Health workforce design for the 21st century

Stephen J Duckett

Abstract

The Australian health workforce has changed dramatically over the last 4 years, growing in size and changing composition. However, more changes will be needed in the future to respond to the epidemiological and demographic transition of the Australian population. A critical issue will be whether the supply of health professionals will keep pace with demand. There are current recorded shortages of most health professionals, but this paper argues that future workforce planning should not be based on providing more of the same. Rather, the roles of health professionals will need to change and workforce planning needs to place a stronger emphasis on issues of workforce substitution, that is, a different mix of responsibilities. This will also require changes in educational preparation, in particular an increased emphasis on interprofessional work and common foundation learning.

THE CURRENT STRUCTURE of the Australian health care workforce represents the logical outworkings of a process of professionalisation which commenced in the late 19th century and was consolidated by the mid 20th century. This process was characterised by a struggle for autonomy from the medical profession by other occupational groups,[1] an increased scientific base for training programs, and a consequent move to university and degree status for preparation for most of the health professions.

There have been dramatic changes in health care since the occupational structure of the work-

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What is known about the topic?
The health workforce is growing and there are perceived shortages in many health professions. Continuing increases in the need for health professionals are predicted.

What does this paper add?
Substitution between medical practitioners and other health professionals and between health professionals and para-professionals is a crucial opportunity for the future. Different substitution models are possible.

What are the implications?
Health workforce planning needs to change to take account of potential substitution. Managers need to think about different workforce configurations within their own organisations. Educators need to change the monoprofessional basis of education programs.

force was consolidated, including changes in payment mechanisms, the incidence and treatment of diseases and in the organisation of health care. Incremental change in the educational preparation of health care workers is probably no longer an appropriate response to the major challenges facing the health system and its workforce. This paper outlines a new approach for preparing the health workforce.

The Australian health workforce today

The health sector in Australia accounts for 6.7% of the employed workforce, smaller than the health share of gross domestic product. Health professionals account for 43% of employment in the health industry (other groups include managers, cleaners, social welfare professionals, people in trades, and so on). Nurses comprise the single largest health profession, accounting for just over one-quarter of all health industry employment. The health workforce is predominantly female (77.4%), although the higher income professions tend to be male dominated: 79% of specialist

medical practitioners are male; males make up 59% of generalist medical practitioners, compared with 8% of registered nurses and 18% of physiotherapists.[2]

The health workforce has grown substantially over the last 40 years. The 1961 census, for example, recorded a total 72 598 health professionals (that is, people with health professional qualifications, whether employed or not), 56% of whom were registered nurses, 16% medical practitioners, and the remaining 28% all other health professionals. By 2001, the health workforce had quadrupled to 291 604 with nurses now accounting for 59%, medical practitioners 17%, and others 24%. The number of health professionals per head of population increased from 6.9 per 1000 population in 1961 to 15.4 per 1000 population in 2001.[2]

The health workforce is now characterised by a large number of separate professions, each with a different course of preparation, a different emphasis in practice and, to some extent, a different ideological foundation in terms of the way in which the profession interacts with other professions and with patients or consumers. The workforce has changed dramatically over the last 20 years with increasing specialisation both within professions (for example, additional specialisations in medicine and nursing) and also by the creation of new professions. To some extent, this specialisation has led to increased quality of care as individual professionals have been able to develop in-depth knowledge and skills across a narrower range of areas.[3] However, by the late 1990s there was recognition that this increasing specialisation may have a downside in increased coordination costs, leading to inefficiency and problems of continuity of care.

The changing context for the workforce

The context within which the health workforce operates is changing. Life expectancy in Australia has been increasing steadily over the last century, increasing by 3 years for females and 4.5 years for males over the period 1981–1998. However, disability-free life expectancy has declined for both males and females: about half to two-thirds of the increase in life expectancy entailed a period of severe handicap.[4] This trend of increasing severely handicapped expectancy is also apparent in the figures for trends in health expectancy at age 65.

The increase in years lived with disability changes the nature of the demand on the health system. Chronic disease, by definition, cannot be cured by a pharmacological solution — the so-called magic bullet. Rather, chronic disease needs to be managed over its course, drawing not only on the skills of medical practitioners and nurses but also the skills of the range of professions that have emerged over the last century, including physiotherapy, occupational therapy and social work. As more separate workers are involved in the care process, this increases the demand for different forms of practice involving coordination, integration and teamwork.[4] Further, because chronic disease continues over a long period, its increasing prevalence places a concomitant requirement on systems to improve continuity of care between the professionals involved and to ensure that the consumer is able to develop an ongoing relationship with the care team.

As well as living longer (and living longer with chronic disease), the Australian population is growing and the elderly population over 75 is growing faster than the population as a whole. The impact of this on health services is complex. During the 1990s, hospital admissions of the "old old" (those over 75) almost doubled (increase of 89%), but because of the decline in length of stay, bed-days only increased by 12%, and there was a 10% decline in the rate of use (bed-days) per thousand population over 75.[5] If these trends continue, despite the decline in rates of use the increased numbers of elderly will lead to increased demand for care and for the skills necessary to manage chronic disease.

In addition to the epidemiological and demographic transition, the environment for the health workforce is also changing because of wider social trends, in particular the impact of changes in information and communication technologies (ICT). ICT changes impact on the way in which

health professionals interact with consumers, with other professionals, and with payers. ICT is changing the knowledge base of consumers, especially those with chronic conditions, and contributes to empowerment of consumers, thus changing the relationship between the professional and their client. ICT applications to the health sector are still in their early stages, and there has been little rigorous demonstration of clinical or economic benefits of these new applications, although the potential is clearly great.[6]

Anderson and Stenzil[7] have claimed that developments in ICT could lead to "a real increase in physician productivity of 50% or more over the next 10–20 years … (including by) substituting 'e-visits' for office visits" (p. 3). ICT development could lead to improved patient-to-provider communication, including the use of web-enabled telephone triage providing advice by telephone to potential patients to assist in determining the appropriate response to their health care needs. The most noteworthy of these internationally is NHS Direct in the United Kingdom.[8] The first large-scale Australian call-centre development (Health Direct) was established in Western Australia in 1999 with promising results.[9]

Multidisciplinary care plans which systematise the treatment and care processes are increasingly part of hospital and ambulatory care.[10,11] ICT-facilitated access to state of the art care paths and protocols changes the nature of the required educational preparation for health professionals. Currently, professional education is based on a "just in case" model of attempting to acquaint students with skills and knowledge to prepare them for a wider range of conditions than might possibly be faced in practice. In the future, service delivery (and provider knowledge) could be on a "just in time" basis where care protocols can guide the professional through the diagnosis and treatment process.

Supply and substitution: critical issues for the future

Each of the major health professions is facing major challenges to their *modus vivendi* in the early years of the 21st century, particularly realignment of responsibilities among the professions and adequacy of workforce supply.

A review of nursing education in Australian universities in 1994[12] identified a range of policy issues affecting the nursing workforce, including labour force planning, career pathways and educational preparation. In its report, the review made a large number of recommendations for change and development that received little policy attention. National policy interest in nursing was reawakened in 2001 with two inquiries being established, one by the Senate[13] and one by the Commonwealth government.[14] Both national reviews recognised there were significant problems in workforce planning for the nursing profession. The 2002 National Review, for example, highlighted (p. 107):

■ the lack of long-term planning for the health workforce and nursing specifically;

■ fragmentation of the responsibilities for different aspects of nursing and nursing education.

Both reviews identified critical shortages of nurses (see pp. 14–17 and 48–52 of the Senate report and pp. 188–9 of the 2002 National Review). The extent of the shortage of general nurses has been estimated at between 6500[15] and 40 000[15] by 2010, the range being symptomatic of the parlous state of workforce planning in the sector. Shortages of nurses are also reported in the USA and in other countries.[16,17] Given the international migration of nurses, recruitment of Australian nurses to work overseas might exacerbate the forecast shortage. Response to the shortage has included provision of only 610 additional nursing places in universities (210 in response to the Nelson Review of Higher Education and 400 places focussing on aged care) but, given the magnitude of the forecast shortage, restructuring of the workplace and changing demand patterns for nurses must also be considered. This may be facilitated through a new Nursing and Nursing Education Taskforce established by the Australian Health Ministers' Advisory Council to address the recommendations of the Nursing Review.

The role of nursing

A major issue for nursing workforce policy in the medium term therefore relates to the role of the professional (registered) nurse. Without clarification of the role of the nurse, there cannot be clarity about how many nurses are needed in the workforce, and educational institutions will find it difficult to make coordinated decisions about design of curricula and the appropriate number of nurses that ought to be enrolled in nursing education programs.

The role of the nurse is the subject of a number of pressures, posing both threats and opportunities for the profession.[18] In the first instance, the educational preparation of all nurses is improving, associated with the move to university-based education and the continuing refinement of university curricula.[19,20] This broader educational preparation of nurses provides a foundation for nurses to undertake more complex roles and tasks. Failure to provide challenges in the workplace may lead to dissatisfaction among nurses who have contemporary levels of educational preparation, and may affect retention. There is now a developing body of literature about the potential for nurses to undertake roles that were previously the sole preserve of doctors.[21-24]

Nurses can substitute for general practitioners in many primary care tasks, for resident medical officers in intensive care units, and can undertake high level triage and treatment functions in hospital emergency departments. Midwives also play a significant role in maternity care. In Australia, most experience in substitution has occurred in areas that are less likely to attract medical practitioners (for example rural areas, aged care, services for Aboriginal people and Torres Strait Islanders) and hence substitution strategies have not caused conflict with the medical profession.

Opportunities for substitution would be substantially greater if nurses had independent prescribing rights (either for a limited range of drugs, or according to specific protocols). The extent to which nurses should have independent prescribing and practice rights is thus a critical issue for determining the future role of the nurse. It is also likely to be a contentious one, attracting opposition from the medical profession, as did the transfer of nursing education to universities in the 1980s.[25]

Potential impacts on the medical workforce

Changes in the role of nurses will have impacts on other professions, particularly medical practitioners. A critical issue in medical workforce planning thus relates to the future role and place of the medical profession. As argued above, there can be considerable overlap in the roles of nurses and medical practitioners in primary care and in major hospitals. Given the difficulty of attracting medical practitioners to rural areas, a nurse-led strategy would seem to form a key part of addressing rural medical workforce shortages. Similar strategies could also be applied in metropolitan areas.

There are also potential overlaps in some areas of the specialist workforce. For example, in the United States, nurse anaesthetists play a significant role in the provision of anaesthetic services, complementing and substituting for medically qualified anaesthetists. In the US and the United Kingdom, podiatric surgeons undertake some orthopaedic surgery which in Australia tends to be the preserve of orthopaedic surgeons. These issues of substitution and role clarification are going to become increasingly important as the cost of educating nurses, podiatrists, and others is substantially less than educating medical practitioners, as are their average earnings. It may be more cost-effective for there to be wider use of alternative personnel in provision of health care, subject to ensuring that the time taken to perform similar tasks is around the same and that the quality of care is not affected. In the long run, however, wage creep might change the salary relativities. Identifying what is the unique role of medical practitioners then becomes an important issue for policy.

Substitution and skill transfer

Although there is currently a perceived shortage of nurses, an expanded role for nurses could assist in retaining nurses in the workforce or

Skill transfer options
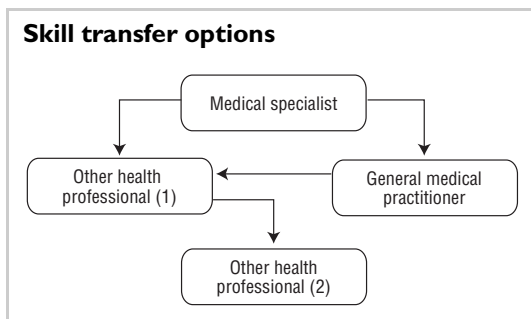
attracting new entrants seeking better career prospects. A small shift of nurses to performing new roles would yield a substantial increase in the supply of services previously provided by other professionals such as medical practitioners. But substitution strategies are not only relevant in the technically advanced component of a professional's role. As professional roles at the high end are accreted, substitution of less cognitively dense tasks should also be considered. This will require changes in the roles of a number of professions, for example substitution between registered nurses and enrolled nurses or nursing assistants, and between allied health professionals and allied health assistants or multiskilled workers (see the Box).

The health sector is at a critical juncture, requiring a major rethink of the way its workforce is organised. Significant shortages are foreshadowed in nursing, the largest of the health professions. Changes in the organisation of medical work in hospitals, and the reduction in average hours worked for medical practitioners, also presage further workforce change. Calls for workforce redesign are often made in the context of a perceived workforce shortage. However, as argued above, roles within the health sector are in transition, and static role and productivity assumptions are thus not reasonable.

The health workforce is an input into provision of health services, and therefore health workforce planning should not simply be concerned with planning the numbers required in each profession (based on assumptions of continuation of current roles and current productivity patterns) but, rather, should focus on planning the provision of

professionals with the mix of skills necessary to ensure adequate provision of services. Further, expanding intakes into health professional courses will not be sufficient to meet the emerging needs. New roles and new patterns of working will be required, but at present the health sector does not have the right structures to facilitate a rethink of workforce roles, let alone implement them.

Workforce substitution may involve conflict between the health professions. The interests of the professions are not coincident because substitution affects the professions differentially. Nursing staff may substitute for medical staff in rural communities; similarly, substitution can also occur in major teaching hospitals where nursing staff could appropriately substitute for some medical staff in intensive care units, cancer treatment, emergency departments, and patient admissions. In some states, hospital funding design militates against such substitution, for example by providing a significant subsidy for employing hospital-based registrars. There are similar possibilities for substitution of allied health for nursing staff (and vice versa) and other non-medical disciplines for medical practitioners.[26]

Required changes in educational preparation

Epidemiological, technological and social changes have led to increasing challenge to the monodisciplinarity of health workforce preparation. The challenge has been global, with calls for reform to health professional education in most countries. Health sector reports have decried the inadequacies of existing educational preparation, with particular emphasis on the need to restructure education to provide a greater emphasis on teamwork and interprofessional issues.[27] There have also been calls to facilitate career transition and the development of clearer, articulated career ladders.[28]

Educational preparation for the health workforce has not kept pace with changes in the environment. Although education of health professions has been by no means static, new needs

have typically led to development of niche professions rather than reorganising professional boundaries to meet new needs.

Reform to promote teamwork, interprofessional ways of working, and flexibility in the workforce has been recommended by many reviews. The educational sector response has principally been to make marginal adjustments to the existing monodisciplinary frame of educational preparation: existing single profession educational programs have been adjusted to incorporate more multidisciplinary activities. These activities have been of a number of kinds, including shared lectures, shared small group activities and shared clinical placements. Shared lectures are efficient and may provide a common base of knowledge across professions. However, shared lectures represent a model of "learning alongside" rather than "learning together" so may not have an enduring impact in terms of improving interprofessional work post-graduation. In contrast, shared clinical placements can provide very powerful formative experiences,[29] but the challenges are still great.[30]

Although there is voluminous literature on interprofessional education programs,[31-38] its methodological quality is poor and does not lead to any solid conclusions about its impact on professional practice or health care outcomes.[39-41]

Despite implementation of interprofessional education and teamwork development strategies in a number of educational institutions, there have been a number of calls for more fundamental reform to educational preparation[42,43] and subsequent analysis of the issues associated with major changes to workforce roles.[44] In the United Kingdom, the Schofield report on the future of the health workforce presented an articulate case for the creation of a multiskilled health worker with a range of competencies[45,46] That report identified a number of weaknesses of the existing monodisciplinary training, including forcing early career choice, and weaknesses in understanding the roles of other groups. In the workplace, the existing professional structures were seen to lead to inflexibility in staff deployment; lack of clarity of roles and thus reduced accounta-

bility; and increased time spent in coordination of care. The report proposed increased use of multiskilled health workers with a range of competencies. In acute care, for example, the Schofield multiskilled worker would have a role including:

- the current nursing workload;
- prescribing and dispensing in line with treatment guidelines;
- the majority of the current physiotherapy, occupational therapy, and speech and language therapy workloads; and
- making decisions to admit and discharge in line with treatment guidelines.[45]

Possibly in response to that challenge, the NHS Modernisation Agency has embarked on a number of projects to develop multiskilled health workers (see, for example, http://www.kingston-hospital.nhs.uk/jobs/hcp.htm). Nearly all countries have skill-mix imbalances[47] and changing skill-mix projects are being increasingly reported in both developed and developing countries.[48]

Within Australia, the most recent government statement on workforce reform was issued by the Australian Health Ministers' Conference in April 2004 in the form of Australia's first "National Health Workforce Strategic Framework"(see http://www.health.nsw.gov.au/amwac/pdf/NHW_stratfwork_AHMC_2004.pdf). The framework, to set directions for the next decade, recognised that realignment of existing workforce roles or the creation of new roles may be necessary. The framework endorsed a range of strategic directions including:

- The need to "develop models that enable articulated, multiple career pathways" (p. 17);
- "Continue to develop new and innovative ways to deliver health education and training, which facilitates accelerated entry to the workforce and flexible delivery of clinical training" (p. 17);
- Develop workplace, professional and education and training practices that facilitate team approach and multidisciplinary care.

Menadue, who conducted reviews of both the New South Wales and South Australian health systems in the last 5 years, has concluded that "the structure of the workforce is more appropri-

ate to the needs of the 19th century than the 21st century" (p. 187).[49] Brooks has also argued for the development of multiskilled workers in Australia.[26]

The nature of the relationships between professionals within the health sector has been evolving, and has the potential to lead to further changes in the way in which professionals work and the nature of their roles. As the knowledge base of non-medical professionals increases, the relationships between these professionals and medical practitioners is becoming less subservient, moving from one where the relationship could be described as a treatment-prescribing relationship, to a collegial one.[50] In turn, the role of non-medical personnel is also changing from one where the non-medical professional had a treatment-performing role to one where they have a treatment-prescribing relationship with other health personnel. This changed relationship will impact on the productivity of non-medical professionals. As they move away from performing "hands on" treatment to prescribing and directing others, the number of patients or clients they can manage will increase.

There are obvious consequences of these changed relationships for educational providers. Inherent in a treatment-prescribing relationship is a monitoring and evaluation role, underlining the importance of evaluation and research skills in the educational preparation of health professionals. Similarly the development of a collegial relationship emphasises the importance of teamwork and interpersonal skills in the professional's educational preparation. A supervisory relationship with other health personnel also emphasises the importance of development of leadership skills, even for newly graduated professionals.

The changes in productivity arising from these changed relationships impact on the number of professionals required and impact on workforce requirements. Changing the nature of the tasks which can be delegated to other health personnel also changes the nature of the role. In light of anecdotal evidence that non-medical health professionals are bored with their current range of tasks, reducing the treatment-performing compo-

nent of the job may lead to increased job satisfaction and improved retention.

Options for new roles

This paper has already identified a number of options for new roles within the Australian health workforce, generally involving cascading task substitution, with nurses and other health professionals undertaking roles previously provided by medical specialists. Nurses and other health professionals can also undertake the roles provided by junior doctors in training, thus helping to reduce the unhealthy hours of work that still characterise much of medical training.

New roles can also be developed at the less cognitively complex end of the task hierarchy. Mention has already been made of registered nurse/enrolled nurse substitution. There is also the potential for increased roles for allied health assistants and a change in the ratio of professional to para-professional providers of care. Expanded use of allied health assistants could reduce demand for allied health professionals, although ageing of the population and emerging new roles would suggest strong demand for these professions into the future. Development of expanded allied health assistant roles would require health agencies to identify precisely the tasks to be performed by allied health assistants and the nature of their supervision. It would require health agencies to provide (or purchase) training for the new roles.

However, these new roles will not address issues of interprofessional work or those associated with an ageing population who experience more multisystem disease and require greater levels of care coordination. There are two main alternatives (which are not mutually exclusive) for addressing interprofessional work.

The first is to develop multitasking roles using experienced practitioners. Such multitasking could, for example, focus on assessment functions where a single practitioner (be they nurse or allied health professional) undertakes a comprehensive assessment of a client's needs on behalf of all members of the care team. In this model the

advanced practitioner would then identify specific roles for each of the other team members. Such a role would require the advanced practitioner to have a comprehensive knowledge of the skills base of each of the other members of the health care team and, concomitantly, would require the other members of the team to trust the advanced practitioner that they were identifying the range of issues normally the preserve of the individual specialist practitioner. An assessment role of this kind would reduce the number of professionals interacting with clients and, if they had a continuing primary practitioner role, could improve care continuity. Fulfilment of such a role would be facilitated by agreement of common assessment protocols, possibly with ICT support.

An alternative approach would be to see the development of a new degree-level program to prepare a multiskilled health worker who would:

- have a strong science foundation;
- be registrable as an enrolled nurse;
- have a skill base drawing on functions currently performed by a range of allied health professionals including occupational therapists, physiotherapists and podiatrists.

Under this model a new degree should be introduced to incorporate common preparation in foundation sciences (eg, physiology, anatomy, human behaviour) and in a generic foundation skill set in assessing basic human physical function (including measuring physiological signs). Students should build on this so that by their third semester they will have met the competency requirements for registration as an enrolled nurse.

New educational strategies

The basic, common skill set for professional health workers in Australia should be at this level. Enrolled nurses have physical assessment skills, and some treatment skills (including provision of medication). These skills provide a very useful underpinning for a broad range of professions and will ensure that health professionals have a common language and understanding of diseases, disease processes and treatment options. Gradu-

ates from these programs could also provide the core nursing workforce in many health settings.

The three-semester foundation module would provide a platform for advanced training in a range of areas. It is expected that the largest advanced program to be offered would be to develop "rehabilitation therapists". The graduates from this stream would have competencies across a broad range of the rehabilitation professions including, for example, patient mobilisation skills. Additional fundamental sciences may also be provided in this program (eg, in anatomy) to ensure a sound theoretical basis for practice. Although graduates of the program would not be registrable in any additional health profession (such as physiotherapy), they would have the skills to provide therapy under the direction of other health professionals. They should also be able to practise with remote videoconference supervision in small rural centres. This type of multiskilled worker would also be particularly relevant in home-based programs, reducing the number of separate professionals required to provide care in domiciliary settings.

Lateral entry

Graduate entry (masters qualification) is required for speech pathology in North America, and is being phased in over the next 5 years for physiotherapy and occupational therapy in the US and Canada. A number of universities in Australia already provide graduate entry masters programs for a number of the health professions, and an increased emphasis on graduate preparation for the health professions in Australia is probably inevitable.

The new workforce model should involve a major expansion of graduate entry programs for health professional education, with phasing out of undergraduate preparation for most health professions (other than nursing) in favour of preparing graduates for these preferences through intensive 2-year graduate entry masters programs. As well as being consistent with North American developments for the professions, the 2-year masters program responds to calls for shorter educational programs for professions to facilitate career

mobility, career advancement and retraining through a career.

Downsides of graduate entry programs are the increased length of the programs and their cost to students. The multiskilled worker program as outlined above could be developed as an accelerated program with use of summer semesters. In this way the undergraduate and masters program may be able to be completed in 4 years, thus not requiring an increase in the overall time taken to graduate as a therapist in the traditional disciplines. With early recognition as enrolled nurses, students would be able to increase their earning capacity during their study. Coupled with the wider availability of income-contingent loans for postgraduate study, this will mitigate any adverse equity consequences of a greater emphasis on graduate-entry, full-fee preparation for the professions.

Conclusion

Preparation of the health workforce in Australia requires radical transformation. The changes in the health workplace have not led to a fundamental rethink of the way in which professionals ought to be prepared for this environment.

Transformation of the health workforce will not be easy. Despite regular calls for reconfiguration of roles, such changes will disrupt current power and status hierarchies in the health sector and so will be challenged from the perspective of professional self-interest, advocating "social closure" of professional roles.[51] The counter-position, of improved efficiency in health services, will thus need to be continually emphasised to ensure that the benefits of reform are highlighted.

Competing interests

None identified.

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