12 A research base for professional staffing of health services

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Historical roles in health care are changing. This is partly driven by changes in care itself; the clinical role is becoming more complex and demanding, and workloads are ever increasing. Some role changes, however, are due to more fundamental changes in the expectations of whole sectors of the health service. Primary care is shouldering an increasing share of the burden of care at a time when it is being asked to lead commissioning and to undertake research for evidence based medicine.

These changes might be forced in the years to come by changes in medical staffing. Applications for medical posts in primary and secondary care are declining, and many younger doctors are opting either to leave medicine altogether or to take on a lower time commitment than their predecessors. Equally nurses are leaving the profession because they do not think that their skills are being used to best effect, and they are frustrated by not being able to nurse patients properly

This chapter looks at the changing roles of doctors and nurses; it proposes and defines health care teams that will be necessary if we are to adjust to the changing realities of patient care. We will then discuss the implications for primary care, with a final look at the trends in the secondary care medical workforce that will have an impact on the wider picture.

The changing roles of doctors and nurses

The boundaries between the work of doctors and nurses are changing in every health care sector because of a complex range of

factors. One reason put forward by many commentators is the move to more cost effective care through substituting expensive professionals with less expensive, competent workers,[1] while others cite quality improvements that occur when tasks are shifted from one group to another.[2] Shifts of boundaries are often precipitated by increasing workload in one group. Recently advances in medical technology and changes in junior doctors' hours[3] and in the training of specialists[4] have noticeably impacted on the provision of acute hospital care. Equally the move in the 1980s of education of nurses from an apprenticeship model to higher education left a large gap in the nursing workforce to be filled by unqualified health care assistants and other support workers.[5]

It must be acknowledged that such profound shifts in roles, responsibilities, and working patterns are based on expediency and pragmatism rather than effectiveness,[6] with few studies examining, for example, doctor-nurse substitution.[7] It has been observed, however, that to the superficial logic that nurses are cheaper than doctors must be added the cost of supervision of nurses by doctors, the volume of activity, and the difference between salary (doctors) and fixed payments plus overtime (nurses).[6]

Early studies have shown that a large proportion of tasks performed by doctors—perhaps up to 70%—could be undertaken by nurses without adverse effects on patient care.[6] These studies are, however, usually single site with small sample sizes and no randomisation; and outcome measures are suspect as are the representativeness of the doctors and nurses involved. Recent studies in the United Kingdom have, however, supported the earlier general conclusions.[2 7 8] Nurses taking on medical work improved patient care and improved junior doctors' job satisfaction[2]; nurse led inpatient service for elderly patients was effective[7]; but nurse substitution for junior doctors (the "watered down doctor" model) led to unsatisfactory nurse roles if the nurse-doctor roles were not integrated.[8]

Studies of substitution of care by those not trained in nursing have, on the other hand, found that reducing the number of qualified nurses had an adverse effect on quality of care and patient outcomes.[9-11] It would seem, therefore, that one professional can be substituted for another provided proper training is given—though doubts remain about cost effectiveness when supervision and volume of work are considered—but when professional work is given to untrained staff without proper support, quality of care declines.

The central concern must be how the movement of tasks and responsibilities makes sense in terms of the overall delivery of care to patients. Essentially, if doctors and nurses are to be perceived as highly skilled technicians on a health service conveyor belt then a model based on economically efficient skills training is required; if, on the other hand, multiskilled teams are to be responsible for providing care then several basic principles must be laid down, defining who does what, why, and with what support and training.

Movements of tasks at the boundary can have undesirable consequences. Short[12] and Bradshaw[13] both write about the loss of basic nursing skills such as caring for frail, sick, and vulnerable patients in favour of a high flown, pseudo academic approach to nursing. The tension between old and new roles, evident on both sides of the boundary (S Pembrey, personal communication)[14] can lead to a lack of team work and a vacuum in the delivery of care in the front line team in acute hospital care and in the community.[15]

It must be clear from the onset if a substitution is task or role based. If it is task based then any technically competent person can be trained to substitute—for example, phlebotomists, surgeons' assistants, and treatment room nurses. If, however, more than a set of tasks is being substituted then much greater clarity is required in understanding the impact such shifts will have for those involved—for example, nurse practitioners, nurse specialists, and nurse led units.

The underlying principle should be that most interventions should be devolved down to the level where competency equals cost effectiveness. This will happen only if doctors and nurses are encouraged constantly to improve their own performance, apply more innovative ways of caring for people, and are committed to sharing their knowledge and skill. They will require an understanding of the complementary range of skills and abilities of the members of their health care team.

Care can then be delivered by small teams of highly skilled professionals, all expert in the care of, for example, diabetes, supported by a pool of generic workers. In replacing those roles defined by internal boundaries such as ward sister, such a team would acquire flexibility in responding to patients' needs. Some characteristics of such teams, based on integrated professional roles, can be described.

Integrated professional roles

Doctors and nurses working in health care teams must move away from routine responses in solving clinical problems to formulating those problems in a series of answerable questions, the solutions to which can be implemented in practice. The contribution of all members of the health care team must be considered in determining the effective implementation of solutions into practice. Teams will require the ability to integrate epidemiological and biostatistical skills with clinical experience to ensure that the correct questions are asked, that available evidence can be located in the research literature, and that their actions are evaluated.

Such a move to evidence based health care is intellectually and economically appealing but requires the erosion of the model in which doctors develop guidelines while nurses and therapists carry them out.[16] All professionals will need to undergo training in evidence based health care, and their new skills will need to be integrated into existing initiatives on shared learning between professions.[17] Shared learning offers greater benefits than intellectual or technical understanding—it has been effective in modifying attitudes and perceptions and introduced reflection, evaluation, critical appraisal of practice, and an understanding of team work.[31]

The move to shared learning has been facilitated by an understanding of core competencies—the artistry, intuition, and moral qualities in delivering care; interpersonal and communication skills, networking, managing confidentiality, and openness; forming cooperative relationships and handling conflict—and organisation changes such as the devolution of training budgets to health authorities; more flexible work practices; the commitment to evaluating the effectiveness of continuing professional development; and the move to evidence based medicine throughout the health service.

Such teams will require supervision just at the time that traditional implicit and informal means of supervising inexperienced staff are being dismantled.[18 19] As the traditional role of the ward sister changes more medical supervision of junior doctors will be required just at the time that their hours are reducing causing more tasks to devolve to nurses. As resources are limited and workloads are increasing the best intentions of clinical supervision of these nurses are being compromised.[19] New

systems of mentors, both medical and nursing, to supervise mixed groups delivering particular aspects of care will be required.

The logical consequence of shared learning, shared supervision, and greater teamwork is a review of the career pathways of professional groups, leading to integration. With increasing specialisation experts from a number of professional backgrounds will emerge as natural leaders with, for example, nurses leading in cardiac rehabilitation, incontinence care, or palliative care. Skills will need to be recognised in terms of remuneration and relationships with colleagues.

Some organisations have been able to integrate medical and nursing roles in an exemplary way, with roles and relationships determined after a careful analysis of how best to provide a service centred on patients' needs. Such initiatives as patient centred hospitals, managed care, and care management have attempted to move professionals from traditional to more integrated roles. Such changes do, however, require a supportive organisation, key members of which have an evidence based philosophy.

Such an organisation will develop an evaluative culture,[20] and this will require an augmentation of the few current methods of measuring outcomes.[6] The move from unidisciplinary to clinical audit and the requirement that national guidelines are multiprofessional in construction, however, will ensure that evaluation has a multidisciplinary perspective. As health service contracts specify levels of care and price, the professionals will need to agree the core ingredients, their quality, and the required competencies for each package of care. This will lead to shared accountability.

Lastly, the clinical care team is increasingly working towards patient centred care. Consumerism is a national phenomenon, and evidence based health care will provide more detailed information about treatments and clinical effectiveness and will make choices including rationing more explicit. The partnership between patients and professionals must, however, be protected to ensure that compassion, integrity, and human caring are not squeezed out. Patients in need of treatment will always be in a vulnerable position as will people who need nurses to look after them.

Skill requirement and organisation in primary health care

These conclusions concerning the movement of boundaries and new methods of team working apply in primary care as well as in

acute hospital settings. General practitioners are increasingly using practice nurses to substitute for their increasing workload, with preventive care, chronic disease management, and triage becoming nursing tasks. The nature of general practice—owned and largely managed by doctors who are independent contractors—and its central role in the delivery of primary care, however, offer special opportunities and problems. The past decade has seen both the worst and the best of general practice. From the debacle of the new contract[21] through primary care commissioning and fundholding[22] up to the aspiration for a primary care led health service,[23] general practice has ridden a roller coaster which seems at times to defy gravity and reality. The increasing pressure to practise medicine in which decisions are supported by evidence is occurring in primary care as well. Yet primary care used to rely on others—notably hospital doctors—to supply it with evidence. The inadequacy of this approach can be illustrated by the use of anticoagulation in atrial fibrillation.

A review undertaken by Sweeney and colleagues has shown that the trials that demonstrated the benefits of anticoagulation in atrial fibrillation were conducted on small groups of heavily selected patients in secondary care.[24] It has to be questioned whether this evidence applies to the general population. Until they know better practices will continue to act on the available evidence, but there is an urgent need for evidence from and relevant to the primary care setting.

The research base in primary care has been established only recently. It consisted at first of a few research entrepreneurs who happened to be general practitioners, for example Jenner with his work on a vaccine for smallpox and Mackenzie who undertook seminal research in cardiology. Pickles showed the potential for primary care epidemiology by studying infectious diseases in the Yorkshire dales and was the first researcher of note to be recognisable as a general practitioner of today.

It was not until 1956 that the first university department of general practice was established—in Edinburgh—and 1963 before the first professor of general practice—again in Edinburgh. The first chair in England was created in Manchester in 1972, and by now all British medical schools except Oxford and Cambridge have a professor of general practice. The funding for academic general practice has never been very secure and curriculum time has had to be fought for.[25 26] The General Medical Council's (GMC) document *Tomorrow's Doctors* puts increasing emphasis on

community based teaching and the new proposals for service increment for teaching (SIFT) plan to move resources into primary care teaching. Just as general practice confronts the challenge of generating the evidence to underpin its discipline, it is taking on an increasing role in undergraduate education.

Primary care needs a cohort of skilled researchers. Yet its medical and nursing career structures, unlike those for hospital doctors, do not encourage or value research skills. The old regional health authorities have confronted this problem up and down the country, and various solutions have been proposed.

One model, exemplified by the Trent Focus for the Promotion of Research and Development in Primary Care, is to assist primary care workers to access research training and support. Trent Health has invested £0.5m over two years to offer a region-wide service that offers assessment of educational need, finds and funds research skills training, and offers a support service for early research endeavours. The advantages of this service is that it is available to all primary care workers in general practices or community units.

The Northern region and the South West region have adopted a model that identifies, funds, and encourages a network of research practices. A limited number of general practices, usually with a proved track record of research, are funded for protected research time. The time bought can be that of a general practitioner, practice nurse, or "the team". This model has the advantage that the support is focused on the unit in which the research will occur; it will encourage a research culture in those practices. It does, however, offer a limited vision of the location and mode of future research in primary care. Whichever method is chosen the key understanding is that without support and encouragement primary care cannot miraculously develop a research base to meet its needs.

The rapid changes in primary care have raised questions concerning its staffing and organisation. We are aware of the pressures on recruitment that are building up; vocational training schemes have decreasing numbers of applicants and already practice vacancies lie unfilled.

If general practices are to fulfil the increasing clinical expectations of patients and the health service, while still leading commissioning and education, they will need to review their organisation. There is a need for *real* practice managers—not just puppets who will do the doctors' bidding but managers with the

skills and mandates to run the business side of the practice. In some practices the manager is now a partner—an appropriate recognition of a key role which frees doctors and nurses from much of the bureaucracy to concentrate on clinical care and the strategy for management.

As practices begin to resemble the health care teams described in this chapter they will become fit to assume a central role in the health service. To do so effectively they must have the skills and resources to develop their research base, and they must develop the clinical and managerial roles within their primary care teams.

Medical career patterns and choices in secondary care

Amid the trend toward role substitution and boundary blurring there still exists a dearth of information about career patterns and choices of individual people who actually become doctors and nurses. The evidence on hospital medical career patterns and choices typifies the lack of data, which is even more acute for general practitioners, nurses, and professions allied to medicine.

On 30 September 1993 NHS hospitals in England and Wales employed 17 560 consultants 4118 senior registrars, 6803 registrars, and 12 851 senior house officers; in addition in public health there were 125 directors of public health, 366 consultants, 388 senior registrars and registrars, and 27 senior house officers; and in general practice there were 27 991 unrestricted principals, 149 restricted principals, 517 assistants, and 1653 trainees.[27] A total of 72 552 people.

In the autumn of 1993; 11 671 people applied through the Universities and Colleges Admissions Service (UCAS) to study medicine, of whom 4739 entered United Kingdom medical schools. To understand the careers of these future doctors we need to have data on career patterns throughout the health service; and we need to define and create new working teams both in acute care and general practice.

It would seem a self evident truth that any organisation training nearly 5000 people a year, and (including Scotland and Northern Ireland) employing nearly 100 000 highly trained specialists, would have a sophisticated mechanism in process for monitoring the careers of these vital personnel, for predicting future needs and possible excesses or shortfalls, and for deciding numbers of new trainees. And certainly no company of comparable size—Marks

and Spencer, Sainsbury's, British Airways—would dream of not having a highly organised personnel department, observing the pleasures and the discontents of its staff, tracking their movements, and anticipating potential problems that might impair the viability and effectiveness of its workforce.

Needless to say, the NHS has almost no such mechanisms in place. Excluding the annual statistical compilations quoted above little else is published about the NHS workforce, and probably little else is collected or analysed. Indeed data from general practice are so poor that primary care cannot, unfortunately, be discussed here.

This dearth of data creates a serious problem for assessing the *scientific* basis of medical career patterns and choices. Science requires data, and they are in short supply for medical career patterns. The problem is clearly seen with one of the major changes in the medical workforce in the past three decades—the rapidly increasing proportion of women doctors. Figure 12.1 shows the proportions of women doctors at various career levels since 1963. Proper annual statistical compilations have actually been published only since 1977,[28] and before that the data are based on occasional ad hoc requests from individual researchers.

One might then compare the proportions of women in different grades and claim that women do not enter the higher echelons of hospital medicine as quickly as they might or ought.[29] This simplistic analysis ignores the fact that a typical consultant, aged perhaps 48, would have entered medical school nearly 30 years earlier. The inertial mass of consultants in post therefore means it will take many years for new female medical school entrants to impact on the overall proportion of female consultants. A crude model can be fitted by plotting the proportion of female doctors at each career level as a function of the average year that they probably entered medical school. Figure 12.2 shows a very different picture from figure 12.1. To a first approximation the proportion of women at all stages of hospital careers increases in parallel with the numbers entering medical school—a conclusion with rather different implications.

But even this conclusion is problematic. Figure 12.2 tries to ask what happened in individual careers by assuming that they are all similar and then guessing at many crucial parameters in the model, whereas modelling them properly requires detailed information on their development. And here lurks the principal scientific conclusion of this analysis: *medical careers, which*

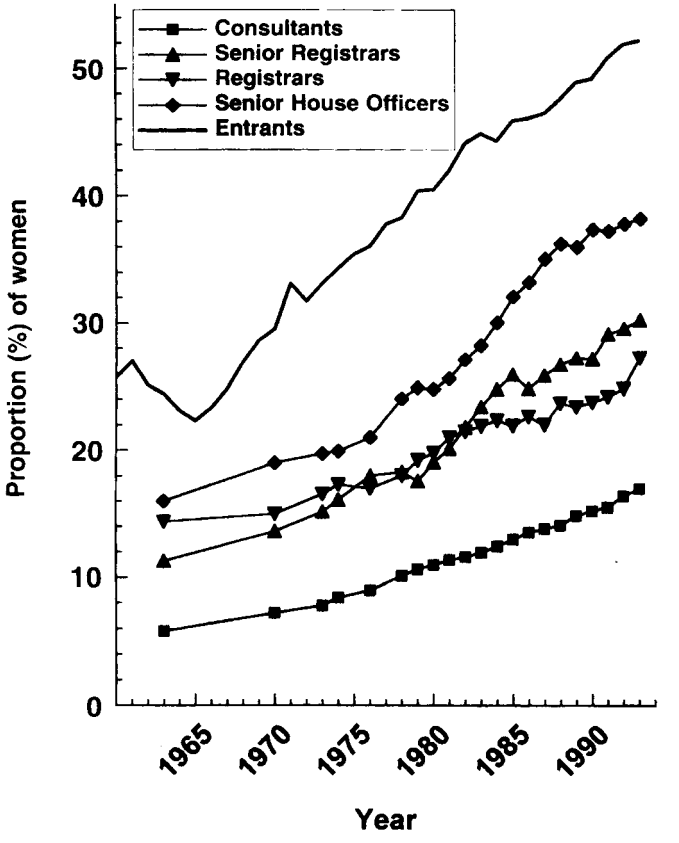

Figure 12.1 The proportion of women in NHS hospital career posts in England and Wales from 1963 to 1993 (C McManus and K Sproston, personal communication). Graphs of this sort have been used to argue that women continue to be underrepresented in hospital careers.

necessarily develop in time, can be modelled properly only from longitudinal data collected through time. And it is those data we do not have. This is surprising as every doctor in the United Kingdom has a General Medical Council registration number, and every hopsital employer has to ask doctors for that number. Tracking the careers of individual doctors ought therefore to be straightforward; it merely seems never to have been done—making planning of the medical workforce nigh on impossible.

The problem lies deeper still. Medical careers start on entrance to medical school, when many decisions are made about careers.

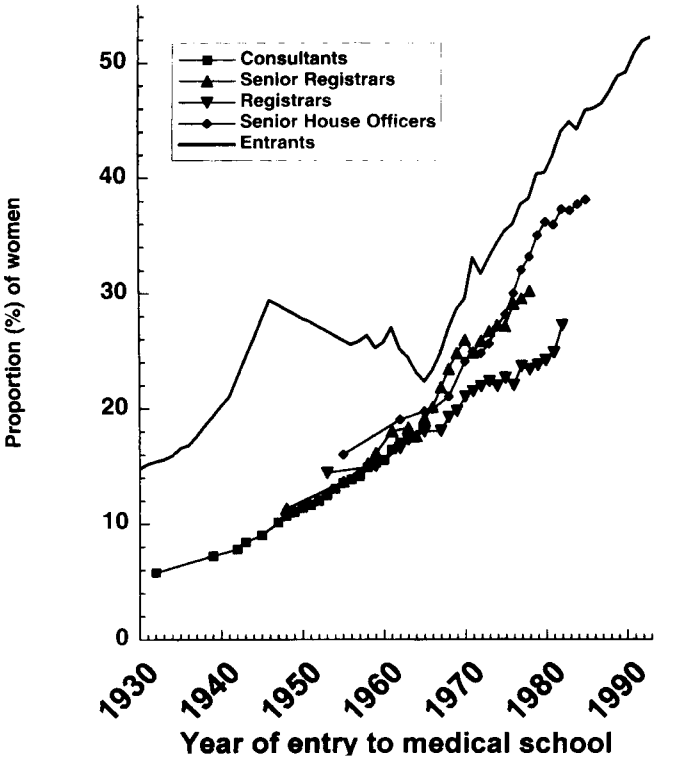

Figure 12.2 The proportion of women in NHS hospital career posts in England and Wales, 1963–1993, plotted in relation to the estimated median year of entry to medical school. The registrar data are somewhat anomalous. In all other groups, however, it is apparent, firstly, that the proportions of women at senior house officer and senior registrar level are broadly equivalent to those at consultant level, and, secondly, that in relation to the proportion of women entering medical school the proportion holding consultant and other career posts in hospital medicine has been rising across the cohorts.

Medical school entrants are not a tabula rasa—they bring with them opinions, attitudes, beliefs, and prejudices, all of which influence career decisions. Returning to the theme of women in medicine, table 12.1 shows not only that few of the final year medical students and preregistration house officers who want to go into careers in surgery are women, but that the same is true of **applicants** to medical school; the implications for increasing the numbers of women surgeons are substantial.

Table 12.1 Proportions of female medical school applicants, final year students, and preregistration house officers choosing a particular speciality as their first choice of career. For some specialities there are small numbers overall, and cohorts have been combined where necessary.

Specialty	Applicants*			Final year students		Young doctors†	Preregistration house officers‡
	1981 (n=1014)	1986 (n=1849)	1991 (n=5074)	1981 (n=307)	1986 (n=372)	1966 (n=1453)	1969–75 (n=17 762)
Hospital medicine	52.7% (112)	52.7% (461)	63.5% (1711)	41.8% (79)	51.4% (111)	18.3% (169)	43.2% (3606)
Surgery	24.3% (124)	27.3% (399)	33.6% (1204)	18.9% (37)	25.0% (68)	6.0% (200)	18.9% (2877)
Obstetrics and gynaecology	69.0% (42)	72.5% (160)	75.3% (320)	44.7% (47)		29.5% (105)	59.5% (586)
Anaesthetics	50.0% (26)		34.6% (52)	35.7% (14)		39.6% (106)	55.3% (941)
Pathology	37.5% (88)		53.5% (101)	42.9% (7)		30.9% (55)	59.5% (586)
Radiology/ radiotherapy	53.6% (28)			45.5% (11)		30.8% (26)	62.7% (480)
Psychiatry	42.9% (21)	61.3% (106)	61.7% (298)	35.7% (42)		20.3% (64)	55.1% (604)

*Total n at top of column refers to the overall number of subjects responding to the questions on career preferences. Individual numbers in parentheses after percentages refer to number of subjects who named the particular subject (1986, 1991) or who said they had a definite intention of going into the career (1981). The questionnaire also included other careers which are not included here.

†Based on data of Last and Stanley.[30]

‡Based on data of Parkhouse *et al.*[31]

Longitudinal research on medical career patterns must be long term; follow up from entry to medical school to, say, consultant appointment, necessarily takes 20 plus years, and few funding bodies can think in such terms. Table 12.2 shows the time scales for three current cohort studies by one author (C McM)—a study started in 1980 stretches into the next millennium before all its useful data will be realised.

Training a doctor costs somewhere between the £40 000 estimated in Hansard in 1987[38] and the £200 000 claimed more recently.[39] If a middle estimate of £120 000 is applied to 4500 medical students the total cost is about £600m. Though a modest percentage of this sum would fund the required studies, no one regards this research as their responsibility. The Medical Research Council simply says it is not within its purview; the Economic and Social Research Council is notionally responsible for education research, but its overall budget is pitifully small, and primary and secondary education inevitably have a higher priority; until recently the Department of Health regarded responsibility as lying with the Department of Education, and for it medical education was but a tiny part of its interest. Some charities such as the Leverhulme Trust and Nuffield Foundation have funded some research in medical education, but they can hardly be expected to shoulder the responsibility alone.

Fortunately the Department of Health is now considering a "small research programme" on postgraduate medical education, and the NHS Executive is beginning to ask questions about the effects of undergraduate training. But it is still precious little on which to build a serious science base for understanding medical careers. In the absence of any hard data on careers, we must look at the changing roles of doctors, nurses, and teams and work towards ensuring more appropriate funding for understanding career patterns in each of the professions.

Conclusions

As the boundaries between roles evolve we need to establish new working relationships based on teamwork rather than hierarchies. Such teams will need to have the skills to base decisions on evidence, to share responsibilities, and to evaluate their effectiveness. Nowhere will this be more important than in primary care, where teams of doctors, nurses, and therapists are already struggling to define new working practices.

Table 12.2 Brief details of the three cohort studies of medical student selection and training and the time scale over which such studies must necessarily work.

Detail	1981 Cohort[32–35]	1986 Cohort[35–36]	1991 Cohort[37]
Applicants to	St Mary's	St Mary's	St Mary's, UMDS, UCL, Sheffield, Newcastle
Entrants to	Any United Kingdom school	Any United Kingdom school	Any United Kingdom school
Year of:			
Application	1980	1985	1990
Entrance	1981	1986	1991
Qualification	1986/87	1991/92	1996/97
Five years after qualification	1991/92	1996/97	2001/02
Ten years after qualification	1996/97	2001/02	2006/07
Twenty years after qualification	2006/07	2011/12	2016/17
Thirty years after qualification	2016/17	2021/22	2026/27
No of applicants in study	1478	2399	6901
Proportion (%) United Kingdom applicants	12.6%	24.7%	~71%
No of entrants	517	871	2962
Proportion (%) United Kingdom entrants	12.9%	22.7%	69.7%

UMDS=United Medical and Dental Schools of Guy's and St Thomas's Hospitals.
UCL=University College London.

If, however, the current career patterns of doctors persist the supply of doctors will largely determine the pace of evolution. All clinicians in the health service need to prepare now for new team based working practices. But, most importantly, the health service managers need to be commissioning research that will forewarn them and their clinical colleagues about demographic changes which will dictate the pace of change.

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