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PLANNING THE MEDICAL WORKFORCE

Struggling out of the time warp

by

Alan Maynard and Arthur Walker

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Abstract

Over the last 50 years there has been a regular cycle of Government committees which have forecast "shortages" and "surpluses" in medical manpower. It is remarkable how little change there has been in the methods used in these forecasts. This has occurred despite regular critiques of the forecasts and their methods. Why is this work apparently trapped in a "time warp" of analytical and research paralysis?

In 1944 the Goodenough Committee advocated a modest increase in the number to be trained as doctors. The Government was more enthusiastic, increased the supply of doctors and precipitated an apparent surplus which the Willink Committee (1957) proposed to remedy by reducing entry to medical schools. The Todd Royal Commission (1968) identified an impending major shortage and intake was dramatically increased.

All these studies were criticised in the 1960s because of the failure to, for instance, explore the implications of alternative skill-mixes and incentives. Such analysis requires the examination of all inputs, not just doctors, used to produce health care and health and how market incentives (pay and prices) affect their behaviour.

Whilst this advice was ignored, the forecasts began to improve in other ways. The forecasters began to pay more regard to budget constraints and carried out their work at intervals of a few years rather than once a decade. Finally in 1992

a Standing Committee (Medical Manpower Standing Advisory Committee) replaced the system of ad hoc committees which had previously been charged with the task of forecasting.

However, the failure to address skill mix and incentive issues has resulted in a 1992 doctor manpower forecast that is flawed and potentially mischievous. There are major variations in clinical practice and most interventions have no scientific basis. The inherent acceptance of such practices and existing staffing arrangements in these forecasts is inefficient. There are major changes taking place in skill mix (eg increased use of practice nurses in general practice) which, if efficient and widely adopted, could translate the apparent shortage of doctors forecast to emerge by 2000 into a surplus!

The authors argue that the 1992 forecast could be improved by sensitivity analysis (eg for GP/population ratios). They conclude that unless the issues of scope (forecasting for all health care staff not just for doctors alone), skill mix and incentives identified in the 1960s are addressed effectively, the recommendations of the Standing Advisory Committee may produce the doctor "surpluses" of the early twenty first century. The analysis paralysis inherent in the conservative activity of existing manpower planners should be challenged at the level of principle and practice, and this implies that the research activity proposed in the 1960s is carried out in the 1990s to facilitate efficient planning in the twenty first century.

Introduction

For the last 50 years the Government has sought to forecast the demand and supply of medical manpower and to plan the labour market for doctors. This has been done by asking a series of ad hoc committees and two Royal Commissions to construct forecasts and make recommendations for policy. The main thrust of these recommendations has always been directed toward the medical schools intake which has been viewed as the main way to adjust the doctor stock. The broad direction of the recommendations of the committees has always been adopted as policy, although in one or two cases the scale or time path of adjustment to the medical school intake has been modified by policy makers.

The success of the forecasting and policy formulation has been mixed. In 1942-43 the medical school intake stood at 2,050. The Goodenough Committee (1944) recommended a modest expansion in numbers but in the event the Government undertook a major expansion to 2,500-2,600. A fear of a "surplus" of doctors in the mid-1950s, led to the Willink Committee (1957) proposing a reduction (10%) in the medical school intake. Although the Willink advice was immediately adopted as policy it was clear within a few years that the methods used by the Committee, and inadequate data, had shifted policy in the wrong direction and steps were taken to restore the medical school intake. The Royal Commission on Medical Education (Todd Report) (1968) produced an interim report (1966) urging a major expansion in numbers, including the opening of new medical schools. The final report set a target intake of 4,230 to be achieved by 1980. The major programme

of expansion set in train by Todd has, with only a minor adjustment to the time profile, carried policy through to the present (intake passed 4,000 in 1980 and the Todd target was finally exceeded in 1991). Subsequent reviews of medical manpower policy (Royal Commission on the Health Service (1978), the Short Report (1981), and two reports by the Advisory Committee for Medical Manpower Planning (1985, 1989)) have not sought to change the direction of policy, although there was some anxiety in the late 1970s and early 1980s about possible doctor "surplus", and the 1989 report of the Advisory Committee did suggest a modest "shortage" early in the new millenium. These later reviews have had access to better data sources and have used a better methodology, including taking greater heed of NHS funding constraints.

The latest forecasting exercise and policy recommendations have come in the first report of the Medical Manpower Standing Advisory Committee (MMSAC), published in December 1992. The decision to establish a Standing Committee in July 1991, rather than continuing to rely on ad hoc committees, came only thirty one years after this arrangement had been recommended by Professor John Jewkes in his memorandum of dissent to the Royal Commission on Doctors and Dentists Remuneration (Pilkington Report) (1960)! Unfortunately, Jewkes other main recommendation, that the remuneration system be used as an instrument to affect the supply of doctors, has still been ignored!

The MMSACs first report is entitled 'Planning the Medical Workforce'. This title is controversial and inaccurate. Controversial because of the prominence given

to the word planning in an era when NHS reforms have taken the health service in a market orientated direction and inaccurate because it is not about the medical workforce but only about doctors.

In their report the MMSAC came to the conclusion that, in the light of a probable shortfall in doctor supply over the next ten to twenty years, the medical school intake should be increased by 240 students to 4,470 per annum.

Although the MMSAC acknowledge at a number of points that the changing nature and structure of the NHS has implications for medical manpower policy, there is no attempt to explore the possible impact of these changes on their findings. The failure to recognise the importance of the changes in the organisation of the NHS renders much of the thinking in the MMSAC report and the suggestions for further work redundant. In particular, none of the solutions, short-term or long-term, listed on page 83-84 of the Report mentions price (or wages) as a significant variable influencing outcomes. This in a system where costs and contracts are now a central concern, where labour is the dominant component of costs and where Trusts now have some freedom to fix both the conditions of employment and the wages of their own employees.

This view, that the MMSAC seriously misunderstands the system it is trying to model and make forecasts for, is explored in the remainder of this paper. The next section contrasts the MMSACs (implicit) view of the health service with what we believe to be a more accurate perspective. This is followed by a lengthier

section discussing theory and evidence relating to four broad issues; the nature of the production technology in health care; the likely supply of factors; the efficiency of the health service; and price determination and the role of price incentives.

1. Two Views of the Health Service

The MMSAC have an (implicit) conception of the NHS which is significantly at variance with reality, particularly the reality of the reformed NHS. Table 1 sets out the (implicit) view of the MMSAC and an alternative view of four key issues and the implications of these different conceptions for policy. (Blaug (1967)) in a similar vein identified two different views of the education system).

2. The Nature of the Production Technology in Health Care

Doctor manpower planning since 1944 has been carried out on the basis of an implicit assumption about the underlying production technology of health care. It is assumed that factors (different types of labour and capital) must be combined in fixed or near fixed proportions to produce care (this is often referred to as a Leontief production function). In these circumstances additional quantities of one factor alone do not lead to higher output, and a reduction (shortfall) in the availability of a factor renders some quantity of complementary factors useless. An important implication of this view of the world is, that, assuming health care resources are currently being used efficiently, improvements in health care require a rise in the doctor/population ratio.

Table 1 Two Views of the Health Service

Issue	MWSAC (Implicit) View	Implications of MWSAC View	Our View Reality	Implications of Our View
1. Production Technology in Health Care	<p>1.1 Fixed coefficients (Leontief)</p> <p>1.2 Improved health care requires higher doctor/population ratios</p>	<p>1.1 Relative prices/wages are unimportant in determining efficiency</p> <p>1.2 More health care/better health means we must have more doctors</p> <p>1.3 Small shortages threaten delivery</p>	<p>1.1 Considerable substitution possibilities</p> <p>1.2 Better health care might as easily be less rather than more doctor intensive</p>	<p>1.1 Relative prices/wages are central in determining efficient input combinations</p> <p>1.2 Need to investigate substitution possibilities</p> <p>1.3 Flexibility means small shortages, surpluses can be ameliorated by wage/price changes</p>
2. Supply of Medical Manpower and Cooperating Factors	<p>2.1 Elastic supply of cooperating factors</p> <p>2.2 Main source of additional active doctors is newly trained - increasing participation from inactive ignored</p>	<p>2.1 Justifies focus on planning doctors alone (the binding constraint in improving health care)</p> <p>2.2 Justifies focus on medical school intake as the only instrument of policy</p>	<p>2.1 Elasticity of the supply of cooperating factors unclear</p> <p>2.2 Additional active doctors can be drawn from the pool of inactive or overseas (inc Europe)</p>	<p>2.1 Need to investigate all health labour markets</p> <p>2.2 Need more investigation of potential flows from inactive and overseas (particularly E. Europe)</p>

Continued ...

Table 1 (Continued) Two Views of the Health Service

3. Efficiency (technical efficiency)	3.1 Fairly efficient	3.1 Limited scope for increasing output/meeting additional demands/needs by improving efficiency	3.1 Fairly inefficient	3.1 Substantial possibilities for increasing the output of health care/meeting increased demands/needs by improving efficiency (eliminating X-inefficiency)
4. Price determinants/role of price incentives	4.1 Monopsonistic/monopolistic. Determination of wages by Government employer/and doctor trade unions 4.2 Limited role for wage/price incentives	4.1 Prices/ wages have not been used as policy instruments. Policy has focused on adjustment of quantities in a deterministic system	4.1 Increasing local negotiation of wages and conditions for all staff. (Declining monopoly/monopsony power). 4.2 Substantial role for price/wage incentives	4.1 Trusts will increasingly use price/wage incentives 4.2 Far more investigation of price/wage elasticities

MMSAC adopt this approach whilst reiterating pleas made for decades for more research on substitution possibilities. A quarter of a century ago Peacock and Shannon argued:

Placing emphasis on some particular ratio is simply not justified in the absence of very explicit assumptions about the progress and utilisation rate of technology. The question must be continually asked : Is the doctor doing any tasks that others could do equally well at a lower cost?

Peacock and Shannon
Lloyds Bank Review, January 1968.

A quarter of a century later, MMSAC continue to ignore this advice. Unfortunately their behaviour is supported by the paucity of relevant research in the area (exceptions are eg. Reinhardt (1976), Pauly (1980) and Carr-Hill et al (1992)).

2.1 The size of the GP list

Successive inquiries into doctor numbers have made assumptions about the "optimal" GP-population ratio and proposed manpower policies to achieve these ideals. For instance the Willink report (1957) proposed a GP population ratio of 1 to 1,775 to be achieved by the year 1980. MMSAC (1992) propose a ratio of 1 to 1,700 to be achieved by the year 2010.

The 1,700 figure is the product of lobbying by professional organisations such as the British Medical Association and, like so many "givens" in health care, is of dubious validity. The normative case made to sustain this advocacy revolves around

the belief that GPs need more time with their patients (there is no evidence that longer consultations are superior to shorter ones), and this need is accentuated by an ageing population.

Casual observation of employment patterns in general practice shows that there is considerable use of both receptionists, practice nurses, health visitors and counsellors in general practice. If tasks are being delegated (and even if there is no knowledge of the cost effectiveness of this substitution), it is possible that fewer GPs are required and that a higher (not lower) GP-population ratio would be appropriate.

There is some evidence (as poor as the evidence to substantiate the 1 to 1,700 ratio it has to be emphasised) that 1 to 3,000 or 1 to 4,000 ratios are effective with nurse substitution. (Fry (1977), (Marsh (1991))). The implications of these ratios are significant (table 4).

The move from 1 : 1,700 to 1 : 3,000 or 1 : 4,000 could only take place gradually : there are not 27,000 practice nurses to replace 13,000 "unwanted" GPs!

If MMSAC is to project doctor numbers into the 21st century, they should use sensitivity analysis to explore the impact not just the BMA advocated "ideal" GP-population (1 : 1,700) but of others used in other practices (eg 1 : 3,000). To do otherwise is to assume that practices are efficient and immutable when in practice both technological change and factor substitution possibilities are considerable.

Table 2 The Implications of High GP-Population Ratios

	GP Population Ratio 1 : 3,000	GP Population Ratio 1 : 4,000
Need fewer GPs	13,000	17,000
Make resource savings	£481 mn	£681 mn
Buy more practice nurses* with the resource savings	27,823	39,338

(* assuming median salary for a practice nurse)

Source: Bloor and Maynard (1992 (c))

2.2 Consultant-junior ratios

As can be seen from Dowie's work (1991 (various)) there are large observable variations in consultant-junior ratios and these production teams have very different activity and cost characteristics (tables 3 and 4). These cost variations partly reflect case mix differences but may also reflect significant differences in the role of other types of staff in providing and organising care.

The notion of the consultant-junior team was inherited by the NHS in 1948 and maintained at the behest of the consultants. The system is unique : no other health care system uses such methods to organise the delivery of patient care. It is maintained not because of evidence about cost effectiveness but because of historical lethargy supported by consultant self interest related to both private practice and fear of some unspecified alternative which might affect consultant roles (eg a medical management system which might reduce existing autonomy).

The work practices of hospital staff produces many anomalies, eg some juniors earning, because of overtime, salaries in excess of those earned by some consultants. There is a case in logic for a large number of skilled senior registrars to be promoted to specialists and for the so-called "training grades" to be translated into effective training grades relying on instruction and education rather than "learning by doing" under pressure and with sometimes inadequate supervision and training (as seen in the CEPOP reports).

Table 3 General Surgery

	Consultants	Sen.Reg/ Reg	SHO/HO	Ratio Cons all Junior	No. of cases	Medical Staff cost per case ¹ £s
DGH/WM	5	3	8	1:2.2	4860	90.5
DGH/EA	3.6	3	5	1:2.2	4500	71.6
DGH/Trent	4	2	8	1:2.5	6690	55.5
GH/EA	1.6	1	4	1:3.125	1940	86.5
GH/Trent	1	2.6	-	1:2.6	950	110.5
GH/North	2	3	2.6	1:2.76	2960	69.0

Table 4 General Medicine

	Consultants	Sen.Reg/ Reg	SHO/HO	Ratio Cons all junior	No. of cases	Medical Staff cost per case ² £s
DGH/WM	5	3	9	1:2.4	4280	106.9
DGH/EA	2.2	1.3	5	1:2.9	2400	91.3
DGH/Trent	5	5	10	1:3.0	6900	75.4
GH/EA	1.4	1	4	1:3.6	1690	99.2
GH/Trent	2	1	4	1:2.5	1940	95.6
GH/North	2.6	2	6	1:3.1	1690	160.3

Sources:

1. The source of the information in columns 1-5 is Dowle (1991 - Various).
2. These calculations relate gross staff salary in 1991 (assuming Consultant at top of scale, senior registrar/registrar at mid-point of senior registrar scale, SHO/HO at mid-point on SHO scale) to the number of cases.

Whilst issues such as these are of great relevance, the issue of substitution in hospital care is of primary importance. For manpower planning purposes the scope for doctor/nurse, doctor/ancillary worker and other types of substitution is substantial as evidenced by the variations in these ratios across the NHS. There is advocacy, by the NHS Management Executive, of substituting unskilled labour for trained nurses although the evidence indicates this may not be efficient (Carr-Hill et al (1992)). Differing skilled/unskilled nursing policies have impacts on doctors' roles and the division of tasks on the ward team. To forecast doctor numbers in isolation from nurse and other labour inputs is as myopic as it is inefficient as it is routine practice in the NHS!

2.3 Other Sectors

The MMSAC examines other potential areas of demand for doctors : the private sector, public health medicine, and DH-Research and Development (R&D) needs.

The private sector is small (10,000 beds, £1.3 billion expenditure) and affected by the recession. Market forecasters predict considerable growth in the private sector to the year 2000 but this will be dependent on the economy's growth and the funding of the NHS. There is unlikely to be a significant increase in the number of doctors working in the private sector unless there is a radical change in public policy. However it is possible that this sector will employ full time specialists. The insurers have recognised that the cost of contracting for consultant time when faced by alleged BMA price fixing (now being investigated by the

Monopolies and Mergers Commission) is very high and may be reduced both by more vigorous purchasing (when supply conditions post Tomlinson may drive down fees) and employing in-house staff.

Some argue that public health medicine is a multi-disciplinary activity which need not be dominated by medically trained practitioners hired on long term contracts with consultant status. These practitioners carry out tasks requiring skills in statistics, epidemiology, sociology, psychology and economics (Williams 1979). Perhaps there is no case for posts as Directors of Public Health Medicine, Specialists in Public Health Medicine and academic chairs in this discipline to be restricted to medical practitioners? Indeed they could be substituted by non-medically qualified staff with considerable resource savings (as remuneration below consultant scales would attract well qualified staff). Whilst the Faculty of Public Health Medicine and Directorates of Public Health are admitting non-medically qualified staff, change is slow and marginal. The case for MMSAC assuming a large reduction in demand in this area is as clear as it has been ignored!

The Department of Health's R&D strategy is long overdue and the appointment of a Director of R&D (Professor Michael Peckham) has raised the R&D profile in the Department. The constraints on public expenditure may constrain the expansion of R&D and whatever its level of growth, its focus will be health services research (hsr). This requires multi-disciplinary activity and the role of the medical practitioner will be limited. The medical model of research (poor trial design with limited end points which ignore cost and effectiveness measurement) has

produced the current ignorance about cost effectiveness and cost effectiveness should not be replicated as h.s.r. is expanded. The need for additional medically qualified people to carry out R&D is small and could be met, in part, by the reductions in manpower needs in public health medicine.

3. The Supply of Medical Manpower and Cooperating Factors

The forecasting exercises and policy recommendations since 1944 have focused on doctor manpower in isolation and regard changes in the UK medical school intake as the most appropriate way to change the active doctor stock. This approach implies an elastic supply of cooperating factors, including other kinds of health service labour. Far less attention has been given to the markets for labour complementary to doctors but there are good grounds for believing that problems for the Health Service are as likely to arise in these complementary labour markets. The training period for much of this labour, although shorter than for doctors, is still of several years duration. In the case of the largest group, nurses, the possible impact of a combination of higher academic entry requirements, demographic changes and, most importantly, rising opportunities elsewhere in the economy for well educated young women deserves more investigation.

The MMSAC like its predecessors focuses on the medical school intake as the main instrument of policy for changing the doctor stock. There is a chapter of their report devoted to flexible working patterns and we feel even more attention should be given to the issue of female participation. With women now forming fifty

per cent of the medical school intake it is clear that there remain too many barriers to participation and constraints in training and hence career choice within medicine.

Overseas doctors have played an important role in the health service since the 1950s but the Royal Commission on Medical Education (1968) established a principle of self sufficiency in medical manpower. Restrictions on entry for doctors from outside the EC, introduced from the 1970s culminating in changes in immigration rules in 1985, mean that the contribution of non EC doctors will for the most part be restricted to a period of up to a few years in training grades. This means that non EC doctors will form a declining part of the stock (because of retirement, return to country of origin etc) and the MMSAC assumes that the numbers seeking training posts will stabilise at present levels. More problematic is the MMSAC's attitude to modelling the flows of EC doctors. They state 'flows of EC doctors were too unpredictable to be relied upon for manpower planning' (paragraph 9.3, page 45). The medical schools of the other major Western European nations have all engaged in even larger growth than those in the UK. These nations also have social insurance systems and all are trying to restrict the rate of growth of health spending, this strongly suggests a growing movement of doctors across Europe is likely. It would be foolish to imagine that linguistic barriers will present a significant obstacle to such a highly educated group of professionals. Consequently flows from EC countries and changing participation of women could easily become a far more significant source of changes in the medical workforce than proposed changes in the medical school intake.

4. Is the delivery of health care efficient?

The authors of the MMSAC report fail to acknowledge the inefficiency inherent in all health care systems and make no attempt to take account of these inefficiencies when carrying out their manpower forecasts.

4.1 practice variations are significant

An illustration of the variations in medical activity rates is shown in table 5, where, for instance, the rate of haemorrhoid procedures per 10,000 population (age and sex adjusted) varies over four fold at the District level and two fold regionally. The activity rate for emergency procedures (eg appendectomy) also varies enormously. Similar variations exist outside surgery eg in the use of drugs and in radiotherapy (eg Priestman et al (1989)).

The causes of these variations have been studied extensively and are summarised in table 6 (from McPherson, (1989)). It can be seen that the most common cause of these variations is clinical decision making ie doctors do not agree what is appropriate.

4.2 effectiveness information is ignored.

Much effectiveness information that is available is ignored by clinicians and does not influence their practices : they continue to use inappropriate procedures

which are demonstrably ineffective or inappropriate and costly.

Three good examples of effective practices which are known and ignored by clinicians are:

- i) diagnostic use of dilation and curettage (D&C) in young women.
- ii) deafness (glue ears) in young children : grommets.
- iii) the treatment of depression : tricyclics or SSRIs.

An analysis of the use of D&C in young women (Coulter et al (1993)) has shown that the activity rate in England is over six times as much as in the USA where D&C has been replaced by non-invasive, outpatient procedures. It seems D&Cs are ineffective and costly and if largely eradicated would have no deleterious effect on the health of young women.

ENT surgeons occupy themselves by treating young children with hearing losses with a risky procedure which involves the insertion of a grommet. The literature (Freemantle et al (1992)) shows that for the majority of patients "watchful waiting" is the appropriate procedure : most children "grow out" of the hearing deficit!

Table 5 Variations in Surgical Activity Rate

Rate per 10,000 population (age and sex adjusted)

Procedure	Districts		Region	
	Low	High	Low	High
Hernias	10.0	20.0	8.5	14.5
Haemorrhoids	1.0	4.6	1.3	3.0
Prostatectomy	4.5	9.5	5.8	13.2
Cholecystectomy	7.0	11.0	5.7	9.7
Hysterectomy	7.5	15.0	18.1	28.7
Appendectomy	14.0	21.0	12.9	19.4
Tonsillectomy with and without adenoidectomy	7.5	27.5	14.0	25.0

Source: Sanders, Coulter and McPherson (1989), table 3 reporting data from McPherson (1981) (1982).

Table 6 **Plausible Sources of Variation at Different Levels of Aggregation**

Variation between	Morbidity	Supply	Clinical	Demand
GPs	S	O	L	S
Districts	M	M	L	S
Regions	L	L	S	M
Countries	L	L	L	L

L = Large; M = Medium; S = Small; O = no effect relative to others in row

Source: McPherson, K. (1989)

The treatment of depression in primary care is poor : many patients do not present, many of those that do, get inappropriate treatment. Recently the industry has developed a new type of anti-depressant (SSRIs) which are up to 30 times as expensive, equally effective as the old treatment (tricyclics) but less toxic in (suicide) overdoses. With great efficiency the pharmaceutical companies selling SSRIs have converted GPs to the new product even though it is obviously cost ineffective for the large majority of patients. Such excess expenditure on an expensive drug is another example of clinicians reluctance to read and act on available information (Maynard (1992)), Freemantle et al (1993), Song et al (1993)).

4.3 efficiency : outcome data

The existence and causes of wide variations in clinical practice and the failure to utilise effectiveness information to improve clinical practice are as well known as is the absence of outcome and cost effectiveness information. Little has changed since Cochrane (1972) re-emphasised that only a small minority of clinical interventions has been evaluated and the majority of clinical activities are of unknown efficiency. Fuchs (1984) put the problem nicely when he argued that 10 per cent of therapies reduce health status, 10 per cent have no effect and 80 per cent of therapies improve health status. The problem is, argued Fuchs, that no one knows which therapies are in the 10 and 80 per cent categories!

The MMSAC forecasts ignore this ignorance and the failure of management to utilise routine data to control practice. For instance from Hospital In Patient

Enquiry data (table 7) it can be seen that age and sex adjusted mortality rates vary considerably (1.00 is the national age and sex adjusted average). What are the causes of this? Is it explained by the socio-economic background or variations in case severity? In the US these factors have been shown to be significant in explaining the variations in mortality between Medicare hospitals. However even after such adjustments, there is an unexplained variation which seems to be due to variations in clinical success.

It is this "success" that the Confidential Enquiry into Perioperative Deaths (Campling, Devlin and Lunn (1990)) sought to investigate. It was found that there were significant numbers of "avoidable deaths". As in all other activities, practitioners success varies and can be improved.

Such improvements may be achieved by specialisation. There is evidence that in some activities (eg vascular surgery and transplants), mortality is lower if clinicians specialise. The implications of findings such as these for manpower forecasts should not be ignored. Why maintain activity if outcomes are unproven? By how much could specialisation improve both the quality and quantity of activity?

For some activities (e.g. vascular surgery and transplants) outcomes (survival) is better if doctors specialise. What are the implications of these issues for the manpower numbers? Surely one lesson may be, no more! until those in post work efficiently!

Table 7 Variations in Inpatient Mortality (HIPE, 1985)

District	Crude mortality rate (%)	Standard mortality rate
Northumberland	9.5	1.297
Grimsby	6.4	1.414
Scarborough	6.9	1.214
Sheffield	4.7	0.829
Harrow	3.4	0.577
North West Hertfordshire	5.9	1.510
Brighton	9.3	1.500
Somerset	7.4	1.355
Macclesfield	8.8	1.330
Central Manchester	2.8	0.695
Chester	5.8	1.142

Source: Kind (1988) table 4.

5. Price Determination and the Role of Incentives

The MMSAC sees its task, to forecast manpower demand and supply, in volume terms and largely ignores the role of prices/wages. This makes sense only in a world of fixed coefficients (Leontief world). In a world with greater substitution possibilities, the technically efficient capital/labour and labour/labour ratios will change with technological developments and the economically efficient input mixes will be affected by relative pay/prices of different types of staff, capital equipment and drugs etc.

It is the case that until recently wages/salaries of staff have been fixed on an annual basis by pay review bodies. Doctors have had a pay review body since the 1960s and nurses and professions allied to medicine have had pay review committees since 1984. The deliberations of these committees have in most years, been dominated by the issue of pay relativities with other groups (equity issue) and have paid only lip service to the balance of supply and demand of staff of different types and grades (efficiency issue). The NHS reforms have the potential to change greatly the relative importance of price and quantity adjustments to deal with supply and demand imbalances. NHS Trusts are now free to fix the pay and conditions of their staff. If, on the MMSAC forecasts, "shortages" of doctors appear, the managers of the Trusts may bid up salaries rather than risk failure to fulfil contracts. It is extremely unlikely that flows into and out of the professions (retirement, temporary non-participation, migration) are beyond the influence of wage changes and this will have a potentially significant impact on the number of

doctors available. Price/wage changes in a market help shift resources to their most highly valued uses. Rising salaries for doctors will help discourage their use for tasks for which less costly substitutes are available. Rising salaries for doctors will oblige Trusts to carry out investigations of substitution possibilities and to examine different work practices.

The present systems of payment of doctors have many deficiencies as instruments for improving resource allocation in health care. In 1991 the Government imposed a new GP contract on the profession. The previous contract had obliged GPs to provide those services which are generally provided by GPs! This is better known as "the John Wayne contract": a GP has got to do what a GP has got to do!! By the late 1980s the Government had discovered that they did not know what a GP did (although the BMA assured the world it was cost effective!) and decided to introduce a performance related contract! Unfortunately many of the services in this new contract were of dubious cost effectiveness (Scott and Maynard (1991)). Thus the new contract persuaded GPs to carry out inefficient activities (eg annual screening of the elderly, and, initially, (until 1/4/93) vague health promotion activities).

The present system of payment for the majority of consultants appears to have little logic in terms of relating performance to pay. The consultant receives a salary, may get a Distinction Award, and may earn considerable amounts (average £90,000 p.a.) from private practice. No attempt has been made to integrate these payment systems to encourage the delivery of good quality care in the NHS. Each

component of the payment system has inherent perverse incentives (eg what is the logic of the distinction awards system? why is the award process secret? why is there no accountability? and why don't recipients ever lose their awards?) These issues are explored elsewhere (Bloor and Maynard (1992 (a) and 1992 (b)).

It is difficult to relate performance to pay but policy makers in the US Medicare system have attempted to do so. To ignore the impact of payment systems on the medical/labour market whilst understandable because of the difficulties, is indefensible.

Salary changes and other sorts of payments might also be used to mitigate some other problems in the doctor labour market, for example:

- i) Could they be used to reduce adjustment lags? It is asserted that it takes 7 years and £80,000 to train a doctor with no specialised skills. A bounty (eg £25,000) might persuade science (or nursing) graduates into medicine greatly reducing the qualifying time.
- ii) Consultant contracts with high pay might persuade doctors into "shortage" specialties? (why should all doctors be paid similar NHS salaries?)
- iii) Short term contracts might enhance flexibility in doctor manpower markets, and what would be the price (higher pay) of this flexibility?

MMSAC proceeds as if payment and contractual issues are "givens". History does not vindicate this approach (pay relativities do change) and if the internal market is developed in the NHS, and this will require considerable political courage, the 'givens' of the past may be rendered meaningless. No other sector has tenure (even academics have lost it!) or an absence of challenge to payment systems quite like that enjoyed by NHS doctors! If change comes it will have to be implemented with care and may have considerable effects on forecasting.

Conclusions

(1) Medical (= doctor) manpower planning done alone is inappropriate. It is inefficient and, to quote Peacock and Shannon a quarter of a century ago, encourages "the expectation that there will always be funds available to allow the projected number of doctors to retain the economic and social status which they have enjoyed for so long" (p.38). Such cosy expectations are untenable and should be subjected to imaginative sensitivity analysis.

(2) It is inappropriate to protect doctors from the forces of change produced by NHS reforms, technological change and substitution possibilities. The implicit assumption of (Leontief) fixed coefficients is inaccurate and the implications of a more flexible world need to be carefully explored.

(3) Research in substitution possibilities and the impact of incentives on the health care "production function" was called for in the 1960s. This requires careful

evaluation, in well designed trials, of the costs of differing input mixes and their effects on the quality of health care.

(4) Why forecast? If MMSAC did not exist, would it have to be invented? The technical exercise of producing forecasts does not require MMSAC, Departmental Officials produce these data. An appropriate role for MMSAC (compared with terms of reference) is to challenge these forecasts and, instead of perpetuating the practices of decades, focus attention on the well identified characteristics of existing practice and the design of plausible scenarios for forecasting work by officials. Some argue that the impact of MMSAC is small and "if they get it wrong", the resource consequences will be slight. This is a poor argument. If the MMSAC procedures implicitly condone the resource misallocation in the NHS which they do, they support a political and economic structure which is demonstrably inefficient. Inefficiency deprives patients on the waiting list of care from which they might benefit. MMSAC's procedures may thus be both inefficient and unethical!

It is depressing that the lessons learnt from medical manpower forecasting over the last fifty years still have all too little influence on its practice. But then all bureaucracies are slow to learn and all too often behave in a Marxist fashion.

"The secret of life is honesty and fair play. If you can fake that, you've made it."

Groucho Marx

References

- Blaug, M. (1967) Approaches to educational planning, Economic Journal, June, 77, No. 2, 262-287.
- Bloor, K., Maynard, A. and Street, A. (1992(a)) How much is a doctor worth? Discussion Paper 98, Centre for Health Economics, University of York.
- Bloor, K. and Maynard, A. (1992(b)) Rewarding excellence? Consultants' distinction awards and the need for reform. Discussion Paper 100, Centre for Health Economics, University of York.
- Bloor, K. and Maynard, A. (1992(c)) W(h)ither NHS Spending, Royal College of Nursing - Institute of Health Service Managers.
- Campling, E.A., Devlin, H.B. and Lunn, J.N. (1990) The report of the National Confidential Enquiry into Perioperative Deaths. London: National Confidential Enquiry into Perioperative Deaths.
- Carr-Hill, R., Dixon, P., Gibbs, I., Griffiths, M., Higgins, M., McCaughan, D., Wright, K. (1992) Skill mix and the effectiveness of nursing care, Occasional Paper, Centre for Health Economics, University of York.
- Cochrane, A.L. (1972) Effectiveness and Efficiency, Nuffield Provincial Hospitals Trust, London.
- Coulter, A., Klassen, A., MacKensie, I.Z. and McPherson, K. (1993) Diagnostic dilation and curettage : is it used appropriately?, British Medical Journal, 306, 236-39.
- Department of Health and Social Security (1978) Medical Manpower - the next twenty years, HMSO, London.
- Department of Health and Social Security, Treasury and Central Policy Review Staff (1980) Medical Manpower Steering Group Report, DHSS, London.
- Department of Health and Social Security (1985(a)) Report of the Advisory Committee for Medical Manpower Planning, DHSS, London.
- Dowie, R. (1991) Ophthalmology. Patterns of Hospital Medical Staffing. London: HMSO.
- Dowie, R. (1991) General Surgery. Patterns of Hospital Medical Staffing. London: HMSO.
- Dowie, R. (1991) General Medicine. Patterns of Hospital Medical Staffing. London: HMSO.

- Dowie, R. (1991) Anaesthetics. Patterns of Hospital Medical Staffing. London: HMSO.
- Dowie, R. (1991) Paediatrics. Patterns of Hospital Medical Staffing. London: HMSO.
- Dowie, R. (1991) Obstetrics and Gynaecology. Patterns of Hospital Medical Staffing. London: HMSO.
- Dowie, R. (1991) Trauma and Orthopaedic Surgery. Patterns of Hospital Medical Staffing. London: HMSO.
- Dowie, R. (1991) General Psychiatry. Patterns of Hospital Medical Staffing. London: HMSO.
- Freemantle, N. et al (1992) The Treatment of Persistent Glue Ear, Effective Health Care 4, School of Public Health, Leeds University.
- Freemantle, N. et al (1993) The Treatment of Depression in Primary Care. Effective Health Care Bulletin No. 5, Centre for Health Economics, (York) - School of Public Health, (Leeds).
- Fry, J. (1977) Primary and continuing care, in C.I. Phillips and J.N. Wolfe (eds) Clinical Practice and Economics, Pitman Medical, Tunbridge Wells.
- Fuchs, V. (1984) Rationing health care, New England Journal of Medicine, 311, 24, 1572-1573.
- Jewkes, J. (1960) Memorandum of Dissent to Royal Commission on Doctors' and Dentists' Remuneration, HMSO, London. (Cmnd 939).
- Kind, P. (1988) Hospital deaths - the missing link : measuring outcome in hospital activity data, Discussion Paper 44, Centre for Health Economics, University of York.
- McPherson, K. (1989) Why do variations occur? in T F Anderson and G Mooney (eds) The Challenge of Medical Practice Variations. Macmillan, London.
- Marsh, G.N. (1991) Future of General Practice. Caring for larger lists. British Medical Journal, 303 : 1312.
- Maynard, A. (1981) The Economics of Medical Manpower Planning paper presented at the 7th Annual Meeting of the European Working Group on Operations Research Applied to Health Services, Thondheim, Norway 13-17 July 1981.
- Maynard, A. (1992) Priorities: Follow the Oregon Trail?, Medical Audit News, 2, 2: 20-22.

- Maynard, A. and Walker, A. (1977) Too many doctors? Lloyds Bank Review, 125, 24-36.
- Maynard, A., and Walker, A. (1978(a)) Doctor Manpower 1975-2000: alternative forecasts and their resource implications, Royal Commission on the National Health Service, Research Paper No. 4, HMSO, London.
- Medical Manpower Standing Advisory Committee (MMSAC) (1992) Planning the Medical Workforce, Department of Health, London.
- Ministry of Health and Department of Health for Scotland (1944) Report of Inter-departmental Committee on Medical Schools, (Goodenough Report), HMSO, London.
- Ministry of Health (1957) Report of the Committee to consider the future numbers of medical practitioners and the appropriate intake of medical students, (Willink Report), HMSO, London.
- Pauly, M.V. (1980) Doctors and their workshops, National Bureau of Economic Research, University of Chicago, Press, Chicago and London.
- Peacock, A.T. and Shannon, R. (1968) Lloyds Bank Review, January.
- Priestman, T.J., Bullimore, J.A., Goddern, T.P. and Deutsch, G.P. (1989) The Royal College of Radiologists Fractionation Study, Clinical Oncology, 1, 63-66.
- Reinhardt, U.E. (1975) Physician productivity and the demand for health manpower, Ballinger.
- Report of the Royal Commission on Doctors' and Dentists' Remuneration (1960) (Chairman, Lord Pilkington), HMSO, London. (Cmnd 939).
- Report of the Royal Commission on Medical Education, (1968) (Chairman, Lord Todd), HMSO, London, (Cmnd. 3569).
- Sanders, D., Coulter, A., McPherson, K. (1989) Variations in hospital admission rates: a review of the literature. Project Paper 79, Kings Fund, London.
- Scott, T. and Maynard, A. (1991) Will the new GP contract lead to cost effective medical practice?, Discussion Paper 82, Centre for Health Economics, University of York.
- Song, F., Freemantle, N., Sheldon, T.A. et al (1993) Selective serotonin reuptake inhibitors : meta-analysis of efficacy and acceptability, British Medical Journal, 1215, 683-687.
- Williams, A. (1979) One Economist's View of Social Medicine, Journal of Epidemiology and Community Health, 33, pp 3-7.