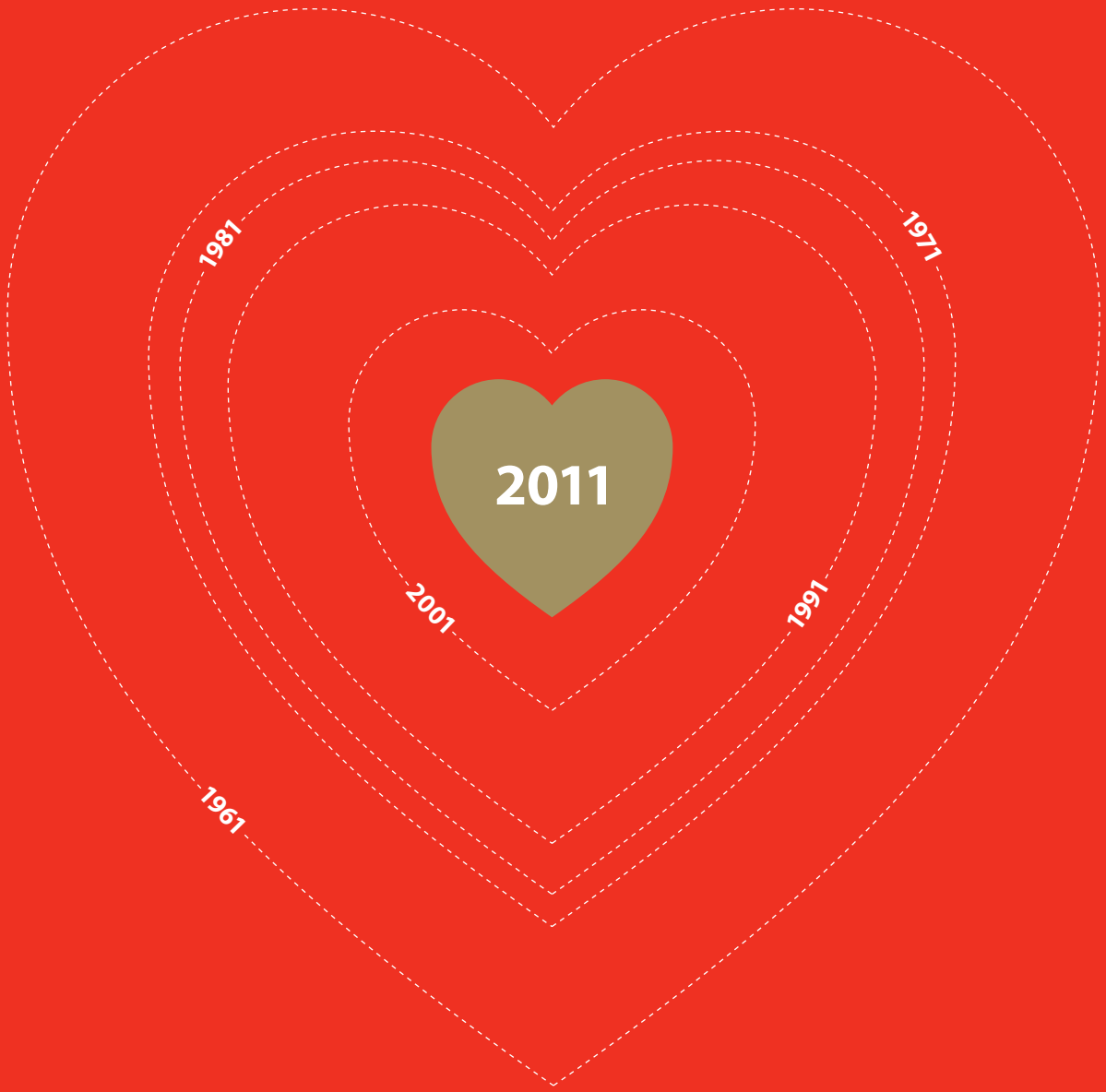
British Heart Foundation



Trends in coronary heart disease, 1961-2011

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Peter Scarborough, Kremlin Wickramasinghe, Prachi Bhatnagar and Mike Rayner
British Heart Foundation Health Promotion Research Group
Department of Public Health, University of Oxford

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Edited by Peter Weissberg, British Heart Foundation

Compiled by Peter Scarborough, Kremlin Wickramasinghe, Prachi Bhatnagar and Mike Rayner, British Heart Foundation Health Promotion Research Group, Department of Public Health, University of Oxford, Old Rd Campus, Headington, Oxford OX3 7LF
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Contents

Foreword

The British Heart Foundation was established in 1961, at a time when coronary heart disease was ravaging the country. More than a quarter of all deaths in 1961 were due to coronary heart disease, and nearly half of all deaths were due to cardiovascular disease. Looking back, it is not hard to see why rates of heart disease where so high. Smoking levels were much higher than today, with perhaps four times as much tobacco smoked in the UK in the early 1960s compared with today. Consumption of foods high in saturated fat such as butter, whole milk and red meat were the norm. Today these foods have largely been replaced by low fat spreads, vegetable oils, skimmed milk, and white meat.

Over the fifty years that the British Heart Foundation has existed, treatment for heart disease has also improved dramatically. We now have treatments that can dramatically reduce the risk of dying from a heart attack; drug therapy for the reduction of blood pressure and blood cholesterol has improved prevention of new cases of heart disease and strokes; and percutaneous procedures that can open up blocked or narrowed arteries and replace damaged valves without the need for a major operation, have reduced the recovery time for cardiac interventions.

The burden of coronary heart disease has subtly shifted over the last fifty years. Death rates for all age groups have consistently fallen since 1961, so that the risk of death from coronary heart disease for an adult in 2011 is equivalent to the risk of someone roughly fifteen years younger in 1961. But increases in life expectancy, combined with successful improvements in survival rates, have lead to a large increase in the number of people in the UK who are suffering from coronary heart disease and its consequences. Over one and a half million people currently living in the UK have had a heart attack, and over two million people have angina and/or heart failure. This places a considerable strain on the health services, which is bound to increase as the population continues to age. Pioneering new approaches to treating heart damage will become increasingly important, with regenerative medicine offering hope of a radical new treatment in the coming years.

Trends in Coronary Heart Disease 1961-2011 shines a light on the improvements over the last fifty years, but it also reveals persistent problems that have not yet been adequately addressed, along with adverse trends that could spell trouble in the future. The inequality between Scotland and England in the experience of coronary heart disease has stubbornly remained over the last fifty years and shows little sign of reducing. Upward trends in the prevalence of obesity and diabetes have been noted for some time, and ominously threaten to derail the decreasing trends in heart disease incidence and death rates. It would be a tragedy if a similar report commemorating the 100th anniversary of the British Heart Foundation in 2061 described the reversal of all of the improvements in the burden of coronary heart disease that are displayed here. We will be working hard to ensure that our next fifty years of research, prevention and care activities build on the heart health achievements observed since 1961.

Professor Peter Weissberg
Medical Director, British Heart Foundation

Introduction

Trends in Coronary Heart Disease Statistics 1961-2011 is an in-depth appraisal of how the burden of coronary heart disease (CHD) has changed in the UK over the last fifty years, which commemorates the fiftieth anniversary of the British Heart Foundation. It is a supplement to the Coronary Heart Disease Statistics series, regularly published by the British Heart Foundation. As well as CHD, the publication reports on long term trends in other cardiovascular conditions (e.g. stroke, heart failure) and risk factors for CHD (e.g. smoking, poor diet, obesity). The primary aim of *Trends in Coronary Heart Disease Statistics 1961-2011* is to describe these trends, rather than provide explanations for them. It provides an overview of the epidemiology of CHD in the UK over the last fifty years, and is designed for health professionals, medical researchers, journalists, students, and anyone with an in interest in CHD.

The publication is divided into four chapters and an appendix. A glossary is also provided at the start of the publication, which explains any technical terms that are used throughout. Chapter one describes trends in mortality from CHD, stroke and cardiovascular disease. Chapter two describes trends in prevalence, incidence and case fatality of heart attack, angina, heart failure and stroke. Chapter three describes trends in treatment for CHD in the UK, including drug therapy, surgical procedures and interventions, and hospital inpatient episodes. Chapter four describes trends in risk factors for CHD, focusing on smoking, poor diet, physical inactivity, heavy alcohol consumption and obesity. The appendix provides details about the changing age structure of the UK over the last fifty years. This is important context for *Trends in Coronary Heart Disease 1961-2011* – CHD is an age-related condition, with a heavy burden on older age groups. The increasing average age of the UK population has dramatic consequences on the resources required to treat CHD.

The title of *Trends in Coronary Heart Disease Statistics 1961-2011* is a little misleading, since the most recent data that are available for this document are from 2010. Likewise, the amount of historical data included in the document has occasionally been restricted by data availability and comparability. Issues with data comparability are referred to in the chapter texts, and also in the notes that accompany the tables and figures that appear in this document. Data comparability can be an issue in many different ways – for example, all of the data presented in chapter one have been collected from death certificates, which have been registered and collected in largely the same way over the last fifty years, but the standard definitions of CHD, stroke and cardiovascular disease have changed at various points over this time period. In some instances there is the opposite problem – for example, the definition of smoking has remained constant over the whole time period, but the method of estimating the prevalence of smoking in Great Britain has only been constant and comparable since the early 1970s. In some cases there are both of these problems – for example, the definition of physical activity has changed on a number of occasions since 1961, as has the method of collecting data on the prevalence of physical activity. For these reasons, the trends that are displayed in this document must be viewed in context and in some cases treated with caution.

The tables and figures presented in *Trends in Coronary Heart Disease 1961-2011* are also available from the British Heart Foundation's www.heartstats.org website. This website aims to be the most comprehensive source of statistics on cardiovascular disease in the UK. Further copies of this publication can be downloaded from the website, as well as copies of other recent publications from the *Coronary Heart Disease Statistics* series, including:

- *Coronary Heart Disease Statistics Compendium* (2010)
- *Ethnic Differences in Cardiovascular Disease* (2010)
- *Stroke Statistics* (2009)
- *European Cardiovascular Disease Statistics* (2008)
- *Regional and Social Differences in Coronary Heart Disease* (2008)

Glossary

This section provides a definition for some of the terms used throughout *Trends in coronary heart disease 1961-2011*.

Age standardised rate – a measure of the rate that a population would experience if it had a standard age structure. It is useful to present rates as age standardised as it allows for comparisons between populations with very different age structures.

Angina – the most common symptom of coronary heart disease. It is characterised by a heaviness or tightness in the centre of the chest which may spread to the arms, neck, jaw, face, back or stomach. Angina occurs when the arteries become so narrow that not enough oxygen-containing blood can reach the heart when its demands are high, such as during exercise.

Angioplasty – a technique to widen a narrowed or obstructed blood vessel by inflating tightly folded balloons that have been passed into the narrowed location via a catheter. This technique squashes the fatty tissue that has caused the narrowing, hence widening the artery.

Atherosclerosis – a disease characterised by accumulation of fatty material in the artery walls leading to narrowing or blockage of the artery. The disease is commonly referred to as 'hardening' or 'furring' of the arteries.

Body Mass Index (BMI) – a formula relating body weight to height to assess whether a person is overweight. BMI is calculated by dividing a person's weight (in kilograms) by their height (in metres) squared. Adults with a BMI of 25-30 are considered to be overweight. Those with a BMI of over 30 are considered obese.

British National Formulary (BNF) – a publication that provides key information on the selection, prescribing, dispensing and administration of all medicines that are generally prescribed in the UK.

Cardiovascular disease (CVD) – the collective term for all diseases affecting the circulatory system (heart and blood vessels).

Case-fatality rate – a measure of the number of people that die from a condition after being diagnosed or admitted to hospital with it, in a defined population, over a particular period of time.

Cerebrovascular disease – the collective term for all diseases affecting blood vessels that supply the brain. Technically, stroke (and the many subtypes of stroke) is a subset of cerebrovascular disease, but the two terms are often used interchangeably.

Coronary Artery Bypass Graft (CABG) – an operation in which a blood vessel from elsewhere in the body is used to bypass a narrowed section of a coronary artery and improve the blood supply to the heart.

Coronary Heart Disease (CHD) – the collective term for diseases that occur when the walls of the coronary arteries become narrowed by a gradual build-up of fatty material called atheroma. The two main manifestations of CHD are heart attack (also known as myocardial infarction) and angina.

Diabetes – a disease caused by a lack of insulin (type 1) or an increased resistance of the body to insulin (type 2). Diabetes is characterised by high blood glucose levels. The resulting chronic high blood glucose levels (hyperglycaemia) are associated with long-term damage, dysfunction and failure of various organs, especially the eyes, kidneys, nerves, heart and blood vessels.

HDL (High Density Lipoprotein) cholesterol – the fraction of cholesterol that is attached to proteins that remove cholesterol (via the liver) from the tissues. Low levels of HDL-cholesterol are associated with an increased risk of atherosclerosis.

Heart attack – the term used when a blockage of one of the coronary arteries leads to death of part of the heart muscle.

Heart failure – a clinical syndrome which occurs when the heart is unable to pump enough blood to meet the demands of the body. It occurs because the heart is damaged or overworked. Some people with moderate heart failure may have very few symptoms. People with moderate or severe heart failure suffer from a number of problems, including shortness of breath, general tiredness and swelling of the feet and ankles.

Hospital Inpatient Episodes – Periods of continuous admitted patient care under the same consultant.

Incidence – a measure of morbidity based on the number of new episodes of an illness arising in a population over a defined time period.

International Classification of Disease (ICD) – a coding system published by the World Health Organization that provides an internationally recognised method of coding diseases in order to categorise mortality and morbidity statistics. The ICD is revised approximately every ten years. The tenth and most recent revision (ICD-10) was introduced in 2000. Change between revisions can result in discontinuities in mortality and morbidity trends, such as the move from ICD-9 to ICD-10 which resulted in an artificial increase in the number of reported stroke incidents and mortalities.

LDL (Low Density Lipoprotein) cholesterol – the fraction of cholesterol which is attached to proteins that carry cholesterol to the tissues. A high LDL level is associated with the development of atherosclerosis.

Myocardial infarction (MI) – *see* heart attack.

National Statistics Socio-Economic Classification (NS-SEC) – a statistical classification based on occupation and details of employment status.

Non-Milk Extrinsic Sugars (NMES) – generally added sugars that are not integrally present in the cells of food like fruit and vegetables, and that are not naturally present in milk.

Non-Starch Polysaccharides (NSP) – complex carbohydrates that are the major part of dietary fibre and can be measured more precisely than total dietary fibre.

Office of Population, Censuses and Surveys Classification of Surgical Operations and Procedures 4th Revision (OPCS-4) – a classification system for surgical operations and procedures conducted in the National Health Service.

Percutaneous Coronary Intervention (PCI) – *see* angioplasty.

Prevalence – a measure of morbidity based on the current number of people with a disease in the population at any particular time.

Primary prevention – interventions aimed at reducing the risk of disease before the disease has presented. Primary prevention interventions may be aimed at populations, such as regulation of tobacco advertising, or at high risk individuals who are prescribed risk modifying drugs.

Secondary prevention – interventions aimed at reducing the risk of disease recurrence after the disease has initially presented. Secondary prevention interventions are therefore targeted at individuals who are known to have the disease already.

Standardised mortality ratio – the ratio of the number of events observed in a population to the number that would be expected if the population had the same structure as a standard or reference population.

Stent – a short tube of expandable mesh which is inserted into the part of the artery that has been widened by coronary angioplasty. It helps to keep the artery open and prevent re-narrowing.

Stroke – the term used to describe the sudden and sustained loss of an aspect of brain function. It is most commonly caused by an interruption to the flow of blood to the brain, leading to localised brain cell death, or by a bleed into the brain as a consequence of a blood vessel rupturing. A stroke can vary in severity from minor disability to a profound paralysis, coma and death.

Waist Circumference (WC) – a measure of central obesity, where fat is concentrated in the abdomen. For men, central obesity is defined as a waist circumference greater than 102cm. For women, central obesity is defined as a waist circumference of greater than 88cm.

Waist to Hip Ratio (WHR) – a measure of central obesity, where fat is concentrated mainly in the abdomen. For men, central obesity is defined as a WHR of 0.95 or over. For women, central obesity is defined as a WHR of 0.85 or over.

For a more comprehensive glossary, please visit **www.heartstats.org**

Summary

– In 1961, there were around 166,000 deaths from coronary heart disease (CHD) in Great Britain.

– In 2009, there were around 80,000 deaths from CHD in Great Britain.

– In 1961, more than 50% of deaths in the UK were due to cardiovascular disease (CVD).

– In 2009, 32% of deaths in the UK were due to CVD.

– Despite this fall, CVD remains the biggest killer in the UK.

– CHD mortality rates have remained 30-40% higher in Scotland than in England since 1961.

– Incidence rates for heart attack have decreased for all age groups and both sexes since the 1960s.

– Survival rates from heart attack have improved since the 1960s.

– The number of people who have suffered a heart attack has increased since 1961, due to increased survival rates and an aging population.

– In 2008, around 266 million prescriptions were issued for CVD in England, nearly five times as many as issued in 1986.

– Over 80,000 percutaneous coronary interventions are conducted every year in the UK, more than three times as many as a decade ago.

– The prevalence of smoking in Great Britain declined sharply between 1972 and 1994. Since then, prevalence has continued to fall, but more slowly.

– The quality of the average UK diet has improved in some aspects since the 1960s, such as reductions in saturated fat and sugar intake.

– The prevalence of heavy drinking has not substantially increased in either men or women since the 1970s.

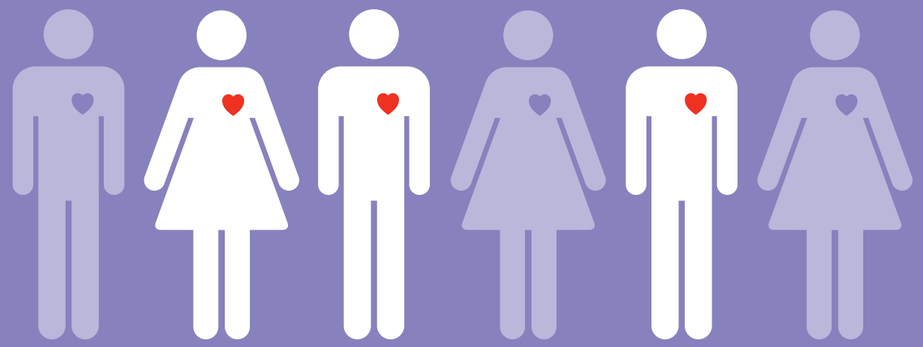
– Childhood obesity has been increasing since the mid 1980s in both boys and girls in the UK.

– Adult overweight and obesity rates are also continuing to increase.

1. Mortality

The number of people dying from coronary heart disease (CHD) has more than halved from 166,000 in 1961 to about 80,000 in 2009.

1961



2009

1. Mortality

Data on the number of deaths due to different causes have been routinely collected in the UK for the whole of the twentieth century. Population data are also readily available, allowing the construction of country-level death rates. The estimates of trends in mortality rates that are presented in this chapter are therefore fairly robust. However, the definitions of different conditions have changed on three different occasions since 1961, first in 1967, then 1978, and again in 2000. These changes correspond with the uptake of revisions of the International Classification of Diseases (ICD) in the UK and can sometimes result in discontinuities in mortality trends. But, as can be seen in many of the figures presented in this chapter, these discontinuities are generally reasonably small.

Trends in mortality by cause

In 1961, the death toll from cardiovascular disease (CVD) in the UK was immense. Over 150,000 men and nearly 170,000 women died from CVD – over half of all deaths that year. In Great Britain in 1961, more than half of the deaths from CVD were from coronary heart disease (CHD). As is still the case today, the majority of the burden of CVD in 1961 was felt in older age groups, but despite this, CVD was also the biggest killer in every age group from 35 upwards. This situation remained largely unchanged until the early 1980s – for example, in 1971 CVD caused over half of all deaths in the UK, around 160,000 men and 170,000 women. Since the early 1980s, the mortality burden of CVD has diminished. In 1981 there were around 330,000 deaths from CVD in the UK, nearly 180,000 of which were due to CHD. By 1991, there were fewer than 300,000 deaths from CVD and around 170,000 deaths from CHD. In 2009, the most recent year for which data are available, there were around 180,000 deaths from CVD, 80,000 of which were due to CHD. Although these numbers have fallen considerably in a relatively short period of time, CVD remains the biggest killer in the UK, responsible for around a third of all deaths in men and women. However, deaths from CVD in younger age groups have fallen considerably since 1961 – there are now more deaths from cancer than from CVD in every age group younger than 75. In 1961, 155,000 people aged under 75 died from CVD – this had fallen to 45,000 in 2009 (Tables 1.1 to 1.6, Figures 1.1 to 1.8).

Trends in mortality rates for cardiovascular diseases

Although the number of deaths from CHD, stroke and CVD in men and women are reasonably similar, death rates from these conditions are much higher in men than in women. The explanation for this apparent anomaly is that women tend to live longer than men – therefore, even though cardiovascular death rates in older men are higher than in older women there are many more older women to suffer from CVD. For example in 2009 over 78,000 women aged over 75 died from CVD compared to 55,000 men of the same age, but the population of women aged over 75 was 2.9 million and men aged over 75 was 1.9 million (*see* appendix).

Male death rates from CHD in Great Britain have continuously decreased since 1961. Between the early 1960s and the mid 1980s this decline was reasonably slow – the death rate fell by 16% between 1961 and 1985 – but since then the rate of decline has accelerated. The male death rate for CHD in 2009 was nearly 75% lower than the rate in 1961, and over 65% lower than the rate in 1985. A similar pattern can be seen in female death rates, although the difference in the rate of decline before and after the mid 1980s is not as exaggerated as for men. Between 1961 and 2009 there have been similar declines in the male and female death rates from stroke and CVD (Figures 1.9a and 1.9b).

Improvements in premature (i.e. under 75) mortality rates for CHD took longer to achieve. Between the early 1960s and the mid 1980s, under 75 death rates from CHD barely changed in Great Britain, for men or women. However, since the mid 1980s the improvements that have been seen in death rates in older age groups have been mirrored by reductions in premature mortality rates. For men, the under 75 mortality rate for CHD fell by nearly 75% between 1985 and 2009. For women, rates fell by more than 75%. In contrast, premature mortality rates for stroke have declined steadily between 1961 and 2009, and have remained consistently lower than premature CHD mortality rates (Figures 1.10a and 1.10b).

There are some intriguing differences between trends in early (i.e. under 55) mortality rates for CHD, stroke and CVD in comparison to trends for premature and all ages mortality. The most striking of these differences is the increase in early mortality rates for CHD that occurred for both men and women between the early 1960s and the mid 1970s. For both men and women, early CHD mortality rates increased by 25% between 1961 and 1975. Since the mid 1970s, early CHD mortality rates for both men and women have declined, but in contrast to older age groups, the rate of decline has begun to slow recently. This potential plateau in CHD mortality rates in younger age groups has been documented elsewhere [1-3]. Early mortality rates for stroke have fallen consistently between 1961 and 2009, but as with CHD the rate of decline has been slow in more recent years. For women, the early mortality rates for stroke and CHD are now reasonably similar (Figures 1.11a and 1.11b).

Trends in geographic inequalities in coronary heart disease mortality rates

Death rates from CHD vary considerably around the UK [4]. Throughout the last fifty years, CHD mortality rates have generally been highest in Scotland, lowest in England, and intermediate in Wales and Northern Ireland. In 1961, male CHD mortality rates were 30% higher in Scotland than in England, and nearly 40% higher for women. The difference between England and Scotland has remained reasonably consistent since 1961, peaking at 32% higher for male mortality rates in 2007, and at 42% higher for female mortality rates in 1969. For Northern Ireland, male mortality rates were around 30% higher than in England in the early 1970s, but since then this gap has closed slightly. Male CHD mortality rates in Northern Ireland are now around 20% higher than in England.

Female CHD mortality rates in Northern Ireland have been around 25% higher than in England since the early 1970s, but with some variation over time. CHD mortality rates in Wales have remained around 15% higher than in England for both men and women since 1961 (Tables 1.12 to 1.17, Figures 1.12 to 1.18a and 1.18b).

Geographic inequalities in premature mortality rates for CHD are more erratic, due to the smaller number of deaths on which to base estimates of underlying rates. However, it would appear that the premature CHD mortality gap between Scotland and England narrowed between the early 1960s and the early 1980s, but has been widening since then. This pattern is clearer for men, where premature CHD mortality rates were 21% higher in 1981, but were 33% higher in 2009. The difference in premature CHD mortality rates between Wales and England has remained fairly steady since 1961, with rates for both men and women around 15-20% higher in Wales. But the gap between Northern Ireland and England appears to be narrowing – especially for men. In the early 1970s, male CHD premature mortality rates were around 30% higher than in England, whereas rates in 2009 were only 11% higher in Northern Ireland than in England (Figures 1.19a and 1.19b).

1. O'Flaherty M, Bishop J, Redpath A, McLaughlin T, Murphy D, Chalmers J, Capewell S (2009). 'Coronary heart disease mortality among young adults in Scotland in relation to social inequalities: time trend study', *British Medical Journal* 339: b2613.
2. Allender S, Scarborough P, O'Flaherty M, Capewell S (2008). 'Patterns of coronary heart disease mortality over the 20th century in England and Wales: possible plateaus in the rate of decline', *BioMed Central Public Health* 8: 148.
3. O'Flaherty M, Ford E, Allender S, Scarborough P, Capewell S (2008). 'Coronary heart disease trends in England and Wales from 1984 to 2004: concealed levelling of mortality rates among younger adults', *Heart* 94: 178-181.
4. Scarborough P, Allender S, Peto V, Rayner M (2008). *Regional and social differences in coronary heart disease.* British Heart Foundation: London.

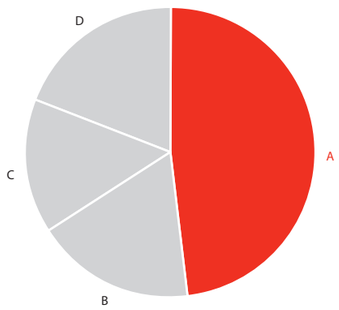
Table 1.1
Deaths by cause, sex and age, 1961, United Kingdom

		All ages	Under 35	35-44	45-54	55-64	65-74	75+
All causes	Men	322,028	23,195	8,800	26,558	63,590	88,410	111,475
	Women	309,766	15,333	6,495	16,951	36,291	74,785	159,911
	Total	631,794	38,528	15,295	43,509	99,881	163,195	271,386
Cardiovascular disease (3300-3349; 4000-4549; 4560-4689;7820-7829)	Men	153,695	987	3,069	11,468	28,856	44,625	64,690
	Women	169,222	664	1,567	5,245	15,672	42,329	103,745
	Total	322,917	1,651	4,636	16,713	44,528	86,954	168,435
Cancer (1400-2209; 2220-2399; 2940-2949)	Men	61,382	1,659	1,899	7,369	17,344	19,060	14,051
	Women	53,622	1,332	2,518	7,308	11,965	14,836	15,663
	Total	115,004	2,991	4,417	14,677	29,309	33,896	29,714
Respiratory disease (2400-2409; 2410-2419; 4700-5279)	Men	48,723	2,450	690	2,750	9,591	15,116	18,126
	Women	33,796	1,971	543	1,203	3,050	7,648	19,381
	Total	82,519	4,421	1,233	3,953	12,641	22,764	37,507
All other causes	Men	58,228	18,099	3,142	4,971	7,799	9,609	14,608
	Women	53,126	11,366	1,867	3,195	5,604	9,972	21,122
	Total	111,354	29,465	5,009	8,166	13,403	19,581	35,730

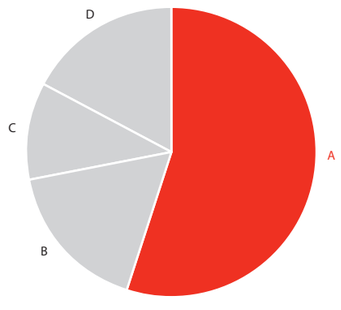
Notes:
ICD-7 codes in parentheses. Number of deaths by coronary heart disease and stroke in Northern Ireland are not available. See table 1.12 for further breakdown by these conditions.

Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.1
Deaths by sex and cause, 1961, United Kingdom



Men
(A) **Cardiovascular disease — 48%**
(B) Cancer — 19%
(C) Respiratory disease — 15%
(D) All other causes — 18%



Women
(A) **Cardiovascular disease — 55%**
(B) Cancer — 17%
(C) Respiratory disease — 11%
(D) All other causes — 17%

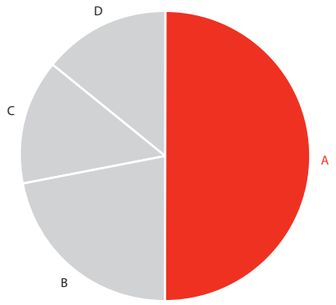
Table 1.2
Deaths by cause, sex and age, 1971, United Kingdom

		All ages	Under 35	35-44	45-54	55-64	65-74	75+
All causes	Men	328,537	20,111	7,735	24,242	63,657	102,139	110,653
	Women	316,541	12,761	5,267	15,358	35,621	73,502	174,032
	Total	645,078	32,872	13,002	39,600	99,278	175,641	284,685
Cardiovascular disease (3900-4441; 4444-4589; 7820-7829)	Men	163,756	932	3,198	12,418	31,991	53,178	62,039
	Women	171,921	572	1,226	4,440	14,485	40,337	110,861
	Total	335,677	1,504	4,424	16,858	46,476	93,515	172,900
Cancer (1400-2089; 2100-2399)	Men	72,018	1,558	1,678	6,488	18,826	26,210	17,258
	Women	61,798	1,289	2,236	7,167	13,611	17,795	19,700
	Total	133,816	2,847	3,914	13,655	32,437	44,005	36,958
Respiratory disease (4600-5199)	Men	46,398	2,338	422	1,688	6,671	14,494	20,785
	Women	35,350	1,772	337	1,001	2,603	6,438	23,199
	Total	81,748	4,110	759	2,689	9,274	20,932	43,984
All other causes	Men	46,365	15,283	2,437	3,648	6,169	8,257	10,571
	Women	47,472	9,128	1,468	2,750	4,922	8,932	20,272
	Total	93,837	24,411	3,905	6,398	11,091	17,189	30,843

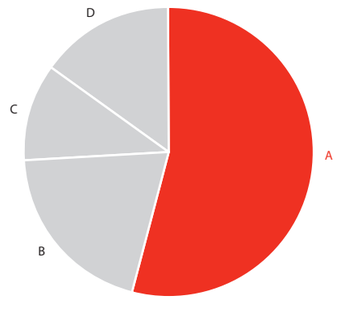
Notes:
ICD-8 codes in parentheses. Number of deaths by coronary heart disease and stroke in Northern Ireland are not available. See table 1.13 for further breakdown by these conditions.

Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.2
Deaths by cause, sex and age, 1971, United Kingdom



Men
(A) **Cardiovascular disease — 50%**
(B) Cancer — 22%
(C) Respiratory disease — 14%
(D) All other causes — 14%



Women
(A) **Cardiovascular disease — 54%**
(B) Cancer — 20%
(C) Respiratory disease — 11%
(D) All other causes — 15%

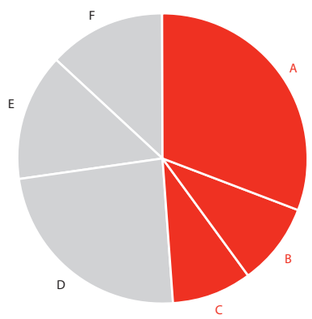
Table 1.3
Deaths by cause, sex and age, 1981, United Kingdom

		All ages	Under 35	35-44	45-54	55-64	65-74	75+
All causes	Men	328,023	14,182	6,448	19,583	53,523	104,693	129,594
	Women	328,080	8,214	4,274	12,206	31,493	72,286	199,607
	Total	656,103	22,396	10,722	31,789	85,016	176,979	329,201
Cardiovascular disease (3900-4599)	Men	160,681	815	2,429	10,163	27,637	54,390	65,247
	Women	166,555	460	796	3,210	11,643	36,791	113,655
	Total	327,236	1,275	3,225	13,373	39,280	91,181	178,902
Coronary heart disease (4100-4149)	Men	101,870	289	1,784	8,108	21,005	36,163	34,521
	Women	76,122	59	296	1,541	6,645	20,302	47,279
	Total	177,992	348	2,080	9,649	27,650	56,465	81,800
Stroke (4300-4380)	Men	30,361	191	310	1,030	3,229	9,713	15,888
	Women	49,186	190	284	910	2,701	9,573	35,528
	Total	79,547	381	594	1,940	5,930	19,286	51,416
Cancer (1400-2399)	Men	78,619	1,269	1,431	5,313	16,500	29,591	24,515
	Women	69,789	1,202	2,076	6,156	13,490	20,509	26,356
	Total	148,408	2,471	3,507	11,469	29,990	50,100	50,871
Respiratory disease (4600-5199)	Men	46,241	997	256	929	4,142	12,618	27,299
	Women	48,834	656	231	697	2,404	6,770	35,076
	Total	95,075	1,653	487	1,626	6,546	19,388	62,375
All other causes	Men	42,482	11,101	2,332	3,178	5,244	8,094	12,533
	Women	42,902	5,896	1,171	2,143	3,956	8,216	24,520
	Total	85,384	16,997	3,503	5,321	9,200	16,310	37,053

Notes:
ICD-9 codes in parentheses.

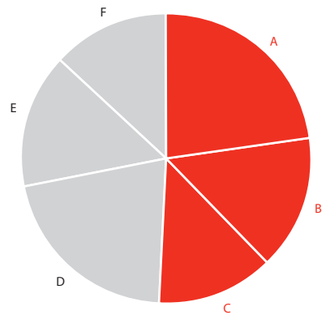
Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.3
Deaths by cause, sex and age, 1981, United Kingdom



Men

(A) **Coronary heart disease — 31%**
(B) **Stroke — 9%**
(C) **Other cardiovascular disease — 9%**
(D) Cancer — 24%
(E) Respiratory disease — 14%
(F) All other causes — 13%



Women

(A) **Coronary heart disease — 23%**
(B) **Stroke — 15%**
(C) **Other cardiovascular disease — 13%**
(D) Cancer — 21%
(E) Respiratory disease — 15%
(F) All other causes — 13%

Notes: Total cardiovascular disease is the sum of (A), (B) and (C).

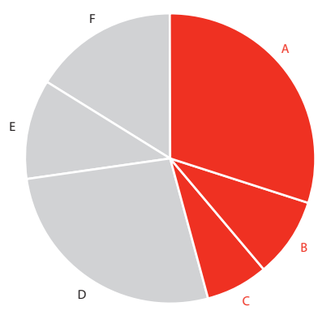
Table 1.4
Deaths by cause, sex and age, 1991, United Kingdom

		All ages	Under 35	35-44	45-54	55-64	65-74	75+
All causes	Men	313,243	12,338	7,007	15,334	39,994	87,749	150,821
	Women	330,997	6,650	4,237	9,624	24,829	62,040	223,617
	Total	644,240	18,988	11,244	24,958	64,823	149,789	374,438
Cardiovascular disease (3900-4599)	Men	142,348	593	1,922	6,433	18,709	42,418	72,273
	Women	154,750	363	645	1,930	7,883	27,143	116,786
	Total	297,098	956	2,567	8,363	26,592	69,561	189,059
Coronary heart disease (4100-4149)	Men	92,502	148	1,347	4,981	14,377	29,677	41,972
	Women	78,089	40	232	983	4,973	16,508	55,353
	Total	170,591	188	1,579	5,964	19,350	46,185	97,325
Stroke (4300-4380)	Men	28,921	143	272	734	2,250	7,041	18,481
	Women	47,992	136	257	582	1,657	6,426	38,934
	Total	76,913	279	529	1,316	3,907	13,467	57,415
Cancer (1400-2399)	Men	85,092	1,026	1,490	4,966	14,317	28,973	34,320
	Women	78,418	1,017	2,146	5,522	11,897	21,789	36,047
	Total	163,510	2,043	3,636	10,488	26,214	50,762	70,367
Respiratory disease (4600-5199)	Men	35,301	491	276	608	2,530	8,158	23,238
	Women	37,443	304	165	391	1,749	5,430	29,404
	Total	72,744	795	441	999	4,279	13,588	52,642
All other causes	Men	50,502	10,228	3,319	3,327	4,438	8,200	20,990
	Women	60,386	4,966	1,281	1,781	3,300	7,678	41,380
	Total	110,888	15,194	4,600	5,108	7,738	15,878	62,370

Notes:
ICD-9 codes in parentheses.

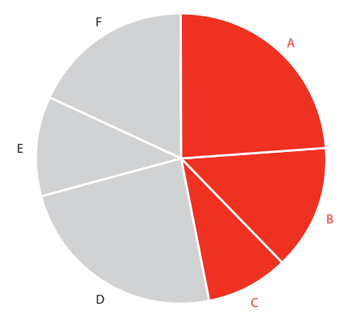
Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.4
Deaths by cause, sex and age, 1991, United Kingdom



Men

(A) **Coronary heart disease — 30%**
(B) **Stroke — 9%**
(C) **Other cardiovascular disease — 7%**
(D) Cancer — 27%
(E) Respiratory disease — 11%
(F) All other causes — 16%



Women

(A) **Coronary heart disease — 24%**
(B) **Stroke — 14%**
(C) **Other cardiovascular disease — 9%**
(D) Cancer — 24%
(E) Respiratory disease — 11%
(F) All other causes — 18%

Notes: Total cardiovascular disease is the sum of (A), (B) and (C).

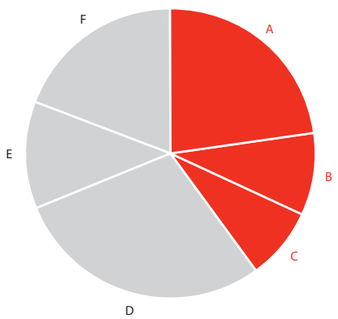
Table 1.5
Deaths by cause, sex and age, 2001, United Kingdom

		All ages	Under 35	35-44	45-54	55-64	65-74	75+
All causes	Men	287,062	9,940	7,193	15,542	32,000	66,063	156,324
	Women	315,960	5,179	4,453	10,310	20,402	47,027	228,589
	Total	603,022	15,119	11,646	25,852	52,402	113,090	384,913
Cardiovascular disease (I00-I99)	Men	114,335	548	1,508	5,115	11,882	27,372	67,910
	Women	125,931	291	675	1,783	4,849	16,398	101,935
	Total	240,266	839	2,183	6,898	16,731	43,770	169,845
Coronary heart disease (I20-I25)	Men	66,400	122	885	3,581	8,358	17,579	35,875
	Women	54,491	26	195	758	2,514	8,642	42,356
	Total	120,891	148	1,080	4,339	10,872	26,221	78,231
Stroke (I60-I69)	Men	25,129	118	249	674	1,586	4,720	17,782
	Women	41,392	86	244	572	1,176	4,084	35,230
	Total	66,521	204	493	1,246	2,762	8,804	53,012
Cancer (C00-D48)	Men	81,992	821	1,247	4,872	12,685	24,043	38,324
	Women	76,531	805	1,852	5,354	10,487	18,533	39,500
	Total	158,523	1,626	3,099	10,226	23,172	42,576	77,824
Respiratory disease (J00-J99)	Men	34,848	249	271	722	2,246	6,702	24,658
	Women	40,961	203	189	559	1,574	5,154	33,282
	Total	75,809	452	460	1,281	3,820	11,856	57,940
All other causes	Men	55,887	8,322	4,167	4,833	5,187	7,946	25,432
	Women	72,537	3,880	1,737	2,614	3,492	6,942	53,872
	Total	128,424	12,202	5,904	7,447	8,679	14,888	79,304

Notes:
ICD-10 codes in parentheses.

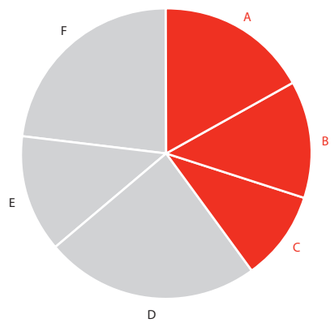
Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.5
Deaths by cause, sex and age, 2001, United Kingdom



Men

(A) **Coronary heart disease — 23%**
(B) **Stroke — 9%**
(C) **Other cardiovascular disease — 8%**
(D) Cancer — 29%
(E) Respiratory disease — 12%
(F) All other causes — 19%



Women

(A) **Coronary heart disease — 17%**
(B) **Stroke — 13%**
(C) **Other cardiovascular disease — 10%**
(D) Cancer — 24%
(E) Respiratory disease — 13%
(F) All other causes — 23%

Notes: Total cardiovascular disease is the sum of (A), (B) and (C).

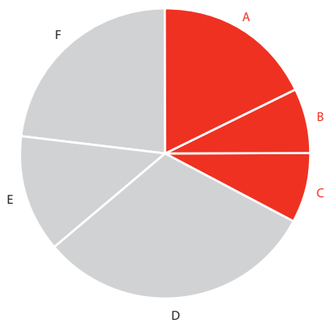
Table 1.6
Deaths by cause, sex and age, 2009, United Kingdom

		All ages	Under 35	35-44	45-54	55-64	65-74	75+
All causes	Men	270,146	8,449	7,529	13,965	30,615	53,813	155,775
	Women	288,370	4,701	4,260	9,357	20,480	38,172	211,400
	Total	558,516	13,150	11,789	23,322	51,095	91,985	367,175
Cardiovascular disease (I00-I99)	Men	87,542	460	1,436	3,890	8,986	16,879	55,891
	Women	93,084	267	600	1,487	3,461	9,200	78,069
	Total	180,626	727	2,036	5,377	12,447	26,079	133,960
Coronary heart disease (I20-I25)	Men	47,149	107	709	2,548	5,958	10,178	27,649
	Women	35,379	31	152	594	1,541	4,201	28,860
	Total	82,528	138	861	3,142	7,499	14,379	56,509
Stroke (I60-I69)	Men	19,009	80	213	483	1,137	2,796	14,300
	Women	30,289	56	194	403	844	2,304	26,488
	Total	49,298	136	407	886	1,981	5,100	40,788
Cancer (C00-D48)	Men	83,775	684	1,190	3,980	12,898	22,877	42,146
	Women	75,892	628	1,595	4,577	11,007	17,651	40,434
	Total	159,667	1,312	2,785	8,557	23,905	40,528	82,580
Respiratory disease (J00-J99)	Men	35,918	271	280	740	2,468	6,084	26,075
	Women	40,718	233	205	548	1,845	4,618	33,269
	Total	76,636	504	485	1,288	4,313	10,702	59,344
All other causes	Men	62,911	7,034	4,623	5,355	6,263	7,973	31,663
	Women	78,676	3,573	1,860	2,745	4,167	6,703	59,628
	Total	141,587	10,607	6,483	8,100	10,430	14,676	91,291

Notes:
ICD-10 codes in parentheses.

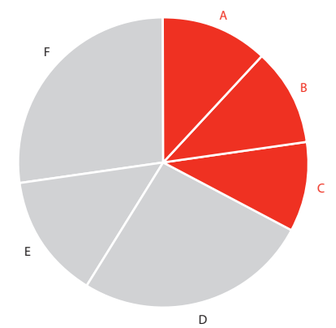
Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.6
Deaths by cause, sex and age, 2009, United Kingdom



Men

(A) **Coronary heart disease — 18%**
(B) **Stroke — 7%**
(C) **Other cardiovascular disease — 8%**
(D) Cancer — 31%
(E) Respiratory disease — 13%
(F) All other causes — 23%

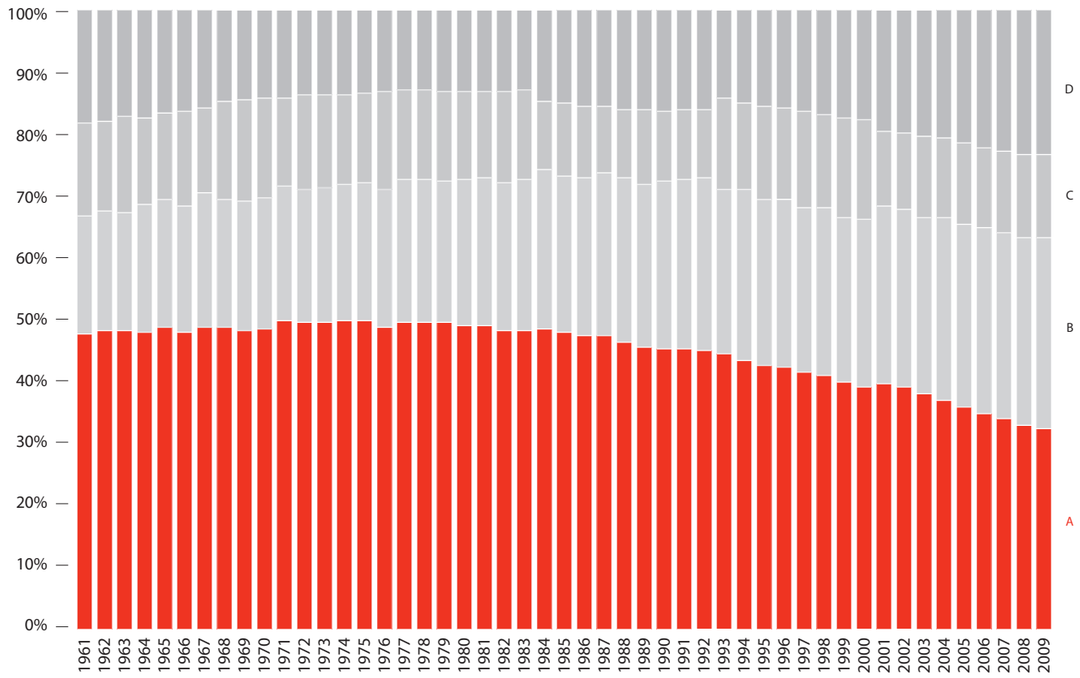


Women

(A) **Coronary heart disease — 12%**
(B) **Stroke — 11%**
(C) **Other cardiovascular disease — 10%**
(D) Cancer — 26%
(E) Respiratory disease — 14%
(F) All other causes — 27%

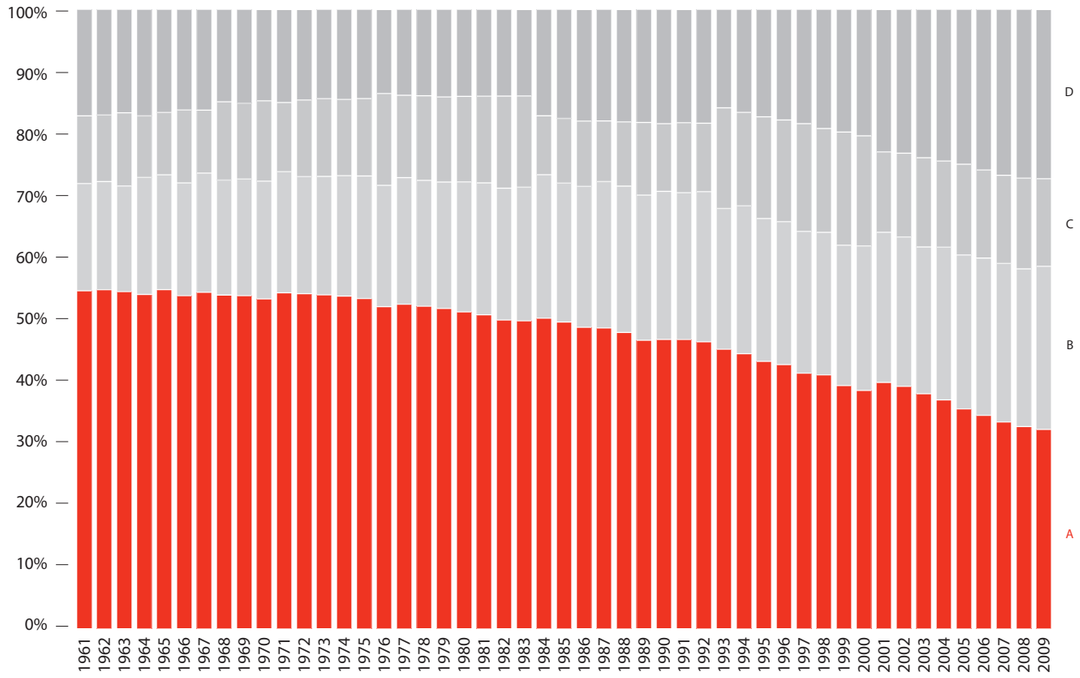
Notes: Total cardiovascular disease is the sum of (A), (B) and (C).

Figure 1.7a
Percentage of all deaths by cause, men, 1961 to 2009, United Kingdom



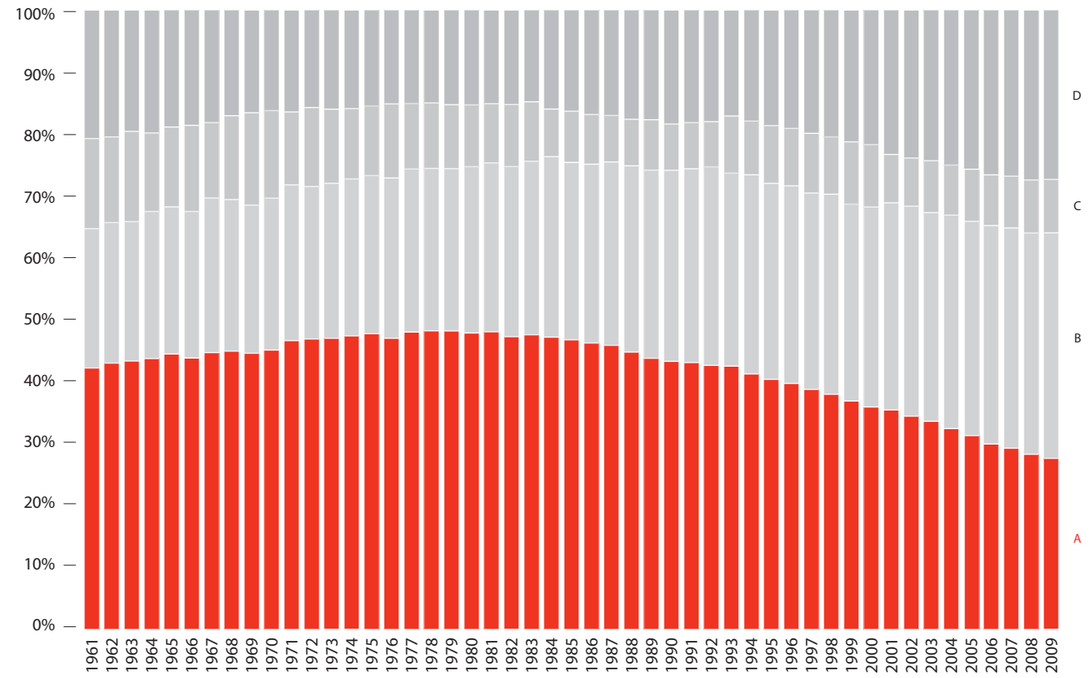
(A) **Cardiovascular disease** (B) Cancer (C) Respiratory disease (D) All other causes

Figure 1.7b
Percentage of all deaths by cause, women, 1961 to 2009, United Kingdom



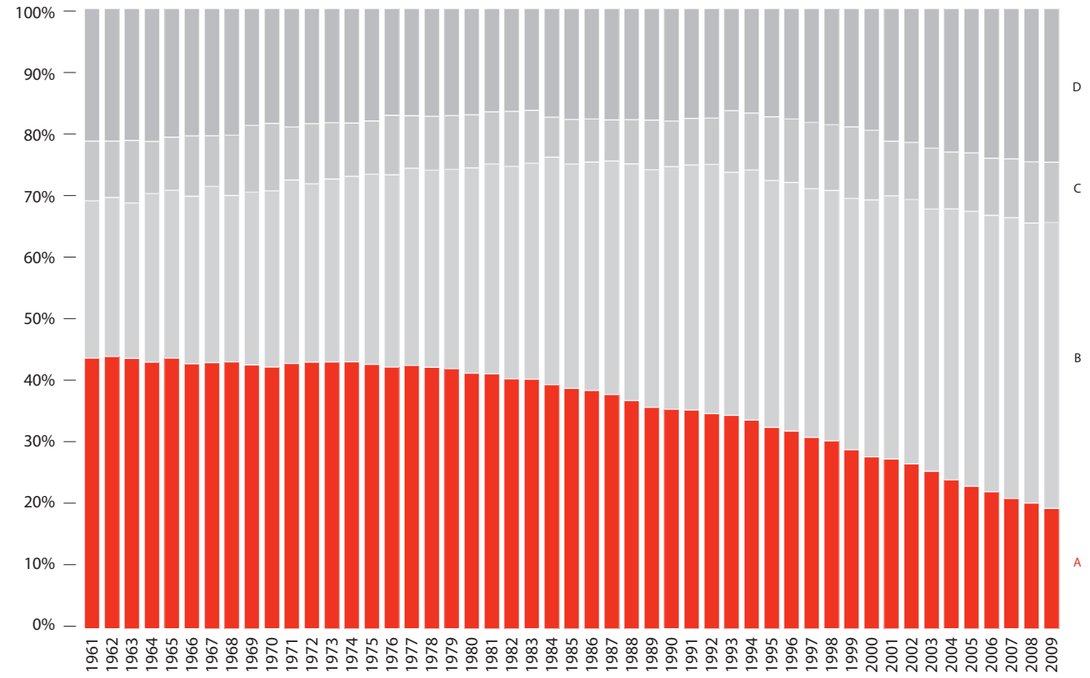
(A) **Cardiovascular disease** (B) Cancer (C) Respiratory disease (D) All other causes

Figure 1.8a
Percentage of all deaths by cause, men under 75, 1961 to 2009, United Kingdom



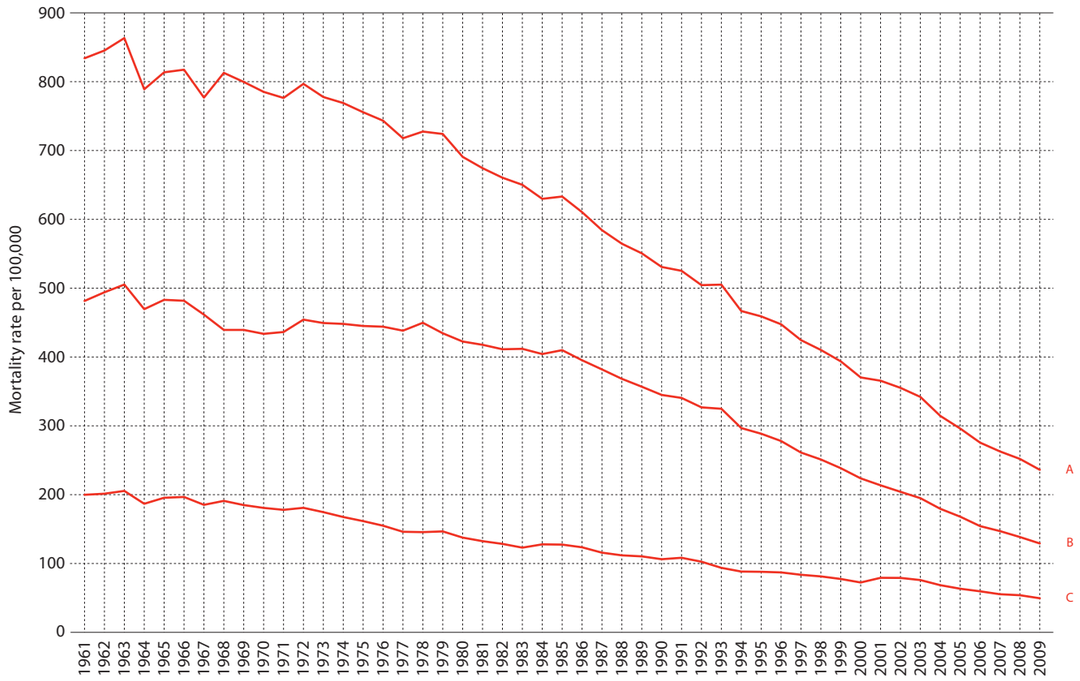
(A) **Cardiovascular disease** (B) Cancer (C) Respiratory disease (D) All other causes

Figure 1.8b
Percentage of all deaths by cause, women under 75, 1961 to 2009, United Kingdom



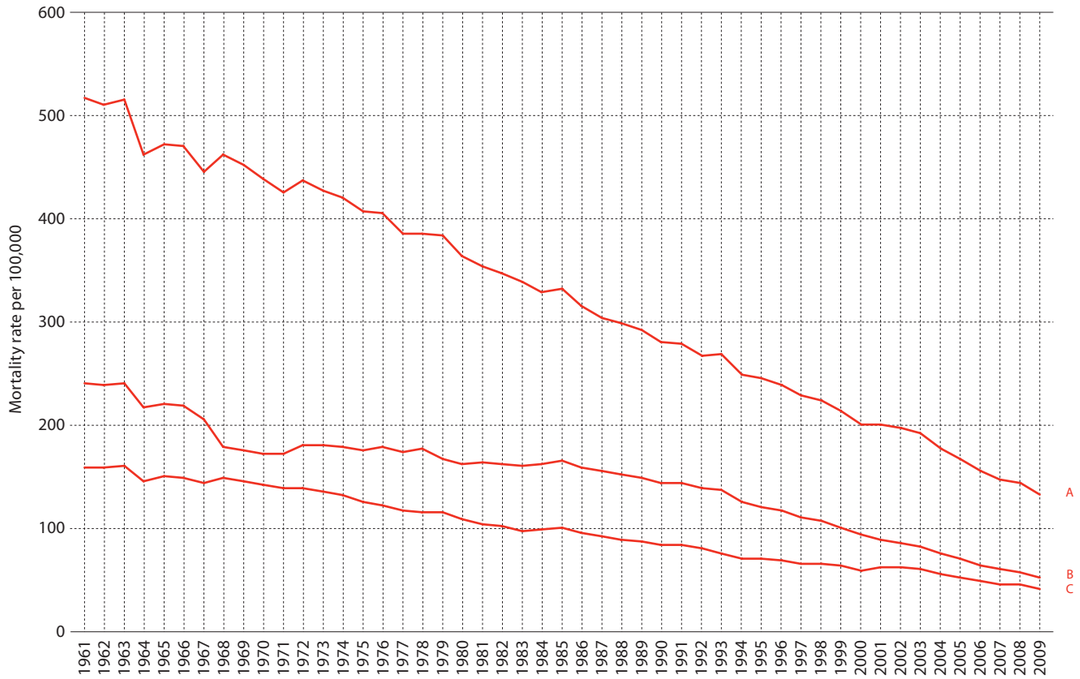
(A) **Cardiovascular disease** (B) Cancer (C) Respiratory disease (D) All other causes

Figure 1.9a
Age-standardised mortality rates for cardiovascular diseases, men, 1961 to 2009, Great Britain



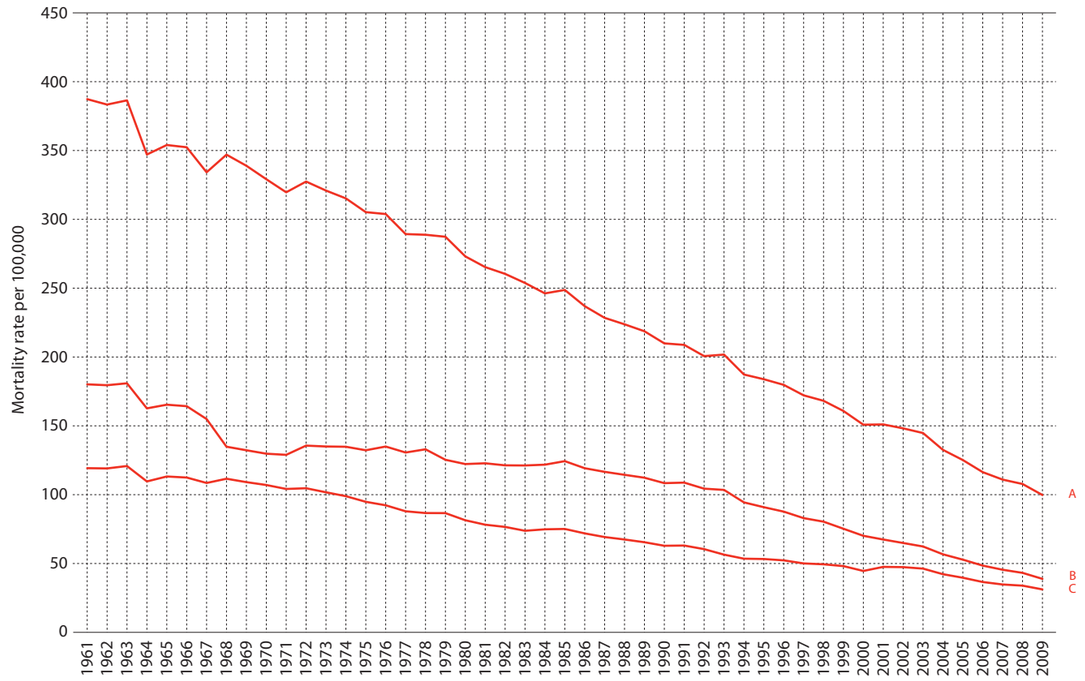
(A) **Cardiovascular disease** (B) **Coronary heart disease** (C) **Stroke**

Figure 1.9b
Age-standardised mortality rates for cardiovascular diseases, women, 1961 to 2009, Great Britain



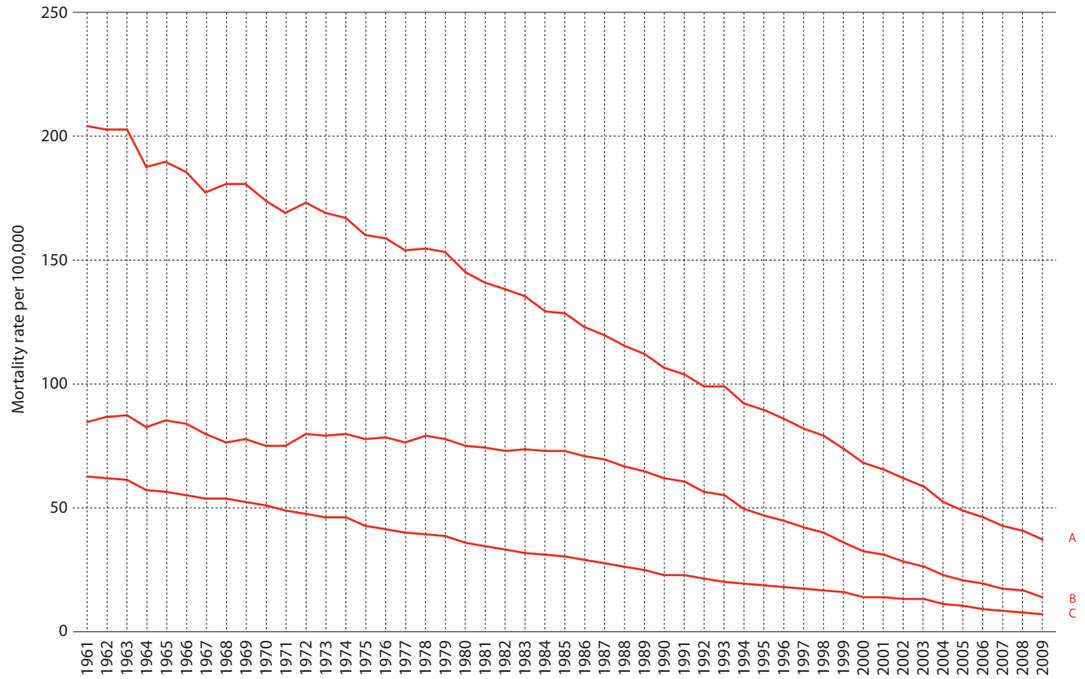
(A) **Cardiovascular disease** (B) **Coronary heart disease** (C) **Stroke**

Figure 1.10a
Age-standardised mortality rates for cardiovascular diseases, men under 75, 1961 to 2009, Great Britain



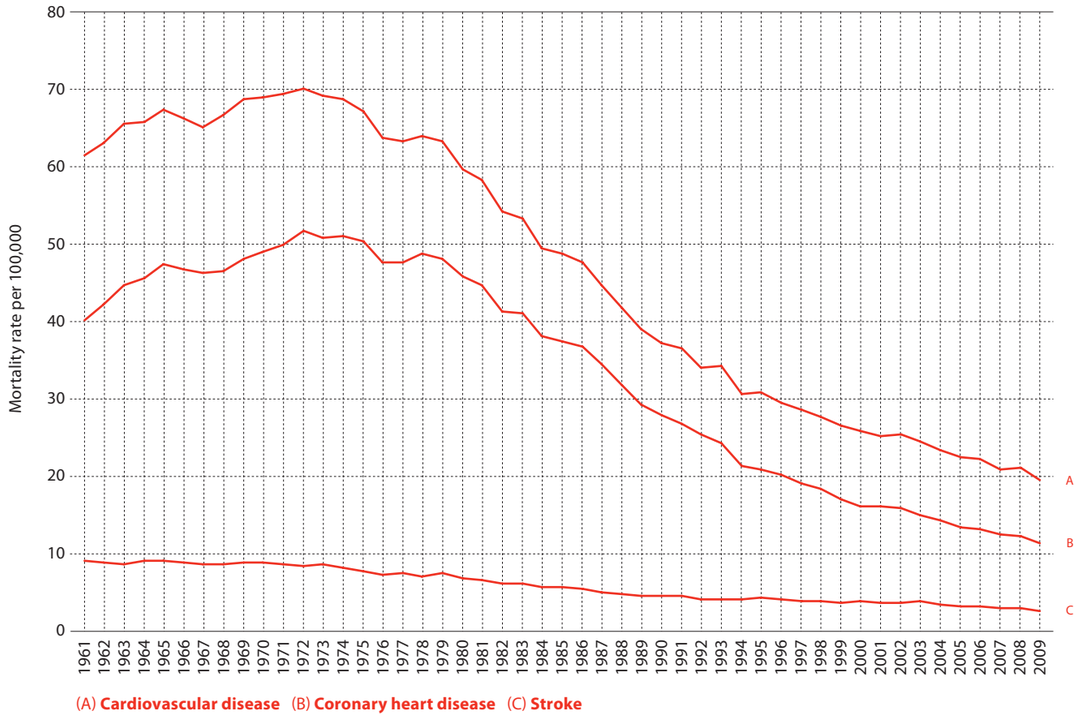
(A) **Cardiovascular disease** (B) **Coronary heart disease** (C) **Stroke**

Figure 1.10b
Age-standardised mortality rates for cardiovascular diseases, women under 75, 1961 to 2009, Great Britain



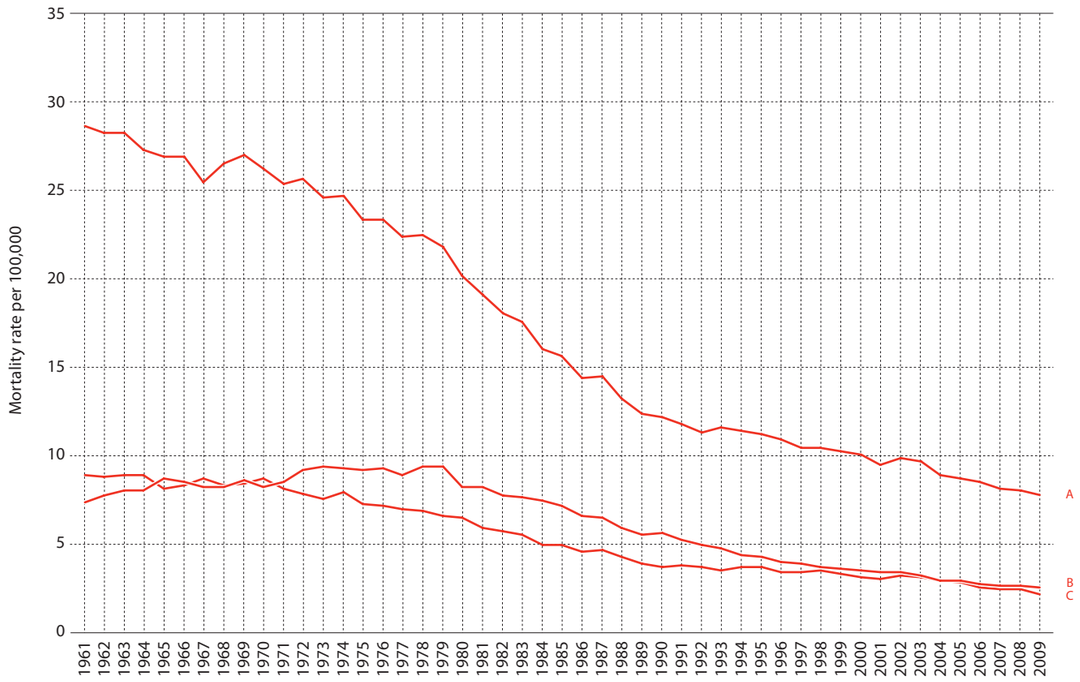
(A) **Cardiovascular disease** (B) **Coronary heart disease** (C) **Stroke**

Figure 1.11a
Age-standardised mortality rates for cardiovascular diseases, men under 55, 1961 to 2009, Great Britain



(A) **Cardiovascular disease** (B) **Coronary heart disease** (C) **Stroke**

Figure 1.11b
Age-standardised mortality rates for cardiovascular diseases, women under 55, 1961 to 2009, Great Britain



(A) **Cardiovascular disease** (B) **Coronary heart disease** (C) **Stroke**

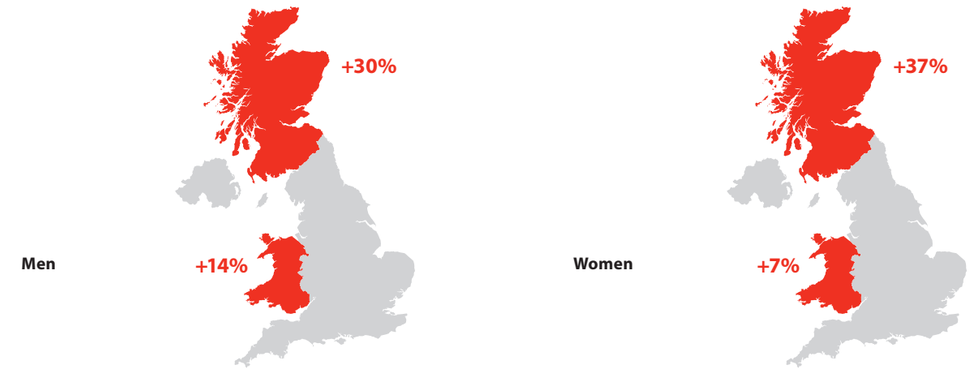
Table 1.12
Deaths by cause, sex and country, 1961, United Kingdom

		All ages				Under 75			
		England	Scotland	Wales	Northern Ireland	England	Scotland	Wales	Northern Ireland
All causes	Men	262,627	32,819	18,160	8,422	170,907	22,135	12,167	5,344
	Women	255,426	31,109	15,545	7,686	121,459	16,616	7,889	3,891
	Total	518,053	63,928	33,705	16,108	292,366	38,751	20,056	9,235
Cardiovascular disease (3300-3349; 4000-4549; 4560- 4689;7820-7829)	Men	124,754	16,642	8,798	3,501	71,889	9,840	5,305	1,971
	Women	139,438	17,905	8,851	3,028	52,676	7,852	3,711	1,238
	Total	264,192	34,547	17,649	6,529	124,565	17,692	9,016	3,209
Coronary heart disease (4200-4229)	Men	72,570	10,312	5,070		44,417	6,588	3,274	
	Women	64,355	8,897	4,012		22,457	3,691	1,573	
	Total	136,925	19,209	9,082		66,874	10,279	4,847	
Stroke (3300-3349)	Men	29,090	4,048	2,070		14,898	2,035	1,115	
	Women	43,168	5,791	2,695		16,791	2,600	1,152	
	Total	72,258	9,839	4,765		31,689	4,635	2,267	
Cancer (1400-2209; 2220-2399; 2940-2949)	Men	50,945	6,068	3,153	1,216	39,290	4,686	2,422	933
	Women	44,584	5,292	2,644	1,102	31,422	3,879	1,895	763
	Total	95,529	11,360	5,797	2,318	70,712	8,565	4,317	1,696
Respiratory disease (2400-2409; 2410-2419; 4700-5279)	Men	40,980	3,692	2,952	1,099	25,352	2,574	2,005	666
	Women	29,045	2,410	1,397	944	12,125	1,214	652	424
	Total	70,025	6,102	4,349	2,043	37,477	3,788	2,657	1,090
All other causes	Men	45,948	6,417	3,257	2,606	34,376	5,035	2,435	1,774
	Women	42,359	5,502	2,653	2,612	25,236	3,671	1,631	1,466
	Total	88,307	11,919	5,910	5,218	59,612	8,706	4,066	3,240

Notes:
ICD-7 codes in parentheses.

Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.12
Difference in age-standardised CHD mortality rates by sex and country, 1961, United Kingdom



Note:
Percentages refer to the difference in age-standardised CHD mortality rate for men or women in comparison to the male of female rate in England.

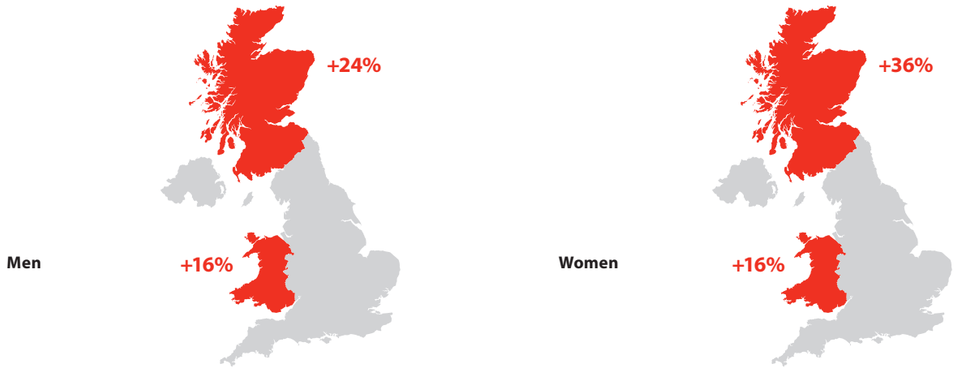
Table 1.13
Deaths by cause, sex and country, 1971, United Kingdom

		All ages				Under 75			
		England	Scotland	Wales	Northern Ireland	England	Scotland	Wales	Northern Ireland
All causes	Men	270,228	31,585	18,131	8,593	178,186	21,959	12,207	5,532
	Women	262,217	30,029	16,686	7,609	115,732	15,218	7,810	3,749
	Total	532,445	61,614	34,817	16,202	293,918	37,177	20,017	9,281
Cardiovascular disease (3900-4441; 4444-4589; 7820-7829)	Men	133,300	16,452	9,428	4,576	82,412	10,611	6,016	2,678
	Women	140,967	17,277	9,336	4,341	48,572	7,172	3,576	1,740
	Total	274,267	33,729	18,764	8,917	130,984	17,783	9,592	4,418
Coronary heart disease (4100-4149)	Men	77,521	10,027	5,515		53,972	7,187	3,916	
	Women	56,244	7,629	3,844		22,192	3,504	1,669	
	Total	133,765	17,656	9,359		76,164	10,691	5,585	
Stroke (4300-4380)	Men	29,005	3,946	2,044		14,788	2,163	1,143	
	Women	45,837	6,052	3,041		14,777	2,338	1,086	
	Total	74,842	9,998	5,085		29,565	4,501	2,229	
Cancer (1400-2089; 2100-2399)	Men	60,028	6,906	3,542	1,542	45,600	5,339	2,699	1,122
	Women	51,379	5,961	3,097	1,361	34,906	4,141	2,133	918
	Total	111,407	12,867	6,639	2,903	80,506	9,480	4,832	2,040
Respiratory disease (4600-5199)	Men	39,336	3,332	2,690	1,040	21,402	2,062	1,572	577
	Women	30,876	2,098	1,660	716	10,328	916	606	301
	Total	70,212	5,430	4,350	1,756	31,730	2,978	2,178	878
All other causes	Men	37,564	4,895	2,471	1,435	28,772	3,947	1,920	1,155
	Women	38,995	4,693	2,593	1,191	21,926	2,989	1,495	790
	Total	76,559	9,588	5,064	2,626	50,698	6,936	3,415	1,945

Notes:
ICD-8 codes in parentheses.

Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.13
Difference in age-standardised CHD mortality rates by sex and country, 1971, United Kingdom



Note:
Percentages refer to the difference in age-standardised CHD mortality rate for men or women in comparison to the male of female rate in England.

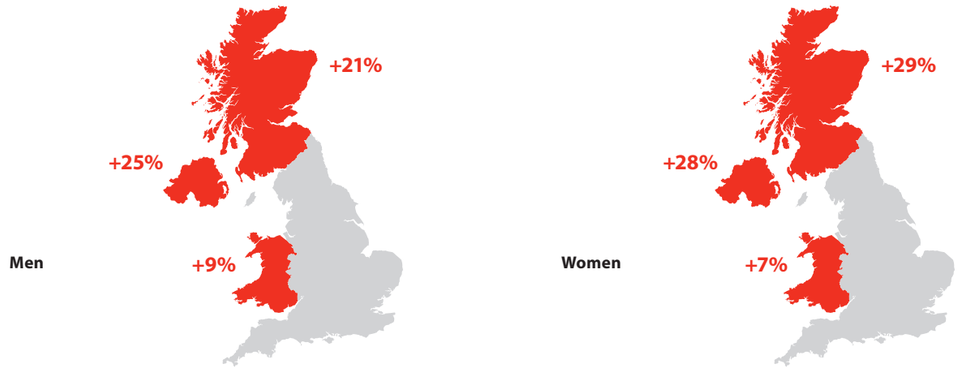
Table 1.14
Deaths by cause, sex and country, 1981, United Kingdom

		All ages				Under 75			
		England	Scotland	Wales	Northern Ireland	England	Scotland	Wales	Northern Ireland
All causes	Men	270,267	31,700	17,633	8,423	161,948	20,364	10,827	5,290
	Women	270,771	32,128	17,348	7,833	103,875	14,177	7,020	3,401
	Total	541,038	63,828	34,981	16,256	265,823	34,541	17,847	8,691
Cardiovascular disease (3900-4599)	Men	131,342	16,033	8,863	4,443	77,512	9,867	5,391	2,664
	Women	136,151	17,181	9,011	4,212	42,029	6,374	2,982	1,515
	Total	267,493	33,214	17,874	8,655	119,541	16,241	8,373	4,179
Coronary heart disease (4100-4149)	Men	83,139	10,272	5,586	2,873	54,580	7,095	3,733	1,941
	Women	61,889	8,181	4,016	2,036	22,733	3,633	1,567	910
	Total	145,028	18,453	9,602	4,909	77,313	10,728	5,300	2,851
Stroke (4300-4380)	Men	24,812	3,524	1,723	302	11,708	1,756	861	148
	Women	40,139	5,666	2,823	558	10,895	1,790	808	165
	Total	64,951	9,190	4,546	860	22,603	3,546	1,669	313
Cancer (1400-2399)	Men	65,760	7,373	3,933	1,553	45,101	5,186	2,715	1,102
	Women	58,045	6,710	3,524	1,510	35,917	4,291	2,233	992
	Total	123,805	14,083	7,457	3,063	81,018	9,477	4,948	2,094
Respiratory disease (4600-5199)	Men	39,053	3,451	2,647	1,090	15,631	1,628	1,180	503
	Women	39,401	3,095	2,317	1,021	8,859	975	633	291
	Total	78,454	6,546	4,964	2,111	24,490	2,603	1,813	794
All other causes	Men	34,112	4,843	2,190	1,337	23,704	3,683	1,541	1,021
	Women	37,174	5,142	2,496	1,090	17,070	2,537	1,172	603
	Total	71,286	9,985	4,686	2,427	40,774	6,220	2,713	1,624

Notes:
ICD-9 codes in parentheses.

Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.14
Difference in age-standardised CHD mortality rates by sex and country, 1981, United Kingdom



Note:
Percentages refer to the difference in age-standardised CHD mortality rate for men or women in comparison to the male of female rate in England.

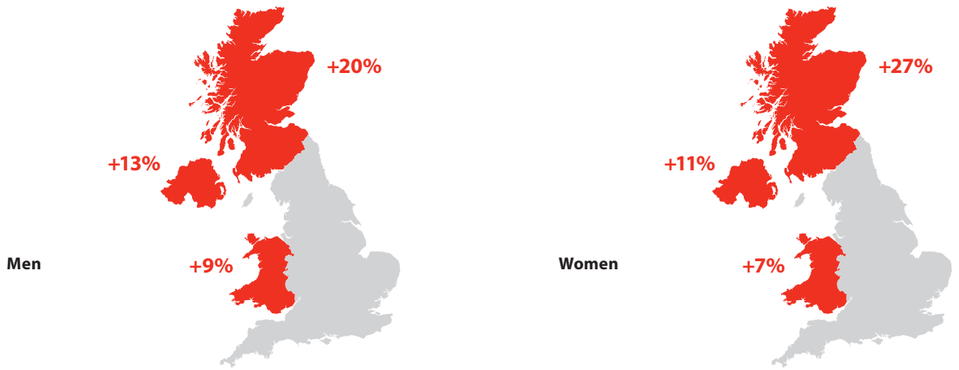
Table 1.15
Deaths by cause, sex and country, 1991, United Kingdom

		All ages				Under 75			
		England	Scotland	Wales	Northern Ireland	England	Scotland	Wales	Northern Ireland
All causes	Men	259,661	29,312	16,737	7,533	132,488	16,773	8,947	4,214
	Women	274,300	31,729	17,405	7,563	87,100	11,686	5,816	2,778
	Total	533,961	61,041	34,142	15,096	219,588	28,459	14,763	6,992
Cardiovascular disease (3900-4599)	Men	117,459	13,630	7,849	3,410	56,793	7,412	4,040	1,830
	Women	127,315	15,536	8,326	3,573	30,212	4,565	2,128	1,059
	Total	244,774	29,166	16,175	6,983	87,005	11,977	6,168	2,889
Coronary heart disease (4100-4149)	Men	75,954	8,963	5,242	2,343	40,813	5,391	2,951	1,375
	Women	64,006	7,903	4,300	1,880	18,024	2,795	1,282	635
	Total	139,960	16,866	9,542	4,223	58,837	8,186	4,233	2,010
Stroke (4300-4380)	Men	24,224	2,936	1,585	176	8,503	1,206	633	98
	Women	40,120	5,032	2,595	245	7,328	1,117	513	100
	Total	64,344	7,968	4,180	421	15,831	2,323	1,146	198
Cancer (1400-2399)	Men	71,158	7,658	4,456	1,820	41,937	4,959	2,698	1,178
	Women	65,100	7,373	4,213	1,732	34,856	4,246	2,264	1,005
	Total	136,258	15,031	8,669	3,552	76,793	9,205	4,962	2,183
Respiratory disease (4600-5199)	Men	28,892	3,374	1,882	1,153	9,697	1,262	716	388
	Women	30,526	3,694	1,883	1,340	6,382	952	428	277
	Total	59,418	7,068	3,765	2,493	16,079	2,214	1,144	665
All other causes	Men	42,152	4,650	2,550	1,150	24,061	3,140	1,493	818
	Women	51,359	5,126	2,983	918	15,650	1,923	996	437
	Total	93,511	9,776	5,533	2,068	39,711	5,063	2,489	1,255

Notes:
ICD-9 codes in parentheses.

Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.15
Difference in age-standardised CHD mortality rates by sex and country, 1991, United Kingdom



Note:
Percentages refer to the difference in age-standardised CHD mortality rate for men or women in comparison to the male of female rate in England.

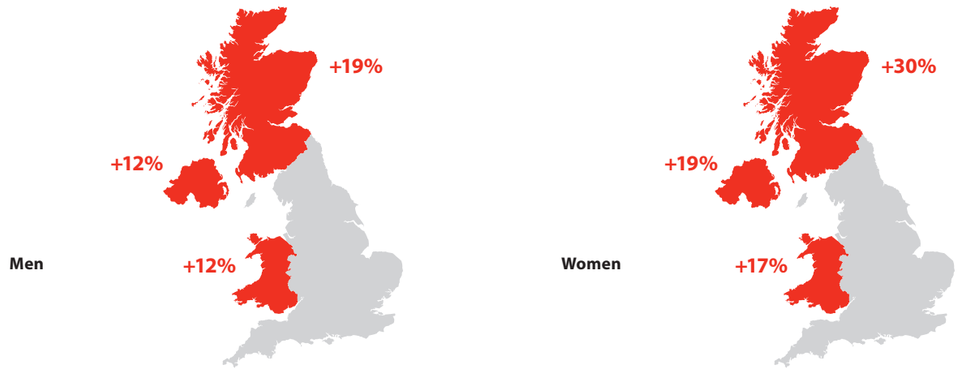
Table 1.16
Deaths by cause, sex and country, 2001, United Kingdom

		All ages				Under 75			
		England	Scotland	Wales	Northern Ireland	England	Scotland	Wales	Northern Ireland
All causes	Men	237,017	27,324	15,714	7,007	105,722	14,482	7,128	3,406
	Women	260,861	30,058	17,535	7,506	70,525	9,686	4,845	2,315
	Total	497,878	57,382	33,249	14,513	176,247	24,168	11,973	5,721
Cardiovascular disease (I00-I99)	Men	94,568	10,455	6,549	2,763	37,717	4,864	2,690	1,154
	Women	103,320	12,211	7,334	3,066	19,176	2,752	1,427	641
	Total	197,888	22,666	13,883	5,829	56,893	7,616	4,117	1,795
Coronary heart disease (I20-I25)	Men	54,567	6,258	3,882	1,693	24,669	3,231	1,823	802
	Women	44,144	5,656	3,236	1,455	9,556	1,480	742	357
	Total	98,711	11,914	7,118	3,148	34,225	4,711	2,565	1,159
Stroke (I60-I69)	Men	20,802	2,438	1,387	502	6,010	806	382	149
	Women	34,042	4,183	2,343	824	4,937	740	340	145
	Total	54,844	6,621	3,730	1,326	10,947	1,546	722	294
Cancer (C00-D48)	Men	67,601	7,891	4,511	1,989	35,590	4,579	2,358	1,141
	Women	62,916	7,584	4,218	1,813	30,216	3,828	2,020	967
	Total	130,517	15,475	8,729	3,802	65,806	8,407	4,378	2,108
Respiratory disease (J00-J99)	Men	29,226	2,897	1,834	891	8,382	1,032	509	267
	Women	34,055	3,538	2,284	1,084	6,177	847	448	207
	Total	63,281	6,435	4,118	1,975	14,559	1,879	957	474
All other causes	Men	45,622	6,081	2,820	1,364	24,033	4,007	1,571	844
	Women	60,570	6,725	3,699	1,543	14,956	2,259	950	500
	Total	106,192	12,806	6,519	2,907	38,989	6,266	2,521	1,344

Notes:
ICD-10 codes in parentheses.

Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.16
Difference in age-standardised CHD mortality rates by sex and country, 2001, United Kingdom



Note:
Percentages refer to the difference in age-standardised CHD mortality rate for men or women in comparison to the male of female rate in England.

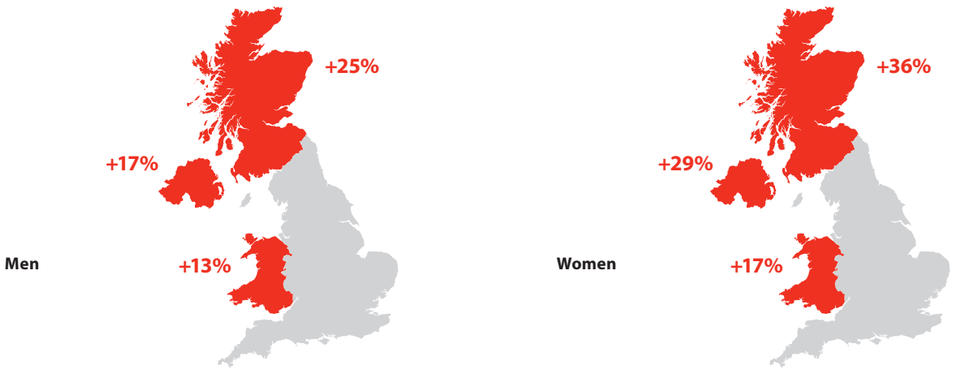
Table 1.17
Deaths by cause, sex and country, 2009, United Kingdom

		All ages				Under 75			
		England	Scotland	Wales	Northern Ireland	England	Scotland	Wales	Northern Ireland
All causes	Men	222,379	25,828	15,025	6,914	92,180	12,526	6,420	3,245
	Women	236,862	28,028	15,981	7,499	61,672	8,703	4,303	2,292
	Total	459,241	53,856	31,006	14,413	153,852	21,229	10,723	5,537
Cardiovascular disease (I00-I99)	Men	72,380	8,016	5,002	2,144	25,613	3,351	1,852	835
	Women	76,575	8,753	5,415	2,341	11,865	1,785	921	444
	Total	148,955	16,769	10,417	4,485	37,478	5,136	2,773	1,279
Coronary heart disease (I20-I25)	Men	38,531	4,600	2,744	1,274	15,632	2,151	1,166	551
	Women	28,565	3,674	2,109	1,031	5,023	876	400	220
	Total	67,096	8,274	4,853	2,305	20,655	3,027	1,566	771
Stroke (I60-I69)	Men	15,790	1,841	1,066	312	3,806	553	246	104
	Women	24,868	3,065	1,796	560	2,996	491	229	85
	Total	40,658	4,906	2,862	872	6,802	1,044	475	189
Cancer (C00-D48)	Men	69,212	7,862	4,640	2,061	33,967	4,239	2,314	1,109
	Women	62,228	7,622	4,111	1,931	28,832	3,706	1,938	982
	Total	131,440	15,484	8,751	3,992	62,799	7,945	4,252	2,091
Respiratory disease (J00-J99)	Men	29,752	3,272	1,993	901	7,949	1,059	575	260
	Women	33,471	3,853	2,278	1,116	5,912	899	404	234
	Total	63,223	7,125	4,271	2,017	13,861	1,958	979	494
All other causes	Men	51,035	6,678	3,390	1,808	24,651	3,877	1,679	1,041
	Women	64,588	7,800	4,177	2,111	15,063	2,313	1,040	632
	Total	115,623	14,478	7,567	3,919	39,714	6,190	2,719	1,673

Notes:
ICD-10 codes in parentheses.

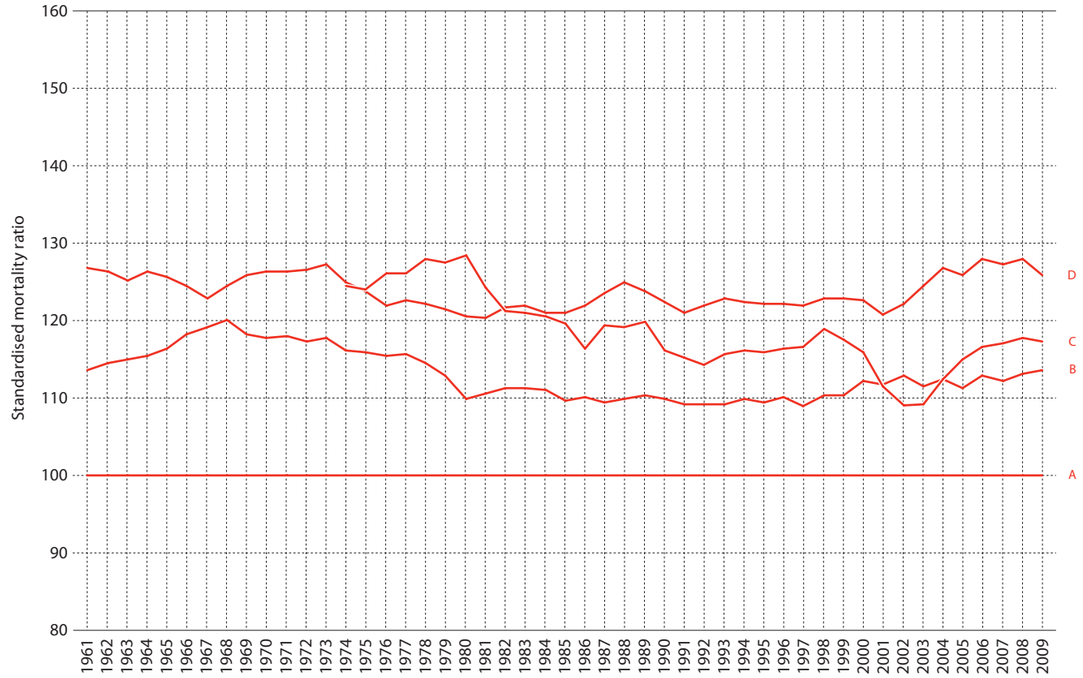
Source:
England and Wales, Office for National Statistics (2010). Personal communication. ¶ Scotland, General Register Office (2010). Personal communication. ¶ Northern Ireland, Statistics and Research Agency (2010). Personal communication.

Figure 1.17
Difference in age-standardised CHD mortality rates by sex and country, 2009, United Kingdom



Note:
Percentages refer to the difference in age-standardised CHD mortality rate for men or women in comparison to the male of female rate in England.

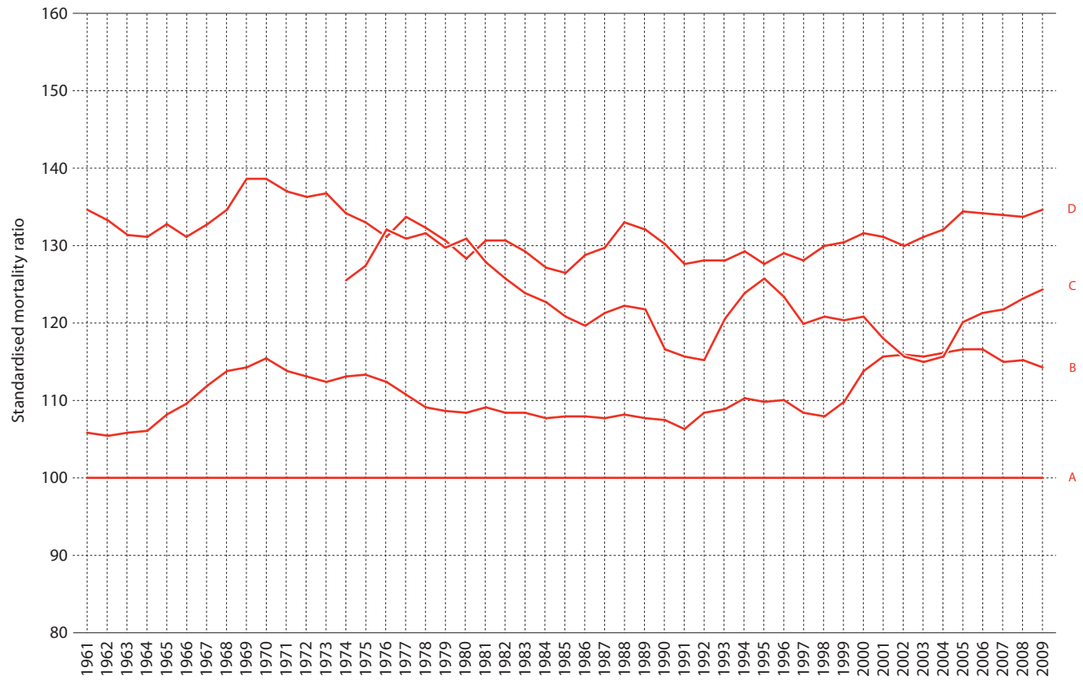
Figure 1.18a
Standardised mortality ratios for coronary heart disease by country (baseline = England), men, 1961 to 2009



(A) **England** (B) **Wales** (C) **Northern Ireland** (D) **Scotland**

Note: Ratios based on three year moving averages of age-standardised CHD mortality rates.

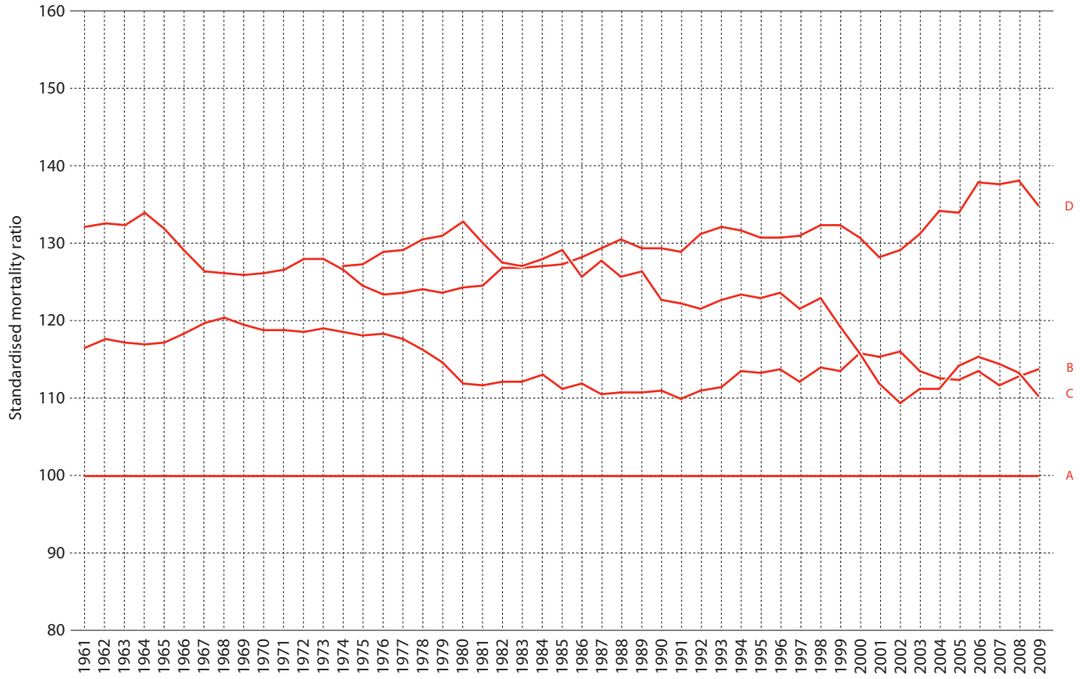
Figure 1.18b
Standardised mortality ratios for coronary heart disease by country (baseline = England), women, 1961 to 2009



(A) **England** (B) **Wales** (C) **Northern Ireland** (D) **Scotland**

Note: Ratios based on three year moving averages of age-standardised CHD mortality rates.

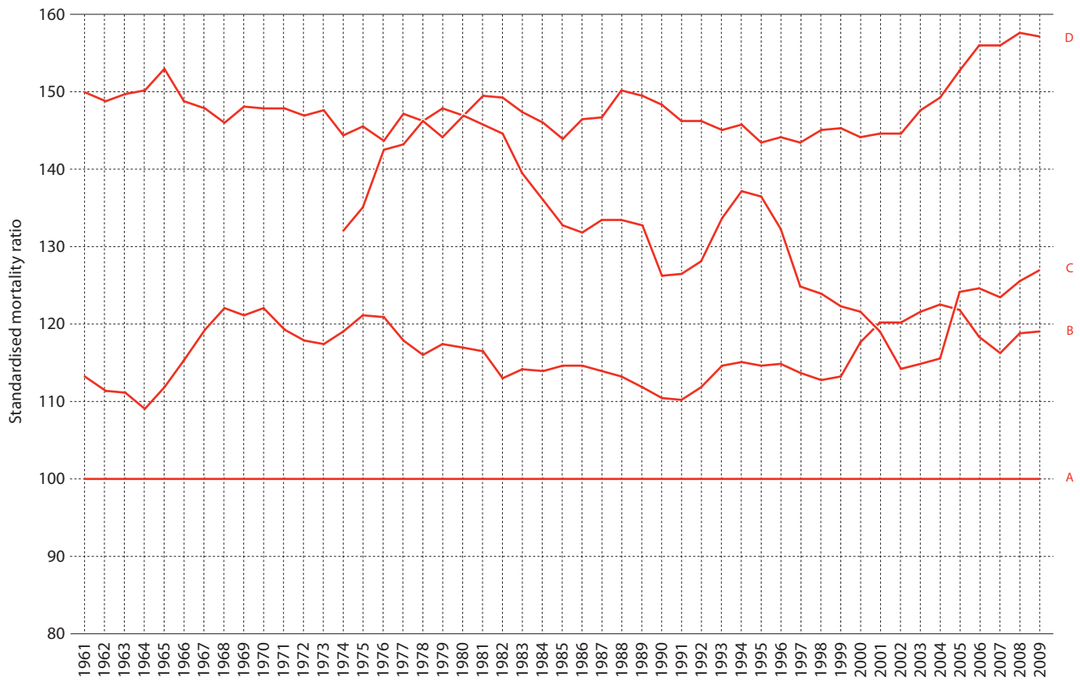
Figure 1.19a
Standardised mortality ratios for coronary heart disease by country (baseline = England), men under 75, 1961 to 2009



(A) **England** (B) **Wales** (C) **Northern Ireland** (D) **Scotland**

Note: Ratios based on three year moving averages of age-standardised CHD mortality rates.

Figure 1.19b
Standardised mortality ratios for coronary heart disease by country (baseline = England), women under 75, 1961 to 2009

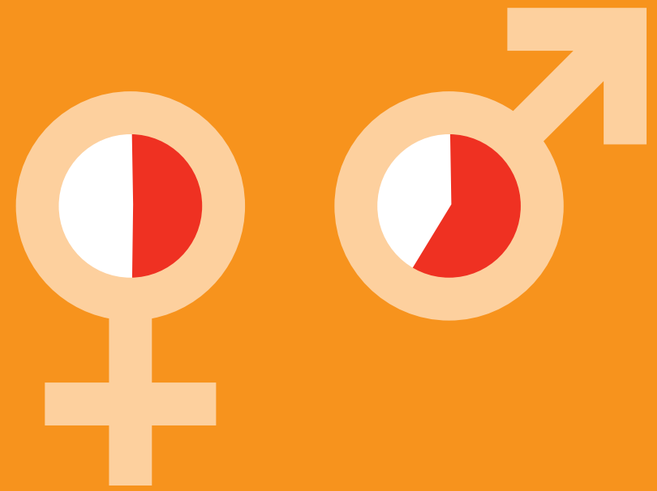


(A) **England** (B) **Wales** (C) **Northern Ireland** (D) **Scotland**

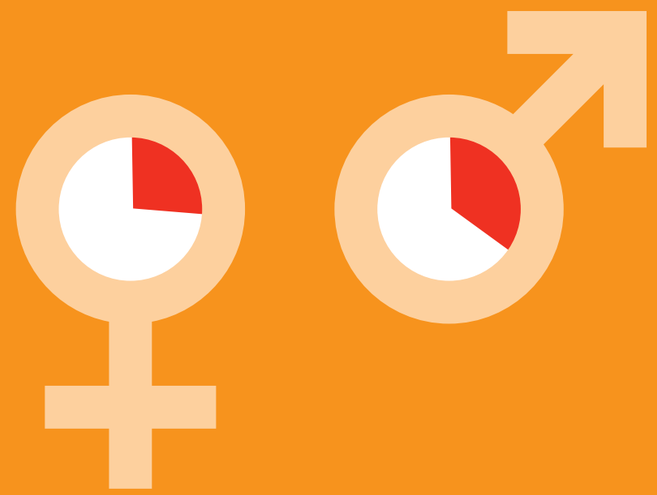
Note: Ratios based on three year moving averages of age-standardised CHD mortality rates.

2. Morbidity

The percentage of 55 to 59 year-old women dying after a heart attack nearly halved between 1968 and 1998 while the percentage of men aged 60 to 64 fell by a third.



1968



1998

2. Morbidity

This chapter reports on time trends in prevalence, incidence and case-fatality of cardiovascular diseases since around 1961. Prevalence of angina, stroke, heart attack (also referred to as myocardial infarction) and heart failure is presented. Incidence of heart attack, heart failure and CHD, and case-fatality of heart attack is presented. Measuring the morbidity of a disease is more problematic than monitoring mortality, as people may have the condition without being aware of it, or there may be no information about the exact time of onset of the disease. Data on time trends in morbidity can therefore be of varying quality and differences in data collection and definitions mean that comparing across time can be challenging. The data presented in this chapter come from a variety of sources; prevalence data have been collected nationally by general practitioners (GPs) since the 1950s, however incidence and case-fatality data has a much shorter history of being collected at this scale. Each source has its own strengths and limitations, which should be borne in mind when comparing results across the decades.

Prevalence

The prevalence data in this chapter come from two sources: the *National Morbidity Survey* and national health surveys that have been conducted using comparable methods (e.g. *Health Survey for England*). The *National Morbidity Survey* was established in 1955 and collected data in the 1970s, 1980s and 1990s. A representative sample of GPs was asked to record the prevalence of certain conditions in their practice for a year in each of these decades. In comparison, the national health surveys asked a representative sample of the population whether they have ever been diagnosed with certain conditions by a doctor. Although it would appear that these two methods should provide broadly comparable results, there are a number of reasons why this is not the case. For example, the *National Morbidity Survey* reports prevalence rates per 100,000 person years at risk, whereas the national surveys simply provide an estimate of the percentage of the population who have the condition. Also, GP consultation rates have increased since the 1960s, due to changes in the pattern of care (e.g. devolution from hospitals to general practice). For these reasons, it is therefore recommended that the two types of data are not directly compared, but used to see if general trends between the series of data are similar.

Prevalence of angina increased between 1955 and 2006, particularly in those aged 65 and above; this trend is seen in both the *National Morbidity Survey* (between the mid 1950s and the early 1990s) and the *Health Survey for England* (between the early 1990s and 2006). Between 1970 and 1991, prevalence of angina nearly tripled for men over 75 and more than doubled for women over 75. Between 1994 and 2006 prevalence continued to increase – by 46% in men over 75 and 20% in women of the same age group. Although the increase is substantial in both sexes, it appears that the prevalence increased more steeply in men than women (Table and Figure 2.1).

Between 1971 and 1991, the prevalence of cerebrovascular disease (i.e. people who have suffered a stroke at some point) increased by almost 40%. An increase in prevalence also occurred between 1994 and 2006, by 33% in men and 38% in women. Generally, the increases in prevalence occurred in all age and sex groups (Table 2.2).

The overall trends in the prevalence of myocardial infarction (i.e. people who have suffered a heart attack at some point) are inconsistent: prevalence rates for men and women increased slightly between 1971 and 1981 and then fell between 1981 and 1991; similarly the prevalence between 1994 and 2006 has gone up and down for both men and women. However, trends do emerge in older age groups. For men and women aged 75 and over, the prevalence of myocardial infarction increased slightly between 1971 and 1991, and continued to increase between 1994 and 2006. For example, in women aged above 75, there was a 42% increase in the prevalence of myocardial infarction between 1994 and 2006 (Table 2.3).

The prevalence of heart failure substantially increased between 1955 and 1971. This was apparent for all age groups and both sexes. Between 1955 and 1971, prevalence more than doubled in men and more than tripled in women. More recent trends in heart failure prevalence are not available, but data from the *Welsh Health Survey* suggest that the condition currently affects 9% of men aged 75 and over and 6% of women of the same age (Table and Figure 2.4).

Incidence

Incidence data has come from two linked datasets of mortality and hospitalisations; one from Oxfordshire and one from Scotland. These databases estimate incidence of heart attack by combining first hospital admissions for heart attack with heart attack mortalities that occurred without a previous hospital admission.

In Oxfordshire between 1968 and 1998, incidence of heart attack decreased in all age groups. The steepest declines occurred in the younger age groups, with a reduction in incidence of about 60% in men aged 40 to 54. The same is also true of women, with the biggest decline of 67% happening in women aged 30 to 35 (Table and Figures 2.5a,b).

Between 1986 and 2008, incidence of CHD, heart attack and heart failure all decreased in Scotland. During this time, incidence of heart attack decreased by 60% in men and women, and by over a third for heart failure. These two data sources comparing trends in incidence in two different regions of the UK suggest that the incidence of cardiovascular conditions in the UK has been decreasing since the 1960s, and is still continuing to decrease (Table and Figures 2.6a,b,c).

Case-fatality

Estimates of case-fatality rates are based on the incidence rate estimates described above. Of all incident cases, the percentage that result in death within 30 days is defined as the case-fatality rate.

Case-fatality from heart attack declined in Oxfordshire between 1968 and 1998 for all ages and both sexes. This decline was faster for the younger age groups, with the slowest declines seen in men aged over 75 and women over 80. The decrease in case-fatality from myocardial infarction over the second half of the 20th century is likely to be due to the reduction of sudden, out of hospital deaths[1] (Table and Figures 2.7a,b).

1. Goldacre MJ, Roberts SE, Yeates D, Gill LE (2003). *Myocardial infarction: an investigation of measures of mortality, incidence and case-fatality.* Oxford: National Centre for Health Outcomes Development.

Table 2.1
Prevalence of angina by age and sex, 1955/56 to 1991/92, England and Wales, 1994 to 2006, England

Study	Setting	Year	Sex	Age	Rates per 100,000 person years at risk
National Morbidity Survey	England & Wales	1955/56	Men	15-44	40
				45-64	740
				> 65	1,600
				All ages	380
			Women	15-44	20
				45-64	480
				> 65	1,350
		1970/71	Men	15-24	10
				25-44	110
				45-64	1,210
				65-74	2,380
				>75	1,960
				All ages	540
			Women	25-44	60
				45-64	710
				65-74	1,910
				>75	1,780
				All ages	460
		1981/82	Men	15-24	
				25-44	90
				65-74	3,540
				>75	3,190
				All ages	810
			Women	15-24	
				25-44	70
				45-64	970
				65-74	2,150
				All ages	580
		1991/92	Men	15-24	
				25-44	140
				45-64	2,570
				65-74	5,800
				>75	5,730
				All ages	1,300
			Women	15-24	
				25-44	70
				45-64	1,330
				65-74	3,640
				>75	4,400
				All ages	980

Study	Setting	Year	Sex	Age	Prevalence per 100,000
Health Survey for England	England	1994	Men	16-24	
				25-34	100
				35-44	300
				45-54	1,900
				55-64	4,900
				65-74	9,100
				>75	13,300
		1998	Men	16-24	
				25-34	100
				35-44	700
				45-54	2,800
				55-64	10,500
				>75	18,300
				All ages	5,300
			Women	16-24	
				25-34	200
				35-44	400
				55-64	5,500
				65-74	9,900
				>75	17,000
				All ages	3,900
		2006	Men	16-24	100
				35-44	300
				45-54	2,400
				55-64	8,000
				65-74	14,200
				>75	22,700
				All ages	4,800
			Women	16-24	100
				25-34	100
				35-44	200
				45-54	1,200
				55-64	3,200
				65-74	8,300
				>75	15,900
				All ages	3,300

Notes:
1955/56 uses ICD-6 420.2 and 1971/72 to 1991/92 uses ICD-8 and ICD-9 code 413. The number of person years at risk is the sum of the number of days each patient was registered with a study practice during the year, divided by the number of days in the year. The Health Survey for England estimates are based on whether people reported having had angina diagnosed by a doctor. Blank cells indicate there were not enough events for an accurate estimate.

Source:
General Register Office (1958). *Morbidity statistics from general practice, 1955-56 (vols I-III). Studies on Medical and Population Subjects No 14.* HMSO: London. ¶ Royal College of GPs, Office of Population Censuses and Surveys, and Department of Health and Social Security (1974). *Morbidity statistics from general practice: second national study, 1970-71. Studies on Medical and Population Subjects No 26.* HMSO: London. ¶ Royal College of GPs, Office of Population Censuses and Surveys, and Department of Health and Social Security (1986). *Morbidity statistics from general practice: third national study, 1981-82. Series MB5 No 1.* HMSO: London. ¶ Royal College of GPs, OPCS and Department of Health (1995). *Morbidity statistics from general practice: fourth national study, 1991-92. Series MB5 No 3.* HMSO: London. ¶ Joint Health Surveys Unit (1996). *Health Survey for England 1994.* HMSO: London. ¶ Joint Health Surveys Unit (1999). *Health Survey for England 1998.* The Stationery Office: London. ¶ Joint Health Surveys Unit (2008). *Health Survey for England 2006.* The Information Centre: Leeds.

Table 2.2
Prevalence of cerebrovascular disease by age and sex, 1970/71 to 1991/92, England and Wales, 1994 to 2006, England

Study	Setting	Year	Sex	Age	Rates per 100,000 person years at risk
National Morbidity Survey	England & Wales	1970/71	Men	15-24	10
				25-44	30
				45-64	60
				65-74	2,470
				>75	4,440
				All ages	460
			Women	15-24	10
				25-44	40
				45-64	360
				65-74	1,670
				>75	4,080
				All ages	490
		1981/82	Men	15-24	10
				25-44	20
				45-64	420
				65-74	1,530
				>75	3,960
				All ages	390
			Women	15-24	10
				25-44	10
				45-64	260
				65-74	1,250
				>75	3,320
				All ages	430
		1991/92	Men	15-24	20
				25-44	30
				45-64	720
				65-74	2,720
				>75	5,790
				All ages	640
			Women	15-24	20
				25-44	40
				45-64	460
				65-74	1,770
				>75	4,960
				All ages	670

Study	Setting	Year	Sex	Age	Prevalence per 100,000
Health Survey for England	England	1994	Men	16-24	
				25-34	100
				35-44	100
				45-54	300
				55-64	2,900
				65-74	6,500
				>75	8,600
				All ages	1,800
			Women	16-24	
				25-34	200
				35-44	300
				45-54	600
				55-64	1,800
				65-74	3,500
				>75	7,500
				All ages	1,600
		1998	Men	16-24	100
				25-34	
				35-44	400
				45-54	1,200
				55-64	3,300
				65-74	6,200
				>75	10,300
				All ages	2,300
			Women	16-24	400
				25-34	400
				35-44	600
				45-54	700
				55-64	2,200
				65-74	5,000
				>75	8,800
				All ages	2,100
		2006	Men	16-24	
				25-34	
				35-44	500
				45-54	1,200
				55-64	3,000
				65-74	7,100
				>75	13,100
				All ages	2,400
			Women	16-24	200
				25-34	100
				35-44	400
				45-54	900
				55-64	2,300
				65-74	4,200
				>75	10,700
				All ages	2,200

Notes:
1970/71 to 1991/92 uses ICD-8 and ICD-9 codes 430-438. The number of person years at risk is the sum of the number of days each patient was registered with a study during the year, divided by the number of days in the year. 1981/82 excludes TIA and hypertensive encephalopathy, therefore 1981/82 and 1991/92 are not directly comparable. The Health Survey for England is based on whether people reported having had stroke diagnosed by a doctor. Blank cells indicate there were not enough events for an accurate estimate.

Source:
Royal College of GPs, Office of Population Censuses and Surveys, and Department of Health and Social Security (1974). *Morbidity statistics from general practice: second national study, 1970-71. Studies on Medical and Population Subjects No 26.* HMSO: London. ¶ Royal College of GPs, Office of Population Censuses and Surveys, and Department of Health and Social Security (1986). *Morbidity statistics from general practice: third national study, 1981-82. Series MB5 No 1.* HMSO: London. ¶ Royal College of GPs, OPCS and Department of Health (1995). *Morbidity statistics from general practice: fourth national study, 1991-92. Series MB5 No 3.* HMSO: London. ¶ Joint Health Surveys Unit (1996). *Health Survey for England 1994.* HMSO: London. ¶ Joint Health Surveys Unit (1999). *Health Survey for England 1998.* The Stationery Office: London. ¶ Joint Health Surveys Unit (2008). *Health Survey for England 2006.* The Information Centre: Leeds.

Table 2.3
Prevalence of myocardial infarction by age and sex, 1970/71 to 1991/92, England and Wales, 1994 to 2006, England

Study	Setting	Year	Sex	Age	Rates per 100,000 person years at risk
National Morbidity Survey	England & Wales	1970/71	Men	15-24	10
				25-44	150
				45-64	1,160
				65-74	2,140
				>75	1,760
				All ages	520
			Women	15-24	10
				25-44	40
				45-64	320
				65-74	720
				>75	1,040
				All ages	210
		1981/82	Men	15-24	
				25-44	160
				45-64	1,170
				65-74	1,990
				>75	2,240
				All ages	550
			Women	15-24	
				25-44	30
				45-64	380
				65-74	1,110
				>75	1,280
				All ages	290
		1991/92	Men	15-24	
				25-44	60
				45-64	730
				65-74	1,580
				>75	1,860
				All ages	380
			Women	15-24	
				25-44	10
				45-64	200
				65-74	710
				>75	1,180
				All ages	200

Study	Setting	Year	Sex	Age	Prevalence per 100,000
Health Survey for England	England	1994	Men	16-24	
				25-34	100
				35-44	300
				45-54	2,000
				55-64	7,000
				65-74	13,100
				>75	14,300
				All ages	3,800
			Women	16-24	100
				25-34	100
				35-44	100
				45-54	900
				55-64	2,300
				65-74	4,600
				>75	6,400
				All ages	1,700
		1998	Men	16-24	100
				25-34	200
				35-44	500
				45-54	2,700
				55-64	8,400
				65-74	11,600
				>75	13,500
				All ages	4,200
			Women	16-24	
				25-34	100
				35-44	300
				45-54	800
				55-64	2,400
				65-74	5,500
				>75	6,500
				All ages	1,800
		2006	Men	16-24	
				25-34	200
				35-44	600
				45-54	2,100
				55-64	6,300
				65-74	14,400
				>75	16,600
				All ages	4,100
			Women	16-24	
				25-34	
				35-44	100
				45-54	700
				55-64	1,600
				65-74	3,300
				>75	9,100
				All ages	1,700

Notes:
1970/71 to 1991/92 uses ICD-8 and ICD-9 code 410. 1981/82 includes other acute and subacute forms of ischaemic heart disease (ICD 411). The number of person years at risk is the sum of the number of days each patient was registered with a study practice during the year, divided by the number of days in the year. The Health Survey for England is based on whether people reported having had a heart attack diagnosed by a doctor. Blank cells indicate there were not enough events for an accurate estimate.

Source:
Royal College of GPs, Office of Population Censuses and Surveys, and Department of Health and Social Security (1974). *Morbidity statistics from general practice: second national study, 1970-71. Studies on Medical and Population Subjects No 26.* HMSO: London. ¶ Royal College of GPs, Office of Population Censuses and Surveys, and Department of Health and Social Security (1986). *Morbidity statistics from general practice: third national study, 1981-82. Series MB5 No 1.* HMSO: London. ¶ Royal College of GPs, OPCS and Department of Health (1995). *Morbidity statistics from general practice: fourth national study, 1991-92. Series MB5 No 3.* HMSO: London. ¶ Joint Health Surveys Unit (1996). *Health Survey for England 1994.* HMSO: London. ¶ Joint Health Surveys Unit (1999). *Health Survey for England 1998.* The Stationery Office: London. ¶ Joint Health Surveys Unit (2008). *Health Survey for England 2006.* The Information Centre: Leeds.

Table 2.4
Prevalence of heart failure, 1955/56 to 1970/71, England and Wales, 2008, Wales

Study	Setting	Year	Sex	Age	Rates per 100,000 person years at risk
National Morbidity Survey	England & Wales	1955/56	Men	15-44	
				45-64	150
				> 65	1,480
				All ages	200
			Women	15-44	10
				45-64	150
				> 65	1,290
				All ages	230
		1970/71	Men	15-24	10
				25-44	20
				45-64	430
				65-74	2,260
				> 75	6,450
				All ages	460
			Women	15-24	20
				25-44	30
				45-64	400
				65-74	2,130
				> 75	6,700
				All ages	700

Study	Setting	Year	Sex	Age	Prevalence per 100,000
Welsh Health Survey	Wales	2008	Men	16-24	
				25-34	
				35-44	
				45-54	1,000
				55-64	2,000
				65-74	4,000
				> 75	9,000
				All ages	2,000
			Women	16-24	
				25-34	
				35-44	
				45-54	
				55-64	1,000
				65-74	2,000
				> 75	6,000
				All ages	1,000

Notes:
1955/56 uses ICD-7 code 434.1 and 1970/71 uses ICD-9 code 427.0. Welsh data is self report of being diagnosed with heart failure by a doctor. Blank cells indicate there were not enough events for an accurate estimate.

Source:
General Register Office (1958). *Morbidity statistics from general practice, 1955-56 (vols I-III). Studies on Medical and Population Subjects No 14.* HMSO: London. ¶ Royal College of GPs, Office of Population Censuses and Surveys, and Department of Health and Social Security (1974). *Morbidity statistics from general practice: second national study, 1970-71. Studies on Medical and Population Subjects No 26.* HMSO: London. ¶ Welsh Assembly Government (2009). *Welsh health Survey 2008.* Welsh Assembly Government: Cardiff.

Table 2.5
Incidence rates for myocardial infarction by sex and age, 1968 to 1998, Oxfordshire

	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Incidence rate per 100,000											
Men											
1968-1973	40	125	257	394	599	850	1,127	1,364	1,814	2,082	2,632
1974-1978	38	135	253	462	666	937	1,247	1,691	1,974	2,458	3,226
1979-1983	48	116	258	420	615	916	1,258	1,619	2,023	2,600	3,388
1984-1988	35	86	183	314	534	765	977	1,450	1,913	2,609	2,855
1989-1993	28	68	124	238	403	611	876	1,212	1,790	2,210	2,549
1994-1998	22	48	95	159	265	425	656	915	1,353	1,812	2,212
Women											
1968-1973	6	13	35	73	124	241	371	618	909	1,266	1,673
1974-1978	6	15	38	75	147	255	461	749	1,069	1,599	2,205
1979-1983	3	11	31	69	141	267	460	737	1,135	1,603	2,114
1984-1988	2	6	26	66	136	247	399	674	1,055	1,496	2,091
1989-1993	2	9	19	41	106	217	378	600	932	1,403	1,936
1994-1998	2	9	16	27	74	151	282	456	741	1,091	1,528
No. of events in Oxfordshire population											
Both sexes											
1968-1973	*199*	*569*	*1,052*	*1,613*	*2,128*	*2,824*	*2,950*	*2,532*	*2,127*	*1,584*	*1,239*
1974-1978	*401*	*1,072*	*2,005*	*3,193*	*4,131*	*5,074*	*6,212*	*6,566*	*4,887*	*3,844*	*3,151*
1979-1983	*491*	*1,071*	*2,080*	*3,202*	*4,472*	*5,511*	*6,903*	*7,506*	*6,781*	*4,831*	*3,890*
1984-1988	*536*	*1,066*	*1,923*	*3,110*	*4,705*	*6,303*	*6,718*	*7,855*	*8,047*	*6,292*	*4,656*
1989-1993	*375*	*989*	*1,704*	*2,722*	*3,903*	*5,319*	*6,812*	*7,333*	*7,836*	*6,711*	*5,613*
1994-1998	*418*	*839*	*1,739*	*2,477*	*3,298*	*4,415*	*5,689*	*6,554*	*6,789*	*5,848*	*5,732*

Notes:
Incidence is based on hospitalisations and out of hospital death coded as myocardial infarction and in-hospital death coded as myocardial infarction.

Source:
Goldacre MJ, Roberts SE, Yeates D, Gill LE (2003). *Myocardial infarction: an investigation of measures of mortality, incidence and case-fatality.* National Centre for Health Outcomes Development: Oxford.

Figure 2.5a
Incidence rates for myocardial infarction, 1968 to 1998, men, Oxfordshire

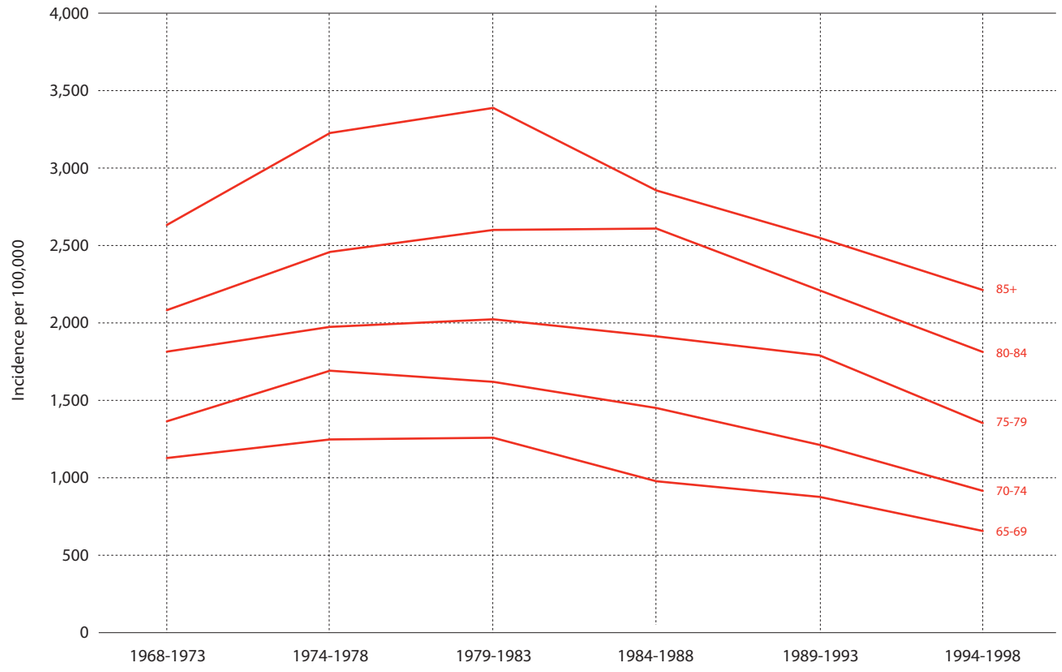


Figure 2.5b
Incidence rates for myocardial infarction, 1968 to 1998, women, Oxfordshire

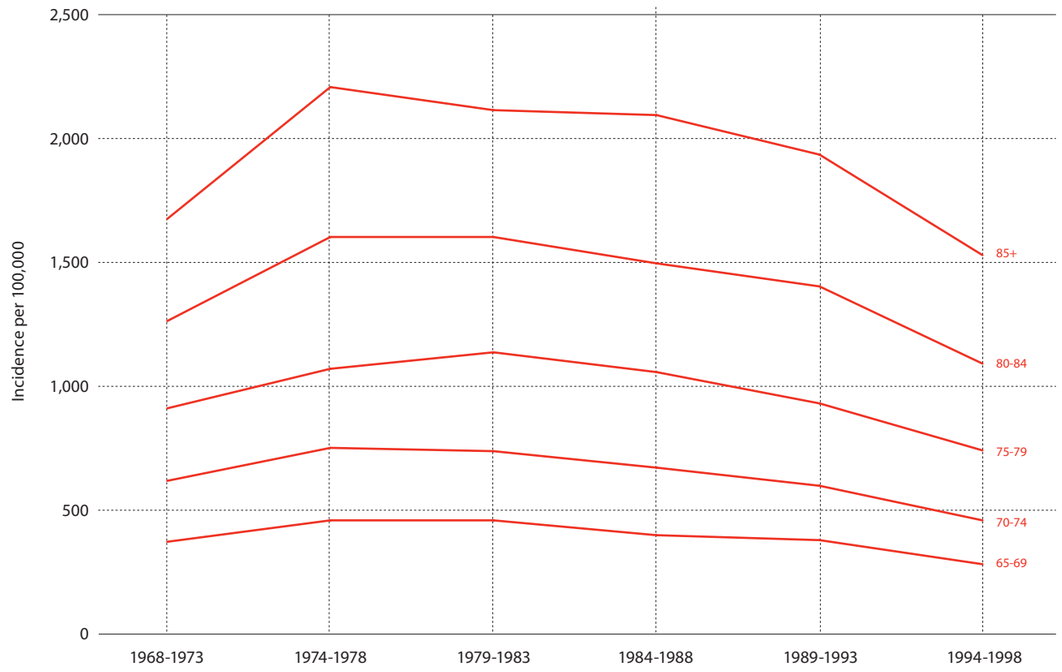


Table 2.6
Age-standardised incidence of coronary heart disease, myocardial infarction and heart failure, by sex, 1986 to 2008, Scotland

	Coronary heart disease		Myocardial infarction		Heart failure	
	Men	Women	Men	Women	Men	Women
Incidence rates per 100,000						
1986	716	346	525	242	114	79
1987	723	354	526	245	120	80
1988	717	354	514	240	118	86
1989	711	354	496	238	125	86
1990	692	345	479	225	130	89
1991	697	345	474	227	133	89
1992	692	345	469	226	141	94
1993	701	351	456	216	142	100
1994	654	337	406	195	142	96
1995	646	335	393	190	125	92
1996	637	333	364	171	130	90
1997	633	334	343	165	122	85
1998	626	328	339	162	125	85
1999	603	311	318	152	122	82
2000	579	296	289	135	115	74
2001	560	287	282	133	106	69
2002	557	289	283	134	101	68
2003	545	275	269	125	97	64
2004	523	267	252	119	93	57
2005	507	258	238	111	81	55
2006	472	245	218	104	80	51
2007	475	231	212	94	78	51
2008	444	216	213	95	76	49

Notes:
Incidence is based on hospitalisations and out of hospital deaths. Rates are age-standardised to the European Standard Population.

Source:
ISD Scotland (2010). Personal Communication.

Figure 2.6a
Age-standardised incidence of coronary heart disease by sex, 1986 to 2008, Scotland

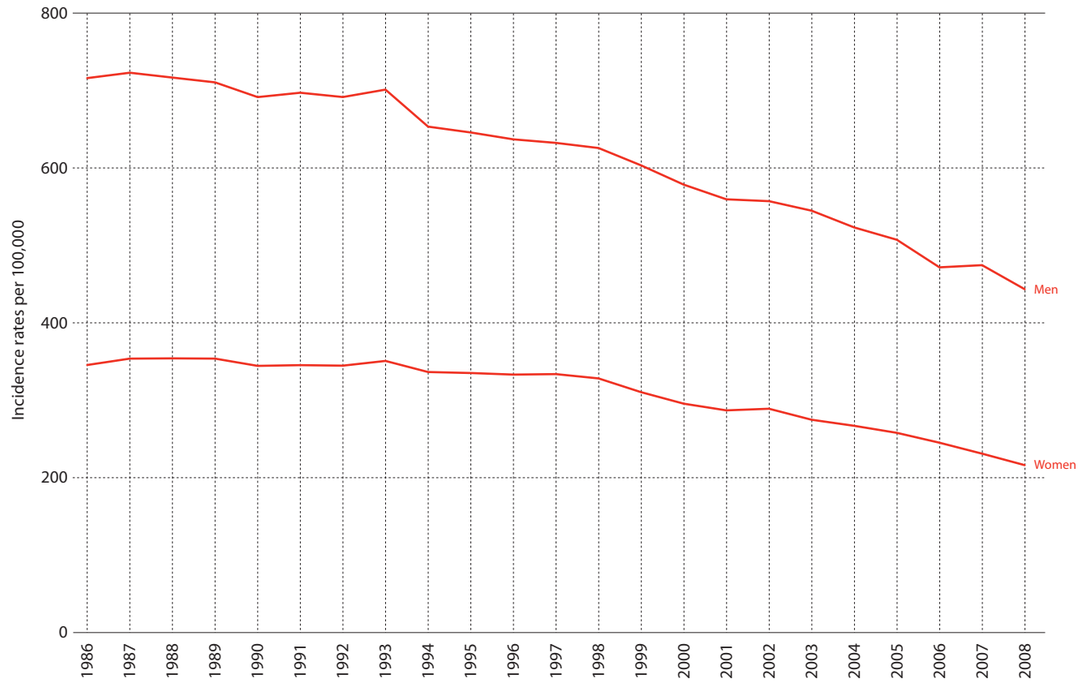


Figure 2.6b
Age-standardised incidence of myocardial infarction by sex, 1986 to 2008, Scotland

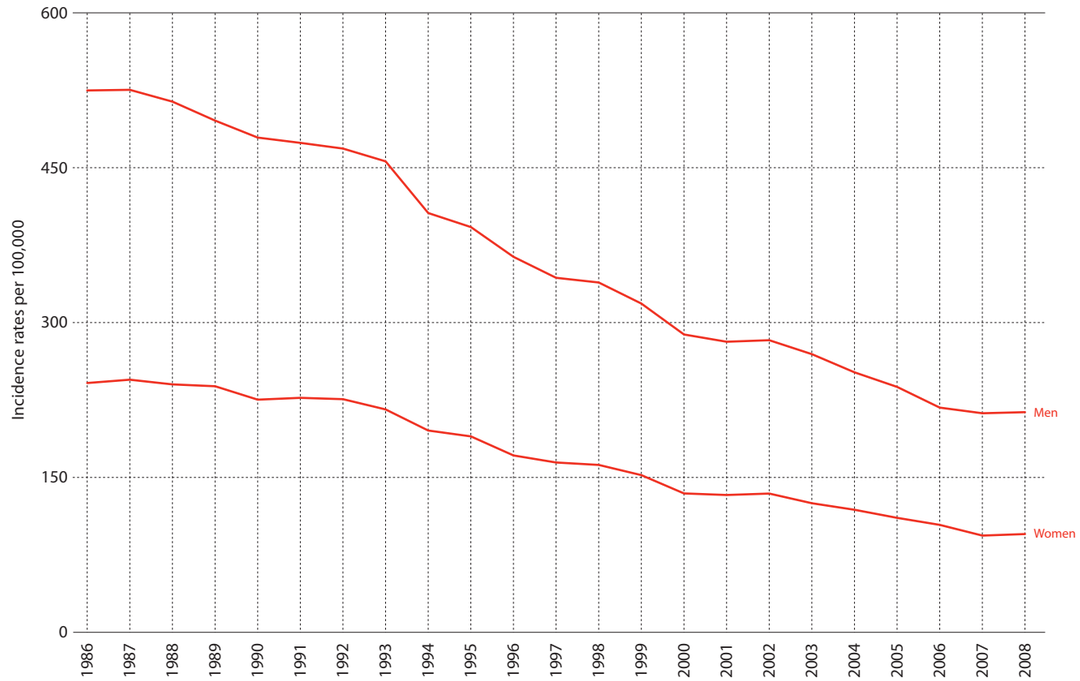


Figure 2.6c
Age-standardised incidence of heart failure by sex, 1986 to 2008, Scotland

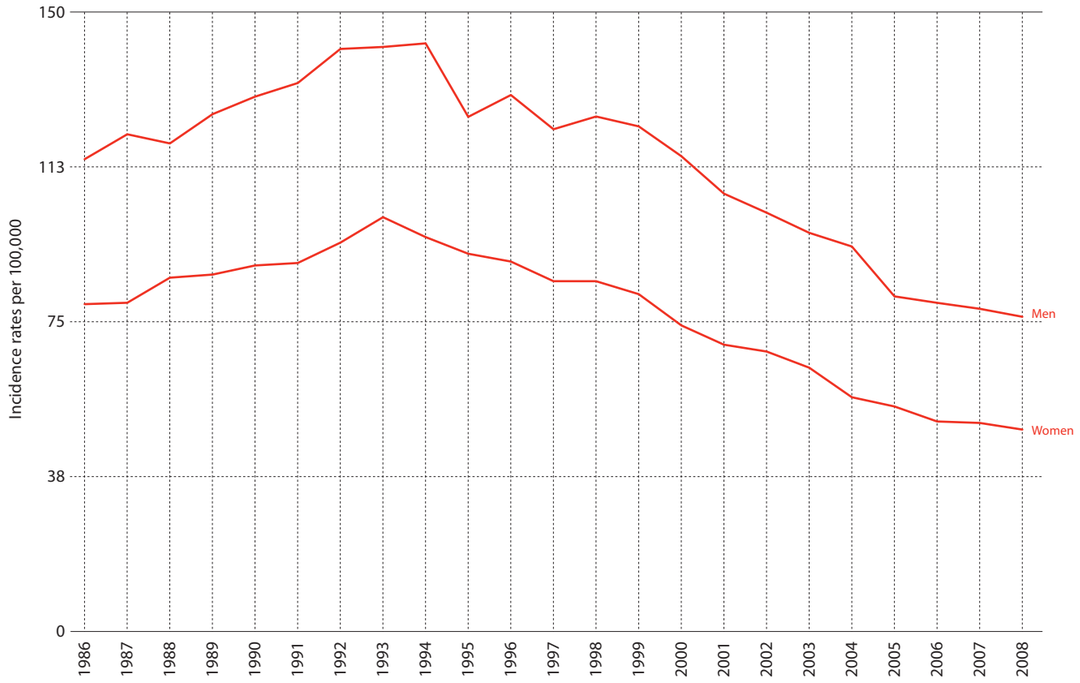


Table 2.7
Case-fatality rates for myocardial infarction by sex and age, 1968 to 1998, Oxfordshire

	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 and above
% of myocardial infarctions that resulted in deaths within 30 days											
Men											
1968-1973	35.5	31.3	42.3	42.7	46.0	59.9	70.4	77.6	83.4	86.6	91.5
1974-1978	35.2	36.2	42.8	50.8	50.2	57.8	67.7	76.5	85.4	87.3	91.9
1979-1983	34.9	32.0	35.6	40.3	48.4	54.5	62.7	72.8	80.2	87.9	91.2
1984-1988	33.1	31.9	34.4	39.6	44.7	49.7	59.4	67.9	75.2	82.1	88.9
1989-1993	35.0	31.3	30.5	32.7	40.2	43.9	53.3	59.1	68.1	75.2	82.1
1994-1998	25.9	29.1	30.7	33.1	33.6	42.3	51.8	56.5	64.5	70.3	79.2
Women											
1968-1973	77.8	52.6	45.1	46.9	50.0	58.4	69.0	75.3	85.3	89.6	93.2
1974-1978	58.8	55.3	50.0	53.7	52.4	66.2	68.5	76.7	83.5	87.1	90.9
1979-1983	54.5	46.7	39.3	52.6	49.0	59.8	62.9	69.7	78.7	83.2	87.0
1984-1988	42.9	47.6	36.7	33.9	46.1	55.1	59.3	69.8	73.0	79.4	85.7
1989-1993	33.3	35.7	29.9	33.3	39.7	46.7	54.7	61.3	67.7	74.4	82.4
1994-1998	55.6	32.5	36.4	31.9	26.4	43.6	51.1	57.2	65.9	74.5	83.1
Number of events											
Both sexes											
1968-1973	37	114	257	429	642	1,098	1,421	1,440	1,418	1,144	983
1974-1978	71	208	441	903	1,263	1,957	2,861	3,582	3,116	2,527	2,251
1979-1983	87	174	412	778	1,350	2,039	3,029	3,960	4,098	3,214	2,763
1984-1988	73	153	298	578	1,128	1,856	2,434	3,643	4,179	3,751	3,080
1989-1993	55	143	219	377	764	1,287	2,143	2,779	3,663	3,645	3,531
1994-1998	42	91	214	321	450	913	1,554	2,171	2,789	2,908	3,460

Notes:
Case-fatality is based on deaths that occurred in hospital after an admission for myocardial infarction, deaths that occurred in hospital without an admission record, and deaths outside hospital with no admission for myocardial infarction in the previous 30 days.

Source:
Goldacre MJ, Roberts SE, Yeates D, Gill LE (2003). *Myocardial infarction: an investigation of measures of mortality, incidence and case-fatality.* National Centre for Health Outcomes Development: Oxford.

Figure 2.7a
Case-fatality for myocardial infarction 1968 to 1998, men, Oxfordshire

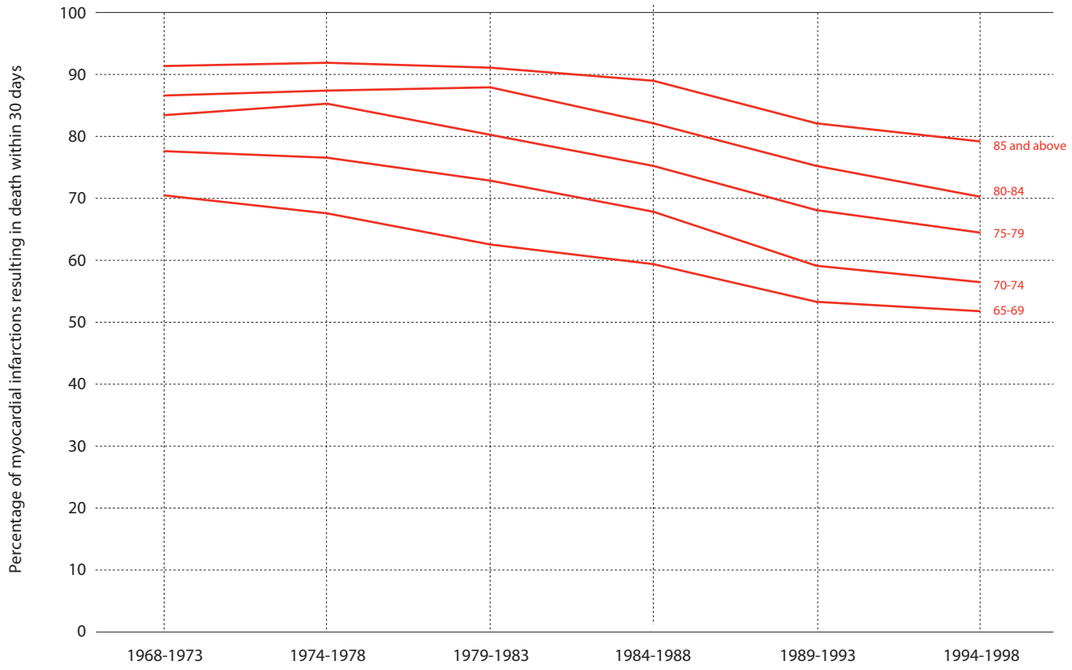
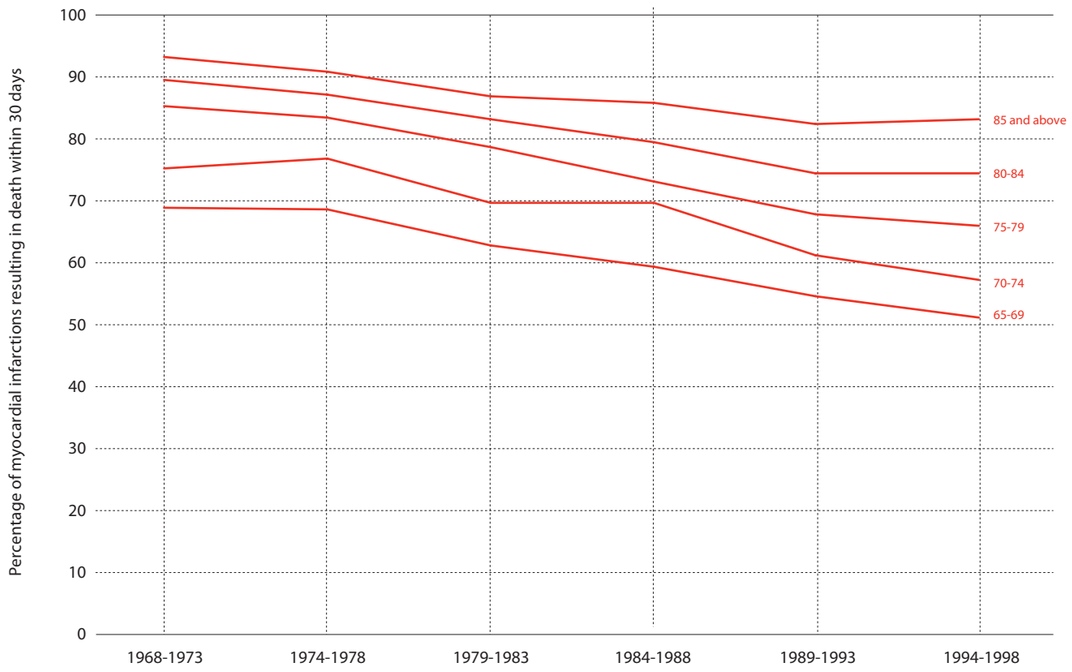
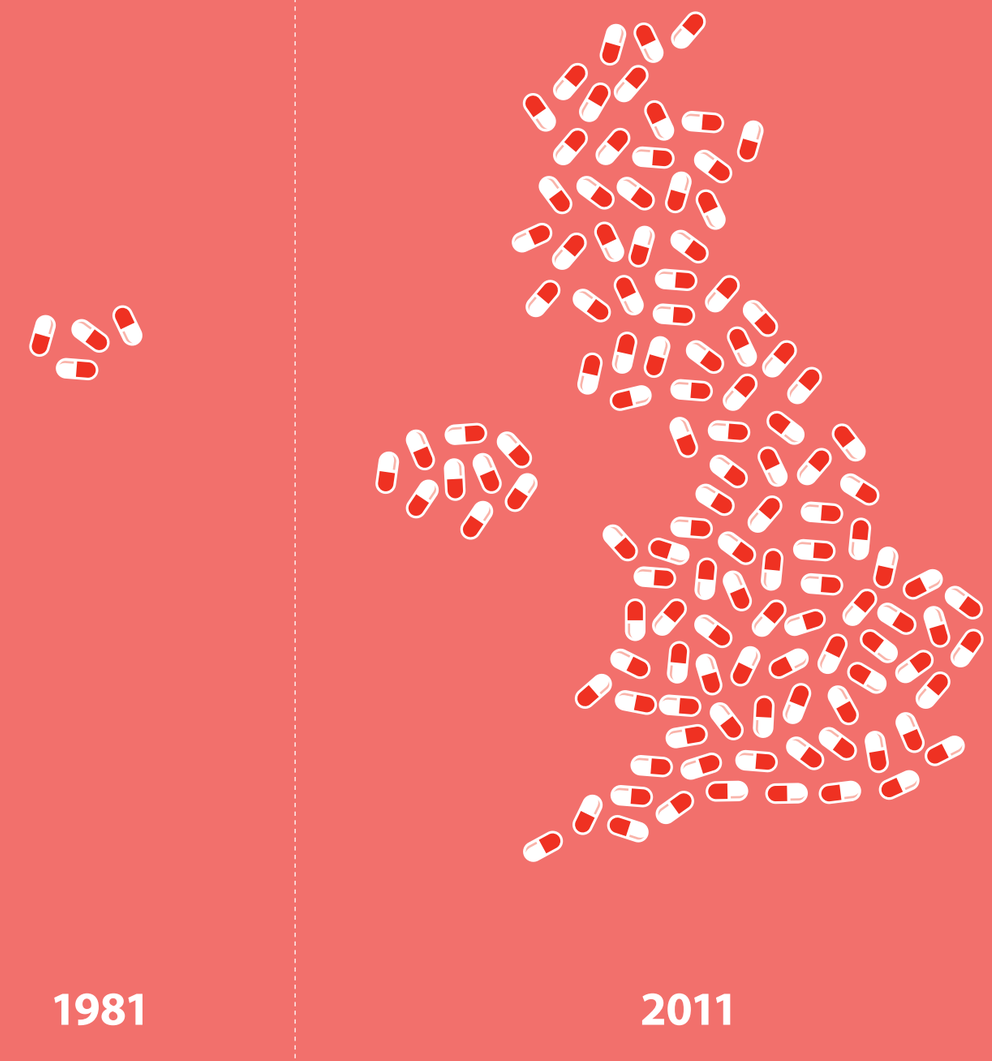


Figure 2.7b
Case-fatality for myocardial infarction 1968 to 1998, women, Oxfordshire



3. Treatment

More people benefit from life-saving lipid lowering drugs: number of prescriptions made a year explodes from 295,000 to over 50 million in 30 years.



3. Treatment

This chapter reports on treatment for cardiovascular diseases (CVD) with a focus on treatments for coronary heart disease (CHD). The chapter includes tables and figures on the number of prescriptions, operations and hospital episodes for CVD. The definitions of different conditions have changed on three different occasions since 1961, first in 1967, then 1978, and again in 2000. These changes correspond with the uptake of revisions of the International Classification of Diseases (ICD) in the UK and can sometimes result in discontinuities in hospital episode trends. Similarly, standard classifications for drug treatments and surgical procedures have occasionally changed since 1961, as has best practice for treatment of CVD. Therefore, the trends presented in this chapter are not always straightforward to interpret.

Prescriptions

Since 1981, data have been collected on the number of items and the net ingredient cost of all prescriptions dispensed in the community in England. The rapid increase in the number of prescriptions for the treatment and prevention of CVD that began in the late 1980s currently shows no signs of slowing. In 2008, around 266 million prescriptions were issued for CVD in England, nearly five times as many as issued in 1986, and an increase of 6% from the number of prescriptions in 2007 (Table 3.1).

Since 1990, the number of prescriptions for antiplatelet drugs has increased steadily, and there are now over 38 million prescriptions for antiplatelet drugs in England every year. Before the late 1990s, increases in the number of prescriptions of lipid lowering drugs were slight, but since then prescriptions have increased dramatically. The number of prescriptions for lipid lowering drugs is now more than fifteen times higher than a decade ago (Table 3.1 and Figure 3.1).

The cost of prescriptions for cardiovascular diseases currently stands at around £1.6 billion per year [1]. However, costs do not necessarily increase at the same rate as the increase in the number of prescriptions, since when commonly used drugs come out of patent they can be replaced by cheaper generic drugs (Figure 3.1).

Operations

Until 1989, data on the number of admissions and operations within NHS hospitals were provided by the Hospital In-patient Enquiry system, which was based on a 10% sample of all hospital records in England and Wales. This system was replaced by Hospital Episode Statistics, which routinely collects data on all admissions and operations in NHS hospitals. Additional data on cardiovascular surgery has been collected by the Society for Cardiothoracic Surgery in Great Britain and Ireland since 1977. However, these data are analysed and categorised in different groups and the broad categories of operations that could include surgical interventions for CHD are presented in this chapter.

In 1962, there were 700 operations carried out to treat arteriosclerotic heart disease (which includes CHD) in England and Wales. By 1967, this had increased to 920. By the mid 1970s, the classification had changed to include all heart and intrathoracic vessels surgeries – these showed a sharp increase from nearly 17,000 in 1974 to over 22,000 in 1976 (Table 3.2 and Figure 3.2).

The registry initiated by the Society for Cardiothoracic Surgery in 1977 provides continuous data on the number of coronary artery bypass graft surgeries (CABGs) and percutaneous coronary interventions (PCIs), and shows that the number of PCIs carried out in the UK in 2008 is more than three times higher than a decade earlier; over 80,000 procedures are now carried out annually in the UK. However, the amount of CABGs reached a plateau in the late 1990s, driven by more widespread use of less invasive procedures (e.g. stents). Currently around 25,000 CABG procedures are carried out in the UK each year (Table 3.2 and Figure 3.2).

Inpatient hospital episodes

Overall, there were around 70,000 estimated inpatient episodes of CHD in NHS hospitals in England and Wales in 1961. This had increased to around 450,000 by 2008/09, but as a percentage of all inpatient episodes, CHD remained around 3-5% for men and between 1-2% for women. In 1975 among males there were over 84,000 inpatient episodes for CHD and among females there were over 44,000 cases. By 1991, there were 174,000 inpatient episodes for men and 95,000 for women.

In 1961 there were 30,000 inpatient episodes (5% of all inpatient episodes) for stroke among men and 36,000 (2% of all inpatient episodes) among women. Although the total number of inpatient episodes for stroke has steadily increased since the early 1960s, the percentage of inpatient episodes that are due to stroke has decreased. By 1991/92, the percentage had dropped to 1% for both sexes with 49,000 episodes among males and 58,000 episodes among females. In 2009/10 there were 98,000 episodes among males and 106,000 episodes among females (1% of all episodes for each sex) (Tables 3.3 to 3.8 and Figures 3.3 to 3.8).

1. Office for National Statistics (2009). *Prescription cost analysis 2008*. The Information Centre: Leeds.

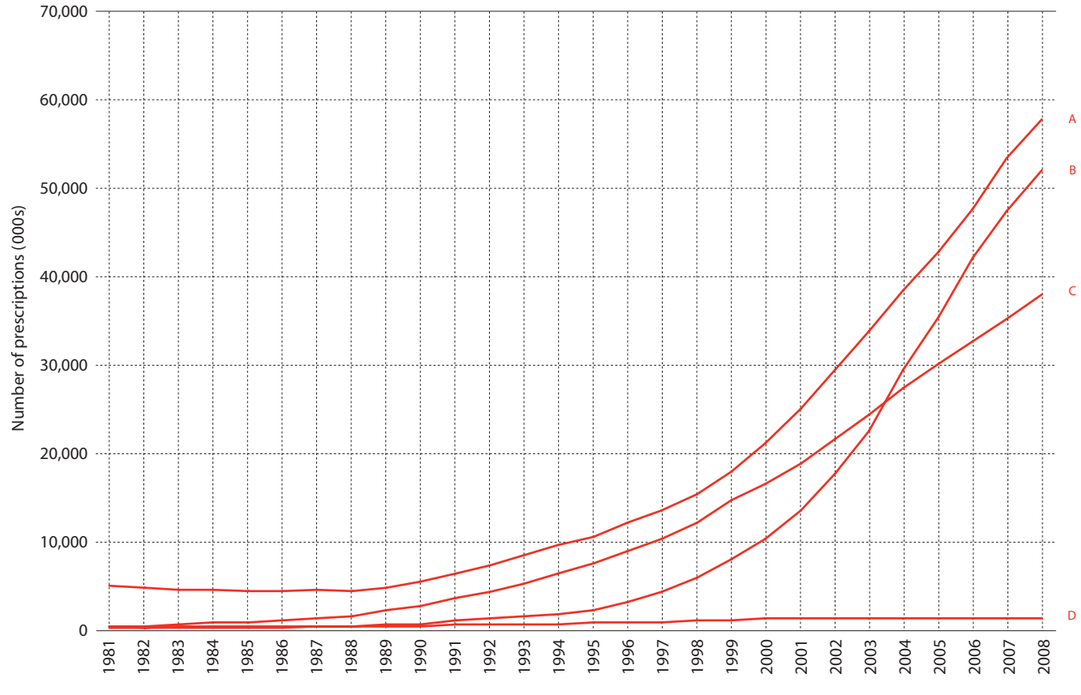
Table 3.1
Prescriptions used in the prevention and treatment of cardiovascular disease, 1981 to 2008, England

Prescriptions (thousands)	1981	1986	1991	1996	2000	2001	2002	2003	2004	2005	2006	2007	2008
Digoxin and other positive inotropic drugs (2.1)	4,243	3,722	3,822	3,871	3,983	4,031	4,029	4,043	4,088	4,103	4,126	4,141	4,149
Diuretics (2.2)	20,678	21,996	22,195	23,106	27,738	30,203	32,185	34,432	36,546	37,619	37,582	37,355	37,536
Anti-arrhythmic drugs (2.3)	232	334	532	840	1,214	1,292	1,338	1,343	1,325	1,292	1,265	1,247	1,226
Beta-adrenoreceptor blocking drugs (2.4)	9,827	12,525	14,282	14,375	18,321	20,439	22,439	24,336	26,361	27,460	27,378	26,810	27,634
Antihypertensive therapy (2.5)	4,912	4,424	6,431	12,125	21,075	25,047	29,591	33,788	38,580	42,865	47,742	53,634	57,823
Nitrates, calcium blockers and potassium activators (2.6)	5,156	10,314	16,718	21,971	25,394	26,814	27,994	29,156	30,715	32,309	34,707	37,214	39,100
Sympathomimetics (2.7)	15	6	19	7	3	2	2	3	4	4	5	6	8
Anticoagulants and protamine (2.8)	629	900	1,356	2,609	4,152	4,609	4,975	5,389	5,871	6,294	6,790	7,309	7,991
Antiplatelet drugs (2.9)	281	1,058	3,619	9,002	16,552	18,891	21,601	24,428	27,356	30,218	32,779	35,382	38,124
Anti-fibrinolytic drugs and haemostatics (2.11)					267	282	289	300	310	311	327	352	358
Lipid-lowering drugs (2.12)	295	247	1,066	3,138	10,331	13,523	17,604	22,655	29,444	35,568	42,098	47,412	52,190
Local sclerosants (2.13)					1	1	0	0	0	0	0	0	0
All prescriptions for disease of the circulatory system	46,267	55,526	70,041	91,044	129,030	145,134	162,046	179,872	200,598	218,043	234,798	250,862	266,138

Notes:
The data up to 1990 are not consistent with data from 1991 onwards. Figures up to 1990 are based on fees and on a sample of 1 in 200 prescriptions dispensed by community pharmacists and appliance contractors only. Figures from 1991 are based on items and cover all prescriptions dispensed by community pharmacists, appliance contractors, dispensing doctors and prescriptions submitted by prescribing doctors for items personally administered. British National Formulary (BNF) codes in parentheses.

Source:
Office for National Statistics (2009). *Prescription cost analysis 2008*. The Information Centre: Leeds, and previous editions.

Figure 3.1
Prescriptions used in the prevention and treatment of CVD, selected BNF paragraphs, 1981 to 2008, England



(A) **Antihypertensive therapy** (B) **Lipid lowering drugs** (C) **Antiplatelet drugs** (D) **Anti-arrhythmic drugs**

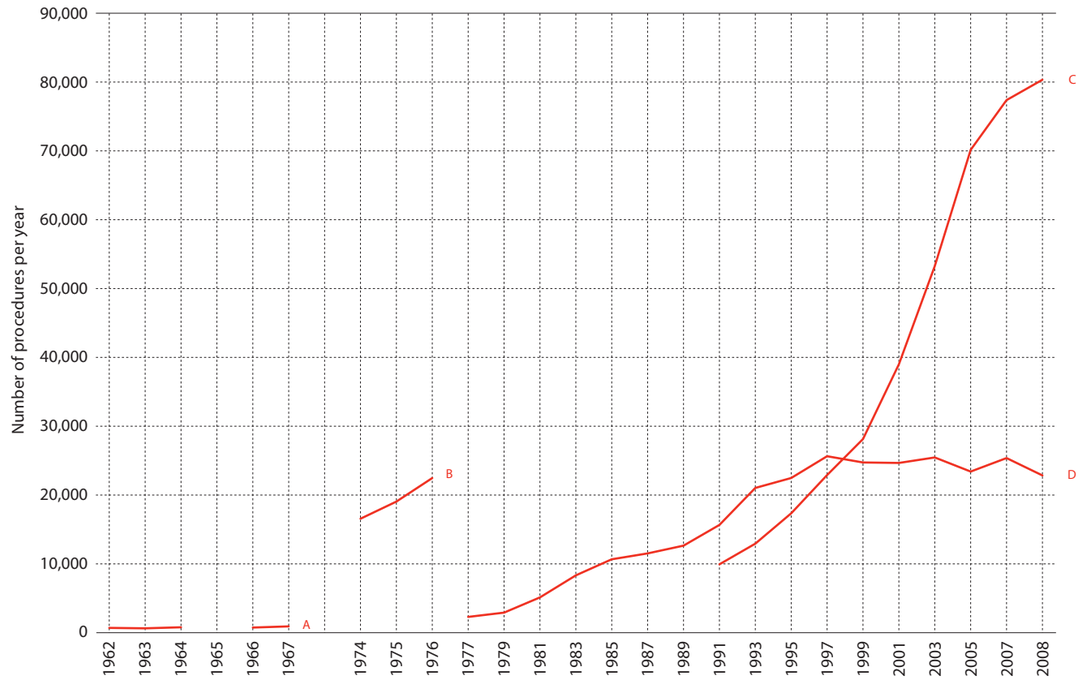
Table 3.2
Main cardiac procedures, 1962 to 1976, England and Wales, 1977 to 2008, United Kingdom

	Arteriosclerotic heart disese including coronory disease	Heart and intrathoracic vessels surgery	Coronary arter bypass surgery (CABG)	Percutaneous coronary interventions (PCI)
1962	700			
1963	640			
1964	790			
1966	750			
1967	920			
1974		16,560		
1975		19,050		
1976		22,470		
1977			2,297	
1979			2,918	
1981			5,130	
1983			8,332	
1985			10,667	
1987			11,521	
1989			12,648	
1991			15,659	9,933
1993			21,031	12,937
1995			22,475	17,344
1997			25,639	22,902
1999			24,733	28,133
2001			24,663	38,992
2003			25,461	53,261
2005			23,412	70,142
2007			25,372	77,373
2008			22,846	80,331

Notes:
Pre 1977 data estimated from 10% sample. Procedures performed within the private sector are not included.

Source:
Department of Health and Social Security (1972). *Hospital In-patient Enquiry 1962-1967.* HMSO: London. ¶ Department of Health and Social Security (1978). *Hospital In-patient Enquiry 1974, 1975 and 1976.* HMSO: London. ¶ British Cardiovascular Intervention Society (2009). Personal communication. ¶ The Society for Cardiothoracic Surgery in Great Britain & Ireland (2009). *National Adult Cardiac Database Report*. Dendrite: London.

Figure 3.2
Number of operations for coronary heart disease 1962 to 1976, England and Wales, 1977 to 2008, United Kingdom



(A) **Arteriosclerotic operations** (B) **Heart and intrathoracic vessels surgery** (C) **Percutaneous coronary interventions** (D) **Coronary artery bypass surgery**

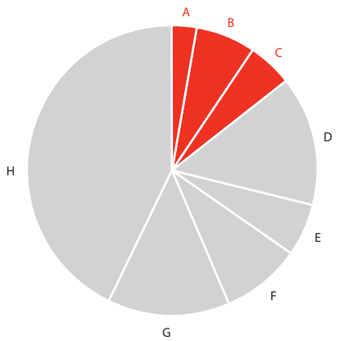
Table 3.3
Inpatient episodes by main diagnosis and sex, National Health Service hospitals, 1961, England and Wales

	Men	Women
All diagnoses	1,536,460	2,226,390
Diseases of circulatory system (400-468)	146,380	142,040
Coronary artery disease (420.1)	45,770	24,790
Hypertensive heart disease (440-447)	11,850	14,460
Other diseases of heart (421-22, 430-434)	27,090	27,690
Stroke (330-334)	30,240	36,300
Diabetes (260)	13,980	20,290
All cancer (140-239)	96,510	104,670
Malignant neoplasms (140-205)	96,410	99,080
Benign and unspecified neoplasms (210-239)	100	5,590
Diseases of respiratory system (470-527)	232,150	187,020
Diseases of urinary system (400-468)	146,380	142,040
Congenital malformations (750-759)	26,380	17,840
Symptoms and ill-defined conditions (780-795)	70,940	73,310
Fractures, injuries, poisoning (800-829; 860-869; 940-949; 960-979)	208,590	124,050
All other diagnoses	564,910	1,378,830

Notes:
Estimated from a 10% sample of hospital records. ICD-7 codes in parantheses.

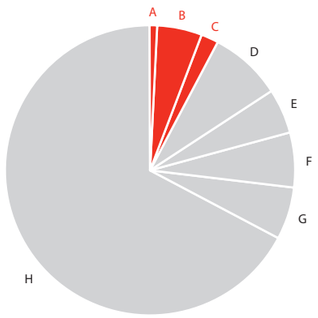
Source:
Ministry of Health and General Registrar Office (1964). *Report on Hospital In-patient Enquiry patterns of morbidity 1961*. HMSO: London.

Figure 3.3
Inpatient episodes by main diagnosis by sex, National Health Service hospitals, 1961, England and Wales



Men

(A) **Coronary heart disease — 3%**
(B) **Other cardiovascular disease — 7%**
(C) **Stroke — 5%**
(D) Respiratory disease — 15%
(E) Cancer — 6%
(F) Urinary disease — 9%
(G) Injury and poisoning — 14%
(H) All other causes — 44%



Women

(A) **Coronary heart disease — 1%**
(B) **Other cardiovascular disease — 5%**
(C) **Stroke — 2%**
(D) Respiratory disease — 8%
(E) Cancer — 5%
(F) Urinary disease — 6%
(G) Injury and poisoning — 6%
(H) All other causes — 67%

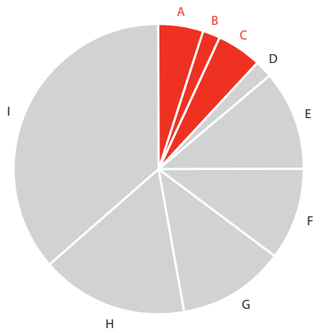
Table 3.4
Inpatient episodes by main diagnosis and sex, National Health Service hospitals, 1975, England and Wales

	Men	Women
All diagnoses	1,840,280	2,700,130
Cardiovascular disease (390-459)	244,130	212,810
Coronary heart disease (410-414)	84,430	44,310
Acute myocardial infarction (410)	57,440	27,180
Other coronary heart disease (411-414)	26,990	17,130
Stroke (430-438)	44,560	53,220
All cancer (140-239)	176,980	231,020
Malignant neoplasms (140-208)	138,010	141,190
Benign neoplasms and unspecified (210-239)	21,780	76,450
All diseases of the nervous system (320-359)	39,640	43,310
All diseases of the respiratory system (460-519)	194,280	148,300
All diseases of the digestive system (520-577)	225,920	195,640
Injury and poisoning (800-999)	288,270	149,195
All other diagnoses	671,060	1,719,855

Notes:
Estimated from a 10% sample of hospital records. ICD-8 codes in parantheses.

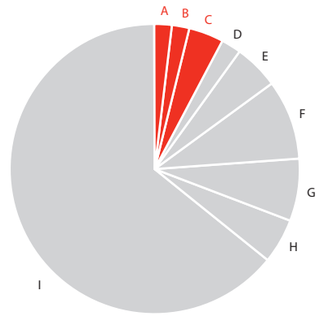
Source:
Department of Health and Social Security (1978). *Hospital In-patient Enquiry main tables 1975*. HSMO: London.

Figure 3.4
Inpatient episodes by main diagnosis and sex, National Health Service hospitals, 1975, England and Wales



Men

(A) **Coronary heart disease — 5%**
(B) **Stroke — 2%**
(C) **Other cardiovascular disease — 5%**
(D) Nervous system disease — 2%
(E) Respiratory disease — 11%
(F) Cancer — 10%
(G) Digestive system disease — 12%
(H) Injury and poisoning — 16%
(I) All other causes — 36%



Women

(A) **Coronary heart disease — 2%**
(B) **Stroke — 2%**
(C) **Other cardiovascular disease — 4%**
(D) Nervous system disease — 2%
(E) Respiratory disease — 5%
(F) Cancer — 9%
(G) Digestive system disease — 7%
(H) Injury and poisoning — 5%
(I) All other causes — 64%

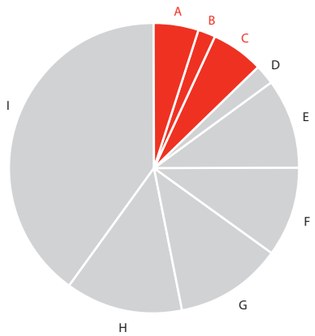
Table 3.5
Inpatient episodes by main diagnosis and sex, National Health Service hospitals, 1981, England and Wales

	Men	Women
All diagnoses	2,297,070	2,594,940
Cardiovascular disease (390-459)	295,970	255,590
Coronary heart disease (410-414)	104,890	54,220
Acute myocardial infarction (410)	66,720	33,640
Other coronary heart disease	38,170	20,580
Stroke (430-438)	52,850	62,390
All cancer (140-239)	226,840	262,250
Malignant neoplasms (140-208)	201,020	199,230
Benign neoplasms and unspecified (210-239)	25,820	63,020
All diseases of the nervous system (320-359)	48,200	52,810
All diseases of the respiratory system (460-519)	232,740	176,530
All diseases of the digestive system (520-579)	281,590	247,360
Injury and poisoning (800-999)	305,690	256,120
All other diagnoses	906,040	1,344,280

Notes:
Estimated from a 10% sample of hospital records. ICD-9 codes in parantheses.

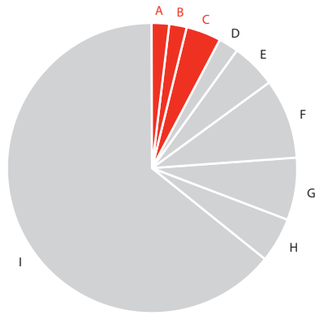
Source:
Department of Health and Social Security (1983). *Hospital In-patient Enquiry 1981 summary tables*. HMSO: London.

Figure 3.5
Inpatient episodes by main diagnosis and sex, National Health Service hospitals, 1981, England and Wales



Men

(A) **Coronary heart disease — 5%**
(B) **Stroke — 2%**
(C) **Other cardiovascular disease — 6%**
(D) Nervous system disease — 2%
(E) Respiratory disease — 10%
(F) Cancer — 10%
(G) Digestive system disease — 12%
(H) Injury and poisoning — 13%
(I) All other causes — 40%



Women

(A) **Coronary heart disease — 2%**
(B) **Stroke — 2%**
(C) **Other cardiovascular disease — 5%**
(D) Nervous system disease — 2%
(E) Respiratory disease — 7%
(F) Cancer — 10%
(G) Digestive system disease — 10%
(H) Injury and poisoning — 10%
(I) All other causes — 52%

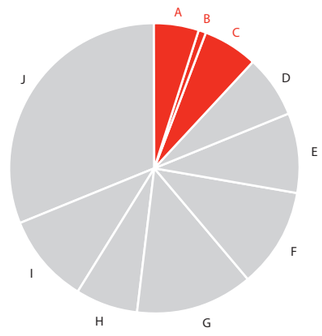
Table 3.6
Inpatient episodes by main diagnostis and sex, National Health Service hospitals, 1991/92, England

	Men	Women
All diagnoses	3,543,565	4,890,507
Cardiovascular disease (390-459)	429,631	386,376
Coronary heart disease (410-414)	173,506	94,997
Acute myocardial infarction (410)	72,844	43,674
Other coronary heart disease	100,662	51,323
Stroke (430-438)	49,188	57,754
Diabetes(250)	27,571	28,207
All cancer (140-239)	404,897	439,151
Malignant neoplasms (140-208)	340,340	307,895
All diseases of the nervous system (320-359)	231,299	264,567
All diseases of the respiratory system (460-519)	331,279	277,134
All diseases of the digestive system (520-579)	447,276	439,063
All diseases of the genitourinary system (580-629)	263,475	519,005
Injury and poisoning (800-999)	351,813	307,019
All other diagnoses	1,056,324	2,229,985

Notes:
Data based on finished consultant episodes. ICD-9 codes in parantheses.

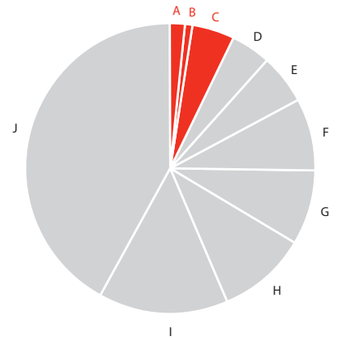
Source:
Department of Health (1994). *Hospital Episode Statistics 1991/92.* www.hesonline.nhs.uk (accessed October 2010).

Figure 3.6
Inpatient episodes by main diagnostis and sex, National Health Service hospitals, 1991/92, England.



Men

(A) **Coronary heart disease — 5%**
(B) **Stroke — 1%**
(C) **Other cardiovascular disease — 6%**
(D) Nervous system disease — 7%
(E) Respiratory disease — 9%
(F) Cancer — 11%
(G) Digestive system disease — 13%
(H) Genitourinary disease — 7%
(I) Injury and poisoning — 10%
(J) All other causes — 31%



Women

(A) **Coronary heart disease — 2%**
(B) **Stroke — 1%**
(C) **Other cardiovascular disease — 5%**
(D) Nervous system disease — 5%
(E) Respiratory disease — 6%
(F) Cancer — 9%
(G) Digestive system disease — 9%
(H) Genitourinary disease — 11%
(I) Injury and poisoning — 16%
(J) All other causes — 46%

Table 3.7
Inpatient episodes by main diagnosis and sex, National Health Service hospitals, 2000/01, England

	England	
	Men	Women
All diagnoses	5,321,016	6,943,661
All diseases of the circulatory system (I00-I99)	592,714	479,281
Coronary heart disease (I20-I25)	243,564	134,968
Angina pectoris (I20)	86,564	61,833
Acute myocardial infarction (I21)	57,919	34,148
Chronic coronary heart disease (125)	87,327	33,089
Heart failure (I50)	52,803	53,227
Stroke (I60-I69)	68,183	76,478
Diabetes (E10-E14)	39,070	33,282
All cancer (C00-D48)	659,888	694,009
Colo-rectal cancer (C18-C21)	97,766	67,807
Lung cancer (C33-C34)	48,077	30,728
Breast cancer (C50)	773	125,961
Bladder cancer (C67)	59,659	20,845
All diseases of the nervous system (G00-G99)	109,192	126,264
All diseases of the respiratory system (J00-J99)	370,188	335,711
All diseases of the digestive system (K00-K93)	647,052	655,330
All diseases of the genitourinary system (N00-N99)	298,095	495,645
Injury and poisoning (S00-T98)	387,629	345,724
All other diagnoses	2,217,188	3,778,415

Notes:
Data from finished consultant episodes. Pregnancy cases are not included. ICD-10 codes in parantheses.

Source:
Department of Health (2002). *Hospital Episode Statistics 2000/01.* www.hesonline.nhs.uk (accessed October 2010).

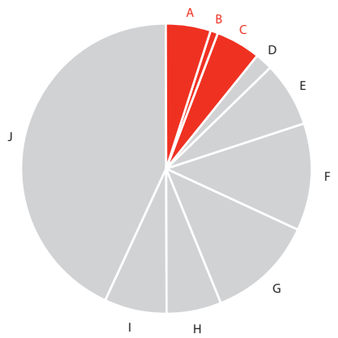
Table 3.8
Inpatient episodes by main diagnosis and sex, National Health Service hospitals, 2009/10, England, Scotland and Wales

	England		Scotland		Wales	
	Men	Women	Men	Women	Men	Women
All diagnoses	7,408,085	9,398,111	656,837	735,320	402,707	505,134
All diseases of the circulatory system (I00-I99)	759,672	598,575	81,519	64,889	46,544	37,543
Coronary heart disease (I20-I25)	265,667	142,008	31,884	17,620	17,614	9,726
Angina pectoris (I20)	63,166	45,325	7,164	5,469	4,011	3,069
Acute myocardial infarction (I21)	62,326	39,316	12,301	7,169	4,118	2,773
Other coronary heart disease	140,175	57,367	12,419	4,982	9,485	3,884
Heart failure (I50)	57,987	54,989	6,131	5,360	4,151	3,791
Stroke (I60-I69)	97,878	105,827	10,612	11,321	5,995	6,829
Diabetes (E10-E14)	57,987	54,989	3,410	3,267	2,515	2,052
Obesity (E66)	2,695	8,478	148	330	48	94
All cancer (C00-D48)	831,627	869,898	88,967	108,040	39,123	35,972
Colo-rectal cancer (C18-C21)	89,096	63,384	12,240	9,983	3,167	2,354
Lung cancer (C33-C34)	58,669	45,642	10,397	9,271	3,039	2,403
Breast cancer (C50)	947	176,015	145	26,930	14	4,064
Bladder cancer (C67)	67,801	21,056	3,697	1,705	3,522	1,118
All diseases of the nervous system (G00-G99)	173,922	200,737	14,754	17,861	168	150
All diseases of the respiratory system (J00-J99)	551,965	528,305	54,223	57,715	37,141	36,541
All diseases of the digestive system (K00-K93)	955,848	998,011	87,587	94,085	52,760	55,651
All diseases of the genitourinary system (N00-N99)	427,183	646,780	34,913	54,376	24,911	36,630
Injury and poisoning (S00-T98)	574,222	567,078	61,423	55,777	34,015	32,351
All other diagnoses	3,072,964	4,925,260	229,893	278,980	110,366	228,139

Notes:
Data from finished consultant episodes. Pregnancy cases are not included. ICD-10 codes in parantheses. Data for Wales from 2008/09.

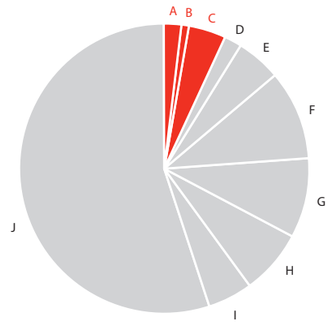
Source:
Department of Health (2010). *Hospital Episode Statistics 2009/10.* www.hesonline.nhs.uk (accessed Oct 2010). ¶ Information Services Division Scotland (2009). *Main diagnosis discharges from hospital 2007/08.* www.isdscotland.org (accessed May 2010). ¶ Health Solutions Wales (2009). *Primary Diagnosis – 2008/09.* www.infoandstats.wales.nhs.uk (accessed Aug 2010).

Figure 3.7
Inpatient episodes by main diagnosis and sex, National Health Service hospitals, 2000/01, England



Men

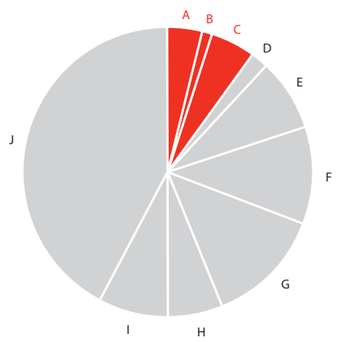
(A) **Coronary heart disease — 5%**
(B) **Stroke — 1%**
(C) **Other cardiovascular disease — 5%**
(D) Nervous system disease — 2%
(E) Respiratory disease — 7%
(F) Cancer — 12%
(G) Digestive system disease — 12%
(H) Genitourinary disease — 6%
(I) Injury and poisoning — 7%
(J) All other causes — 43%



Women

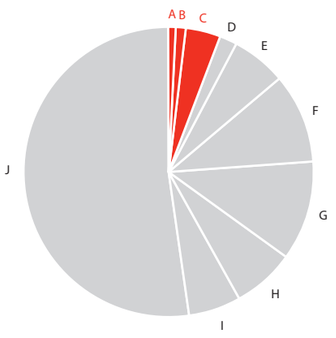
(A) **Coronary heart disease — 2%**
(B) **Stroke — 1%**
(C) **Other cardiovascular disease — 4%**
(D) Nervous system disease — 2%
(E) Respiratory disease — 5%
(F) Cancer — 10%
(G) Digestive system disease — 9%
(H) Genitourinary disease — 7%
(I) Injury and poisoning — 5%
(J) All other causes — 55%

Figure 3.8
Inpatient episodes by main diagnosis and sex, National Health Service hospitals, 2009/10, Great Britain



Men

(A) **Coronary heart disease — 4%**
(B) **Stroke — 1%**
(C) **Other cardiovascular disease — 5%**
(D) Nervous system disease — 2%
(E) Respiratory disease — 8%
(F) Cancer — 11%
(G) Digestive system disease — 13%
(H) Genitourinary disease — 6%
(I) Injury and poisoning — 8%
(J) All other causes — 42%

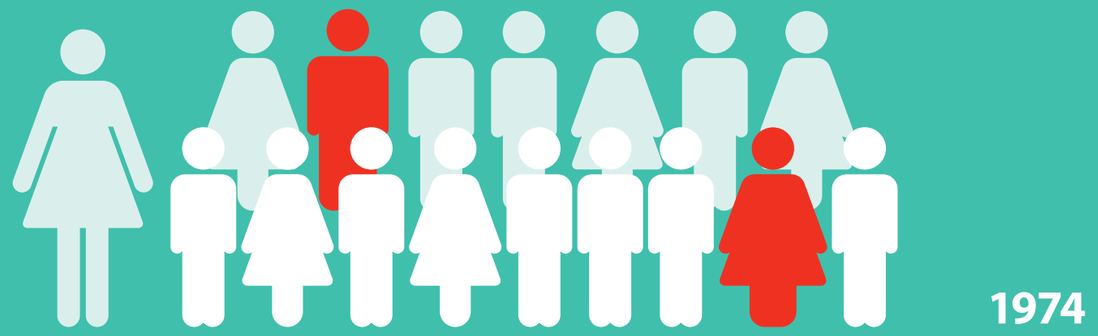


Women

(A) **Coronary heart disease — 1%**
(B) **Stroke — 1%**
(C) **Other cardiovascular disease — 4%**
(D) Nervous system disease — 2%
(E) Respiratory disease — 6%
(F) Cancer — 10%
(G) Digestive system disease — 11%
(H) Genitourinary disease — 7%
(I) Injury and poisoning — 6%
(J) All other causes — 52%

4. Cardiovascular risk factors

Number of overweight and obese kids more than doubles in a generation: in 1974, around 10% of boys and girls aged 5-10 were overweight and obese, rising to around 23% in 2003.



4. Cardiovascular risk factors

This chapter reports on trends in the prevalence of cardiovascular risk factors – behaviours and conditions that increase the risk of developing coronary heart disease (CHD) and associated conditions. Specifically, the chapter reports on trends in smoking, poor diet, physical inactivity, alcohol consumption and obesity. Data on long term trends in the prevalence of diabetes, raised blood pressure and raised cholesterol are very hard to obtain. There are problems in comparability of estimates conducted fifty years apart: different populations, sampling techniques, measurement techniques, and definitions of raised blood pressure, raised cholesterol and diabetes are all problematic. For this reason, these conditions are not discussed here. A discussion of some shorter time trends on raised blood pressure, raised cholesterol and diabetes (covering around twenty years of data) is available in the most recent compendium of Coronary Heart Disease Statistics, published by the British Heart Foundation in 2010 [1].

Smoking

The impact of smoking on health first became widely known and accepted in the late 1950s / early 1960s. Initially, researchers were concerned with the effect of smoking on cancer rates. One of the earliest studies to show a significant impact of smoking on health was Sir Richard Doll's analysis of survival rates for doctors, which showed substantially increased lung cancer rates in doctors who smoked compared to non-smokers [2]. The relationship between smoking and CHD was established soon after. As a result, smoking rates in the UK first began to fall in the 1960s, with the number of cigarettes smoked per person per day dropping from a peak of around 12 for men and 7 for women to about 7 for men and 5 for women by the mid-1980s [3].

The prevalence of smoking in Great Britain has been measured consistently since 1972 in the *General Lifestyle Survey*. Prevalence rates declined sharply between 1972 and 1994, falling from 52% to 28% in men and from 41% to 26% in women. Since then, prevalence has continued to fall, but more slowly. In 2008, 22% of men in Great Britain smoked, and 21% of women. The rate of decline in prevalence since 1972 has generally been similar for different age groups, although prevalence rates in older men have declined slightly quicker than for younger men (Table and Figure 4.1).

The general trend of decrease in the prevalence of smoking and in the amount of cigarettes smoked is shown in the domestic supply of tobacco in the United Kingdom. These data are collected by the Food and Agriculture Organization and are an annual measure of the amount of tobacco that is imported into the UK. Trends in these rates are fairly turbulent, as cigarette manufacturers may import more tobacco in years when prices are deflated. However, generally the domestic supply of tobacco in the UK has reduced substantially since 1961. In the early 1960s, around 300 tonnes of tobacco per year were available per 100,000 adults in the UK – this had fallen to 76 tonnes by 2006/07 (Table and Figure 4.2).

Poor diet

Poor diet is an important risk factor for CHD. High intake of saturated fat raises cholesterol levels, high salt intake can raise blood pressure and low intakes of fibre, fruit and vegetables can lead to a greater susceptibility to cardiovascular disease. Apart from the nutritional content of our diet, the total amount of energy we intake can affect our risk of heart disease; intake of more calories than are expended, can result in excess weight and obesity.

Information on trends in UK diet comes from the National Food Survey and the Family Food Survey. Both these surveys are based on household expenditure on food, and do not take account of wastage of food after it has been bought. A recent report looking at food wastage in UK homes estimated that up to 25% of bought food is wasted [4] therefore this should be considered when interpreting trends in diet when using expenditure as a proxy to consumption.

Overall, the quality of our diet has improved in some aspects since the 1970s; for example, saturated fat and sugar intake has considerably decreased. Trends in total energy intake vary according to the method of measurement. When using household expenditure data, consumption of calories appears to have steadily decreased since 1961. However, this does not take into account expenditure on food for consumption outside of the home. When energy intake is measured using food availability data (a measure of the food commodities available for human consumption in the UK, derived from import and export data), total energy intake increased between 1974 and 2007. Food availability data does not take account of wastage at any stage in the food chain, and it is difficult to assess which measure of trends in energy intake is more accurate. In the context of rising obesity levels (see below), it is likely that energy intake has increased over time, although this needs to be considered in conjunction with trends in physical activity levels (Table and Figure 4.3).

The decrease in saturated fat levels in our diet is reflected in trends in the types of foods we eat. In 1961, the majority of milk we ate came from whole milk; however this has changed over the past 50 years, so that by the early 1990s, the majority of our milk intake came from skimmed milk. A similar trend is seen in the types of oils and fats we eat. Butter, margarine and lard were the predominant types of fats eaten in 1961, but these have now been replaced by low fat spreads and vegetable oils, which are much lower in saturated fat. Finally, a lower intake of saturated fat is also observed in the change in the type of meats we now eat. Consumption of red meat, such as beef, lamb and pork has significantly declined, being replaced with poultry, which is much lower in saturated fat than red meat (Tables and Figures 4.4, 4.5 and 4.6).

A diet containing oily fish has been linked to lower incidence of cardiovascular disease [5]. The evidence surrounding this became more prominent in the 1990s, and increases in the consumption of oily fish have been observed from the early 1990s to 2008. This increase is seen in conjunction with a decrease in consumption of cooked and fresh white fish, suggesting that consumption of oily fish may be replacing other fish consumption rather than other protein-based food groups such as meat (Table and Figure 4.7).

Between 1970 and 2007, the availability of fruits and vegetables to the UK population increased by 60%. It appears that most of this increase is likely to be due to an increase in demand for fruit, as over the past 50 years, consumption of fruit has increased in the UK, whereas consumption of vegetables has decreased (Table and Figures 4.8 and 4.9).

Physical inactivity

The role of physical inactivity as a risk factor for developing cardiovascular disease and diabetes has been established by many studies around the world [6,7]. To produce the maximum benefit, exercise needs to be regular and aerobic. This should involve the use of the major large muscle groups steadily and rhythmically, so the heart rate and breathing increase significantly. The recommended level for adults is 30 minutes of physical activity on at least 5 days a week [8].

Physical activity levels in Great Britain were first measured in a national survey by the General Household Survey in 1973. However, definitions and measurements of physical activity have changed a number of times since then, leading to difficulty in assessing trends in physical activity rates. Between 1973 and 1983, the prevalence of participation in outdoor sports increased dramatically – more than doubling in women (from 11% in 1973 to 24% in 1983). More recently, the prevalence of meeting Government recommendations for physical activity has slowly increased in England, Wales and Scotland since the mid 1990s. Prevalence rates are highest in Scotland for both men and women (Table 4.17).

Because of the changing definitions and measurements, it is useful to look at proxy measures for physical inactivity. Television ownership and car ownership are two such examples of proxy measures for sedentary behaviour[9]. In 1961, 12 million out of 17 million households in the UK had at least one working TV. The percentage of households with access to a TV quickly increased, and by the mid 1970s 97% of all households had at least one TV. Since 2000 the number of households with access to digital TV, with its increased range of channels, has increased dramatically (Table and Figure 4.11).

In 1961, around 70% of households in Great Britain did not have a car or van. However, this percentage has consistently fallen since the early 1960s – in 2009 only 25% of households had no car or van. The number of households with two or more cars or vans has increased consistently since the early 1960s. Active travel (e.g. walking or cycling) is likely to have fallen dramatically over this time period due to increases in access to cars (Table and Figure 4.12).

Alcohol consumption

High levels of alcohol intake increases the risk of CVD. The World Health Report 2002 estimated that 2% of CHD and almost 5% of stroke in men in developed countries was due to alcohol. However, the impact of alcohol consumption in women in developed countries was estimated to be positive – if no alcohol were consumed, there would have been a 3% increase in CHD and a 16% increase in stroke [10].

The prevalence of heavy drinking in Great Britain has been measured since 1978 in the General Household Survey. The definition of a "heavy drinker" has changed a number of times since then, which makes interpretation of trends complicated. However, looking at data from national surveys restricted to years when definitions or measurements are consistent, it appears that prevalence of heavy drinking has not substantially increased in either men or women since the late 1970s. The gender gap in the prevalence of heavy drinking has narrowed considerably since the late 1970s, but this is largely due to differences in definitions (e.g. in 1978 the definition of 'heavy drinking' was the same for both men and women, whereas current definitions have a lower threshold for women) and measurements (the number of units assigned to a glass of wine was revised upwards in 2006, due to increases in the alcoholic strength of wine and in standard serving sizes) (Table and Figure 4.13).

Data from the World Health Organization also suggests that the total amount of alcohol consumed in the UK has not changed much since the late 1970s. However, the type of alcohol we drink has changed over this period. Whilst beer has consistently been the most consumed drink in the UK, the total consumption of beer has been falling since the late 1970s. Meanwhile the total consumption of wine has been increasing over this time period. In the mid 1990s the total amount of alcohol consumed as wine in the UK overtook the amount consumed in spirits for the first time (Table and Figure 4.14).

Overweight and obesity

Overweight and obesity increase the risk of developing CHD. As well as being an independent risk factor for CHD, obesity increases the risk of developing diabetes, impaired glucose tolerance, raised cholesterol and high blood pressure. Obesity is widely prevalent in the UK population; it has been predicted that by 2050, 60% of men and 50% of women could be clinically obese [11] (BMI of 30 and above).

Obesity has been of some concern in the UK for at least 35 years. A government report published in 1976 outlined increases in body weight in the UK population since the war. This report collated available measurements of BMI in adults taken from different studies around the UK at different time points. The results from those studies are repeated in this chapter, and additionally are compared to more recent results from the Health Survey for England series. Childhood obesity levels have been assessed since the 1970s in the National Survey of Health and Growth and the Health Survey for England, and trends in childhood obesity are also displayed here.

Between 1960 and 1974 the mean BMI of men aged below 60 was largely within the 'normal' range of 20 to 25. In 1974 women generally had a lower mean BMI compared to the men, with the exception of the 55 to 60 age group which was slightly higher for women. From the early 1990s however, mean BMI for all age groups except 16-24 has been above the 'normal' cut-off of 25. The mean BMI of all but the very youngest age groups increased from the 1993 level in 2003 and in 2008 (Table 4.15).

Childhood obesity is also a particular problem in the UK, and has been increasing since the mid 1980s in both boys and girls. People who are obese or overweight as children are more likely to be so in adulthood [12]. While the levels for the majority of risk factors for heart disease have improved over the past 50 years, the increasing trend in obesity (and associated increases in diabetes) has the potential to change or slow the improvements in the CHD incidence and mortality that has been reported in this publication (Table and Figures 4.16a,b).

1. Scarborough P, Bhatnagar P, Wickramasinghe K, Smolina K, Mitchell C, Rayner M (2010). *Coronary Heart Disease Statistics 2010 edition*. British Heart Foundation: London.
2. Doll R, Bradford Hill A (1954). 'The mortality of doctors in relation to their smoking habits'. *British Medical Journal*, 328: 1529-1533.
3. Doll R, Darby S, Whitley E (1997). 'Trends in mortality from smoking-related diseases'. In: *The Health of Adult Britain 1841-1994.* Ed: Charlton J, Murphy M. The Stationery Office: London.
4. Waste & Resources Action Programme (2009). *Household food and drink waste in the UK. Waste & Resources Action Programme*: Banbury.
5. Kris-Etherton PM, Harris WS, Appel LJ; Nutrition Committee (2003). 'Fish consumption, fish oil, omega-3 fatty acids, and cardiovascular disease'. *Arteriosclerosis, Thrombosis and Vascular Biology,* 23(2): e20-30.
6. Hu G, Tuomilehto J, Silventoinen K, Barengo N, Peltonen M, Jousilahti P (2005). 'The effects of physical activity and body mass index on cardiovascular, cancer and all-cause mortality among 47 212 middle-aged Finnish men and women'. *International Journal of Obesity*, 29: 894–902.
7. Sigal R, Kenny G, Wasserman D, Castaneda-Sceppa C, White R (2006). 'Physical activity/exercise and type 2 diabetes. A consensus statement from the American Diabetes Association'. *Diabetes Care*, 29: 1433–1438.
8. Department of Health (2004). *At least five a week: evidence on the impact of physical activity and its relationship to health*. Department of Health: London
9. Allender S, Peto V, Scarborough P, Boxer A, Rayner M (2006). *Diet, physical activity and obesity statistics*. British Heart Foundation: London.
10. World Health Organization (2002). *The World Health Report 2002. Reducing Risks, Promoting Healthy Life.* World Health Organization: Geneva.
11. Butland BB, Jebb S, Kopelman P, McPhearson K, Thomas S, Mardell J, Parry V (2007). *Foresight. Tackling obesities: future choices – project report. 2nd edition.* Department of Innovation, Universities and Skills: London.
12. Serdula MK, Ivery D, Coates RJ, Freedman DS, Williamson DF, Byers T (1993). 'Do obese children become obese adults? A review of the literature'. *Preventive Medicine*, 22(2): 167-77

Table 4.1
Cigarette smoking by sex and age, 1972 to 2008, Great Britain

	1972	1974	1976	1978	1980	1982	1984	1986	1988	1990	1992	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Men																							
16-19	43	42	39	35	32	31	29	30	28	28	29	28	26	30	30	25	22	27	23	23	20	22	18
20-24	55	52	47	45	44	41	40	41	37	38	39	40	43	42	35	40	37	38	36	34	33	32	29
25-34	56	56	48	48	47	40	40	37	37	36	34	34	38	37	39	38	36	38	35	34	33	29	30
35-49	55	55	50	48	45	40	39	37	37	34	32	31	30	32	31	31	29	32	31	29	26	25	24
50-59	54	53	49	48	47	42	39	35	33	28	28	27	28	27	27	26	27	26	26	25	23	22	23
60+	47	44	40	38	36	33	30	29	26	24	21	18	18	16	16	16	17	16	15	14	13	13	13
All ages	52	51	46	45	42	38	36	35	33	31	29	28	29	28	29	28	27	28	26	25	23	22	22
Unweighted base	*10,351*	*9,852*	*10,888*	*10,480*	*10,454*	*9,199*	*8,417*	*8,874*	*8,673*	*8,106*	*8,417*	*7,642*	*7,172*	*6,579*	*6,593*	*7,055*	*6,837*	*8,097*	*6,868*	*10,038*	*7,677*	*7,240*	*6,700*
Women																							
16-19	39	38	34	33	32	30	32	30	28	32	25	27	32	31	28	31	29	25	25	26	20	20	26
20-24	48	44	45	43	40	40	36	38	37	39	37	38	36	39	35	35	38	34	29	30	29	30	31
25-34	49	46	43	42	44	37	36	35	35	34	34	30	34	33	32	31	33	31	28	29	26	23	25
35-49	48	49	45	43	43	38	36	34	35	33	30	28	30	28	27	28	27	28	28	26	25	23	23
50-59	47	48	46	42	44	40	39	35	34	29	29	26	26	27	28	25	24	23	22	23	22	21	20
60+	25	26	24	24	24	23	23	22	21	20	19	17	19	16	15	17	14	14	14	13	12	12	12
All ages	41	41	38	37	37	33	32	31	30	29	28	26	28	26	25	26	25	24	23	23	21	20	21
Unweighted base	*12,143*	*11,480*	*12,554*	*12,156*	*12,100*	*10,641*	*9,788*	*10,304*	*10,122*	*9,445*	*9,764*	*9,108*	*8,501*	*7,830*	*7,496*	*8,299*	*7,951*	*9,327*	*8,029*	*11,627*	*9,005*	*8,380*	*7,930*
Total																							
16-19	41	40	37	34	32	30	31	30	28	30	27	27	29	31	29	28	25	26	24	24	20	21	22
20-24	51	48	46	44	42	40	38	39	37	38	38	39	39	40	35	37	38	36	32	32	31	31	30
25-34	52	51	46	45	45	38	38	36	36	35	34	32	36	35	35	34	34	34	31	31	30	26	27
35-49	51	52	47	45	44	39	37	36	36	34	31	30	30	30	29	29	28	30	29	27	25	24	24
50-59	50	51	47	45	45	41	39	35	33	29	29	27	27	27	27	26	26	25	24	24	22	21	22
60+	34	34	31	30	29	27	26	25	23	21	20	17	18	16	16	17	15	15	14	14	12	12	13
All ages	46	45	42	40	39	35	34	33	32	30	28	27	28	27	27	27	26	26	25	24	22	21	21
Unweighted base	*22,494*	*21,332*	*23,442*	*22,636*	*22,554*	*19,840*	*18,205*	*19,178*	*18,795*	*17,551*	*18,181*	*16,750*	*15,673*	*14,409*	*14,089*	*15,354*	*14,788*	*17,424*	*14,897*	*21,665*	*16,682*	*15,620*	*14,630*

Notes:
From 2000 data are weighted for non-response. Pre-2000 data are unweighted. The effect of weighting on smoking data appears slight: it increased the overall prevalence of smoking in 2000 by one percentage point, from 26% to 27%.

Source:
Office for National Statistics (2009). *General Lifestyle Survey 2008*. The Stationery Office: London.

Figure 4.1
Prevalence of smoking by sex, 1972 to 2008, Great Britain

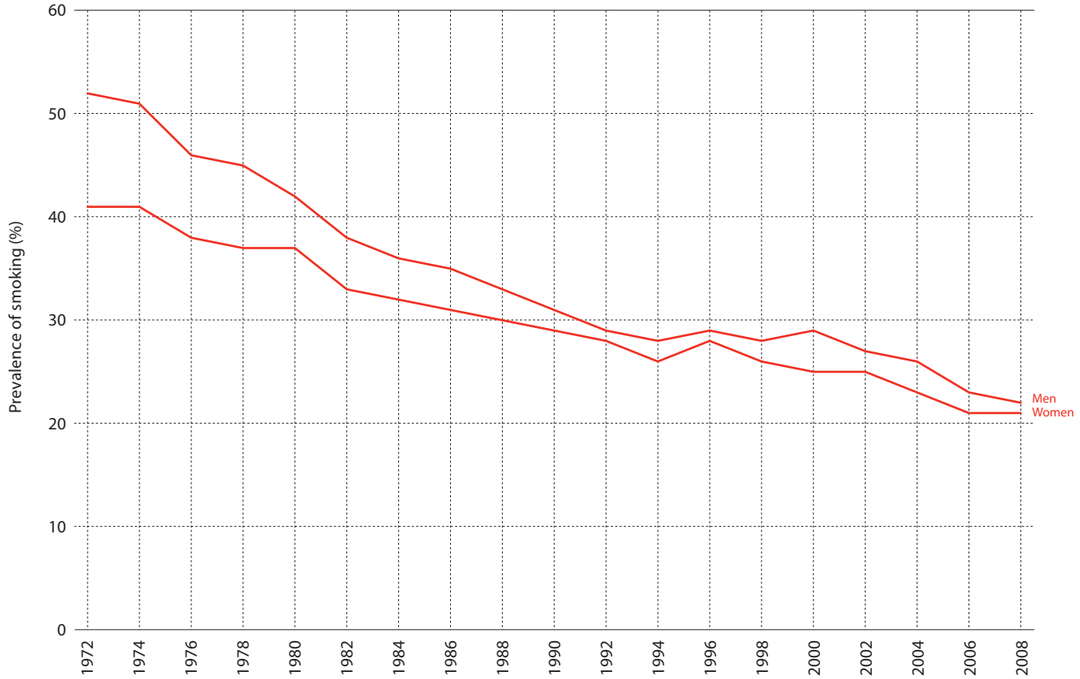


Table 4.2
Domestic supply of tobacco, 1961 to 2007, United Kingdom

	Total tobacco availablity (tonnes)	Tobacco availability (tonnes per 100,000 per year)
1961-65	636,572	309.7
1966-70	572,675	272.5
1971-75	610,046	285.2
1976-80	577,684	263.5
1981-85	476,557	210.9
1986-90	445,166	192.9
1991-95	514,261	220.9
1996-00	458,726	194.7
2001-05	153,982	63.3
2006-07	76,224	76.2

Notes:
Tobacco availability refers to measures of 'domestic supply', which measures domestic production plus imports, minus exports and accounts for changes in stock. Tobacco availability per 100,000 per year is a measure of tobacco availability scaled by the size of the population of the UK aged 15 and over. No data were available for 2002, and the measure for this year has been constructed as an average of domestic supply in the years 1999, 2000, 2001, 2003, 2004 and 2005.

Source:
Food and Agriculture Organization (2010). *FAOSTAT website* (www.faostat.fao.org), accessed October 2010.

Figure 4.2
Domestic supply of tobacco per 100,000 adults, 1961 to 2007, United Kingdom

Notes:
The plotted line is smoothed by taking five year moving averages. The dots indicate the data points for individual years.

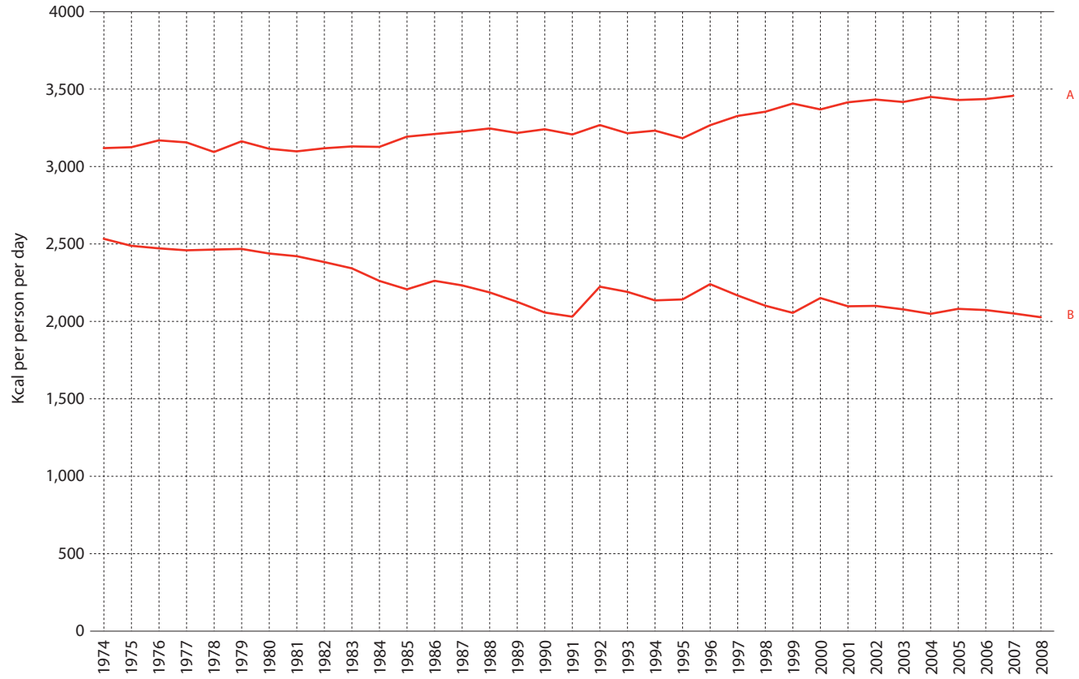
Table 4.3
Nutrient intake, 1974 to 2008, Great Britain

	Energy kcal	Fat g	Saturated fat g	Carbohydrate g	Total sugars g	Non-milk extrinsic sugars g	Fibre g
	Per person per day						
1974	2,534	111	52	327			
1975	2,489	112	53	313			
1976	2,473	110	52	315			
1977	2,460	110	49	311			
1978	2,465	111	49	310			
1979	2,469	112	50	306			
1980	2,439	112	49	301			
1981	2,422	110	48	301			
1982	2,384	110	47	294			
1983	2,344	108	47	287			
1984	2,262	104	44	279			
1985	2,208	102	43	269			
1986	2,263	105	43	275			
1987	2,233	103	42	273			
1988	2,188	100	41	267			
1989	2,127	97	40	260			
1990	2,058	94	37	253			
1991	2,031	92	36	252			
1992	2,225	97	38	278	132	90	13.2
1993	2,191	94	37	275	130	88	13.0
1994	2,137	91	36	270	129	87	12.9
1995	2,143	89	36	272	129	87	12.8
1996	2,241	93	37	287	134	91	13.7
1997	2,168	89	35	277	130	88	13.6
1998	2,102	86	34	268	125	84	13.4
1999	2,056	83	33	265	123	82	13.2
2000	2,152	86	35	277	131	88	13.9
2001	2,098	86	34	264	123	81	13.3
2002	2,101	85	34	266	124	82	13.5
2003	2,079	85	34	261	124	82	13.1
2004	2,050	83	33	257	123	80	13.2
2005	2,082	85	33	262	123	79	13.8
2006	2,074	85	33	259	121	77	13.8
2007	2,052	84	33	256	119	76	13.4
2008	2,028	83	32	254	117	76	13.3

Notes:
Fibre as non-starch polysaccharides. Carbohydrate is available carbohydrate, calculated as monosaccharide.

Source:
Department for the Environment, Food and Rural Affairs (2010). *National Food Survey and Family Food Survey trend data*. http://www.defra.gov.uk/evidence/statistics (accessed October 2010).

Figure 4.3
Total energy intake, 1974 to 2008, comparison of two measures, United Kingdom



(A) **Estimated by total food commodities available for consumption** (B) **Estimated by foods purchased by consumer**

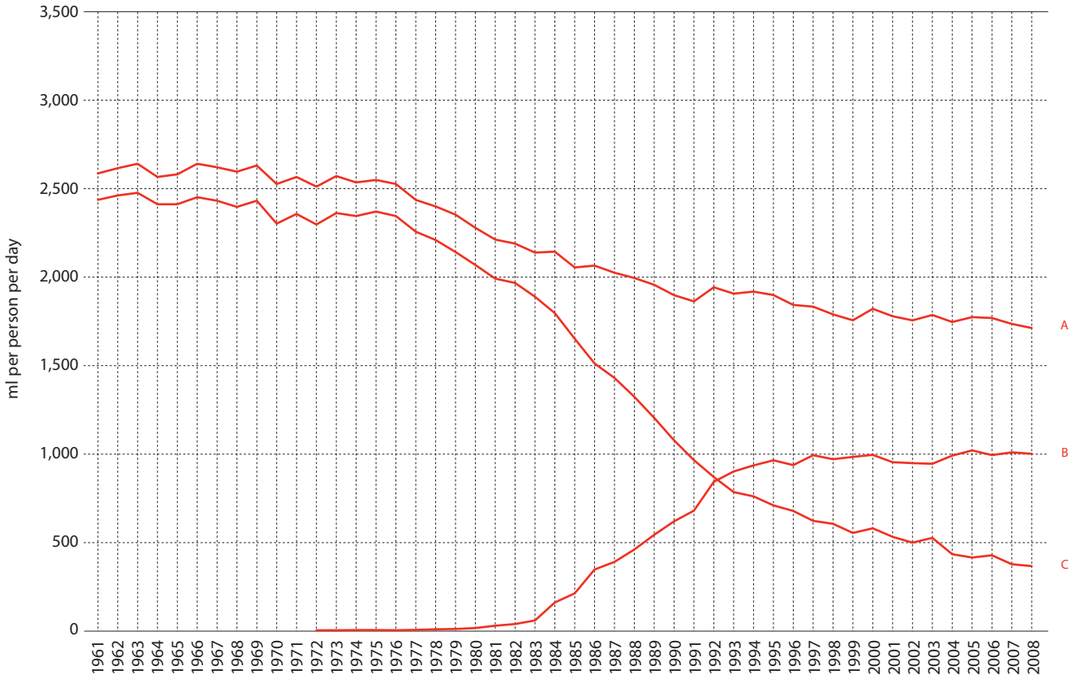
Table 4.4
Consumption of milk, 1961 to 2008, Great Britain

	Liquid wholemilk	Skimmed milk	Total milk and cream
	ml per person per week		
1961	2,784		2,955
1963	2,830		3,017
1965	2,756		2,949
1967	2,779		2,995
1969	2,779		3,006
1971	2,694		2,932
1973	2,699	6	2,938
1975	2,709	7	2,913
1977	2,579	8	2,784
1979	2,448	14	2,689
1981	2,276	35	2,528
1983	2,159	69	2,444
1985	1,888	244	2,348
1987	1,635	447	2,314
1989	1,377	622	2,236
1991	1,104	778	2,129
1993	898	1,031	2,179
1995	812	1,103	2,170
1997	712	1,136	2,095
1999	634	1,125	2,007
2001	609	1,091	2,033
2002	572	1,085	2,006
2003	602	1,081	2,041
2004	497	1,133	1,996
2005	475	1,167	2,027
2006	490	1,137	2,022
2007	432	1,154	1,984
2008	420	1,145	1,957

Notes:
Skimmed milk includes dairy desserts and other milk until 1983. From 2001 to 2008, data are from Family Food Survey trend tables.

Source:
Department for the Environment, Food and Rural Affairs (2010). *National Food Survey and Family Food Survey trend data.* http://www.defra.gov.uk/evidence/statistics (accessed October 2010).

Figure 4.4
Consumption of milk, 1961 to 2008, Great Britain



(A) **Total milk and cream** (B) **Skimmed milk** (C) **Liquid wholemilk**

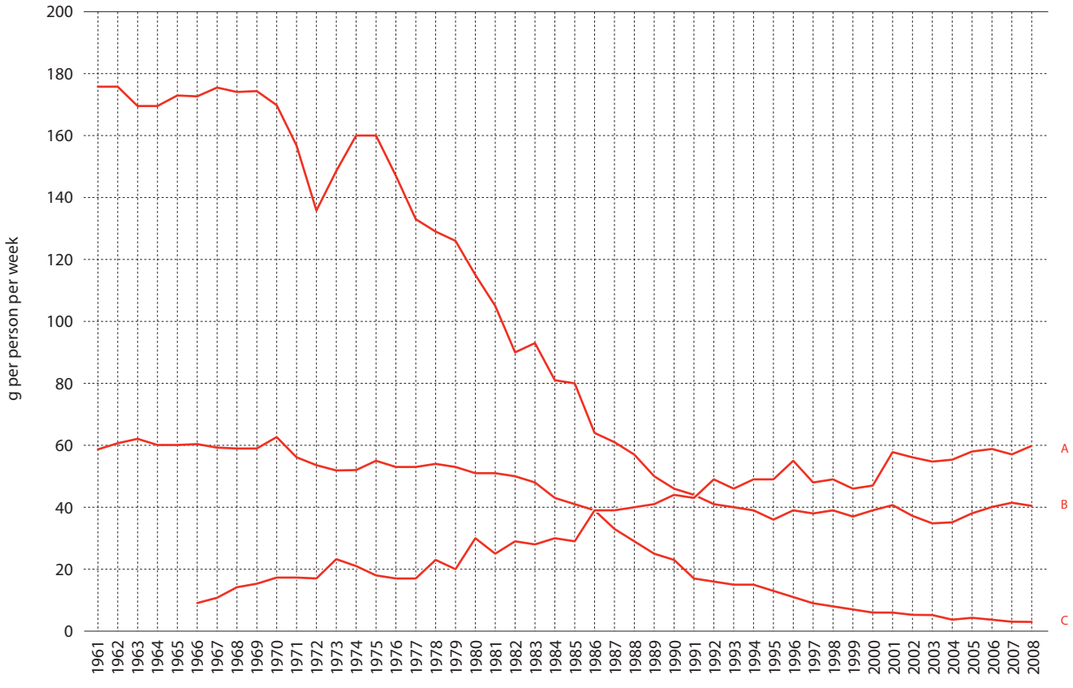
Table 4.5
Consumption of fats and oils, 1961 to 2008, Great Britain

	Butter	Margarine	Lard	Vegetable oils	Low fat spreads	Reduced fat spreads	Total fats
	g per person per week						
1961	176	94	59				342
1963	170	94	62				341
1965	173	86	60				336
1967	175	85	59	11			338
1969	174	79	59	15			335
1971	157	89	56	17			329
1973	149	86	52	23			318
1975	160	74	55	18			315
1977	133	98	53	17			311
1979	126	103	53	20			313
1981	105	116	51	25			313
1983	93	116	48	28			303
1985	80	106	41	29	13		286
1987	61	113	33	39	20	11	285
1989	50	98	25	41	25	21	269
1991	44	89	17	43	26	21	248
1993	40	70	15	46	26	26	230
1995	36	41	13	49	26	46	218
1997	38	26	9	48	22	55	203
1999	37	20	7	46	22	49	186
2001	41	13	6	58	14	58	196
2002	37	13	5	56	15	55	190
2003	35	12	5	55	13	58	186
2004	35	11	4	55	23	44	182
2005	38	20	4	58	16	39	183
2006	40	18	4	59	13	43	184
2007	41	19	3	57	12	41	181
2008	40	22	3	60	11	40	184

Notes:
Totals may include other foods so may not equal the sum of subgroups. From 2001 to 2008, data are from Family Food Survey trend tables.

Source:
Department for the Environment, Food and Rural Affairs (2010). *National Food Survey and Family Food Survey trend data.* http://www.defra.gov.uk/evidence/statistics (accessed October 2010).

Figure 4.5
Consumption of fats, 1961 to 2008, Great Britain



(A) **Vegetable oil** (B) **Butter** (C) **Lard**

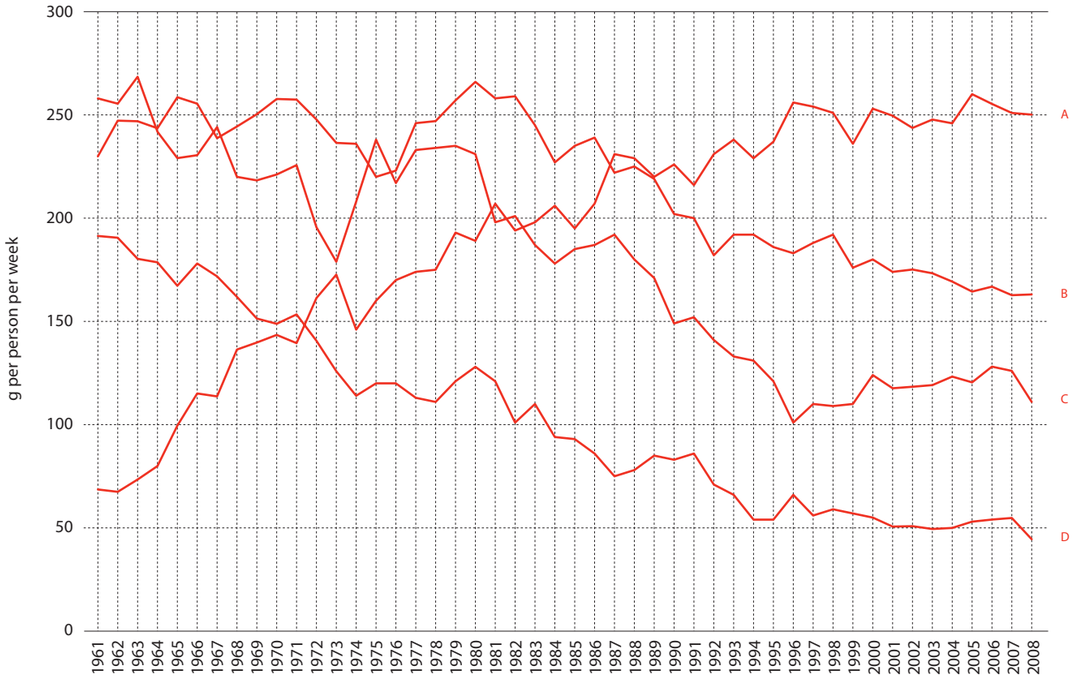
Table 4.6
Consumption of meat, 1961 to 2008, Great Britain

	Beef and veal	Mutton and lamb	Pork, bacon and ham	Poultry	Sausages	Total meat and meat products
	g per person per week					
1961	258	191	230	69	102	1,042
1963	268	180	247	73	106	1,080
1965	229	167	259	100	106	1,066
1967	244	172	239	114	99	1,086
1969	218	151	250	140	104	1,091
1971	226	153	257	139	105	1,106
1973	179	126	236	173	97	1,038
1975	238	120	220	160	92	1,054
1977	233	113	246	174	98	1,092
1979	235	121	257	193	98	1,142
1981	198	121	258	207	97	1,116
1983	187	110	245	198	94	1,082
1985	185	93	235	195	84	1,042
1987	192	75	222	231	76	1,050
1989	171	85	219	220	71	1,019
1991	152	86	200	216	62	962
1993	133	66	192	238	61	956
1995	121	54	186	237	63	945
1997	110	56	188	254	63	940
1999	110	57	176	236	58	912
2001	118	51	174	250	66	1,041
2002	118	51	175	244	66	1,050
2003	119	49	173	248	70	1,061
2004	123	50	169	246	67	1,049
2005	120	53	164	260	64	1,046
2006	128	54	167	255	65	1,042
2007	126	55	163	251	65	1,029
2008	111	45	163	250	62	998

Notes:
Totals may include other foods so may not equal the sum of subgroups. From 2001 to 2008, data are from Family Food Survey trend tables.

Source:
Department for the Environment, Food and Rural Affairs (2010). *National Food Survey and Family Food Survey trend data.* http://www.defra.gov.uk/evidence/statistics (accessed October 2010).

Figure 4.6
Consumption of meat, 1961 to 2008, Great Britain



(A) **Poultry** (B) **Pork, bacon and ham** (C) **Beef and veal** (D) **Mutton and Lamb**

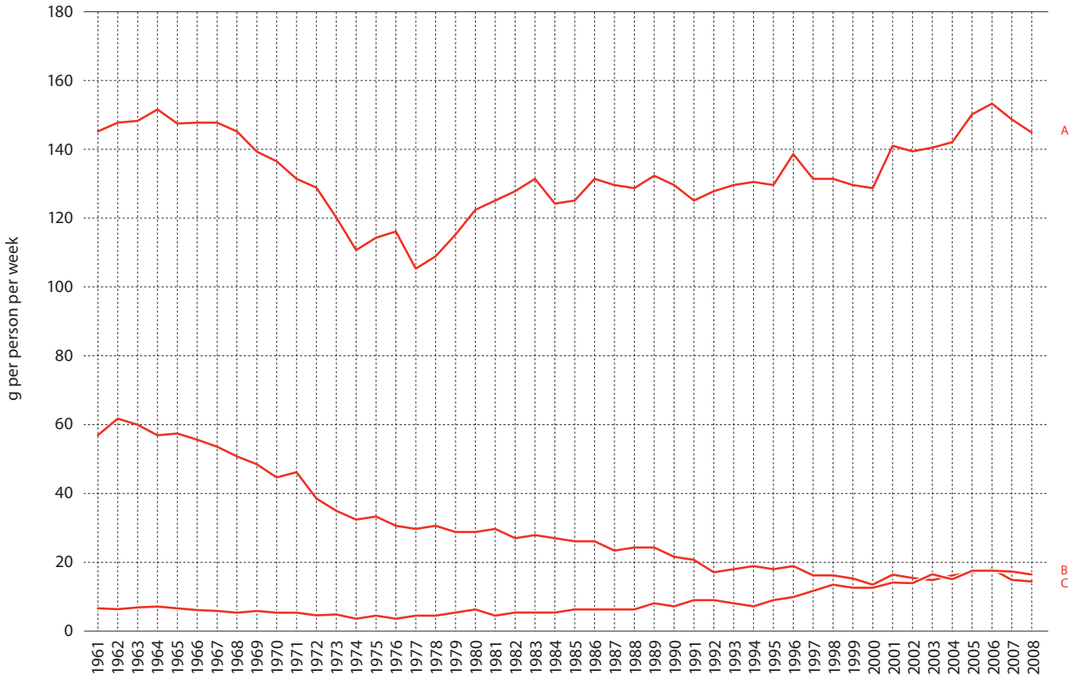
Table 4.7
Consumption of fish, 1961 to 2008, Great Britain

	Fresh white fish	Fresh oily fish	Cooked fish	Total fish and fish products
	g per person per week			
1961	63	7	27	161
1963	67	8	28	165
1965	64	7	28	164
1967	60	7	30	164
1969	54	7	26	155
1971	51	6	27	146
1973	39	5	21	134
1975	37	5	19	127
1977	33	5	14	117
1979	32	6	21	128
1981	33	5	22	139
1983	31	6	24	146
1985	29	7	17	139
1987	26	7	21	144
1989	27	9	16	147
1991	23	10	11	139
1993	20	9	18	144
1995	20	10	15	144
1997	18	13	11	146
1999	17	14	12	144
2001	18	16	15	157
2002	17	15	14	155
2003	16	18	13	156
2004	18	17	14	158
2005	19	19	13	167
2006	20	20	13	170
2007	17	19	12	165
2008	16	18	11	161

Notes:
Totals may include other foods so may not equal the sum of subgroups. From 2001 to 2008, data are from Family Food Survey trend tables.

Source:
Department for the Environment, Food and Rural Affairs (2010). *National Food Survey and Family Food Survey trend data.* http://www.defra.gov.uk/evidence/statistics (accessed October 2010).

Figure 4.7
Consumption of fish, 1961 to 2008, Great Britain



(A) **Total fish and fish products** (B) **Fresh oily fish** (C) **Fresh white fish**

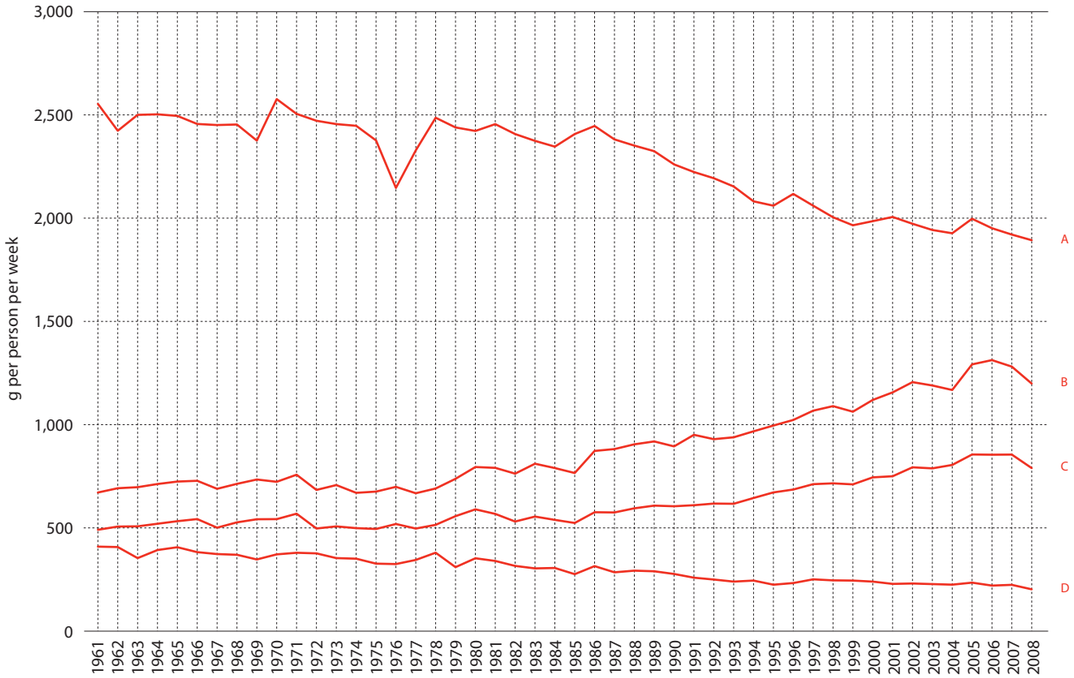
Table 4.8
Consumption of fruit and vegtables, 1961 to 2008, Great Britain

	Total fresh fruit	Total Fruit	Fresh green vegetables	Total vegetables
	g per person per week			
1961	491	672	409	2,554
1963	508	697	354	2,501
1965	533	725	407	2,496
1967	501	689	373	2,452
1969	542	735	347	2,376
1971	569	758	380	2,506
1973	507	708	354	2,456
1975	495	676	327	2,377
1977	497	668	345	2,329
1979	557	738	310	2,440
1981	568	791	340	2,456
1983	555	811	304	2,375
1985	524	766	276	2,408
1987	575	882	285	2,382
1989	608	919	290	2,325
1991	610	951	259	2,224
1993	617	939	240	2,154
1995	672	996	225	2,061
1997	712	1,068	251	2,061
1999	711	1,063	245	1,966
2001	750	1,157	229	2,006
2002	794	1,206	231	1,973
2003	789	1,190	228	1,943
2004	805	1,168	225	1,927
2005	856	1,292	235	1,998
2006	855	1,313	221	1,952
2007	855	1,281	224	1,921
2008	790	1,199	203	1,894

Notes:
Totals may include other foods so may not equal the sum of subgroups. Total vegetables includes potatoes.

Source:
Department for the Environment, Food and Rural Affairs (2010). *National Food Survey and Family Food Survey trend data.* http://www.defra.gov.uk/evidence/statistics (accessed October 2010).

Figure 4.8
Consumption of fruit and vegetables, 1961 to 2008, Great Britain



(A) **Total vegetables** (B) **Total Fruit** (C) **Total fresh fruit** (D) **Fresh green vegetables**

Table 4.9
Availability of fruits and vegetables, 1970 to 2007, United Kingdom

	Fruit and vegetables
	kg per person per year
1970	136
1972	132
1974	138
1976	121
1978	131
1980	136
1982	145
1984	149
1986	150
1988	160
1990	164
1992	167
1994	162
1996	162
1998	178
2000	171
2001	187
2002	187
2003	207
2004	206
2005	223
2006	231
2007	218

Notes:
Data for availability comes from UK production, import and export data combined. It does not take account of food wastage at any stage of the food chain.

Source:
European Health for All database (HFA-DB). http://data.euro.int/hfadb (accessed November 2010).

Figure 4.9
Total availablity of fruit and vegetables, 1970 to 2007, United Kingdom

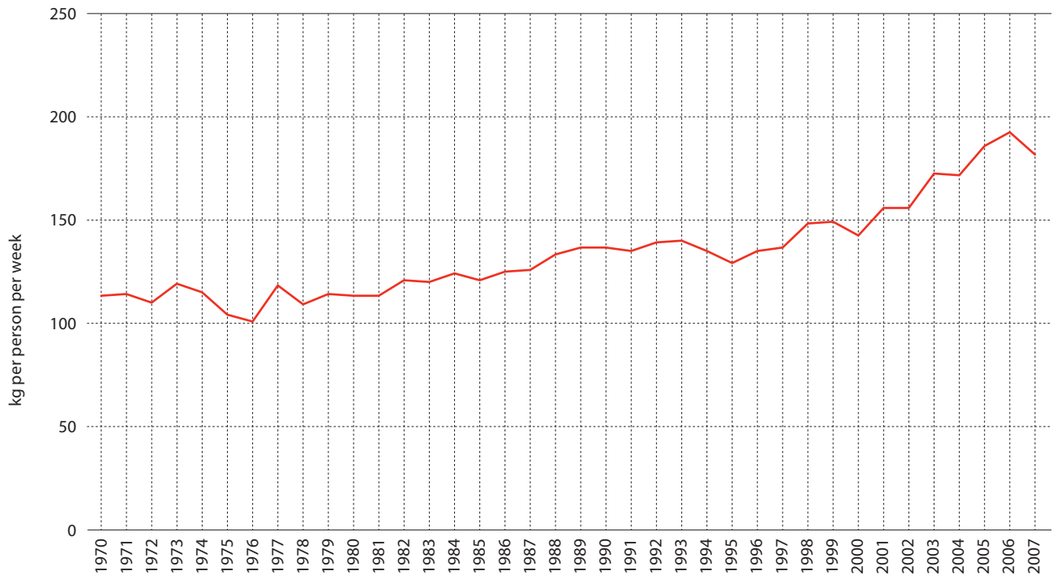


Table 4.10
Prevalence of physical activity by sex and country, 1973 to 1993, Great Britain and 1997 to 2009, England, Scotland and Wales

	1973	1977	1980	1983	1990	1993	1997	2003	2007	2008	2009
	%										
Men											
Great Britain	24	35	37	39	73	72					
England							32	36		42	
Wales								36	36	38	36
Scotland								42		46	
Women											
Great Britain	11	21	24	24	57	57					
England							21	24		31	
Wales								22	23	22	23
Scotland								32		35	
Bases:											
Men											
Great Britain	*11,197*	*10,763*	*10,478*	*8,744*	*8,119*	*8,062*					
England							*3,882*	*7,177*		*7,314*	
Wales								*7,486*	*6,418*	*6,119*	*7,412*
Scotland								*3,269*		*2,533*	
Women											
Great Britain	*12,472*	*12,352*	*12,116*	*10,306*	*9,455*	*9,490*					
England							*4,671*	*7,611*		*7,678*	
Wales								*8,812*	*7,499*	*7,194*	*8,606*
Scotland								*4,034*		*3,209*	

Notes:
1973 - 1983: % participating in outdoor sports in the last 4 weeks.
1990 - 1993: % participating in (at least one) sports or physical activity in the last 4 weeks.
1997 - 2009: % meeting Government recommendations (greater than 30 minutes physical activity on at least five days per week).
Data are for adults aged 16 and over in England and Wales, adults aged 16 to 64 in Scotland.

Source:
Office for National Statistics (1994). *General household survey 1993.* HMSO: London, and previous years. ¶ Department of Health (2010). *Health Survey for England 2008.* The Stationery Office: London, and previous years. ¶ Scottish Health Executive (2010). *The Scottish Health Survey 2008.* Scottish Executive: Edinburgh, and previous years. ¶ Welsh Assembly Government (2010). *Welsh Health Survey 2009.* Welsh Assembly: Cardiff.

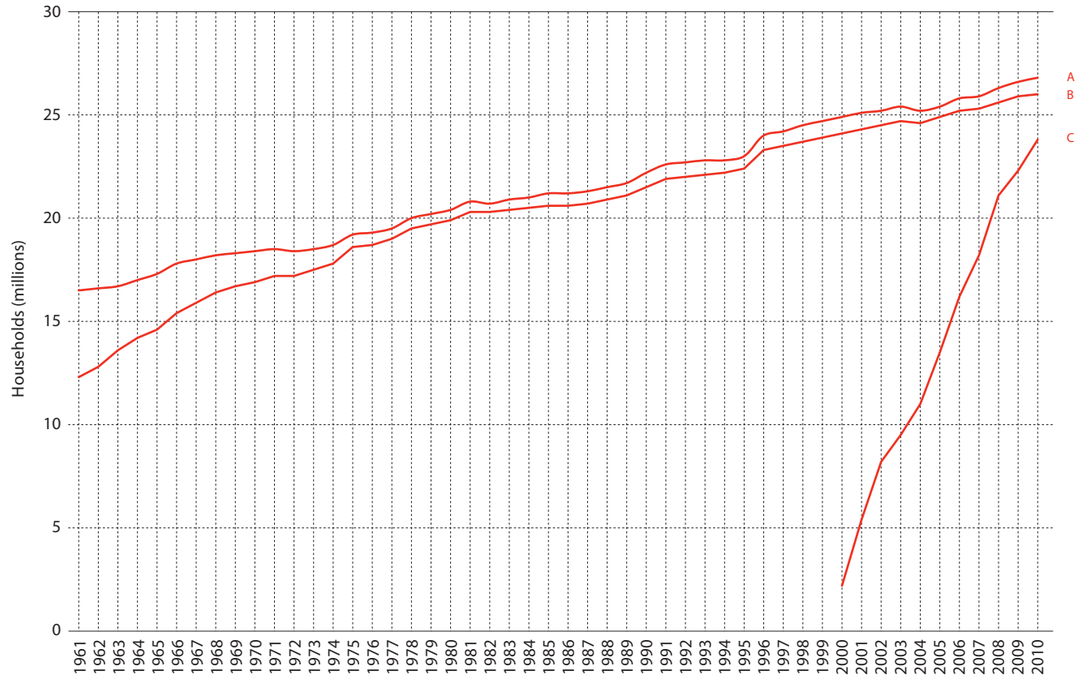
Table 4.11
Television ownership in private domestic households, 1961 to 2010, United Kingdom

	Households with any TV	Households with colour TV	Households with digital TV	All households
	Number of households (millions)			
1961	12.3			16.5
1963	13.6			16.7
1965	14.6			17.3
1967	15.9			18.0
1969	16.7			18.3
1971	17.2	1.1		18.5
1973	17.5			18.5
1975	18.6			19.2
1977	19.0			19.5
1979	19.7	13.7		20.2
1981	20.3			20.8
1983	20.4			20.9
1985	20.6	17.9		21.2
1987	20.7	18.7		21.3
1989	21.1	19.6		21.7
1991	21.9	20.6		22.6
1993	22.1	21.4		22.8
1995	22.4	21.6		23.0
1997	23.5	22.9		24.2
1999	23.9	23.7		24.7
2000	24.1	24.0	2.2	24.9
2001	24.3	24.2	5.4	25.1
2002	24.5	24.5	8.2	25.2
2003	24.7	24.7	9.5	25.4
2004	24.6	24.6	11.0	25.2
2005	24.9	24.9	13.5	25.4
2006	25.2	25.2	16.2	25.8
2007	25.3	25.3	18.2	25.9
2008	25.6	25.6	21.1	26.3
2009	25.9	25.9	22.3	26.6
2010	26.0	26.0	23.8	26.8

Notes:
Since the 1980s, data has been collected via an Establishment Survey (ES) - a continuous survey of private homes based upon a large sample of households (currently 52,000 per annum).

Source:
Broadcasters' Audience Research Board Ltd (2010). www.barb.co.uk/ (accessed November 2010).

Figure 4.11
Television ownership in private domestic households, 1961 to 2010, United Kingdom



(A) **All households** (B) **All households with a TV** (C) **All households with a digital TV**

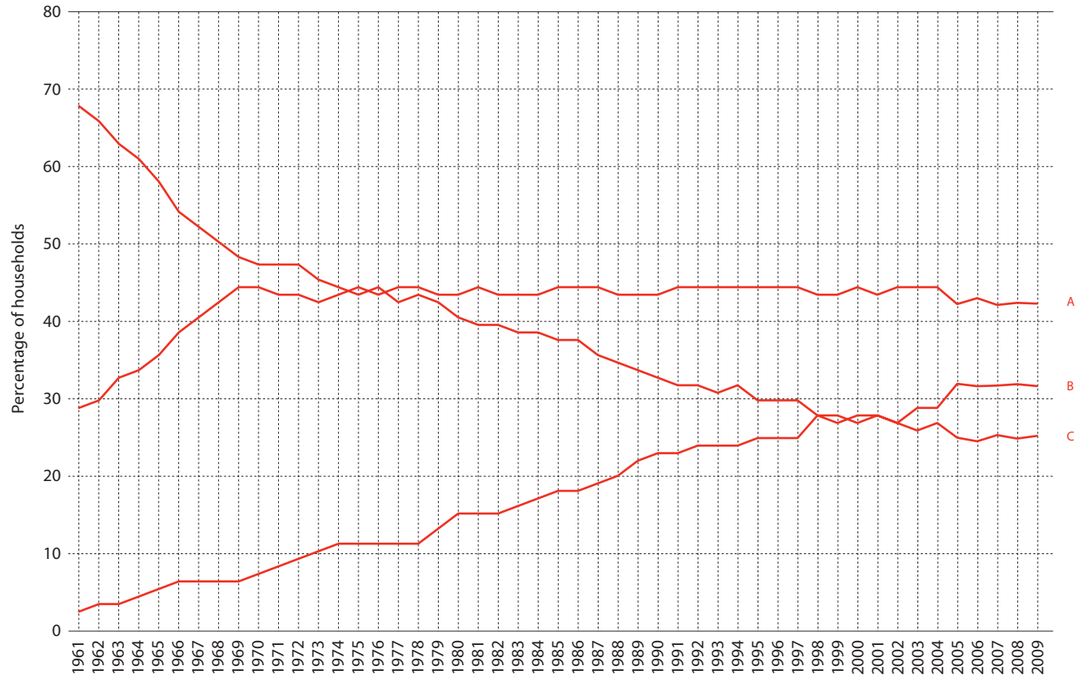
Table 4.12
Proportion of households with car or van ownership, 1961 to 2009, Great Britain

	Percentage of households with:			
	No car or van	One car or van	Two or more cars or vans	*Unweighted base*
1961	69	29		
1965	59	36		
1972	48	43	9	*11,624*
1975	44	45	11	*11,929*
1981	41	44	14	*11,989*
1985	38	45	17	*9,963*
1991	32	44	23	*9,910*
1995	29	45	26	*9,758*
1996	30	46	25	*9,158*
1998	28	44	29	*8,636*
2000	27	45	28	*8,221*
2002	27	45	27	*8,620*
2004	27	45	29	*8,700*
2005	25	43	32	*9,453*
2006	25	44	32	*9,261*
2007	25	43	32	*9,278*
2008	25	43	32	*8,924*
2009	25	43	32	*9,128*

Notes:
Bases for 1961 and 1965 are not available.

Source:
Department for Transport, Scottish Executive and Welsh Assembly (2005). *Transport statistics 2005.* Office for National Statistics: London. ¶ Department for Transport (2010). *National Travel Survey 2009.* www.dft.gov.uk/pgr/statistics/datatablespublications (accessed November 2010).

Figure 4.12
Percentage of households with car or van ownership, 1961 to 2009, Great Britain



(A) **One car** (B) **Two or more cars** (C) **No car**

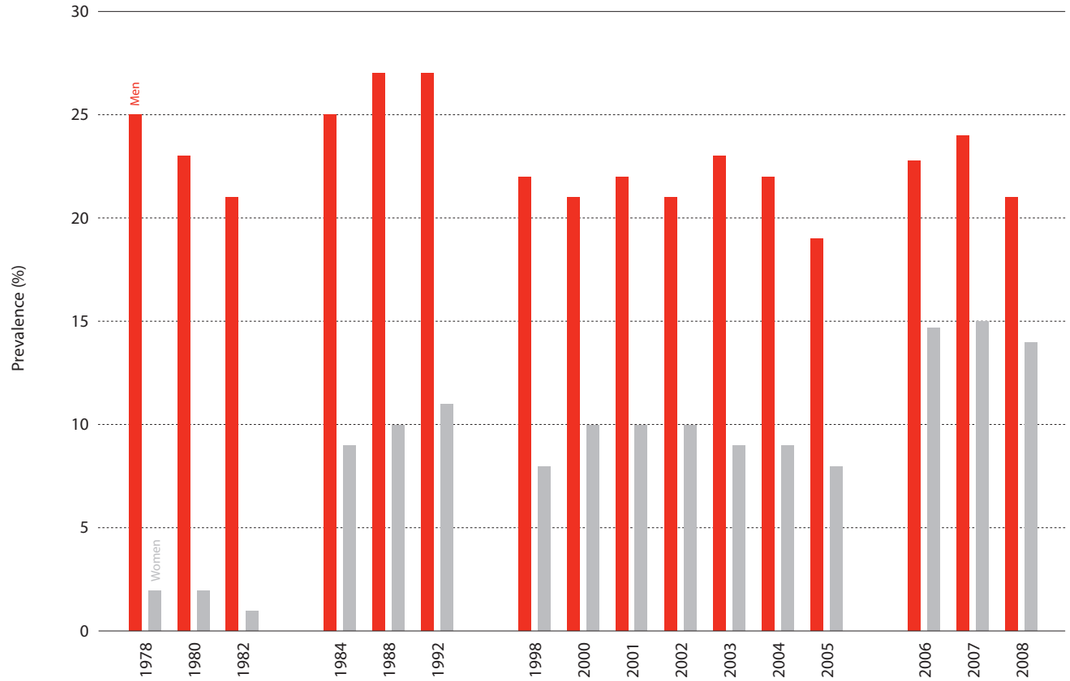
Table 4.13
Heavy drinking levels by sex and age, 1978 to 2008, Great Britain

	Men	Women		*Bases:*
	%	%	*Men*	*Women*
1978	25	2	*10,015*	*11,650*
1980	23	2	*9,959*	*11,557*
1982	21	1	*8,780*	*10,185*
1984	25	9	*8,044*	*9,399*
1988	27	10	*8,371*	*9,814*
1992	27	11	*8,150*	*9,490*
1998	22	8	*6,561*	*7,821*
2000	21	10	*6,598*	*7,491*
2001	22	10	*7,054*	*8,299*
2002	21	10	*6,828*	*7,942*
2003	23	9	*8,087*	*9,304*
2004	22	9	*6,862*	*8,012*
2005	19	8	*10,028*	*11,617*
2006	23	15	*7,674*	*9,013*
2007	24	15	*7,230*	*8,380*
2008	21	14	*6,720*	*7,950*

Notes:
The definition of a heavy drinker has varied over time and are as follows: from 1978 to 1982, seven units or more on one occassion at least once a week. From 1984 to 1992, alcohol consumed more than 21 units per week for men and 14 units per week for women. From 1998 to 2008, alcohol consumption levels are based on the number of units of alcohol consumed on the heaviest day during the previous week. Methods for estimating the number of units of alcohol consumed were updated in 2006, therefore estimates since 2006 are not directly comparable with estimates from before 2006.

Source:
Office for National Statistics (2009). *General Lifestyle Survey 2008,* and previous years. Results published online at www.statistics.gov.uk/STATBASE/Product.asp?vlnk=5756 (accessed June 2010).

Figure 4.13
Heavy drinking levels by sex, 1978 to 2008, Great Britain



Note:
Estimates are not directly comparable due to changes in the methods used to estimate the number of units consumed.

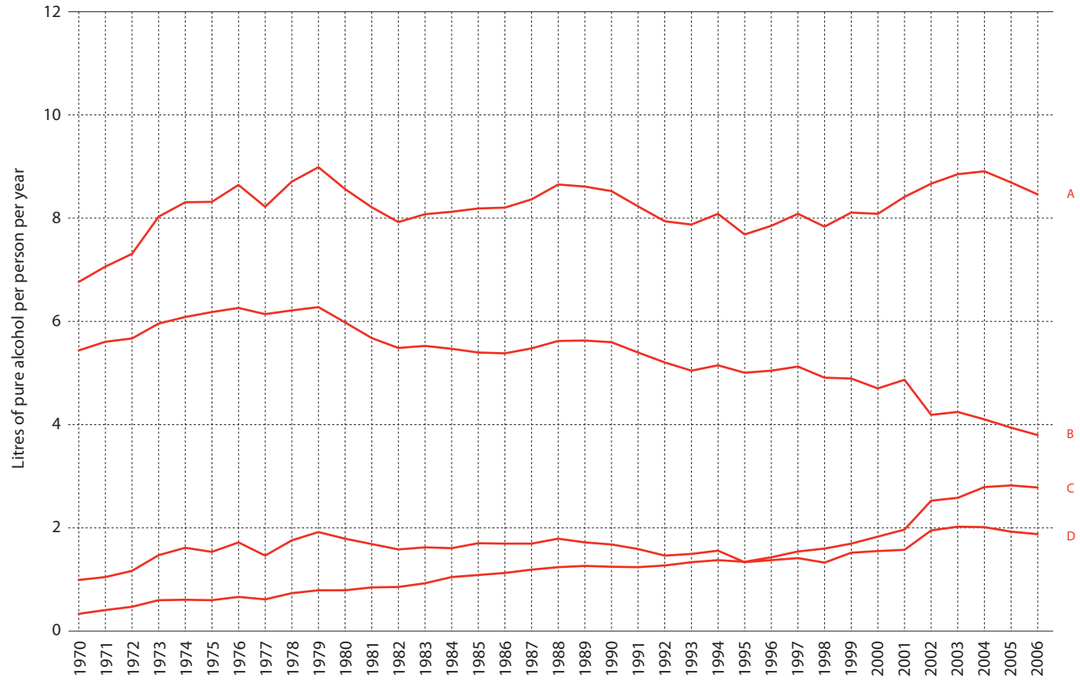
Table 4.14
Estimated alcohol intake levels by drink, 1970 to 2006, United Kingdon

	Spirits	Wine	Beer	Total
	Amount consumed (equivalent in pure alcohol) litres per person per year			
1970	1.2	0.4	6.8	8.4
1972	1.4	0.5	7.0	8.9
1974	2.0	0.7	7.6	10.3
1976	2.1	0.8	7.8	10.7
1978	2.2	0.9	7.7	10.8
1980	2.2	0.9	7.4	10.5
1982	1.9	1.0	6.8	9.7
1984	2.0	1.3	6.8	10.1
1986	2.1	1.4	6.7	10.2
1988	2.2	1.5	7.0	10.7
1990	2.1	1.5	7.0	10.6
1992	1.8	1.5	6.5	9.8
1994	1.9	1.7	6.4	10.0
1996	1.7	1.7	6.3	9.7
1998	1.6	2.0	6.1	9.7
2000	1.9	2.2	5.8	9.9
2002	2.4	3.1	5.2	10.7
2004	2.5	3.4	5.1	11.0
2006	2.3	3.4	4.7	10.4

Notes:
Average estimates for both males and females aged 15 and above.

Source:
European health for all database (2010). World Health Organization http://data.euro.who.int/hfadb/, (accessed October 2010).

Figure 4.14
Consumption of pure alcohol by drink, 1970 to 2006, United Kingdom



(A) **Total** (B) **Beer** (C) **Wine** (D) **Spirits**

Table 4.15
Mean BMI by age and sex, different studies compared, 1960 to 2008, England and Wales

Study	Setting	Year	Sex	Age	Mean BMI (kg/m²)
	Birmingham	1960	Men	20-25	22.8
				35-40	24.9
				55-60	24.9
	Port Talbot	1965	Men	20-25	24.3
				35-40	26.2
				55-60	26.2
	Richmond	1974	Men	15-29	22.6
				30-49	24.9
				50-65	24.7
			Women	15-29	21.6
				30-49	23.7
				50-65	25.1
Health Survey for England	England	1993	Men	16-24	23.4
				25-34	25.4
				35-44	26.4
				45-54	26.8
				55-64	27.1
				65-74	26.7
				> 75	25.7
			Women	16-24	23.5
				25-34	24.6
				35-44	25.6
				45-54	26.6
				55-64	27.2
				65-74	27.0
				> 75	26.1
		2003	Men	16-24	23.7
				25-34	26.3
				35-44	27.6
				45-54	28.0
				55-64	28.0
				65-74	28.1
				> 75	27.1
			Women	16-24	24.2
				25-34	26.0
				35-44	26.7
				45-54	27.4
				55-64	27.8
				65-74	28.1
				> 75	27.3
		2008	Men	16-24	23.7
				25-34	26.5
				35-44	27.8
				45-54	28.1
				55-64	28.5
				65-74	28.7
				> 75	27.4
			Women	16-24	24.3
				25-34	25.8
				35-44	27.1
				45-54	27.7
				55-64	28.0
				65-74	28.5
				> 75	27.2

Notes:
Where 'study' is blank, these results have come from a government report which collated these results; see source for details.

Source:
Department of Health and Social Security (1976). *Research on obesity, a report of the DHSS/MRC group*. HMSO: London. ¶ Joint Health Surveys Unit (2010). *Health Survey for England 2008. Adult trend tables*. The Information Centre: Leeds.

Table 4.16
Prevalence of overweight and obesity in children, 1974 to 2002/03, England

		1974	1984	1994	1996/97	1998/99	2000/01	2002/03
		%						
Boys								
5-7 years	Overweight	12.4	9.4	9.9	14.1	17.3	16.5	18.5
	Obese	1.9	1.2	1.7	2.5	3.7	3.1	5.2
8-10 years	Overweight	10.4	10.1	15.5	18.4	22.1	26.8	26.3
	Obese	1.8	1.1	3.1	4.3	5.6	8.1	6.7
5-10 years	Overweight	11.3	9.8	12.7	16.2	19.7	21.7	22.6
	Obese	1.8	1.2	2.4	3.4	4.7	5.6	6.0
Girls								
5-7 years	Overweight	9.0	8.2	11.4	14.9	15.9	16.9	20.0
	Obese	1.0	1.1	2.3	3.8	4.4	3.9	5.6
8-10 years	Overweight	10.1	11.5	17.3	20.1	22.7	27.8	27.1
	Obese	1.6	2.4	3.1	5.3	6.3	6.5	7.6
5-10 years	Overweight	9.6	10.0	14.4	17.5	19.1	22.6	23.7
	Obese	1.3	1.8	2.7	4.5	5.3	5.2	6.6

Notes:
Overweight and obesity is defined using a UK specific defintion. Overweight includes obesity. 1974 to 1994 data comes from the National Study of Health and Growth. 1994 to 2002/03 comes from the Health Survey for England.

Source:
Stamatakis E, Primatesta P, Chinn S, Rona R, Falascheti E (2005). Overweight and obesity trends from 1974 to 2003 in English children: what is the role of socioeconomic factors? *Archive of Diseases in Children;* 90: 999–1004.

Figure 4.16a
Prevalence of overweight children by sex, 1974 to 2002/03, England

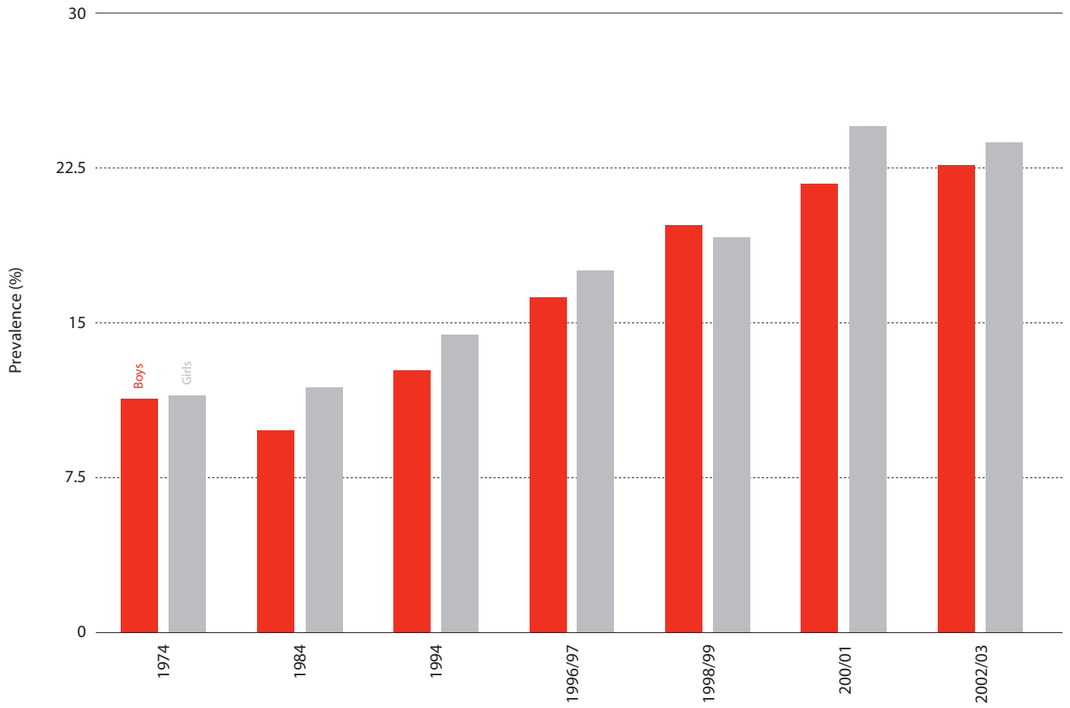
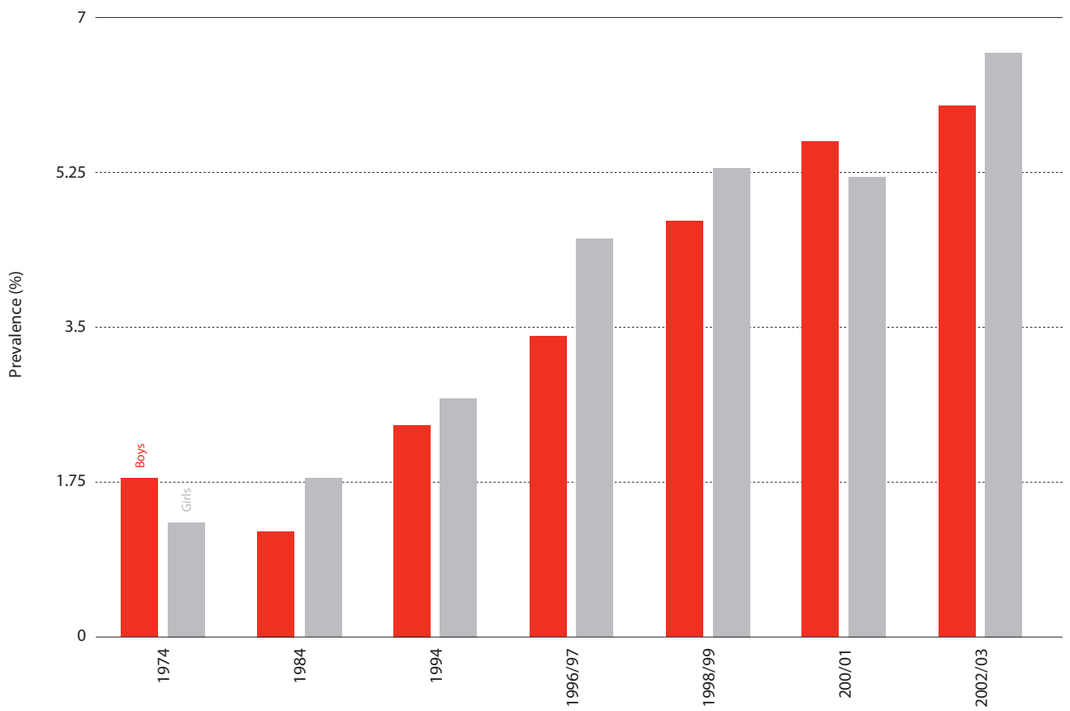
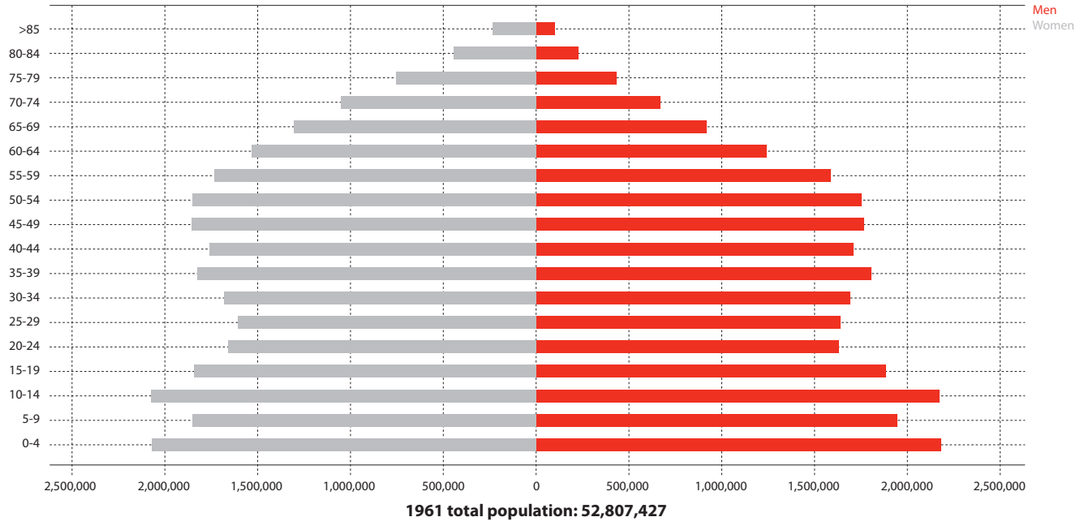


Figure 4.16b
Prevalence of obese children by sex, 1974 to 2002/03, England

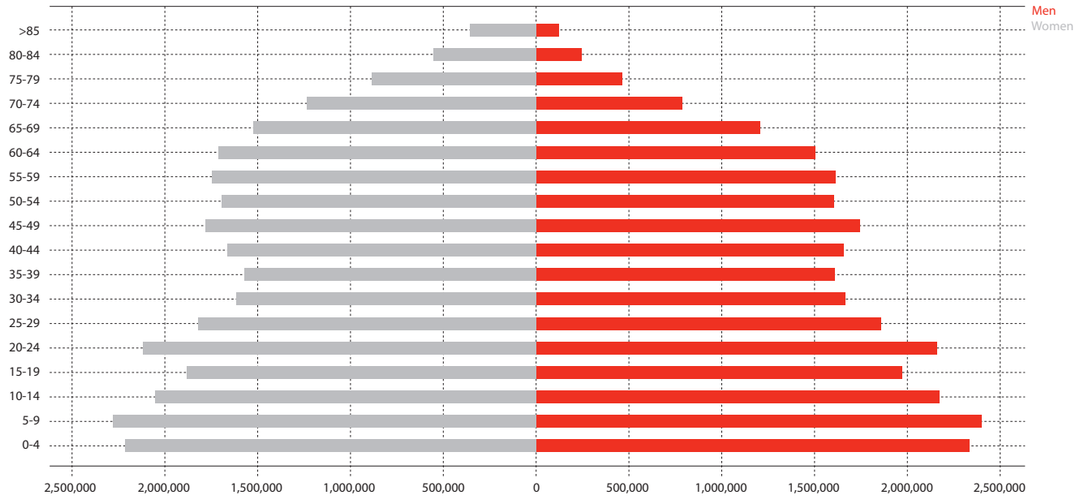


Appendix

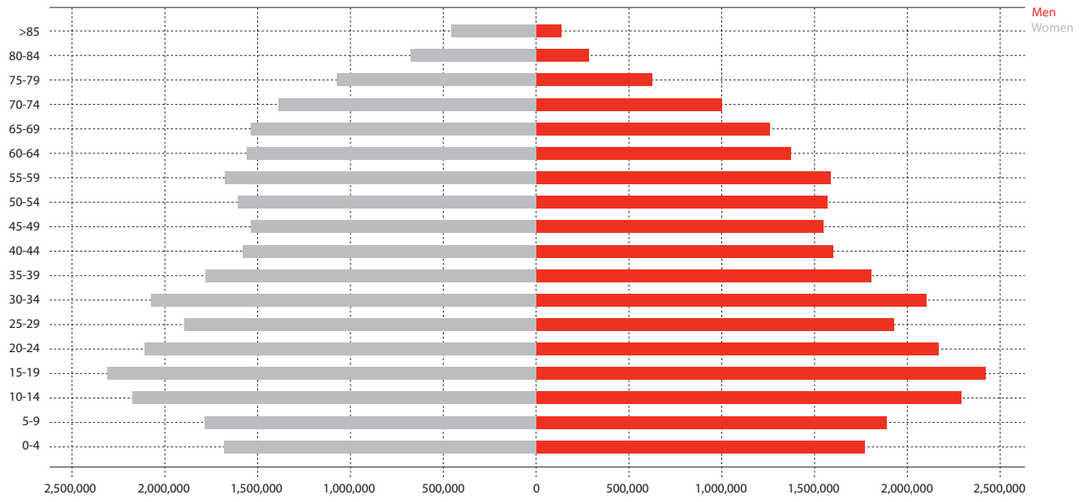
Appendix
Population structure of the United Kingdom, 1961 to 2009



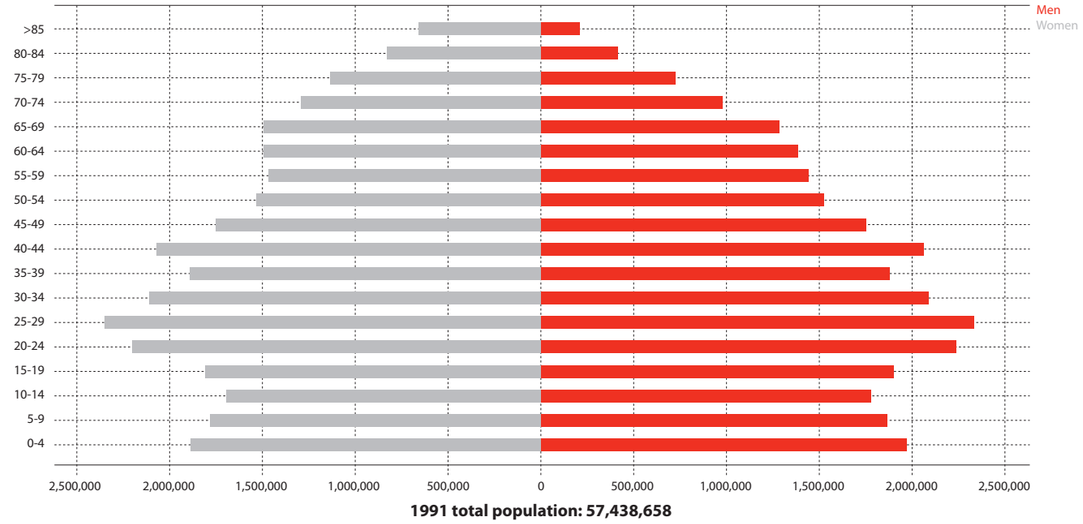
1961 total population: 52,807,427



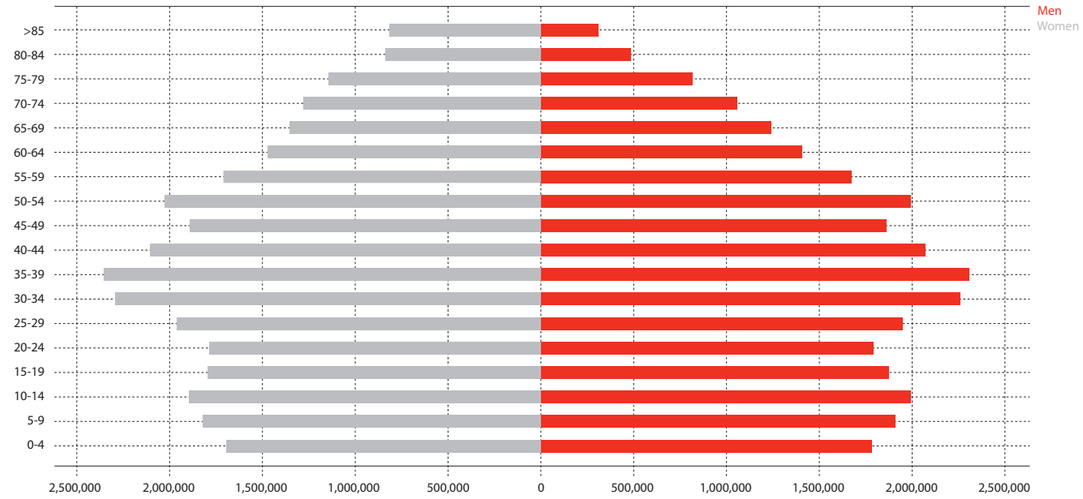
1971 total population: 55,928,013



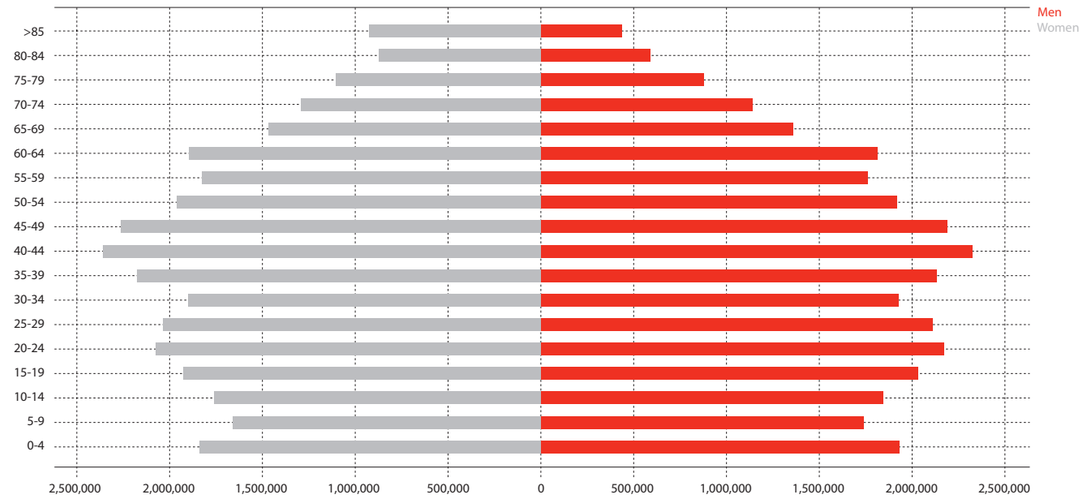
1981 total population: 56,357,464



1991 total population: 57,438,658



2001 total population: 59,113,497



2009 total population: 61,791,956

About the British Heart Foundation

The British Heart Foundation is a major national charity which plays a leading role in the fight against heart and circulatory disease, the UK's biggest killer. It is the largest independent source of funds for heart research in this country. The foundation also plays an important role in funding education, both of the public and health professionals, and in providing life-saving cardiac equipment and support for rehabilitation and patient care. For further information visit www.bhf.org.uk or write to the British Heart Foundation, Greater London House, 180 Hampstead Road, London, NW1 7AW.

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2011 is the British Heart Foundation's 50th birthday. Since 1961, we have been the nation's heart charity, dedicated to saving lives through pioneering research, patient care, campaigning for change and by providing vital information. But we urgently need your help. We rely on your donations of time and money to continue our life-saving work. Because together we can beat heart disease.

bhf.org.uk

Heart Helpline
0300 330 3311
bhf.org.uk

Information & support on anything heart-related
Phone lines open 9am to 5pm Monday to Friday
Similar cost to 01 or 02 numbers

British Heart Foundation
Greater London House
180 Hampstead Road
London NW1 7AW
T 020 7554 0000
F 020 7554 0100

Spine

Trends in coronary heart disease, 1961-2011 British Heart Foundation and University of Oxford