Regional and remote health, and the quantification of the allied health workforce

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This paper describes determinants of health, health status, and health services for people living in regional and remote areas of Australia, and the quantification of the allied health labour force in those areas.

The first part of this paper draws heavily on Australia's Health 2006 (AIHW 2006a). I would also like to acknowledge Glenice Taylor, who reviewed the material relating to allied health workforce.

Introduction

In recent times there has been a special focus on understanding and improving the health of the 34% of Australians who live in rural and remote areas. This is because, as a broad generalisation, they have somewhat higher mortality rates than those living in urban areas and higher levels of several health risk factors. This raises questions about whether those in rural and remote areas have inadequate access to health services; more occupational or environmental hazards; more adverse social and economic conditions; or some combination of these elements.

Rural and remote populations are those outside cities having populations greater than 250 000 people. They comprise a range of environments: large regional centres, coastal settlements, small inland towns, farms and so-called 'outback' Australia. The common feature of their people is that they live some distance from the major population centres. The following discussion about the health of people living in rural and remote areas uses the geographical terms Major Cities, Inner Regional, Outer Regional, Remote and Very Remote—see the Box below.

Classifying the areas where we live

The ABS Australian Standard Geographical Classification (ASGC) Remoteness Areas classification (ABS 2001, AIHW 2004), allocates one of five remoteness categories to areas depending on their distance from a range of five types of population centre (Figure 1).

Areas are classified as Major Cities, as Inner Regional or Outer Regional (referred to here as 'regional' when taken together), or as Remote and Very Remote ('remote' when taken together). In Tables and Figures in this paper, the categories of Major Cities, Inner and Outer Regional, Remote and Very Remote areas are represented by the abbreviations MC, IR, OR, R and VR, respectively.

The bulk (66%) of the Australian population lives in Major Cities, 31% in regional areas and 3% in remote areas. Indigenous people live mainly in Major Cities (30%) and regional areas (43%), with the remaining 27% living in remote areas. Although Indigenous Australians comprise 2.4% of the total Australian population, they comprise 24% of the population in remote areas, including 45% in Very Remote areas (Table 1).

Statistics on the health of Australians living in rural and remote areas are given in some detail below but some observations may help explain the findings. First, compared with people in Major Cities, those living elsewhere are more likely to be smokers; to drink alcohol in hazardous quantities; to be overweight or obese; to be physically inactive (AIHW 2005); to have lower levels of education; and to have poorer access to work, particularly skilled work (Garnaut 2001). They also have less access to specialist medical services and a range of other health services (AIHW 2005). In addition, numerous rural occupations (for example, farming, forestry, fishing and mining) are physically risky, and travelling over the often long distances of country roads can be more dangerous because of factors such as higher speeds, fatigue from longer driving times, and animals on the road (AIHW: Strong et al. 1998). A final feature is that Remote and Very Remote areas have substantial Indigenous populations, and Indigenous health is generally poor (ABS & AIHW 2003 and AIHW 2005).

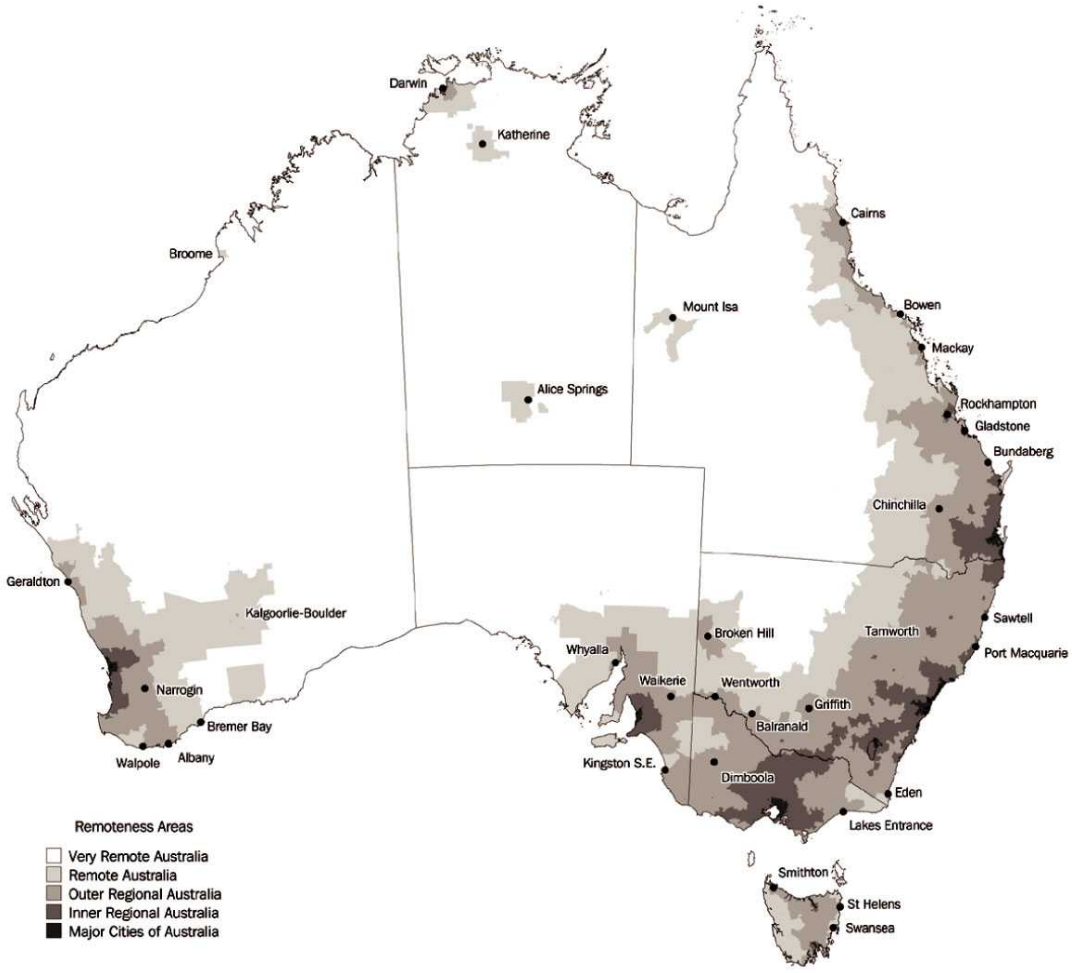
Despite these general patterns, there is considerable variation within each broad geographical area. Remoteness does not guarantee poorer health, just as living in a large population centre does not guarantee the opposite. Populations in some metropolitan fringe and inner-city areas for example, have relatively poor health (Burnley 1994). Also, in an

analysis covering 1993–1999 about half of all statistical local areas (SLAs) in Very Remote areas had lower death rates than the Major Cities average (AIHW 2003c), however, of those SLAs that had higher rates, about half had rates that were at least twice as high as those of Major Cities.

A major problem in understanding the health of people in regional and remote areas is the limited availability, representativeness and quality of data. Very few data sources are complete, accurate, regionally representative and unambiguous enough to allow meaningful comparisons between populations from different areas (AIHW 2003b). This applies particularly to remote areas. Also, because Indigenous Australians make up a substantial proportion of rural and (particularly) remote area populations, 'rural/remote' issues can frequently be related to Indigenous issues. For example, overall rates of cervical cancer death tend to be higher in remote areas, but not in the non-Indigenous people who live there (AIHW 2003d, AIHW 2003c). In this case, the extra challenge is therefore one of Indigenous health, not necessarily the health of those living in remote areas as such. However, information that allows distinctions such as this is uncommon because the identification of Indigenous people in data sources can frequently be incomplete (ABS & AIHW 2005).

Another difficulty in interpreting the data is that different patterns of service provision in city, regional and remote areas can lead to invalid comparisons of their resource usage and access to services (AIHW 2003b). For example, rural areas make greater use than cities of hospital emergency departments as a source of primary care services and of hospital beds as a source of aged care services. This factor complicates inter-regional comparisons of hospital usage, aged care and provision of primary health care.

Figure 1 ASGC Remoteness Areas of Australia



Source: ABS.

Characteristics of regional and remote area populations

Although the most visually obvious component of the economy in regional and remote areas is agriculture, the majority of people in these areas derive their income from other industry sectors (Table 1).

Levels of income and education are lower in regional and remote areas than in Major Cities. In 2001, over half (55%) of people living in Very Remote areas were classified as being amongst the most disadvantaged people in Australia, and 2% were amongst the least disadvantaged (AIHW 2005). This compares poorly with those living in Major Cities, where only one-fifth were amongst the most disadvantaged, and just over a third (34%) were amongst the least disadvantaged (Table 1).

About 25% and 10%, respectively, of 17–20-year-olds from regional and remote areas commenced university or TAFE in 2001, compared with almost 40% of those from Major Cities (Table 1).

Table 1 Indigenous and total populations, and selected characteristics within each ASGC Remoteness area, 2001

Factor	MC	IR	OR	R	VR	Australia
Percentage of:			(per cent)			
the national population living in each area	66	21	10	2	1	100
the Indigenous population living in each area	30	20	23	9	18	100
the population in each area who are Indigenous	1	2	5	12	45	2
adults employed in primary production[2] and mining	<1	4	11	20	16	3
adults employed in other industry sectors	58	50	46	45	44	55
adults not in the workforce or unemployed	41	46	43	35	39	42
people living in areas classified as being in the						
— least disadvantaged national SEIFA quartile[3] (1996)	34	14	8	10	2	26
— most disadvantaged national SEIFA quartile[3] (1996)	20	28	33	26	53	24
youth starting tertiary study[4]	39	26	23	12	10	33
non-Indigenous youth starting tertiary study[4]	39	27	24	13	21	34
reticulated water supplies adequately fluoridated[5]	81	39	34	30	20	49
Costs (average)			(dollars)			
monthly mortgage	985	813	775	786	605	926
weekly rent	206	155	154	148	122	189

Notes

1. Primary production includes agriculture, forestry and fishing.
2. The percentages for SEIFA (Socioeconomic Indexes for Areas) relate to the percentage of the population in each area who lived in Census collectors districts that were among the 25% least disadvantaged, and the 25% most disadvantaged in Australia, in 1996.
3. The percentage commencing tertiary (university and TAFE) study is the apparent percentage of 17–20-year-olds from each area who commenced tertiary study in 2001. Limited accuracy of the Indigenous identifier cautions against regional reporting for Indigenous people. Nationally, 10% of Indigenous people of this age commence tertiary study.
4. Fluoride data relate to a rolling survey. Some of the data may be up to 10 years old and do not relate specifically to 2001.

Source: AIHW population database; (AIHW 2005).

The cost of housing in regional and remote areas tends to be, respectively, 75% and 65% of housing costs in Major Cities (Table 1), but other costs are higher. For example, the costs of food and petrol increase with increasing remoteness, so that in Very Remote areas they are respectively about 15–20% and 10% more expensive than in Major Cities (AIHW 2005).

About 35% and 25% of reticulated water supplies in regional and remote areas, respectively, were considered to be adequately fluoridated compared with 80% in Major Cities (Table 1).

Health status

On a wide range of health status measures, people who live in regional and remote areas generally do worse than people who live in Major Cities (Table 2).

Higher death rates and poorer health outcomes in regional and remote areas are likely to be the result of factors such as higher levels of socioeconomic disadvantage (lower incomes and lower levels of education), poorer access to health services, higher levels of personal health risk factors such as smoking, and environmental issues associated with road travel and occupation. The relatively large proportion of Indigenous people in Remote and Very Remote areas (12% and 45% respectively) compared with Major Cities, coupled with their poor overall health, is reflected in high rates of death in remote areas.

Table 2 Comparison of selected health indicators, by ASGC Remoteness area

Measure	MC	IR	OR	R	VR
			Standardised ratio		
Males <65 yrs with severe/profound activity restriction (1998)[b]	1.00	1.57	1.46	n.a.	n.a.
Females <65 yrs with severe/profound activity restriction (1998)[b]	1.00	1.27	1.03	n.a.	n.a.
Pertussis notifications (2001)	1.00	*1.31	*1.88	*1.90[a]	*1.90[a]
Ross River virus notifications (2001)	1.00	*3.15	* 4.85	* 8.71[a]	*8.71[a]
Perinatal deaths (1999–2001)	1.00	*1.13	*1.28	*1.43	*2.42
Deaths (all ages, 1997–1999)	1.00	*1.06	*1.10	*1.13	*1.50
Deaths, non-Indigenous (all ages, 1997–1999)	1.00	*1.05	*1.08	*1.03	0.95
Death >74 years, non-Indigenous (1997–1999)	1.00	*1.03	*1.04	*0.93	0.71
Death <65 years, non-Indigenous (1997–1999)	1.00	*1.11	*1.15	*1.13	*1.21
			Number		
Average DMF teeth in 6 year olds (1998)[b]	1.45	1.93	1.87	1.71	1.88
Average DMF teeth in 12 year olds (1998)[b]	0.84	0.98	0.85	1.02	1.09

(a) These ratios are not specific to Remote or Very Remote areas, but are averages for remote areas generally.
(b) Statistical significance not available for these results.
Note: Reported standardised ratios are indirect age-standardised using Major Cities age-specific rates. The ratios are a way of comparing the levels of health in various areas with that in a reference area, in this case Major Cities. A ratio of 1.5 for mortality, for example, indicates that there were 1.5 times as many deaths as expected had Major Cities age specific rates applied to the population in that area. Ratios that are statistically different to 1.00 are in bold font and with an asterisk (except for activity restriction and DMF teeth, for which statistical significance was not available).
Source: AIHW 2003c, AIHW 2005.

It is believed that older people in remote areas tend to move to less remote areas so as to access services, particularly after the onset of ill-health. The resulting concentration of healthy older people in remote areas may help to explain their apparent relatively low rates of death (Table 2), an effect that complicates inter-regional comparisons of mortality.

In 1998, people younger than 65 years and living in regional areas were up to 1.6 times as likely to have a severe/profound disability as those in Major Cities (AIHW 2005). They were also more likely to be diagnosed with a communicable disease; for example, in 2001, people from Very Remote areas were 1.9 and 8.7 times as likely to be diagnosed with, respectively, pertussis and Ross River virus.

Children living in regional and remote areas in 1998, had more decayed, missing and filled teeth (DMFT) than their Major Cities counterparts; and this probably reflects a number of issues including the lower availability of adequately fluoridated water outside Major Cities (AIHW 2005).

Mortality

Although they do not express the full range of health experiences, measures of mortality are arguably the most robust way of comparing the health of people living in the various areas.

Compared with those in Major Cities, perinatal death rates were higher in regional areas and especially in remote areas. This is at least partly a reflection of the Indigenous population distribution and the overall high Indigenous perinatal mortality (Table 2).

Considering death rates for people across all ages, those in regional, Remote and Very Remote areas were about 1.1, 1.1 and 1.5 times as high in 1997–99 as those in Major Cities (AIHW 2003c). This corresponds to about 3300 additional deaths annually, over and above what would be expected if regional and remote age-specific death rates were the same as in Major Cities. These extra deaths were due to coronary heart disease (23% of the 'excess' deaths); other circulatory diseases (16%); chronic obstructive pulmonary disease (11%); motor vehicle accidents (11%); diabetes (6%); suicide (6%); other injuries (6%); and prostate, colorectal and lung cancer (together about 10%).

It is not possible to compare Indigenous death rates across areas because of uncertainty about the accuracy of Indigenous identification in each area (AIHW 2003c). However, it is clear that the mortality of Indigenous people overall is much higher that for non-Indigenous people irrespective of where the latter live.

Death rates for non-Indigenous people in regional and remote areas were, respectively, a little higher than or similar to those in Major Cities (Table 2). The moderate overall death rates in remote areas are strongly influenced by the lower death rates for older people living there (discussed above). Death rates of younger non-Indigenous people from regional and remote areas were respectively about 1.1 and 1.2 times as high as those in Major Cities.

Improvements in death rates

Between 1992 and 2003, all-cause death rates declined in all five Remoteness areas; by about 3% per year for males and correspondingly by about 2% per year for females (AIHW 2006b). The absolute decline in death rates was greater for both sexes in Very Remote areas than in the other areas (from a substantially higher death rate at the beginning of the period), but the absolute decline was slightly less for males in Inner Regional areas.

These improvements have been driven mainly by reductions in circulatory disease and cancer death rates. These two areas of gain have been respectively responsible for about 72% and 17% of the decline in Major Cities, about 80% and 11% in regional areas and about 60% and 20% in remote areas.

Apart from the improvements in circulatory disease and cancer death rates, declines in mortality due to respiratory disease, injury and other causes contributed little in most areas, although respiratory disease contributed 22% of the mortality decline in Very Remote areas (AIHW 2006b).

For specific causes of death, mortality tended to decline over time, frequently with faster rates of decline in Very Remote areas (where death rates have tended to be higher). However, for some causes and in some areas, rates have increased over time. For example, whereas suicide death rates declined overall for males between 1992 and 2003, they increased in remote areas. Suicide death rates increased over the period for females in Inner Regional areas (AIHW 2006b).

Access to services

People living in regional and remote areas tend to have lower levels of access to health services (AIHW: Strong et al. 1998). Despite this, immunisation rates for children under 2 years in 2002 appeared similar to, or only slightly lower than those in Major Cities, and rates of breast cancer and cervical screening in 2001 appeared higher than in Major Cities (AIHW 2005).

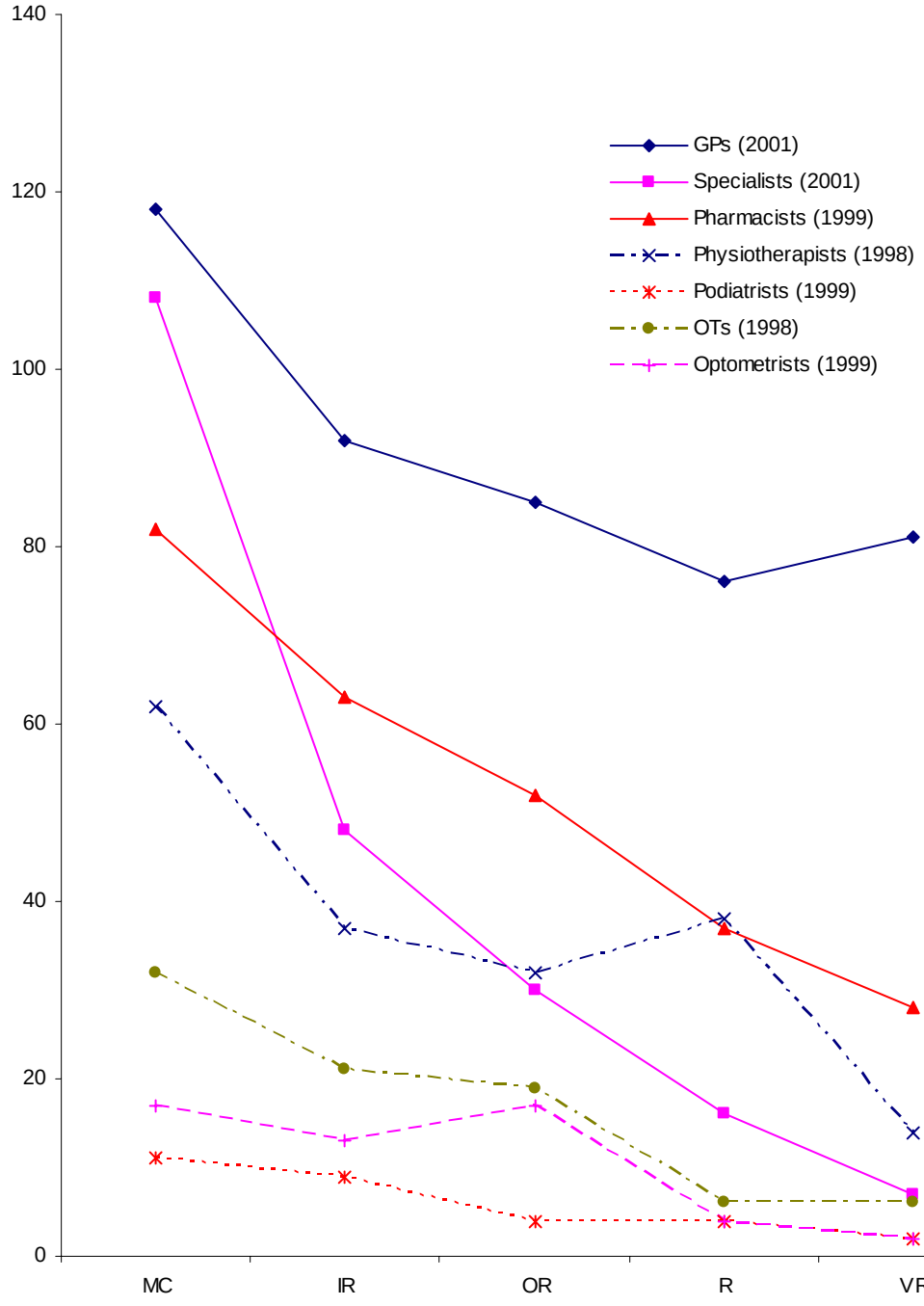
There were more hospital beds per capita in regional and remote areas in 2002–03 (respectively, 3 beds and 5 beds per 1000 residents) than in Major Cities (2.5 beds per 1000 residents). Compared with Major Cities, hospitals in regional and remote areas were less likely to be accredited under a national accreditation scheme, and tended to be a lot smaller. Many hospitals outside Major Cities had fewer than 30 beds, but about 30 had between 100 and 300 beds (AIHW 2005).

There were differences in the rate at which people from Major Cities, regional and remote areas were admitted to hospital for a range of surgical procedures in 2002–03. Noticeably, the rate of admission for coronary artery bypass graft surgery and coronary angioplasty was lower for residents of regional and especially remote areas than for those in Major Cities. This contrasts with the higher death rates due to coronary heart disease in these areas. Rates of surgical procedure are likely to be affected by issues such as need and access, both physical and financial.

The supply of health workers

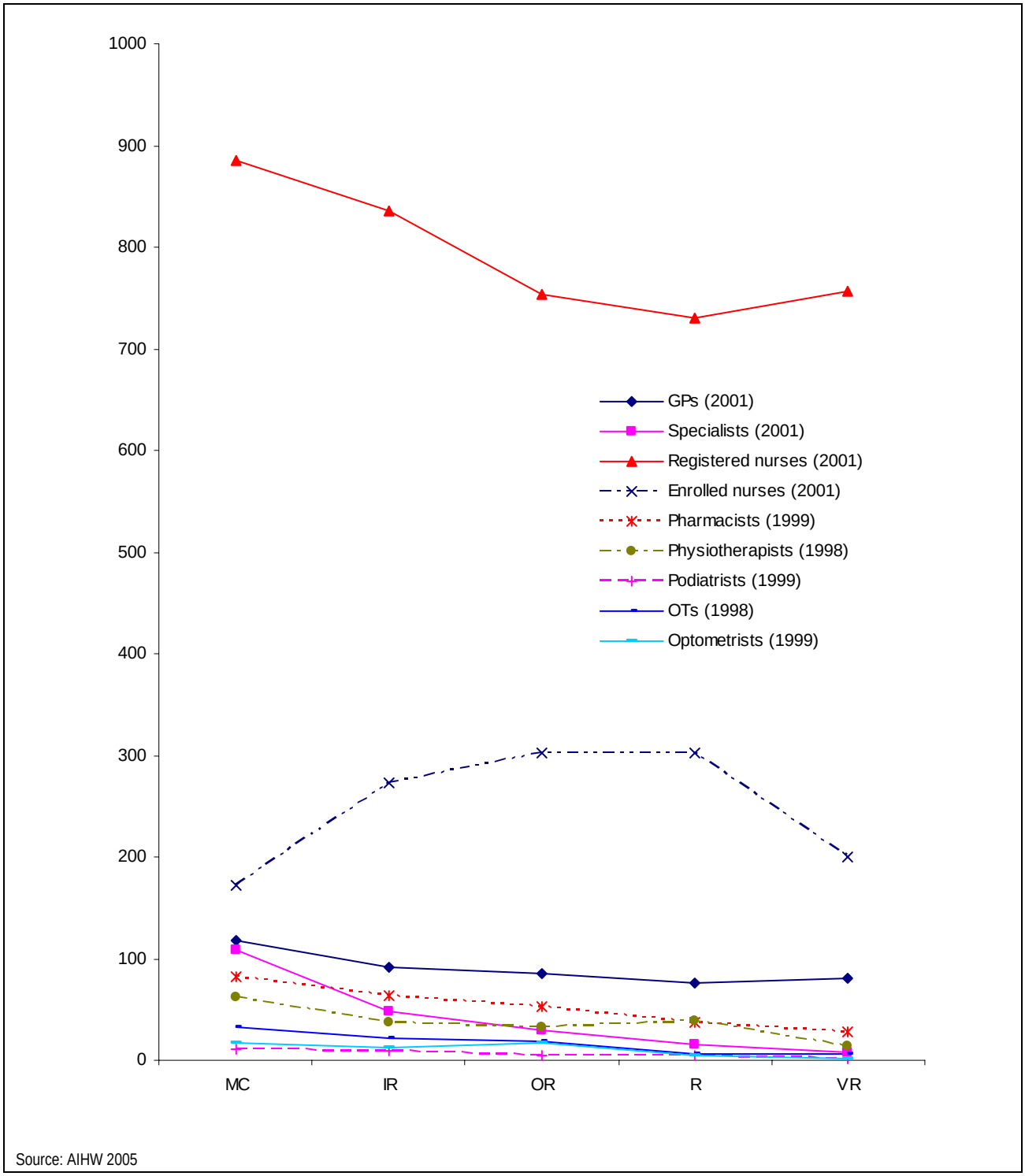
The supply of health workers typically declines with remoteness (Figures 2 and 3).

Figure 2 Health workers per 100 000 population, by ASGC Remoteness area (excluding nurses)



Source: AIHW 2005

Figure 3 Health workers per 100 000 population, by ASGC Remoteness area (including nurses)



Source: AIHW 2005

Nurses have been excluded from Figure 2 because their large numbers obscure details of the inter-regional supply of allied health workers. Figure 3 illustrates the large supply of nurses relative to allied health workers, and compares their supply in each of the areas.

Table 4 describes the number of selected allied health professionals in 1998 and 1999, the most recent years for which regional and remote data is available. As would be expected, most worked in Major Cities, reflecting the population distribution.

Table 4 Numbers of employed workers by Remoteness area of work location

Profession	MC	IR	OR	R	VR	Australia[3]
	Number of employed workers					
Podiatry (1999)	1 417	359	80	13	3	2 011
Physiotherapy (1998)	7 703	1 456	643	121	24	11 304
Occupational Therapy[1] (1998)	2 181	436	219	57	12	3 115
Optometry[2] (1999)	2 013	188	405	181		2 787
Pharmacy (1999)	10 284	2 446	1 037	120	49	14 747

Notes:
1. OT excludes NSW, SA and Tas
2. refers not to ASGC Remoteness but to RRMA categories Capital cities, Other Metropolitan, Large rural centre and small rural centre, other rural and remote.
3. Includes workers whose work location is not stated.
Source: AIHW 2000a, AIHW 2000b, AIHW 2001, AIHW 2002, AIHW 2003a, AIHW 2005.

Table 5 describes the number of health workers per 100 000 population living in each area. The per capita supply of allied health workers is clearly much greater in Major Cities than in regional or remote areas.

Table 5 Employed workers per 100 000 population, by Remoteness area of work location

	MC	IR	OR	R	VR	Australia
Profession	Workers per 100 000 population					
Podiatry (1999)	11	9	4	4	2	11
Physiotherapy (1998)	62	37	32	38	14	57
Occupational Therapy[1] (1998)	32	21	19	25	8	29
Optometry[2] (1999)	17	13	17	6		15
Pharmacy (1999)	82	63	52	37	28	78

Notes:
1. OT excludes NSW, SA and Tas
2. refers not to ASGC Remoteness but to RRMA categories Capital cities, Other Metropolitan, Large rural centre and small rural centre, other rural and remote.
Source: AIHW 2000a, AIHW 2000b, AIHW 2001, AIHW 2002, AIHW 2003a, AIHW 2005.

The most recent AIHW labour force publications (Podiatry 2003, Physiotherapy 2002, Occupational Therapy 2002–2003 and Psychology 2003—see Table 6 source) do not describe workforce in each remoteness area, rather they describe workforce in the combined Major Cities/Inner Regional (referred to as 'metropolitan') areas and also in the combined Outer Regional and remote (referred to as 'non-metropolitan') areas. Table 6 compares the rate of supply in these two areas, again reflecting lower levels of supply in Outer Regional and remote areas.

Table 6 Rate ratio, supply of selected allied health workers in 'metropolitan' areas and 'other' areas, 2002 and 2003

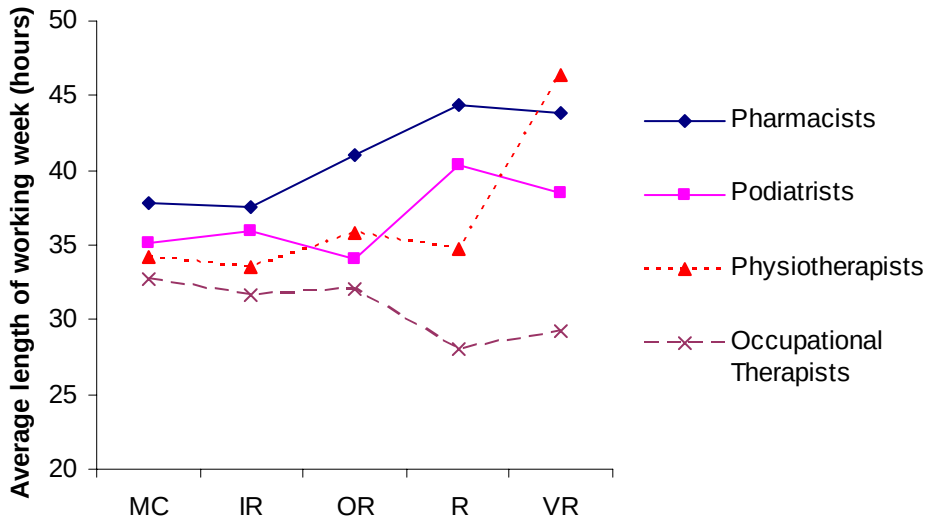
Profession	'metropolitan'	'non-metropolitan'
	Ratio of supply rate in 'metropolitan' areas to the supply rate in 'non-metropolitan' areas	
Podiatry (2003)	1.00	0.50
Psychology (2003)	1.00	0.36
Occupational Therapy (02–03)	1.00	0.67
Physiotherapy (2002)	1.00	0.50

Note: Podiatry excludes WA, NT and ACT, psychology and physiotherapy excludes WA, NT and Tas, OT excludes NSW, SA and Tas. 'Metropolitan' includes Major Cities and Inner Regional areas, 'non-metropolitan' includes Outer Regional, Remote and Very Remote.
Source: Adapted from AIHW 2006c, AIHW 2006d, AIHW 2006e, AIHW 2006f.

Health workers in regional and especially remote areas tend to work longer hours than those in Major Cities. For example, in 1998 and 1999, pharmacists, podiatrists, physiotherapists and occupational therapists worked roughly similar hours in Major Cities, Inner Regional areas and (except for pharmacists) Outer Regional areas, but (except for occupational therapists) tended to work substantial longer hours in remote areas.

In 2001, the weekly hours worked by GPs in regional, Remote and Very Remote areas were 10%, 15% and 26% longer than those in Major Cities (AIHW 2005).

Figure 4 Hours worked by employed health workers, by ASGC Remoteness Area, 1998 and 1999



Note: Excludes those who provided insufficient information to allocate Remoteness, and those who did not specify the number of hours they worked.
Source: AIHW 2003a, AIHW 2002, AIHW 2000a, AIHW 2001, AIHW 2005.

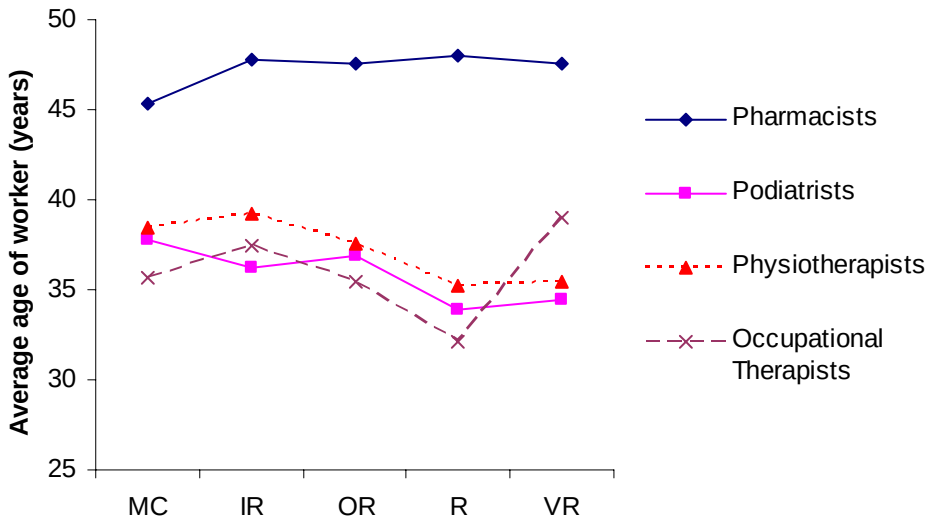
The longer hours partly compensates for the shortfall in the numbers of health workers in these areas, but, on the downside, longer working hours could impose additional strain on these workers, with resultant difficulties retaining staff in these areas in the longer term.

Figure 5 describes the average age of selected professions by remoteness.

The average age of pharmacists tends to be higher than the other professions, and their average age in regional and remote areas tends to be higher than in Major Cities.

The average age of other professions working in Outer Regional and remote areas tends to be lower than in Major Cities and Inner Regional areas.

Figure 5 Age of employed health workers, by ASGC Remoteness Area, 1998 and 1999



Note: Excludes those who provided insufficient information to allocate Remoteness, and those who did not specify their age.
Source: AIHW 2003a, AIHW 2002, AIHW 2000a, AIHW 2001, AIHW 2005.

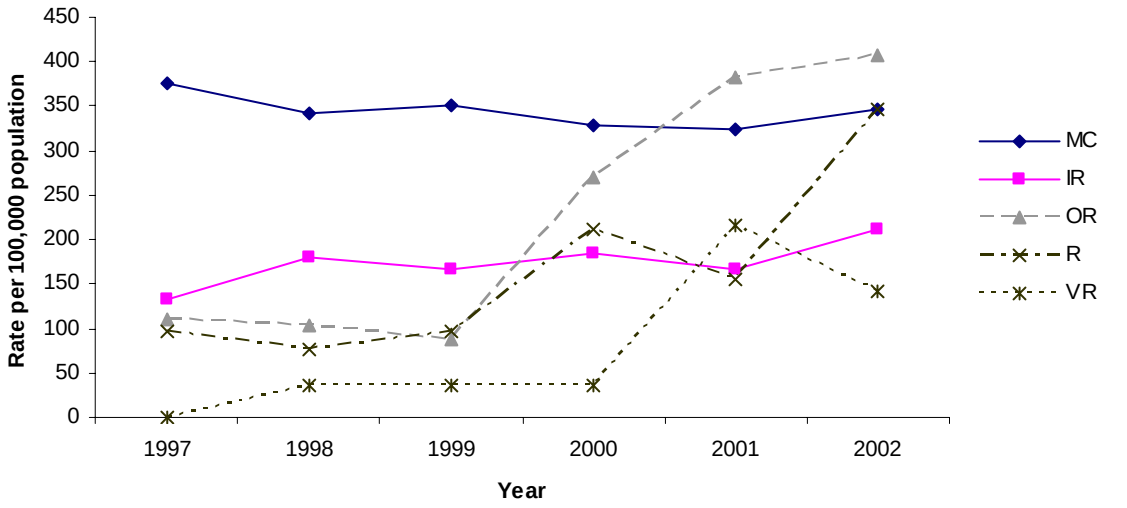
Training the allied health work force

For some time, it has been thought that students from regional and remote areas are more likely that those from Major Cities to end up working outside Major Cities (Strasser 1992). Increased numbers of students with a rural or remote area background enrolled in tertiary allied health courses should result in a future increase in the numbers of allied health workers in regional and remote areas.

Young people commencing undergraduate health courses tend to be predominantly from Major Cities areas, with young people from regional and remote areas substantially less likely to commence a tertiary health degree (Figures 6–9).

This pattern was disrupted for medical students in 1999, when young people from Outer Regional and remote areas became about as likely to commence a medical degree as those from Major Cities, likely because of the introduction of Rural Australia Medical Undergraduate Scholarships (RAMUS) that year by the Federal government.

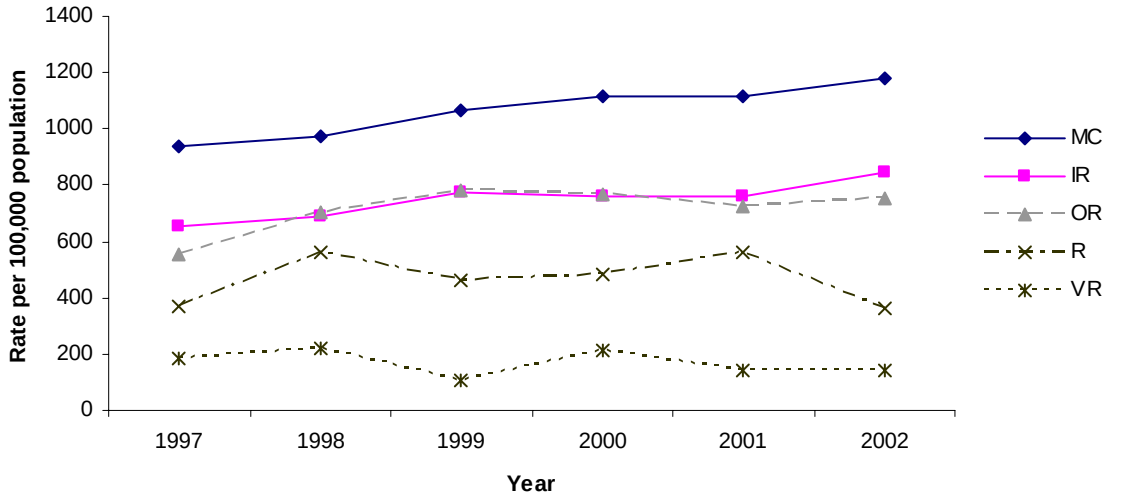
Figure 6 Undergraduate commencement rate for medicine, 17–20-year-olds from each area, 1997–2002



Source: AIHW 2005.

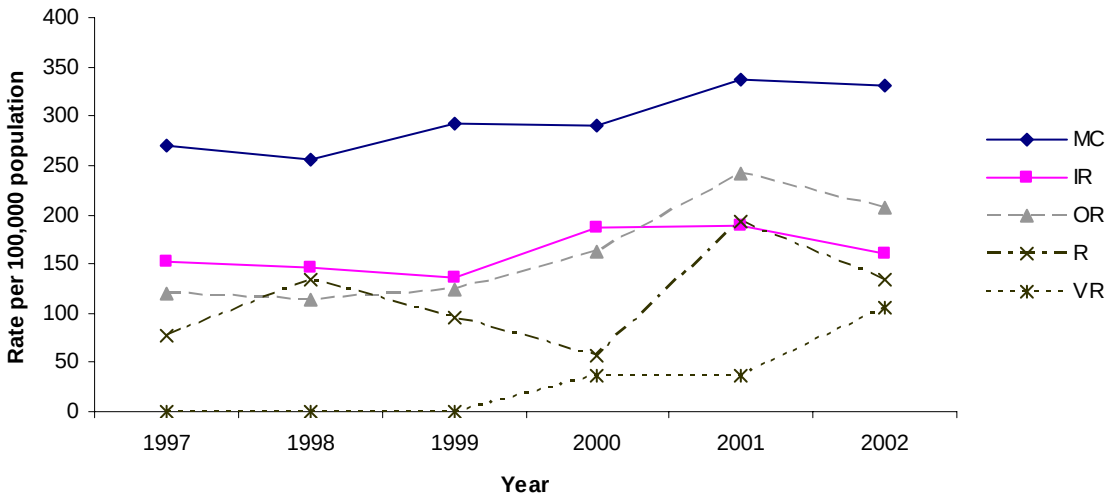
No such dramatic change had been evident in the other disciplines. However, in September 2005, the Federal government introduced undergraduate scholarships to assist young people from outside Major Cities commence tertiary allied health studies. It will be interesting to see to what extent this influences the relative rates at which young people from rural areas commence allied health studies.

Figure 7 Undergraduate commencement rate for selected allied health disciplines, 7–20-year-olds from each area, 1997–2002



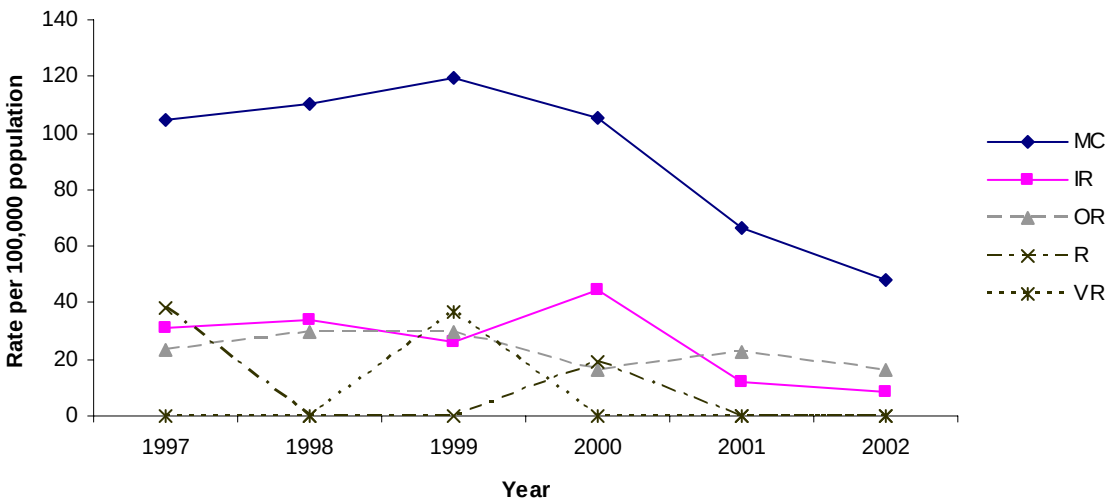
Notes: Selected allied health professions comprise physiotherapy, occupational therapy, podiatry, radiography, speech pathology and nutrition/dietetics).
Source: AIHW 2005.

Figure 8 Undergraduate commencement rate for pharmacy, 17–20-year-olds from each area, 1997–2002



Source: AIHW 2005.

Figure 9 Undergraduate commencement rate for optometry, 17–20-year-olds from each area, 1997–2002



Source: AIHW 2005.

How the allied health labour force is counted

Just as it is difficult to agree which health professions are 'allied health', describing the health labour force is more difficult than it sounds.

Counting and describing the health labour force is important because it provides government and professional organisations with an understanding of the current logistics and with information for planning purposes.

Important characteristics for planning purposes include a count of the number of workers, and details such as their age and sex, hours worked, location of work and type of work (eg clinical or other).

Key issues in the process of counting and describing the labour force include:

- identifying a reliable data source that 'captures' the entire population of workers;
- having the support of all key organisations;
- developing an appropriate questionnaire that is uniform across the nation;
- collecting the data;
- receiving the data;
- aggregating and cleaning the data, imputing for missing fields, and weighting for non-response;
- generating tables, writing and publishing the report.

Reporting for regional and remote areas tends to be secondary behind reporting nationally and for states and territories. It also tends to be technically more difficult and carries with it greater opportunities for bias (primarily because it is currently difficult, based on data from registration boards, to quantify survey response rates below state/territory level).

Selection of a reliable and representative data source

The ABS Census has previously been used to report numbers of health workers (AIHW 2003e). It has the advantage of having a very high response rate, it is nationwide, collects good detail from regional and remote areas and collects information about occupation. On the downside however, it is at best a year out of date, relies on self reporting, contains little detail on specialty area, can't yield FTEs and only reports highest qualification. When comparisons have been made in the past, it has been clear that the total numbers differ substantially from those of the registration boards (the gold standard) in each state (Table 7).

Table 7 Comparison of selected health labour force estimates, Australia

	ABS Census- self-reported occupation			Registration board, AIHW survey, Medicare (1998 and/or 1999)		
Occupation	1991	1996	2001	Registered	Employed	Clinicians
Physiotherapy	7 120	8 896	10 242	13 399	11 304	10 807
Podiatry	1 140	1 462	1 767	2 135	2 011	1 962
Optometry	1 820	2 255	2 695			2 787
Pharmacy	10 880	12 310	13 902	17 633	14 747	13 922

Notes: Numbers in the two right hand columns refer to 1998 (physiotherapy), 1998/99 (optometry), and 1999 (physiotherapy and podiatry).
Clinicians are a subset of employed registrants, who are a subset of registrants.
Source: AIHW 2003e, AIHW 2003a, AIHW 2002, AIHW 2000a, AIHW 2000b.

For those professions requiring registration, counts of the number registered in each state are as accurate as you can get. However registration board data are unable to provide other useful information (e.g. age, hours worked, employment status, location, etc) and some workers are registered in more than one state. For these details, it is necessary to rely on other data sources.

If all workers were registered with Medicare or DVA, then these would be good sources of information about the number, age and distribution of health workers, but not necessarily the volume of work performed by members of that profession. At present, no profession is exclusively funded by Medicare, which leaves the AIHW survey, linked to the registration process, the only means of measuring these aspects of the health workforce in Australia.

Developing and disseminating the questionnaire

A core set of questions is developed by AIHW in consultation with the registration boards and each of the State and Territory health departments. Each state board or state/territory health department may add additional questions and

then prints its own questionnaire. In some cases, the wording of the core questions can be changed, unfortunately reducing the opportunity to report nationally.

The state/territory specific questionnaires are then distributed by the registration boards along with registration paperwork. Health workers then complete the registration papers and (hopefully) the questionnaires, and return them to the registration board.

At the end of the registration renewal period, the registration board forwards the returned questionnaires to the State/Territory health department who processes the data. These are then used to develop jurisdictional profiles and to advise state health policy. Identifying information including name and address is removed from a copy of the data base which is then forwarded to AIHW, where it is cleaned and weighted to the data received from the registration boards, before being aggregated with similar data sets from other States and Territories.

National reporting

AIHW is reliant on each of the jurisdictions to:

- maintain the core set of questions in the questionnaire;
- ensure the boards receive the correct forms in time to send out with the registration renewals;
- forward the de-identified State/Territory data set and details of the total number of registrations to AIHW.

If any of these requirements is not adhered to by any one of the states, reporting at the national level may not be possible. For example, some states have previously altered the core questions, some have taken up to several years to forward their data to AIHW, and some have not run the survey at all.

Not all questionnaires are completed and returned by workers at registration renewal, and not all questions are answered by all respondents. To synthesise a national picture, unanswered questions are imputed where possible (using a statistical model) and the dataset is 'weighted-up' to account for non-respondents. The weighting-up process is based on a count of the number of males and females, by age group, registered in each jurisdiction provided to AIHW by the registration boards (although age group, and sometimes sex, is not always available from boards).

Data is then analysed, the report written and released.

Problems

This approach can only be used to report for registered professions. Professions not requiring registration do not have a vehicle (the board) for dissemination of the questionnaire, nor is a count of the total registered to practise available (again, from the boards, and very important in the weighting-up process at AIHW). Additionally, it is also not possible to report nationally for a profession that is registrable in some states but not others (e.g. occupational therapy).

Clearly, the production of national reports using this method relies on:

- good relationships and cooperation with jurisdictional health departments and registration boards;
- commitment by jurisdictions to include the core questions in the questionnaire;
- completion of the questionnaires by health professionals at registration;
- transfer of the completed questionnaires from the workers to the registration boards, and thence to the jurisdictional health department;
- timely transfer of the resultant data sets (the survey file and the registration benchmarking data) from jurisdictional health departments to AIHW.
- Arrival at AIHW of data sets from all jurisdictions.

The final determining factor, is whether there is funding available for AIHW to analyse the data and report.

Methodological issues

Weighting-up for non-response and imputing for missing questions clearly is not perfect, but is inevitable given the voluntary nature of the surveys.

The only available benchmark by which the survey results can be 'weighted-up' is the total number registered in each state. So as to report for regional and remote areas, it is necessary to assume that similar percentages of workers complete their survey form in each remoteness area (which may not be the case). If, for example, workers in regional and remote areas are more likely that those in Major Cities to complete and return the labour force survey, the reported supply of workers in these areas will be artificially inflated.

Why does AIHW have this role and who pays?

The main strengths of the AIHW relate to its unique legal position under the Australian Institute of Health and Welfare Act 1987, to its accumulation of statistical and logistical expertise, and to its role in reporting national health statistics.

Aggregation of data at the national level is possible because of the unique legal position occupied by AIHW. The AIHW Act provides the Institute with the ability to quarantine data confidentially and securely, ensuring that data provided by the States and Territories is aggregated, analysed and stored in an environment inaccessible to anyone else. The results of analyses can then be published at a level that ensures confidentiality, but which provides enough detail to inform Australian Government policy decisions, it is hoped.

AIHW work on the Australian health labour force is partially funded by appropriation under the Act, but also from outside funding. For example, medical and nursing labour force data collections are jointly funded by support from AHMAC and appropriation. There is no specific source of funding for reporting the allied health labour force, other than recent one-off funding by DoHA to produce the latest four reports, Podiatry labour force 2003, Physiotherapy labour force 2002, Occupational Therapy labour force 2002–2003 and Psychology labour force 2003.

Future developments

Future reporting of the allied health workforce, as well as the nursing and medical workforce, is likely to be substantially more straightforward and efficient. The COAG communiqué of 14 July 2006 states that "In order to facilitate workforce mobility, improve safety and quality, and reduce red tape, COAG has agreed to establish by July 2008 a single national registration scheme for health professionals, beginning with the nine professions currently registered in all jurisdictions". In terms of reporting a wide range of characteristics of the health workforce, such a move would eliminate duplicates and improve timeliness, and possibly also improve the accuracy of reported statistics.

The Health Workforce Principal committee (HWPC), which is an AHMAC sub-committee, is presently engaged in a comprehensive data development project. This should result in consistent minimum data sets for all the major health professions, resulting in revised questionnaires.

We are currently entering a period of change, which has the potential to improve the overall reporting of health labour force statistics.

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