

Coronary heart disease statistics: heart failure supplement

2002 edition

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Foreword

Heart failure is a cause of significant ill health and death in late middle-aged and elderly men and women in the UK. It is a serious condition with a poor prognosis and can markedly reduce the quality of life. Currently there are around 650,000 people in the UK with definite heart failure, and another 225,000 with probable heart failure. Despite the heavy burden that heart failure imposes, many people remain unaware of this condition, its causes, prevention and treatment.

This supplement to our main compendium *Coronary heart disease statistics* brings together, for the first time, a range of data to provide a comprehensive set of statistics on the burden of heart failure in the UK today. It includes estimates for the UK on the number of new cases of heart failure each year, the total number of people living with heart failure and the total cost of heart failure to the National Health Service. The aim of the publication is to highlight the issue of heart failure and to help those involved in providing prevention and healthcare services.

While we lack direct evidence on trends in the incidence and prevalence of heart failure, hospital admissions statistics show that the number of people treated for heart failure has increased steadily over the past 20 years. Over the next 20 years, as the UK population ages and more people survive heart attacks, the number of people with heart failure is likely to increase substantially, creating a major burden for the National Health Service.

We need further research into the problems of heart failure and help for people living with this condition. Accurate identification of all patients with heart failure is important since treatments are available that can alleviate symptoms, delay progression of the disorder and improve prognosis. Prescription data show that not everyone with heart failure is receiving effective treatment. There is also scope to prevent heart failure for which the main cause is coronary heart disease (CHD). Ultimately, the prevention of CHD and early diagnosis and treatment of hypertension should prevent long term damage to the heart muscle thereby reducing the burden of heart failure in future years.

Professor Sir Charles George
Medical Director
British Heart Foundation

Summary

- In the UK¹ there are about 63,000 new cases of heart failure each year, of whom around 34,000 are in men and 29,000 are in women.
- Currently, in the UK¹ there are about 878,000 people who have definite or probable heart failure, of whom around 473,000 are men and 405,000 are women.
- Heart failure has a poor prognosis: just under 40% of people diagnosed with heart failure die within a year.
- Survival rates from heart failure are similar to those from cancer of the colon and worse than those from cancer of the breast, uterus, bladder and prostate.
- It is estimated that over 5% of all deaths in the UK are due to heart failure.
- In England, a total of one million inpatient bed days, 2% of all inpatient bed days, are due to heart failure.
- Hospital admissions for heart failure are projected to increase by 50% over the next 25 years.
- Less than 50% of patients with treated heart failure are prescribed ACE inhibitors, a class of drug which has been shown to be effective in reducing both mortality and hospitalisation due to heart failure. Women and older patients are less likely to be taking ACE inhibitors than men and younger patients.
- Around one in ten patients with treated heart failure are prescribed beta-blockers, a class of drug which has been shown to increase the length and quality of life in people with heart failure. Older patients are less likely to be taking beta-blockers than younger patients.
- People with heart failure have a lower quality of life than people with arthritis, chronic lung disease or angina.
- The annual cost of heart failure to the National Health Service in the UK is just over £625 million.

1. These estimates are derived from applying age-sex-specific rates from selected studies to the UK population estimates for 2000. For details of the selected studies see 1. Incidence and Prevalence. See Appendix for UK population estimates for 2000.

Introduction

The aims of this publication

Heart failure is a cause of significant morbidity and mortality in late middle-aged and elderly men and women. It is a serious condition with a poor prognosis and one that can markedly reduce the quality of life.

This supplement presents statistics on the burden of heart failure in the UK, including new estimates of the numbers of people currently living with heart failure. It aims to characterise the burden of heart failure both to individuals and to UK society as a whole.

The publication contains four sections: on mortality, morbidity, treatment and economic costs. Each section gives as far as is possible UK data by sex, age, socio-economic group and geographical region. Data by ethnic origin were not available and are not therefore included.

What is heart failure?

Heart failure is a clinical syndrome that occurs when the heart is unable to pump enough blood to meet the demands of the body. It occurs because the heart muscle is damaged or overworked. The “failing heart” keeps working but not as well as it should.

Some people with mild 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.

Definitions and diagnosis of ‘heart failure’

There is no universally agreed definition of heart failure. “Heart failure is a syndrome which develops as a consequence of cardiac disease, and is recognised clinically by a constellation of symptoms and signs produced by complex circulatory and neurohormonal responses to cardiac dysfunction¹.”

The presence and severity of heart failure can be assessed by questionnaires, physical examination, chest x-ray, echocardiography (a measure of ventricular performance) and exercise testing. All these methods have major limitations when used independently, and there is no one investigation, which can be considered “gold standard” for confirming the diagnosis. Because of this, diagnosing individual cases, especially where the syndrome is mild, remains problematic.

The causes of heart failure

Heart failure has many causes. The commonest cause is coronary heart disease, including past heart attack (myocardial infarction) which is responsible for around half of all new cases of heart failure². Other causes include high blood pressure (hypertension); primary disease of the heart muscle (cardiomyopathy); heart valve disease due to past rheumatic fever or other causes; a congenital heart or blood vessel defect, abnormal heart rhythms (arrhythmias) and excess alcohol.

The treatment of heart failure

Heart failure is treated in several ways. The aims of treatment are to reduce symptoms and delay progression of the disease, reduce hospitalisation, and extend and improve the quality of life.

There are three main groups of drugs which are used to treat heart failure: angiotensin converting enzyme (ACE) inhibitors, diuretics and beta blockers. ACE inhibitors help dilate arteries and lower blood pressure, and thus improve heart and circulation function. Beta-blockers can improve the function of the left ventricle and may help prevent heart rhythm problems. Diuretics keep fluid from building up in the body and decrease the amount of fluid in the lungs, which aids breathing.

In rare cases, heart failure can be treated by surgery, such as valve replacement or repair, coronary artery bypass surgery, or even transplantation.

Difference and relation between heart failure and left ventricular systolic dysfunction

There is a strong association between left ventricular systolic dysfunction and heart failure. About two-fifths of people with heart failure will have impaired left ventricular systolic function (defined as an ejection fraction of less than 40%), and around half of those with left ventricular systolic dysfunction have definite heart failure³. Heart failure associated with left ventricular systolic dysfunction is the type of heart failure for which treatment with ACE inhibitors and beta-blockers is most effective. Early assessment of left ventricular systolic dysfunction could, therefore, lead to more effective diagnosis and treatment of heart failure.

Methods for this publication

Various sources of information have been used in compiling this supplement. The sources of data can be divided into routinely collected national data, national studies and local studies. Data from different sources are collected in different ways and with different degrees of validity and reliability. Most sources can only provide data on one or two aspects of heart failure. Not all sources supply data for all ages or even both sexes. Sample sizes of studies vary considerably as do sampling methods. Most fundamentally, the way heart failure is defined and diagnosed also varies between sources. This limits the extent to which the information can be combined, modelled or even compared.

Nevertheless there are many sources that provide detailed and valuable information in their own areas. In compiling this supplement we have aimed to investigate all possible sources of recent data relating to the burden of heart failure in the UK but have presented data, and calculated estimates of numbers, only from studies which give the widest coverage in terms of age, sex, geographical location, etc. and which used valid and reliable methods of data collection. We have not included data from outside the UK and have aimed to include the most recent data available.

1. Poole-Wilson P (1996) *Chronic heart failure: definition, epidemiology, pathophysiology, clinical manifestations and investigation*. In Julian DG, Camm AJ, Fox KE, Hall RJC, Poole-Wilson PA eds. *Diseases of the Heart* (2nd edition). London: Balliere-Tindall: Chapter 24, 467-81.
2. Fox KE, Cowie MR, Wood DA, Coats AJS, Gibbs JSR, Underwood SR, Turner RM, Poole-Wilson PA, Davies SW, Sutton GC (2001) *Coronary artery disease as the cause of incident heart failure in the population*. *European Heart Journal* 22: 228-236.
3. Davies MK, Hobbs FDR, Davis RC, Kenkre JE, Roalfe AK, Hare R, Wosornu D, Lancashire RJ (2001) *Prevalence of left-ventricular systolic dysfunction and heart failure in the Echocardiographic Heart of England Screening study: a population based study*. *The Lancet* 358: 439-44.

1. Incidence and prevalence of heart failure

Incidence

Population-based studies on heart failure are scarce and the studies that have been published are particularly difficult to compare because of differences in methodology, notably in the diagnosis of heart failure. The Hillingdon Heart Failure Study, however, used a combination of clinical assessment, echocardiography and radiography to diagnose heart failure in the study population.

Table 1.1 shows that the crude incidence rate for men (aged 25 years and over) was 1.4 per 1,000 population and for women (aged 25 years and over) it was 1.2 per 1,000¹. From the incidence rates in this table we estimate that there are about 34,000 new cases of heart failure in men in the UK each year and about 29,000 cases in women, giving a total of about 63,000.

The incidence of heart failure increases steeply in the elderly and is more common in men than women (Fig 1.1).

Prevalence

There are a number of different UK studies of the prevalence of heart failure in the community. Table 1.2 summarises the results of the five most comparable studies of the prevalence of heart failure – a small scale study of two general practices in Liverpool, a study of the MONICA Project population in Glasgow, Morbidity Statistics from General Practice, Key Health Statistics from General Practice, and the Heart of England Screening study. The five studies give similar estimates of prevalence, but it should be noted that only the MONICA and the Heart of England Screening studies used a particularly systematic approach to the identification of heart failure.

The most recent study, the Heart of England Screening study, selected patients by systematic random sampling of all men and women aged over 45 years registered at GP practices in the West Midlands. Patients were screened using a combination of echocardiography and clinical examination, and European Society of Cardiology criteria for the diagnosis of heart failure were applied. Over 2% of patients screened had definite heart failure (Table 1.3). Probable heart failure was seen in around a further 1% of patients, which suggests that over 3% of people aged 45 years or older in the UK have definite or probable heart failure.

From these prevalence rates we estimate there are about 350,000 men aged 45 years and over living in the UK with definite heart failure, and about 300,000 women, giving a total of around

650,000. If probable cases of heart failure are included, there are an estimated 473,000 men and 405,000 women, a total of 878,000 people aged over 45 years who have heart failure in the UK today².

The prevalence of heart failure increases steeply with age in both men and women. While around one in 35 people aged 65–74 years has heart failure, this increases to about one in 15 of those aged 75–84 years, and just over one in 7 of those aged 85 and above (Table 1.3). At all ages, heart failure is more common in men than women (Table 1.3).

The prevalence of heart failure varies with deprivation. Data from General Practitioner medical records in England, show that for both men and women the prevalence rate of treated heart failure is lowest in the least deprived quintile of electoral wards and highest in the most deprived quintile of electoral wards (Table 1.4). These differentials are most marked at younger ages. For example, in those aged 55–64 years, the prevalence rates for treated heart failure in the most deprived areas in England, are almost three times as high in women and twice as high in men, compared to the rates found in the least deprived areas (Fig 1.4).

It is often suggested that the incidence and prevalence of heart failure is increasing in the UK. This may well be the case, but there is no direct evidence that it is so.

1. *A more recent study of adults in Bromley which used the same methods of case identification, found almost identical crude incidence rates of 1.4 per 1,000 for men and 1.1 per 1,000 for women. See Fox KF, Cowie MR, Coats AJS, Gibbs JSR, Underwood SR, Turner RM, Poole-Wilson PA, Davies SW, Sutton GC (2001) Coronary artery disease as the cause of incident heart failure in the population. European Heart Journal 22: 228–36.*
2. *These estimates differ from those published in our earlier Morbidity supplement - see Rayner M, Petersen S, Moher M, Wright L, Lampe F (2001) Coronary heart disease statistics: morbidity supplement. British Heart Foundation: London. Previous estimates were calculated using age specific prevalence rates derived from the General Practice Research Database. Lower prevalence rates in women, particular older women, reported in the Heart of England Screening study, are the primary reason for the difference in estimates.*

Table 1.1 Incidence of heart failure by sex and age, 1995/96, Hillingdon

| Age group | Population | Number of cases | Incidence/1000 population |
|--------------|----------------|-----------------|---------------------------|
| MEN | | | |
| 25-34 | 14,042 | 0 | 0.0 |
| 35-44 | 11,135 | 3 | 0.2 |
| 45-54 | 9,405 | 4 | 0.3 |
| 55-64 | 7,408 | 21 | 1.7 |
| 65-74 | 5,260 | 34 | 3.9 |
| 75-84 | 2,506 | 41 | 9.8 |
| 85 & over | 537 | 15 | 16.8 |
| Total | 50,293 | 118 | 1.4 |
| WOMEN | | | |
| 25-34 | 13,620 | 1 | 0.04 |
| 35-44 | 10,056 | 3 | 0.2 |
| 45-54 | 8,827 | 1 | 0.1 |
| 55-64 | 7,157 | 8 | 0.7 |
| 65-74 | 6,243 | 24 | 2.3 |
| 75-84 | 4,254 | 42 | 5.9 |
| 85 & over | 1,435 | 23 | 9.6 |
| Total | 51,592 | 102 | 1.2 |
| TOTAL | | | |
| 25-34 | 27,662 | 1 | 0.02 |
| 35-44 | 21,191 | 6 | 0.2 |
| 45-54 | 18,232 | 5 | 0.2 |
| 55-64 | 14,565 | 29 | 1.2 |
| 65-74 | 11,503 | 58 | 3.0 |
| 75-84 | 6,760 | 83 | 7.4 |
| 85 & over | 1,972 | 38 | 11.6 |
| Total | 101,885 | 220 | 1.3 |

Source: Cowie MR, Wood DA, Coats AJS, Thompson SG, Poole-Wilson PA, Suresh V, Sutton GC (1999) Incidence and aetiology of heart failure. A population-based study. *European Heart Journal* 20: 421-28.

Fig 1.1 Incidence of heart failure by sex and age, 1995/96, Hillingdon

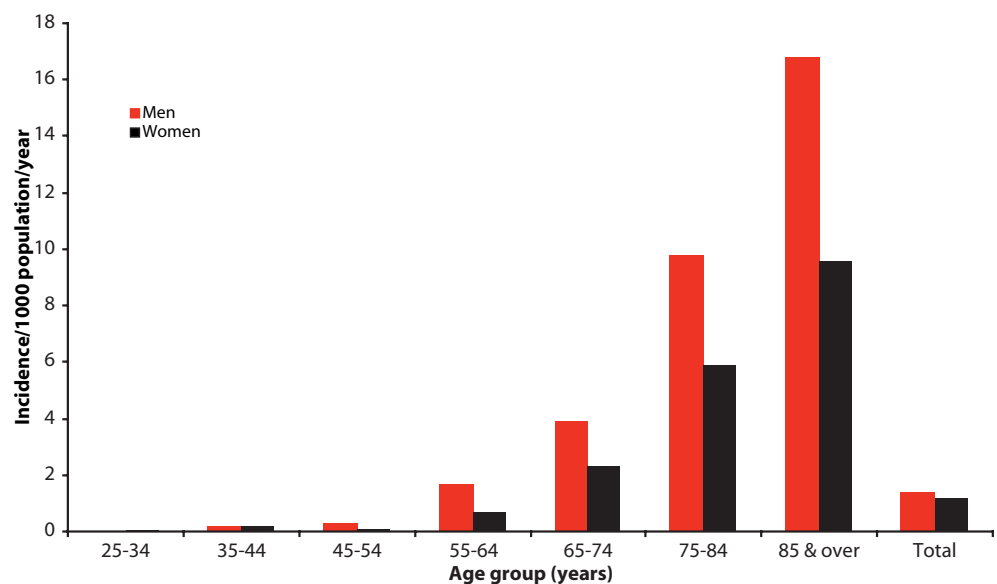


Table 1.2 Prevalence of heart failure, adults aged between 45 and 84, latest available year, UK studies compared

| Source | Study | Year | Place | MEN | | | | WOMEN | | | |
|--|--|---------|-------------------|-------|-------|-------|--------|-------|-------|-------|--------|
| | | | | 45-54 | 55-64 | 65-74 | 75-84 | 45-54 | 55-64 | 65-74 | 75-84 |
| Royal College of General Practitioners et al, 1995 | 4th National Study of Morbidity Statistics from General Practice | 1991/92 | England and Wales | | 0.5* | 3.2 | 8.0 | | 0.4* | 2.3 | 7.1 |
| McDonagh et al, 1997 | MONICA | 1992 | Glasgow | 2.5 | 3.2 | | | | 2.0 | 3.6 | |
| Mair et al, 1996 | Two general practices in Liverpool | 1994 | Liverpool | | 2.7 | 5.3 | 10.4** | | 1.2 | 5.1 | 13.3** |
| Office for National Statistics, 2000 | Key Health Statistics from General Practice | 1998 | England and Wales | 0.3 | 1.4 | 4.5 | 10.9 | 0.2 | 0.9 | 3.6 | 9.9 |
| Davies et al, 2001 | Heart of England Screening study | 1995/99 | West Midlands | 0.3 | 2.7 | 4.2 | 7.3 | 0 | 0.9 | 1.7 | 6.6 |

* for those aged 45-64 years

** for those aged 75 & over

Sources:

- Royal College of General Practitioners, the Office of Population Censuses and Surveys and the Department of Health (1995) *Morbidity Statistics from General Practice, Fourth National Study 1991-1992*. HMSO: London;
Mair FS, Crowley T, Bundred P (1996) *Prevalence, aetiology and management of heart failure in general practice*. *British Journal of General Practice* 46: 777-9;
McDonagh TA, Morrison CE, Lawrence A, Ford I, Tunstall-Pedoe H, McMurray JJV (1997) *Symptomatic and asymptomatic left ventricular systolic dysfunction in an urban population*. *Lancet* 350: 829-33;
Office for National Statistics (2000) *Key Health Statistics from General Practice*. The Stationery Office: London;
Davies MK, Hobbs FDR, Davis RC, Kenkre JE, Roalfo AK, Hare R, Wosornu D, Lancashire RJ (2001) *Prevalence of left-ventricular systolic dysfunction and heart failure in the Echocardiographic Heart of England Screening study: a population based study*. *The Lancet* 358: 439-44.
Other sources of prevalence data: Parameshwar J, Shackell MM, Richardson A, Poole-Wilson PA, Sutton GC (1992) *Prevalence of heart failure in three general practices in north west London*. *British Journal of General Practice* 42: 287-89.

Table 1.3 *Prevalence of definite heart failure by sex and age, 1995/99, West Midlands*

| Age group | Number with definite heart failure | Number without definite heart failure | % with definite heart failure |
|--------------|------------------------------------|---------------------------------------|-------------------------------|
| MEN | | | |
| 45-54 | 2 | 633 | 0.3 |
| 55-64 | 17 | 623 | 2.7 |
| 65-74 | 20 | 480 | 4.2 |
| 75-84 | 15 | 205 | 7.3 |
| 85 & over | 5 | 23 | 21.7 |
| Total | 59 | 1964 | 3.0 |
| WOMEN | | | |
| 45-54 | 0 | 681 | 0.0 |
| 55-64 | 5 | 571 | 0.9 |
| 65-74 | 8 | 472 | 1.7 |
| 75-84 | 15 | 229 | 6.6 |
| 85+ | 5 | 43 | 11.6 |
| Total | 33 | 1996 | 1.7 |
| ALL | | | |
| 45-54 | 2 | 1314 | 0.2 |
| 55-64 | 22 | 1194 | 1.8 |
| 65-74 | 28 | 952 | 2.9 |
| 75-84 | 30 | 434 | 6.9 |
| 85 & over | 10 | 66 | 15.2 |
| Total | 92 | 3960 | 2.3 |

Source: Davies MK, Hobbs FDR, Davis RC, Kenkre JE, Roalfe AK, Hare R, Wosornu D, Lancashire RJ (2001) Prevalence of left-ventricular systolic dysfunction and heart failure in the Echocardiographic Heart of England Screening study: a population based study. *The Lancet* 358: 439-44.

Table 1.4 *Prevalence of treated heart failure by sex, age and deprivation category, 1998, England and Wales*

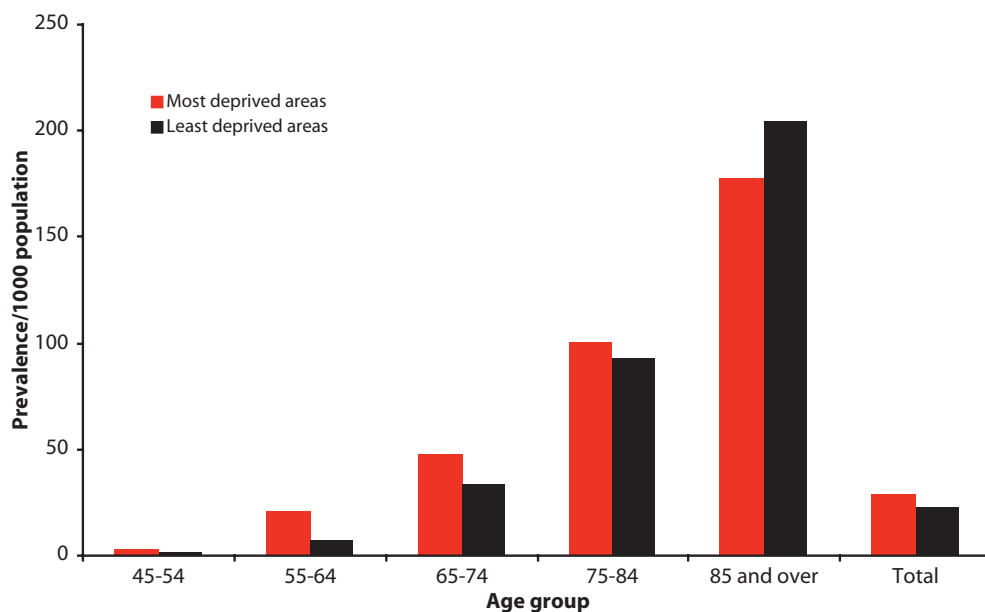
| Prevalence per 1,000 population | All ages | 45-54 | 55-64 | 65-74 | 75-84 | 85 & over |
|---------------------------------|----------|-------|-------|-------|-------|-----------|
| Men | | | | | | |
| Q1 (least deprived) | 25.9 | 1.7 | 10.0 | 39.7 | 102.7 | 213.2 |
| Q2 | 28.8 | 2.8 | 12.7 | 43.2 | 120.5 | 193.2 |
| Q3 | 26.8 | 2.7 | 13.1 | 41.8 | 101.6 | 184.8 |
| Q4 | 29.3 | 2.6 | 14.4 | 48.0 | 109.6 | 195.4 |
| Q5 (most deprived) | 30.5 | 3.5 | 18.3 | 50.6 | 107.5 | 169.5 |
| Women | | | | | | |
| Q1 (least deprived) | 19.8 | 1.4 | 5.4 | 27.0 | 83.0 | 195.7 |
| Q2 | 23.6 | 1.3 | 7.8 | 35.4 | 99.7 | 199.2 |
| Q3 | 23.0 | 1.5 | 8.5 | 32.5 | 101.6 | 183.0 |
| Q4 | 25.1 | 2.0 | 9.6 | 37.7 | 106.8 | 184.9 |
| Q5 (most deprived) | 26.8 | 2.6 | 14.0 | 43.9 | 93.6 | 186.1 |

Data from the General Practice Research Database. Age-standardised rate for all ages.

Deprivation categories were derived using the Townsend Material Deprivation Score at ward level. The category Q1 contains the 20% least deprived wards in England and Wales and category Q5 contains the 20% most deprived wards.

Source: Ellis C, Gnani S, Majeed A (2001) Prevalence and management of heart failure in General Practice in England and Wales, 1994-1998. *Health Statistics Quarterly* 11: 17-24.

Fig 1.4 *Prevalence of heart failure by age, most deprived and least deprived areas compared, 1998, England and Wales*



2. Mortality from heart failure

National mortality statistics

In 2000, just under 10,000 deaths due to heart failure were officially recorded in the UK (Table 2.1). However, the number of deaths attributed to heart failure in national mortality statistics is likely to be a huge underestimate of the actual number of deaths caused by heart failure. Guidance on death certificates - that heart failure is not a cause but a mode of death – explicitly discourages doctors from noting heart failure as the underlying cause of death. This means that other causes of death, such as coronary heart disease, are more commonly given as the cause of death in the death certificates of people with heart failure¹.

Survival after a diagnosis of heart failure

Prognosis from heart failure is poor. Data from the Hillingdon Heart Failure Study show that around 40% of people die within one year of an initial diagnosis of heart failure (Table 2.2).

Comparing one-year survival rates for heart failure with those for a number of common cancers shows that prognosis from heart failure is relatively poor. The one-year survival rate for heart failure is worse than those for cancer of the breast, uterus, prostate and bladder, and very similar to that for cancer of the colon (Table and Fig 3.3).

Better estimates of mortality from heart failure

Combining data on incidence and survival, we estimate² that in 2000, the true number of deaths from heart failure in the UK was at least 24,000. This means at least 5% of all deaths in the UK are due to heart failure.

1. A retrospective analysis of death certificates between 1979 and 1992 in Scotland, found that heart failure was coded as the underlying cause of death in only 1.5% deaths during this period. Heart failure was, however, coded as a contributory cause in a further 14.3% of deaths between 1979 and 1992. In 1979, 29% of male and 40% of female deaths attributed to coronary heart disease (as the underlying cause of death) also had a coding for heart failure. By 1992, these percentages had risen significantly to 34% and 45% respectively. The authors conclude that death from heart failure is substantially underestimated by official statistics. See Murdoch DR, Love MP, Robb SD, McDonagh TA, Davie AP, Ford I, Capewell S, Morrison CE, McMurray JJV (1998) Importance of heart failure as a cause of death. Changing contribution to overall mortality and coronary heart disease mortality in Scotland 1979-1992. *European Heart Journal* 19: 1829-35.
2. From incidence rates in the Hillingdon Heart Failure Study we estimate that there are just around 63,300 new cases of heart failure each year in the UK. Applying a 62% one-year survival rate to this figure, means that just over 24,000 of those diagnosed from heart failure die within a calendar year. This estimate is based on incident cases only and the true figure, which includes prevalent cases, will be higher still.

Table 2.1 Deaths from heart failure, by sex, age and country, 2000, United Kingdom

| | | All ages | Under 35 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85 & over |
|-------------------|-------|----------|----------|-------|-------|-------|-------|-------|-----------|
| England and Wales | Men | 3,152 | 10 | 9 | 38 | 113 | 455 | 1,209 | 1,318 |
| | Women | 5,456 | 6 | 5 | 25 | 81 | 402 | 1,564 | 3,373 |
| | Total | 8,608 | 16 | 14 | 63 | 194 | 857 | 2,773 | 4,691 |
| Scotland | Men | 324 | 0 | 0 | 2 | 13 | 60 | 111 | 138 |
| | Women | 581 | 2 | 0 | 1 | 8 | 29 | 154 | 387 |
| | Total | 905 | 2 | 0 | 3 | 21 | 89 | 265 | 525 |
| Northern Ireland | Men | 129 | 0 | 0 | 1 | 3 | 23 | 58 | 44 |
| | Women | 238 | 0 | 1 | 0 | 4 | 28 | 79 | 126 |
| | Total | 367 | 0 | 1 | 1 | 7 | 51 | 137 | 170 |
| UK | Men | 3,605 | 10 | 9 | 41 | 129 | 538 | 1,378 | 1,500 |
| | Women | 6,275 | 8 | 6 | 26 | 93 | 459 | 1,797 | 3,886 |
| | Total | 9,880 | 18 | 15 | 67 | 222 | 997 | 3,175 | 5,386 |

ICD code (9th revision/10th revision) 428/I50.

Sources: Office for National Statistics (2001) *Mortality Statistics: Cause Series DH2 no.27*. The Stationery Office: London;

General Register Office (2001) *Annual Report 2000*. General Register Office: Edinburgh;

General Register Office (2001) *Annual Report 2000. Statistics and Research Agency: Northern Ireland*.

Table 2.2 Survival after initial diagnosis of heart failure, 1995/98, Hillingdon

| | Number | Percentage |
|---|--------|------------|
| All with initial diagnosis of heart failure | 220 | 100% |
| Survive for longer than 1 month | 178 | 81% |
| Survive for longer than 3 months | 165 | 75% |
| Survive for longer than 6 months | 154 | 70% |
| Survive until end of first year | 136 | 62% |
| Survive for longer than 18 months | 125 | 57% |

Source: Cowie M R, Wood D A, Coats A J S, Thompson S G, Suresh V, Poole-Wilson P A, Sutton G C (2000) *Survival of patients with a new diagnosis of heart failure: a population based study*. *Heart* 83: 505-10.

Table 2.3 *Number of new cases and survival rates for heart failure and the major cancers compared, 1996, England and Wales*

| | ICD9/ICD10 codes | Number of new cases, 1996 | One-year survival (%) |
|-----------------------|--------------------------|---------------------------|-----------------------|
| Heart failure | 428/I50 | 54,410 | 62 |
| <i>Cancer of the:</i> | | | |
| Lung | 162/C33-34 | 40,900 | 20 |
| Breast | 174-175/C50 | 36,100 | 92 |
| Colo-rectal | 153-154/C18-21 | 34,300 | 63 * |
| Prostate | 185/C61 | 21,400 | 79 |
| Bladder | 188/C67 | 13,600 | 79 |
| Stomach | 151/C16 | 10,350 | 28 |
| Non-Hodgkins lymphoma | 200,202/C82-85,C91.4,C96 | 8,440 | 66 |
| Oesophagus | 150/C15 | 7,060 | 25 |
| Pancreas | 157/C25 | 6,860 | 11 |
| Ovary | 183/C56-57 | 6,570 | 58 |
| Leukaemia | 204-208/C91-95 | 6,230 | 54 |
| Kidney | 189/C64-66, C68 | 5,610 | 56 |
| Uterus | 182/C54 | 4,520 | 87 |
| Melanoma of skin | 172/C43 | 5,350 | 94 |

New cases: cancer registrations in 1996; estimate of new cases of heart failure derived from applying age-specific incidence rates from the Hillingdon Heart Failure Study (see Table 1.1) to England and Wales population estimates for 1996.

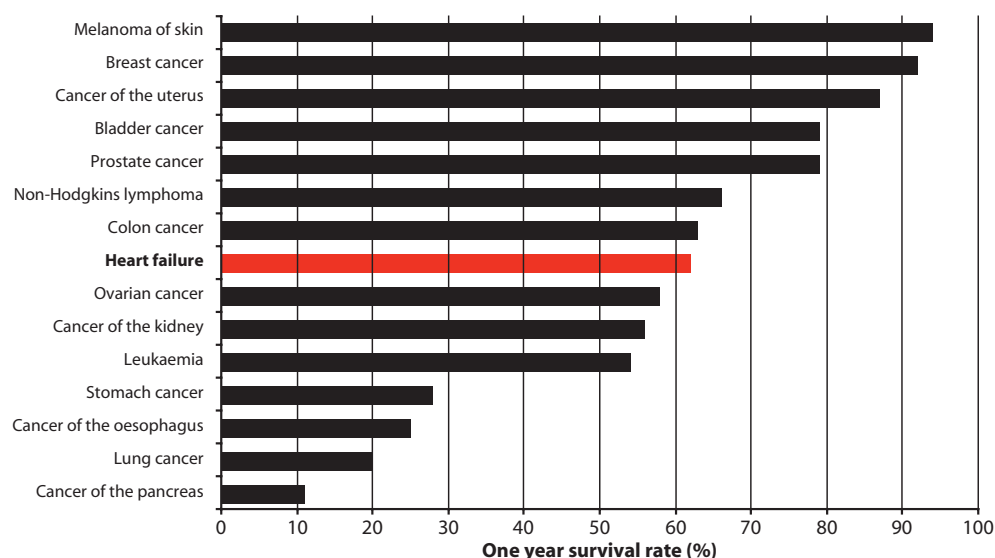
One year survival rates: patients diagnosed with cancer in England and Wales 1991-93; patients diagnosed with heart failure in Hillingdon Heart Failure Study, 1995-96 (see Table 2.2).

* Colon cancer

Sources: Office for National Statistics (2001) Quinn M, Babb P, Brock A, Kirby L, Jones J *Cancer trends in England and Wales 1950-1999*. The Stationary Office: London;

Cowie M R, Wood D A, Coats A J S, Thompson S G, Suresh V, Poole-Wilson P A, Sutton G C (2000) *Survival of patients with a new diagnosis of heart failure: a population based study*. *Heart* 83: 505-10.

Fig 2.3 *One-year survival rates, heart failure and the major cancers compared, mid-1990's, England and Wales*



3. Morbidity from heart failure

Heart failure is associated with severe and disabling morbidity.

Breathlessness – dyspnoea - is one of the main symptoms of people with heart failure. Data from the Heart of England Screening study suggest that for around one third of people with heart failure, dyspnoea severely limits their physical activity, with breathlessness occurring either at rest, or upon minimal exertion, such as washing, dressing or walking from room to room (Table 3.1).

The quality of life of people with heart failure is poor relative to that found in people with other chronic conditions. The Short-Form 36 (SF-36) questionnaire measures quality of life in eight areas of life, including physical, mental and social functioning. The Heart of England Screening study used the SF-36 to measure quality of life in the general population and in people with heart failure.

SF-36 scores of people with heart failure are significantly lower than those found in the general population, with all eight areas of quality of life affected. Heart failure causes more severe impairment of physical functioning, social functioning and energy levels than chronic lung disease, arthritis, or other cardiac conditions such as angina. Overall, quality of life in people with heart failure declines markedly as the severity of the disease increases¹.

The risk of co-morbidity is high in people with heart failure. People with heart failure are over three times as likely to have coronary heart disease and twice as likely to have diabetes as people without heart failure. At younger ages the risk of co-morbidity is greatest (Table 3.2).

1. For tables and figures on the impact of heart failure on quality of life see: Hobbs FDR, Kenkre JE, Roalfe AK, Davis RC, Hare R, Davies MK. Impact of heart failure and left ventricular systolic dysfunction on quality of life: a cross-sectional study comparing chronic cardiac and medical disorders and a representative adult population. *European Journal of Heart Failure* (in press).

Table 3.1 *New York Heart Association functional class of patients with heart failure, compared to the general population, 1995/99, West Midlands*

| New York Heart Association functional class | Definition | Heart failure cases % | General population % |
|---|--|-----------------------|----------------------|
| I | No limitation: ordinary physical exercise does not cause dyspnoea. | 0 | 82 |
| II (s) | Slight limitation of physical activity: dyspnoea on walking more than 200 yards or on stairs; | | |
| II (m) | Moderate limitation of physical activity: dyspnoea walking less than 200 yards. | 69 | 14 |
| III | Marked limitation of physical activity: comfortable at rest but dyspnoea washing and dressing, or walking from room to room. | 15 | 2 |
| IV | Severe limitation of physical activity: dyspnoea at rest, with increased symptoms with any level of physical activity. | 16 | 2 |
| <i>Bases</i> | | 92 | 3960 |

Source: Davies MK, Hobbs FDR, Davis RC, Kenkre JE, Roalfe AK, Hare R, Wosomu D, Lancashire RJ (2001) Prevalence of left-ventricular systolic dysfunction and heart failure in the Echocardiographic Heart of England Screening study: a population based study. *The Lancet* 358: 439-44.

Table 3.2 *Cardiovascular and diabetic co-morbidity in people aged 45 years and over, with and without heart failure, 1991/92, England and Wales*

| | | Heart failure patients % | Non-heart failure patients % | Age-specific risk ratios | | | Age-standardised risk ratios |
|----------------------------|-------|--------------------------|------------------------------|--------------------------|-------|-----------|------------------------------|
| | | | | 45-64 | 65-74 | 75 & over | |
| Coronary heart disease | Men | 26.30 | 5.14 | 10.92 | 3.82 | 2.74 | 3.69 |
| | Women | 17.40 | 3.07 | 15.62 | 4.21 | 3.06 | 3.61 |
| Atrial fibrillation | Men | 8.46 | 0.63 | 35.33 | 8.63 | 4.74 | 6.68 |
| | Women | 9.24 | 0.60 | 43.07 | 11.55 | 5.97 | 6.91 |
| Hypertension | Men | 10.58 | 9.16 | 1.75 | 0.94 | 0.88 | 0.98 |
| | Women | 10.58 | 11.43 | 1.23 | 0.96 | 0.68 | 0.78 |
| Diabetes mellitus | Men | 7.38 | 2.73 | 4.99 | 1.94 | 1.63 | 1.98 |
| | Women | 6.57 | 2.17 | 6.67 | 2.38 | 2.04 | 2.30 |
| Stroke | Men | 4.17 | 1.03 | 6.18 | 2.48 | 1.61 | 1.95 |
| | Women | 4.10 | 0.92 | 10.82 | 4.25 | 1.62 | 1.95 |
| Transient ischaemic attack | Men | 3.43 | 0.74 | 1.82 | 3.56 | 1.44 | 1.85 |
| | Women | 2.93 | 0.72 | 0.00 | 3.27 | 1.67 | 1.80 |

Source: Gnani S, Ellis C, Majeed A (2001) Co-existing conditions and utilisation of health services associated with heart failure: general-practice-based study. *Health Statistics Quarterly* 12: 27-33.

4. Treatment of heart failure

General practice consultations

Statistics collected by general practitioners suggest that heart failure is managed at nearly 0.7% of all general practice consultations and around 4% of consultations involving patients aged 45 and over (Table 4.1). Men and women aged 75 and above, are around twice as likely to consult their GP for heart failure than for coronary heart disease or stroke (Table 4.1).

Medication

The main groups of drugs used to treat heart failure are angiotensin converting enzyme (ACE) inhibitors, beta-adrenoceptor blocking drugs (beta-blockers) and diuretics. Results from randomised control trials in the USA and Scandinavia in patients with heart failure due to left ventricular systolic dysfunction, have shown that ACE inhibitors^{1,2} and beta blockers³ can improve patients symptoms, improve the mortality rate and reduce the number of hospital admissions, in the case of ACE inhibitors by around 30%.

Data from the General Practice Research Database show that just under 50% of patients with heart failure are prescribed ACE inhibitors, 10% are prescribed beta-blockers and over 90% are prescribed diuretics (Table 4.2).

Younger patients are more likely to be prescribed ACE inhibitors and beta-blockers compared to older patients (Table 4.2). At all ages, women are less likely to receive treatment with ACE inhibitors than men (Fig 4.2).

The same data also show substantial variation in prescribing between individual practices, particularly for ACE inhibitors. Among the 211 practices contributing to the General Practice Research Database, the proportion of patients with treated heart failure currently prescribed ACE inhibitors, varied from 0% to 100%.

Data from the Heart of England Screening study, a population based screening study, show that levels of appropriate treatment are likely to be even lower than the General Practice Research Database figures suggest. Overall, only 30% of those diagnosed with definite heart failure were receiving ACE inhibitors⁴.

Between 1994 and 1998, the percentage of treated heart failure patients prescribed ACE inhibitors in the General Practice Research Database increased from 37% to 53% in men, and from 30% to 44% in women – an overall increase of over 40%. The percentage prescribed beta-blockers

also increased, by 23% in men and 15% in women, but levels of prescribing remain relatively low compared to those for ACE inhibitors (Table 4.2).

Hospitalisations

Hospital episode statistics show that in 2000/01 there were just under 74,500 hospitalisations in National Health Service hospitals in England where heart failure was the principal diagnosis (Table 4.3). These represent 1% of all inpatient cases in men and 0.4% in women.

The average length of stay for a patient admitted to hospital with heart failure is over 13 days, three times the average length of stay for all patients (Table and Fig 4.3). Overall, there were about 1,000,000 days of inpatient care due to heart failure in 2000/01, representing just under 2% of all inpatient days in England (Table 4.3).

Heart failure accounts for an even higher proportion of hospitalisations in Scotland. Scottish Morbidity Record Scheme statistics show that in 1996, 1.1% of all hospital admissions and 1.4% of all inpatient days were due to hospitalisations where the principal diagnosis was heart failure, with another 1.5% of all hospital admissions and 1.9% of all inpatient days due to hospitalisations where heart failure was a secondary diagnosis⁵.

In the last ten years, the number of hospital admissions for heart failure in England, has increased by around 5% in men and 4% in women aged 45 years and over (Table and Fig 4.4). Hospital admissions for heart failure have also increased in Scotland, for which earlier trend data are available. Here, between 1980 and 1996, hospitalisations for heart failure as the principal diagnosis, increased by just under 75% in men and 45% in women, and hospitalisations for heart failure as either the principal or secondary diagnosis, increased by around 105% in men and 85% in women (Table and Fig 4.5).

In both countries, admission rates peaked in 1993/94 (Tables 4.4 and 4.5). However, due to an aging population, the total number of admissions for heart failure in the UK are likely to continue to increase substantially in the future⁶. In England, hospital admissions for heart failure are projected to increase by over 50% over the next 25 years⁷, from 74,500 in 2000/01 (Table 4.3) to 113,000 in 2026/27 (Table 4.6).

National Service Framework for Coronary Heart Disease

The National Service Framework for Coronary Heart Disease⁸, which was announced in March 2000, sets twelve national standards for the prevention, diagnosis and treatment of CHD. Standard Eleven relates specifically to heart failure and aims to improve both access and quality of care for patients with heart failure:

“Doctors should arrange for people with suspected heart failure to be offered appropriate investigations (e.g. electrocardiography, echocardiography) that will confirm or refute the diagnosis. For those in whom heart failure is confirmed, its causes should be identified – treatments most likely to both relieve their symptoms and reduce their risk of death should be offered.”

Despite recent increases in prescribing rates, data show that not everyone is getting appropriate treatment, such as ACE inhibitors, which the National Service Framework aims to promote.

Progress towards the National Service Framework standard on heart failure will be monitored in future editions of the British Heart Foundation's *Coronary Heart Disease Statistics*⁹.

1. Consensus Trial Group (1987) Effects of enalapril on mortality in severe congestive heart failure. Results of the Cooperative North Scandinavian Enalapril Survival Study (CONSENSUS). *New England Journal of Medicine* 316: 1429-35.
2. SOLVD Investigators (1991) Effect of enalapril on survival in patients with reduced ventricular ejection fractions and congestive heart failure. *New England Journal of Medicine* 325: 303-10.
3. Packer M, Bristow MR, Cohn JN et al (1996) The effect of Carvedilol on morbidity and mortality in patients with chronic heart failure. *New England Journal of Medicine* 334, 1349-55.
4. Davies MK, Hobbs FDR, Davis RC, Kenkre JE, Roalfe AK, Hare R, Wosornu D, Lancashire RJ (2001) Prevalence of left-ventricular systolic dysfunction and heart failure in the Echocardiographic Heart of England Screening study: a population based study. *The Lancet*, 358: 439-44.
5. Stewart S, MacIntyre K, MacLeod MMC, Bailey AEM, Capewell S, McMurray JJV (2001) Trends in hospitalisation for heart failure in Scotland, 1990-1996. An epidemic that has reached its peak? *European Heart Journal* 22, 209-17.
6. The burden of any disease can be measured in two ways. Firstly, by an age-adjusted rate (e.g. incidence rate, prevalence rate, hospital admission rate), which is a measure of the likelihood of an individual in the population getting the disease. Alternatively, the burden of a disease can be measured by an actual number, (e.g. of new cases, of all people with the disease, of hospital admissions), which is a measure of the population burden of the disease. In the case of heart failure in the UK, an aging population means that the population burden (number of cases, number of hospital admissions) is projected to increase, even if the rates stay the same or decrease slightly.
7. Gnani S, Ellis C (2001) Trends in hospital admissions and case fatality due to heart failure in England, 1990/91 to 1999/2000. *Health Statistics Quarterly* 13: 16-21.
8. Department of Health (2000) *National Service Framework for Coronary Heart Disease*. DH: London.
9. See www.heartstats.org

Table 4.1 General practitioner consultation rates for selected diseases, by sex and age, 1991/92, England and Wales

| Rate per 10,000 population | All ages | 0-4 | 5-15 | 16-24 | 25-44 | 45-64 | 65-74 | 75-84 | 85 & over |
|-------------------------------------|----------|--------|--------|--------|--------|--------|--------|--------|-----------|
| All conditions | Men | 51,027 | 20,142 | 17,198 | 19,290 | 30,622 | 43,138 | 51,708 | 57,761 |
| | Women | 48,288 | 22,954 | 43,186 | 42,846 | 43,291 | 47,478 | 54,301 | 55,247 |
| Coronary heart disease (410-414) | Men | 534 | 0 | 1 | 63 | 1,157 | 2,223 | 2,169 | 1,688 |
| | Women | 326 | - | 0 | 24 | 461 | 1,191 | 1,513 | 1,241 |
| Heart failure (428) | Men | 208 | 0 | - | 2 | 122 | 937 | 2,127 | 4,047 |
| | Women | 252 | 0 | 1 | 1 | 92 | 573 | 1,755 | 3,519 |
| Stroke (430-438) | Men | 133 | 1 | 3 | 5 | 163 | 577 | 1,066 | 1,587 |
| | Women | 128 | - | 4 | 7 | 95 | 337 | 798 | 1,259 |
| Diabetes (250) | Men | 292 | 1 | 55 | 113 | 544 | 1,053 | 1,164 | 778 |
| | Women | 256 | 3 | 35 | 86 | 394 | 858 | 932 | 496 |

ICD (9th revision) codes in parentheses.

Source: Royal College of General Practitioners, the Office of Population Censuses and Surveys and the Department of Health (1995) *Morbidity Statistics from General Practice, Fourth National Study 1991-1992*. HMSO: London.

Table 4.2 Prescribing of specific types of drug for patients with treated heart failure by sex and age, 1994-1998, England and Wales

| | Age-group | | | | | | | |
|---|-----------|--------|-------|-------|-------|-------|-------|-----------|
| | All ages | 0-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85 & over |
| MEN | | | | | | | | |
| <i>Percentage prescribed ACE inhibitors</i> | | | | | | | | |
| 1994 | 37.3 | 40.6 | 71.4 | 66.7 | 57.1 | 45.7 | 34.0 | 20.8 |
| 1995 | 41.5 | 57.9 * | 82.4 | 72.5 | 61.1 | 50.6 | 39.2 | 22.5 |
| 1996 | 38.4 | 52.2 * | 73.7 | 73.7 | 66.1 | 56.8 | 46.1 | 28.3 |
| 1997 | 51.1 | 65.0 * | 73.0 | 75.5 | 69.2 | 59.6 | 49.8 | 32.9 |
| 1998 | 53.1 | 65.0 * | 74.4 | 71.6 | 71.5 | 63.1 | 52.1 | 33.8 |
| % change 1994-1998 | 42.5 | - | 4.2 | 7.3 | 25.2 | 38.1 | 53.2 | 62.5 |
| <i>Percentage prescribed diuretics</i> | | | | | | | | |
| 1994 | 94.2 | 90.6 | 82.1 | 87.9 | 89.0 | 93.7 | 95.6 | 95.5 |
| 1995 | 93.9 | 78.9 | 67.6 | 85.2 | 89.3 | 92.4 | 94.9 | 97.0 |
| 1996 | 93.9 | 65.2 * | 71.1 | 82.6 | 87.7 | 90.9 | 93.3 | 96.9 |
| 1997 | 91.9 | 60.0 * | 86.5 | 81.3 | 86.0 | 89.9 | 93.2 | 95.8 |
| 1998 | 91.1 | 60.0 * | 92.3 | 78.2 | 84.7 | 89.6 | 91.9 | 95.4 |
| % change 1994-1998 | -3.3 | - | -12.4 | -11.0 | -4.8 | -4.4 | -3.9 | -0.1 |
| <i>Percentage prescribed beta-blockers</i> | | | | | | | | |
| 1994 | 8.6 | 9.4 | 14.3 | 16.4 | 15.9 | 11.7 | 7.5 | 2.7 |
| 1995 | 8.3 | 15.8 * | 26.5 | 16.4 | 16.3 | 10.8 | 7.5 | 2.2 |
| 1996 | 10.2 | 4.3 * | 26.3 | 13.6 | 16.6 | 11.8 | 7.1 | 4.0 |
| 1997 | 9.3 | 10.0 * | 24.3 | 17.8 | 15.7 | 12.6 | 8.0 | 4.1 |
| 1998 | 10.6 | 5.0 * | 28.2 | 21.0 | 17.5 | 14.2 | 9.5 | 4.2 |
| % change 1994-1998 | 22.9 | - | 97.2 | 28.0 | 10.1 | 21.4 | 26.7 | 55.6 |
| WOMEN | | | | | | | | |
| <i>Percentage prescribed ACE inhibitors</i> | | | | | | | | |
| 1994 | 30.2 | 39.3 | 39.3 | 37.6 | 38.0 | 36.3 | 29.8 | 18.2 |
| 1995 | 34.9 | 50.0 * | 44.0 | 45.5 | 43.1 | 40.9 | 34.8 | 22.3 |
| 1996 | 38.4 | 42.3 | 36.0 | 48.4 | 43.4 | 45.2 | 39.0 | 25.4 |
| 1997 | 41.5 | 50.0 * | 40.7 | 51.9 | 49.4 | 48.2 | 41.7 | 27.8 |
| 1998 | 43.6 | 42.3 | 48.0 | 56.6 | 50.4 | 49.1 | 44.0 | 31.4 |
| % change 1994-1998 | 44.6 | 7.6 | 22.1 | 50.5 | 32.6 | 35.3 | 47.7 | 72.5 |
| <i>Percentage prescribed diuretics</i> | | | | | | | | |
| 1994 | 95.3 | 89.3 | 89.3 | 93.6 | 93.5 | 94.1 | 96.0 | 96.8 |
| 1995 | 94.7 | 80.0 * | 96.0 | 88.2 | 94.5 | 92.8 | 95.5 | 96.5 |
| 1996 | 93.9 | 84.6 | 92.0 | 87.5 | 91.8 | 92.6 | 94.4 | 96.3 |
| 1997 | 93.6 | 77.3 * | 88.9 | 91.6 | 91.4 | 92.1 | 94.1 | 96.3 |
| 1998 | 93.5 | 76.9 | 92.0 | 93.8 | 91.1 | 91.8 | 94.1 | 96.0 |
| % change 1994-1998 | -1.9 | -13.9 | 3.0 | 0.2 | -2.6 | -2.4 | -2.0 | -0.8 |
| <i>Percentage prescribed beta-blockers</i> | | | | | | | | |
| 1994 | 10.0 | 3.6 | 21.4 | 13.8 | 16.5 | 14.1 | 8.4 | 4.0 |
| 1995 | 10.1 | 5.0 * | 24.0 | 11.8 | 17.3 | 12.9 | 9.4 | 4.1 |
| 1996 | 10.2 | 3.8 | 24.0 | 14.1 | 14.7 | 13.1 | 10.0 | 4.2 |
| 1997 | 10.2 | 9.1 * | 22.2 | 16.0 | 17.6 | 13.5 | 8.7 | 4.8 |
| 1998 | 11.4 | 7.7 | 20.0 | 13.1 | 16.8 | 15.3 | 10.6 | 5.2 |
| % change 1994-1998 | 14.5 | 113.9 | -6.5 | -5.1 | 1.8 | 8.5 | 26.2 | 30.0 |

All age percentages are age-standardised.

Rates calculated with fewer than 25 cases of treated heart failure patients are indicated with an asterisk. Their reliability may be affected by the small number of cases. When either the 1994 or 1998 rate is based on fewer than 25 cases, no figure is given for the percentage change (shown by -).

Source: Ellis C, Gnani S, Majeed A (2001) Prevalence and management of heart failure in General Practice in England and Wales, 1994-1998. *Health Statistics Quarterly* 11: 17-24.

Fig 4.2

Percentage of patients with treated heart failure prescribed ACE inhibitors and beta-blockers by sex and age, 1998, England and Wales

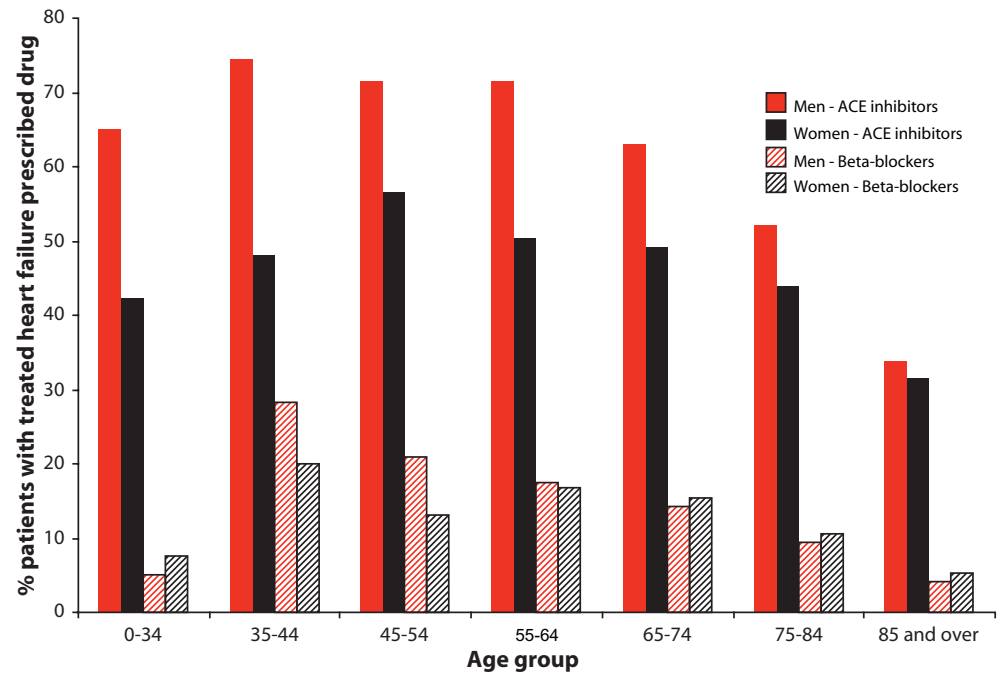


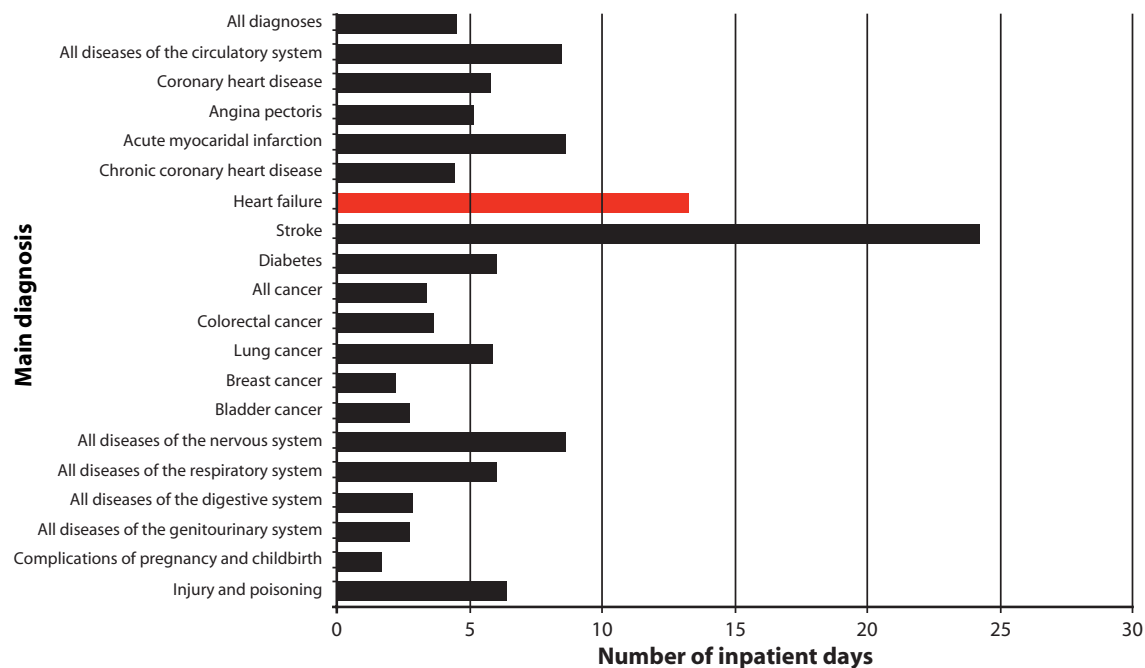
Table 4.3 *Inpatient cases by main diagnosis, sex and age, National Health Service hospitals, 2000/01, England*

| | Admissions | | | Days in hospital | |
|---|------------|-----------|------------|------------------|------------------------------------|
| | Men | Women | Total | Total days | Average length of admission (days) |
| All diagnoses | 5,321,016 | 5,795,145 | 11,116,161 | 50,446,289 | 4.5 |
| All diseases of the circulatory system (I00-I99) | 592,714 | 244,880 | 837,594 | 7,104,551 | 8.5 |
| Coronary heart disease (I20-I25) | 243,564 | 50,347 | 293,911 | 1,707,141 | 5.8 |
| Angina pectoris (I20) | 86,564 | 26,130 | 112,694 | 580,097 | 5.1 |
| Acute myocardial infarction (I21) | 57,919 | 6,814 | 64,733 | 559,324 | 8.6 |
| Chronic coronary heart disease (I25) | 87,327 | 17,233 | 104,560 | 464,784 | 4.4 |
| Heart failure (I50) | 52,803 | 21,638 | 74,441 | 986,996 | 13.3 |
| Stroke (I60-I69) | 68,183 | 29,509 | 97,692 | 2,369,926 | 24.3 |
| Diabetes (E10-E14) | 39,070 | 21,183 | 60,253 | 363,068 | 6.0 |
| All cancer (C00-D48) | 659,888 | 609,414 | 1,269,302 | 4,278,159 | 3.4 |
| Colorectal cancer (C18-C21) | 97,766 | 58,522 | 156,288 | 574,013 | 3.7 |
| Lung cancer (C33-C34) | 48,077 | 18,889 | 66,966 | 395,059 | 5.9 |
| Breast cancer (C50) | 773 | 123,864 | 124,637 | 279,806 | 2.2 |
| Bladder cancer (C67) | 59,659 | 17,683 | 77,342 | 213,123 | 2.8 |
| All diseases of the nervous system (G00-G99) | 109,192 | 95,270 | 204,462 | 1,758,477 | 8.6 |
| All diseases of the respiratory system (J00-J99) | 370,188 | 215,011 | 585,199 | 3,534,155 | 6.0 |
| All diseases of the digestive system (K00-K93) | 647,052 | 497,359 | 1,144,411 | 3,290,514 | 2.9 |
| All diseases of the genitourinary system (N00-N99) | 298,095 | 444,784 | 742,879 | 2,041,028 | 2.7 |
| Complications of pregnancy and childbirth (O00-O99) | 0 | 1,134,453 | 1,134,453 | 1,935,632 | 1.7 |
| Injury and poisoning (S00-T98) | 387,629 | 278,401 | 666,030 | 4,265,157 | 6.4 |

ICD codes (10th revision) in parentheses.

Source: Department of Health (2001) Hospital Episode Statistics. <http://www.doh.gov.uk/hes/>

Fig 4.3 *Average length of hospital admission by main diagnosis, National Health Service hospitals, 2000/01, England*



Coronary heart disease statistics: heart failure supplement

Table 4.4 Hospital admissions for heart failure in those aged 45 and over by sex and age, 1990/91-1999/2000, England

| Age group | 1990/91 | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | Change 1990/91 to 1999/2000 % |
|--|----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------------------------|
| Men | Number of admissions | | | | | | | | | | |
| 45-64 | 7,382 | 7,442 | 7,521 | 7,617 | 7,391 | 6,601 | 6,344 | 6,346 | 6,133 | 6,091 | -17.5 |
| 65-74 | 11,785 | 12,296 | 13,490 | 14,585 | 14,365 | 13,117 | 12,486 | 12,129 | 11,866 | 11,156 | -5.3 |
| 75-84 | 13,330 | 14,039 | 15,159 | 15,716 | 15,545 | 14,986 | 15,339 | 15,107 | 14,980 | 14,712 | +10.4 |
| 85 & over | 4,139 | 4,421 | 5,089 | 5,605 | 5,931 | 5,815 | 6,378 | 6,422 | 6,281 | 6,473 | +56.4 |
| All ages | 36,636 | 38,198 | 41,259 | 43,523 | 43,232 | 40,519 | 40,547 | 40,004 | 39,260 | 38,432 | +4.6 |
| Admission rate (per 1,000 population) | 1.59 | 1.65 | 1.77 | 1.85 | 1.83 | 1.72 | 1.70 | 1.67 | 1.63 | 1.59 | 0.0 |
| Women | Number of admissions | | | | | | | | | | |
| 45-64 | 3,287 | 3,227 | 3,512 | 3,617 | 3,542 | 3,079 | 3,096 | 3,076 | 3,031 | 2,730 | -16.9 |
| 65-74 | 8,297 | 8,675 | 9,345 | 10,101 | 10,094 | 8,790 | 8,471 | 8,459 | 7,996 | 7,461 | -10.1 |
| 75-84 | 16,083 | 16,929 | 18,337 | 19,113 | 18,216 | 17,006 | 16,839 | 16,541 | 15,920 | 15,552 | -3.3 |
| 85 & over | 9,448 | 10,205 | 11,401 | 12,731 | 12,891 | 12,341 | 13,001 | 13,054 | 13,088 | 12,881 | +36.3 |
| All ages | 37,115 | 39,036 | 42,595 | 45,562 | 44,743 | 41,216 | 41,407 | 41,130 | 40,035 | 38,624 | +4.0 |
| Admission rate (per 1,000 population) | 1.53 | 1.61 | 1.8 | 1.9 | 1.8 | 1.7 | 1.7 | 1.65 | 1.61 | 1.55 | +1.3 |

Finished consultant episodes where main diagnosis was heart failure. ICD (9th/10th revision) codes 428/450.

Source: Ghani S, Ellis C (2001) Trends in hospital admissions and case fatality due to heart failure in England, 1990/91 to 1999/2000. *Health Statistics Quarterly* 13: 16-21.

Fig 4.4 *Heart failure admission rates per 1000 population for those aged 45 years and over, 1990/91-1999/2000, England*

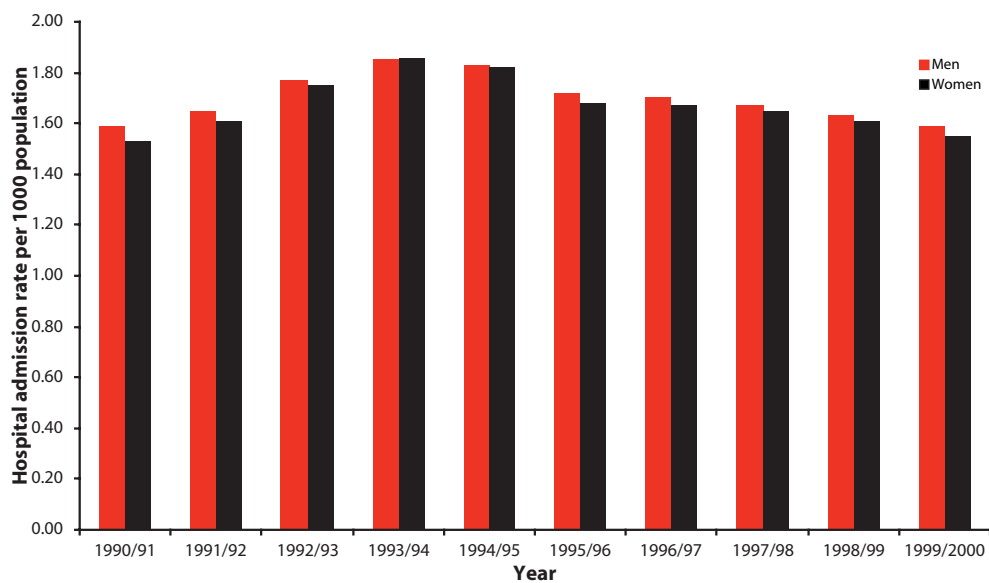


Table 4.5 Hospital discharges for heart failure by sex and diagnostic position, 1980-1996, Scotland

| | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |
|------------------------------------|------|------|------|------|------|------|------|------|
| Discharge rate per 1000 population | | | | | | | | |
| Men | | | | | | | | |
| Principal diagnosis | 1.27 | 2.1 | 2.0 | 2.2 | 2.3 | 2.3 | 2.1 | 2.2 |
| Secondary diagnosis | 1.22 | 1.4 | 1.8 | 2.1 | 2.3 | 2.5 | 2.7 | 2.9 |
| Any diagnostic position | 2.49 | 3.5 | 3.8 | 4.3 | 4.6 | 4.8 | 4.8 | 5.1 |
| Women | | | | | | | | |
| Principal diagnosis | 1.32 | 1.9 | 2.0 | 2.2 | 2.4 | 2.3 | 2.2 | 1.9 |
| Secondary diagnosis | 1.21 | 1.8 | 1.9 | 2.2 | 2.4 | 2.5 | 2.7 | 2.8 |
| Any diagnostic position | 2.53 | 3.7 | 3.9 | 4.4 | 4.8 | 4.8 | 4.9 | 4.7 |

Data from Scottish Morbidity Record Scheme.
ICD (9th revision) codes 428.0, 428.1, 428.9, 425.9, 402.

Source: Stewart S, Macintyre K, MacLeod MMC, Bailey AEM, Capewell S, McMurray JJV (2001) Trends in hospitalization for heart failure in Scotland, 1990-1996. An epidemic that has reached its peak? *European Heart Journal* 22: 209-17.

Fig 4.5 Heart failure hospital discharge rates, 1980-1996, Scotland

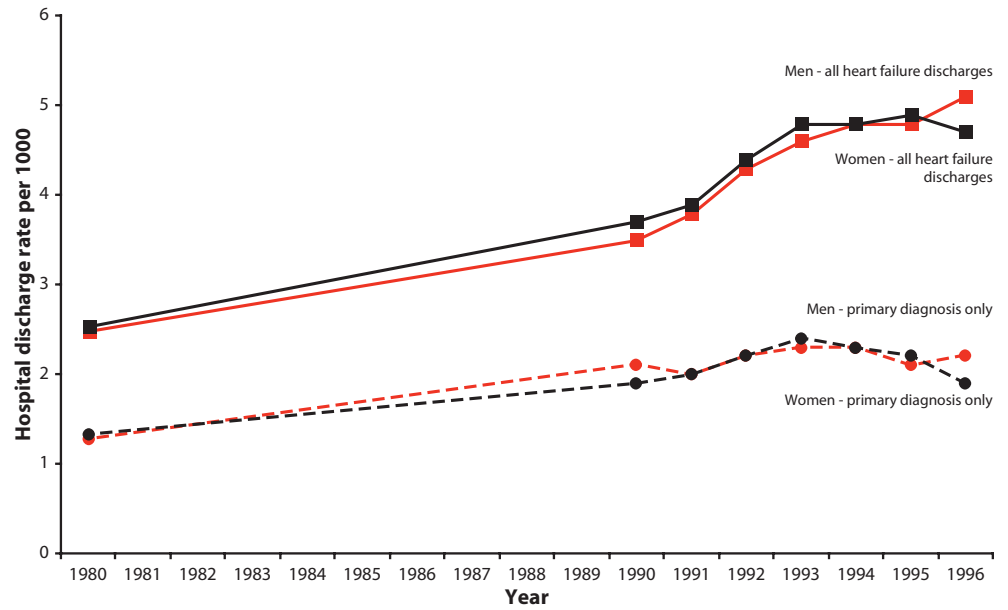


Table 4.6 *Projected number of hospital admissions for heart failure in those aged 45 and over, by sex and age, 2006/07-2026/27, England*

| <i>Age group</i> | <i>2006/07</i> | <i>2011/12</i> | <i>2016/17</i> | <i>2021/22</i> | <i>2026/27</i> |
|------------------|----------------|----------------|----------------|----------------|----------------|
| Men | | | | | |
| 45-64 | 6,700 | 7,400 | 7,700 | 7,800 | 7,700 |
| 65-74 | 11,600 | 12,900 | 15,100 | 15,800 | 16,400 |
| 75-84 | 16,200 | 17,000 | 18,400 | 20,900 | 25,000 |
| 85 and over | 7,600 | 9,100 | 10,400 | 11,900 | 13,500 |
| Total | 42,200 | 46,400 | 51,600 | 56,500 | 62,600 |
| Women | | | | | |
| 45-64 | 3,000 | 3,300 | 3,300 | 3,400 | 3,300 |
| 65-74 | 7,400 | 8,100 | 9,500 | 9,800 | 10,000 |
| 75-84 | 15,400 | 15,100 | 15,600 | 17,500 | 20,600 |
| 85 and over | 13,300 | 14,000 | 14,400 | 15,200 | 16,500 |
| Total | 39,200 | 40,500 | 42,900 | 45,800 | 50,500 |

Finished consultant episodes where main diagnosis is heart failure. ICD (10th revision) code I50.

Based on 1999/2000 Hospital Episode Statistics admission rates rounded to the nearest hundred applied to mid-year population projections.

Source: Gnani S, Ellis C (2001) Trends in hospital admissions and case fatality due to heart failure in England, 1990/91 to 1999/2000. Health Statistics Quarterly 13: 16-21.

5. Economic costs

General practitioner costs

Data from the 4th National Study of Morbidity in General Practice, show that the number of general practitioner consultations in patients with heart failure ranges from around 11 per year in patients aged 75 years and over, to just over 13 per year in people aged 45 to 64 years (Table 5.1). Applying these rates to the prevalence rates for definite heart failure from the Heart of England Screening study (see Table 1.3), we estimate that in 2000 there were around 7.6 million consultations for heart failure in the UK. Multiplying these consultations by the appropriate unit cost gives a total general practitioner cost of about £104 million (Table 5.1).

Hospital costs

From routinely collected hospital statistics we estimate that in 2000/01 there were approximately 86,000 inpatient admissions to National Health Service hospitals in the UK for heart failure, with an associated total cost of £379 million (Table 5.2).

From similar routinely collected statistics, we further estimate that there were just under 2,000 day-case admissions for heart failure in the UK in 2000/01, which cost £450, 000 (Table 5.2).

There is little reliable information on the number of outpatient attendances related to heart failure. However, data from the 4th National Study of Morbidity in General Practice show that on average there are 0.5 referrals to secondary care per annum per patient with heart failure (Table 5.3). Using this figure we estimate that in 2000 there were over 325,000 first outpatient hospital visits in the UK. We also estimate there were an additional 210,000 subsequent outpatient visits, which together represent a cost of over £51 million (Table 5.3).

A number of routine investigations such as electrocardiogram (ECG) and chest x-ray are performed on heart failure patients at their first and subsequent outpatient visits. The cost of these investigations in 2000 in the UK is estimated to be around £37 million (Table 5.4).

Drug costs

Overall, in 2000, around 5.3 million prescriptions were issued in the UK for drugs used specifically to treat heart failure (Table 5.5). The total cost associated with prescribing and dispensing these drugs amounted to approximately £54 million (Table 5.5)

Total cost of heart failure to the National Health Service

Overall, the total cost of heart failure to the National Health Service in the UK is just over £625 million per year (Table 5.6).

Hospital inpatient care is the biggest single cost, accounting for just over 60% of the total health care costs of heart failure in the UK (Fig 5.6).

Table 5.1 Mean annual number of general practice consultations per person with heart failure, 1991/1992, England and Wales, and estimates of the total numbers of consultations and their cost to the NHS, 2000, UK

| | England and Wales | | | UK | |
|--------------|--|-------------|-----------------|----------------------------------|----------------|
| | Mean annual number of GP consultations per person with heart failure | | | Total number of GP consultations | Cost £ million |
| | 45-64 years | 65-74 years | 75 years & over | | |
| Males | 13.05 | 12.35 | 10.92 | 4,164,933 | |
| Females | 13.54 | 12.54 | 11.14 | 3,479,019 | |
| All patients | 13.27 | 12.44 | 11.06 | 7,643,951 | 103.84 |

Sources: Gnani S, Ellis C, Majeed A (2001) Co-existing conditions of health services associated with heart failure: general-practice-based study. *Health Statistics Quarterly* 12: 27-33;

Netten A, Dennett J, Knight J (1999) *Unit costs of health and social care*. PSSRU, University of Kent: Canterbury.

Table 5.2 Hospital admissions related to heart failure, 2000/01, England, and estimates of hospital admissions and their cost to the NHS, 2000, UK

| | England | UK | Cost £ million |
|-------------------------------|----------------------|----------------------|-------------------|
| | Number of admissions | Number of admissions | |
| Ordinary inpatient admissions | 74,441 | 84,151 | 378.60 |
| Day cases | 1,725 | 1,950 | 0.45 |
| All hospital admissions | 76,166 | 86,101 | 379.05 |

The cost includes any interventions undertaken on an inpatient basis.

Sources: Department of Health (2002) *Hospital Episode Statistics 2000-2001*. <http://www.doh.gov.uk/hes/>
Department of Health. *Annual Trust Financial Returns 1998 and 1999*.

Table 5.3 *Mean annual number of referrals to secondary care per patient with heart failure, 1991/92, England and Wales, and estimates of the total number of hospital outpatient visits (first and subsequent) for heart failure, 2000, UK*

| | Mean annual number of referrals to secondary care per patient with heart failure, 1991/92, England and Wales | | | Number of hospital outpatient visits, 2000, UK | | Total cost £ million |
|--------------|--|-------------|-----------------|--|------------------------|----------------------|
| | 45-64 years | 65-74 years | 75 years & over | First attendance | Subsequent attendance* | |
| Males | 0.48 | 0.55 | 0.52 | 181,481 | - | |
| Females | 0.51 | 0.45 | 0.49 | 146,056 | - | |
| All patients | 0.50 | 0.50 | 0.50 | 327,568 | 210,377 | 51.25 |

* The estimate for the number of subsequent outpatient attendances was based on estimates by McMurray et al. (1993) who assumed that each hospitalised case generates an average of 2.5 outpatient follow-up visits in the following year.

Sources: Gnani S, Ellis C, Majeed A (2001) Co-existing conditions of health services associated with heart failure: general-practice-based study. *Health Statistics Quarterly* 12: 27-33;
 McMurray J, Hart W Rhodes G (1993) An evaluation of the cost of heart failure to the National Health Service in the UK. *British Journal of Medical Economics*, 6: 99-110;
 Department of Health, Annual Trust Financial Returns 1998 and 1999.

Table 5.4 *Estimates of the probability of outpatient investigations performed at first and subsequent attendances of heart failure patients and their total cost to the NHS, 2000, UK*

| Investigation | Probability at first attendance | Probability at follow-up | Total cost £ million |
|--------------------|---------------------------------|--------------------------|----------------------|
| Chest x-ray | 1 | 1 | 18.22 |
| ECG | 1 | 1 | 4.56 |
| Blood chemistry | 1 | 1 | 1.82 |
| Haematology | 1 | 1 | 1.82 |
| Cardiac ultrasound | 0.6 | 0 | 11.02 |
| | | | 37.44 |

Source: McMurray J, Hart W, Rhodes G (1993) An evaluation of the cost of heart failure to the National Health Service in the UK. *British Journal of Medical Economics*, 6: 99-110.

Table 5.5 Estimates of the number and cost of prescriptions used in the treatment of heart failure, 2000, UK

| Drug type | Number of prescriptions | Total net ingredient cost £ million |
|---|-------------------------|--|
| ACE inhibitors | 1,425,122 | 25.32 |
| Beta blockers | 38,303 | 0.22 |
| Loop diuretics | 2,260,471 | 6.97 |
| Potassium sparing diuretics and compounds | 474,265 | 2.75 |
| Thiazides and related diuretics | 156,791 | 0.26 |
| Cardiac glycosides | 627,941 | 0.43 |
| Angiotensin-II receptor antagonists | 131,525 | 3.76 |
| Potassium | 135,829 | 1.11 |
| Xamoterol fumarate | 86,098 | 2.61 |
| Total | 5,336,345 | 54.08 |

The total cost includes the cost of dispensing the drug.

The total cost estimate is likely to be an underestimate of the true total cost of prescriptions for heart failure. A number of drugs are used for a number of diseases (not solely heart failure) and the costs of these drugs are not included.

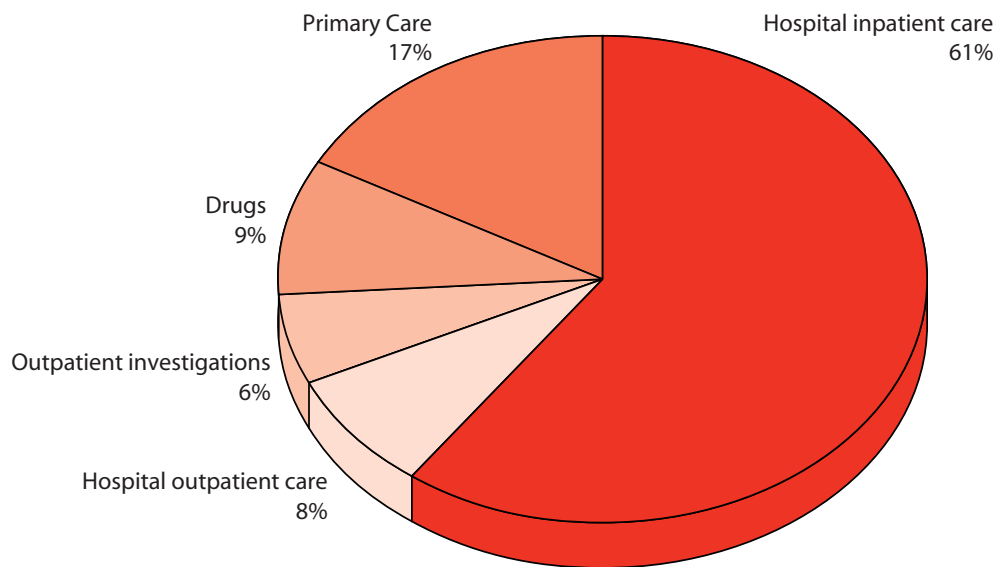
*Sources: IMS, Medical Data Index 2000 (personal communication 2002);
Department of Health Statistics Division. Prescription cost analysis 2000.
<http://www.doh.gov.uk/prescriptionstatistics/index.htm>*

Table 5.6 *Costs of heart failure to the National Health Service, 2000, UK*

| | £ million | % of total |
|---------------------------|---------------|------------|
| Primary care | 103.8 | 17 |
| Hospital inpatient care | 378.6 | 61 |
| Hospital day-case care | 0.45 | <1 |
| Hospital outpatient care | 51.25 | 8 |
| Outpatient investigations | 37.44 | 6 |
| Drugs | 54.08 | 9 |
| Total | 625.62 | 100 |

Sources: See Tables 5.1 to 5.5.

Fig 5.6 *Costs of heart failure to the National Health Service, 2000, UK*



*Appendix Mid-2000 population estimates by age and sex,
United Kingdom*

| | Men | Women | Total |
|-----------------|-------------------|-------------------|-------------------|
| 0-4 | 1,832,000 | 1,743,200 | 3,575,200 |
| 5-9 | 1,979,400 | 1,883,400 | 3,862,800 |
| 10-14 | 1,993,800 | 1,890,700 | 3,884,500 |
| 15-19 | 1,893,900 | 1,788,800 | 3,682,700 |
| 20-24 | 1,827,400 | 1,736,400 | 3,563,800 |
| 25-29 | 2,134,400 | 2,018,700 | 4,153,100 |
| 30-34 | 2,430,800 | 2,314,800 | 4,745,600 |
| 35-39 | 2,463,000 | 2,372,400 | 4,835,400 |
| 40-44 | 2,099,900 | 2,069,700 | 4,169,600 |
| 45-54 | 1,887,100 | 1,886,700 | 3,773,800 |
| 55-54 | 2,022,400 | 2,036,500 | 4,058,900 |
| 55-59 | 1,609,000 | 1,641,100 | 3,250,100 |
| 60-64 | 1,410,700 | 1,472,800 | 2,883,500 |
| 65-69 | 1,232,500 | 1,350,100 | 2,582,600 |
| 70-74 | 1,054,500 | 1,280,100 | 2,334,600 |
| 75-79 | 823,200 | 1,169,600 | 1,992,800 |
| 80-84 | 450,000 | 794,300 | 1,244,300 |
| 85 & over | 315,100 | 847,300 | 1,162,400 |
| All ages | 29,459,100 | 30,296,600 | 59,755,700 |

Source: Office for National Statistics, General Register Office for Scotland and Northern Ireland Statistics and Research Agency.
www.statistics.gov.uk