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Planning human resources in health care: Towards an economic approach An international comparative review

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Karen Bloor
Alan Maynard
University of York

National informants:

Australia:
Professor Jane Hall, Centre for Health Economics Research and Evaluation
France:
Dr Phillippe Ulmann, Conservatoire National des Arts et Metiers de Paris
Germany:
Dr Oliver Farhauer, Technical University Berlin and European Centre for Comparative Government and Public Policy
Sweden:
Professor Bjőrn Lindgren, Lund University

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For more information on the Canadian Health Services Research Foundation, contact the foundation at:
11 Holland Avenue, Suite 301
Ottawa, Ontario
K1Y 4S1
E-mail: communications@chsrf.ca
Telephone: (613) 728-2238
Fax: (613) 728-3527

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11, avenue Holland, bureau 301
Ottawa (Ontario)
K1Y 4S1
Courriel : communications@fcrss.ca
Téléphone : (613) 728-2238
Télécopieur : (613) 728-3527

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Main Messages

Policy makers in Canada's healthcare system recognize the need to plan health human resources better, with more systematic and integrated planning. Many are looking to other healthcare systems for ideas and examples that might be useful in the Canadian context.

To inform the design and development of improved workforce planning, a review of healthcare systems was done in five countries: Australia, France, Germany, Sweden and the United Kingdom. A number of key implications emerged:

- All countries examined have a partial approach to planning, and ignore relationships between health professions.

- Most countries have some central planning when it comes to the medical workforce, ranging from planning medical student intake to forecasting future demand for doctors, which is often inadequate.

- Most countries have some central planning of the nursing workforce and allied professions, but with less systematic approaches to forecasting demand.

- While there has been some control of overall staff numbers, little or no attention has been given to the distribution of medical and nursing staff between specialties and regions, resulting in inequalities.

- Despite attempts to plan, all countries have experienced cycles of shortages and surpluses of health professionals, perhaps most acutely in the nursing workforce.

- A number of countries, including the UK and Sweden, rely on the immigration of health professionals from other countries, such as Spain, as a short-term fix for shortages.

- There is little or no performance management of health professional staff, particularly in the medical profession, so it is difficult to plan and measure efficiency.

- Performance problems are perpetuated by poor access to information, weak management and an absence of systematic continuing education and re-accreditation.

- In general, there is a lack of attention to basic economic principles: the role of incentives is largely ignored, and supply elasticities in the labour market are, for the most part, unknown and poorly researched. It is often assumed that manipulating price alone will control expenditure, without paying attention to volume.

- There is clearly a need to better integrate planning across the professions, with special attention to skill mix and geographic balance. Effective development of skill mix requires legislative change and incentives for physicians that encourage advancement.

Executive Summary

The planning of supply of and demand for human resources in healthcare is a neglected topic characterised by significant methodological weaknesses which have been discussed for decades but not resolved. Workforce planning policies, where they exist, tend to assume that existing healthcare delivery systems are efficient, and the forecasts made are rarely costed systematically. In most healthcare systems, workforce planning is driven by healthcare expenditure, with resources dictating volume of provision. Typical workforce planning systems ignore variations in practice and the possibility of changing productivity, skill mix and substitution. Healthcare policy makers increasingly recognise the need for more integrated planning of human resources in healthcare, in particular making the management of human resources responsive to system needs and design, instead of vice versa.

To inform the design and implementation of improved workforce planning systems, a review of healthcare systems and interaction between systems of service delivery and approaches to planning human resources was done in five countries: Australia, France, Germany, Sweden and the United Kingdom. These represent different welfare state regimes, and a range of health systems dominated by national taxation (UK, Australia), local taxation (Sweden) and social insurance (France, Germany). These countries have some parallels to the Canadian health system, including the funding base (most have a mix of public and private finance and provision) and payment structures (Australian doctors and some aspects of other medical provision are funded fee-for-service, like in Canada).

Spending on healthcare in the five countries varied between US$1,569 per capita (UK) and US$2,361 per capita (Germany). In all five countries, per capita spending increased rapidly between 1980 and 1995, and has continued to increase between 1995 and the most recent available comparative data, although at a slower rate in most cases. Total spending on health as a percentage of GDP varied between 6.9 percent (UK) and 10.3 percent (Germany), and in all five countries has increased slowly. All five countries in this sample are dominated by public funding of healthcare: public spending on health as a percentage of total expenditure varies from 70 percent (Australia) to 84 percent (Sweden).

Although all are dominated by public funding of healthcare, the five countries have differing systems of funding. Australia, UK and Sweden are funded primarily from general taxation, but France and Germany from social insurance, although France has in recent years replaced the employee portion of social insurance with a straightforward income tax. The role of out-of-pocket payments and private insurance varies between the countries. Australia encourages private insurance through tax subsidies and penalties. France has substantial out-of-pocket payments, largely covered by additional voluntary health insurance, held by over 90 percent of the population.

Australia, UK and Sweden all have primarily publicly owned and administered hospitals and systems of delivery of secondary care, but with some division between purchaser and provider functions. In comparison with the centralised systems of Australia, France and the UK, Sweden and Germany have more decentralised systems of healthcare funding and delivery. In Sweden, the county councils dominate funding and care provision, and in Germany these are dominated by the regional or occupational sickness funds, Länder hospitals and the medical profession.

Payment systems for medical staff also differ across the five countries. In Australia, most medical services are provided by private practitioners paid by fee-for-service with a fixed rate of reimbursement. In France, most general practitioners and specialists in the ambulatory sector are paid fee-for-service, while staff in public hospitals are salaried. In Germany, ambulatory care is organised on the basis of office-based physicians, and in both ambulatory and hospital care medical staff are paid fee-for-service. In Sweden and the UK, public hospital doctors are all salaried, but hospital doctors in the private sector are paid fee-for-service. In Sweden, primary healthcare physicians are also salaried, but in the UK, a

mixed payment system exists, primarily capitation but with target payments and some fee-for-service. The payment of physicians may be one of the keys to policy development in this area. For example, it may be that fee-for-service payment discourages changes in skill mix, because if nurses or non-physician clinicians substitute for doctors in providing health interventions, doctors' income is threatened.

Tables 1 and 2 illustrate activity rates and healthcare employment in the five countries under consideration.

Table 1: Comparative rates of activity in healthcare in five countries

	Australia	France	Germany	Sweden	UK
Inpatient care bed days per capita	2.6	2.4	2.6	1.1	1.2
Acute care bed days per capita	1	1.1	1.9	0.7	0.9
Acute care staff ratio - staff per bed	2.5	1.1	1.5	1.85	3.7
Acute care nurses ratio - staff per bed	1.4	0.5	0.6		1
Admissions of inpatients per 1000 population	159	230	205	181	151
Acute care admissions per 1000 population	156	204	201	166	214
Doctors' consultations per capita	6.5	6.5	6.5	2.9	5.4

Table 2. Comparative health employment in five countries

	Australia	France	Germany	Sweden	UK
Employment in health and social work per 1000 population	44.3	40.8	44.8		50.8
Total employed in healthcare per 1000 population	33.7		42.3	35.2	29.9
Total employed in hospital per 1000 population	21.5	18.6	10.4	24.4	22.2
Practising physicians per 1000 population	2.5	3	3.4	2.9	1.8
General practitioners per 1000 population	1.1	1.5	1	0.6	0.6
Practising specialists per 1000 population	0.8	1.5	2.2	2.2	1.5
Practising nurses per 1000 population	10.7	6	9.6	8.4	4.5

In Australia, France, Sweden and the UK, medical school intake is controlled by central government, through the funding of university places. This does not occur in Germany, where there is no control of the overall size of the medical workforce. Planning for the medical workforce in these four countries is determined by relatively mechanistic estimates of demand for medical care, from demographic forecasting, resource constraints and estimates of likely retirement and other loss of existing medical staff. These four also do nursing workforce planning through control of training places. Again, Germany has no planning mechanism. In some countries (notably France and the UK), current shortages have created substantial political concern, and considerable immigration of nursing staff.

None of these countries have formal planning to meet the need for ancillary healthcare workers or for management and administrative staff. There has been little planning for other components of the professional workforce, such as the professions allied to medicine. In France, Sweden and the UK, there is currently no integration of their systems of workforce planning: medical, nursing and other healthcare professions are largely considered apart from each other. However, in Australia, a Health Workforce Advisory Committee (AHWAC) was formed in December, 2000 to develop a more strategic focus to health workforce planning in Australia. Its prime focus is national health workforce planning, analysis of information and the identification of data needs. Despite the existence of this committee, medical workforce planning is still kept separate from other health workforce planning. The UK, through Workforce Development structures, has also signalled an intention to have more integrated planning, but so far this development is limited in practice.

There appear to be very limited indicators of success or failure of workforce planning mechanisms. Cyclical shortages and occasional surpluses tend to provoke short-term changes in student intake, rather than any attempt at strategic solutions, or at improving methods of forecasting demand and supply, particularly modelling supply elasticities. There is a need to create an evidence base to inform the use of incentives by policy makers to influence activity rates, quality of care and outcomes.

The principal lesson derived from this comparative review is that the practice of workforce planning (with the exception of Germany where there is none) is similar, and potentially inefficient, as it ignores crucial economic issues. This negative lesson can be translated into a positive program of change to improve workforce planning in Canada and in other healthcare systems:

- There is a need to invest in the collection and use of information on the activity of health professionals and resulting health outcomes. Before planning to increase the stock of human resources it is essential to establish that the existing workforce is working effectively, minimising unexplained practice variations and inappropriate care. Investing in better information and management systems could increase transparency, accountability and efficiency of healthcare systems.

- There is evidence in ambulatory care and in some areas of hospital care, such as anaesthetics and endoscopy, that nurses may be effective substitutes for doctors. It is necessary to break down divisions in the workforce market, and take an integrated approach to planning the healthcare workforce if such substitution possibilities are to be exploited.

- Financial incentives affect both the supply of effort by practitioners and the acceptance of changes in skill mix. With physicians paid fee-for-service (as in Canada, Australia and Germany) development of skill mix, for example nurse substitution, is a threat to physicians' income, potentially reinforcing physician resistance. Amelioration of these market imperfections requires a better mix of payment systems to balance incentive structures. Physicians paid differently, such as UK GPs, welcome the use of nurses because it reduces their workload and can even increase their income. In addition, the application of a vigorous competition policy to the physician workforce would support changes in incentives. Anti-trust legislation has been used in Australia where cartel behaviour in the medical profession has inhibited price competition, and is being used in the UK to investigate price fixing by anaesthetists in the private sector.

Policy developments such as these are essential constituents of workforce planning processes in Canada and elsewhere. They would make planning more complex, but potentially more efficient, and if implemented could have profound influences on skill mix and use of the whole healthcare workforce.

1. Background

Health care is a labour-intensive industry, and human resources are the most important input into the provision of health care, and the largest proportion of health care expenditure. It is remarkable that the market for human resources in health care has been relatively under-researched and under-managed in all developed countries health systems.

The market for human resources in health care, like any other labour market, is made up of an interaction between demand and supply. The demand for human resources in health care is derived from patients' demand for health services, which in turn is derived from the population's demand for 'health'. These demands are assumed to be related to the overall size and structure of a population, to patient expectations of health care and to the income of society.

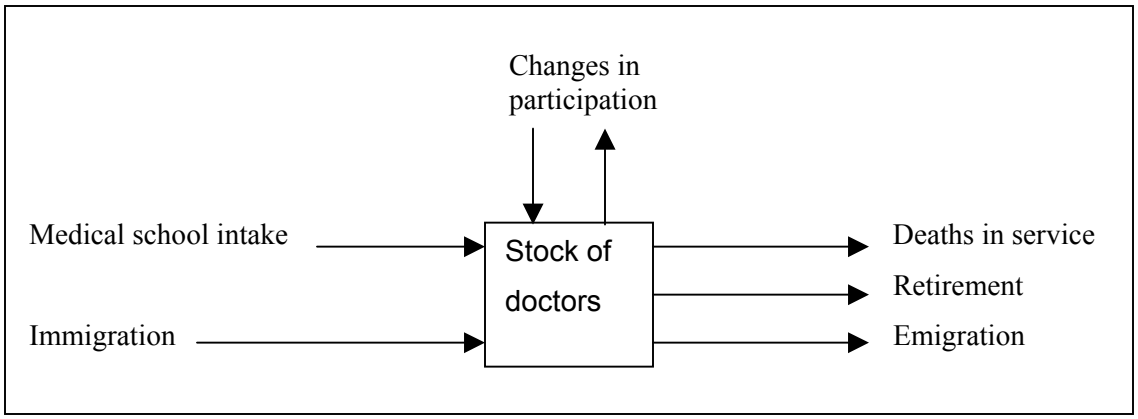
The supply of human resources in health care is determined by many factors, including the income and perceived status of health professionals, and the relationship between different health professionals in terms of skill mix, and use of complements and substitutes. External factors also influence labour supply, such as the European Union's working time directive, which regulates the labour supply of doctors in specialist and training grades.

In the freely operating labour markets discussed in textbooks, wages (the price of labour) adjust to create an equilibrium, matching the supply of and demand for labour. The market for health care human resources is not a free market for several reasons. There is substantial public sector regulation of all health care markets, entry to the labour market is highly constrained by licensing and professional regulation, and wages are often negotiated nationally for groups of health professionals, making 'price' inflexible in response to changing demand and/or supply. Consequently, the price mechanism does not create equilibrium, and other mechanisms for matching supply and demand have to be used. This has meant that many countries have systems of planning health care human resources, particularly the medical workforce.

The planning of supply of and demand for human resources in health care is subject to two major weaknesses:

1. It is typically narrow in its focus, examining medical practitioners in isolation. This approach ignores the interrelationships between health professionals, and substitution possibilities (e.g. using nurse anaesthetists in place of physicians).
2. It is often mechanistic and supply side driven, for example:

Figure 1.1: assumptions about medical workforce supply



The flows that create a stock of doctors in any country are estimated from extrapolation of earlier time series data. Typically this ignores behavioural shifts (e.g. increased emigration in the UK in the early 1960s, occasioned by declining relative domestic real income and enhanced job opportunities overseas). This supply side approach tends to be complemented with imperfect demand estimation using fixed parameters (e.g. doctor: population ratios) which are linked crudely, if at all, to real resource constraints.

Workforce planners implicitly assume that existing systems of health care delivery are efficient, and make forecasts based on these existing systems, assuming current staff: patient ratios are appropriate. Often it is assumed that the historical supply of human resources, particularly physicians, reflects demand. This ignores the fact that physicians can influence the services they provide and other health care services used by patients (Barer 2002). Workforce planners also usually make incomplete costings of their forecasts. In most health care systems, workforce planning is expenditure driven, with resources dictating the volume of provision. However, the planners use crude physical numbers of staff, whose links to accurate financial forecasts are often frail.

In all health care systems there are substantial variations in clinical practice, which may indicate inappropriate care and the ineffective use of resources (Wennburg 1999, Coulter et al 1988, Andersen et al 1994). Workforce planning systems ignore such variation. Furthermore labour and capital substitution is ignored despite evidence of widespread change in staffing practices (e.g. nurses

undertaking laparoscopy and anaesthesia) and capital substitution (e.g. pharmaceutical therapy replacing gastric surgery for acute ulcer treatment). The potential of new technology to enhance productivity, as it does in other sectors of the economy, tends to be ignored (Barer 2002). Crude measures of activity indicate that physician productivity may be falling over time, e.g. in the UK (Bloor and Maynard 2001). These trends are not generally measured or managed, and workforce policy makers do not consider, let alone confront, the issue of whether changes in demand for care can be compensated with increased productivity from reducing variation and increasing overall activity. Such increases in clinical effort require consideration of the role of incentives (financial and non-financial) to influence productivity in health care. This policy is rarely linked to workforce planning and management.

Health care policy makers may recognise the need for more integrated planning of human resources in health care, in particular making management of human resources responsive to system needs and design, instead of vice versa. However, they have largely failed to practice what they preach. To inform design and implementation of improved systems of workforce planning, a review of health care systems, and interaction between systems of service delivery and approaches to planning human resources, was undertaken in five countries.

2. Sample

The five countries chosen were Australia, France, Germany, Sweden and the United Kingdom. These represent the three 'worlds of welfare capitalism' (following Esping-Andersen 1990): social democratic (Sweden), corporatist (France, Germany) and liberal (Australia, UK). They also include health systems dominated by national taxation (UK, Australia), local taxation (Sweden) and social insurance (France, Germany). The countries chosen do not include Canada, or its immediate neighbour, the USA, but nonetheless provide sharp lessons for Canadian health human resource planners. The countries were chosen to represent diversity in funding structures, systems of provision, payment mechanisms and their approach to central planning. There are parallels between these countries and Canadian health policy: Australia, like Canada, pays doctors by a fee-for-service system, as does France in the ambulatory sector; Sweden and Germany have a strong regional element to health care planning, which form a parallel with the emerging Canadian regional health authorities; and in Australia and the UK, like Canada, policy makers are attempting to develop a more strategic approach to health workforce planning.

3. Objectives

The review explores the implications of different systems of health care delivery for human resource planning, and aims to derive lessons from international experience.

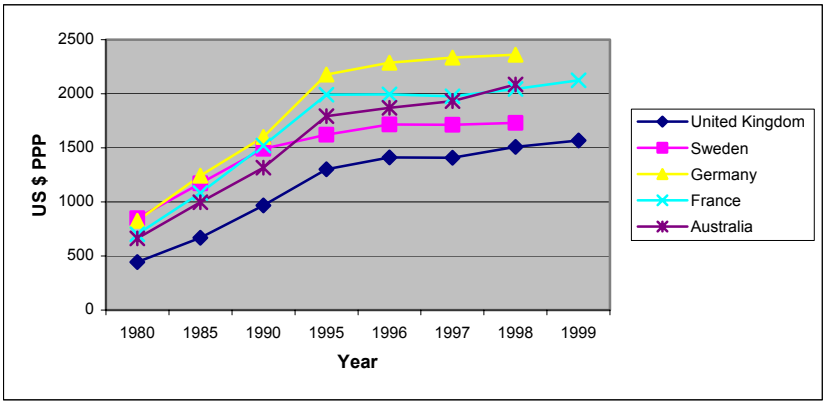
The objectives of the review are:

- To categorise systems of finance and delivery of health care in each major component of health care systems, and apply the categorisation scheme to five countries' health care systems.
- To identify systems of human resource planning, and to relate the finance and delivery systems to the way in which human resources are planned for each component of the system in each country.
- To contribute to development of indicators of effectiveness and efficiency of human resources in health care systems, in order that these can be related to the categorisation of finance and delivery, and the human resources planning systems, of each country.

4. Summary of financing and delivery of health care in five countries

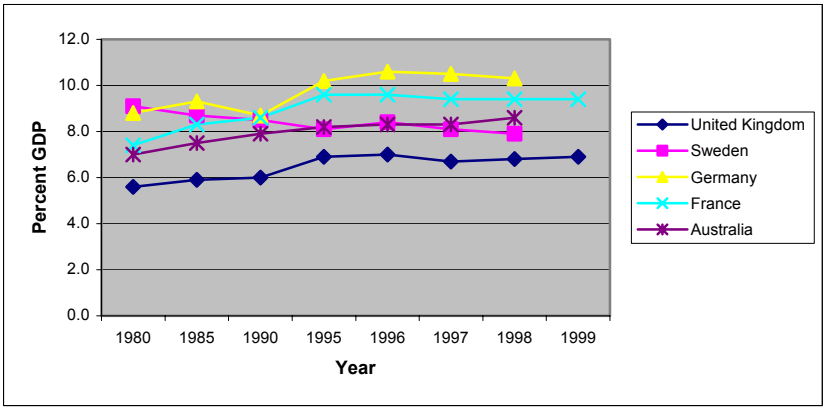
Expenditure on health care in the five countries varied between US$PPP 1,569 per capita (UK) and US$2,361 per capita (Germany) (see chart 4.1). In all five countries, expenditure per capita increased rapidly between 1980 and 1995, and has continued to increase between 1995 and the most recent available comparative data (1998 or 1999) although at a slower rate in most cases. Total expenditure on health as a percentage of GDP is illustrated in Chart 4.2. It varies between 6.9 (UK) and 10.3 (Germany), and in all five countries has increased slowly over time. All five countries in this sample are dominated by public finance: public expenditure on health as a percentage of total expenditure varies from 70 per cent (Australia) to 84 per cent (Sweden) (chart 4.3).

Chart 4.1: Total expenditure on health, per capita, US$ PPP



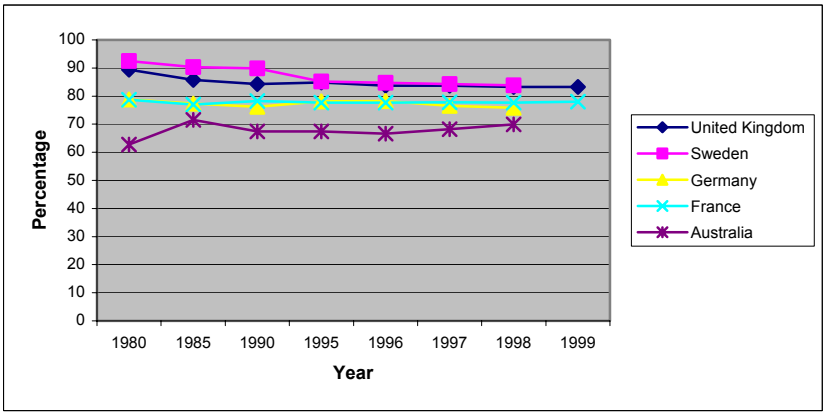
Source: OECD health data 2001

Chart 4.2: Total expenditure on health, percentage of GDP



Source: OECD health data 2001

Chart 4.3: Public expenditure as percentage of total expenditure



Source: OECD health data 2001

Although all five countries are dominated by public finance, they have differing systems of funding. Australia, UK and Sweden are all funded primarily from general taxation. Australia has an earmarked health tax, as well as funds from general taxation. France and Germany are funded primarily from social insurance, although in recent years France has replaced the employee portion of social insurance with a proportional income tax. The role of out-of pocket payments and private insurance varies between the countries. Australia encourages private insurance through tax subsidies to insure, and tax penalties are applied for not insuring privately, although they have rescinded an earlier policy of 'opting out' of the earmarked health tax. France has substantial out-of-pocket payments, but these are largely covered by additional voluntary or complementary health insurance, which is held by over 90 per cent of the population.

Australia, UK and Sweden all have primarily publicly owned and administered hospitals and systems of delivery of secondary care. In Australia, there are five yearly agreements negotiated to pay the publicly funded hospitals. UK maintains a purchaser-provider split, although purchasers and providers are both in the public sector. There are also three-yearly agreements between the funders and providers of hospital care.

In France, hospital care dominates the provision of health services, and there are public and private not-for-profit hospitals. The public sector owns 65 per cent of the beds. Hospital budgets are capped as part of a global budget from the health insurance scheme, but these caps are often exceeded and deficits occur (currently there is a deficit of over 3 billion Euros). There is a gradual move towards DRG funding of hospitals.

In comparison with the centralised systems of Australia, France and the UK, Sweden and Germany have more decentralised systems of health care finance and delivery. In Sweden, finance and provision are dominated by the county councils, and in Germany it is dominated by the regional or occupational sickness funds.

Payment systems for medical staff also differ in the five countries. In Australia, most medical services are provided by private practitioners paid by fee-for-service with a fixed rate of reimbursement. In France, most general practitioners and specialists in the ambulatory sector are paid fee-for-service, while staff in public hospitals are salaried. Ambulatory care in Germany is organised on the basis of office-based physicians, and in both ambulatory and hospital care medical staff are paid fee-for-service. In Sweden and the UK, public hospital doctors are all salaried, but hospital doctors in the private sector are

paid fee-for-service. In Sweden, primary health-care physicians are also salaried, but in the UK a mixed payment system exists, primarily capitation but with target payments and some fee-for-service, and in recent years 20 per cent of GPs have moved to salaries. Capitation also exists for French primary care physicians who agree to be 'referring GPs' (a kind of gate-keeper), but this affects only 10% of GPs and 1% of patients.

The role of the gatekeeper also varies. This is most obvious in the UK, where referrals from GPs are necessary before patients can receive non-emergency hospital care. In Australia, GPs also play an important gate-keeping role in the system, as referral is essential for any reimbursement of specialist services, including diagnostic tests, and therefore most hospital admissions. In Sweden, there is variety between counties, but in general the gatekeeper function of the GP is very weak. In France, gate keeping is also limited and in Germany it is non-existent.

5. Planning health human resources in five countries

5.1. Controlling supply of health human resources

Systems of planning health human resources in the five countries are detailed in the individual countries in the appendix, with key characteristics summarised in Tables 5.1 – 5.4.

On the supply side, four of the five countries (Australia, France, Sweden and UK) have policies of central control of the size of the medical workforce, through controlling the intake of medical schools (or, in the case of France, controlling the number of students that enter the second year of study in medical school). This does not happen in Germany, where although there is some central planning of the quantity of hospitals, there is no planning of the workforce within them. The 34 medical schools in Germany notify a central agency of the places they have available, but the central agency cannot influence capacity. In the four countries with central planning of the medical workforce, appropriate numbers are determined by a relatively crude forecasting method, based on the existing supply of doctors, changes in supply such as likely retirements and other losses to the profession, and a prediction of the future demand for health care. Demand predictions tend to be based on demographic change, assuming that the same doctor / patient ratio is required for future generations.

The same four countries also plan the supply of nursing and some other health professional workforces, tending to use an even more crude approach, again by controlling university intake. There is very little

evidence of a systematic approach to training a workforce in health administration and management. Only Australia appears to be developing an integrated approach to health workforce planning, but this is a policy in its early stages, and so far exists largely in principle rather than in practice.

5.2. Indicators of effectiveness and efficiency of health human resources planning

There are a number of potential indicators of the success or failure of systems of planning of human resources in health care, which could be used to create a 'gold standard' system. These include:

- The existence of 'shortages' and 'surpluses' of health professionals at national level, measured objectively and with reference to clear and integrated objectives of human resource planning. All five countries tend to report a cycle of 'shortages' and 'surpluses', particularly of doctors and nurses but the nature and causes of theses are not analysed systematically, they are rarely related to other health professional workforces, and they are not assessed with regard to planning systems and their success or failure. More objective measures of shortage and surplus could include vacancy rates, growth of the workforce, unemployment rates, real wage rates, rates of return and overtime, but these indicators are of mixed value (Zurn et al 2002).
- The existence of 'shortages' and 'surpluses' of health professionals in parts of the health care system – in particular problems of geographical and specialty distribution of staff. Again all five countries have some levels of inequity in staffing across geographic regions and between specialties, which tend not to be addressed in the overall planning system. A 'gold standard' system would include indicators of inequity as well as total aggregated human resources.
- Indicators of success of health services as employers: this could include rates of recruitment, retention, return and early retirement of health professionals.
- Performance of the health care workforce. This would ideally be measured in terms of health outcomes, but in practice it is measured, if at all, in terms of process (e.g. activity rates such as number of patients or patient episodes treated). A 'gold standard' planning system would consider performance and productivity of health human resources in terms of patient outcomes, or at least in terms of activity with some indicators of quality of health care.

Current indicators of effectiveness and efficiency of health human resources planning appear to be rather limited. Australia has assessed the processes of medical workforce planning, in terms of provision of advice, involvement of stakeholders and development of methods and data collection, but no countries assess clearly the outcomes of workforce planning, in terms of whether or not forecasts were fulfilled, and

if not, why not. To assess the effectiveness and efficiency of health human resources, the information base has to be improved in all five health care systems. There are currently insufficiently developed indicators of success and failure, and even when information exists, it is under-used, perhaps due to the relative power of the medical profession, compared with health care planners and policy makers. The casual approach to measurement and management ensures that observable inefficiencies in practice are neither challenged nor mitigated.

5.3. Policy change in health human resource planning

In the five countries in this review, policy changes in health human resource planning are modest, slow and lacking in theoretical basis. In particular they seem to ignore powerful economic influences and incentives. In the UK and Australia there are some attempts to develop a more strategic approach to workforce planning, but in both cases the approach to planning the medical workforce is largely separated from other professions, and dominates policy debate. In the UK, substantial increases in NHS expenditure are funding increasing medical and nursing student places, without any systematic process of forecasting: there are reports that policy makers decided on the size of increases in medical student numbers on the basis of ‘a nice round number’.

Table 5.1: Planning the health workforce

	Australia	France	Germany	Sweden	UK
Control of medical workforce supply	Yes: medical school intake controlled centrally by Commonwealth government.	Yes: medical school 2nd year quota, controlled centrally – 'numerus clausus'.	No central planning for health workforce: hospitals plan their own staff	Yes: medical school intake controlled centrally	Yes: medical school intake controlled centrally
Demand forecasting for medical workforce	Forecasting based on existing medical numbers and future demand for health care	Forecasting based on existing medical numbers and future demand for health care	No	Little: each municipality responsible for medical workforce policy	Forecasting based on existing medical numbers and future demand for health care and health care expenditure
Specialty planning of medical workforce	Inadequate	Inadequate	No	Inadequate	Inadequate
Planning the geographical distribution of the medical workforce	Inadequate	Inadequate	Some: planning of hospitals but not workforce within them	Some: policy of one full time doctor in primary care per 2000 population in health district	Inadequate: indirectly through hospital funding, insufficient in primary care
Controlling nursing and midwifery workforce supply	Yes: workforce planning at State level, but viewed as inadequate:	Yes: quota of students at national level, no attention to specialty or geographical distribution	No	Yes: quota of students at national level	Yes: quota of students at national level, insufficient attention to specialty and geographical distribution
Planning of workforce for other health professionals	Little: new committee formed in 2000 to include this.	Quota for pharmacists, physiotherapists and clinical psychologists	No	Quota systems for some but not all other staff groups	Quota systems for most professions allied to medicine
Ancillary health workers planning	No	No	No	Not clear	No
Health administration and management workforce planning	No	No real planning, but a single public health national school	No	Not clear	Some: management trainee programme
Integrated workforce planning	Inadequate but developing, although medical workforce still separately planned	Not clear	No	Not clear	Inadequate but developing
Responsiveness of workforce planning to health system change	Not clear	Not clear	Market approach: some flexibility	Not clear	Not clear

Table 5.2: Indicators of effectiveness and efficiency of health human resources planning

	Australia	France	Germany	Sweden	UK
Processes of planning and forecasting	Medical workforce planning judged 'highly successful' in terms of provision of advice, involvement of stakeholders, development of methods and data collection	No clear assessment of processes	No planning and forecasting	No clear assessment of processes	No clear assessment of processes
Outcomes of planning and forecasting	No attempt to determine whether or not medical workforce predictions were 'correct'	Principal goal has been to limit increasing numbers of health professionals (particularly doctors): numbers stabilised but expenditure inflation remains	No planning and forecasting	Short term indicators: vacancies and unemployment of health workers	Generally successful in avoiding major shortage and surpluses in medical and nursing staff. High dependence on foreign graduates
Current shortages and surpluses	Shortages in several medical specialties Possible surplus in general practice. Cycles of shortage and surplus reported in nursing, but no good documentation of this.	No medical specialty targets, creating specialty imbalances: psychiatry and anaesthetics understaffed Severe shortage of nursing, exacerbated by 35-hour working week law.	Labour unions may identify shortages, as may federal government, but hardly any mechanisms for intervention	Expansion of public health care system created shortages from 1960s, since addressed by expansion in workforce. Shortages in family medicine and primary care	Insufficient medical specialty planning, creating shortages in some specialties. Reports of recent shortage in primary care physicians
Geographical equity	Imbalance between rural and urban areas	Imbalance between geographical areas	Imbalance between geographical areas	Imbalance between geographical areas	Imbalance between geographical areas of primary care physicians
Inclusion of skill mix issues in workforce planning	Limited	None	None	None	Limited
Performance/productiv-ity of health workforce	Not assessed systematically	Not assessed systematically	Not assessed systematically	Not assessed systematically	Not assessed systematically
Attempts to influence performance with incentives	Doctors paid FFS, but this may induce over-treatment and resistance to skill mix development	FFS in ambulatory sector – possibly attempting to discourage referral to hospitals, but hospital care still dominates provision	Doctors paid FFS, but this may induce over-treatment and resistance to skill mix development	Salary system: very limited use of financial incentives	Salary / capitation pay: some limited recent use of FFS for surgeons to reduce waiting lists

Table 5.3: Policy changes in health human resources planning

Australia	France	Germany	Sweden	UK
AHWAC set up to develop a more strategic approach to the health workforce but little practical progress so far, and medical workforce still separate and dominant	Recent change to policy of limiting staffing numbers to limit expenditure inflation	No major changes planned to overall planning of health workforce	Current concern about shortages due to demographics (retiring baby boom generation)	Developing a more strategic approach to workforce planning but little practical progress so far.
Some use of competition regulation to prohibit exclusion by physicians of non-physicians	Increases in quota for medical students	Green cards granted for nursing staff	Attempts to recruit foreign health care personnel	Increasing medical and nursing numbers without standard forecasting
		Change in access to medical school: based on grade average not medical test		Attempts to recruit overseas graduates in me and nursing
				Attempts to increase productivity of health workforce
				Changing skill mix in primary care: more nurse practitioners and use of nurses in acute care, and some use of competition regulation to prohibit exclusion by physicians of non-physicians

In Australia and in the UK there have been some attempts to use competition policy to regulate the health human resources labour market, in particular to prohibit groups of physicians (e.g. anaesthetists) from restricting entry competition from non-physicians (e.g. nurse anaesthetists). This has been slow to develop so far, but may have substantial impact in future.

A number of countries are attempting to attract foreign health professionals, particularly doctors in the UK, and nurses in all five countries. In October 2001, delegates from 66 countries met to discuss the 'global growth of nursing shortages' (Buchan 2002). These international shortages are thought to be due to demand factors such as ageing populations, and supply factors such as ageing nursing workforces and increasing alternative employment opportunities for young women (Buchan and Dal Poz 2002).

The strengths and weaknesses of the five countries' systems of health workforce planning are summarised in table 5.4. Weaknesses include fragmentation of planning processes, ignoring interrelationships between health professions, absence of integrated workforce planning, and inefficient and/or inequitable distributions between geographical regions and clinical specialties.

5.4. Health human resources in five countries: employment levels and activity rates

Figures 5.1 and 5.2 illustrate activity rates and health care employment in the five countries under consideration. Despite different financing and delivery structures, utilisation and employment in the five countries appear to be relatively similar. Exceptions are inpatient care bed days, where Sweden and the UK are relatively low, and acute care staff ratios, where the UK is high. Some interesting patterns emerge from these comparisons. In the UK, although doctor-patient and particularly nurse-patient ratios are relatively low, overall health employment and staff per bed are high, suggesting that there may be substitution of less skilled ancillary health workers for qualified nurses.

Figure 5.1. Hospital admission rates in five countries

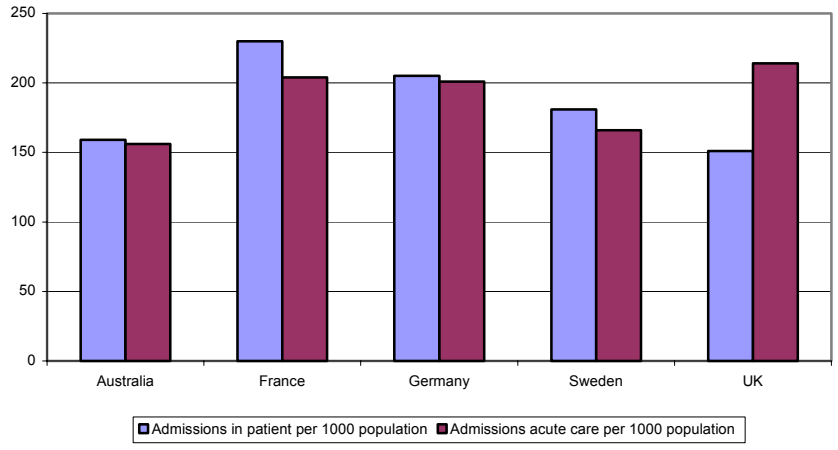


Table 5.4: Strengths and weaknesses of health human resources planning

	Australia	France	Germany	Sweden	UK
Strengths	Development of national datasets	System has achieved aggregate control of doctor numbers	Good basic education of medical and nursing staff	Human resources planned and organised locally due to municipal approach	Established track record of medical workforce planning: refining methods
	Attempts to formulate and implement a national strategy		Growth in numbers of new work groups due to flexible market approach	Locality has incentives to recruit and retain staff	
	Development of collaboration with medical profession				
Weaknesses	Piecemeal approach neglecting inter-relationships between health professions	'non-economic' thinking dominates expenditure control decisions: price is controlled but not volume	Continuing medical education and training could be improved		Workforce planning destabilised by large increases in NHS expenditure and ad hoc decisions to increase medical school numbers
	Medical workforce still separated from other health workforce planning	Doctors and nurses relatively low paid: increase activity to compensate	Underdeveloped clinical risk management		Absence of integrated workforce planning: fragmented policies isolated from theory
	Failure to recognise the role of incentives	Fewer people studying medicine and nursing	Hierarchical nature of hospitals: insufficient collaboration between medical and nursing staff		Absence of medical performance management
	Geographical inequity in distribution of doctors and other health workforce	Geographical inequity in distribution of doctors and other health workforce	Geographical inequity in distribution of doctors and other health workforce	Geographical inequity in distribution of doctors and other health workforce	Significant wage inflation
	Failure to define best practice or consider changes due to technology or changing organisation / financing			Particularly sparsely populated rural areas have shortage of primary care doctors	
	Failure to invest in HSR and economics capacity to support workforce planning				

Figure 5.2. Hospital utilisation and staffing in five countries

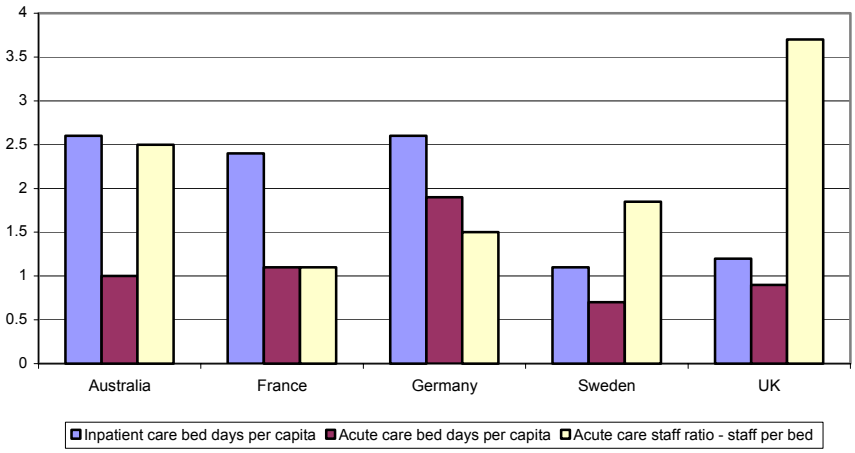


Figure 5.3: Health employment in five countries

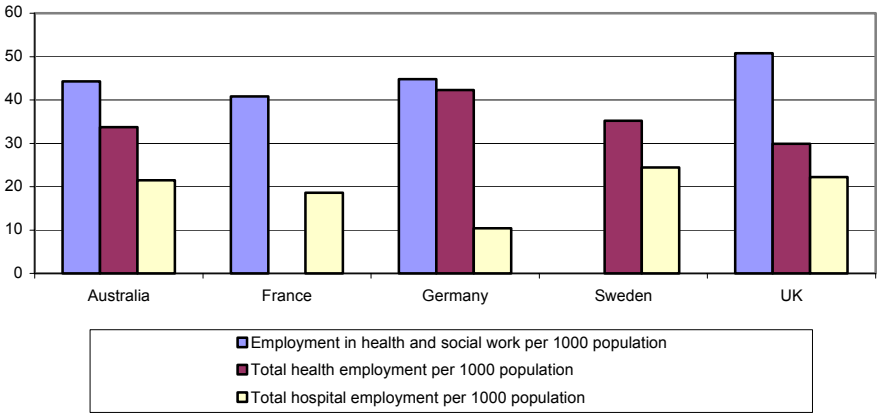


Figure 5.4: Physician / population ratios in five countries

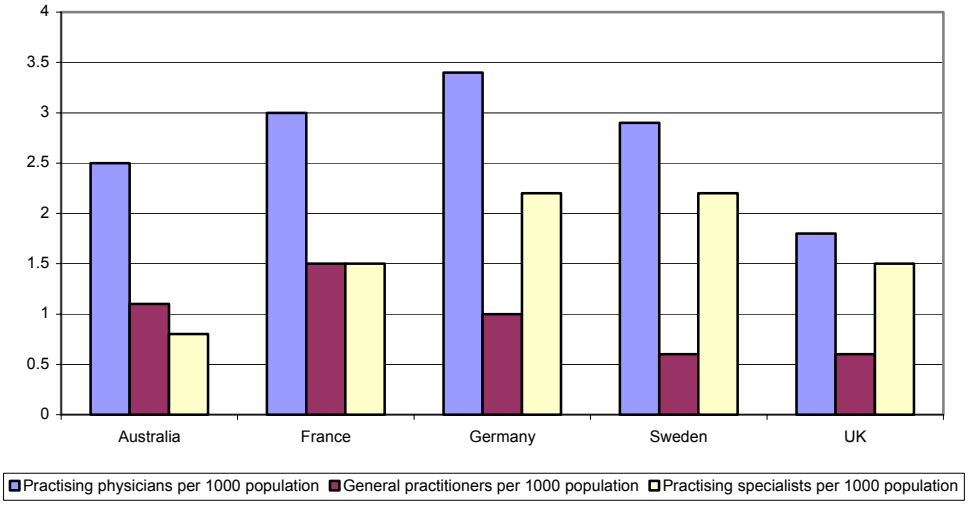


Figure 5.5: Nurse / patient ratios in five countries

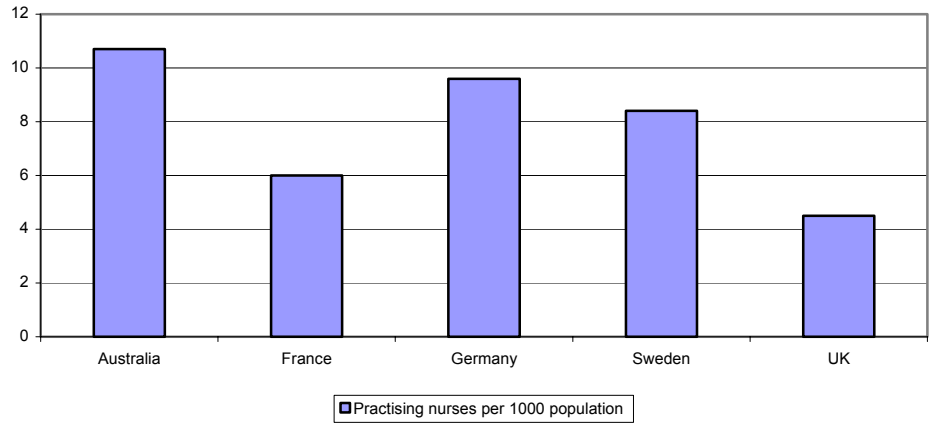


Table 5.5. Comparative rates of health care activity in health care in five countries

	Australia	France	Germany	Sweden	UK
Inpatient care bed days per capita	2.6	2.4	2.6	1.1	1.2
Acute care bed days per capita	1	1.1	1.9	0.7	0.9
Acute care staff ratio - staff per bed	2.5	1.1	1.5	1.85	3.7
Acute care nurses ratio - staff per bed	1.4	0.5	0.6		1
In-patient admissions per 1000 population	159	230	205	181	151
Acute care admissions per 1000 population	156	204	201	166	214
Doctors consultations per capita	6.5	6.5	6.5	2.9	5.4

Table 5.6. Comparative health employment in five countries

	Australia	France	Germany	Sweden	UK
Employment in health and social work per 1000 population	44.3	40.8	44.8		50.8
Total health employment per 1000 population	33.7		42.3	35.2	29.9
Total hospital employment per 1000 population	21.5	18.6	10.4	24.4	22.2
Practising physicians per 1000 population	2.5	3	3.4	2.9	1.8
General practitioners per 1000 population	1.1	1.5	1	0.6	0.6
Practising specialists per 1000 population	0.8	1.5	2.2	2.2	1.5
Practising nurses per 1000 population	10.7	6	9.6	8.4	4.5

6. Common themes

A number of themes emerge as common to all or most of the countries reviewed, regardless of finance and delivery structures:

- The size of the health care workforces in the five countries is remarkable. In countries such as Germany and France, where unemployment is currently a major social problem, capping health care expenditure and increasing efficiency in the delivery of health care would affect employment levels in a way that may be socially and politically contentious. Maintaining inefficient health care systems is one way of maintaining employment.
- Most countries (with the notable exception of Germany) have some central planning of the medical workforce, through medical student intake, including attempts to forecast future demand for doctors. This forecasting is based largely on demographic profiles of the population and the age structure of the medical workforce.
- Most countries (again except Germany) have some central planning of the nursing workforce and of professions allied to medicine, again through control of student intake, but with a less systematic approach to forecasting demand.
- Despite this planning, all countries have experienced a cycle of shortages and surpluses in the health professional workforce, perhaps most acutely felt in the nursing workforce. However, the notion of 'shortage' and 'surplus' is relative, and reports of shortages often are not substantiated (Zurn et al 2002).
- A number of countries rely on immigration of health professionals from overseas (e.g. from Spain, where surpluses exist) to address shortages in the short term.
- All countries have a partial approach to planning, and ignore inter-relationships between the health professions, in particular substitution possibilities and the development of complementary skills (Cooper et al 1998).
- There is little or no attention to the geographical distribution of medical and nursing staff, with the result that, in some countries (e.g. Sweden and France), there is substantial inequality in health professional staff between regions.
- There is little or no performance management of health professional staff, particularly the medical profession. Practice variations, the delivery of inappropriate health care and poor outcome measurement are universal phenomena that invalidate the usual workforce planning assumption of

efficiency in the health care sector. These problems are perpetuated by poor access to information, weak management and an absence of continuing education and reaccreditation.

- There is a general lack of attention to basic economic principles: the existence of supplier induced demand is ignored, the role of incentives in improving productivity is largely ignored, supply elasticities in the labour market are, for the most part, unknown and poorly researched, and it is often assumed that controlling price alone will control expenditure, without paying attention to control of the volume and appropriateness of clinical activity
- There importance of competition regulatory policy may be increasingly important as a mechanism of controlling restrictive practices, particularly by physicians, in the health care labour market. Such use of regulation is emerging in Australia and in the UK.

The economic growth of the 1990s has created intense pressure on health care labour markets in these five countries and worldwide. Each country has adopted similar policies (e.g. encouraging immigration of nurses) to tackle similar problems that could have been anticipated with better management of human resources. As countries contemplate significant policy changes in training investments, for example the UK's rush for staffing to increase NHS capacity, the seeds of the next round of workforce surpluses may be sown.

7. Country lessons

7.1. Australia

There are two significant recent developments in health human resources planning in Australia. Firstly, there is recognition that planning physician numbers in isolation is inefficient, and secondly there has been application of anti-trust policy to the medical profession. In Australia, organisational structure has been extended to develop workforce planning for nurses and other personnel in a more integrated way. However, progress in this direction has been limited: the principle has been accepted but not put into practice. Australia has yet to explore, let alone develop, the potential of skill mix changes. This potential may be inhibited by the physician payment system (fee-for-service) and the slow application of competition policy to physician practices in relation to fee setting and access and quality improvement.

7.2. France

The French corporatist structure has ensured that the planning of the physician workforce has been detailed. However, this control led to high levels of physician production and subsequently the vigorous application of "numerus clausus" to rein back entry to Medical School. Adherence to the latter policy has been slavish over the last decade, as GDP and public expectations increased. The targets set have now been achieved, but at the same time anxiety has emerged about both the size and the age structure of the medical profession. In many ways, French practice is an exemplar of myopic planning in isolation of changing economic circumstances.

The French nursing shortage is a product of the failure to plan this vital part of the workforce. Skill mix changes are inhibited by the physician dominance of the health care market, reinforced by the remuneration system (e.g. fee-for-service in ambulatory care).

7.3. Germany

Physicians also dominate the German workforce market. The Schroeder government, faced by a stagnant economy and fiscal deficits that breach EU rules, has sought without success to reform medical practice. Its failure has involved the exercise of political power by the German medical profession, leading to the resignation of one Minister and the frustration of the current incumbent. The political response from the right has been the proposition of expenditure cuts and the creation of a "competitive" health insurance market.

Once again, these political problems are a product of governmental failure to plan the medical workforce. "Market forces" can be afforded when the economy is growing and the income and employment targets of health care workers (particularly physicians) can be met by increased expenditure. Now this is no longer possible, the health care market is reaching an impasse, with fee-for-service payment of physicians and consequent supplier-induced demand placing severe pressure on politicians. This also may limit openness to skill mix change and the use of non-physician clinicians, which has not, unlike in Australia, been addressed by competition regulators.

7.4. Sweden

The Swedish health care market is characterised by good expenditure control and some diversity systems of delivering care. The primary political organisations involved are the counties, and the extent to which they have developed, for instance, the gate-keeping role of general practice and the prioritisation of hospitals (e.g. in Stockholm) is subject to variation. Evidence as to the costs and benefits of this diversity is not yet available.

The funding of health care is dominated by the State, central and local. Central government funding augments and subsidises local tax revenues to achieve equity targets. In the recent past, vigorous control of expenditure was necessary to meet EU accession rules. However, micro-economic management of medical practice variations, appropriateness and outcome measures remains muted.

As in the other countries, the development of skill mix has been limited, as has the application of competition policy. Inward migration has partially mitigated the development of shortages, but these are still felt, particularly in rural areas. The policy challenge in Sweden is to integrate economic considerations more fully into workforce management.

7.5. United Kingdom

The tradition of mechanistic workforce planning which dominated UK policy making has been thrown into disarray by the current rapid increase in NHS funding. The traditional approach had some success in the management of "shortages" and "surpluses" of physicians when increase in expenditure was modest. However, since 1999, after two years of austerity, the Labour government has generated a rapid increase in expenditure, in excess of workforce capacity. The increase coincided with their decision to decentralise workforce planning in England to new local organisations. These Workforce Planning Confederations are currently forecasting specialist "needs", based on crude capacity planning and simple minded interpretation of national targets (whose cost is generally in excess of the increased funding levels). There is a very wide gap between said "needs" and what can be funded, let alone staffed.

The government continues to state physician workforce targets whose rationale and evidence base is far from apparent. In the absence of sophisticated national planning, other policies are being introduced. An attempt is being made to complement surgical specialist salary payment systems with fee-for-service in order to increase activity and meet 'modernisation' targets (Department of Health 2003). This approach

has not been welcomed by hospitals, and consultants remain militant after the rejection of recent contract proposals. A new payment system for GPs would lead, if accepted, to them receiving up to 40% of their income from bonus payments for achieving clinical, managerial and patient satisfaction targets (Department of Health Press Release, 2003).

The constraints of the current gaps between capacity funding and policy targets are also producing UK attempts at a radical alteration of skill mix. Use of nurses in general practice increased substantially as a result of the 1990 contract, where fee-for-service and bonus payments for GPs led to them to employ nurses to generate income. These innovatory practices soon became instituted, some with very little evidence base and lacking evaluation of impact. In some circumstances nurses diagnose, treat (with freedom to prescribe from a controlled formulary) and refer patients to hospital, often with substantial discretion.

Recent substantial expenditure increases have produced a determination to alter skill mix and to encourage it with new training initiatives (e.g. to boost the number of nurse prescribers), central incentives driven by the government's Modernisation Agency and in some cases with the support of Royal Colleges (e.g. Royal College of Anaesthetists and NHS Modernisation Agency 2002).

This short-term expediency is necessary if current (three year) targets are to be achieved. Absence of systematic planning beyond this time horizon makes for some robust challenges over the next ten years, as nurses take on many physician tasks and medical school production is raised by one third.

7.6. Overview

Turbulence in the world economy, generated by stock market falls and the possibility of war in the Middle East, may engender fiscal parsimony in these five and many other countries, including Canada. The UK fiscal imbalance has increased to £30 billion. Pressure is seen in Germany and elsewhere in Europe for higher taxes and cuts in public expenditure. Greater scrutiny of funding levels and growth pressures will need to be accompanied by more rigorous control of demand and by measures to improve the performance of health care providers.

We may soon see the issues of skill mix and incentives move nearer to centre stage in health policy, despite relative neglect for decades by workforce planners worldwide. The restrictive working practices of professionals relate both to fee fixing and to adopting differing skill mixes and provider settings.

Specialised 'hip factories' are a prime example of the latter, as are UK Diagnostic and Treatment Centres, capable of providing efficient day surgery and located in easily accessible town centre locations. Scrutiny of these labour market changes may highlight the potential benefits of using anti-trust policy to liberate these practices.

8. The way forward

Given the limited nature of health human resource planning in the five countries reviewed, how can policy and practice be improved? The general lesson from the country case studies is that, with the exception of Germany, where workforce planning is absent, recent practice has been incomplete.

Figure 1.1 above shows the assumptions made about medical workforce supply in the other four countries: the stock of doctors is added to by medical school intake, supplemented by immigration. Losses to the doctor stock include deaths in service, retirement and emigration. Changes in participation, such as people taking career breaks and/or returning to work in medicine also influence the overall size of the medical workforce. Forecasts are made about physicians by physicians, and the process is dominated by physicians. Estimates of future demand in these four countries (Australia, France, Sweden, UK) are based on static assumptions about doctor: population ratios and population forecasts.

To improve existing forecasting practice, there is a need for improved data collection for each of the flows, in terms of quality and quantity. The data collected should be used to model the flows more frequently, subjecting the estimates to sensitivity analysis including costing of the policies inherent in the generation of the flows. Such costing would facilitate identification not only of the opportunity costs of particular policies (e.g. reducing emigration, increasing immigration, investing in labour force retention (of women over the life cycle and of men and women nearing retirement) and investing in medical schools, and also inform choices between these policies.

The existing inadequate workforce forecasting work has to be radically refocused away from a physician dominated myopia to include estimates of the determinants of labour supply, estimating the elasticity of labour supply for provider groups, and to broaden views beyond the medical profession. It may also be possible to deploy vigorous competition policy to break down divisions in the workforce market, for example prohibiting groups of physicians and dentists to restrict entry competition from nurses, non-physician clinicians and dental assistants.

There is a need for recognition that financial incentives affect both the supply of effort by practitioners and the acceptance of charges in the skill mix. With physicians paid fee-for-service (as in Canada, Australia and Germany) development of skill mix, for example nurse substitution, is an immediate potential challenge to physicians' income. This negative incentive may reinforce physician resistance to skill mix development. Where such resistance is overcome by purchaser pressure (e.g. managed care in the USA) there is a risk that physicians will continue to control the care process, using non-physician clinicians as complements rather than substitutes (Druss et al, 2003). Amelioration of these market imperfections requires continued application of competition policy, and a better mix of payment systems to balance incentive structures (Robinson 2001).

The resistance to skill mix change in Australia contrasts with the behaviour of British physicians, especially general practitioners, whose income is not directly threatened by the use of other skill groups. There is evidence that nurses can substitute for doctors, particularly in primary care (Horrocks et al 2002, Richardson et al 1998) Indeed, given the UK GP contract, nurses can generate GP income by providing reimbursed services (e.g. immunisation, cervical screening, health promotion) as substitutes for doctors. Substitution is also potentially efficient in hospital care, for example the use of nurse endoscopists, which is undergoing substantial research in the UK, and the use of nurse anaesthetists, which is developing rapidly (Royal College of Anaesthetists 2002).

There is a need for collection, validation and use of activity data at the level of the individual physician. This is beginning in England, with use of Hospital Episode Statistics at the level of the consultant surgeon (Bloor and Maynard 2002). Risk adjustment systems and improved performance indicators should be developed over time as a supplement to activity data, in order to identify and manage variations. Such management, alongside financial and non-financial incentives, may reduce the variation in the distribution of activity of physicians and/or shift the whole distribution. One goal of this investment is to maximise activity by employed physicians and to minimise the need to manipulate migration, medical school investment and other expensive policy interventions.

The effective management of physician activity could have adverse effects on the quality of health care delivery. Quality, like beauty, can tend to be in the eye of the beholder. The medical market place, both public and private, has demonstrated an unwillingness to ensure adherence to protocols of best (cost-effective) practice. These process difficulties have been compounded by an absence of outcome measures that demonstrate, to quote Florence Nightingale, whether patients are "dead, relieved, or unrelieved". The problems of case mix adjustment and small numbers make analysis of mortality difficult, but not

impossible (Jarman et al, 1999; Dr Foster 2003). Routine linking of health service and population mortality data (i.e. registration of deaths) offers some potential for longer-term exploration of mortality quality analysis.

However, as most patients survive encounters with the health care system, the policy challenge is to explore the validity and sensitivity of routine health related quality of life measures such as SF36 and EQ5D. The only known routine use of SF36 to determine the quality of outcomes is the innovatory work of the UK's British United Provident Association (BUPA) who deploy SF36 in hospital and three months after discharge from treatment of largely elective surgery interventions. (Vallance Owen and Cubbin, 2002)

The basis of current physician workforce planning is incomplete and mechanistic, using fixed ratio relationships that have no empirical validity (e.g. the UK has targets of one GP to 1800 patients, which dominate estimates of the 'demand' for doctors, despite arguments that with increasing nurse employment, a GP might be expected much larger list sizes (Marsh 1991). These ratios, and the application of policies such as the European Working Time Directive, are used without careful consideration of costed policy options such as changes in skill mix and improved incentives, which could produce additional activity without training new doctors. This continued behaviour may be a product both of unthinking habits and the desire of the medical profession to resist changes in skill mix.

That such behaviour is tolerated by regulatory authorities in all countries is a reflection of the political sensitivity of unrest amongst medical practitioners. Conflicts of this type can seriously damage governments, both directly by threats of withdrawing services, and indirectly by failing to collaborate in the pursuit of policy objectives.

Finally, the limited nature of workforce planning has continued because of a combination of the ignorance of policy makers about the merits of a more empirical, comprehensive and economic approach, and the failure of economists and other researchers to convince policy makers that different methods may be productive. Canadian, British and other academics (e.g. Lomas, Stoddart and Barer 1985, Maynard and Walker 1977) have criticised existing practice for many years, but failed to achieve substantive shifts towards more quantitative and methodical approaches.

9. Conclusion

Workforce planning is remarkably consistent across countries and health care systems. This consistency appears to be the product of the conservatism of policy makers, constrained by the political reality of the health care market place, and of limited appreciation of economic issues in the health labour market. Internationally the medical profession has used its market power to maintain high relative levels of remuneration, high rates of return to investment in medical education over the life cycle, and substantial professional autonomy. The latter has ensured continuation of various well-known phenomena, such as variations in medical practice, delivery of inappropriate care and the lack of systematic measurement and management of health outcomes and medical errors (IOM 2000, Vincent et al 2001, Baker and Norton 2003). These problems have been well described for decades but not managed in any health care reform process worldwide.

Development of more integrated and systematic workforce planning policies in Canada and elsewhere will be complex, but could have profound influences on skill mix and utilisation of the whole health care workforce.

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