

HOW DOES THE UK MATCH UP TO OTHER COUNTRIES?

This chapter considers how the UK compares with other countries across a range of health care indicators, focusing in particular on health outcomes. It considers what factors might account for differences in outcomes between countries. The main points are:

- UK health outcomes are generally poor compared with other countries, with significant gaps between the UK and the best performers for key measures such as life expectancy, infant mortality, premature mortality and survival rates from cancer and heart disease. Comparable data on morbidity are more difficult to obtain. Survey results provide mixed evidence on the UK's relative performance in terms of health care accessibility and satisfaction;
- the UK spends a lower proportion of its national income on health care than comparator countries. It also has a significantly lower number of health professionals per head of the population and lags behind other countries in the use of medical technology;
- health outcomes reflect the interaction of a wide range of health care, socio-economic, lifestyle and environmental factors. Among studies which explore the determinants of health outcomes, recent work by the OECD identifies a number of significant factors, including the level of health care resources, the public sector share of total health spending, GDP, occupational status, tobacco and alcohol consumption and air pollution; and
- the OECD work suggests that most of the UK's relatively poor performance in health outcomes can be explained by the UK's relatively low level of resources devoted to health care. However, further consideration of this and other work is required before forming a view of the main reasons for the differences in health outcomes between the UK and other countries and the implications for achieving more comparable health outcomes in the future.

Introduction

- 5.1 Discussion and debate about the performance of the UK health service increasingly takes place with reference to what happens in other countries. Reports about how much more of their national income other countries spend on health care or how waiting lists are shorter in other countries frequently make the media headlines. This trend towards a growing awareness of what health systems in other countries cost and deliver can be expected to continue.
- 5.2 International comparisons provide one possible benchmark for looking at the quality, efficiency and comprehensiveness of the UK health service. What health outcomes other countries achieve and an assessment of what factors

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are driving those outcomes is an important indicator of how the UK is performing and of the potential for achieving improved health outcomes in the future.

- 5.3 This chapter therefore sets UK health care in an international context. It discusses how the UK matches up to other countries and examines what might explain some of the key differences.

Comparator countries

- 5.4 Two key criteria have been used to identify a core group of comparator countries for the Review:

- countries with broadly similar levels of income (GDP) per head; and
- countries which aim to provide a comprehensive, universal health care system for their populations.

- 5.5 The countries selected as being most relevant based on these two criteria (although not necessarily the only countries which meet these criteria) are: Australia, Canada, France, Germany, the Netherlands, New Zealand and Sweden. Comparisons are also made with the average of the 15 EU Member States (hereafter referred to as the EU average).

- 5.6 There are various ways in which averages across countries can be presented. In particular, averages can be weighted or unweighted. As set out by the Organisation for Economic Cooperation and Development (OECD)¹, the rationale for using unweighted averages is that for some indicators it is appropriate to treat each country's experience as one observation carrying equal weight to any other observation. However, the OECD also presents weighted averages for indicators where there is interest in assessing the position for the group of countries taken as a whole. For example, population-weighting of health outcome indicators for EU member States provides a more accurate picture of the health of the EU population as a whole. In this report, where possible, the EU average for health outcome indicators is population weighted.

- 5.7 For health expenditure data, both weighted and unweighted averages are commonly quoted and, where possible, both measures are reported in this chapter. Figures for health spending per capita have been population weighted, while figures for health spending as a percentage of GDP are income weighted (using weights based on GDP on a US\$ purchasing power parity basis). Both averages have advantages. The weighted average equates to the sum of EU health spending divided by the sum of EU GDP. The unweighted average gives equal weight to each country's individual experience of running its health system on a particular level of spending.

¹ OECD (2001), *Health at a Glance*, OECD, Paris.

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- 5.8 In some cases it is interesting to compare the UK with the United States (US) and Japan. However, because the health care system and health care delivery is so different in the US, and because cultural and social factors tend to be so different in Japan, they are not included in the core group of comparator countries.
- 5.9 As set out in Chapter 4, all of the countries against which the UK is compared here aim to provide a health system with universal, or largely universal, access. Public funding dominates in all the comparator countries, although the method of financing varies between countries. Responsibility for provision also varies between the countries. While Sweden and the UK are characterised by mainly public provision, health services in Canada and the Netherlands are largely privately provided. The other comparator countries have varying mixes of public and private provision.
- 5.10 What is clear is that all health care systems are complex and face a wide range of pressures, some common to all countries and some country specific. This is evidenced by cross-country surveys of both patients and medical workers, which show that while satisfaction levels vary between countries, dissatisfaction with health care is generally high in all countries. For example, the Commonwealth Fund's 1998 International Health Policy Survey² found that in none of the five nations questioned (Australia, Canada, New Zealand, the UK and the US) was a majority content with the health care system. Almost every major country continues to seek new approaches and reforms to the way in which health care is financed and delivered.

Cross-country comparisons

- 5.11 A large amount of health-related data is collected and published by major national and international organisations such as the OECD, from whose database³ many of the data presented in this chapter are drawn. A much more comprehensive comparison of health indicators across countries than there is space to set out here can be found in the recent OECD publication, *Health at a Glance*¹.

² Donelan K, Blendon R. et al (1999), The Cost of Health System Change: Public Discontent in Five Nations, *Health Affairs* 18: 206-16.

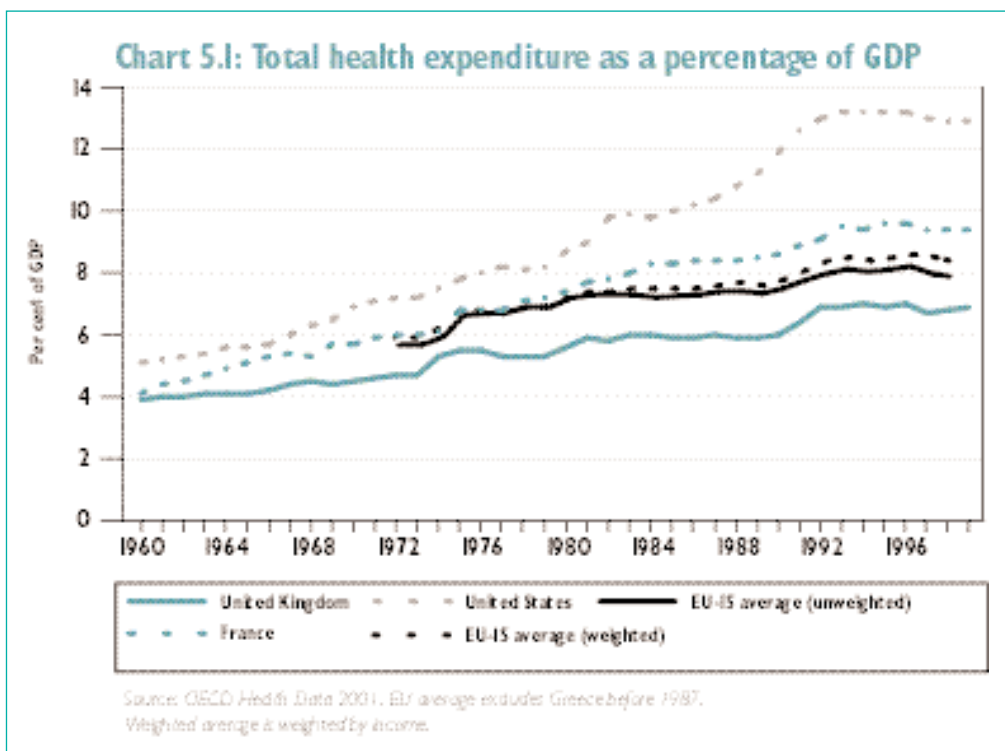
³ OECD (2001), *OECD Health Data 2001: A Comparative Analysis of 30 Countries*, 10th anniversary, database available on CD-ROM, OECD, Paris.

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5.12 In making comparisons between countries and drawing inferences and conclusions from them, it is important to keep in mind issues of data quality. Comparisons will only ever be as good as the quality of the data on which they rely. The quality of the data available has undoubtedly improved over time. It should improve further as countries make welcome progress towards producing Health Accounts within the internationally agreed framework which has been developed by the OECD⁴ in consultation with member states and the World Health Organisation (WHO). But even where data are reported to a standard definition, differences in measurement error between countries may persist. So caution needs to be exercised when comparing data both over time and especially between countries and, in general, the focus should be on broad trends and magnitudes.

Health expenditure

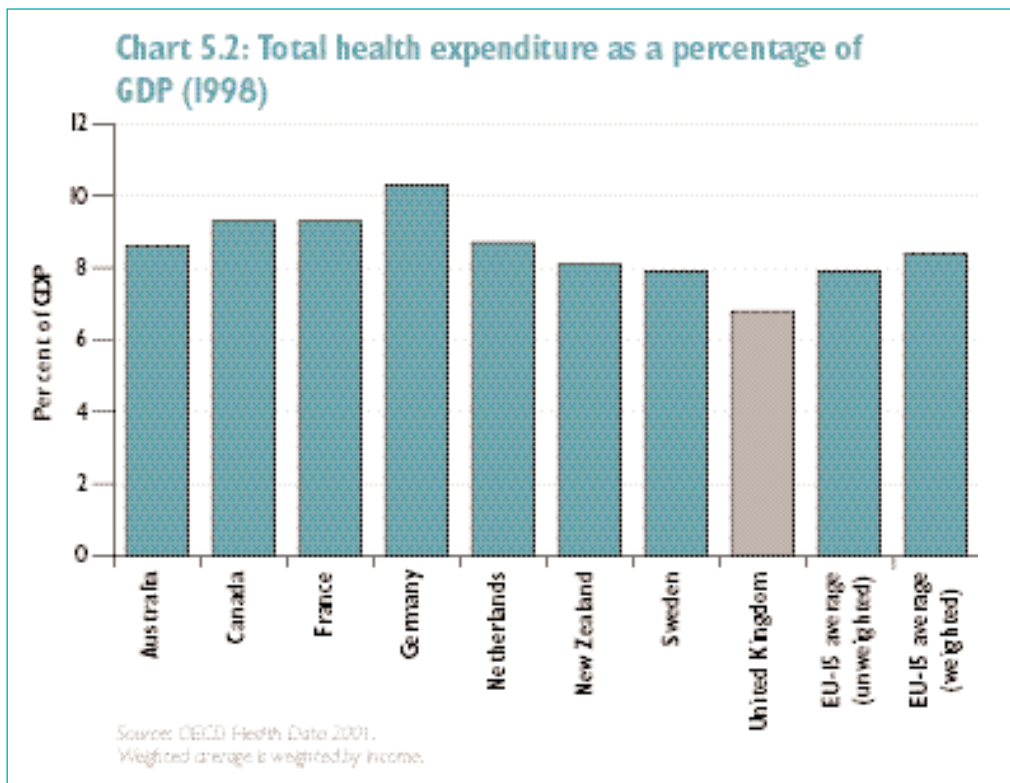
5.13 The most commonly quoted international comparison in the area of health care is total health expenditure. The share of total health spending in GDP has consistently been lower in the UK than in any of the group of comparator countries for at least 30 years, and as shown in Chart 5.1 has been well below the EU average (on both a weighted and unweighted basis). Against some comparator countries, such as France, the gap has widened.



⁴ OECD (2000), *A System of Health Accounts, Version 1.0*, OECD, Paris.

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5.14 Chart 5.2 shows that in 1998 - the latest year for which comparable data are available for all countries - UK total health spending was 6.8 per cent of GDP, compared with an unweighted EU average of 7.9 per cent and an income-weighted average of 8.4 per cent. Only Luxembourg among the EU Member States devoted a smaller share of GDP to health. Among individual comparator countries, spending ranged from 7.9 per cent in Sweden to 10.3 per cent in Germany. It is also worth noting the position in the US where total health spending accounted for almost 13 per cent of GDP.



5.15 Total health spending per head of the population was lower in 1998 in the UK than in any comparator country except New Zealand (see Table 5.1). It was around 13 per cent lower than in Sweden, around 25 to 30 per cent lower than in Australia, France and the Netherlands and around 35 per cent lower than in Canada and Germany. The gap with the EU (population-weighted) average was around 17 per cent.

5.16 Table 5.1 also shows a breakdown of total health spending as a percentage of GDP in 1998 between public sector and private sector spending. The UK spends less on health in both the public and private sectors than any comparator country.

5.17 At 1.1 per cent of GDP in 1998, private sector health spending was lower in the UK than any of our comparator countries, where figures ranged from 1.3 per cent in Sweden to 2.8 per cent in Canada. In some cases, the gap in total

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health spending between the UK and other countries largely reflects this difference in private spending. Publicly funded health spending accounted for 5.7 per cent of GDP in the UK in 1998, compared with 6.0 per cent in Australia and the Netherlands. In other comparator countries, including France and Germany, the gap in total spending reflects a mixture of both higher public spending and higher private spending. The relative merits of public and private funding of health care are discussed in Chapter 4.

Table 5.1: Health expenditure per capita and as a percentage of GDP(1998)

Country	Per capita ¹	Percentage of GDP		
	Total	Total	Public	Private
Australia	2,085	8.6	6.0	2.6
Canada	2,360	9.3	6.5	2.8
France	2,034	9.3	7.1	2.2
Germany	2,361	10.3	7.8	2.5
Netherlands	2,150	8.7	6.0	2.7
New Zealand	1,440	8.1	6.3	1.9
Sweden	1,732	7.9	6.6	1.3
United Kingdom	1,510	6.8	5.7	1.1
EU-15 average:				
unweighted	1,764	7.9	5.9	2.0
weighted ²	1,824	8.4	6.4	2.1
Other countries:				
US	4,165	12.9	5.8	7.1
Japan	1,795	7.4	5.8	1.6

Source: OECD Health Data 2001. Public and private may not sum to total due to rounding.

¹ Expressed in US\$ economy-wide purchasing power parities.

² Health spending per capita is population weighted. Health spending as a percentage of GDP is income weighted.

5.18 The gap in total spending between the UK and other countries is likely to have narrowed as a result of the significant real terms increase in UK health spending in 2000 – and some further narrowing seems likely between 2001 and 2003 as UK spending is planned to increase by an average of around 6 per cent a year in real terms. Nevertheless, a significant gap will still remain.

5.19 Of course, the performance of a health system or the standard of health of a population should not be judged by the aggregate level of health expenditure. While the comparatively low level of resources devoted to health care in the UK is one of the key factors which explains relatively poor UK health outcomes (see later), many other countries which spend more on health care than the UK still suffer from problems such as long waiting lists and low staff morale. And on many measures, the US experiences worse health outcomes than the UK despite spending almost double the proportion of its national income on health care.

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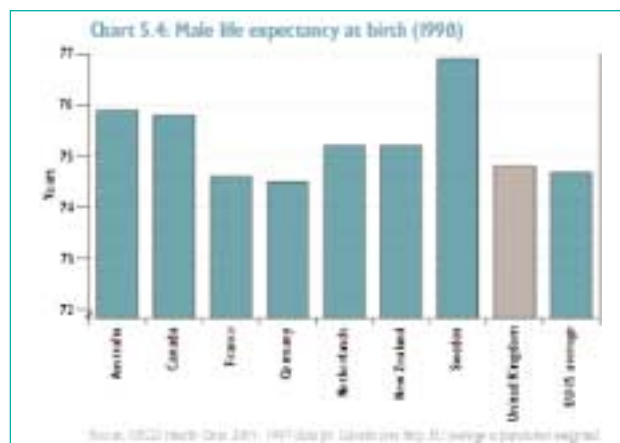
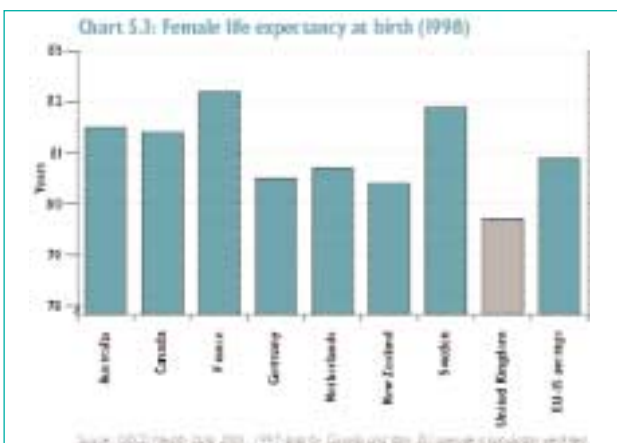
- 5.20 The efficiency with which resources are utilised, the effectiveness of outputs in delivering desired outcomes and country-specific socio-economic, lifestyle and environmental factors are also likely to be extremely important in explaining health outcomes.
- 5.21 This chapter therefore explores how health outcomes and measures of accessibility and patient satisfaction in the UK compare with those in other countries and considers what factors - both medical and non-medical - might account for observed differences in health outcomes.

Health outcomes

- 5.22 Many indicators of health outcomes are readily available, although in some cases with a time lag of a few years. Unless otherwise stated, the outcome indicators quoted in this chapter are taken from the OECD Health Database 2001 and the OECD *Health at a Glance* publication.
- 5.23 Across a range of health outcome indicators, the picture which emerges is one of generally poor outcomes in the UK relative to comparator countries, with significant gaps between the UK and the best performers for key outcome measures. Outside the group of comparator countries, the US tends to have poor outcomes (often worse than the UK) while Japan is characterised by generally good health outcomes (often significantly better than any of the comparator countries).

Life expectancy

- 5.24 **Life expectancy at birth** provides one of the broadest indicators of the overall health of a population. There have been large increases in life expectancy across almost all major countries over the past 40 years, with a strong convergence towards the average. In the UK, female life expectancy at birth has risen by $5\frac{1}{2}$ years since 1960 and male life expectancy has risen by $6\frac{1}{2}$ years. This narrowing of the gap over time in favour of males is in contrast to most other countries where female life expectancy has been increasing faster than male life expectancy.



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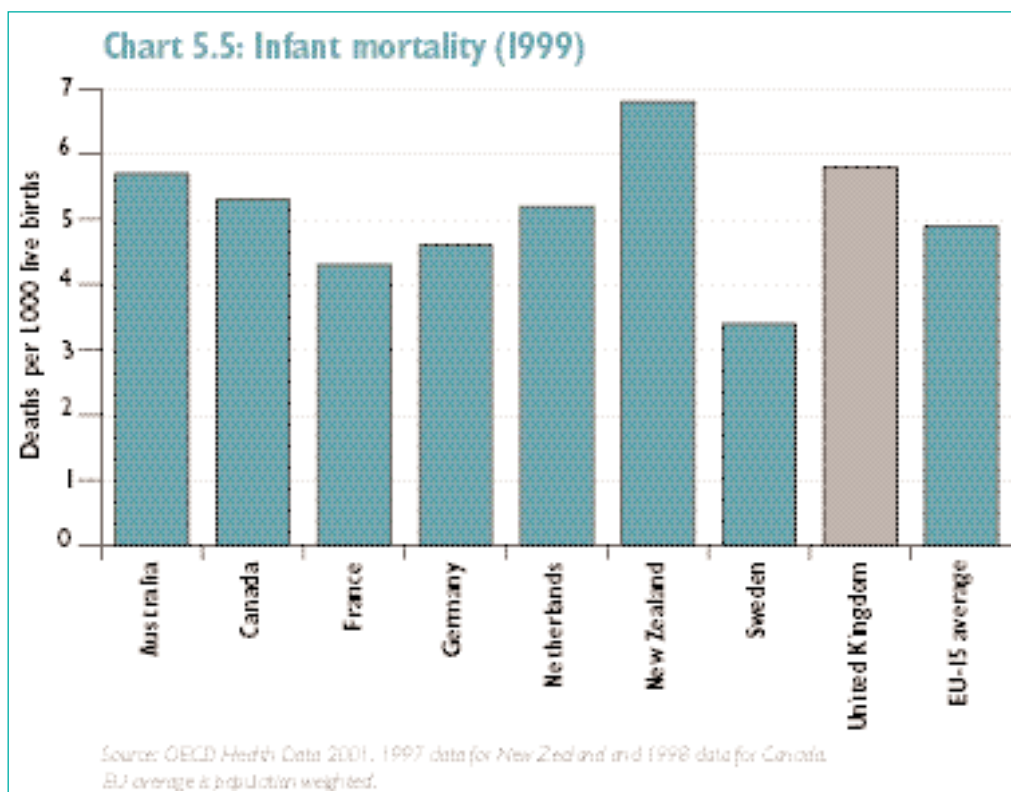
- 5.25 At 79.7 years for females in 1998, life expectancy at birth was lower in the UK than in any of the comparator countries, where figures ranged from 80.4 years in New Zealand to 82.2 years in France. The EU (population-weighted) average was 80.9 years. The UK fared better in terms of male life expectancy at birth, coming in slightly above France, Germany and the EU (population-weighted) average. But at 74.8 years, male life expectancy at birth was around one year lower than in Australia and Canada and two years lower than in Sweden. To put these gaps into context, it took around five years for UK life expectancy to increase by one year to its 1998 level.
- 5.26 A second commonly-used measure of life expectancy is that at older age, for example at age 65. This provides a broad indicator of the health of elderly people in the population. The effect of health care probably explains a greater proportion of life expectancy at age 65 than it does life expectancy at birth given that causes of death such as violence, suicide and road accidents tend to be less prevalent among older age groups.
- 5.27 As with life expectancy at birth, **life expectancy at age 65** has been on a steadily rising trend over the past 40 years in all major countries. Female life expectancy at age 65 in the UK was 18.5 years in 1997, lower than in any comparator country and significantly lower than in some countries such as Canada (20.1 years) and France (20.8 years). Male life expectancy at 65 was lower in 1997 than in any comparator country except for the Netherlands.
- 5.28 WHO has developed summary measures of population health which take account of time lived with disability. One of WHO's key summary statistics is **disability-adjusted life expectancy (DALE)** - the expectation at birth of life lived in equivalent full health⁵. In producing estimates of DALE, unadjusted life expectancy at birth figures are adjusted downwards to take account of time lived with disability. Varying weights are assigned to different types of disability, which may or may not vary with age.
- 5.29 According to this measure, the UK does a little better in terms of health outcomes relative to other countries, with the WHO estimating that the percentage of lifespan lived with disability is lower for the UK than other countries. However, the impact only partly offsets the longer unadjusted life expectancy in countries such as Australia, Canada and Sweden.

⁵ WHO (2000), *The World Health Report 2000, Health Systems: Improving Performance*, World Health Organisation, Geneva.

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Infant mortality

- 5.30 **Infant mortality** is defined by the number of deaths of children under one year of age per 1,000 live births. While infant mortality has declined in the UK over the past 40 years, it has done so more slowly than in most comparator countries. At 5.8 deaths per 1,000 live births in 1999, the UK rate is above the EU (population-weighted) average of 4.9 which includes figures of 4.6 in Germany, 4.3 in France and just 3.4 in Sweden. But in contrast to life expectancy, Australia and Canada perform little better than the UK on infant mortality and New Zealand has worse outcomes.

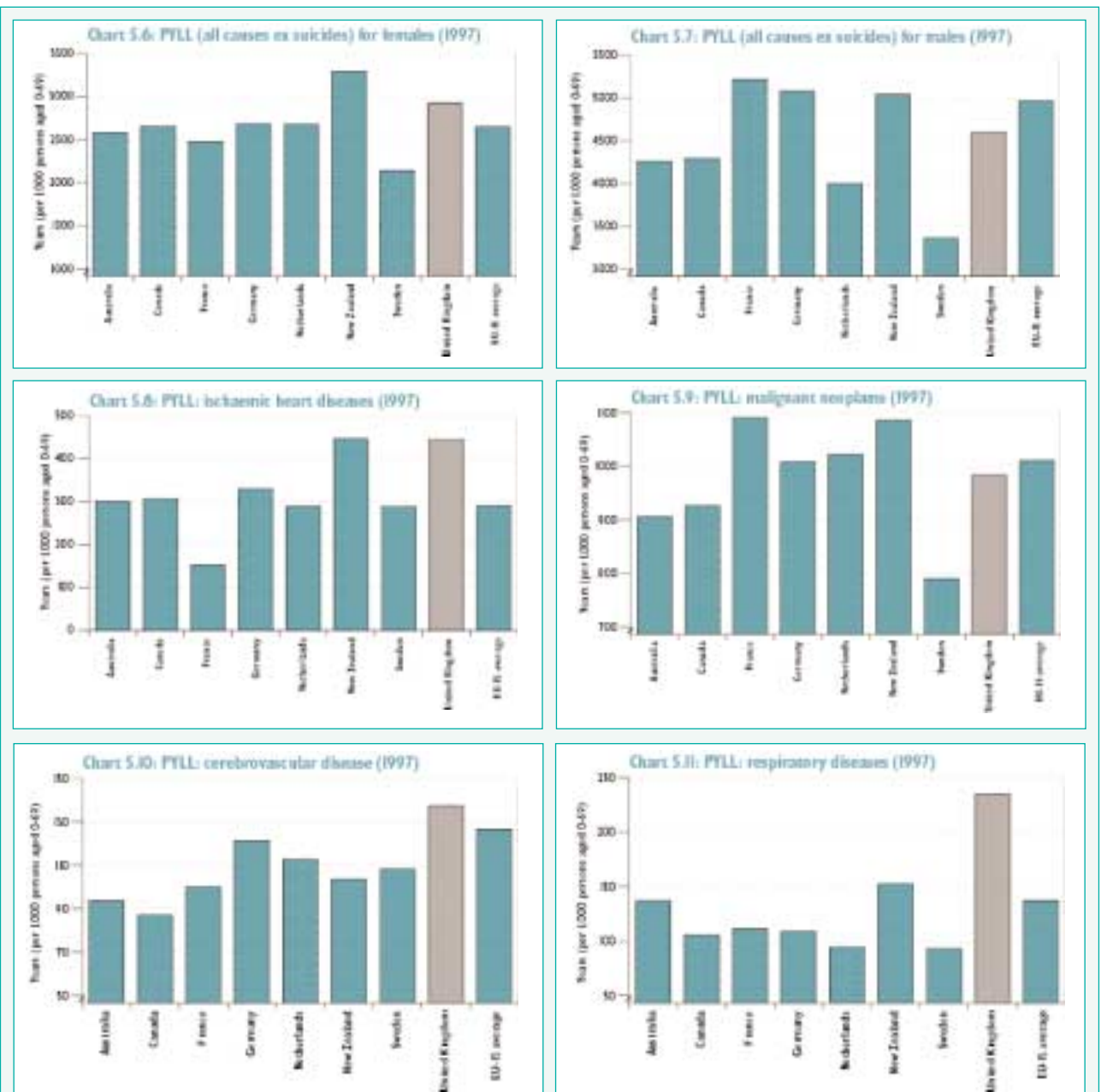


Premature mortality

- 5.31 A further commonly reported measure of health outcomes is **potential years of life lost (PYLL)**. This is a measure of premature mortality calculated by measuring the gap between age at death and a specified age limit - often 70 years. As such, this measure can be considered for both all causes of death and for specific conditions. The measure gives greater weight to deaths at younger ages. Mortality is considered premature if it was preventable had appropriate medical knowledge been applied and known public health principles been in force, or had risky behaviour not been so prevalent.
- 5.32 The UK does not generally compare well with comparator countries in terms of potential years of life lost per 100,000 of the population, measured both across all causes (excluding suicides) and specific causes.

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- 5.33 1997 data show that **PYLL from all causes (excluding suicides)** for females was higher in the UK than in all comparator countries except New Zealand, with PYLL around 10-15 per cent lower in Australia, Canada and France and around 25 per cent lower in Sweden.
- 5.34 The UK's ranking for males was more favourable, ahead of France, Germany and New Zealand and the EU (population-weighted) average. Nevertheless, PYLL for males was around 7 per cent lower in Australia and Canada, 13 per cent lower in the Netherlands and over 25 per cent lower in Sweden.



Source: OECD Health Data 2001. 1995 data for Belgium, 1996 data for Denmark, Finland, Ireland and Sweden. EU average is population weighted.

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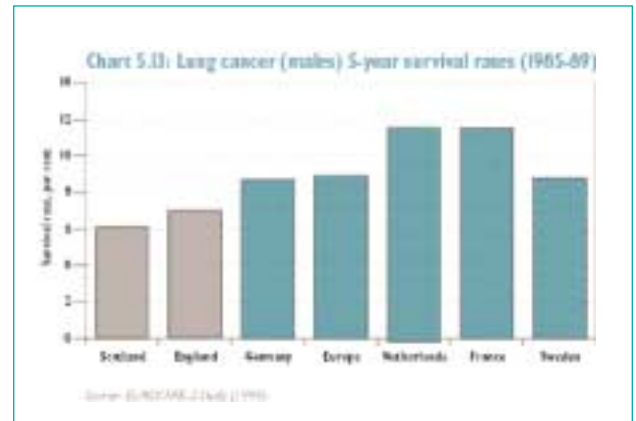
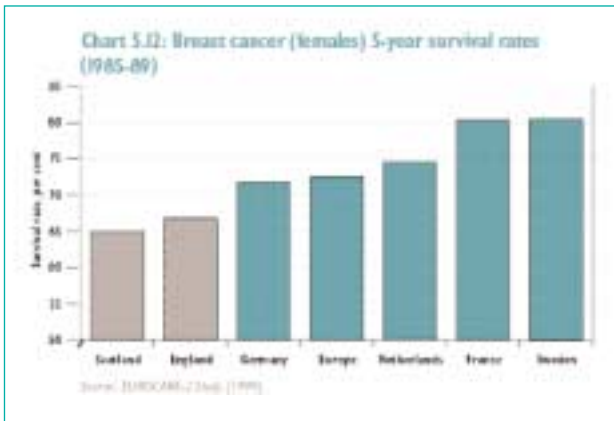
- 5.35 As mentioned above, it is possible to look at PYLL for specific diseases and causes of illness. UK outcomes for most major diseases significantly lag behind the best performers. Charts 5.8 to 5.11 compare PYLL across countries for selected diseases: ischaemic heart diseases (IHD), malignant neoplasms (cancer), cerebrovascular diseases (including stroke) and respiratory diseases. Together these account for around 45 per cent of total UK PYLL.
- 5.36 Data for 1997 show that the UK has the worst outcomes among the countries considered for cerebrovascular diseases and respiratory diseases and the joint worst outcome with New Zealand for heart disease. For example, total PYLL from ischaemic heart disease (IHD) was almost 450 per 100,000 of the population in the UK in 1997 compared with less than 300 in Sweden and the Netherlands and just 150 in France. The UK has poor IHD outcomes for both males and females.
- 5.37 Overall the UK's outcome for cancer is better than in France, Germany, the Netherlands and New Zealand and also better than the EU (population-weighted) average. But it is significantly worse than in Australia, Canada and particularly Sweden (where PYLL from cancer is around 20 per cent lower than in the UK). Within the total, PYLL from cancer for females is higher in the UK than in all countries apart from the Netherlands and New Zealand, mainly reflecting outcomes for breast cancer. PYLL from cancer for males is, by contrast, broadly in line with most comparator countries (the exceptions being France with a particularly high level of PYLL and Sweden with a very low level).

Survival rates

- 5.38 An alternative to using PYLL is to look at data on post-diagnosis survival rates for specific key diseases. An advantage of this measure is that it looks specifically at the length of time people survive following diagnosis of a disease, of which the effectiveness of health care is likely to be a significant determining factor.
- 5.39 Survival rates for cancer, which accounts for around a quarter of all deaths in the UK, have been improving. However, they lag behind those of the rest of Europe. The 1999 EUROCARE-2 study⁶, the latest available comprehensive cross-country study, measures five-year survival rates for various types of cancer – the percentage of patients surviving five years after diagnosis.

⁶ Berrino F, Capocaccia R. et al (eds) (1999), *Survival of Cancer Patients in Europe: the EUROCARE-2 Study*, IARC Scientific Publication No. 151, International Agency for Research on Cancer, Lyon.

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5.40 It shows the UK performing poorly among European countries, with the lowest survival rates for both breast cancer and lung cancer (see Charts 5.12 and 5.13). The five-year breast cancer survival rate for diagnoses made in the mid-to late 1980s was 65 per cent in Scotland and 67 per cent in England, compared with a European average of 73 per cent and figures of over 80 per cent in France and Sweden. For lung cancer in males, England and Scotland had the lowest five-year survival rates. At around 6-7 per cent, the survival rates were significantly lower than the European average of 9 per cent and the best performing country - the Netherlands - which had a survival rate of almost 12 per cent.

5.41 Based on this study, it has been estimated⁷ that if Britain could achieve the survival rates of the best country in Europe for each cancer, over 25,000 lives a year would be saved, while if it could reach the European average, nearly 10,000 lives a year would be saved.

Measures of morbidity

5.42 The above outcome indicators focus very much on mortality. But as set out in Chapter 9, measures of morbidity are also highly relevant. Whether people are living in good health or in ill health is important in assessing a population's overall health status. However, data comparing morbidity across countries on a comparable basis are difficult to find, particularly for what would be regarded as objective measures. Some indirect indicators such as data on smoking and obesity are referred to below.

5.43 The OECD also publishes a measure of self-reported general health. Cross-country comparisons using this indicator needs to be interpreted with caution because of both survey variations and more importantly because people's overall assessment of their own health is subjective and will be influenced by many factors, some of which will be country specific such as cultural

⁷ Sikora K (1999), Cancer Survival in Britain, *British Medical Journal*, 319:461-62.

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background and access to health services. Bearing these caveats in mind, figures for the mid- to late 1990s show that for the population aged 15 and over, the percentage reporting their health as “good” or better was lower in the UK than in all comparator countries except Germany. For the population aged 65 and over, the UK had the third lowest figure after Germany and the Netherlands.

Accessibility and patient satisfaction

- 5.44 Comparing health service accessibility and patient satisfaction across countries is not straightforward and survey results need to be interpreted with care. In particular, it is important to recognise the role which expectations play in interpreting levels of satisfaction across countries. In general, a low satisfaction reading recorded by a country with low patient expectations should be regarded less favourably than a similarly low reading for a country with high patient expectations. There is a general consensus that patient expectations in the UK have in the past been low compared with other countries.
- 5.45 The Picker Institute has been conducting surveys covering hospitals in the US since 1987 and in Germany, Sweden, Switzerland and the UK since 1998. As shown in Table 7.2 in Chapter 7, based on 1998 to 2000 surveys⁸, the UK scored worst in terms of patient experiences on six of the seven dimensions of care considered: information and education, coordination of care, physical comfort, emotional support, respect for patients’ preferences, involvement of families and friends and continuity and transition. 8.5 per cent of patients in the UK described overall care as not good, compared to 7.4 per cent in Sweden and 6.6 per cent in Germany. 7.8 per cent of patients in the UK said that they would not recommend the hospital to friends and family, compared to 5.0 per cent in Germany and 2.8 per cent in Sweden.
- 5.46 The Commonwealth Fund² found mixed results for patient experience in a 1998 survey covering Australia, Canada, New Zealand, the UK and the US. The percentage of respondents rating as excellent or very good the care received at the last visit to a doctor was lowest in the UK, but the UK had the highest percentage of respondents reporting overall hospital experience as excellent or very good.
- 5.47 Information on accessibility and particularly comparisons of waiting times tends to be confined to ad hoc surveys relating to a particular point in time. For example, the Commonwealth Fund found 69 per cent of UK respondents reporting that they or a family member had waited a month or longer for

⁸ Coulter A and Cleary PD (2001), Patients’ Experiences With Hospital Care In Five Countries, *Health Affairs* 20: 244-52.

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non-emergency surgery, compared with 49 per cent in Australia, 50 per cent in New Zealand and 55 per cent in Canada. By contrast, in the same survey the UK recorded lower readings than these other countries for the percentage of patients reporting it extremely, very or somewhat difficult to see a specialist when needed.

Input and output measures and non-medical indicators of health

5.48 A large amount of information also exists - too much to cover in detail in this report - comparing health inputs, outputs and non-medical indicators of health across countries. Some of the main points of interest are:

- the UK has low numbers of doctors, nurses and other health care professionals per 1,000 of the population compared with other countries (see Chapter 11);
- the UK had fewer acute care beds and total inpatient beds than most comparator countries in 1998. While the occupancy rate for acute care beds was higher in the UK than in most other countries, it was little different for total inpatient beds;
- available indicators, such as the number of MRI and CT scanners and the amount of radiation therapy equipment per million of the population, suggest that the UK lags behind other countries, in the use of medical technology (see Chapter 10);
- the percentage of UK males smoking daily is around the middle of the group of comparator countries and below the EU average, while the percentage of UK females smoking daily is above the EU average and higher than in any comparator country except the Netherlands; and
- both male and female obesity are higher in the UK than in any comparator country. The latest OECD data classify 20 per cent of the UK population as obese, compared with between 7 and 8 per cent in the Netherlands and Sweden.

Explaining differences in health outcomes

5.49 The above suggests that considerable gaps exist between the UK and comparator countries across a range of health outcome indicators. This is particularly the case for health outcomes for women. A key issue is to understand what might be driving these differences in outcomes between countries.

5.50 Health outcomes are likely to be explained by the interaction of various factors, some of which will be common to all countries and some of which will be country specific. These will include factors which are directly health care

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related, such as the level of resources devoted to health care and the structure of the health system. They will also include wider socio-economic, lifestyle and environmental factors, such as the age structure of the population, income levels and education, the degree of inequality in society, consumption of tobacco and alcohol and diet.

5.51 Various studies have explored the determinants of health outcomes, adopting different approaches and considering a range of drivers. Among these:

- there are differences in views about the impact that medical care has had over time on improving health outcomes;
- some have found little or no relationship between health spending and health outcomes while others point to a rather stronger positive relationship between the two. A summary of past findings is included in a recent OECD paper⁹;
- there is some evidence that countries with strong primary care systems tend to achieve better outcomes¹⁰; and
- socio-economic deprivation and inequalities are frequently cited as important drivers of health outcomes. This is discussed in Chapter 9.

5.52 The Review has looked at a number of past studies. It has also considered recent work undertaken by the OECD¹¹ which examines the relative importance of a wide range of factors in explaining health outcomes. Although subject to a number of caveats set out below, the OECD work appears to be one of the best analyses of the cross-country determinants of health outcomes currently available, covering 21 countries and a 25 year period.

5.53 The OECD work considers a range of broad health outcome measures: PYLL from all causes excluding suicides, life expectancy at birth and age 65, infant mortality and PYLL from heart disease and cancer. Using data pooled across OECD countries and over time, it produces estimates of the relative importance of the following factors in explaining these measures of health outcomes:

- the number of doctors per 1,000 of the population, which is used as a proxy for the overall input of resources into the health care system. (It may be preferable to using a measure of health spending because of difficulties over the choice of an appropriate monetary conversion factor to enable cross-country comparisons);
- the share of public expenditure in total health expenditure, as a proxy for the distribution of health care in a country;

⁹ Or Z (2000), Determinants of health outcomes in industrialised countries: a pooled, cross-country, time-series analysis, *OECD Economic Studies* 30, Paris.

¹⁰ Starfield B (1992), *Primary care: Concept, evaluation and policy*, Oxford University Press, New York.

¹¹ Or Z (2001), Exploring the effects of health care on mortality across OECD countries, *OECD Labour Market and Social Policy*, Occasional Papers No. 46.

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- GDP per head, measuring economic development;
- the share of white collar workers in the total workforce, mainly as a proxy for social and educational status;
- alcohol and tobacco consumption;
- nitrogen oxide emissions, measuring air pollution; and
- various features of the organisation of health care systems, including methods of paying doctors and hospitals and referral practices.

5.54 Although the OECD results vary between males and females and the specific outcome measures considered, a general pattern emerges. The OECD work suggests that the most important determinants of health outcomes are the level of GDP, occupational status and the level of health resources in a country, with improvements in each having a positive impact on health.

5.55 Table 5.2 summarises some of the results. In the case of both premature mortality and infant mortality, the level of health resources is the second most important factor after occupation in explaining variations in outcomes across countries and over time. For example, the estimates suggest that a 10 per cent increase in the number of doctors per 1,000 of the population or a 10 per cent increase in the share of white collar workers in the total workforce (holding other factors constant) will reduce female PYLL from all causes excluding suicides by around 4 per cent. The results also suggest that in general the level of health care resources has a greater impact on health outcomes for women than for men. This is interesting given that, as shown above, UK health outcomes are generally worse relative to other countries for females than males.

Table 5.2: Estimated impact of various factors on health outcomes

Percentage impact on outcome of a 1 per cent change in each factor:	Potential years of life lost excluding suicides		Infant mortality
	Females	Males	All
Doctors per 1,000 of population (proxy for health resources)	-0.38	-0.28	-0.64
Share of public spending in total health spending	-0.13	-0.16	-0.23
GDP per capita	-0.24	-0.26	-0.49
Share of white collar workers in workforce	-0.40	-0.43	-0.76
Alcohol consumption	0.11	0.17	0.19
Tobacco consumption	0.09	0.06	0.14
Nitrogen oxide emissions	0.08	0.09	0.10

Source: Or Z (2001), Exploring the effects of health care on mortality across OECD countries, *OECD Labour Market and Social Policy*, Occasional Papers No. 46.

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- 5.56 The OECD results generally find a significant inverse relationship between health outcomes and alcohol and tobacco consumption, pointing to potential benefits to health outcomes of successful public health promotion activities. The results also suggest that higher levels of air pollution lead to worse outcomes, with the estimated impact similar to that of tobacco.
- 5.57 While not included in this study, previous work by the OECD⁹ has also shown levels of both butter and sugar consumption to be inversely related to health outcomes suggesting that diet is also likely to be an important factor.
- 5.58 The OECD work finds evidence that a higher share of public financing of health care is associated with better health outcomes. The variables included to take account of various institutional and organisational features of health care systems have a relatively small impact on outcomes (although they may well have a much larger impact on the efficiency of health systems). The OECD notes that further work is required to explore this result more fully.
- 5.59 Looking at 1997, the latest year for which a wide range of the relevant data are available, the OECD work suggests that most of the UK's poor health outcome performance compared with other major countries can be explained by the UK's relatively low level of resources, proxied by the number of doctors per 1,000 of the population. OECD data put the number of practising physicians per 1,000 of the population in 1997 at 1.7 in the UK, compared with an (unweighted) average of 2.7 for the comparator group of countries (see Chapter 11).
- 5.60 Indeed, for some outcome indicators, the estimates suggest that a low number of UK doctors can more than explain the UK's poor outcomes relative to comparator countries, partly offset by the impact of higher than average shares of public spending in total health spending and white collar workers in the total workforce and lower than average pollution levels.
- 5.61 The validity of using doctor numbers as an explanatory variable in the OECD work warrants consideration. As for many health indicators, measurement differences mean that the figures for all countries are not directly comparable. In particular, the UK figures do not include doctors working outside the NHS and some countries record the number of registered doctors rather than the number of practising doctors and thus non-practising doctors inflate the figures. However, the latter issue tends to be confined to countries outside of our direct comparator group. The OECD has also tested the robustness of the results by excluding groups of countries where it considers measurement problems to be an important issue, but found little impact on the estimated importance of doctor numbers in explaining health outcomes.

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- 5.62 The validity of drawing conclusions based on an analysis including doctor numbers might also be questionable if the structure of the UK health service was very different to that of other countries with, for example, the UK's low doctor numbers at least partly compensated for by a higher than average number of nurses. However, the data indicate that this is not the case. For example, the ratio of doctors to hospital beds and the ratio of health professionals to hospital beds are not significantly out of line with comparator countries - the UK also has a low number of nurses and hospital beds per 1,000 of the population.
- 5.63 The OECD has stressed the need for further refinement and additional future research. In addition to considerations about the quality and comparability of the international data, the OECD model does not allow for dynamic effects and no explicit account is taken of factors such as the diffusion of technology or quality of care. The impact of each of the variables on outcomes is effectively, therefore, assumed to be the same in different countries and over time.
- 5.64 In addition, the OECD notes that the analysis does not take account of income inequalities and other socio-economic inequalities which have been shown to be associated with health inequalities. The extent to which these are important in explaining differences in outcomes between countries will depend on how inequality differs between countries. Evidence as to whether such inequalities are greater in the UK than in other major countries is mixed.
- 5.65 The Review would welcome views on the value of such work in providing a better understanding of cross-country variations in health outcomes. It would also welcome suggestions of other studies and alternative methodologies which might be used to examine these issues further, including the extent to which differences in the degree of inequality in countries can explain variations in health outcomes between them. The Review will be considering these issues further in advance of its final report.

The main trends that will affect the health service over the next 20 years are:

- different expectations of the public and patients about the range and quality of health care that should be provided;
- changing health needs – arising from demographic changes, different patterns of morbidity and health seeking behaviour;
- technological developments and medical advance; and
- levels of pay and productivity and use of the workforce.

To assess the impact of these trends on resource requirements, the Review is using two complementary approaches: a disease-based analysis and a life course analysis. For each, the Review is assessing the impact of the trends affecting the health service on both the cost and volume of care which will be provided. The Review is considering the impact on acute care services, primary care and long-term care services.

Introduction

- 6.1 Several groups, in the UK and internationally, have undertaken studies to look at the trends that will affect the health service over the next 20 years. The key conclusions of these studies are that demographic trends will steadily increase costs but still do not pose a major threat to the affordability of the NHS. Work on acute and long-term care costs suggests that demographic trends, other effects being held constant, will add 1 per cent or less a year to the costs of health care in real terms^{1,2}.
- 6.2 Previous research indicates that the main pressures on health care in the future will come from patient expectations, technology and the rising costs of providing care. These trends present health care systems across the world with a number of choices. They also have implications for health care that go way beyond funding levels.
- 6.3 Looking towards the next two decades, the following four main groups of factors are likely to have a significant impact on the health service in the UK:
- patient expectations of the range and quality of health care;
 - changing health care needs, arising from demographic changes, patterns of morbidity and trends in health seeking behaviour;
 - technology and medical advances; and
 - workforce, pay and productivity.

¹Emmerson C, Frayne C and Goodman A (2000), *Pressures in UK healthcare: challenges for the NHS*, Institute for Fiscal Studies, London.

²Wittenberg R, Pickard L, Comas-Herrera A et al (2001), Demand for long-term care for older people in England to 2031, *Health Statistics Quarterly* 12.

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Approach

- 6.4 Studies that have attempted to forecast the spending implications of the long-term trends affecting health care have typically focused on historic trends in expenditure growth. They have used these data to extrapolate forward the impact of past trends on future annual increases in the total resources required. This approach is undoubtedly useful – the past can be a very important guide to the future. But, if past and present expenditure has produced inadequate outcomes, then extrapolation is potentially dangerous and misleading.
- 6.5 There is no single, fixed relationship between long-term health trends and health service resources. The impact of factors such as the ageing of the population or new technology will depend critically on the quality of service and health outcomes which government, patients and the public expect. This Review is attempting to link the analysis of long-term spending pressures as closely as possible to the outcomes that the government, public and patients expect.
- 6.6 To map the relationship between the trends affecting the health service and resources, a clear understanding of the health service expected in 20 years' time is needed. The terms of reference for the Review are clear that the Government's aim for the next two decades is:
- “to ensure that the NHS can provide a publicly funded, comprehensive, high quality service available on the basis of clinical need and not ability to pay.”*
- 6.7 With this firm objective in mind, the Review has three stages:
- Stage one:** to understand what patients and the public are likely to expect from a comprehensive, high quality service available on the basis of clinical need and not ability to pay in 20 years' time;
 - Stage two:** to map the likely changes in health care needs, technology and medical advance, workforce pay and productivity; and
 - Stage three:** to assess how these changes will affect the resources required to meet patient and public expectations.

Assessing the resource implications of trends affecting health

- 6.8 Two separate but complementary approaches are being used to assess the resource implications of the main trends affecting the health service. The first is a **disease-based analysis** looking at some of the key conditions that will account for a significant share of the burden of mortality and morbidity in the UK in 20 years' time. The second approach focuses on health care over people's **life course** and assesses health trends and their implications for funding at the different stages from birth, through childhood, into working age and then retirement. The time immediately preceding death is an important driver of health care needs at any age.

Using a disease-based approach

- 6.9 A disease-based approach has considerable advantages over the traditional focus on aggregate spending trends. It is more transparent, providing a much clearer link between the outcomes desired from the health services and resources required. It also has the potential to be more robust. The US Institute of Medicine recently recommended this approach as part of its review to identify strategies for achieving a substantial improvement in the quality of health care in America³.
- 6.10 But, for this Review, it is not possible to base the assessment of the cost of the main trends affecting the health service entirely on a disease-based analysis. To do this would require good quality data on the use of resources by each disease, something which is still not generally available in the UK. It would also require clear specification of quality standards for each disease. The National Service Frameworks (NSFs) introduced by the Government over the past few years provide a clear outline of what a high quality service would constitute and the steps which need to be taken to achieve this standard consistently across the NHS. At present, NSFs are only available for a few disease areas but they are being extended to others. As these are put in place it will be possible to undertake a much more comprehensive disease-based analysis of the resource requirements for the UK health service in the future.
- 6.11 For this Review, it is possible to use the disease-based approach for a number of specific areas. At this stage, the Review has focused on five main disease areas:
- coronary heart disease (CHD);
 - cancer;
 - renal disease;
 - mental health; and
 - diabetes.
- 6.12 In total these diseases account for approximately 50 per cent of mortality and 12 per cent of morbidity in the UK. 10 per cent of health service spending currently treats these conditions⁴. The Review is examining:
- the resource implications of meeting the quality standards set out in the NSFs; and
 - how changes in expectations and health trends might affect the standards that would need to be provided over the next two decades.

³ Committee on Quality of Health Care in America, Institute of Medicine (2001), *Crossing the quality chasm: a new health system for the 21st century*, National Academy Press, Washington DC.

⁴ Department of Health, Burdens of Disease Data.

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Using a life course approach

6.13 The life course approach analyses how the trends affecting the health service will affect the use and cost of services for people at different stages of their lives. Although it would be desirable to assess the impact of these factors in detail on each stage of life, the Review is focusing on the later stages of life – death and old age – as these are main drivers of cost.

6.14 For the life course analysis, the Review is:

- quantifying the amount and cost of services currently provided to people at different ages; and
- considering how much the changes in the size and composition of the population will add to health spending, assuming the amount of health care each individual uses at each stage of life and its average cost stays the same.

This provides a baseline for 20 years' time. The next step is to consider how all the important changes in the need for and quality and cost of care will impact on this baseline. To do this, future trends are categorised into those that are likely to affect costs and those that are likely to affect the amount of health care which people need. Some trends affect both. Patterns of morbidity and health status will impact on the amount of health care provided. Productivity and pay will affect the cost of providing care. Technology and quality will affect both the cost and volume of care. A new technology might reduce unit costs but also mean that many more people would benefit from treatment. A higher quality service might increase the cost of care as facilities are upgraded but it may also mean providing a wider range of services to a wider range of people.

6.15 The health services included are:

- emergency and elective acute, in-patient hospital admissions;
- day cases;
- outpatient visits;
- GP visits and prescriptions;
- community nursing visits; and
- long-term care.

Health care, long-term care and social care – boundaries to the Review

6.16 For this Review, health care is taken to include all the services currently provided or planned to be provided and funded by the health services in England, Northern Ireland, Scotland, and Wales. This covers hospital care, primary care and community nursing services among others. This care will be a mixture of short-term acute treatment and long-term management of chronic conditions.

6.17 As concerns over bed blocking have highlighted, health care and social care provision are closely inter-related. For the Review, the way in which some of these key trends may affect social care is explored, to provide information on how the inter-relationships between health care and social care might change over 20 years. The Review is focusing on residential and nursing home care and the support which local authorities provide to help people to remain in their own homes. It is looking at the services which have been either wholly or partly publicly funded. This illustrates a generally important point. Decisions in health care often have significant implications in apparently unconnected parts of the system. For total resources to be managed effectively, a 'whole' system assessment is vital and the decision-making processes should not be narrowly defined.

Productivity

6.18 The trends affecting the health service will change the demand for health care and the cost of provision. In assessing their implications for total health care resources, the scope for improvements in the productivity and performance of the health sector need to be considered. The Review has looked at the scope for long-term productivity gains in the NHS by examining:

- technology-driven improvements in productivity and efficiency; and
- increases in labour productivity.

6.19 The Review has focused on how the scope for productivity gains and efficiency savings might change over the next two decades. It has not looked in detail at the extent to which the NHS currently uses its resources as efficiently and effectively as possible. If current inefficiencies and ineffectiveness were eliminated, this would reduce the requirement for additional resources to meet the increasing demands identified. A detailed assessment of the current efficiency and effectiveness of the service is outside the scope of this Review but is clearly a key question. A more efficient and effective health care system should arise as the NSFs and the National Institute for Clinical Excellence (NICE) provide better information on the effectiveness of treatments, enabling more resources to be moved away from less effective treatments and towards more effective interventions. Better use of information technologies should have a significant impact. For example, electronic booked admissions systems should improve services to patients and ensure that resources are used more effectively. The way in which a long-term productivity assessment is built into the calculations will be important and is an area on which views are welcome.

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Organisation of the report

6.20 The remainder of the report examines the trends affecting the health service in more detail and draws together questions which need to be addressed to assess their implications for funding:

- Chapter 7 outlines current perceptions of quality in the health service and analyses the drivers which will affect patient and public expectations of quality over the next two decades;
- Chapters 8-11 look in more detail at the key trends that will affect the health service over the next two decades; and
- Chapter 12 assesses how those trends may differ between the countries that make up the UK.