

ECONOMY AND FINANCE

A prospective view of the financing of health care

The National Health Service (NHS) has not changed its funding arrangements since it was established in 1948. Panos Kanavos draws attention to factors that may change this tradition. Factors include the internationalisation of health and the development of health and health care as a commodity, rising pharmaceutical expenditure, pressures on expenditure that have led to the exclusion or restriction of some services from the NHS, and demographic projections that show a smaller working population supporting an ever-larger dependent population. The paper raises questions that will need to be addressed in the financing of health care. For example, how should policy use tools such as evidence-based medicine and economic analysis in its decision making? How will long-term care be financed in the future? When and on what basis should alternative systems of finance be considered and evaluated? Panos Kanavos takes a suitably international perspective in order to assess economic and financial considerations in UK health for the future and addresses the question of whether the NHS is financially sustainable in its current form.

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POLICY FUTURES FOR UK HEALTH

Edited by Charlotte Dargie

This paper is part of a series written for the Policy Futures for UK Health Project, which examines the future environment for UK health, with a time horizon of 2015. The full series is listed below.

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A prospective view of the financing of health care

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Charlotte Dargie

FOREWORD

Since its inception the Nuffield Trust has identified individuals and subjects that would impact on health and health care policy in the United Kingdom, with notable examples being *Screening in Medical Care* [1], Archie Cochrane's *Effectiveness and Efficiency: Random Reflections on Health Services* [2], Thomas McKeown's *The Role of Medicine: Dream, Mirage or Nemesis?* [3], David Weatherall's *The New Genetics and Clinical Practice* [4] and Alain Enthoven's *Reflections on the Management of the National Health Service* [5].

In keeping with tradition and reflecting the more complex issues in health and health care policy today, the Nuffield Trust established a Policy and Evaluation Advisory Group (PEAG), supported by the appointment of a Nuffield Trust Fellow at the Judge Institute of Management Studies at the University of Cambridge, to provide a research and intelligence capability for the Trust.

The Policy Futures for UK Health Project stems from the work of PEAG. It involves examining the future environment for UK health, with a time horizon of 2015. The first environmental scan has resulted in a series of 10 technical papers, which cover the following areas':

1. The Global Context
2. The Physical Environment
3. Demography
4. Science and Technology
5. Economy and Finance
6. Social Trends
7. Organisation and Management
8. Workforce
9. Ethics
10. Public Expectations

Each paper in the series is a stand-alone piece, but has also been used by the project to derive an overview report, which focuses on policy assessment in the light of the environmental scan. Entitled 'Pathfinder Report', the overview report is published separately and will be subject to external consultation².

The Policy Futures for UK Health Project and the work of PEAG are ongoing. Further reports and publications will appear in subsequent years. The technical papers will also be revisited and different subjects will be tackled.

The strength of the technical series is in providing a context for analysing health and health care policy for the United Kingdom. Each author has produced an independent piece of work that analyses trends and issues in their subject area, focusing on 2015. The papers enable one to read across the issues, in order to provide a general analysis of health and health care policy, which is lacking in the highly specialised debates that dominate the health world today. They have formed the basis for consultation and discussion as part of the Policy Futures for UK Health Project.

Finally, the Trust is grateful to the members of the PEAG, to Professor Sandra Dawson and Pam Garside of the Judge Institute of Management Studies and to the authors of the 10 technical papers. A particular thanks due to Dr Charlotte Dargie, Nuffield Trust Fellow at the Judge Institute of Management Studies, the author of the Pathfinder report.

John Wyn Owen CB
July 1999

ENDNOTES

1. *Screening in Medical Care: Reviewing the Evidence* A collection of essays with a preface by Lord Cohen of Birkenhead (Oxford: Oxford University Press for the Nuffield Provincial Hospitals Trust, 1968).
2. AL Cochrane *Effectiveness and Efficiency: Random Reflections on Health Services* (London: Nuffield Provisional Hospitals Trust, 1971).
3. T McKeown *The Role of Medicine: Dream, Mirage or Nemesis?* (London: Nuffield Provisional Hospitals Trust, 1976).
4. D Weatherall *The New Genetics and Clinical Practice* (London: Nuffield Provisional Hospitals Trust, 1982).
5. AC Enthoven *Reflections on the Management of the National Health Service: An American Looks at Incentives to Efficiency in Health Services Management in the UK* (London: Nuffield Provincial Hospitals Trust, 1985).
6. S Williams, S Michie and S Pattani *Improving the Health of the NHS Workforce* (London: The Nuffield Trust, 1998).

Each of the papers in the series is available from the Nuffield Trust.

² C Dargie *Policy Futures for UK Health: Pathfinder* (London: The Nuffield Trust, 1999). The Pathfinder Report is for wide consultation and invited comment. You can email your comments to policyfutures@jims.cam.ac.uk. You can also send your comments to Dr Charlotte Dargie, Nuffield Fellow in Health Policy, The Judge Institute of Management Studies, Cambridge University, Cambridge, CB2 1AG. You can also find this Pathfinder Report along with other technical papers in the Policy Futures series at the Nuffield Trust website: <http://www.nuffieldtrust.org.uk>. Please respond with your comments by Friday 19 November 1999.

ABBREVIATIONS

AIDS	acquired immune deficiency syndrome
BMA	British Medical Association
BSE	bovine spongiform encephalopathy
CABG	coronary artery bypass graft
CT	computed tomography
DfID	Department for International Development
DoH	Department of Health
EMU	Economic and Monetary Union
EU	European Union
GDP	gross domestic product
HIV	human immunodeficiency virus
IMF	International Monetary Fund
MRI	magnetic resonance imaging
MRSA	methicillin resistant <i>staphylococcus aureus</i>
NHS	National Health Service
NHSE	National Health Service Executive
OECD	Organisation for Economic Co-operation and Development
OHE	Office of Health Economics
OTA	Office of Technology Assessment
PTCA	percutaneous transluminal coronary angioplasty
R&D	research and development
RCTs	randomised control trials
TA	technology assessment
UK	United Kingdom
USA	United States of America
VHI	voluntary health insurance
WHO	World Health Organisation

SUMMARY

Trends

- There will be no significant increase in the share of private health expenditure, which remains at approximately 12 percent of total health spending in the UK. Nevertheless, private insurance could provide an additional means of cover and payment in the future, if NHS services are excluded from cover.
- Pressures on spending have led to a number of services being altogether excluded from NHS cover over the past 20 years, or being selectively provided under strict eligibility criteria - this trend will mostly likely continue.
- Health will become internationalised, with the increasing influence of the European dimension.
- Pharmaceutical expenditure as a proportion of total health expenditure has been rising over the past decade and is expected to continue to do so in the near future, reflecting changes in technology and a switch to newer medicines.
- Between 1999 and 2015, the UK will experience a deterioration in the dependency ratio, and this may impact on society's ability to sustain current levels of financing human services - including health - through taxation.

Policy issues

- The fact that health care is becoming a tradable service across borders, and is thus subjected to the law of supply and demand, may lead to a breakdown in the monopoly/monopsony power of national agencies and place national policy under scrutiny. The UK needs to examine the impact of the issues arising from such movements (fiscal, rationing, etc.). Internationalisation also means that producers of health-related goods (such as pharmaceuticals and devices) set prices internationally, to the extent that national regulation allows them to do so, and, therefore, benefit through export activity.
- Setting priorities or rationing care brings to the fore a series of critical questions to which answers are particularly difficult to obtain. Firstly, if extensive rationing needs to take place, is there then a package of care to be reimbursed and, if so, how is this determined? Secondly, who should ration, at what level and on the basis of what evidence? Thirdly, if evidence-based medicine is to assist in policy formation and transparency, how can it do so and on the basis of what and whose evidence? What is the role of economic analysis in decision making?
- A series of important and sensitive issues arise from projected demographic trends. Maintaining the current level of spending as a proportion of gross domestic product (GDP) by a smaller active population may require higher contributions. Financing services, both in terms of long-term care and treatment for diseases prevalent amongst the elderly, are also important issues that need to be addressed.
- The increased contribution of technology puts pressure on finite resources and may lead towards explicit rationing, unless there is general consensus

about additional resources to be financed through general taxation, or through increased national insurance contributions.

- The increasing use of technology calls for the adoption of policies that would assess it effectively and determine whether new technology offers value for money.
- Health care in the UK, or at least part of it, is likely to remain tax financed in the foreseeable future. One question is how intense financing pressures are going to be in order for future governments to abandon the principle of equity. Another relates to a gradual change in which services are financed, namely, evaluating the pros and cons of the applicability in the UK of increased co-payments, a switch to social insurance, medical savings accounts, a more widespread use of voluntary health insurance, or a combination of all the above.

INTRODUCTION

Health care financing has been on the agenda of policy makers in the United Kingdom (UK) and elsewhere for several years and will continue to do so in the foreseeable future. The issue of financing health services is strongly associated with ever increasing health care costs and ever tighter budgetary constraints, increasing demand by consumers who to a great extent do not contribute directly to the payment of health services, ageing populations, new and expensive technologies and treatments, and the advent of health care as a tradable commodity that allows consumers to compare health services, their availability and their quality across countries.

This paper addresses the problem of financing health services in the UK, now and in future, and identifies and evaluates the factors that are likely to be of relevance. In doing so, it distinguishes between exogenous factors (macroeconomics, welfare state, internationalisation of health) and endogenous factors (health technology, health reform, financing options, ageing, health challenges) and analyses their contribution to the problem. The aim of the paper is threefold:

- to provide a thorough evaluation of the above factors and their contribution to UK health care financing
- to analyse their impact within a dynamically changing world
- to 'predict', to the extent that this is possible, how these factors are going to manifest themselves in the future and what the policy reactions are likely to be.

The next section provides a short background into health expenditure accounting and gives evidence of the relative significance of different areas of the health economy in terms of spending over time. In addition, it briefly highlights the determinants of health spending in terms of a formal health-production function and classifies these determinants into exogenous and endogenous.

The third section outlines and briefly analyses the major (direct and indirect) exogenous pressures and constraints on the UK National Health Service (NHS). It adopts a historical perspective and looks into the evolution of macroeconomic, welfare and health policy and contrasts these individual policies with some main outcome indicators. It also compares the UK's position with that of other Organisation for Economic Co-operation and Development (OECD) economies and thus places policy developments in the UK within an international context.

The fourth section analyses the endogenous pressures on the NHS and places emphasis on the driving forces behind health care reform, the available policy options for financing health care, the impact of ageing, and the various health challenges that a meta-industrial society faces. This section analyses the impact of the above factors on the UK health service whilst at the same time drawing on the international experience.

The fifth section adopts a prospective view on the financing of the national health service and attempts to explain how the pressures identified in the second and third sections will affect the health service in the future and what the likely policy responses will be. In this respect, it pursues a number of likely scenarios and identifies areas where public policy and methodological research still need to be conducted. In doing so, it examines the dynamics of health care reform and projects these into the future, highlighting potential areas of focus, analyses the dilemma that health technology poses, pursues some likely financing scenarios, and attempts to explain what determines current and future health expenditures. The final section draws the main conclusions.

The paper draws on national and international published and unpublished sources for each of the above sections and uses national and international databases (the Office of Health Economics [OHE], the International Monetary Fund [IMF], OECD and Department of Health [DoH]). In doing so, it also draws particular attention to the main methodological issues relating to international comparisons.

THE DEMAND FOR HEALTH CARE FUNCTION

UK spending on health

The UK National Accounts [1] provide a source of total and disaggregated health-expenditure estimates. According to the International Classification of Health Expenditure, total expenditure on health in the UK comprises personal medical services (ambulatory care, in-patient care and medical goods), collective health services, health program administration and health insurance (both public and private), and health-related spending functions.

Personal expenditure on health comprises:

- in-patient care (in particular, acute hospital care, and psychiatric hospital care)
- ambulatory care (in particular, physician services, dental services, dental prostheses, laboratory tests, x-ray and imaging diagnoses, patient transport, home care services, other professional health services and other ambulatory care)
- medical goods (pharmaceutical goods and therapeutic appliances).

Collective health services comprise:

- expenditure on health promotion
- disease prevention
- occupational health care.

Finally, health-related spending functions account for:

- investment into medical facilities
- education and training of health personnel
- research and development (R&D) in health

- environmental health
- administration and provision of health-related cash benefits.

The above definitions, however, exclude from measurement a series of items and, due to measurement problems, consistently under-report others. Items excluded from the above definitions include expenditure on armed forces' health services, prison health services and nursing homes. These are included in budget lines of the respective departments. Public Gross Fixed Capital Formation includes investment in existing land and dwellings and transfer costs, whereas Private Gross Fixed Capital Formation does not.

The data availability for some of the above lines is relatively problematic and old estimates have been extrapolated by the relevant statistical authorities to provide an up-to-date picture, although this may have resulted in under-reporting of the true expenditure (for instance, a 1988-9 estimate of British private and voluntary-sector expenditure in nursing home care for the elderly [£1.1 million] [2] has been used as a source to provide updates to 1995). Private hospital expenditure is also under-reported. Using benefits of private insurers as a proxy, private hospital expenditure was estimated to have been £3.8 million in 1960, £16.9 million in 1970, £127.6 million in 1980, £454.6 million in 1985, £692.0 million in 1988, and £820.9 million in 1989. Finally, critics of the official accounts have also suggested that expenditure on over-the-counter medicines is underestimated.

Table 1 is my attempt to provide a breakdown of UK expenditure on health over the 1980-97 period (see table 1). The three main items on the health-expenditure bill are:

- in-patient care, consuming just over 40 percent of the total budget, a significant proportion of which is spent on acute care (over 70 percent of in-patient care in 1995)
- ambulatory care, accounting for approximately 25 percent of total health care spending
- pharmaceutical care, which absorbs an increasing amount of resources (17.3 percent of total health care spending in 1997).

Health promotion and prevention accounts for 1 percent of the health budget.

What determines spending?

Health care expenditures are both determined exogenously, through non-system external pressures, which may occur at the macroeconomic level, and endogenously, through factors that impact directly on expenditure and are determined mostly at the microeconomic level through a complex set of relationships.

Within the UK, exogenous pressures on health financing stem mainly from three different sources. The first is the general macroeconomic constraint and its relation to individual aspects of the health service and the provision of health care. The second is the pressure on the publicly funded welfare system, particularly social security. And the third stems from the internationalisation

of health within the European Union (EU) and its perception not only as a service available within national borders, but as a mix of tradable goods and services that are available to consumers across borders within a single market. Therefore, the UK faces a resource constraint (stemming from macroeconomic budgetary limitations), a welfare system constraint (arising from difficult choices in allocating scarce resources between critical components of the welfare system which presents equally pressing needs, e.g. pensions and education) and a cross-border challenge that is expected to intensify in the years to come. Of the above factors, the relationship between gross domestic product (GDP) and the level of health spending has, over the past 30 years, received a great deal of attention. Abel-Smith showed that, after adjustment for inflation, exchange rates and population, GDP per capita is a determinant of health expenditure and that most of the variation in health spending was attributable to variations in real per capita income [3] [4]. The above proposition was tested econometrically by many authors [5] [6] [7] and it was confirmed that, in aggregate terms, spending on health rises faster than national income. As a result, the income elasticity of demand for health care is greater than unity, thereby implying that health care is a luxury good.

The endogenous pressures in the evolution of health expenditures can be explained by making reference to consumers' utility maximisation and demand analysis. Grossman [8] provided a substantial theoretical framework to explain that the demand for health care is derived from the demand for health, which is the outcome of a health production process influenced by education, habits, diet and other lifestyle variables. The pressures that the UK health system faces at this level are similar to those in other similar countries and relate to the financing of the health sector in the light of technological innovation, expected changes in the structure of the population, increasing demand following higher incomes and different perceptions about the state of well-being, the evolution of prices of medical goods and services, the organisation of the health care system, the human resources employed by the health service and their incomes and, indeed, a number of health challenges related to changing disease patterns and lifestyles.

A prospective analysis of financing health care in the UK, must, therefore, consider the relative importance of both exogenous and endogenous pressures within a demand function and assess the likely change in each of these factors in the future.

EXOGENOUS CONSTRAINTS AND PRESSURES

The macroeconomy

Economic growth and policy decision-making

To the extent that health systems are publicly funded, as is the case with all EU countries (see table 2), then macroeconomic policy and economic growth can potentially impact on health care financing. The macroeconomic environment, therefore, provides the starting point for most sectoral analyses, including the health sector. In health care, a resource-intensive service, severe macroeconomic pressures may manifest themselves in a variety of ways

ranging from the relaxation of (health and safety) rules to the deterioration in the quantity and quality of services provided and, in extreme cases, in the deterioration of health status. Although marginal for developed economies, these outcomes have featured quite strongly in health care financing in economies of transition.

The macroeconomic environment has a number of implications for the financing and provision of health care. Although the UK does not spend more than 7 percent of its GDP on health (lower than other European countries - see figure 1), there are concerns about the quality of care and patient satisfaction [9]. Up to 14 percent of health expenditure comes from private sources (see figure 2), mostly private health insurance, but also patient co-payments. The need for cost containment and greater micro-efficiency in different parts of the health sector are high on the agenda of policy makers in the UK and elsewhere [10][11] and that has given rise to efforts to understand what actually works in hospitals and primary care to provide incentives for doctors and health care providers and instigate competition among different providers, as well as create an internal market by splitting purchasing from provision. Similar is the pressure to set priorities for services that can be reimbursed. The issue of health technology - its utilisation and contribution to rising health care costs, improvement of health status and outcomes - poses additional pressures on health budgets and, increasingly, calls for an evaluation of its role [12][13][14]. Finally, if fiscal pressures intensify, it is likely that services may have to be excluded from reimbursement, or altogether shifted to the private sector.

Health systems in the UK and the rest of the EU are facing considerable macroeconomic constraints that may restrict the ability of their publicly funded health systems to keep pace with rising health care costs in the near future. Demand for health services has, over the past 30 years, been increasing consistently more than national income in real terms. At the same time, real GDP growth rates have fallen considerably in the 1980s and 1990s compared with the 1960s and 1970s (see table 3). The macroeconomic constraint is directly linked with the limitations of health systems in providing care for ever-increasing need.

The implications therefore for health care financing are compelling. Health expenditure is part of the overall budget, and has been increasing in significance. This is due to health expenditures rising faster than national resources, and also due to attempts by many countries to privatise other parts of the public sector in view of growing fiscal pressures. Contractionary fiscal policies will mean that the health sector will be subjected to further pressures by national governments, which may imply the privatisation of parts of the health economy or the exercising of more explicit forms of rationing. The latter is already actively on the UK policy agenda [15], together with the debate over appropriateness of care and the resulting development of clinical guidelines by professional bodies [11].

Economic and Monetary Union

Lower growth rates and economic policy choices aiming at keeping inflation under control are not, however, the only pressures on the financing of health care in the EU. The debate of forming an Economic and Monetary Union (EMU) is another. Although the 15 member states could be divided into two categories according to their political stance on the single currency, macroeconomic policy choices are similar regardless of the endorsement or not of the euro. Policy priorities include the control of inflation and macroeconomic stability, thereby implying drastic reduction of fiscal deficits and overall government debt levels. Concerns for both groups of countries have led economic policy makers to call for reductions and rationalisations in public-sector spending, particularly for human services. The UK is not directly affected by the single currency for two reasons: firstly, because it has opted out for the foreseeable future and, secondly, because its current macroeconomic fundamentals are in a much better shape than most euro-zone members. A likely reversal of policy in a few years' time, however, will limit flexibility in economic policy-making and will place considerable pressure on fiscal policy, the only tool that remains under national control.

The welfare system

Human services at large, including education, social housing, social security and health, are the last remaining elements of public intervention in the UK economy, although market elements in all the above have been introduced since 1979 [16]. This follows the rapid increase in welfare spending over the past 20 years [17]. The UK is one of the largest spenders on welfare services amongst developed nations. Although this is less apparent in terms of the usual yardstick of gross public spending as a proportion of GDP, it becomes more obvious when net current total expenditure is measured as a proportion of GDP in the different countries (see figure 3).

Understandably, there are lateral pressures on publicly funded health systems, particularly those arising from the funding of other welfare services that are part of the national budget and have seen their share of GDP increasing over time. Public pensions are an interesting case in this respect because they will almost certainly exert considerable pressure on national resources in the near future for two reasons: first, because the ratio of contributors to beneficiaries in public pension schemes is changing as populations age, and this questions the sustainability of current public schemes and their modes of funding; second, because the generosity of public pension systems, which varies hugely among countries, will imply that for similar benefits to accrue to future pensioners, contribution rates will have to rise considerably (see figure 4), with severe implications for wage bills and employment rates. It has been estimated that most industrialised nations, including the UK to a lesser degree, will be in need of considerably higher contribution rates to sustain current patterns of benefits [18]. The alternative to this would be to abolish public pensions fully and create a stakeholder pension system. Recent proposals in that direction in the UK were met with scepticism [19], although they are still under consideration.

To the extent, therefore, that human services remain largely under the public domain and receive funding from general taxation revenues, they are going to be competing for increased shares of a limited pie. Private solutions are increasingly being favoured in developed economies such as the UK and the US, as well as in some upper-middle income economies (e.g. in Chile). Despite that, even private solutions may be subject to criticism, as private pension plans increasingly fail to guarantee a certain expected return upon maturity or to pay out to beneficiaries as much as was originally thought due to increased life expectancy after retirement. Furthermore, attempts to privatise other parts of the welfare system are likely to see strong public opposition.

Cross-border issues

Globalisation is expected to have a significant impact on health services in the near future. Driven by demand for medical goods and services available across markets, attempts to harmonise regulations relating to such goods and services, and international collaboration in health-related research, the effect of globalisation can be significant and can lead to standardisation of health-goods and services provided across borders.

Within the European context, two recent rulings by the European Court of Justice have changed the nature of reciprocal care between member states of the EU and potentially introduced an entirely new dimension to European health care. Both rulings involved citizens of Luxembourg seeking care in other EU member states. In the first, where Nicholas Decker had been refused reimbursement of a pair of spectacles that he purchased in Belgium using a prescription issued by an Luxembourg optician, the European Court ruled that refusing reimbursement violated the Treaty of European Union on free movement of goods [20]. In the second, Raymond Kohll requested, and was refused, authorisation for his daughter to receive orthodontic treatment in Germany, on the basis that the treatment was not urgent, that appropriate treatment was available in Luxembourg, that freedom to provide services is not absolute and that the control of health care expenditure must be considered [21]. The European Court, however, ruled that purely economic issues cannot justify obstructing the free movement of services.

Health policy has traditionally been the responsibility of each Member State under the principle of subsidiarity. The European Court rulings introduce an entirely new dimension to European health policy-making and European citizens can now obtain health care in any member state other than that of their residence without prior authorisation. The possibility of cross-border movements in order to receive care or acquire medical goods puts national health care under the scrutiny of Europe's citizens, particularly in what concerns services or goods that are reimbursed in some member states whereas they are rationed in others [22]. In the latter cases, governments are likely to be encountered with growing public dissatisfaction. This may, in turn, increase the debate about whether there should be a standard package of care offered across the EU, and, if so, how should this be defined and on what basis.

The rulings introduce an indirect, but definite, element of transparency that leads to the way systems are financed in different EU member states, and the fiscal implications for those systems that deliver less satisfactory services. There is thus a clear clash between the principle of subsidiarity and the freedom in the movement of goods and services that is expected to lead to much heated debate.

The Treaty of Rome gave little attention to health care [23]. Receiving care in a member state other than one's country of residence is not uncommon and the relevant regulations and bilateral agreements have evolved considerably to support this process [24]. Cross-border movement of patients is increasing and is likely to continue to do so in the future. Patients will be seeking care outside their country of residence for a number of reasons including perceived quality of care, out-of-pocket cost in the case of direct voluntary payments, differences in the level of co-payments, and, most importantly, implicit or explicit rationing in their country of residence, which may take the form of a long waiting list or restricting access to services.

ENDOGENOUS CONSTRAINTS

Options for financing health care

The international experience suggests seven different ways to finance health services: out of general taxation revenues, social insurance, hypothecated taxation, voluntary health insurance, medical savings accounts, user charges (co-payments, co-insurance, deductibles), and out-of-pocket payments. Most countries pursue one or more of the above methods in their pursuit of the different policy objectives, namely equity, efficiency (macro and micro), choice, quality and responsiveness. Given the conflicting nature of the objectives of health policy, there is no optimal method of financing health services and each of the above has its own advantages and disadvantages (see table 4). Much, of course, depends on two key factors: firstly, the priorities that countries/governments have in the conduct of health policy (cost, access, basic or comprehensive cover, etc.) and, secondly, the resource allocation process that determines the strategic interaction between the players involved in the management of health resources.

In the UK, health care is financed mainly from tax revenues with a small proportion of the funds coming from earmarked National Insurance contributions. Approximately 10 to 12 percent of the total represent private insurance including patient co-payments. A tax-financed system can be integrated or contracted: the UK, Denmark and Sweden follow the latter variation, whereas other countries with tax-financed health systems (Spain, Portugal and Greece) follow the former. There is evidence that a tax-financed system is macroeconomically efficient, vis-a-vis a social insurance or a voluntary health insurance system, in terms of spending on health as a proportion of GDP (see figure 1) and keeps total costs down, due to the finite amount of resources allocated to it by the Exchequer. At the same time it provides the justification for (explicit or implicit) rationing by the central funding body due to the cap on resources.

Microeconomic efficiency depends on the method of paying providers, the interactions between them and the role of purchasers. The 1991 reform that retained public funding of health care had as a goal to improve the efficiency of resource allocation by creating competition on the supply-side of the market. The elements of the 1991 'internal market creation' reform have been questioned [25], and there are a few samples of an overall evaluation of its performance over time [26] [27] [28]. The achievement of microefficiency, however, seems to be passing through political channels with the publication of yet another white paper in December 1997 aiming in principle at abolishing the internal market, and introducing more co-operation rather than relying on competition [29]. The new reform was implemented in April 1999 and, although its outcome is unknown, a driving force behind it has certainly been the high administration cost that the previous system brought about, which was not deemed to be disproportionately high for the benefits it yielded.

At the other end of the spectrum, a tax-financed system may not necessarily be responsive to patient needs, may limit choice and may lead to the provision of low-quality services. Two indicators, namely patient satisfaction and the waiting list for elective treatments, provide some guidance on how a system performs. For both these indicators, the UK fares less well than countries with comparable systems. Evidence from the literature [9] suggests that overall patient satisfaction is considerably lower in the UK than, for instance, in Denmark, a country that devotes a similar amount of resources (per capita and as a proportion of GDP) to health and finances health services in an almost identical way. This does not take into account recorded differences in patient satisfaction levels arising from different provider types within the UK (e.g. total purchasing versus non-fundholding practices) [30].

The size of the waiting list for non-emergency treatment and speed of treatment have always been the Achilles heel of the NHS [31]. The size of the list recently rose to record levels and the same holds for the number of patients waiting longer than the 18-month period guaranteed by the Patient's Charter [32]. Other countries, notably Sweden, have attempted to tackle these problems by introducing policy measures that would guarantee treatment for a number of elective procedures within a much narrower span of time; alternatively patients can opt to be treated in other parts of the country where an available bed exists [33]. Tackling the size of the waiting list in the UK and the speed of treatment may result in pursuing the following policies which are mutually exclusive: increasing the availability of resources in the system, and/or increasing the mobility of patients across health authorities with all the financial consequences this may imply.

The issue of financing future health services in the UK is likely to remain on top of the political agenda, not least because it is a complex issue affected by several parameters. Clearly, there is no evidence that there exists an optimal amount of resources that a society should allocate to health [34]. Such decisions are subject to several factors, including resource allocation mechanisms and how these work in practice, consumers bearing part of the cost, the public-private mix, the emphasis on some health policy objectives versus others (e.g. cost containment versus increasing choice), the impact of

factors affecting total cost (namely technology and ageing) and the way decisions are taken by policy makers. Taxation provides one way of financing health services and it seems that in the UK this is likely to remain the main method of finance in future. Historical evidence on the financing of European health systems suggests that there has been a strategic shift in policy makers' emphasis, from direct and indirect controls in the 1970s/mid- 1980s, to budget setting in the mid- 1980s/mid- 1990s and to budget shifting, rationing, and an increasing share of private sources of funds (voluntary health insurance, out-of-pocket payments, co-payments) from the mid 1990s onwards to the new millennium [35]. This also holds for the UK NHS and specific parts of the service, which are now either excluded from cover (for instance optical care, dental care for extensive parts of the population, in-vitro fertilisation) or rationed (for instance, expensive pharmaceuticals such as betaferon), or have had the responsibility shifted to the social services sector and/or private initiatives to provide cover (for instance, long-term care).

In future, the likely introduction of more expensive treatments will impose further constraints on the financing of health services. The outcome may be a reinforcement of the trends mentioned in the above scenario, which may, in turn, manifest itself in a number of ways:

- First, the system maintains its egalitarian foundations and covers the cost of new treatments at the cost of higher general taxation or the introduction of an earmarked tax. Both these are politically hazardous, whereas hypothecated taxation is also associated with a number of difficulties in its implementation [36].
- Second, the system applies rationing and means-testing principles for the reimbursement of new and expensive therapies, provided that these are clinically as well as cost-effective. This decision implies either higher and stricter patient co-payments or some sort of private cover.
- Finally, and depending on the intensity of new and effective treatments being introduced, the system largely abandons its egalitarian foundation, decides on a basic package of care for all citizens and the rest will be paid for either by occupational health plans or through voluntary health insurance.

The impact of technology

Health care technology is perceived to encompass all of the instruments, equipment, drugs and procedures used in health care delivery, as well as the organisations supporting delivery of such care [37][38]. Technological innovation has rendered profound changes in the delivery of health care services over the last 50 years, and has led to a further reduction of avoidable mortality, a limitation of the incidence and duration of many diseases and a significant improvement in the quality of life and life expectancy across all population groups. However, expansion in the utilisation of medical technologies is deemed responsible for the rapid escalation in health care costs in the developed world [13] [14] [3 9] [40] [41]. Apart from increased prices, patient complexity and the intensity of services have been found to be the main factors underlying hospital cost increases [42]. Strictly speaking, technologies can be cost reducing, contributing, for instance, to the reduction

of length of stay in hospitals or saving on specialists' costs. However, technologies are also resource intensive and cost increasing in that their successful implementation and integration into the health-production function may be skill-intensive and therefore require additional skills provided by specialists.

There are several types of costs associated with the adoption and use of medical technologies, all of which are subjected to different rules and regulations. These costs include:

- the cost of acquiring the new technology, which is part of capital investment and must be recovered by the investing body (usually a provider)
- the cost of technology acquisition, which is supplemented by the cost of operating the technology [43], in terms of the necessary skilled staff needed to use it appropriately
- the cost to the system once a given technology is provided; in this particular case, the issue is the appropriate utilisation of the technology and the extent to which overutilisation occurs.

These cost considerations raise the issue of whether technology actually improves outcomes and on what patients, rather than only whether it is safe or does what it purports to do and with accuracy. An effective new technology can so easily replace an older and much less expensive technology for routine use when, for many conditions, the outcome using the old technology may be just as good as with the new [12].

The impact of technology on health care costs has at best been estimated in a rather indirect way, treating technology as a residual [44] or, at the micro level, analysing the impact on growth in hospital costs [45]. Alternatively, technology has been treated as 'big-ticket' or 'small-ticket'^a; the impact of the latter was found to be greater than the former in some studies [40][41], whilst this was disputed in others that looked at later periods [46], thereby producing conflicting results [47].

Ceteris paribus, however, there are two stylised facts about medical technology that hold across the board: first, that expenditure on health care goods has increased considerably over the past two decades and, second, that the intensity of technology use has also risen considerably. Pharmaceutical spending has, for instance, increased over time both in terms of per capita spending and as a proportion of total health expenditures (see figures 5 and 6). Similarly, the intensity of available 'big ticket' diagnostic appliances and the use of new surgical procedures have increased substantially over time (see tables 5 and 6).

It is very likely that technology will contribute increasingly to rising health care costs in future. Decision makers need therefore to take into account two policy-related issues: the first relates to 'the entry' of new compounds,

^a Big-ticket technology applies to large scale, costly technologies, such as scanners, whereas small-ticket applies to small-scale technologies, such as laboratory equipment.

devices, and procedures into the marketplace. This, more than likely, will increase, as research has led to the discovery of new products and processes through which products are derived (e.g. biotechnology, high-throughput screening⁸ for medicines, or use of satellite technology in diagnostic imaging that improves our ability to diagnose diseases at early stages). Policy makers need to answer which of these technologies constitute significant and which marginal improvements. For instance, it has been established that the vast majority of new drugs in the market are not truly innovative but constitute marginal improvements over existing therapies. Indeed, only a fraction (less than 10 percent) are truly innovative [49]. Similarly, there is evidence that 'older' technologies can deliver the same result as 'new' technologies at a fraction of the cost [50].

The second issue relates to the interplay between health policy and industrial policy. The field of health care technology is one where the interests of health policy makers quite often confront the interests of technology manufacturers. There is evidence of that from many countries [50][51], including the UK, particularly concerning medicines [52][53]. The issues surrounding this debate are pricing, reimbursement and affordability to the NHS, on the one hand, and support to industry, research and development (R&D), employment, and contribution to the balance of payments, on the other. The health-industrial policy dilemma features more prominently in countries such as the UK, where a strong industrial base and R&D culture in the relevant industries exists.

An ageing population

The overall impact of ageing on health care expenditure is not entirely clear. Additional evidence is also needed for the future impact of ageing on spending, given changes in future (expected) mortality and morbidity trends in a number of countries.

It has long been recognised that people need to use more health care as they get older. An early estimate of demographic change on the cost of the British NHS found that demographic change would increase the cost of the service by 8.1 percent over the 20 years from 1951/2 to 1971/2. Of this increase, about half would be due to population growth and the rest to the changing age structure [54].

It has also been shown that around a fifth of health care costs are devoted to persons in their last year of life [55]. Additional evidence from the United States (US) suggests that, contrary to common belief, the costs of those who die aged 80 or over are about 80 percent of the costs for those who die aged 65 to 79. Moreover, these costs were heavily concentrated in nursing-home and home-care costs [56]. It seems therefore that it is the 'younger-old' rather than the very old who get expensive high-technology care. Harrison *et al.* [57], on the basis of a number of assumptions, estimated that demographic change in the UK would require an extra 8.25-percent growth in real expenditure between 1994 and 2014, which is slightly less than the estimated growth of 10.3 percent from 1974 to 1994, and therefore concluded that pressures arising

^a A new technology that uses information technology to screen several thousand molecules and their potential suitability for a given condition.

from demography and morbidity are likely to have a modest impact in the future. Regardless of these conclusions, the ageing implications for revenue raising to finance health care and the increasing demand for health care will become more acute in the UK towards 2020, when the baby-boom generation of the 1960s reaches retirement. That does not mean that the UK population is young. By contrast, it is ageing fast and is in line with similar trends in other developed economies both in terms of share of the population aged 65 and over (see figure 7) and in terms of a rising dependency ratio (see figure 8).

In addition to the above issues, there has been an extensive debate concerning the evolution of mortality and morbidity trends in the future. Fries [58] and Oslansky *et al.* [59] argued that improvements in health and medical care will actually delay the onset of illness and disabling conditions. Others [60] suggested that reduced mortality could increase the number of older people living with disabilities or ill health and the length of time they survive disabled or ill. The results of different estimates for the US population differ considerably with some of them suggesting that there is an upper limit (i.e. the age of 85) for life expectancy, whereas others anticipate life expectations of 95 or 100 in the twentieth century. Stoto and Durch [61] suggest that forecasts of the number of people aged 85 and over in 2040 differ even more markedly. In addition, very different models of ageing process were shown to produce the same mathematical expression for death rates as a function of age [62]. According to Wilmoth [63], the direct calculation of mortality rates at very high ages presents several problems, including the excessive random fluctuation due to the small number of individuals who survive to advanced ages. Another difficulty is systematic bias due to inaccuracies in the reporting of age in population census and vital registration data. Age heaping and age exaggeration are known to have occurred in census and death registration data.

Should specific quantitative forecasts of health care expenditure be made for four or five decades into the future? Should this be done on the basis of current age-adjusted consumption of health care services and morbidity and mortality trends? If so, these forecasts may result in quite inaccurate predictions if they do not take into account qualitative adjustments based on medical and biological knowledge about future changes in the forces affecting morbidity, mortality and demand for health care. The supposed independence of different factors (i.e. mortality, disability, ageing), which is a common and mathematically simple assumption, is likely to be incorrect [61]. Is it possible to predict the impact of these factors and quantify them? A forecast with some degree of uncertainty is one option, although because of the uncertainty in what will actually happen the confidence intervals around the forecasts should increase over time beyond those based on statistical fluctuations in the past. Any past statistical fluctuations should also be incorporated in the projections. Stochastic forecasts (those with a formal statistical model for uncertainty) are preferable compared with those providing only high, medium, and low values. In addition, sensitivity analysis should be conducted routinely in this type of analysis. Post hoc analysis of forecast errors can also provide a means of estimating uncertainty [61].

It is not fully known to what extent risk factors are going to affect future morbidity and mortality trends. The prevention or elimination of a number of risk factors may result in quite extensive differences in the future. Furthermore, there are always time lags between behaviour change and its impact on mortality and morbidity. Further research is needed to measure these time lags and quantify their impact. In addition, changes in the determinants of health may significantly affect per capita expenditure and consumption patterns. Risk reduction at younger ages may lead to exposure to other risks which may in turn be less susceptible to intervention [61]. Preston [64] has estimated that the excess mortality for older males in different populations was closely linked to the per capita consumption of cigarettes. When the younger heavy-smoking female cohorts reach very old ages mortality and morbidity rates may increase. Is it possible to predict and quantify the impact of all the above factors on a long-term basis? Disability may be a result of the same process that determines mortality but also an independent risk factor for mortality. The nature of the relationship, which may be cause specific, needs to be further understood [61].

Finally, a number of exogenous factors such as housing, cooling, heating and environmental changes may also affect the health status of the elderly population and consequently their demand for health services. Furthermore, societal changes, including the fact that the number of the elderly living alone grows significantly, may affect the health status and the delivery of informal care for the elderly in the future. These societal changes are not going to be homogenous in all countries. They may reflect different cultural and societal national developments and may take quite different shapes in countries with similar economic development.

Health challenges

Health challenges are less compelling, but nevertheless quite important. It is clear that health 'performance indicators' suggest that the UK has achieved high life expectancy at birth (see figure 9), and low infant mortality (see figure 10). These compare well with other EU countries. Despite these indicators, the UK, in line with other developed countries, faces a number of evolving patterns in the causes of disease and death, which could impact on the financial ability of health services to deliver care in the near future.

There are three such challenges. Firstly, infectious diseases, such as the human immunodeficiency virus (HIV), pose considerable threat to the extent that there are no effective treatments that cure them. In addition, there are many known conditions/infections that are resistant to many (or most) known antibiotics - for instance, methicillin resistant staphylococcus aureus (MRSA), strains of tuberculosis resistant to many antibiotics (MDR-TB), the case of Group A Beta-haemolytic streptococcus, and trimethoprim-resistant salmonella. Antibiotic resistance is not new, but what is new is that many more bacteria have developed resistance - and to a larger number of antibiotics [65]. The cost implications of these developments lie in the administration of more costly antibiotics, the need for additional drug testing, and for more prolonged hospital stays, as well as the use of non-antibiotic management, such as isolation techniques.

Secondly, conditions such as diabetes and conditions of the central nervous system are gaining in importance. These conditions are to a certain extent associated with age (Alzheimer's), or psycho-social factors (depression, schizophrenia), and contribute considerably to the cost of treating patients as the UK population ages gradually and available treatments are more palliative than curative [66][67][68][69][70][71][72].

Thirdly, diseases related to diet, habits and lifestyle impose a further economic burden that is not strictly related to the health sector per se, but brings further spill-over effects to the family and the social system. Cardiovascular deaths are epidemiologically more apparent in the wealthier EU countries and are closely related to economic development and prosperity, arising partly from diet patterns rich in animal fat. There are various types of cancers that are evidently associated with smoking, although the prevention strategy in the UK has yielded considerable benefits on that front over the past 40 years. Traffic accidents present a major cause of death in the age groups of 25 to 44 years [73]. For a number of these health challenges, prevention rather than cure may be the most cost-effective way forward.

ASSESSMENT OF FUTURE TRENDS

Financing health and long-term care services

Abolishing the NHS in its current form is a misnomer and is likely to continue to be so in the years to come. However, issues of financing as well as quality of care will continue to feature very strongly in the decision-making process and in consumers' perception of the system.

In terms of sources of financing the most likely options are a greater emphasis on social insurance, in addition to revenues from general taxation, increasing taxation rates to cover pressures on spending, and shifting attention to voluntary health insurance. All three present difficult policy options partly because they are associated with political costs and a break with tradition. More earmarked financing through increased social insurance contributions is likely to be opposed by employers and employees, and is associated with equity problems. It is, nevertheless, politically preferable to higher rates of taxation, which may not necessarily result in higher funding of health services.

Taxation at its current rate, however, appears to be the political favourite also because it provides the justification for rationing. If there continues to be an upwardly inflexible cap on funds, then the likelihood of higher user charges (with tougher means testing) and extension of rationing to other parts of the health service are more than likely. Patients will then have to cover for what is not reimbursed (for instance, long-term care in addition to dental care and eye care). Under these circumstances, voluntary health insurance (VHI) seems likely to increase in the near future if user charges rise, or if rationing is extended, or if the perception of the NHS deteriorates amongst employers and employees. A recent survey among employers revealed an alarming increase in pessimism about the prospects for the NHS since the government came to power, and almost 25 percent of employers expected NHS standards to

deteriorate compared with 10 percent ten years ago [74]. Employers, however, seem reluctant to pay for private medical insurance, therefore any increase in VHI may come from direct payments by consumers.

Future governments may also be forced to consider the following options: first, to allow consumers to opt out of the service and providing incentives for them to do so, as is currently the case in other parts of the welfare state. Second, policy makers may wish to decide on a basic package of care that will be reimbursed to all patients, the remainder to be covered by supplementary insurance. In both cases the creation of a two-tier system will be the outcome. Currently, equity considerations disallow such scenarios to feature in government decision-making, but it is not entirely sure that equity will be as strong a health policy objective in the more distant future.

The impact of exogenous factors

Wagner's Law (1883) stresses the inevitability of rising public expenditure, including health expenditure as income rises. This means that as wealth per capita increases, so will the per capita expended sum on health. Although this claim has received a great deal of attention in the past, particularly with regards to health care expenditures, fresh evidence suggests that this may not necessarily be the case for the health sector. While the relationship between health and GDP has been explored in some depth, the fact remains that economic growth is a determinant of policy makers' stance on public financing, including health care. Whereas, for areas of public policy, decision makers may wish to adopt a cyclical or, most often, a counter-cyclical fiscal policy, the 'human sector' and, in particular, health, cannot be subjected to the cyclically of fiscal policy.

Changes in demographic structure may have a significant impact on the ability of the UK to finance health services and indeed other welfare services at current rates of taxation. Between 1999 and 2015, the UK will experience a deterioration in the dependency ratio, implying that an increasingly smaller working population will have to support, through taxation, increasing numbers of dependants (people aged 65 and over and children under 14 - see figure 10). Figure 3 suggests that *currently* the UK is one of the largest spenders on welfare amongst industrialised countries, and certainly the second largest after Germany in terms of net current total expenditure, which takes out the effect of taxation of social/welfare benefits and includes the requirements of private companies to provide social benefits (e.g. sick pay, workers' compensation for industrial accidents, or tax incentives for private pensions). Maintaining the current level of spending as a proportion of GDP by a smaller active population may require higher contributions. Alternatively, future UK governments are faced with further reform of the welfare system, a shift towards 'stakeholder' welfare, delaying retirement by at least an additional two years, raising the retirement age of women by up to five years, or, indeed, a combination of the above measures.

At the other end of the spectrum, internationalisation is very likely to have an impact on the health services and their availability in the UK. Firstly, patients carrying private insurance can increasingly be treated in countries other than

in those they pay contributions to. The case may change for all those covered by statutory health insurance in the near future. There is a political dimension in that national and supra-national entities may have opposing views and the latter may interfere with the policy sovereignty of the former. Health-related goods and services are pretty standardised, although considerable differences exist between countries for what may be essentially the same product or service. Attempts to further standardise such differences may be desirable but are politically difficult to resolve, especially if there are clashes between different policies (health policy, industrial policy or science policy) and at different levels (national and supra-national).

Technology and its assessment

Countries with national systems of health care have attempted to develop policies to manage new and existing technologies in concert with global or prospective budgeting. One element of these policies is technology assessment and its linkage to policy decisions. Health care technologies are (tradable) goods and can broadly be categorised into drugs and medical devices. The proprietary nature of much medical technology, together with the high costs of innovation, have created world markets for many technologies - particularly pharmaceuticals and imaging and surgical instrumentation. The issues associated with the incorporation of technology into a (national) health production function relate to the criteria for its adoption and utilisation. The impact of technology assessment varies, but it is becoming an important factor in decisions about technology acquisition [75] and reimbursement by insurers. (See table 7 for the best judgement on the impact of technology assessment in eight countries based on a sample of medical devices and surgical procedures common to all countries; table 8 highlights the limited use to date of a '4th hurdle' in the reimbursement of pharmaceuticals.)

In the UK, the intention behind the introduction of the purchaser-provider split was that the former would explicitly take into account the cost effectiveness of services purchased from the latter. The available evidence suggests that cost-effectiveness considerations feature very little in the contractual arrangements between purchasers and providers [76]. An important consideration here is that academic cost-effectiveness work focuses on outcomes of very specific treatments, whereas health authorities make very general contracts with an entire hospital or speciality leaving treatment decisions to medical staff [31]. However, health authorities were price sensitive and although this did not feature through cost effectiveness, it did as average cost per treatment in a speciality. This was one of the main reasons for moving contracts from one provider to another.

From a methodological standpoint, the availability of cost-effectiveness data is limited and this creates problems of credibility. Available data can be sorted into three categories, namely class I (the results of randomised control trials [RCTs]), class II (the results of cohort, case control and descriptive studies) and class III (the results - or opinions - of consensus conferences and expert panels). In doing this, it becomes clear that there are few RCTs in any given therapeutic category and an over-dependence on class III information, which may be problematic in providing effective evidence for clinical guidelines

[25]. Research is therefore central in ensuring the availability of credible data that would lead to meaningful policy conclusions. This must certainly be within the remit of the National Institute for Clinical Excellence, established through the recent NHS reform.

Rapid communication and the globalisation of markets has meant that the range of technologies available in a given country is likely to be similar to that in another country, at least within the developed world. The availability of new treatments is also likely to increase considerably in the future, posing additional constraints on the UK NHS budget. Thus, the role of technology assessment in policy-making is quite significant, *ceteris paribus*. Technologies, in order to be adopted, may need to demonstrate benefits accruing to patients (in terms of decreased mortality, morbidity or improved quality of life), to providers (for instance more efficient provision of services such that there is a global gain from the adoption of a specific technology, or that at least it is Hicks-neutral) and to societies (nurturing high-tech and high value-added industries). Of course, the relative importance of these incentives depends on the technology itself [75]. Although the diffusion of computed tomography (CT), magnetic resonance imaging (MRI) and pharmaceutical R&D have been shaped by economic development and industrial policy issues in France, the Netherlands and the UK respectively, the spread of laparoscopic cholecystectomy has been driven largely by patient and practitioner preferences.

The diffusion of different types of effective technologies has been phenomenal over the past 20 years. This relates to all types of medical technology, namely pharmaceuticals, medical devices and surgical procedures. The use of Zantac and Losec for the treatment of various forms of ulcer are two examples of successful medicines that reversed the process of surgical treatment of the condition. Similar is the case of the intertemporal diffusion in CT and MRI scanners and coronary artery bypass graft (CABG) and percutaneous transluminal coronary angioplasty (PTCA) procedures. One issue relating to the diffusion of technology is its appropriate use. This is largely dependent on the method of paying providers with fee-for-service reimbursement, most certainly inducing more use.

The impact of demography

Changes in demographic structure are expected to have some impact on health expenditure and this will intensify after 2020, when the baby-boomers of the 1960s will begin to retire. Again, the issue of ageing is rather delicate and its impact on health uncertain as to when it occurs. The current trends suggest that an increasing share of the population will live longer and a larger share of this will suffer from conditions associated with old age. Conditions such as Alzheimer's in its various forms may afflict 25 to 45 percent of the population aged 85 and older [78]. Pharmaceutical treatments offer relatively modest benefits and institutionalisation accounts for a significant proportion of the costs. A recent study in the US [79] puts the total cost of formal and informal care at a range from US\$ 1,534 in mild cases to US\$ 3,011 in severe cases and in all settings (average of community and residential). Ageing populations raise not only the issue of financing long-term care, which the recent Royal

Commission [80] attempted to address, but also of treating diseases prevalent amongst the elderly and for which little treatment is currently available. A strategy towards treating such conditions may need further research for the discovery and development of more cost-effective treatments that would prolong life at reasonable quality.

Consumer satisfaction and demand

There are different rates of satisfaction in different countries about the levels of service provided by health systems. A recent survey [9], although presenting evidence for a single year, indicates that, on average, the level of satisfaction increases as per capita spending on health rises among countries: i.e., it seems to hold that the more citizens spend on health, the happier they seem to be with their health care systems.

Although this is a rather plausible result, it is astonishing that this positive relationship breaks down dramatically in a number of cases. For instance, relatively low levels of spending can be associated with high levels of patient satisfaction and vice versa. Typical in this case are the examples of Denmark and the UK. Both countries spend per capita similar amounts on health; however, 90 percent of the people asked in Denmark are at least fairly satisfied with health care provision in the country, while the respective percentage in the UK was just over 48 percent.

These trends cannot always be explained in the most rational way, but highlight consumers' empowerment in different countries and the fact that dissatisfaction with public services is politically dangerous if not tackled. In this way, they provide additional pressure points in the hands of consumers vis-a-vis their governments or service providers. One possible implication is that rising expectations about what a health system should cover may force governments to strengthen the presence of private insurance. Although this is already happening in the Netherlands and Germany, a trend can be observed in a number of European countries for governments to reduce their role in the financing and provision of health care. This is the case of Belgium, Denmark and Ireland [81]. Such pressures on national governments, including the UK, may open the way for more private insurance cover, which can become more attractive to the general population by the provision of (tax) incentives. Rising income inequalities may also provide a stimulus, as the increasingly better off part of the population may increasingly seek private insurance rather than join the waiting lists.

Projection of health care expenditure

In order to be able to project health spending into the future, it is essential to try and understand what drives health care costs and what the relevant contribution is from different factors. It is therefore essential to try and build a demand function for health care. Evidence of that has so far been very patchy and methodologically flawed [82], emphasising the relationship between health spending and macroeconomic variables, such as gross domestic product. Recent attempts [83] have focused on the determination and estimation of a dynamic demand for health care function, seeking to incorporate the impact of such factors as technology, ageing, the medical

profession, prices of medical goods and services, population and in-patient variables, in addition to the impact of macroeconomic variables. The evidence suggests that the empirical literature has severe limitations in explaining the intertemporal variation in health care expenditures and has suggested an analytical methodology pursuing a country-by-country investigation on a time series basis.

According to the evidence provided, a forecasted value of health care expenditures depends on a number of factors. Among them are macroeconomic variables (e.g. growth rate and fiscal deficit) and a series of variables relating to the performance of the health service. More specifically, technology and, in particular, pharmaceuticals are an important cost-push factor. The reduction in the length of stay and the total number of beds in in-patient care may lead to lower total health costs *ceteris paribus*, although in many cases the opposite is happening. This may be due to more intensive use of resources or more high-tech care provision. Furthermore, it appears that improvements in mortality rates over time have contributed significantly to health care costs. On the other hand, ageing has produced mixed results which, *ceteris paribus*, point at an exaggeration of its importance over time. The impact of ageing is however difficult to isolate, partly because it is related to different parts of the health budget. An additional factor that has been found to contribute to escalating costs, *ceteris paribus*, is average wages.

An understanding of the factors that drive health care costs upwards should be associated with the conduct of research at the micro level rather than the macro level, and take into account historical data rather than inferring policy conclusions from analysing a demand for health function at a specific point in time. On both accounts, research is still very patchy and further work needs to be done.

Is the NHS financially sustainable?

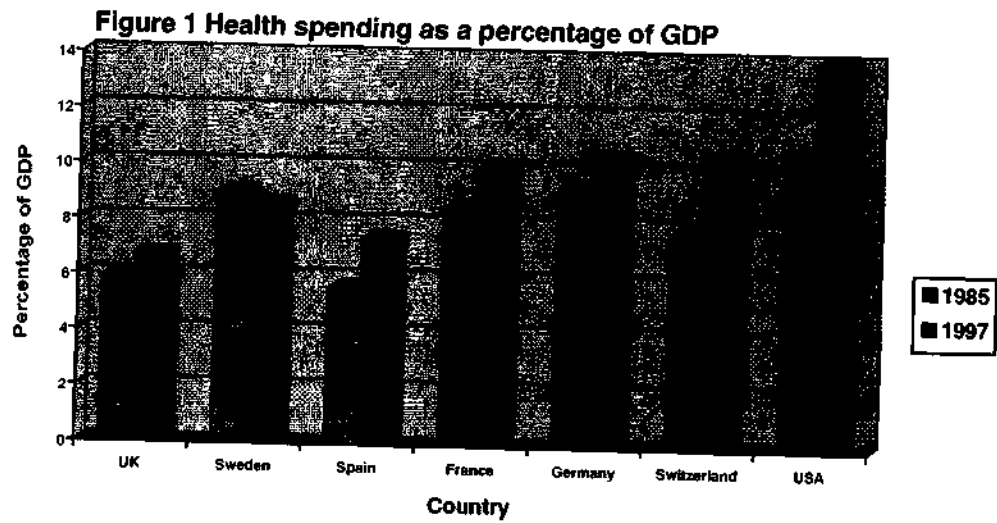
The sustainability of the NHS is a function of a number of supply-side and demand-side factors. Although it is relatively straightforward to extrapolate each of these factors into the future on the basis of past trends, their combined effect is difficult to estimate and needs statistical analysis. (The impact of several supply-side and demand-side factors is summarised in table 9, with an attempts at overall assessment at the end.)

CONCLUSION

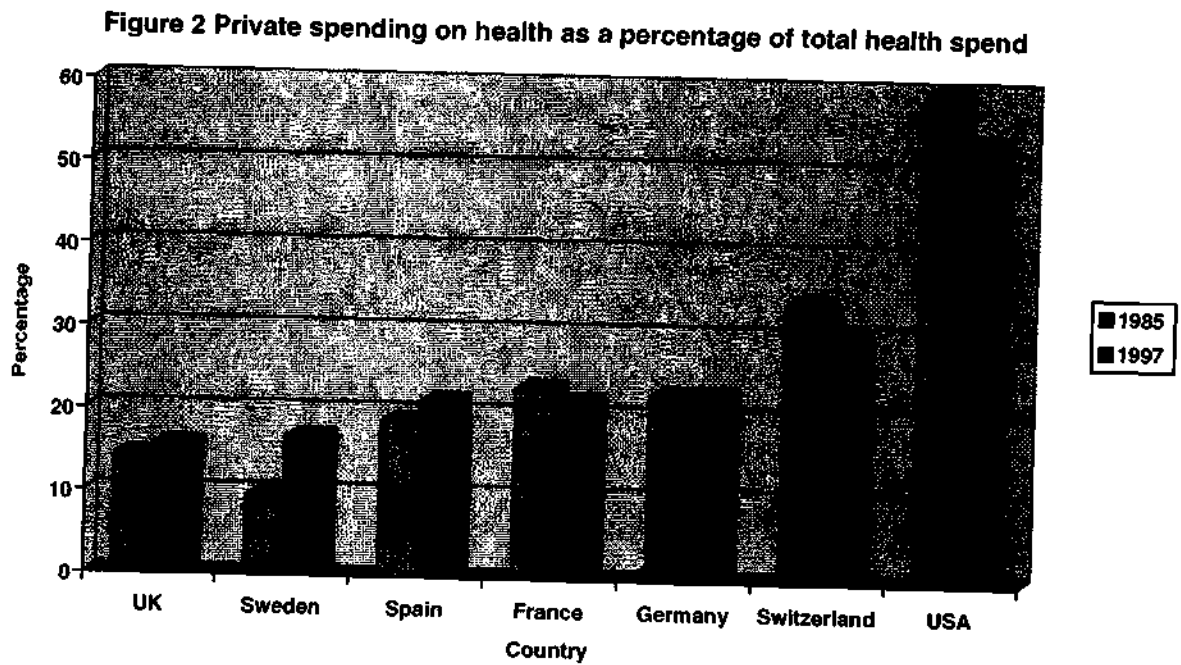
This paper has discussed a number of issues relating to future economic and financial considerations for UK health. The internationalisation of health is a neglected aspect in the UK, particularly concerning the impact that greater transparency and opportunity may have on public opinion, choice of treatment and what is financed and/or rationed elsewhere. The European dimension is increasing in strength. Other forward issues that have been raised in this paper include the impact of technology and its assessment, the share of private health expenditure, appropriate systems for rationing health care, the changing UK demographic structure and the consequences of the internationalisation of health,. Finally, the question of the sustainable financing of the NHS was raised. There are questions about the future financing of health care: for

example, how intense will financing pressures be in order for future governments to abandon the principle of equity? There are issues relating to the gradual change in what services are financed - namely, evaluating the applicability of increased co-payments, a shift towards social insurance or medical savings accounts, a more widespread use of voluntary health insurance, or a combination of all the above. It is not forgotten that the financial sustainability of the NHS clearly depends on a large number of factors, but is also a political issue.

FIGURES

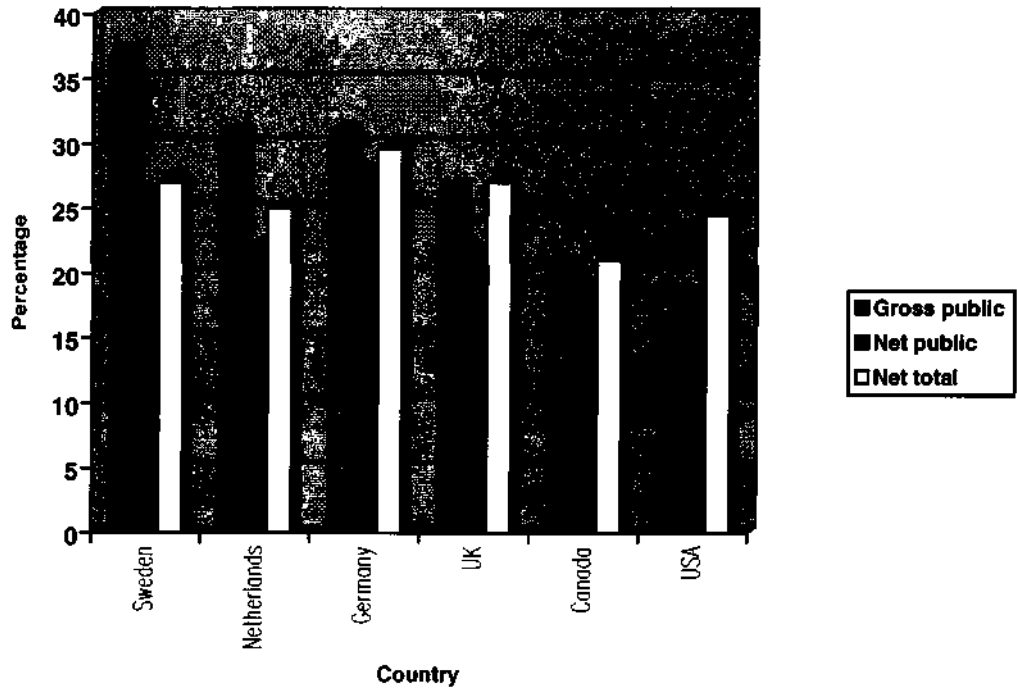


Source: OECD Health Data 1998



Source: OECD Health Data 1998

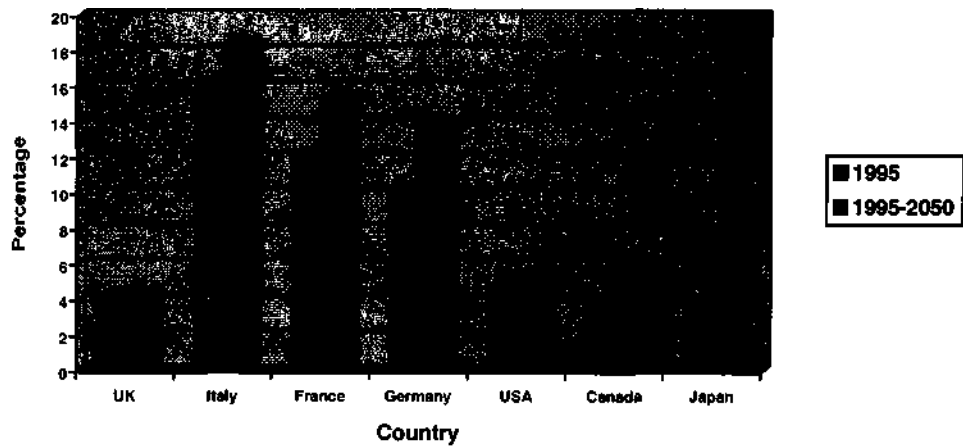
Figure 3 Social spending as a percentage of GDP, 1995



Source: OECD Health Data 1998

1. GDP is measured at factor cost.

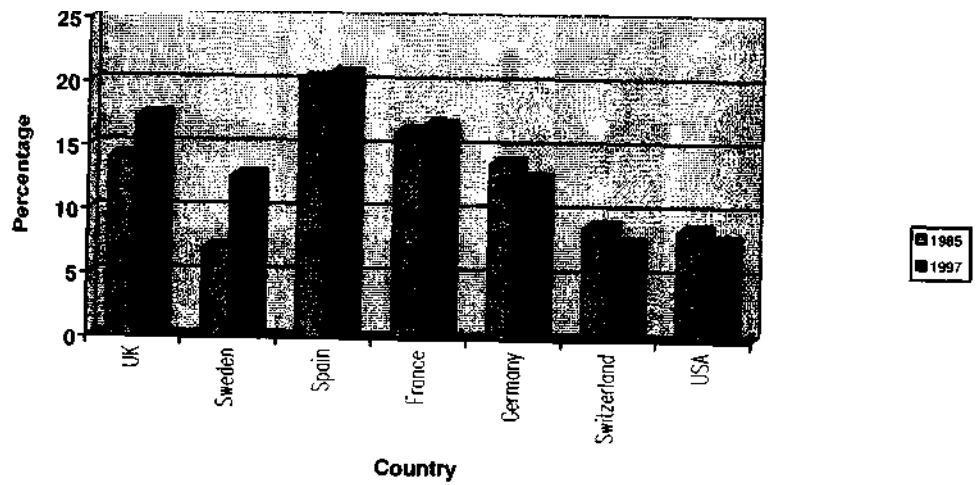
Figure 4 The burden of pensions as a percentage of GDP



Source: IMF Staff Estimates, IMF

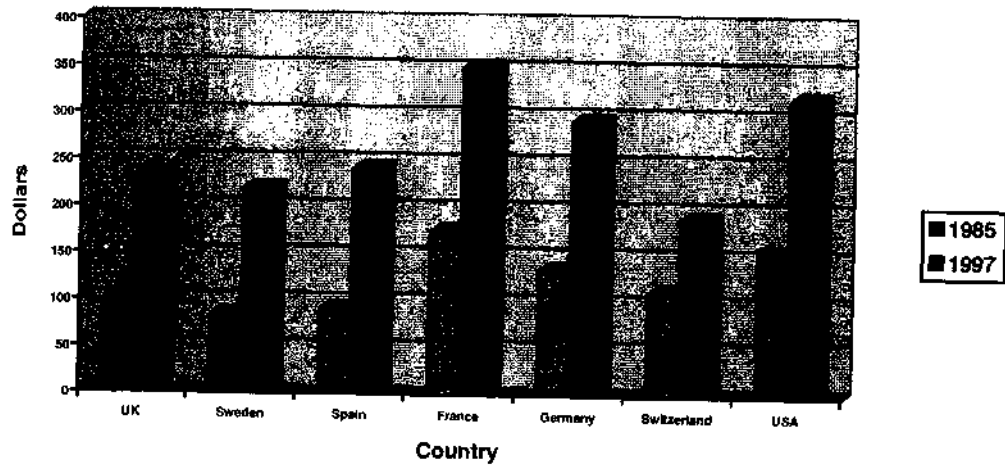
1. Data for 1995 are based on projected contribution rates for that year.
2. The percentage for 1995-2050 is the estimated sustainable contribution rate to maintain services at their current level.

Figure 5 Pharmaceutical spending as a percentage of total health spend



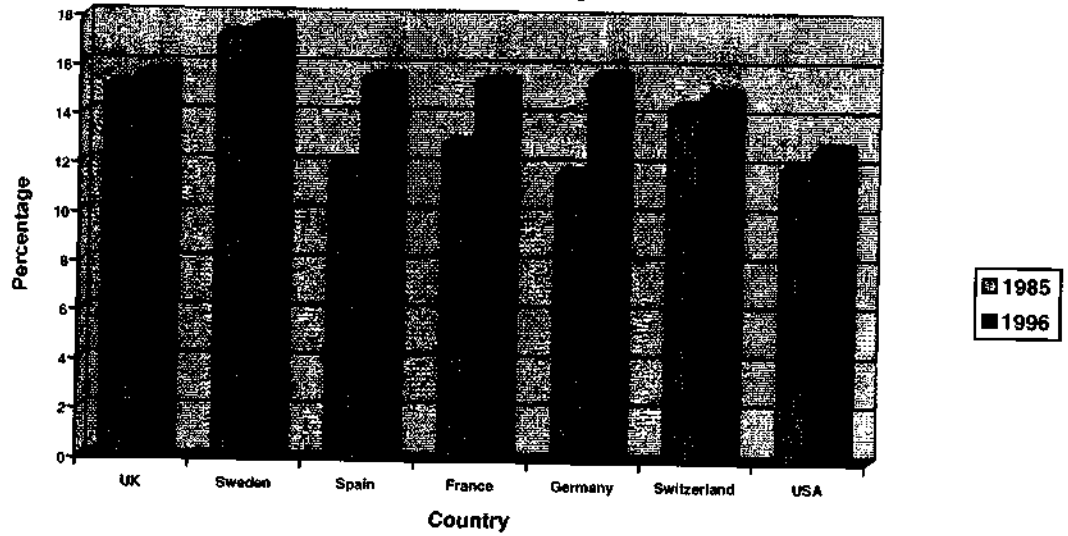
Source: OECD Health Data 1998

Figure 6 Per capita pharmaceutical spending (\$PPPs)



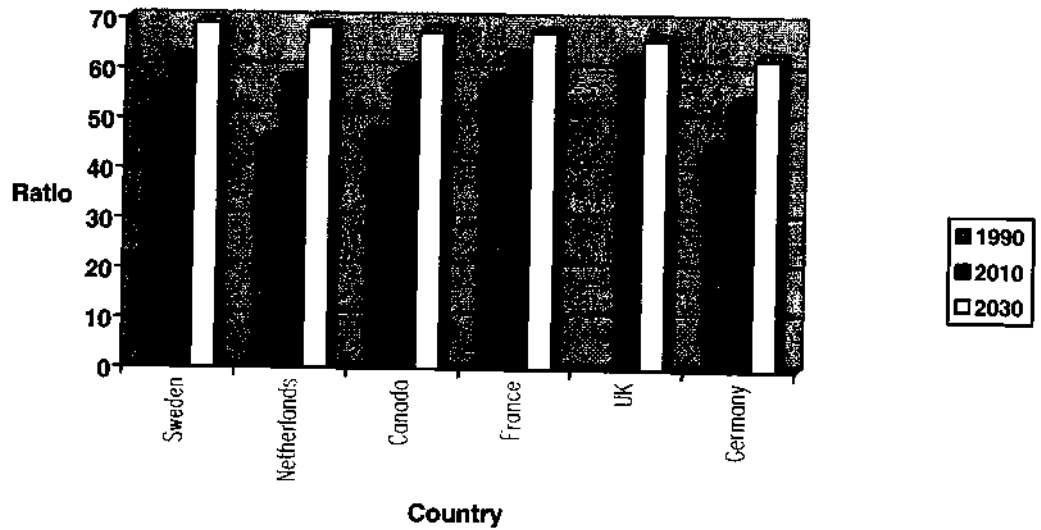
Source: OECD Health data 1998

Figure 7 Share of population aged 65+



Source: OECD Health data 1998

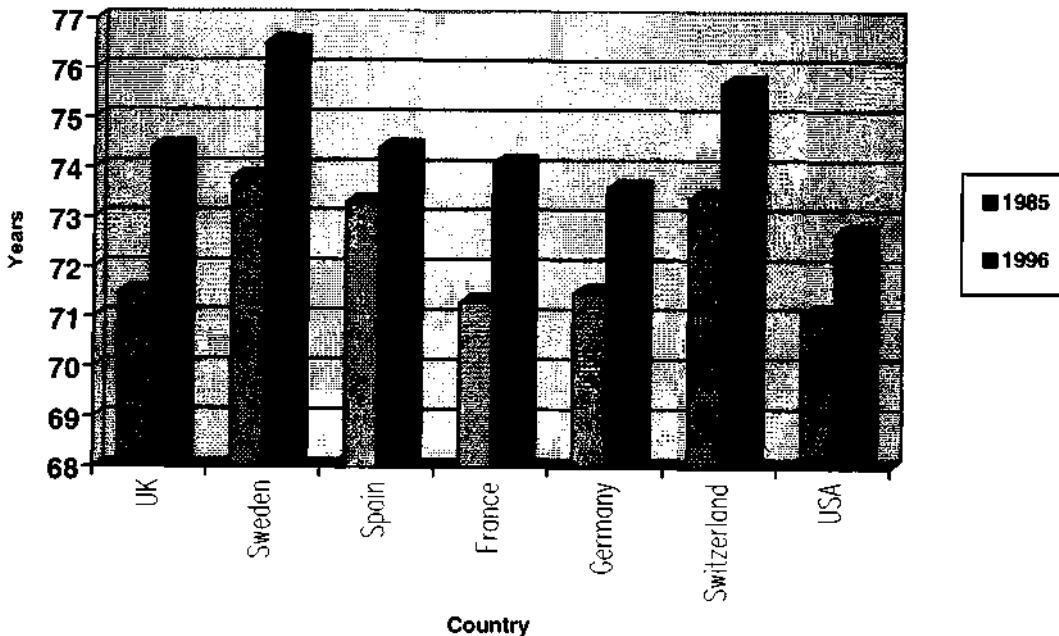
Figure 8 Dependency ratios in selected countries, 1990-2030



Source: OECD Health data 1998 and Author's Own Projections

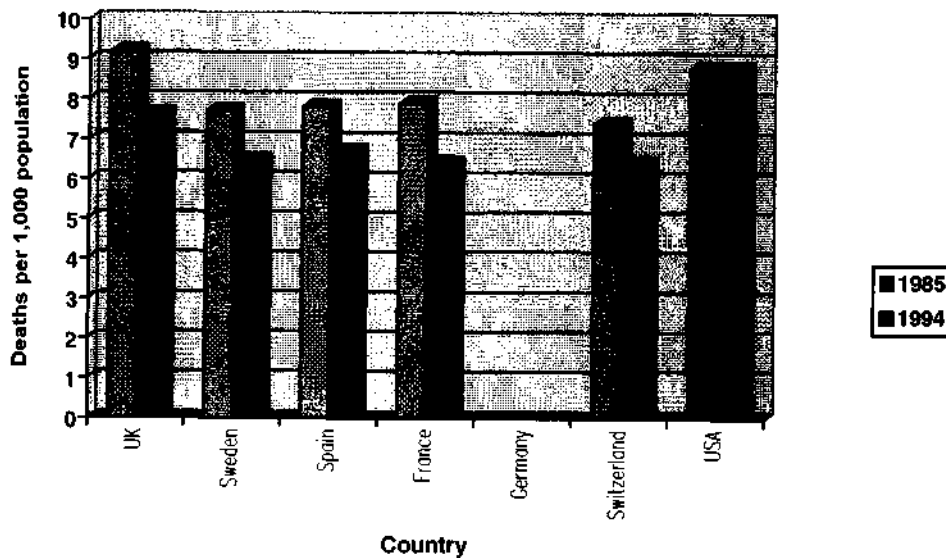
Note: The dependency ratio is defined as the population aged 0-14 and 65+ as a percentage of the working age population.

Figure 9 Life expectancy at birth (in years)



Source: OECD Health Data 1998

Figure 10 Infant mortality per 1000 population (all causes)



Source: OECD Health Data 1998

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TABLES

Table 1 Breakdown of health care expenditure in the UK, 1980-1997¹

Total expenditure	1980	1985	1987	1990	1991	1992	1993	1994	1995	1996	1997
1.1 In-patient care	53.5		44.5	43.9	44.6	43.3	42.8	42.2	42.2	-	-
1.2 Acute care	-	-	29.1	29.3	30.8	30.0	29.8	29.7	30.0	-	-
2.1 Ambulatory care	-	-	-	-	-	-	-	-	-	-	-
2.2 Physicians' services	13.8	15.3	-	15.2	15.3	15.0	15.4	15.2	-	-	-
2.3 Dental services	-	11.0	-	-	-	5.5	-	-	-	-	-
2.4 Laboratory tests	-	-	-	-	-	-	-	-	-	-	-
3 Pharmaceutical goods	12.8	14.1	13.8	13.8	14.0	14.5	15.3	15.3	15.9	16.5	17.3
4 Therapeutic appliances	1.3	1.4	1.3	-	-	-	-	-	-	-	-
5 Promotion and prevention	-	-	-	1.0	1.1	1.0	1.1	1.0	-	-	-
6 Health administration	-	-	-	-	-	-	-	-	-	-	-
7.1 Health R&D	-	-	-	-	-	-	-	6.4	-	-	-
7.2 Health education training	-	-	-	-	-	-	-	-	-	-	-
7.3 Environmental health	-	11.3	-	-	-	-	-	-	-	-	-

Source: OECD Health Data, 1998

1. All figures are expressed as a proportion of total health spending.

Table 2 Methods of financing and provision of health services in different countries

Country	Main method of finance	Main method of provision
The Netherlands	Mix of social and private insurance	Private
UK, Denmark, Sweden, Finland, Iceland, Spain, Portugal, Greece	Taxation	Public
France, Belgium, Luxembourg, Germany, Austria	Social insurance	Public
Italy	Social insurance (52%), taxation (48%)	Public
Switzerland, USA	Private health insurance	Private
Canada	Taxation	Private
Australia, New Zealand	Taxation	Mixed
Singapore	Medical savings accounts	Private
Turkey	Out-of-pocket, social insurance	Mixed

Source: Author's compilations from OECD publications

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Table 3 Average annual growth rates in GDP, health spending and pharmaceutical spending in EU member states, 1980-95

Country	1980 - 1984			1985 - 1989			1990 - 1994		
	GDP	Health spending	Pharmaceutical spending	GDP	Health spending	Pharmaceutical spending	GDP	Health spending ¹	Pharmaceutical spending ¹
Austria	1.03	0.40	2.70	2.67	2.27	3.22	2.07	2.80	4.81
Belgium	0.80	2.52	-0.64	2.89	3.78	4.31	1.15	2.20	6.53
Denmark	2.24	0.19	0.55	1.41	1.95	1.23	2.01	2.23	14.14 ²
Finland	2.71	2.76	1.11	4.25	4.10	3.30	-2.02	-3.25	0.29
France	1.44	5.66	7.96	3.14	4.74	7.78	0.83	4.20	5.99
Germany	1.23	0.23	-1.63	3.03	2.24	0.93	5.14	9.25	5.14
Greece	0.90	4.54	2.43	2.39	4.83	-2.26	1.10	0.56	5.37 ²
Ireland	2.42	-1.79	-5.36	3.62	-2.07	8.27	3.98	2.87	4.04
Italy	1.10	1.88	10.82	3.27	4.12	11.27	0.72	1.70	3.55
Luxembourg	2.41	2.82	-2.38	5.01	3.56	8.03	2.05	3.79	n/a
Netherlands	0.82	1.33	3.12	2.86	3.27	5.10	1.80	2.92	8.81
Portugal	0.42	-1.28	n/a	5.30	8.69	n/a	0.70	6.46	n/a
Spain	1.27	1.45	n/a	4.68	10.05	n/a	0.96	3.84	8.90 ²
Sweden	1.69	2.36	0.68	2.52	2.05	9.13	-0.62	-5.48	7.76
UK	1.56	2.02	6.12	4.07	1.78	5.06	0.86	1.87	10

Source: adapted from International Financial Statistics, IMF and OECD Health Data, 1996

1. 1990-93.

2. 1990-92.

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Table 4 Relative advantages and disadvantages of different methods of financing health care

Method	Macroeconomic efficiency	Microeconomic efficiency	Equity	Choice	Quality ¹
Taxation	Yes	Requires purchaser-provider split; also depends on provider remuneration	Yes	Limited	Can be low
Social insurance	Not necessarily	Potentially; also depends on provider remuneration	Yes – pooling of risks; Insurance covers employees and their families	Yes – in principle	Yes
Voluntary health insurance	No	Yes – high administrative costs though	No – premiums are risk adjusted	Yes	Yes
Hypothecated taxation	Yes	Same as taxation	No	Same as taxation	Can be low
Medical savings accounts	Yes – accounts are individual responsibility; insurance or government has nothing to do with it; characterised by rising overall costs though	Depends on organisation of health service delivery and provider remuneration	No, in principle; Yes, if supplemented by government action (e.g. catastrophic insurance)	Yes	Yes
User charges	n/a	n/a	No, if no exemptions	n/a	n/a
Out-of-pocket	n/a	n/a	No	Yes	Yes, if regulated

Source: Author's own

1. Measured by system responsiveness and consumer satisfaction.

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Table 5 CT and MRI scanners and eight countries, 1986 and 1992¹

Country	CT scanners				MRI scanners			
	1986		1992		1986		1992	
Australia	165	(10.6)	292	(17.1)	3	(0.2)	25	(1.5)
Canada	n/a		200	(7.1)	5	(0.2)	28	(1.0)
France	264	(4.8)	409	(7.2) ²	29	(0.5)	107	(1.9)
W. Germany	423	(7.0)	750	(12.2) ²	41	(0.6)	200	(3.2) ³
Netherlands	45	(3.2)	109	(7.3) ²	2	(0.1)	27	(1.8)
Sweden	45	(5.4)	102	(12.0)	2	(0.2)	22	(2.6)
UK	149	(2.7)	250	(4.3)²	14	(0.2)	80	(1.4)
USA	3000	(12.7)	6715	(26.8) ²	114	(0.4)	2940	(11.3)

Source: Adapted from OTA, 1995

1. Figures given are per million population.
2. Data for 1990.
3. Data for 1991.

Table 6 CABG and PTCA procedures and eight countries, 1985 and 1991¹

Country	CABG procedures				PTCA procedures			
	1985		1991		1985		1991	
Australia	7,100	(470)	12,649	(731)	1,244	(79)	5,726	(330)
Canada	9,690	(380)	18,360	(680)	10,730	(405) ²	12,420	(460)
France	5,900	(110)	22,250	(410)	3,480	(60)	23,125	(410)
W. Germany	12,600	(190)	30,500	(500)	4,490	(77)	34,328	(560)
Netherlands	6,800	(478)	9,470	(635) ³	2,556	(185)	8,899	(593)
Sweden	1,970	(236)	5,693	(670)	165	(20)	1,834	(215)
UK	10,840	(195)	22,882	(405)	1,640	(29)	9,775	(170)
USA	201,000	(855)	265,000	(1,055)	90,000	(380)	298,000	(1,187)

Source: Adapted from OTA, 1995

1. Figures given are per million population.
2. Data for 1989.
3. Data for 1990.

Table 7 Overall impact of technology assessment (TA) on policymaking in eight countries

Impact	Country
Significant	Sweden
Moderate	Canada; the Netherlands
Modest	Australia; UK
Minimal	USA; France
No (nascent TA)	Germany

Source: Battista, Feeny and Hodge [102]

Table 8 Use of CEA in the reimbursement of pharmaceuticals

Type of policy	Country
Explicit use of CEA in reimbursement	Australia; Canada [Province of Ontario only]
CEA studies are required by the authorities but are not explicitly taken into consideration in reimbursement decisions	Finland; France; UK
CEA guidelines under preparation; after that they will be used for reimbursement decisions	The Netherlands; New Zealand; Portugal

Source: Author's own, June 1999

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Table 9 Health spending as a percentage of GDP

Factor	Future likely impact
Level of contributions	May have to rise or further services may have to be excluded
Number of net contributors	Not expected to rise; it is likely to fall due to demographics
Commitment of central government	Depends on resources and pressures
Health-care package provided	Package of health care commensurate with available resources and political acceptability of increased taxation
Professionals' incentive structure	May need to be modified to save costs and improve efficiency
Organisational structure	May need to be modified to save costs and improve efficiency
Price growth/inflation	<ul style="list-style-type: none"> • Need more transparency in price setting • Prices of some inputs will rise commensurate with technological development • Pricing output/services provided: scope for 'true' competition and 'true' patient mobility?
Volume growth	Modest, if current policies apply; mostly from consumer awareness and patients with long-term care needs
Economic growth	<ul style="list-style-type: none"> • Growth forecasts well into the second decade of the new millennium are meaningless from an economic perspective • High growth does not necessarily mean more resources to spend on human services due to technological progress and higher cost of inputs • Productivity of health service can be improved only marginally
Consumer/patient demand	Very likely to increase due to income growth and 'consumer awareness'
Number of users	Potential increase due to demographics
Intensity of treatment	More technologically intensive, but not necessarily cost reducing
Internationalisation	Will increase with impact on patient preference and, potentially, on overall costs to the system
Technological innovation	<ul style="list-style-type: none"> • Constantly improves but at a premium • Benefits from new technologies are often marginal • Policy makers need to decide what is value for money • Each wave of new technology carries a price premium over and above previous waves
Prevention	<ul style="list-style-type: none"> • Must be strengthened in order to save on future costs • Benefits occur over the long term • There are limits on spending and uptake of campaigns by the public
Financial sustainability	Above trends will certainly require new resources on a permanent basis assuming current level of services remains as is

Source: Author's own

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