532	19,299	4.7	8,172	2.0	49,418	12.2	13,485	3.3
Western Isles	12	7,014	418	6.0	140	2.0	1,180	16.8	231	3.3
Wales	500	3,064,537	130,756	4.3	54,031	1.8	382,413	12.5	117,670	3.8
North Wales		686,530	30,446	4.4	11,817	1.7	87,283	12.7	24,651	3.6
Mid and West Wales		1,040,780	47,296	4.5	20,801	2.0	133,924	12.9	42,272	4.1
South East Wales		1,337,227	53,014	4.0	21,413	1.6	161,206	12.1	50,747	3.8

Source: England - QMAS database - 2004/05 data as at end of June 2005
Wales - <http://www.stats.wales.gov.uk/TableViewer/tableView.aspx?ReportId=2111>
Scotland - QMAS database, as at 25th August 2005. Quality & Outcomes Framework (QOF) for April 2004 - March 2005, Scotland

Notes: Stroke refers to Stroke and Transient Ischaemic Attack
List size is the number of patients registered with the practice
Prevalence (unadjusted) = (number on disease register / list size) * 100
Prevalence estimates for Shetland are relatively unstable, due to their being based on a smaller number of patients
www.isdscotland.org/qof for further information and explanation of Scottish figures

Table 2.4 *Age-standardised prevalence of various CVD conditions and associated risk factors per 100,000 by sex and deprivation, 1994/98, England*

		Least deprived			Most deprived		Total	
		Q1	Q2	Q3	Q4	Q5		
MEN								
	Coronary heart disease	Townsend	31.1	33.9	34.6	35.7	41.0	35.5
		IMD	29.5	31.6	36.8	36.5	40.5	35.5
Stroke	Townsend	1.7	1.9	1.9	2.0	2.7	2.1	
	IMD	1.5	1.8	2.1	2.0	2.7	2.1	
Hypertension	Townsend	57.5	55.8	54.2	54.7	56.8	55.6	
	IMD	55.2	54.7	55.7	54.5	57.2	55.6	
Raised blood pressure	Townsend	33.9	26.5	28.6	28.7	27.7	28.7	
	IMD	30.9	31.5	27.1	27.9	27.2	28.7	
WOMEN								
Coronary heart disease	Townsend	17.4	18.9	20.8	21.4	26.1	21.1	
	IMD	15.9	18.1	21.8	21.5	25.7	21.1	
Stroke	Townsend	1.3	1.5	1.5	1.5	1.9	1.5	
	IMD	1.3	1.3	1.6	1.5	1.9	1.5	
Hypertension	Townsend	67.2	63.8	64.7	65.9	68.7	65.8	
	IMD	63.3	64.6	65.7	64.9	69.4	65.8	
Raised blood pressure	Townsend	41.4	31.4	35.3	36.7	34.5	35.4	
	IMD	37.5	38.7	32.3	35.3	34.8	35.4	

Notes: Townsend refers to a deprivation score.
IMD refers to Index of Multiple Deprivation

Source: Office for National Statistics. (2003) Health Statistics Quarterly. Summer.

Table 2.5 *Age-standardised rates of finished consultant episodes for CHD by sex and quintile of deprivation, 2001/06, England*

	Age-standardised all ages FCEs for CHD per 100,000					Age-standardised under 75 FCEs for CHD per 100,000				
	Least deprived		Most deprived			Least deprived		Most deprived		
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
MEN	727.9	831.9	914.4	1,022.9	1,187.5	566.4	656.5	728.9	831.5	993.3
WOMEN	272.4	319.3	367.1	429.1	541.5	183.2	221.8	261.7	317.3	423.3

Notes: Estimates are based on deprivation measured at the ward level by the Carstairs index.

Finished Consultant Episodes (FCEs) for ICD (10th revision) codes I20-25. Rates are directly standardised to the European Standard Population. The reported rates are average annual rates calculated using data from 2001 to 2006 inclusive.

An FCE is defined as a period of admitted patient care under one consultant within one healthcare provider. Note that the figures do not represent the number of patients, as a person may have more than one episode of care within the year.

Source: The deprivation index was provided by the Office for National Statistics. The Information Centre (2007). Hospital Episode Statistics. Personal communication. Copyright © 2007, The Information Centre. All rights reserved.

3. Treatment

Government inequalities targets

The National Service Framework (NSF) for Coronary Heart Disease¹ was announced in March 2000, and sets national standards for the prevention, diagnosis and treatment of CHD in England. In particular the Framework requires that ‘the NHS and partner agencies should develop, implement and monitor policies that reduce the prevalence of coronary risk factors in the population, and reduce inequalities in risks of developing heart disease.’

There has been a significant increase in the number of prescriptions for the treatment and prevention of CVD in the last twenty years. In 2006, around 280 million prescriptions were issued for diseases of the circulatory system in the UK. The English figure of almost 235 million is more than four times the number of prescriptions in 1985, and represents an increase of around 10% since 2004 (Table 3.1).

The NSF set a goal for ambulance services. 74% of category A (immediately life threatening) calls should be responded to within 8 minutes². By 2005/06 75% of ambulance services across England were meeting this target. This target was met most often in Staffordshire (88%) and Oxfordshire (82%) and the least often in West Yorkshire (68%) and Gloucestershire (69%) (Table 3.2).

At the national level the number of responses to category A calls within 8 minutes has been relatively stable since 2003/04. In 2005/06 the proportion meeting the target was 74% in England, 59% in Scotland and 57% in Wales (Table 3.3).

The NSF also outlined the importance of cardiac rehabilitation. It set an overall goal that in every hospital over 85% of people discharged with a primary diagnosis of heart attack or after coronary revascularisation should be offered cardiac rehabilitation. Data from the British Association of Cardiac Rehabilitation show that the current rate of provision is well below the goal set by the NSF. In 2003/04, only around a third of people discharged from hospital in England after a heart attack or coronary revascularisation received cardiac rehabilitation³. The rate of provision varied substantially across the country with lowest levels in London (22%) and highest levels in the North East (51%) (Table 3.4).

Operations

Rates of coronary artery bypass surgery (CABG) and percutaneous coronary intervention (PCI) vary substantially across the UK. Maps of coronary revascularisation rates for men and women by local authority in England in 2002 show a greater than six fold difference between the lowest and highest rates. These rates varied in men from 57 per 100,000 population in the Isle of Wight to 137 per 100,000 in Watford and in women from 21 per 100,000 in the Isle of Wight to 137 per 100,000 in Teesdale⁴. These maps are available at www.heartstats.org.chd_atlas (Table 3.4).

Information on the numbers of Finished Consultant Episodes (FCEs)⁵ for operations for CHD is available at ward level within England and is summarised to local authority level for the tables and figures in this report (Table 3.5). There are clear patterns of higher operation rates in the

South West and South East and lower rates in the East and West Midlands for men and women of all ages (Figures 3.5a and 3.5b) and for those aged 75 and under (Figures 3.5c and 3.5d).

There are clear discrepancies between the maps of operation rates for CHD and maps of morbidity and mortality rates for CHD, discussed in earlier chapters. For example, 21% of wards in the South East are in the highest quintile for male operations rate in England, despite the fact that only 9% of wards from this region are in the top quintile for both male mortality and morbidity rates. It would appear that operation rates are not entirely dependent upon need (data on ward level operation rates are available from www.heartstats.org).

Rates of FCEs for CHD operations vary by area level deprivation. Among men of all ages the rate of operations is around a third greater among those in the most deprived group than those in the least deprived group and among women the difference is around 50%. Among men aged 75 and under the rate of operations is around 40% greater among those in the most deprived group than those in the least deprived group, and among women the difference is around 60% (Table 3.6).

Although the rate of operations in the more deprived group is higher than for the least deprived group, it is not as high as should be expected given the mortality and morbidity rate of this group. A similar situation is apparent in Scotland where, after adjustment for CHD mortality, men in the least deprived 10% are 58% more likely to receive CABG or angioplasty when compared with the Scottish average; men in the most deprived 10% are 34% less likely to receive CABG or angioplasty than the Scottish average. Women in the least deprived 10% in Scotland are 77% more likely to receive CABG or angioplasty when compared with the Scottish average; women in the most deprived 10% are 25% less likely to receive CABG or angioplasty when compared with the Scottish average⁶.

1. Department of Health (2000) *National Service Framework for Coronary Heart Disease*. The Stationary Office: London.
2. Department of Health Statistical Bulletin (2005) *Ambulance services, England 2004-2005*. See www.dh.gov.uk.
3. The British Association of Cardiac Rehabilitation Database annually surveys all centres providing cardiac rehabilitation in the UK. In 2003/04, data on cardiac rehabilitation provision were reported by 139 of 255 English centres. The data have been adjusted upwards to take into account non-responders to the survey.
4. Otreba P, Rayner M, Hill A, Goldacre M (2003) *An atlas of coronary heart disease mortality, hospital admission and coronary revascularisations in South East England*. SEPHO: Oxford. This publication contains maps of CHD mortality, hospital admissions and coronary revascularisations by local authority across England as well as the South East Region see www.heartstats.org/chd_atlas.
5. Department of Health (2006) *Hospital Episode Statistics 2005/06*. www.hesonline.nhs.uk. A Finished Consultant Episode (FCE) refers to a completed period of care of a patient using a NHS hospital bed, under one consultant within one NHS Trust.
6. For detailed information on deprivation and CHD mortality in Scotland see <http://www.isdscotland.org/isd/2421.htm>

Table 3.1 Prescriptions used in the prevention and treatment of all diseases of the circulatory system, 2006, England, Scotland, Wales and Northern Ireland

Prescriptions (thousands)	England	Scotland	Wales	Northern Ireland
Positive Inotropic Drugs (2.1)	4,126	323	362	104
Diuretics (2.2)	37,582	3,913	2,983	1,009
Anti-Arrhythmic Drugs (2.3)	1,265	90	106	36
Beta-Adrenoceptor Blocking Drugs (2.4)	27,378	3,027	1,985	918
Hypertension and Heart Failure (2.5)	47,742	3,776	3,107	1,247
Nit,Calc Block & Other Antianginal Drugs (2.6)	34,707	3,544	2,607	1,039
Sympathomimetics (2.7)	5	1	0	0
Anticoagulants And Protamine (2.8)	6,790	611	541	194
Antiplatelet Drugs (2.9)	32,779	3,448	2,365	1,026
Antifibrinolytic Drugs & Haemostatics (2.11)	327	36	22	12
Lipid-Regulating Drugs (2.12)	42,098	3,648	2,576	1,227
Local Sclerosants (2.13)	0	0	0	0
All prescriptions for diseases of the circulatory system	234,798	22,417	16,654	6,812

Notes: British National Formulary chapter and section codes in parentheses.

Sources: Office for National Statistics (2007). Prescription Cost Analysis England 2006.
<http://www.ic.nhs.uk/statistics-and-data-collections/primary-care/prescriptions/prescription-cost-analysis-2006>
 Scottish Health Statistics (2007). Prescription cost analysis for Scotland.
http://www.isdscotland.org/isd/info3.jsp?pContentID=2241&p_applic=CCC&p_service=Content.show&
 Welsh Assembly Government (2007). Prescriptions Dispensed in the Community in Wales, 2000 to 2006 and Prescription Cost Analysis (PCA) Data.
<http://new.wales.gov.uk/topics/statistics/headlines/health-2007/bdw200703222/?lang=en>
 Central Services Agency (2007). Prescription Cost Analysis.
<http://www.centuralservicesagency.com/display/statistics>

Table 3.2 *Emergency calls (ambulance service responses within 8 minutes) by Government Office Region and Ambulance Service, 2002/03 to 2006/07, England*

	Percentage of responses within 8 minutes				
	2002-03	2003-04	2004-05	2005-06	2006-07
England	74.6	75.7	76.2	75.3 *	74.6
North East	75.8	74.9	77.3	75.2	76.3
North East Ambulance NHS Trust	76.6	75.6	77.4	75.3	..
Tees, East & North Yorkshire Ambulance NHS Trust	73.4	73.7	77.1	75.0	..
North West	79.1	79.1	76.7	74.3	72.7
Cumbria Ambulance NHS Trust	76.6	76.7	75.0	74.4 **	..
Greater Manchester Ambulance NHS Trust	82.4	82.5	79.6	75.9	..
Lancashire Ambulance NHS Trust	76.7	77.7	76.7	75.5	..
Mersey Regional Ambulance NHS Trust	76.7	76.1	73.7	71.2	..
Yorkshire	73.4	70.6	75.1	72.7	72.4
Tees, East & North Yorkshire Ambulance NHS Trust	73.4	73.7	77.1	75.0
South Yorkshire Metropolitan Ambulance NHS Trust	75.3	71.8	72.5	78.9 **	..
West Yorkshire Metropolitan Ambulance NHS Trust	72.1	68.4	76.0	67.6 **	..
East Midlands	74.2	75.3	75.8	75.1	75.9
East Midlands Ambulance NHS Trust	73.2	75.0	75.4	75.3	..
Lincolnshire Ambulance NHS Trust	76.4	75.7	77.0	76.0	..
The Two Shires Ambulance NHS Trust	76.0	76.6	76.0	72.6	..
West Midlands	78.1	76.2	75.9	75.1	75.4
West Midlands Ambulance NHS Trust	78.3	76.4	76.2	74.4 **	..
Coventry & Warwickshire Ambulance NHS Trust	76.8	75.7	75.6	78.1	..
Hereford & Worcester Ambulance NHS Trust	77.8	75.3	75.0	75.2	..
Staffordshire	86.4	86.6	88.3	87.5 **	82.2
Staffordshire Ambulance NHS Trust	86.4	86.6	88.3	87.5 **	..
East of England	73.9	75.7	76.3	76.6	75.2
Bedfordshire & Hertfordshire NHS Trust	76.2	75.3	75.2	77.1	..
Essex Ambulance NHS Trust	67.3	75.7	77.3	77.1	..
East Anglian Ambulance NHS Trust	75.2	76.1	76.5	75.9	..
London	69.1	76.0	76.6	75.1	75.2
London Ambulance NHS Trust	69.1	76.0	76.6	75.1	..
South East Coast	73.3	74.3	74.8	76.0	75.1
Kent Ambulance NHS Trust	72.9	74.3	75.8	76.6	..
Surrey Ambulance NHS Trust	75.0	77.1	74.8	75.8	..
Sussex Ambulance NHS Trust	72.4	71.8	73.4	75.5	..
South Central	74.5	75.2	76.2	76.0	73.8
Hampshire Ambulance NHS Trust	73.0	74.1	75.6	75.6	..
Oxfordshire Ambulance NHS Trust	75.2	75.4	77.9	81.6	..
Royal Berkshire Ambulance NHS Trust	76.4	76.1	76.6	77.2	..
The Two Shires Ambulance NHS Trust	76.0	76.6	76.0	72.6	..
Great Western	72.4	68.8	72.7	74.0	72.8
Avon Ambulance NHS Trust	73.2	72.0	75.4	76.8	..
Gloucestershire Ambulance NHS Trust	71.5	73.3	71.2	69.0	..
Wiltshire Ambulance NHS Trust	71.4	55.7	68.0	71.2	..
South Western	72.1	75.4	75.7	75.9	74.1
Dorset Ambulance NHS Trust	71.9	75.4	76.9	78.0	..
Westcountry Ambulance NHS Trust	72.2	75.4	75.1	75.3 **	..
Isle of Wight	73.3	76.5	77.2	75.7	78.0
Isle of Wight Ambulance Service (NHS Trust)	73.3	76.5	77.2	75.7	..

Notes: *Unadjusted figure: in 2005-06 several trusts misreported data. Adjusted estimate of the percentage for England is around 74%.

** Original data submitted by trust, (see 'Data Quality' in the text).

On 1st July 2006 both Tees, East & North Yorkshire Ambulance NHS Trust and The Two Shires Ambulance NHS Trust were split across new ambulance trusts, for comparability data for these two former trusts have been split for all years (see 'Organisational Changes' in the text).

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Source: Health and Social Care Information Centre (2007) Statistics on NHS Ambulance Services.

See <http://www.ic.nhs.uk/webfiles/publications/ambulanceserv06/Bulletin%20Tables%20Final%20070607.xls>. Table 6.

Table 3.3 *Emergency calls (ambulance service responses within 8 minutes), 2003/04 to 2005/06, England, Scotland and Wales*

	Responses to emergency calls within 8 minutes		
	% 2003/04	% 2004/05	% 2005/06
England	76	76	74
Scotland	57	57	59
Wales	52	58	57

Notes: England 2005/06 is an adjusted estimate of 74: several trusts misreported data and the unadjusted figure was 75.3

Source: Wales Audit Office. (2006) *Ambulance services in Wales. Part 1: Figure 13.*
<http://www.wao.gov.uk/assets/englishdocuments/Ambulance%20Inquiry%20Part%201%20Eng.pdf>

Table 3.4 *Percentage of patients receiving cardiac rehabilitation after hospitalisation for heart attack, coronary artery bypass surgery or percutaneous coronary interventions by Government Office Region, 2003/04, England*

Government Office Region	Number hospitalised for heart attack, CABG or PCI*	Number receiving cardiac rehabilitation post heart attack, CABG or PCI**	% receiving cardiac rehabilitation post heart attack, CABG or PCI
North East	12,864	6,516	51
North West	30,757	11,276	37
Yorkshire and the Humber	20,398	5,890	29
East Midlands	16,581	4,196	25
West Midlands	21,372	6,906	32
East of England	21,329	5,125	24
London	22,484	4,872	22
South East	27,928	9,373	34
South West	23,692	6,636	28
England	197,405	62,495	32

Notes: * Hospital Episode Statistics

** British Association of Cardiac Rehabilitation Database, data adjusted for non-response.

Sources: Department of Health (2005) *Hospital Episode Statistics, personal communication.*
 British Association Cardiac Rehabilitation Database (2005), *personal communication.*

Table 3.5 Age-standardised rates of finished consultant episodes for operations for CHD by sex and local authority, all ages and under 75 years, 2001/06, England

Map reference	Local authority name	Rate of finished consultant episodes for operations for CHD per 100,000 population				Map reference	Local authority name	Rate of finished consultant episodes for operations for CHD per 100,000 population			
		Men All ages	Men Under 75	Women All ages	Women Under 75			Men All ages	Men Under 75	Women All ages	Women Under 75
ENGLAND											
A	South East	175.50	155.86	51.22	43.24	90	Lewisham	204.45	181.27	67.60	58.40
1	Medway Towns UA	119.78	113.69	27.32	24.39	91	Merton	221.47	198.51	64.74	55.94
2	Bracknell Forest UA	171.85	147.93	59.38	47.00	92	Newham	264.36	244.30	86.15	75.88
3	West Berkshire UA	167.39	147.90	57.61	47.59	93	Redbridge	260.12	231.05	73.50	65.91
4	Reading UA	166.41	143.55	50.16	42.01	94	Richmond upon Thames	197.97	170.11	48.69	39.00
5	Slough	230.77	212.86	82.37	72.76	95	Southwark	203.50	180.47	68.92	58.45
6	Windsor & Maidenhead UA	169.80	148.78	45.95	36.81	96	Sutton	208.30	187.12	51.93	42.86
7	Wokingham UA	169.87	145.19	50.12	41.39	97	Tower Hamlets	335.88	308.64	96.03	82.26
8	Milton Keynes UA	174.13	160.10	51.49	43.48	98	Waltham Forest	204.66	186.62	60.48	54.45
9	Brighton & Hove UA	201.47	178.13	54.55	46.17	99	Wandsworth	224.44	200.11	70.15	60.31
10	Portsmouth UA	112.21	106.30	31.01	27.36	100	Westminster	267.14	228.19	83.12	66.08
11	Southampton UA	215.49	194.70	68.63	59.60	B	South West	180.58	162.53	51.78	44.41
12	Isle of Wight UA	116.00	103.38	38.51	34.36	101	Bath & North East Somerset UA	122.40	111.99	39.85	34.42
13	Aylesbury Vale	214.78	180.65	74.84	62.41	102	Bristol UA	170.14	155.12	47.01	42.19
14	Chiltern	204.24	174.03	66.82	55.99	103	North Somerset UA	147.50	134.53	36.11	30.35
15	South Bucks	191.07	166.38	65.32	50.75	104	South Gloucestershire UA	134.67	122.93	33.09	29.41
16	Wycombe	233.61	204.85	68.52	56.71	105	Plymouth UA	334.37	302.54	86.13	76.04
17	Eastbourne	219.90	199.61	63.30	57.30	106	Torbay UA	167.41	157.36	44.13	39.75
18	Hastings	192.80	179.68	56.58	50.56	107	Bournemouth UA	145.07	131.78	38.88	32.38
19	Lewes	223.28	200.43	51.30	43.19	108	Poole UA	179.40	158.64	58.03	49.01
20	Rother	193.34	178.83	46.51	40.18	109	Swindon UA	151.08	138.38	42.13	36.72
21	Wealden	205.45	181.66	57.04	47.85	110	Caradon	295.50	255.97	74.39	61.68
22	Basingstoke & Deane	227.35	199.43	72.30	60.97	111	Carrick	239.44	209.58	56.54	48.25
23	East Hampshire	162.98	137.89	60.78	50.58	112	Kerrier	238.41	212.82	59.49	50.11
24	Eastleigh	198.15	173.39	45.43	37.38	113	North Cornwall	242.31	215.85	65.76	57.64
25	Fareham	111.78	99.17	35.59	29.88	114	Penwith	215.49	199.28	54.44	45.82
26	Gosport	143.70	129.76	39.25	33.82	115	Restormel	249.39	224.12	54.65	45.64
27	Hart	176.94	144.60	47.84	38.06	116	Isles of Scilly	145.47	122.39	31.82	31.82
28	Havant	123.10	110.92	34.32	28.96	117	East Devon	213.76	186.96	63.25	52.62
29	New Forest	186.91	164.89	45.38	37.80	118	Exeter	236.20	209.90	63.68	51.51
30	Rushmoor	188.34	159.71	61.27	51.21	119	Mid Devon	222.96	191.94	73.64	58.00
31	Test Valley	183.17	161.71	47.98	39.18	120	North Devon	168.73	152.47	49.91	41.57
32	Winchester	137.84	118.80	42.20	35.86	121	South Hams	204.33	177.45	64.89	55.48
33	Ashford	189.78	167.19	68.29	55.93	122	Teignbridge	179.93	160.12	51.39	43.00
34	Canterbury	145.95	134.07	43.33	37.04	123	Torridge	190.31	169.16	61.65	55.40
35	Dartford	180.59	158.55	48.88	39.95	124	West Devon	249.20	218.36	83.95	72.35
36	Dover	174.36	157.79	46.88	41.12	125	Christchurch	162.94	150.04	48.56	42.24
37	Gravesham	167.47	147.64	55.59	46.29	126	East Dorset	159.23	140.02	52.76	44.11
38	Maidstone	171.09	153.71	48.38	40.73	127	North Dorset	137.86	121.80	66.85	56.98
39	Sevenoaks	156.86	137.30	49.78	41.30	128	Purbeck	169.39	150.30	42.56	35.19
40	Shepway	196.30	178.88	53.52	46.32	129	West Dorset	141.19	125.18	42.20	37.94
41	Swale	116.04	106.26	39.51	36.39	130	Weymouth & Portland	155.52	141.52	54.27	49.46
42	Thanet	174.76	165.75	51.85	46.49	131	Cheltenham	135.06	124.33	35.56	30.87
43	Tonbridge & Malling	195.55	171.12	59.98	50.76	132	Cotswold	146.65	129.12	43.40	37.16
44	Tunbridge Wells	163.81	143.75	50.55	42.27	133	Forest of Dean	181.04	162.78	53.04	45.61
45	Cherwell	192.75	173.61	52.63	42.49	134	Gloucester	179.55	167.99	44.57	40.07
46	Oxford	189.29	167.43	63.62	53.99	135	Stroud	178.52	160.57	46.35	39.06
47	South Oxfordshire	182.23	159.40	60.08	50.21	136	Tewkesbury	181.47	167.30	45.90	39.96
48	Vale of White Horse	194.85	168.12	63.11	51.79	137	Mendip	136.63	121.25	48.01	41.49
49	West Oxfordshire	192.51	167.17	55.64	46.89	138	Sedgemoor	189.79	174.41	46.86	41.73
50	Elmbridge	160.49	136.85	41.57	33.52	139	South Somerset	186.07	171.16	56.01	47.25
51	Epsom & Ewell	155.83	141.36	40.72	33.72	140	Taunton Deane	194.03	179.06	72.14	62.68
52	Guildford	163.79	141.03	43.53	35.17	141	West Somerset	166.24	150.54	63.44	54.68
53	Mole Valley	139.36	123.75	40.69	34.35	142	Kennet	127.52	114.15	48.18	39.84
54	Reigate & Banstead	145.33	129.22	34.03	27.21	143	North Wiltshire	132.28	118.72	40.77	36.02
55	Runnymede	225.65	206.96	45.62	38.14	144	Salisbury	123.96	108.77	39.61	31.67
56	Spelthorne	207.07	181.87	52.51	44.40	145	West Wiltshire	122.28	113.25	42.08	36.97
57	Surrey Heath	182.68	156.61	55.05	41.82	C	East of England	174.83	153.72	51.12	43.00
58	Tandridge	198.31	174.41	48.49	36.86	146	Peterborough UA	182.17	165.29	54.32	44.85
59	Waverley	153.09	130.98	44.17	35.96	147	Luton UA	185.96	171.12	47.76	42.96
60	Woking	189.96	166.20	62.09	52.76	148	Southend-on-Sea UA	148.55	131.43	36.59	29.92
61	Adur	218.83	197.42	54.64	47.69	149	Thurrock UA	165.90	148.76	45.61	39.30
62	Arun	181.14	162.10	50.90	44.41	150	Mid Bedfordshire	188.32	161.60	52.96	42.29
63	Chichester	123.34	109.48	44.98	37.84	151	Bedford	170.08	150.56	64.61	55.58
64	Crawley	233.78	208.41	71.28	58.85	152	South Bedfordshire	163.67	148.63	50.17	42.11
65	Horsham	175.67	156.27	47.48	38.43	153	Cambridge	173.47	150.52	41.59	32.87
66	Mid Sussex	177.29	156.35	43.29	34.07	154	East Cambridgeshire	195.96	166.49	60.07	46.69
67	Worthing	186.31	167.41	60.27	54.56	155	Fenland	184.60	163.62	69.25	57.63
	London	229.70	204.72	66.30	56.33	156	Huntingdonshire	226.63	190.94	61.69	46.86
68	City of London	138.58	116.64	80.15	56.93	157	South Cambridgeshire	188.71	158.09	60.59	46.21
69	Barking & Dagenham	226.91	209.44	66.28	57.41	158	Basildon	169.25	151.27	46.82	41.55
70	Barnet	204.25	178.48	52.71	44.95	159	Braintree	157.50	139.02	53.62	47.70
71	Bexley	192.64	175.42	56.52	48.87	160	Brentwood	133.49	117.30	44.10	36.72
72	Brent	309.56	273.93	89.97	74.59	161	Castle Point	166.49	144.57	42.75	35.34
73	Bromley	181.70	160.53	39.73	32.65	162	Chelmsford	147.86	129.50	34.69	30.28
74	Camden	217.69	190.47	57.43	45.42	163	Colchester	155.19	138.17	47.92	41.74
75	Croydon	237.58	213.16	73.25	61.40	164	Epping Forest	182.75	160.04	55.92	46.41
76	Ealing	344.46	305.08	116.70	98.67	165	Harlow	235.20	202.58	71.26	61.50
77	Enfield	202.31	182.43	51.92	44.33	166	Maldon	159.84	140.77	56.14	48.01
78	Greenwich	192.08	176.20	48.84	43.37	167	Rochford	130.51	111.08	39.38	32.00
79	Hackney	202.81	178.16	63.34	55.65	168	Tendring	168.23	158.29	43.49	38.03
80	Hammersmith & Fulham	223.54	197.25	69.47	59.37	169	Uttlesford	172.58	142.18	60.10	51.74
81	Haringey	163.14	147.87	43.63	37.15	170	Broxbourne	197.44	173.85	53.55	45.79
82	Harrow	304.56	266.76	83.62	68.74	171	Dacorum	238.91	199.53	57.98	47.68
83	Havering	183.90	164.33	52.32	44.01	172	East Hertfordshire	173.16	152.20	50.37	42.14
84	Hillingdon	240.39	215.75	62.70	53.77	173	Hertsmere	204.15	179.85	55.73	49.01
85	Hounslow	332.26	298.31	97.80	85.02	174	North Hertfordshire	187.30	162.83	56.25	48.51
86	Islington	173.15	150.00	53.93	46.89	175	St Albans	196.77	167.41	46.04	36.08
87	Kensington & Chelsea	194.95	169.12	61.12	50.04	176	Stevenage	254.06	227.15	65.80	58.49
88	Kingston upon Thames	221.34	197.44	58.63	47.60	177	Three Rivers	230.91	199.13	54.98	43.54
89	Lambeth	204.52	179.10	68.19	55.04	178	Watford	259.59	225.87	78.00	68.62

Rate of finished consultant episodes for operations for CHD per 100,000 population

Map reference	Local authority name	Men All ages	Under 75	Women All ages	Under 75
179	Welwyn Hatfield	189.82	172.55	48.12	41.17
180	Breckland	175.97	155.58	56.58	48.65
181	Broadland	180.00	153.72	47.86	37.70
182	Great Yarmouth	133.37	121.62	42.65	36.89
183	Kings Lynn & West Norfolk	151.82	133.51	47.36	40.54
184	North Norfolk	168.56	143.40	54.03	45.52
185	Norwich	163.48	147.25	45.74	39.07
186	South Norfolk	181.52	157.92	53.01	43.02
187	Babergh	143.87	123.37	52.16	45.29
188	Forest Heath	159.95	135.20	68.56	56.30
189	Ipswich	148.49	134.93	46.52	41.07
190	Mid Suffolk	159.10	139.39	50.25	41.17
191	St Edmundsbury	200.99	174.70	63.95	51.68
192	Suffolk Coastal	144.95	131.82	43.48	36.46
193	Waveney	115.29	101.08	35.01	29.28
D	East Midlands	154.70	138.91	50.21	43.27
194	Corby	183.45	161.28	74.68	66.48
195	Daventry	174.98	150.88	56.51	42.97
196	East Northamptonshire	149.71	129.69	53.30	46.52
197	Kettering	155.96	138.22	50.07	41.20
198	Northampton	191.10	171.55	51.10	44.53
199	South Northamptonshire	192.13	158.94	62.49	49.75
200	Wellingborough	154.60	140.00	50.87	42.32
201	Derby UA	124.93	115.54	33.60	30.59
202	Leicester UA	214.60	197.10	63.34	57.17
203	Rutland UA	163.58	143.16	64.03	49.96
204	Nottingham UA	156.68	144.81	60.85	55.17
205	Amber Valley	130.26	118.61	41.90	35.07
206	Bolsover	153.73	139.96	56.92	49.18
207	Chesterfield	162.39	153.28	48.75	44.16
208	Derbyshire Dales	113.70	100.23	41.70	35.90
209	Erewash	124.85	113.08	48.10	42.93
210	High Peak	128.43	110.84	45.95	39.82
211	North East Derbyshire	145.80	134.29	43.87	40.20
212	South Derbyshire	150.31	138.25	42.62	35.30
213	Blaby	182.93	168.99	42.88	34.67
214	Charnwood	177.45	151.52	50.84	42.16
215	Harborough	164.51	141.74	60.53	52.00
216	Hinckley & Bosworth	166.08	151.83	44.10	36.65
217	Melton	161.91	146.81	56.43	45.81
218	North West Leicestershire	169.52	153.48	52.39	44.32
219	Oadby & Wigston	163.06	140.19	57.67	50.19
220	Boston	132.70	119.38	51.33	46.69
221	East Lindsey	139.08	123.68	57.29	49.02
222	Lincoln	157.55	143.12	46.30	40.08
223	North Kesteven	145.66	128.83	53.54	43.44
224	South Holland	136.39	121.53	52.43	45.33
225	South Kesteven	142.12	123.88	48.86	41.16
226	West Lindsey	141.32	126.87	48.84	40.97
227	Ashfield	154.18	142.86	52.17	45.86
228	Bassetlaw	137.88	126.17	39.72	37.22
229	Broxtowe	157.47	134.39	46.89	38.72
230	Gedling	155.69	139.13	43.19	35.03
231	Mansfield	156.60	142.90	54.69	47.49
232	Newark & Sherwood	133.98	118.24	47.35	40.93
233	Rushcliffe	146.10	129.29	47.87	39.64
E	West Midlands	183.42	165.17	56.67	49.38
234	Birmingham	237.78	217.76	77.49	69.12
235	Coventry	228.27	200.34	72.73	62.23
236	Dudley	139.19	127.70	33.76	29.27
237	Sandwell	228.10	204.28	75.24	65.30
238	Solihull	191.31	167.78	56.34	49.13
239	Walsall	174.11	157.50	45.69	40.53
240	Wolverhampton	218.64	198.53	62.95	56.80
241	County of Herefordshire UA	110.93	100.40	34.30	29.05
242	Telford & Wrekin UA	150.60	137.21	45.48	39.31
243	Stoke-on-Trent UA	202.86	191.83	68.00	62.24
244	Bridgnorth	125.80	116.88	52.47	46.66
245	North Shropshire	150.11	135.50	58.27	50.73
246	Oswestry	148.70	135.86	51.32	48.24
247	Shrewsbury & Atcham	144.89	129.92	45.02	37.57
248	South Shropshire	124.42	111.56	64.06	58.26
249	Cannock Chase	165.59	153.74	46.60	41.33
250	East Staffordshire	130.61	118.41	53.11	48.05
251	Lichfield	183.63	166.15	60.83	52.74
252	Newcastle-under-Lyme	212.47	194.30	60.90	53.17
253	South Staffordshire	180.90	159.20	46.64	39.72
254	Stafford	150.66	138.72	40.32	34.28
255	Staffordshire Moorlands	193.82	175.25	56.31	48.04
256	Tamworth	165.80	152.12	45.10	38.28
257	North Warwickshire	191.27	166.86	57.56	44.97
258	Nuneaton & Bedworth	169.64	153.31	57.05	48.25
259	Rugby	203.90	172.96	62.18	52.86
260	Stafford-on-Avon	165.17	139.14	43.90	34.90
261	Warwick	164.36	140.94	44.94	36.44
262	Bromsgrove	151.40	129.80	48.36	39.71
263	Malvern Hills	121.33	107.66	39.63	34.46
264	Redditch	163.11	144.38	52.09	42.73
265	Worcester	146.94	134.87	43.31	37.79
266	Wychavon	144.27	126.43	45.33	38.46
267	Wyre Forest	159.58	141.55	42.10	37.11
F	North West	165.59	152.03	53.23	47.51
268	Bolton	165.97	158.68	47.38	43.73
269	Bury	157.33	146.98	48.71	44.44
270	Manchester	241.33	221.65	90.18	82.13
271	Oldham	157.39	147.78	49.21	45.31
272	Rochdale	186.38	170.68	60.14	54.20
273	Salford	155.56	144.93	53.16	48.33
274	Stockport	145.03	133.56	43.64	39.77
275	Tameside	171.35	162.28	53.20	49.32

Rate of finished consultant episodes for operations for CHD per 100,000 population

Map reference	Local authority name	Men All ages	Under 75	Women All ages	Under 75
276	Trafford	151.02	138.16	39.71	34.23
277	Wigan	155.01	146.65	49.59	45.92
278	Knowsley	204.90	182.61	62.26	55.99
279	Liverpool	188.97	173.37	65.18	58.99
280	St Helens	159.62	146.63	42.31	37.65
281	Sefton	148.61	138.93	41.67	38.05
282	Wirral	141.51	132.32	39.11	35.41
283	Halton UA	170.41	157.09	51.83	46.82
284	Warrington UA	123.49	116.20	34.37	30.11
285	Blackburn with Darwen UA	153.96	140.72	47.49	42.88
286	Blackpool UA	240.28	223.61	76.83	68.46
287	Chester	149.92	131.10	46.94	40.58
288	Congleton	125.24	111.30	29.42	26.43
289	Crewe & Nantwich	96.57	87.71	33.78	30.60
290	Ellesmere Port & Neston	166.88	151.82	53.88	45.96
291	Macclesfield	102.19	90.71	44.60	37.67
292	Vale Royal	110.03	99.77	37.60	33.08
293	Allerdale	174.40	155.92	65.12	55.19
294	Barrow-in-Furness	172.76	160.36	59.92	56.65
295	Carlisle	152.52	138.83	47.94	38.82
296	Copeland	210.20	185.80	82.84	70.68
297	Eden	132.53	111.86	60.01	48.68
298	South Lakeland	134.30	120.91	59.02	53.11
299	Burnley	192.31	176.45	63.67	57.75
300	Chorley	169.28	153.00	49.74	41.89
301	Fylde	236.45	210.81	79.27	69.16
302	Hyndburn	149.56	139.18	44.97	39.93
303	Lancaster	149.40	138.50	46.14	39.12
304	Pendle	168.19	154.06	55.05	50.20
305	Preston	231.37	213.71	60.39	51.12
306	Ribble Valley	147.10	125.26	62.25	52.71
307	Rossendale	159.22	142.23	52.98	47.21
308	South Ribble	167.67	148.99	55.85	47.75
309	West Lancashire	140.25	125.80	46.85	40.18
310	Wyre	231.16	207.88	76.21	68.05
G	Yorkshire and the Humber	183.08	169.42	58.74	52.99
311	Barnsley	170.73	159.70	53.62	49.25
312	Doncaster	182.68	173.05	59.46	54.70
313	Rotherham	179.71	169.54	56.74	53.45
314	Sheffield	180.89	167.90	59.47	53.80
315	Bradford	190.43	180.67	60.24	55.84
316	Calderdale	198.83	183.85	56.96	51.96
317	Kirklees	171.37	164.98	45.89	42.70
318	Leeds	198.41	181.54	65.09	58.18
319	Wakefield	190.97	173.56	62.35	56.92
320	Kingston upon Hull UA	199.05	183.79	84.53	76.61
321	East Riding of Yorkshire UA	209.57	191.03	64.91	57.03
322	North East Lincolnshire UA	153.76	144.20	40.55	36.10
323	North Lincolnshire UA	163.93	151.06	43.09	38.70
324	York UA	181.61	166.07	54.78	48.58
325	Craven	188.39	173.41	70.93	63.30
326	Hambleton	179.82	159.06	59.20	50.72
327	Harrogate	115.40	101.26	40.65	34.28
328	Richmondshire	166.37	145.37	78.39	67.76
329	Ryedale	137.66	120.03	54.87	46.75
330	Scarborough	174.08	162.29	54.78	48.49
331	Selby	200.98	178.99	60.84	49.89
H	North East	194.85	176.87	61.50	54.61
332	Gateshead	240.55	218.67	78.04	69.48
334	Newcastle upon Tyne	190.14	176.14	57.76	51.07
335	North Tyneside	175.46	162.04	48.86	43.66
336	South Tyneside	182.60	170.63	51.55	47.04
337	Sunderland	204.05	188.41	61.81	56.26
338	Hartlepool UA	147.85	136.95	42.09	37.53
339	Middlesbrough UA	240.00	216.26	99.57	88.45
340	Redcar and Cleveland UA	239.80	215.52	71.84	62.22
341	Stockton-on-Tees UA	195.98	175.70	54.17	46.64
342	Darlington UA	192.19	174.42	57.33	49.03
343	Chester-le-Street	194.49	176.00	62.89	56.31
344	Derwentside	195.42	178.61	50.63	45.95
345	Durham	181.49	166.97	56.65	51.52
346	Easington	168.55	152.84	66.30	62.52
347	Sedgefield	180.25	163.99	63.63	56.34
348	Teesdale	197.90	165.25	72.28	64.89
349	Wear Valley	167.33	151.55	58.75	53.22
350	Alnwick	151.84	132.38	64.94	56.24
351	Berwick-upon-Tweed	179.44	151.88	64.74	55.83
352	Blyth Valley	197.77	180.72	59.68	47.49
353	Castle Morpeth	168.40	139.46	54.21	42.99
354	Tynedale	152.67	124.09	54.25	49.05
355	Wansbeck	204.14	182.80	61.54	55.28

Notes: Hospital Episode Statistics data for operations for CHD, treatment codes K40-K51 (inc. Coronary Artery Bypass Grafts and Percutaneous Coronary Interventions). Rates are directly standardised to the European Standard Population. The reported rates are average annual rates calculated using data from 2001 to 2006 inclusive.

A Finished Consultant Episode is defined as a period of admitted patient care under one consultant within one healthcare provider. Please note that the figures do not represent the number of patients, as a person may have more than one episode of care within the year.

Source: The Information Centre (2007). Hospital Episode Statistics. Personal communication. Copyright © 2007, The Information Centre. All rights reserved.

Table 3.6 Age-standardised rates of finished consultant episodes for operations for CHD by sex and quintile of deprivation, 2001/06, England

	Age-standardised all ages					Age-standardised under 75				
	FCEs for operations for CHD per 100,000					FCEs for operations for CHD per 100,000				
	Least deprived		Most deprived			Least deprived		Most deprived		
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
MEN	155.6	167.4	174.2	186.3	208.9	134.9	148.0	155.9	168.8	192.1
WOMEN	46.5	48.0	50.1	55.6	68.1	38.0	40.1	42.7	48.8	61.0

Notes: Estimates are based on deprivation measured at the ward level by the Carstairs index. Hospital Episode Statistics data for operations for CHD, treatment codes K40-K51 (inc. Coronary Artery Bypass Grafts and Percutaneous Coronary Interventions). Rates are directly standardised to the European Standard Population. The reported rates are average annual rates calculated using data from 2001 to 2006 inclusive. A Finished Consultant Episode is defined as a period of admitted patient care under one consultant within one healthcare provider. Please note that the figures do not represent the number of patients, as a person may have more than one episode of care within the year.

Source: The Information Centre (2007). Hospital Episode Statistics. Personal communication. Copyright © 2007, The Information Centre. All rights reserved.

4. CHD risk factors

The main risk factors for coronary disease are well established and have been the subject of many large, international representative studies. The main non-modifiable risk factors include age, gender, family history and ethnicity. The main modifiable risk factors include smoking, physical inactivity, excess alcohol consumption, levels of mental stress, overweight and obesity, diets high in saturated fats and low in fruit and vegetables, hypertension, dyslipidemia and diabetes.

The INTERHEART case control study¹ involved more than 25,000 participants across 52 countries and set out to evaluate the association and attributable burden of each risk factor to myocardial infarction (MI) both globally and within each region. This study confirmed that abnormal blood lipids, smoking and obesity, among other risk factors were strongly associated with the risk of suffering MI. It estimated that 29% of heart attacks in Western Europe were due to smoking, 45% are due to abnormal blood lipids and 63% are due to abdominal obesity². The study further estimated that 94% of heart attacks in Western Europe were due to a combination of the modifiable risk factors mentioned above.

National and regional differences

The prevalence rates of most modifiable risk factors for cardiovascular disease vary in different countries and regions of the United Kingdom. In general, the risk factor profile of a region tends to be worse in the North of England, Wales, Scotland and Northern Ireland than in the South of England. This is not the case for all risk factors, however. For example, for women the prevalence of doctor-diagnosed diabetes is highest in London and lowest in the North East and North West of England (Table 4.1).

For a more detailed discussion of all the main CHD risk factors, see *Coronary heart disease statistics 2007*³ or www.heartstats.org.

Regional differences at a local level

Data on the prevalence of risk factors are generally collected by representative surveys such as the Health Survey for England. These surveys can provide accurate estimates for large areas (countries of the UK, regions of England) but the sample frame and sample size do not allow for estimates to be made for small areas (local authorities, wards). A variety of small area estimation techniques have been developed to address this issue, one of which (synthetic estimation⁴) is the basis for the local level estimates of risk factor prevalence data in this chapter.

Table 4.2 provides detail on the risk factors for which synthetic estimates are available, detail on the risk behaviour measured and descriptive measures for each estimate. This table shows that, at a national level, the estimates derived from synthetic methods are similar to those derived from more traditional survey methods. These comparisons provide some confidence that estimates at a smaller regional level may be representative of risk factor prevalence within that area.

The synthetic estimates that have been used for this chapter have been chosen because they are the best available estimates that can be standardised for age and sex. Whilst some of the synthetic estimation models that generate the estimates have been subjected to validity testing⁵, others have not. This should be borne in mind when the quality of the estimates is considered.

Synthetic estimation provides an estimate of *what the prevalence rate in a given area is expected to be given the demographics of the area, rather than a direct estimate of the prevalence rate*. Synthetic estimates should therefore be viewed with caution. It has been shown that the technique is likely to lead to under estimates in areas where prevalence rates are very high, and over estimates in areas where prevalence rates are very low⁶. Despite this, synthetic estimates are generally agreed to be effective at producing an accurate ranking of the prevalence rates in areas, allowing for effective identification of areas where rates are high, low or average⁷.

Socio-economic differences

Comparative information on risk factor prevalence and socio-economic classification is available at a broader level from various regularly conducted national surveys.

The difference between those in high and low socio-economic groups is marked in some risk factors but not in others (Table 4.3). For example, managerial or professional men and women are about half as likely to smoke as those in semi-routine or routine occupations.

Socio-economic differences and regional variation

There is some variation in CHD risk factor rates by region between manual and non-manual workers (Table 4.4).

The differences in smoking rates between manual and non-manual males are largest in the North East, the North West and the East Midlands. Among women the differences are largest in the North East, the South West and the West Midlands.

Men in manual occupations in the North West of England are three times more likely to have type 2 diabetes than those in non manual occupations and twice as likely in the East of England, and women in manual occupations in the East of England and the East Midlands are twice as likely to have type 2 diabetes than their non manual counterparts.

1. 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.
2. Abdominal (or central) obesity is a measure of fat levels situated around the waist, and is measured by the waist hip ratio.
3. Allender S, Peto V, Scarborough P, Boxer A, Rayner M. (2007) Coronary heart disease statistics 2007. British Heart Foundation: London.
4. Synthetic estimation involves using data from a nationally representative survey to create a model which predicts the likelihood of an individual having an adverse risk factor status (e.g. being a current smoker) on the basis of a number of individual level and area level variables. The individual level variables can include sex, age, marital status, ethnicity etc. The area level variables can include the proportion of people in a given area that live in rented accommodation, the proportion of people who own two or more cars, the Government Office Region etc. The likelihood estimates for individuals are then applied to all individuals in a given area (using census data) to produce an estimate of the prevalence of the risk factor in any given area.
5. Twigg L, Moon G, Walker S. *The smoking epidemic in England*. London: Health Development Agency, 2004.
6. Heady P, Clarke P, Brown G, Ellis K, Heasman D, Hennell S, Longhurst J, Mitchell B (2003). Model-based small area estimation series no. 2. Small area estimation project report. London: Office for National Statistics.
7. The EURAREA Consortium. *Enhancing small area estimation techniques to meet European needs. Final project report*. London: Office for National Statistics, 2004.

Table 4.1 Prevalence of CHD risk factors by sex, country and region of the United Kingdom, latest available year

RISK FACTOR	Country				Government Office Region in England									
	ENGLAND	SCOTLAND	WALES	NORTHERN IRELAND	GREAT BRITAIN	North East	North West	Yorkshire and the Humber	East Midlands	West Midlands	East	London	South East	South West
Men														
Smoking (GB, 2005)	25	28	24	27	25	28	26	27	25	23	25	25	24	26
Physically inactive: < 30 mins per week (See notes)	32	30	31	24	31	34	31	34	31	31	29	36	25	26
Drinking over 4 units of alcohol per day (GB, 2005)	34	38	34	35	35	42	42	42	36	31	33	26	31	33
Binge drinking: over 8 units on at least one day in last week (GB, 2005)	18	22	18	19	19	21	24	25	19	16	17	12	15	19
High GHQ12 score (Eng, 2003)	34	33				17	11	11	11	11	9	13	12	10
BP \geq 140/90mmHg (Eng, Scot 2003)						71	62	65	68	65	65	60	64	64
High total cholesterol \geq 5.0 (Eng, 2003)						65	66	66	69	66	68	58	65	68
Overweight including obesity BMI \geq 25 (Eng, 2003)						3.1	3.3	3.5	3.7	4.9	4.8	5.4	2.9	2.8
Doctor diagnosed diabetes (Eng, 2003)														
Women														
Smoking (GB, 2005)	22	25	21	25	23	30	23	23	25	21	21	20	21	25
Physically inactive: < 30 mins per week (See notes)	40	35	36	25	40	40	40	40	40	42	36	41	37	35
Drinking over 3 units of alcohol per day (GB, 2005)	20	21	18	20	25	25	26	27	19	17	18	13	18	22
Binge drinking: over 6 units on at least one day in last week (GB, 2005)	8	9	8	8	9	9	11	13	7	6	7	5	6	8
High GHQ12 score (Eng, 2003)	30	30	33			18	16	13	15	14	14	17	15	13
BP \geq 140/90mmHg (Eng, Scot 2003)						69	64	63	68	69	64	64	65	66
High total cholesterol \geq 5.0 (Eng, 2003)						59	60	55	57	61	57	48	52	56
Overweight including obesity BMI \geq 25 (Eng, 2003)						2.5	2.7	2.8	3.5	3.8	3.7	4.4	3.2	2.7
Doctor diagnosed diabetes (Eng, 2003)														
Both sexes														
Consumption of fruit and vegetables per day (g/day) (UK, 2002/05)	335	279	303	252	281	298	298	308	334	312	365	345	364	370
Total fat per day (% food energy) (UK, 2002/05)	37.6	37.3	38.3	37.4	38.2	37.9	37.9	37.7	37.5	37.6	37.9	37.3	38.2	38.0
Saturated fat per day (% food energy) (UK, 2002/05)	14.7	14.7	15.0	14.8	15.1	14.6	14.6	14.8	14.8	14.6	14.8	13.9	15.0	15.1

Notes: Data in this table are from multiple sources and refer to different time periods (detail in brackets).

Smoking data for Northern Ireland are for 2004/05

Physical activity data: England and Scotland 2003; Wales 2004/05; N Ireland 2001.

Source: Office for National Statistics (2006) Living in Britain: Results for the 2005 General Household Survey. The Stationery Office: London.
Northern Ireland Statistics and Research Agency Central Survey Unit (2006) Continuous Household Survey 2004/05. See www.csu.nisra.gov.uk/

Office for National Statistics (2006) Expenditure and Food Survey 2004/05. The Stationery Office: London.

Department of Health (2004) Health Survey for England 2003. The Stationery Office: London.

Office for National Statistics (2006) Smoking and drinking among adults 2005. General Household Survey 2005. The Stationery Office: London.

Department of Health (2006) Joint Health Surveys Unit. Forecasting obesity to 2010, Tables 4 and 5.

Department of Health (2005) Health Survey for England 2004. The Stationery Office: London.

Department of Health (2006) Health Survey for England 2005. The Information Centre, London.

Scottish Health Executive (2005) The Scottish Health Survey 2003. Results: <http://www.scotland.gov.uk/Publications/2005/11/25145024/50251> The Scottish Executive, Edinburgh.

National Assembly for Wales (2005) Welsh Health Survey 2004/05. Welsh Assembly, Cardiff

<http://new.wales.gov.uk/topics/statistics/publications/health-survey2004-05?lang=en>

Northern Ireland Statistics and Research Agency (2001) Northern Ireland Health and Social Wellbeing Survey 2001: Physical activity results - Activity level tables. NISRA, Belfast.

Table 4.2 Details of age-standardised synthetic estimates of the prevalence of risk factors for CHD, 2001, England

Risk factor	Synthetically estimated prevalence measure	Source	Mean of estimates		Range of estimates		Standard deviation of estimates	
			MALE %	FEMALE %	MALE %	FEMALE %	MALE %	FEMALE %
Smoking	Current smokers	(Twiggs, 2004)	24.0	21.8	18.3 - 28.9	14.4 - 28.2	2.3	2.4
Diet	Individuals consuming less than five portions of fruit and vegetables per day	(Dibben, 2004)	58.2	45.1	57.2 - 60.5	44.2 - 47.8	0.4	0.4
Physical activity	Individuals doing less than five hours of physical activity per week	(Dibben, 2004)	36.2	45.8	34.6 - 42.7	44.0 - 53.2	1.1	1.2
Alcohol	Individuals consuming greater than recommended weekly consumption of alcohol	(Twiggs, 2000)	29.9	15.7	27.0 - 31.4	13.7 - 18.0	0.7	0.8
Blood pressure	Individuals with systolic blood pressure greater than or equal to 160mmHg, or diastolic blood pressure greater than or equal to 95mmHg	(Dibben, 2004)	8.0	7.5	7.0 - 8.9	6.5 - 8.3	0.4	0.3
Blood cholesterol	Individuals with total cholesterol greater than or equal to 6.5mmol/l	(Dibben, 2004)	20.9	22.1	20.8 - 21.0	22.0 - 22.3	0.0	0.0
Overweight and obesity	Individuals with body mass index greater than 30kg/m ²	(Dibben, 2004)	21.2	22.5	15.9 - 24.7	17.2 - 26.2	1.4	1.5
Diabetes	Individuals with diagnosed or undiagnosed type 1 or type 2 diabetes	(YHPHO, 2005)	4.1	4.9	3.2 - 9.2	3.8 - 9.9	0.9	1.0

Notes: Synthetic estimates for small areas are derived by using Health Survey for England data to model health behaviours using individual and area level covariates. The resulting logistic regression model is applied to 2001 census data to produce a prevalence estimate for local authorities. The estimates have been age-standardised by applying the models to covariate data that has been adjusted to the same age structure as the European Standard Population.

Source: Twiggs L, Moon G, Walker S (2004) *The smoking epidemic in England*. Health Development Agency: London.

Dibben C, Sims A, Watson J, Barnes H, Smith T, Sigala M, Hill A, Manley D (2004) *The Health Poverty Index*. South East Public Health Observatory: Oxford.

Twiggs L, Moon G, Jones K (2000) *Predicting small-area health-related behaviour: a comparison of smoking and drinking indicators*. *Social Science & Medicine*, 50; 1109-1120. Yorkshire and Humber Public Health Observatory (2005) *PBS diabetes population prevalence model - phase 2*. YHPHO: Hull.

Table 4.3 *Prevalence of CHD risk factors by sex and socio-economic classification, England, Great Britain or United Kingdom, latest available year*

RISK FACTOR	NS-SEC of household reference person				
	Managerial & professional	Intermediate	Small employers & own account workers	Lower supervisory & technical	Semi-routine & routine
Men					
Smoking (GB, 2005)	18	22	26	28	35
Physically inactive: < 30 mins per week (Eng, 2003)	28	30	28	30	35
Drinking over 4 units of alcohol per day (GB, 2005)	34	37	34	36	34
Binge drinking: over 8 units on at least one day in last week (GB, 2005)	18	19	18	20	18
Severe lack social support (Eng, 2003)	11	17	18	19	26
High BP \geq 140/90mmHg (Eng, 2003)	25	27	25	29	28
High total cholesterol \geq 5.0 (Eng, 2003)	66	65	67	65	60
Overweight BMI $>25 \leq 30$ (Eng, 2003)	43	43	38	39	39
Obesity BMI > 30 (Eng, 2003)	21	20	27	24	23
Mean waist-hip ratio (Eng, 2003)	25	31	33	31	34
Doctor diagnosed diabetes (Eng, 2003)	3.6	2.6	4.1	3.5	4.1
Women					
Smoking (GB, 2005)	16	19	24	28	31
Physically inactive: < 30 mins per week (Eng, 2003)	36	37	36	38	43
Drinking over 3 units of alcohol per day (GB, 2005)	22	21	20	19	16
Binge drinking: over 6 units on at least one day in last week (GB, 2005)	8	8	7	8	7
Severe lack social support (Eng, 2003)	7	10	10	11	15
High BP \geq 140/90mmHg (Eng, 2003)	24	27	26	32	27
High total cholesterol \geq 5.0 (Eng, 2003)	65	67	69	64	66
Overweight BMI $>25 \leq 30$ (Eng, 2003)	28	29	35	29	28
Obesity BMI > 30 (Eng, 2003)	21	21	22	32	33
Mean waist-hip ratio (Eng, 2003)	24	26	27	35	36
Doctor diagnosed diabetes (Eng, 2003)	2.6	1.6	4.2	4.3	4.0
Both sexes					
Total fat per day (% food energy) (UK, 2002-05)	37.4	37.1	38.3	37.9	37.7
Saturated fat per day (% food energy) (UK, 2002-05)	14.7	14.4	15.1	14.7	14.5

Source: Department of Health (2004) *Health Survey for England 2003*. DH: London.
Office for National Statistics (2006) *General Household Survey 2005*. The Stationery Office: London.
Office for National Statistics (2006) *Expenditure and Food Survey 2004/05*. The Stationery Office: London.

Table 4.4 *Rate ratio (manual vs non-manual) for prevalence of CHD risk factors, by sex and Government Office Region, England*

Government Office Region	Current cigarette smoker	More than 4 units alcohol past 7 days	More than 8 units alcohol past 7 days	Type 2 Diabetes	Fruit and veg consumption on previous day	Meeting PA guideline
MEN						
South West	1.63	1.04	1.00	0.50	0.59	1.53
London	1.27	0.69	0.67	1.00	0.43	0.94
South East	1.69	0.72	0.93	0.50	0.47	1.43
East of England	1.47	0.90	1.00	2.00	0.69	1.54
West Midlands	1.25	1.27	1.50	1.50	0.96	2.08
East Midlands	1.80	1.22	1.54	1.00	0.85	2.50
North West	1.95	1.03	1.21	3.00	0.59	1.24
Yorks & Humber	1.41	1.36	1.69	2.00	0.92	1.77
North East	2.11	1.41	1.87	1.00	0.67	1.57
WOMEN						
Government Office Region	Current cigarette smoker	More than 3 units alcohol past 7 days	More than 6 units alcohol past 7 days	Type 2 Diabetes	Fruit and veg consumption on previous day	Meeting PA guideline
South West	1.69	1.08	3.67	0.50	0.41	0.59
London	1.36	0.63	1.50	1.00	0.25	0.40
South East	1.50	0.96	3.33	0.50	0.30	0.47
East of England	1.39	0.90	3.50	2.00	0.41	0.53
West Midlands	1.52	1.04	3.00	0.50	0.41	1.00
East Midlands	1.40	1.07	2.63	2.00	0.41	0.64
North West	1.45	2.04	5.50	1.00	0.33	0.92
Yorks & Humber	1.51	1.36	3.57	1.00	0.37	0.77
North East	1.73	1.52	2.50	1.00	0.49	0.67

Notes: Department of Health (2004) Health Survey for England 2003. DH: London.
Office for National Statistics (2006) General Household Survey 2005. The Stationary Office: London.
Office for National Statistics (2006) Expenditure and Food Survey 2004/05. The Stationary Office: London.