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# THE PHYSICIAN WORKFORCE IN THE UNITED KINGDOM

Issues, Prospects and Policies

Alan Maynard &
Arthur Walker

Introduction by
John Wyn Owen

The Nuffield Trust
FOR RESEARCH AND POLICY
STUDIES IN HEALTH SERVICES

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Alan Maynard &
Arthur Walker

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Introduction by
John Wyn Owen

Series Editor
Susie Stewart

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## ABOUT THE AUTHORS

Alan Maynard is Professor of Health Economics at the University of York. He was Founding Director of the University of York's Centre for Health Economics (1983-1995) and Secretary of the Nuffield Provincial Hospitals Trust (1995-1996). He is a Visiting Professor at the University of Manchester, the London School of Economics, United Medical and Dental Schools (St Thomas's Campus), and a Visiting Professorial Fellow at the King's Fund Institute.

Dr Arthur Walker is a Principal Lecturer in Economics at the University of Northumbria at Newcastle. He was until 1979 a Research Fellow at the University of York where he completed a doctoral dissertation on the economics of medical education. His research work and publications have been mainly in the areas of health economics and the funding of higher education in the United Kingdom.

## INTRODUCTION

*The Physician Workforce in the United Kingdom* is the second in our new Nuffield Series of publications intended to inform the debate on shaping health services in this country.

In the introduction to the first in the Series *Redesigning Health Services: Reducing the Zone of Delusion* – I said that the most successful health systems are those that have learned to use the right strategy. Planning, implementing and monitoring must be a never-ending process in the achievement of satisfactory changes and the provision of services that provide health gain and that focus on people as well as sound stewardship of resources.

Staff who work in the health service – doctors in particular – are of course the central resource. The Chief Medical Officer, Sir Kenneth Calman, writing in the *British Medical Journal*,[1] looked at the purpose of medicine and the concept of a profession in the wider context of health values in society and the need to involve an increasingly knowledgeable and health-conscious public. He quoted the Book of Proverbs – *Where there is no vision the people perish* – and examined closely what doctors do that others in the wider health team do not. He concluded that the one aspect of practice of profound importance and specific to doctors is making the diagnosis and assessing its consequences.

In his article, Calman addresses a number of other issues crucial to a confident and effective medical profession: the importance of continuing professional development; the ability to work as a team; concern with health as well as with illness; a focus on serving the patient and the public; concern with clinical standards, outcomes, effectiveness and audit; the ability to define outcomes; an interest in change and improvement, research and development; and – key to the whole process – the ability to communicate.

Health services, and what are expected of them, are currently in a process of radical development. *Changes in health needs and health services provision by the year 2005 – the role and training of doctors* was the subject of a trilateral meeting, involving delegates from the United Kingdom, the United States and Canada, organised by the Trust in 1994.[2] Each of the three delegations identified main hopes and requirements for change within their particular health care systems.

The present contribution to this debate examines the current and projected future size and disposition of the physician workforce in the United Kingdom. Maynard and Walker discuss the issues that face decision-makers within the context of a changing health service and look at the implications for workforce policy. They also consider the changing training and career structures within medicine in this country.

A number of areas of concern emerge – including some alarming gaps in the knowledge base – and require further investigation. The authors conclude that there is urgent need for evidence-based policy-making and greater care and expertise in forecasting and planning the United Kingdom's physician labour market if new inflationary pressures within the National Health Service are to be avoided.

John Wyn Owen
*October 1997*

1 Calman K. The profession of medicine, *British Medical Journal* 1994, 309:1140-43.

2 *Changes in Health Needs and Health Services Provision by 2005: the role and training of doctors*. Report of a trilateral Seminar. London: Nuffield Provincial Hospitals Trust, 1995.

## PREFACE

This paper explores the current and likely future size and disposition of the United Kingdom physician workforce and assesses the problems facing policy makers. The flows into and from this workforce (including migration) are considered, and an assessment of the significance of a number of factors affecting these flows is presented. The balance between the supply of and demand (requirements) for the workforce as a whole and for important sub-sections of it (hospital specialities, general practice, the physician workforce of particular geographical areas) is analysed. The changing training and career structures within medicine in the United Kingdom are also described.

The next section of the paper briefly outlines the changing health service context and indicates some of the implications for physician workforce policy . This is followed by a section which outlines a simple model of the physician labour market in the United Kingdom and which illustrates the way in which forecasters and policy makers have conceptualised their task. The remainder of the paper is divided into sections which summarise the main characteristics of the United Kingdom physician labour force, and considers the supply and demand (requirements) for physicians, immigration and emigration, postgraduate medical education and training and the career structure, and geographic and social distribution. A final section identifies some of the major issues which policy makers have to resolve.

## THE CHANGING HEALTH SERVICE CONTEXT: IMPLICATIONS FOR WORKFORCE POLICY

Prior to the 1991 reforms the National Health Service (NHS) 'would appear to have been the most highly centralised health care system in the OECD area' (OECD 1994). The funding was largely from general taxation: 82 per cent from personal taxation, 13 per cent payroll levies (national insurance), and 4 per cent user charges (Dept. of Health 1994). Objectives, set at a national level, of universal coverage, equity and cost control were pursued largely by means of administrative/bureaucratic controls and annual budgets. Whilst the health care system in the United Kingdom is guided by a common set of principles, England, Northern Ireland, Scotland and Wales have, in terms of formal administrative arrangements, separate health services. Prices and financial incentives and rewards were given only a very limited role prior to 1991 and where there were incentives they were often perverse (Maynard and Bloor 1996). Levels of remuneration of all the significant groups of staff were fixed annually by independent review bodies; for physicians this is the Review Body on Doctors' and Dentists' Remuneration which was established in 1962 following a Royal Commission (Royal Commission 1960). Hospital doctors were salaried, although consultants were allowed to hold part-time NHS contracts to allow them to pursue private practice. Since 1980 full-time NHS consultants have also been allowed to undertake private practice to a limited degree.

The deliberations of the Review Body about physicians' pay were dominated by equity (comparison of pay with other professional groups) and public expenditure (the need to constrain NHS expenditure within politically determined annual 'cash limits') rather than efficiency considerations. GPs, the normal first point of contact ('gatekeepers') for physician care for all NHS patients, have enjoyed independent contractor (self-employed) status since the creation of

the NHS. However, they are subject to a number of controls and checks. In particular there are controls on where they can set up in practice. Also, the overwhelming proportion of their income comes from the NHS, principally via a practice allowance and age-weighted capitation payments for each patient on their 'list'. GPs, therefore, were integrated to a significant degree within the administrative system of the NHS.

The private sector of health care in the United Kingdom is comparatively small, even in 1993 private insurance premiums were only £1.5 billion compared to £38.2 billion NHS expenditure, (Office of Health Economics 1995) and, significantly, the private hospital sector does not employ full-time physicians but relies mainly on part-time NHS consultants. However, for physicians and surgeons, particularly those involved in elective procedures, working in the private sector, a considerable proportion, perhaps as much as 40 per cent, of their income comes from non-NHS work (Monopolies Commission 1994). This inevitably diverts effort and creates further perverse incentives in terms of efficient NHS practice.

Within this highly administered system a need was perceived for forecasting/planning to match the capacity of the system to likely demand and requirements for care. For the last 50 years the Government has sought to forecast the demand and requirements for physician labour and made adjustments to the supply in the light of these forecasts in order to achieve 'equilibrium' in the labour market. They have, in effect, sought to plan the labour market for physicians. This work has been done by asking a series of *ad hoc* committees, two Royal Commissions and most recently a standing advisory committee. Their role has been to construct forecasts and make recommendations for policy. The broad direction of the recommendations of the

committees and commissions has always been adopted as policy. The most significant, in terms of magnitude of effect of all changes in policy, was the raising of the medical school intake from a level of 2,500 in the mid 1960s to 4,000 in 1980 following the recommendations of the Royal Commission on Medical Education (Todd Report) (Royal Commission 1968). Prior to the reforms of the 1990s, the NHS and the Medical Schools were perceived, at least implicitly, by policy makers to be part of a largely deterministic system, in which physicians flowed out of medical school and into a series of career channels on a mainly full-time basis. Policy makers chose their methodology for planning accordingly. Their approach was always an over-simplification as there were significant stochastic elements even in the un-reformed NHS, notably the migration and workforce participation decisions of physicians, and this led to significant forecasting and planning errors (Maynard and Walker 1977 a and b).

The NHS reforms announced by the Government in the White Paper Working for Patients, (Secretaries of State for Health, Wales, Northern Ireland and Scotland 1989) which was introduced in 1991, sought to reduce the degree of centralisation and introduce some features of a market (the so-called 'internal market'). However, the reformed system is still funded from general taxation, and is constrained by a cash limited, global budget in which the principle of universal access to care is maintained.

The three key features of the reforms were the separation of the service into purchasers and providers, the transformation of NHS hospitals and some other public sector providers of care into publicly-owned self-governing trusts, and the introduction of general practice fundholding (GPFH). The separation of the purchasing function from the act of supplying care raised the possibility that purchasers (the

primary public purchasers are District Health Authorities covering geographically defined populations of around 300,000 people) may contract with the private sector or with hospitals or agencies in other districts. This introduced the possibility of increased volatility into management and planning.

NHS trusts are independent, non-governmental organisations, but accountable to the Secretary of State for Health and monitored by provincial branches of the NHS Executive Office. They have powers which would allow local pay negotiations for physicians and other staff but little local pay bargaining developed. The chief developments were the transfer to trust hospitals of some consultants' contracts, and the replacement of the 'C' level distinction award with discretionary increments for consultants, although all who already hold the 'C' award moved to the top of the new discretionary scale, (Review Body on Doctors' and Dentists' Remuneration 1996). A greater potential emerged slowly and at the margin to use remuneration to attract staff to particular hospitals. This potential arose partly from greater flexibility in the centrally determined pay structure and partly from the exploitation of local flexibility to vary pay and conditions from those suggested by the centre. The new Labour Government seems set to reduce flexibility and return to central pay determination.

Trusts, pursuing greater efficiency, could vary the proportion of different types of health service labour and other inputs. Like trusts, GPFHs face a different pattern of incentives compared to traditional GPs. They may prefer to employ additional non-physician labour rather than take on additional partners. Possibly of even more significance is the development of a clear national framework to allow GPs to provide secondary care in a general practice setting (Health Service Guidelines (96) 31). The pattern of incentives, and

indeed the organisational framework for general practice, changed following legislation on primary care in 1997. The preceding White Paper recommended that public purchasers and NHS hospital trusts be allowed to employ salaried GPs whilst maintaining the independent contractor (self-employed) status of GPs who do not wish to be employees.

The NHS reforms had significant consequences for the size and disposition of the physician workforce. Whilst the Labour Government policies are unlikely to eradicate all these changes, particularly in primary care, the precise direction of their reforming efforts are as yet unclear.

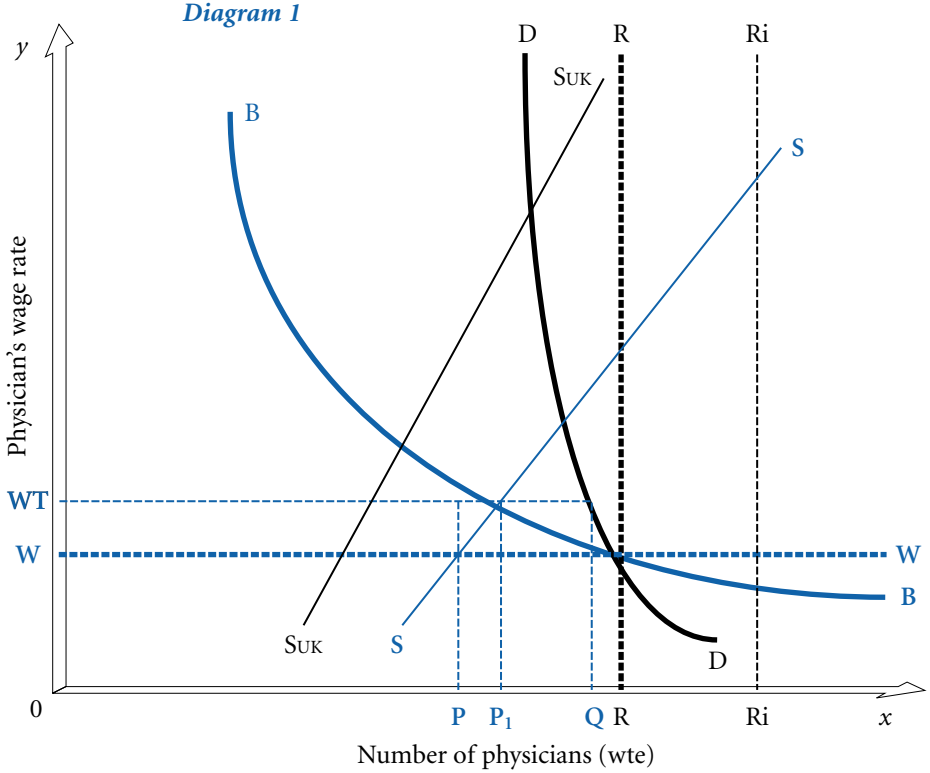
One further contextual feature, with potentially significant consequences for forecasting and policy, is the rise in recent years in the number of physicians (both male and female) seeking part-time employment (for example only 87.6 per cent of GPs in England were full-time in 1995 compared to 94.5 per cent in 1990, and 10 per cent of female and 6 per cent of male junior doctors now have part-time contracts). There has also been a trend toward early retirement in recent years.

The early forecasters were dealing with a predominantly male workforce seeking to work full-time. Physician workforce forecasting has become more complex but the workforce has become more flexible and there are greater opportunities to use price/wage incentives which should make the task of matching supply and demand for physician services easier. The next section of the paper sets out a simple model of the physician labour market in the United Kingdom and the options available to policy makers.

## A FRAMEWORK FOR UNDERSTANDING THE PHYSICIAN LABOUR MARKET IN THE UNITED KINGDOM

The model, adapted from Zabalza *et al* (1979) and adapted in relation to physicians by Wilson (1987), is shown in diagram 1. The diagram is drawn to illustrate one point in time. The *y axis* shows the real wage rate/salary level of physicians (it would also be possible to use this axis to represent the relative wage of physicians, the wages of other staff being assumed constant or the wider concept of net advantages including conditions of service). The *x axis* shows the number of whole-time equivalent (wte) physicians.

***Diagram 1***



The remainder of the diagram may be interpreted as follows:

(i) R→R shows the requirements for physicians indicating the number of doctors the health service in the United Kingdom would like to employ (it is a number based, at least implicitly, upon a given technology for the delivery of care and is drawn as perfectly inelastic i.e. not affected by the real wage level) to indicate that thinking in terms of requirements has often led to policy makers arguing that this is the desirable number without regard to the wage cost. In the United Kingdom there has frequently been a focus on target physician/population ratios as the means of determining requirements.

(ii) W→W is the wage/remuneration level of the physician fixed by the Review Body on Doctors' and Dentists' Remuneration, the wage rate being fixed by reference to comparison groups for doctors, and the NHS budget constraint rather than with a view to securing an equilibrium of demand and supply.

(iii) B→B is the share of the NHS budget available to employ physicians (allocating a higher/lower budget share would shift the curve outwards/inwards) a higher/lower wage rate allows the employment of fewer/more physicians (the curve is a rectangular hyperbola).

(iv) SUK→SUK represents the supply of United Kingdom born physicians from a given stock of physicians, SS is the United Kingdom supply augmented by EU and other overseas physicians (essentially the short run supply curve of physician labour for the health service). Both

supply curves are drawn to be inelastic reflecting the belief, not necessarily carefully tested, of the RBDDR and MWSAC that the supply of United Kingdom physicians from a given stock is relatively unresponsive to changes in the wage/remuneration rate and that EU and overseas doctors are more concerned about such issues as the quality of training opportunities than levels of pay.

(v) D→D represents the demand for physicians if health care is to be delivered efficiently. It is shown here as fairly inelastic but unlike the R→R (requirements) schedule not perfectly inelastic, reflecting the fact that there are some substitution possibilities and if physician wages rise then efficient production of health care will involve increasing the use of other types of health service labour and/or capital.

(vi) Ri→Ri represents a higher level of requirements; it could be regarded as an ideal level of provision in the eyes of the medical profession. When particular specialties have been asked to define ideal standards, given the current state of knowledge, they have usually involved significant increases above existing levels in numbers (see for example Department of Health and Social Security 1980).

The diagram has been drawn in this instance to indicate that the wage (W), budget (B), requirements (R) and demand (D) for physicians are consistent one with another, although it must be noted that United Kingdom policy makers have not typically been seeking such consistency. However, even this does not indicate an equilibrium as it

excludes from consideration the labour supply decisions of physicians. At wage rate W, the supply of physicians is OP leaving a shortage relative to requirements (R) of PR (this involves an underspend on the physician budget; in practice any funds are presumably transferred to other uses). Before the NHS reforms the forecasters/planners would attempt to tackle the shortage over time by expanding the medical school intake to increase the doctor stock and hence shift SS to the right in the medium to long term. The advent of trust hospitals, with the possibility of offering higher wages (WT) allows a reduction in the shortage (relative to requirements) to $P_1R$ while remaining within budget (however at this wage rate, OR, physicians could not be afforded within the budget even if they were available).

It is worth noting that at the higher trust determined wage, if it is to operate efficiently, the NHS should economise on its use of physicians reducing the scale of the shortage to $P_1Q$. Higher requirements Ri Ri indicate even larger shortages. As drawn, because of the inelasticity of supply, only the allocation of a much larger share of the total budget to the employment of physicians would allow the wage levels needed to reach RR or Ri Ri.

The framework suggests a number of issues for policy makers:

i) How responsive is the supply of physician services to a change in wages and conditions of service?

ii) What are the relative costs and benefits of using expanded medical school intake or higher wages and better conditions of service as means of increasing supply? If expanded intake is the superior policy option this raises the question of whether it is more efficient to expand existing medical schools or create new ones.

iii) How responsive is the demand for physicians to a change in the relative wages of physicians (the input substitution issue, that is, will hospitals substitute nurses, other types of labour and/or capital for physician services if the price of the latter increases)?

iv) How large a role might migration play in balancing demand and supply of physician services? By how much can migration flows be influenced by financial (e.g. pay) and non-financial (e.g. quality of training) incentives?

v) Are there mechanisms in place which operate automatically to help to ensure that imbalances between S and D are corrected? In particular it is worth examining whether wages and conditions of service adjust appropriately to have the desired impact on United Kingdom based physicians. In the 1960s and 1970s, migratory flows of doctors from the Indian subcontinent filled the gap between supply and demand and the major shortage anticipated by the Royal Commission on Medical Education (1968) did not materialise.

vi) How are the various supply and demand/requirement functions likely to shift or change over time?

This framework has been used to discuss the whole physician labour market and it can also be used to explore the problems of particular specialties or geographical areas.

## THE UNITED KINGDOM PHYSICIAN WORKFORCE: A SUMMARY OF THE MAIN CHARACTERISTICS

The United Kingdom had a population of 58.4 million in 1994 (58.2 million in 1993) of whom over 80 per cent live in urban areas. This population is served by a physician workforce which has only recently exceeded 100,000. The MWSAC (1995) uses as the baseline for its latest forecasts a figure of 100,897 as the total number of physicians working in the main public sector (largely in the NHS and university medical schools) in the United Kingdom in 1993. Of this number 78,016 are from the United Kingdom, 1,965 are from the EU and 20,816 are from outside the EU, i.e. 'overseas'.

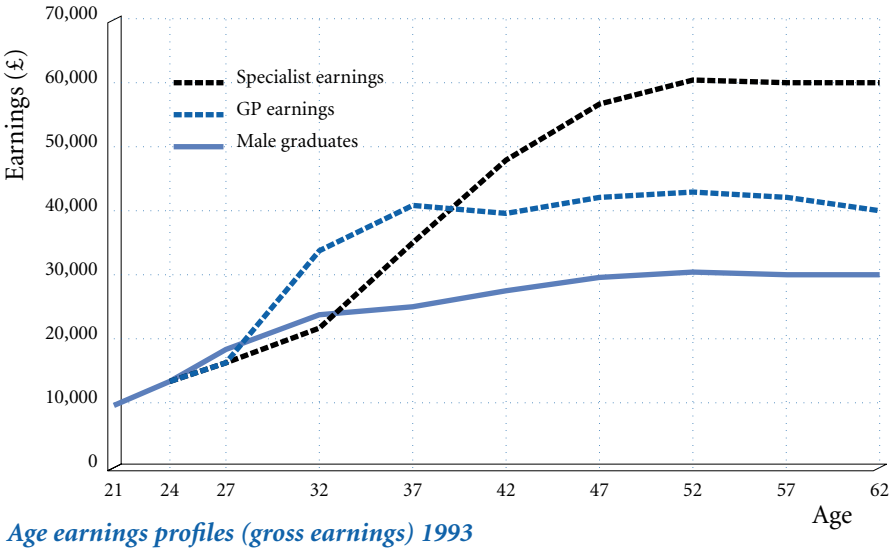
This total number is projected (central or best guess projection) by MWSAC to rise to 110,868 by the year 2000 and 126,470 by year 2020, a 25 per cent increase on 1993 (see Appendix A for further details). The size of the United Kingdom population is expected to grow only slowly reaching 62.2 million by 2021, an increase of only 6.9 per cent on 1993. The overall physician population ratio is therefore projected to rise from 1.73 in 1993 to 2.03 per 1,000 population by 2020, although the ageing of the population alone will clearly increase demand for medical services rather more rapidly than the rise in population.

Of the 100,897 physicians in 1993, 36,900 (36.6 per cent) were in training grades in the hospital service, 21,782 were hospital consultants and 34,021 doctors (33.7 per cent of the total) were engaged in general medical services, the overwhelming number as unrestricted principals in general practice.

A study by Sheffield University (Nicholl and Williams 1987) suggested there were 6,960 physicians in medical employment outside the main public sector in 1986 (including 1,320 in the Armed Forces, 980 in pharmaceutical and private industry and 1,910 wholly in private medical practice).

## THE UNITED KINGDOM PHYSICIAN WORKFORCE: A SUMMARY OF THE MAIN CHARACTERISTICS

In 1994/95 3,670 students (3,410 from the United Kingdom) completed medical school, in the same year 4,470 new students (4,134 from the United Kingdom) entered medical school. The medical school intake is set to rise to 4,970 (4,597 from the United Kingdom) by the year 2000. The drop-out (wastage) rate from medical schools has remained fairly constant at 9-10 per cent per annum. The NHS and universities employ over 90 per cent of newly trained physicians. The public expenditure cost per student for the five year course was estimated by the MWSAC (1995, 7.30) to be between £184,000 and £192,000 (although £105,000 to £114,000 of this money is paid to NHS teaching hospitals (SIFT) and is perhaps related to the excess cost of teaching hospitals rather than the costs of medical education). SIFT is currently under review. The costs of medical education may rise in the future as more clinical experience will have to be gained in outpatient clinics and this is more costly to provide. When they enter employment in the health service, physicians receive a relatively modest basic salary, earning an average of £18,000 per annum in their twenties (although for most junior doctors this salary is increased by out of hours payments). Those who progress steadily through the grades of the hospital service will reach a salary of approximately £40,000 in their late thirties and a salary of £52,500 as a consultant in their forties (a distinction award level B may add up to a further £22,590 per annum). Private practice, available mainly to surgical specialties and anaesthetics, might add a good deal more: estimated to be *circa* £40,000 by 1992. For a general practitioner, salary rises more rapidly in their early thirties (reaching £40,000 to £45,000) as the physician achieves independent status as an unrestricted principal, but thereafter the age earnings' profile is relatively flat at an average of approximately £45,000 per annum for the remainder of their career. All of the above salaries are estimates based on 1997-98 Review Body recommended pay scales.




*Age earnings profiles (gross earnings) 1993*

Notes: The physician earnings' profiles are based on the specimen career asumptions used by the Government Actuary in an analysis of pension arrangements (RBDDR 1991 CM1412 p.64). Hospital specialists and GPs are assumed to follow a similar career path until aged 30. Specialists are assumed to attain consultant status aged 37 and a C grade distinction award aged 46. No account is taken of out of hours payments to juniors or of private practice earnings of consultants. The data on male graduate earnings comes from the General Household Survey (figures supplied by D of EE).

The graph above shows these life cycle earnings' profiles for GPs and specialists together with a profile for male graduates. In 1993 the pay bill for medical remuneration (HCHS and GMS combined) represented 11.9 per cent of total NHS expenditure (MWSAC 1995, 5.22).

The gender balance in the United Kingdom physician workforce is changing quite rapidly. In 1993 there were 52,797 United Kingdom male physicians and 25,319 United Kingdom female physicians. However , there are more women than men entering medical school in the late 1990s. By the year 2020 the MWSAC forecast that there will be 55,056 United Kingdom male physicians and 46,668 United Kingdom female physicians (out of a total of 126,470). The overseas trained physicians are predominantly male.

## THE SUPPLY OF AND DEMAND/REQUIREMENTS FOR PHYSICIANS

The need for some form of forecasting and planning of the physician workforce has been accepted since the inception of the NHS. The first systematic attempt at forecasting, by the Goodenough Committee (1944), predated the NHS. Recently the need for planning was affirmed by the Council of Europe's Committee of Ministers to Member States who passed a 'Recommendation on Health Manpower Planning' (R(93)3) which included as one of its main points the view that 'Health manpower planning is an essential element for achieving a proper balance between supply and demand' (MWSAC 1995, 4.12).

After the Goodenough Committee there was a series of once a decade reviews, the Willink Committee (Ministry of Health 1957), the Todd Report (Royal Commission 1968), two reports to the Royal Commission on the National Health Service (Department of Health and Social Security DHSS 1978), (Maynard and Walker 1978). Reviews then became more regular (DHSS 1980, 1985, 1989), the last two of these reports coming from an Advisory Committee for Medical Manpower Planning (ACMMP). From 1992 the Advisory Committee became a Standing Committee (Medical Workforce Standing Advisory Committee (MWSAC)) and has reported in 1992 and 1995. As a Standing Committee it is able to 'establish a continuing dialogue with the major interest groups and react to feedback in framing recommendations' (MWSAC 1992). The committee can also encourage research with the prospect of being able to implement policy based on the findings.

Over a period of more than fifty years there have been some developments in forecasting practice, in particular the move from a single forecast to the use of a range of different assumptions to establish high, low and best guess forecasts, and consideration of some of the resource implications of the forecast growth in the physician

workforce, and improvements in the quality of the data used. However, the conceptual framework used in these exercises has been drawn from the manpower forecasting tradition (Blaug 1970) and has remained substantially unaltered. The manpower forecasting approach gives little or no weight to important economic variables (prices, wages, costs and the feedback effects of changes in these variables) and usually brings with it strong implicit assumptions about the underlying technology (fixed coefficients). In terms of the framework outlined earlier both the supply and demand curves are regarded, implicitly, by forecasters as being very inelastic. In the most recent exercises (in particular the work of MWSAC) an attempt is now being made to graft on to the manpower forecasting approach some important economic considerations.

At the heart of each of the forecasts is a supply projection or series of projections for up to thirty years into the future. These projections are based upon existing or planned medical school intake together with one or more sets of assumptions about migration, death, retirement and non-participation of younger physicians in the workforce. These supply projections are then compared to the likely demand for physicians' services. In a system funded from general taxation the demand concept used has not been based on estimates of individual willingness to pay. Instead, in the earlier reports, the concept of requirements for physicians to provide a desired level of service was adopted; this has been supplemented in the more recent reviews (most notably in MWSAC 1995) by projections of the likely public expenditure available to employ physicians.

Central to the determination of requirements in many of the forecasts is the concept of the physician/population ratio. One important implication of using physician/population ratios in the United

Kingdom has been forecasts of requirements which involve increases in the number of physicians. This occurs because the forecasters have typically considered the long term trend in the ratio (which has mostly risen fairly steadily in the United Kingdom at 1 to 1½ per cent per annum) and/or compared the United Kingdom ratio to that in other countries (which are generally more affluent and spend more on health care) and concluded that the United Kingdom should have more physicians (the United Kingdom has a relatively low ratio – the OECD (1991) and MWSAC (1995) indicate a figure of 1.5 physicians per 1,000 population in the United Kingdom compared to 2.2 in Canada, 2.3 in the USA, 2.7 in France, 3.1 in Germany and 3.9 in Italy). Projections of future public expenditure on health based upon past trends also produce a rising trend which in turn leads to estimates of a rising demand for physicians.

The MWSAC (1995, 5.15) note that hospital and community health services' (HCHS) expenditure rose by an average of 1.3 per cent per annum in volume terms between 1976/77 and 1991/92. This can be compared to a 1.7 per cent per annum growth in HCHS doctor numbers over the period 1976/77 to 1992/93 (GMS doctor numbers grew by 1.6 per cent per annum over the same period).

In the United Kingdom forecasting exercises, if the projected supply falls short of demand/requirements then the policy adjustment proposed has been to increase the medical school intake (i.e. to shift the supply curve, in the framework introduced earlier, to the right). Little weight has been given by forecasters to the possible role of financial incentives in attracting or retaining physicians in employment. However, a good deal of weight is given in discussion by the forecasters and by other policy makers, for example, the Review Body on Doctors' and Dentists' remuneration, to the role of conditions

of employment. The impact of these non-pecuniary factors is frequently cited in relation to career choice within medicine (see, for example, Allen 1988). For economists wages and conditions are all part of the net advantages of employment (Smith 1776) and hence will be traded-off against one another (although the rate of trade-off will vary between individuals, few will order conditions and wages lexicographically as many policy makers have implied). It is likely also that the changing gender balance in medicine gives policy makers greater scope than in the past to increase the supply of active physicians by changing wages and conditions.

Although the forecasters have neglected the role of financial incentives not all health service policy makers have done so. For example, in the new contract for GPs introduced in 1991, financial rewards were seen as an important means of achieving health service goals for the delivery of care. The payment of fees for some services in the new contract, graduated and related to performance levels, has been successful in increasing levels of immunisation, vaccination and cervical cytology.

The resource implications for the NHS of employing additional doctors have been considered. The most careful approach has been by the MWSAC (1996); their approach involves the development of workforce scenarios, costing them and comparing this to likely resource availability ('affordability'). However, this work by Pannell, Kerr, Forster (PKF) is still in the developmental stage, with further work needed, particularly on the assumptions used to develop the scenarios. Only a summary of this work has been made available for public scrutiny (in the 1995 MWSAC report pp81-85 and pp117-126) and accountability and evaluation demands that both models and data be publicly available for others to scrutinise.

## THE SUPPLY OF AND DEMAND/REQUIREMENTS FOR PHYSICIANS

While the resource implications for the NHS of employing additional doctors have been considered, the costs and benefits of using changes in the medical school intake as the means of dealing with imbalances between demand and supply have not been explored.

Although the forecasters have on occasion considered the supply and requirements for subsets of the physician workforce (most frequently for general practitioners and hospital specialities and within the hospital specialities those which have been termed 'shortage specialities'), their reports and recommendations have focussed mainly on the aggregate supply and demand position. They have for the most part viewed it as their role to plan for the overall number of doctors with the distribution between specialities, career grades and regions being managed by a range of further mechanisms. The MWSAC, for example, state 'we prefer to make a more general projection, within which differential growth rates of individual specialties can be managed by the short-term advisory mechanisms which already exist' (MWSAC 1995, 1.12). The MWSAC provide a detailed summary of these advisory mechanisms (MWSAC 1995, ch 3).

The arrangements vary between England, Wales, Scotland and Northern Ireland and the MWSAC noted that changes in the structure of the NHS made alterations to these mechanisms imperative, particularly in England. They describe the system operating at the end of 1993 as 'rigid, unaccommodating and unrealistically detailed', however 'the smaller size of the NHS in Wales, Scotland, and Northern Ireland and their more flexible and focussed approach to workforce planning, reduces the need for change in these countries jurisdiction' (MWSAC 1995, 3.12). Changes are now under way, some of which are discussed in the later section of this paper on postgraduate medical

education and training. Further changes are inevitable if there is increased devolution from Whitehall to individual countries or regions.

A further aspect of the forecasts is that they are carried out in terms of numbers of physicians. In a profession that was predominantly male and full-time with stable working practices this may have been a reasonable approximation of physician input to health care. However, as indicated earlier, the profession and the NHS have undergone, and are undergoing, substantial changes. The 1992 Report of the MWSAC takes as the baseline for its forecast a figure of 96,402 physicians working in the National Health Service or Universities in the United Kingdom (updated to 100,897 for 1993 as the basis of the forecast in their 1995 Report). They note, however, that in the HCHS in 1990 while the total number of physicians was 60,355, of whom 56,403 were in the hospital service, the whole-time equivalent (wte) number was only 54,543, of whom 52,345 were in the hospital service. The whole-time equivalent number of physicians in HCHS was therefore only 90.4 per cent of the total number used as the baseline for forecasting. The equivalent data on wte for general practice has only recently become available: the Review Body on Doctors' and Dentists' Remuneration note that 11 per cent of GPs in the United Kingdom were part-timers but the trend to part-time working was upwards (Review Body 1996, 6.32).

However, even wte is an imperfect measure of physician input; it is a measure of contractual commitment to the NHS. While the whole-time equivalent concept does capture part-time working it does not capture the changing working hours of physicians or the changing distribution of those hours of work between clinical and non-clinical activity. There have been a number of significant changes in hours of work in recent years. Following the 'New Deal' agreed for junior

doctors in 1991 a target was fixed to reduce weekly contracted hours to 83 or less by 1st April 1993; this was largely achieved. A survey of 2,400 junior doctors across Great Britain revealed that average contracted hours, including 'on call' hours, had fallen from 86 in 1985 to 73 in 1993, with the total number of hours worked falling from 57 to 53 in the same period (Review Body on Doctors' and Dentists' Remuneration 1993). By 31st December 1994 the aim was to reduce maximum contracted hours for hard-pressed on-call posts to 72 per week, for partial shifts to 64 per week and for full shifts to 56 per week. While there was some progress towards this goal the Department of Health informed the Review Body on Doctors' and Dentists' Remuneration (Review Body 1996) that in February 1995 about 30 per cent of junior doctors were working more than 56 hours on average.

The reduction in hours of service of junior doctors has been accompanied by an increased proportion of their time spent in postgraduate training activities (these changes in training are discussed later). The reduction in junior doctor hours has been accompanied by an increase in the proportion of care provided by consultants. This has been achieved partly by an increase in the number of consultant posts, a long term change accelerated by an agreement, set out in 'Achieving a Balance', reached in 1987 between the United Kingdom Health Departments, the Joint Consultants' Committee and Chairs of Regional Health Authorities (Dept. of Health 1987) to reform the hospital staffing structure. In 1989 there were 13,670 consultant posts in England (17,860 in Great Britain) by 1994 there were 15,640 (20,450 in Great Britain, an increase of 2.7 per cent per annum. The ratio of junior doctors to consultants in England fell from 1.60:1 in 1984 to 1.51:1 in 1994 (Department of Health 1995b).

As well as the increase in the number of consultants there has been an increase in their hours of work and, with the changes in the NHS, the balance of their work has been shifted in the direction of management and administration. The most recent evidence on the hours of work of consultants from a large survey (Office of Manpower Economics, 1989) showed that whole-time and maximum part-time consultants spent an average 49.2 hours per week on all NHS activities (14.2 hours in excess of their minimum contractual commitment). A smaller 1994 survey conducted by MWSAC (1995) found consultants working over 35 clinical hours per week and over 20 hours on non-clinical tasks. The non-clinical activity for this group had increased from 11.5 hours in 1989 to 20.2 hours in 1994.

For GPs, workload surveys, undertaken jointly by the Department of Health and the General Medical Services Committee (GMSC) of the British Medical Association (BMA), indicate a rise in the hours of GPs (BMA 1996). The average number of hours spent in general medical services in a working week rose from 38 hours in 1985/86 to 41 hours in 1989/90 and 43.5 hours in 1992/93 (10.3 per cent of GPs were working over 60 hours per week in 1992/93 compared to 4.2 per cent in 1985/86). In addition GPs spend on average 16 additional hours per week on call but not actually working and around 6 hours per week on other professional activities.

Obviously hours of work are still only a measure of input and the amount of health care delivered (throughput) and the consequences of that care (outcome, output) depend on how much work the physician is able to do per unit of time and on the appropriateness of the procedures/treatments used. Work on how well physicians' time is used and on the appropriateness (or inappropriateness) of procedures/treatments adopted by physicians has not been integrated

into the work of forecasters (see Maynard and Walker 1995). The NHS exhibits large variations in clinical activity. Some of these variations result from differing views about treatments/procedures, some from the age of the consultants, and some may result from the effects of private practice where, in poorly managed districts, specialists may neglect their NHS work to generate private sector income (Yates 1995).

One final aspect of the work of forecasters in the United Kingdom which merits comment is their concentration on physicians in isolation from other kinds of health service labour; this has arisen partly because of the narrow terms of reference the forecasters have been given. Most of the forecasters have assumed, at least implicitly, that the substitution possibilities (between physicians and other health service inputs) are limited, a view that the production function for health care is one of fixed coefficients between physicians and other inputs and that there is an elastic supply of co-operating factors (for these other sections of the health service workforce have not been subject to similar forecasting exercises). The MWSAC (1992, 1995) are the first of the forecasters to take substitution at all seriously but their commissioned work on substitution possibilities is at a relatively rudimentary stage of development. The 'affordability study' of PKF (MWSAC 1995, 12.15) did attempt to address the issue of substitution but their model lacked a properly specified production function.

The issue of input substitution is important in both primary and secondary care. For workforce planning purposes the opportunities for physician/nurse, physician/pharmacist, physician/ancillary worker and other types of substitution is important because the greater the substitution possibilities, the more elastic is the demand curve for physicians. The scope for substitution is probably substantial as evidenced by the variations in the ratios of different types of labour

throughout the NHS.

Careful studies of physician/nurse substitution possibilities are mostly from overseas, especially North America (reviewed by Richardson and Maynard 1995). In the USA nurse practitioners and physician assistants play a significant role in health care. In the United Kingdom there is a growing role for practice nurses in general practice, and the MWSAC (1995, 9.11) note also that other staff including midwives, health visitors, social workers and practice managers (whose numbers have increased by 41% since 1990) have taken on aspects of the traditional work of the GP, who in turn has taken on additional administration and managerial tasks (MWSAC 1995, 9.11). In addition pharmacists, with their great expertise in pharmacology, might take over some GPs' tasks both to ensure cost effective prescribing and to minimise adverse effects from multiple therapies for groups such as the elderly, both in their homes and in institutions.

While the MWSAC offer an extended discussion of skill mix/substitution, the lack of good United Kingdom empirical evidence lead them to suggest that 'skill mix changes are a means of augmenting the efforts of the existing medical workforce' (MWSAC 1995, 9.36) and they conclude 'There is no evidence so far to suggest that skill mix changes at the current level will affect the required increase in the number of doctors we need to train for the future' (MWSAC 1995, 9.37). If substitution possibilities are important it is inappropriate to make decisions about physician numbers in isolation from numbers and types of nurses and other health service labour. It should be noted that the terms of reference of the MWSAC, confined to the physician workforce, make the development of a more comprehensive forecasting model rather problematic. It is important that their remit is widened.

## THE SUPPLY OF AND DEMAND/REQUIREMENTS FOR PHYSICIANS

After considering the results of their forecasts the MWSAC concluded there was, or very soon would be, a shortage of physicians. They cite several indicators which suggests a shortage is already upon us: in some major specialties (e.g. anaesthetics, paediatrics, psychiatry) there are no applicants for some consultant posts, there are reports of difficulties in filling GP vacancies and a decline in numbers applying for GP training posts, and there is a widespread use of long-term locums where posts cannot be filled permanently. After weighing the evidence before them, they recommended the traditional solution of a sustained (although in their case modest: 100 places per annum) expansion in the medical school intake.

***Proposed U.K. Medical School Intake***

| Year | Total intake | Overseas quota (7.5%) |
|---|---|---|
| 1995 | 4,470 | 336 |
| 1996 | 4,570 | 343 |
| 1997 | 4,670 | 350 |
| 1998 | 4,770 | 358 |
| 1999 | 4,870 | 365 |
| 2000 | 4,970 | 373 |

Source: MWSAC (1995) p47.

## PHYSICIAN IMMIGRATION AND EMIGRATION

From the late 1950s (Ministry of Health, (Willink) 1957) physician immigration and emigration have been considered a significant factor in medical workforce planning/forecasting in the United Kingdom. Early concerns centred around the emigration of United Kingdom trained doctors, particularly to North America, but also to Australia and South Africa (Seale 1962, 1964). This was believed to be occurring partly as a result of impediments to promotion (time-expired senior registrars) in the hospital career structure. In the late 1950s and 1960s large scale immigration of doctors, particularly from the Indian subcontinent led to concerns expressed formally in the Todd Report (Royal Commission on Medical Education 1968) that the United Kingdom was relying on doctors trained in countries whose own medical services needed additional physicians. The Todd Report recommended a large scale expansion of medical education in the United Kingdom with the objective of achieving 'self-sufficiency' in the training of physicians. This policy objective remains in place.

The current formulation was set out by the MWSAC. 'Self-sufficiency does not necessarily mean planning for all United Kingdom posts to be filled by United Kingdom doctors. Rather, that sufficient United Kingdom doctors should be trained so that United Kingdom demand could be met if the flow of United Kingdom doctors to other countries was balanced by the flow of EC and overseas doctors into the United Kingdom'. (MWSAC 1992, para 9.2, and reaffirmed 1995). The MWSAC went on to note:

> "The main attractions of employment in the United Kingdom to doctors from overseas should be the acquisition of skills and knowledge relevant to medical practice in their country of origin. We should not be encouraging doctors to develop an international career at the expense of their home country." (MWSAC 1992, para 9.4).

> "At the same time it is both inevitable and desirable that there will be global exchanges of doctors."
> (MWSAC 1992, para 9.5).

The MWSAC note that this approach has been confirmed by the 1993 Recommendation (Regulation R93/3) of the Council of Europe that all member countries of the Council should be broadly self-sufficient in health personnel (MWSAC 1995, para 4.3).

As indicated in the earlier quotation the MWSAC distinguishes between United Kingdom, EU and overseas physicians and this distinction is reflected in the United Kingdom data sources. The distinction between EU and overseas is important in terms of immigration rights. From the 1960s to the early 1980s large numbers of overseas doctors entered the United Kingdom, most initially entering the training grades of the hospital service, but a large number moved on into permanent posts in the hospital service or to general practice to form an important permanent segment of the physician workforce in the United Kingdom (11,913 overseas doctors were in non-training grades, mostly hospital consultants and GPs, in 1993, some 12 per cent of the United Kingdom physician workforce). Home Office immigration rules for physicians were tightened in 1985 bringing them into line with requirements for other professions or, in the case of GPs, the self-employed (Home Office, Statement of Changes in the Immigration Rules 1985). Those overseas doctors resident in the United Kingdom before 1985 were given the right to remain indefinitely. Overseas doctors entering since 1985 must do so on the basis of a work permit or, more usually, for a limited period of up to four years, on the basis of permit free entry for postgraduate training (MWSAC 1992, ch 9). These restrictions may be eased in view of the officially defined 'shortage'.

The majority of overseas doctors are now coming to the United Kingdom for supervised training in the hospital service. They embark on this training having satisfied the Professional and Linguistic Assessment Board (PLAB) test and/or obtained GMC registration (usually limited, but it can be full registration if previous qualifications were obtained from one of twenty-two recognised overseas medical schools). It should be noted that there is currently a quota of 7.5 per cent of the intake of United Kingdom medical schools from overseas (336 in 1995).

On 30th September 1993 there were 13,328 doctors working in the hospital sector in Great Britain (mostly in England) who qualified outside the EU of whom 7,540 were in training grades (half of them in the senior house officer grade). Since the 1960s general practice recruitment has relied quite heavily on overseas doctors. However, the practical effect of the 1985 immigration law "has been to prevent overseas doctors entering the country after 1985 from becoming principals in general practice, unless they were able to obtain prior entry clearance" (BMA 1996). In April 1992, 6,602 unrestricted principals in general practice in England and Wales were born outside the EU (out of a total of 31,065). In England and Wales in 1993 of 6,067 unrestricted principals born overseas only 714 were under 40 years of age.

Whilst the entry of overseas doctors is now restricted, the free movement of doctors within the EU was guaranteed in principle by the Treaty of Rome. The MWSAC note that "The Medical Directives, the first of which were adopted in 1975, facilitated this by providing for the mutual recognition throughout the EC of primary and specialist medical qualifications awarded by member states to EC nationals." (MWSAC, 4.11).

Directive 16/93/EEC (5th April 1993) consolidates the various Directives adopted since 1975. The MWSAC note that the GMC records the number of doctors granted full registration from the EU (the EU plus 5 EFTA countries who ratified the Economic Area Agreement (EAA): Austria, Finland, Iceland, Norway and Sweden. The numbers from 1989 to 1994 fluctuate between 956 and 1,184 per annum but with no evidence of an upward trend. The MWSAC also include in an appendix the numbers of EU doctors working in the hospital sector in Great Britain: in this case there is evidence of a rising trend from 1,341 in 1988 to 2,007 (1,750 in England) in 1993 (September). By September 1995 there were 2,420 EU doctors working in the hospital service in England (4.4 per cent of the total number). The issue of extra-EU movement has been mentioned by the MWSAC, but until now has been regarded as marginal. However it is now becoming a significant issue for workforce planning.

Information on emigration of United Kingdom physicians is not very satisfactory. "Numbers of doctors emigrating from the United Kingdom are difficult to quantify. The General Medical Council holds details of doctors who intend to practice medicine abroad on an 'overseas list' but there is no guarantee that doctors leaving to work abroad will remain on the list. Additionally doctors from the United Kingdom working in the EU do not appear on this list and are not obliged to change their registration details" (MWSAC 1992, 9.6). MWSAC in 1995 also noted that the GMC overseas list included many doctors who maintain their United Kingdom registration even when working abroad long term. However, MWSAC and the earlier committees such as the Advisory Committee on Medical Manpower (ACMMP) assert that the numbers emigrating are small and likely to remain so. They note (MWSAC 1995, 4.20) that while it has become

increasingly common over the past ten years for doctors in the training grades, probably at the senior registrar level, to go abroad for a period of training "the majority will return to the United Kingdom after one or two years", especially as opportunities for permanent emigration have become more restricted.

The MWSAC hopes to gather better information on emigration in the next few years from recommissioned cohort studies of doctors' careers (these studies in the 1970s (Parkhouse 1991) indicated that about half of 'wastage' figures was due to emigration). Immigration has been a major factor in balancing supply and demand/requirements for physicians in the United Kingdom in the recent past, particularly in the 1960s and 1970s. Physicians arrived initially for postgraduate training but many stayed to fill a long term role in the health service. The emphasis by policy-makers on the need for self-sufficiency, with the objective that United Kingdom trained outflows match overseas trained inflows of physicians, and hence that United Kingdom medical school output should be sufficient to meet all United Kingdom demand/requirements for physician services, means that an important policy option for tackling supply and demand/requirements imbalances is being rejected. While inflows of physicians from outside the EU have been substantially reduced, and long term loss of United Kingdom trained physicians overseas is now small, policy makers have been slow to acknowledge the consequences of the absence of significant restrictions on the flows of physicians from Europe. There appear to be substantial surpluses of physicians in a number of EU nations, with physician unemployment already a significant problem in Italy. This European surplus is beginning to have a significant effect in the United Kingdom physician labour market. Expanding medical school output in the United Kingdom will add to a Europe-wide surplus.

## POSTGRADUATE MEDICAL EDUCATION/TRAINING: POLICIES AND FINANCING

The postgraduate training of physicians in the United Kingdom has been the subject of major reviews in the 1990s. The Calman Report (Department of Health 1993) and supplementary reports by working groups considering the implications for training for general practice, overseas doctors and academic and research medicine (Department of Health 1995a, 1996) have set in train a substantial pattern of change, although often with little attention to the resource consequences.

One major reason for the review of training was to ensure consistency with EU law. "The European Commission had expressed concern that the system in place in the United Kingdom for the mutual recognition of specialist medical qualifications … might not fully comply with the 1975 Directives (EC Directives 75/362 and 75/363)" (Department of Health 1993, para 1.2). The concern had two aspects. First, that the United Kingdom might not recognise other member states' certificates as being evidence of a completion of training and secondly, that the United Kingdom certificate of specialist training was awarded, contrary to the Directives, at an intermediate point during postgraduate training rather than at its completion.

The duration of postgraduate training in the United Kingdom both before and after the reforms of the 1990s exceeds the minimum periods for specialist training in the rest of Europe. The Calman report notes that for 39 specialities identified in the EU Directives, the average minimum period of training is 4 years (range 3-5 years). It should be noted that all postgraduate training in the United Kingdom takes place within the NHS. The pattern of education (undergraduate and postgraduate) in the United Kingdom was as follows: undergraduate (medical student) 5-6 years, followed by general clinical training (pre-registration house officer (PRHO)) 1 year. All United Kingdom trained physicians follow this route and on completion this allows them *full registration*.

For hospital specialists this was followed by a period of 2-4.5 years as a senior house officer (SHO) (covering basic specialist and general professional training) followed by 2-6 years as registrar then senior registrar (period of higher specialist training).

For general practitioners there is a minimum period of training of three years after full registration (prescribed by the NHS Vocational Training Regulations, SI No 1644, 1979) consisting normally of two years spent as a senior house officer on a planned or self-constructed rotational scheme in relevant hospital based specialties and one year working in a general practice as a trainee.

Those on the hospital specialist route could spend a number of years more in the registrar or senior registrar grades before achieving a consultant appointment (the average period before attaining consultant status was 12 years in 1993). If they failed to find a consultant appointment there were a limited number of permanent posts (2,830 in England in 1995 compared to 18,400 consultants) of lower status and remuneration. Completion of general practice vocational training leaves physicians free to apply for the post of unrestricted principal (the average age of attaining the status of unrestricted principal is currently lower than in the 1960s).

As well as the often long duration of training in the hospital specialities the training element was often squeezed by the demands of the service and there were numerous expressions of dissatisfaction with training provided in some posts (Audit Commission 1995, 1996).

## POSTGRADUATE MEDICAL EDUCATION/TRAINING: POLICIES AND FINANCING

The initial Calman Report focussed on reform of hospital specialist training. A sub-group identified certain fundamental principles which apply to specialist training (Department of Health 1993, Annex C p9) these include:

i) Specialist training should be part of the continuum of medical education.

ii) Arrangement for training must be flexible to take account of differing requirements of specialities.

iii) Flexibility should be sufficient to enable doctors in training to exercise a reasonable degree of choice between specialities and career options allowing trainees to change direction and to obtain some credit for previous experience – this is the particular value of an initial phase of specialist training.

The Calman Report recognised that the Royal Colleges and their Faculties had made progress in developing more organised training programmes (reducing their length without compromising quality). The Royal Colleges and their Faculties would therefore continue to have responsibility for determining the context of training and the standard to be achieved (publishing syllabuses, conducting tests and examinations, inspecting training programmes). A Specialist Training Authority (STA) of the Medical Royal Colleges has been designated as the United Kingdom competent authority for specialist medical training. Membership includes representatives of all the Royal Colleges, Faculties of Public Health Medicine and Occupational Medicine, two representatives of the General Medical Council (GMC), two deans of post-graduate medicine, an NHS manager and a patient representative. The STA is the body legally responsible for safeguarding

standards of postgraduate medical training in the United Kingdom and for ensuring that the training requirements stipulated in European legislation are adhered to (key legislation is the European Specialist Medical Qualifications Order 1995).

The arrangements arrived at by Calman involved the replacement of the registrar and senior registrar grades with a single higher training grade to be known as specialist registrar (the grade was introduced in two specialties, general surgery and diagnostic radiology, from 1st December 1995 and in other specialties from 1st April 1996). It is anticipated that in the majority of cases higher specialist training should be completed within seven years. There will be a period of transition during which registrars and senior registrars will be assimilated into the new grade.

Once physicians have successfully completed a defined Royal College or Faculty specialist training programme, they can apply to the STA for award of a Certificate of Completion of Specialist Training (CCST). Award of a CCST indicates that a doctor has reached a standard compatible with independent practice and is eligible for appointment as a consultant (NHS Executive March 1996). There are transition arrangements to allow inclusion of consultants with permanent NHS appointments and others already accredited by Royal Colleges on the Specialist Register.

For GPs the current NHS Vocational Training Regulations already go beyond EU directives. However the Working Group set up by Calman to consider general practice (Department of Health 1995a) made a number of recommendations which over time will lead to increased training for GPs. In particular, they recommend two phases of GP training, a period of vocational training and a period of

higher/further training/education. The latter was to remain voluntary until its value was widely accepted and additional resources were available. This was important in the light of the enhanced role now given to general practice. The Working Group was also concerned about the suitability of SHO posts undertaken as part of vocational training. They urged greater monitoring in line with improvements in monitoring for hospital specialists.

The changing structures for postgraduate medical training will have a profound impact upon the way hospital care is delivered in the United Kingdom. The reduced length and increased intensity of training under the new arrangements will reduce the service commitment of junior doctors. The balance of provision of physician care will thus be shifted towards consultants, a trend already firmly established as a result of the commitment, discussed earlier in the paper, to reduce the hours of work of junior doctors. This shift toward consultant care will also encourage the substitution of nurses and other health service labour for physicians. As has been indicated some tasks carried out by junior doctors could be as, or more, efficiently carried out by other types of health service labour. It would be even more wasteful if these tasks were to be taken on by consultants.

The arrangements for funding postgraduate training are also in the process of change. From April 1993 postgraduate deans assumed responsibility for funding 50 per cent of the base salaries of all those in training grade posts in the hospital health service. Funding for trainee posts in general practice comes from FHSAs or outside of England from the Health Boards. The working groups on Specialist Medical Training (Department of Health 1995a, p14) recommended that funding of general practice vocational training could also become part of the postgraduate dean's education budget.

The development of the internal market also means that the postgraduate dean's function has shifted to that of purchaser of training from trust hospitals. This should allow greater flexibility in the purchasing and provision of training and offers a powerful incentive mechanism to ensure the quality of the training. However, if the purchasing of most training is in a single budget then there may be direct competition between hospital specialities and general practice for scarce training funds and the BMA fear that general practice will lose out (British Medical Association 1996).

## GEOGRAPHICAL AND SOCIAL DISTRIBUTION

Those who created the NHS held strongly egalitarian views of fairness (in contrast to the minimum standards views of equity propounded by the New Right). However, although they established the principles of universal right of access and freedom from charge at point of service, they did not put in place any strong mechanisms to address the major geographical and social inequalities in provision inherited from the pre-NHS health service. The only exceptions were restrictions on new GPs' right to practise in areas considered to be over-doctored (this included restrictions on rights to join existing practices) and attempts to allocate new capital funds to less well provided areas (the most significant of which was probably the 1962 Hospital Plan which attempted to direct resources to 'where they seemed to be most required' (Royal Commission 1979, para 21.36). The labour force forecasters from Willink (Ministry of Health 1957) onward included estimates of the additional physicians needed to bring the worst off Regions up to the average of all Regions (the average considered was usually that for England and Wales only), but as there were only weak mechanisms covering only GPs, to ensure that the new physicians flowed to the least well provided areas, very large inequalities in provision were revealed in research studies in the late 1960s (see, for example, Cooper and Culyer 1970).

The numbers of physicians and other staff and facilities reflected levels of funding which depended heavily on the numbers of staff and hospitals inherited when the NHS was created. The Metropolitan (Thames) Regions were significantly better funded *per capita* than the Midlands and the North. For example in 1971/72 South West Metropolitan received 30 per cent more revenue spending *per capita* than the average of the English Regions, while Sheffied (Trent) received 17 per cent less than the average. As well as the wide variation between

Regions there were also wide variations within Regions (Cooper and Culyer 1970). Scotland and Northern Ireland also enjoyed significantly higher levels of provision and funding *per capita* than England.

In 1970 the Crossman formula marked the first, and largely ineffective, attempt to tackle the large inequalities in funding between the English Regions. A much more rigorous formula funding system that allowed for the age and sex structure of the population and the standardised mortality rate to assess need to tackle regional inequalities in England, was established following the work of the Resource Allocation Working Party (RAWP) in 1976 and introduced the following year. A similar policy was applied within Scotland (SHARE). However, the policy of equalisation did not extend to eliminating the difference in provision between England and Wales and the better funded Scotland and Northern Ireland health services.

No direct control over the distribution of hospital doctors existed until the establishment in 1972 of the Central Manpower Committee (CMC), the Manpower Advisory Committee on Community Medicine and the Medical Practices Committee for England and Wales, and equivalent bodies for Scotland and Northern Ireland. Even after the introduction of the CMC, it was only the creation of new consultant and senior registrar posts which came under central control in England and Wales. In 1977 just as policies on geographical inequality were beginning to be implemented the ratio of whole-time equivalent (wte) hospital physicians (including locums) to population was 1:1,550 for the United Kingdom as a whole, 1:1,631 for England, 1:1,678 for Wales, 1:1,274 for Northern Ireland and 1:1,088 for Scotland. The least well funded English Region, Trent, had a ratio of 1:1,946 and the best funded North West Thames had 1:1,274. In Trent, therefore, there were 79 per cent more people per hospital doctor than in Scotland.

In the case of general practice the inequalities were less severe, resulting from the long-standing policy of restricting entry of new physicians to certain areas, and probably also the incentive effects arising from a GP remuneration system that was heavily weighted toward the number of patients on the practice list; but a similar ranking of well provided and less well provided Regions prevailed. The average list size of each unrestricted principal in 1977 was 2,008 for the United Kingdom as a whole, 2,066 in England, 1,980 for Wales, 1,799 for Northern Ireland and 1,672 for Scotland. The worst off English Region was again Trent with an average of 2,203 patients per unrestricted principal (32 per cent more people per unrestricted principal than in Scotland). In the years since 1977 there has been a substantial rise in the number (and wte) of hospital physicians and the policies to reduce geographical inequality have had a significant impact.

In 1995 Scotland had a ratio of hospital physicians (wte) to population of 1:861 while the ratio for England reached 1:1,018 (only 18.2 per cent higher than for Scotland compared to 49.9 per cent higher in 1977). The dispersion in levels of provision within England has also been significantly reduced. Although Trent remained the Region with the lowest level of provision in 1993, its ratio of hospital physicians (wte) to population was 90.9 per cent of the average (1:1,045) of all English Regions (compared to 83.8 per cent in 1977). The Region with the highest hospital physician to population ratio in 1993 was North East Thames with 14.1 per cent above (1:833) the average of all the English Regions (in 1977, North West Thames had 28.1 per cent hospital physicians (wte) per capita more than the average). There is reason to believe that this trend toward greater equality in the numbers of hospital physicians may not continue. The

RAWP funding criteria were replaced in 1995 by a new formula, underpinned by the following principles (Carr-Hill *et al* 1994):

i) they measure the spending required to provide a 'standard' level of service and take account of variations in levels of needs between populations/geographical areas;

ii) they are not supposed to be a target or a criterion by which to judge the efficiency and performance of a provider, but a method of distributing central government funds to purchasers;

iii) they are intended to ensure that *ceteris paribus*, all health authority purchasers face the same set of choices with respect to standards of services and the resources available;

iv) they ensure that a given improvement in standards of service should require the same variation in resource input in every area.

The initial allocations with the new formula were 'politically adjusted' to mitigate the redistributive impact of the new formula. However, this protection of rural, south-east constituencies has now been removed (Hacking 1995, Peacock and Smith 1995) with the full implementation of the York formula. As yet there is no primary care resource allocation but this, and the issue of unequal resource allocation between the constituent parts of the United Kingdom, is likely to attract both new research and policy changes in the near future (Birch and Maynard 1988, Bloor and Maynard 1995). In general practice the number of patients per GP principal has fallen in the United Kingdom since 1977 to less than 1,900 in England and Scotland. The dispersion in list sizes

within England has fallen and Trent is no longer the worst off Region, having in 1994 a list size of 1,931. The largest list size was in North East Thames at 2,026 patients per unrestricted principal.

Although the RAWP system required the Regions to consider equalising the distribution of hospital resources at the sub-regional (District) level, as needs can vary significantly across an area as large as a Region, the extent of achievement of this goal was more limited. Even with funding available, some Districts have found it difficult to recruit physicians generally but found it particularly difficult to recruit in shortage specialities. With the conversion of all hospitals to trust status the ability to vary terms and conditions of employment could have increased the possibility of these hospitals filling their vacant posts.

In the case of general practice the most significant problems of areas smaller than the Region relate to the provision of services to those, mainly poor, who live in declining urban areas and particularly in parts of London. Larger numbers of GPs in these areas are old and work as single handed practitioners and are therefore less likely to be replaced by new younger physicians.

## CONCLUSIONS

This review of physician workforce issues in the United Kingdom highlights a number of areas of concern for policy makers. Most of these areas of concern require further data collection and investigation/research to determine their nature. MWSAC is beginning to address some of the gaps in the knowledge base but the committee take the view that we are facing a shortage and, in the interim, has set in train a modest but sustained expansion of the medical school intake. There is pressure from some quarters for a still larger expansion (see for example, Times Higher Education Supp. 7th March, 1997, p3). It seems that late in 1997 they may recommend a further significant increase in medical school intake of the order of twenty per cent. Such policy changes will be expensive and may be precipitative and unwise.

While policy makers favour expansion of medical school intake, there are physicians currently outside the workforce (e.g. immigrants), others retiring early and still others working part-time. There is therefore a clear need to consider more carefully the role of incentives, in particular wages and conditions (including part-time contracts) as alternative means of affecting the supply of physician services. The United Kingdom is not optimising the use of the existing physician stock and this raises concerns about the efficiency of using medical school expansion as the means of dealing with perceived supply and demand imbalances.

There is a need to develop a better measure, or measures, of input of physician services than simply numbers or whole-time equivalents; preferably such measures would distinguish between clinical and non-clinical activity. Hours of work of physicians have been changing quite dramatically in the United Kingdom, with falling hours of work of junior doctors but rising hours for consultants and general practitioners. The last two groups may be devoting many of their

additional hours to non-clinical activity. The balance of the junior doctor hours between training and providing services also needs to be more carefully studied. The rising number of part-time physicians also has an important impact on the available supply of clinical services and could be changed by imaginative and well researched changes in contract and remuneration systems.

The issue of substitution possibilities between physicians and other kinds of health service labour in both the hospital service and general practice has been under-researched and not well integrated into physician workforce planning. The scope for substituting nurses for doctors in primary care appears to be considerable (Richardson and Maynard 1995). Under-utilised community pharmacists could also be more efficiently deployed in primary care. Delegation and team work is flourishing in general practice and, as a consequence, the 'shortage' of GPs could be dealt with without an increase in doctors if the British Medical Association can be persuaded to allow GP list sizes to rise (Jenkins-Clarke, Carr-Hill, Dixon and Pringle 1997).

The policy of pursuing self-sufficiency in physician labour (with outflows of United Kingdom trained physicians matching inflows of overseas trained physicians) means that encouraging immigration of physicians is ruled out by MWSAC as a policy tool for tackling shortages. However, physicians from the EU are now a significant, and increasing, component of the stock of physicians in the United Kingdom. Facing no more restrictions on their rights to practise than United Kingdom born and trained physicians, EU physicians are an important source of potential recruits for trust hospitals with hard to fill vacancies. Similarly United Kingdom physicians may be targeted by EU hospitals/practices. There is, therefore, urgent need to study imbalances between physician supply and demand within the EU as a

whole. Further supplies of physicians are available from outside the EU. However, MWSAC appear to find 'reverse foreign aid', in terms of employing people trained in excess by misguided foreign states, unacceptable. The trade-off between the efficient use of skills world-wide and the inequities this produces needs to be analysed more carefully.

The problems of providing general practice care in inner cities and the problems of 'hard to fill' vacancies in the hospital sector both prompt review of wages and conditions of service. In the case of general practitioners there is already a view that the model of self-employed contractor does not remain appropriate for all circumstances and there is also a case for making their earnings less dependent upon the number of patients on their list.

The mergers and 'reconfigurations' planned for the NHS will require major changes in the physician labour market. The superficial planning of this market has focused on macro issues and ignored fundamental micro economic relationships. Manipulating the supply of doctors in the manner of the recent past will waste scarce resources and create new inflationary pressures in the NHS. Hopefully this unfortunate outcome can be avoided by evidence based policy making and greater care in forecasting and planning the physician stock.

## APPENDIX A

### *United Kingdom Physician Workforce (Main public sector) 1993 and MWSAC Central Projection to 2020.*

| | | Training grades | Non-training grades | | | Total physicians |
|---|---|---|---|---|---|---|
| | | | Consultants | GMS | Other | |
| 1993 | UK Male | 15,977 | 15,514 | 19,815 | 1,491 | 52,797 |
| | UK Female | 10,407 | 3,138 | 8,170 | 3,604 | 25,319 |
| | E.C. | 1,613 | 115 | 176 | 61 | 1,965 |
| | Overseas | 8,903 | 3,015 | 5,860 | 3,038 | 20,816 |
| | Total | 36,900 | 21,782 | 34,021 | 8,194 | 100,897 |
| | | | | | | |
| 2000 | UK Male | 15,399 | 17,815 | 20,548 | 1,606 | 55,368 |
| | UK Female | 13,065 | 5,032 | 10,140 | 3,973 | 32,210 |
| | E.C. | 2,031 | 145 | 222 | 76 | 2,474 |
| | Overseas | 8,903 | 3,015 | 5,860 | 3,039 | 20,816 |
| | Total | 39,398 | 26,006 | 36,770 | 8,694 | 110,868 |
| | | | | | | |
| 2020 | UK Male | 15,156 | 18,533 | 19,689 | 1,678 | 55,056 |
| | UK Female | 14,113 | 11,236 | 15,101 | 6,218 | 46,668 |
| | E.C. | 3,226 | 230 | 352 | 122 | 3,930 |
| | Overseas | 8,903 | 3,015 | 5,860 | 3,038 | 20,816 |
| | Total | 41,398 | 33,013 | 41,003 | 11,056 | 126,470 |

Source MWSAC (1995).

Note: any difference in totals arises from rounding errors.

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Later this year a Government Committee will once again declare that there is a 'shortage' of doctors and advise the Department of Health to expand the intake to Medical Schools, perhaps by as much as 20 per cent. The resource consequences of such an expansion will be substantial. Is such an increase necessary?

There are alternative strategies which would resolve the 'shortage'. For instance nurses could be used more extensively in general practice as the research base and practice shows that such substitution is cost effective for the majority of primary care tasks. Britain is the only country with a 'shortage' of doctors: why not import doctors from the rest of the world which is in surplus?

These are but two alternative ways of meeting the alleged doctor 'shortage'. In this paper these and other strategies to facilitate the more efficient use of the doctor workforce are discussed and it is argued that more care is needed in the design and implementation of policy in this important and expensive part of NHS decision making.