

Geographic health workforce distribution 1986-2011: have policies made a favourable difference for nurses and midwives, physiotherapists and general practitioners?

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Background and aim

Indications so far suggests that the noted maldistribution of the health workforce between urban and rural/remote Australia remains challenging.¹⁻³ The Census offers a consistent source of data on the residential location of Nurses and Midwives (NMs), Physiotherapists (PTs) and General Practitioners (GPs) since at least the 1960s (prior to which there was less detailed information about occupation). Since 1986, further standardisation of the Census classification of occupations has improved data quality further. While issues remain, including the issue of self-identification of occupation, and mismatches between place of residence (which is well recorded in the Census) and place of work (which is poorly recorded), the Census provides insights that are not available from other single data sources for this time period.

The aim of this research was to examine how the distribution of GPs, NMs and PTs (measured by their number per 1000 population) changed between 1986 and 2011 Census (2016 data will be available late 2017). In the area of medicine there is an additional focus on changes between 1996 and 2011, with 1996 being the year when the first National Rural General Practice Study was undertaken.

Method

All persons identifying in the Census as 'nursing and midwifery professionals' (including NMs working part and full-time), 'physiotherapists' (including PTs working part and full-time), 'generalist medical practitioners' (including overseas trained GPs, and GPs working part and full-time) were included in the analysis. TableBuilder Pro was used to analyse the ABS Census data of 1986, 1991, 1996, 2001, 2006 and 2011 (<http://www.abs.gov.au/websitedbs/censushome.nsf/home/tablebuilder>).

Census geography has changed considerably since 1986, but the research was able to create a fairly stable set of geographies which broadly match what were 'Statistical Subdivisions' (SSDs) in Census geography prior to 2011, and which broadly align with sub-State administrative regions for policy areas such as health or education. There were 113 regions used in the final analysis. Regions were classified in line with the Modified Monash Model as major urban (MMM1), regional (MMM2), rural (MMM3-5), and remote (MMM6-7).⁴

Results

Nurses, Physiotherapists and GPs per 1000 population by geographic zone

Between 1986 and 2001, there were between about 8 and 9 NMs per 1000 population nationally. This increased to 10 for 2006, and at the 2011 Census, there were 11 NMs per 1000 population nationally. Throughout the period, regional areas have generally had the highest ratios of NMs per 1000 population, with nearly 10 in 1986 and over 13 in 2011.

In 1986 and 1991, there was about 0.4 PTs per 1000 population nationally. This increased to 0.5 for 1996 and 2001, and 0.6 for 2006. At the 2011 Census, there were 0.7 PTs per 1000 population nationally. Throughout the period, major urban areas have had the highest ratio of PTs per 1000 population—0.5 in 1986, 0.6 in 2001, and 0.8 in 2011.

For GPs in 1986 and 1996, there were about 1.5 GPs per 1000 population nationally. However, by 2011 there were just over 2 GPs per 1000 population. Throughout the period, major urban areas have had the highest ratio of GPs per 1000 population—1.8 in 1986, 1.7 in 1996, and 2.4 in 2011.

Table 1 shows the ratios for each of the three professions by broad geographic zone for each Census year 1986-2011. For GPs the ratios in all zones increased dramatically between 2006 and 2011.

Table 1 Nurses, Physiotherapists and GPs per 1000 population by geographic zone, 1986-2011

Nurses:

	1986	1991	1996	2001	2006	2011
Major urban	9.89	8.31	9.26	9.98	10.76	11.88
Regional	9.77	9.08	9.95	10.44	11.77	13.36
Rural	7.41	7.32	8.00	8.27	9.56	10.74
Remote	5.90	5.98	6.12	6.38	7.50	8.15
National	8.92	8.29	9.10	9.14	10.09	11.14

Physiotherapists:

	1986	1991	1996	2001	2006	2011
Major urban	0.47	0.46	0.53	0.63	0.72	0.84
Regional	0.24	0.29	0.37	0.39	0.48	0.62
Rural	0.23	0.24	0.32	0.35	0.36	0.45
Remote	0.17	0.13	0.20	0.29	0.34	0.28
National	0.38	0.42	0.50	0.55	0.62	0.75

GPs:

	1986	1991	1996	2001	2006	2011
Major urban	1.75	1.80	1.68	1.98	1.69	2.39
Regional	1.23	1.27	1.28	1.42	1.35	1.97
Rural	0.86	0.83	0.85	0.97	0.96	1.17
Remote	0.78	0.68	0.74	0.90	0.93	1.14
National	1.53	1.52	1.49	1.71	1.51	2.03

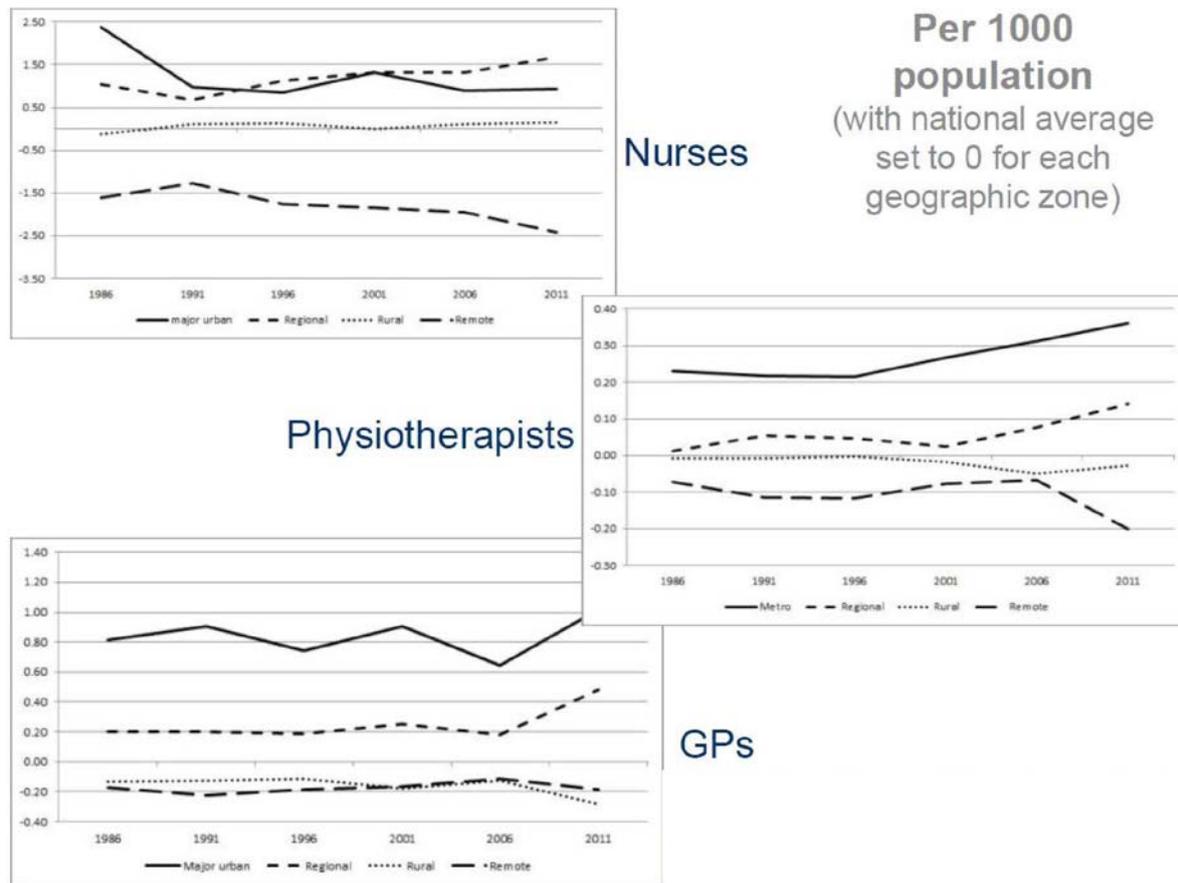
Comparison between number of NMs, PTs and GPs per 1000 population and the national average

Figure 1 shows the number of NMs, PTs and GPs per 1000 in each zone in excess (or deficit if below 0) of the average for each of the 113 regions. The remote zone has consistently had below average ratios of NMs per 1000 population, while the major urban and rural zones have been relatively stable since at least 1991. The regional zone has increased its ratio relative to the average since 1991.

The remote zone has consistently had below average ratios of PTs per 1000 population, while the rural zone has fallen below the average since 2001. Regional and major urban areas have experienced substantial increases in PTs per 1000 population since the late 1990s.

Rural and remote zones have continued to have below average ratios of GP per 1000 population, while regional and major urban areas experienced substantial increase between 2006 and 2011.

Figure 1 Comparison between number of NMs, PTs and GPs per 1000 population and national average (set to 0) for each geographic zone, 1986-2011



NMs, PTs and GPs per 1000 population ratios compared with their national averages for 2011

Figure 2 shows the 2011 NM, PT and GP-population ratios relative to their averages of each of the 113 regions. Dark red regions had very low ratios, light red regions had somewhat low ratios, white regions had about the national average, light blue regions had somewhat above the national average, and dark blue regions had substantially in excess of the national average. The outstanding feature is the high ratios for NMs in Victoria and parts of New South Wales, and the low ratios in most of the remainder of rural and remote Australia. For PTs, most of rural and remote Australia had low and very low PT-population ratios, but there were exceptions including Central Australia, the north of Western Australia, and the southern New South Wales coast. This result is comparable for GPs with most of rural and remote Australia showing low and very low GP-population ratios, although exceptions include Central Australia, the north of Western Australia, and the northern New South Wales coast.

Figure 3 shows the change in NM, PT and GP-population ratios relative to their national averages for each region, covering the period 1986-2011. Only regions which had lower than average ratios during the period are featured. Regions with consistently above average ratios are marked in grey.

For NM the red regions have seen their ratios decline throughout the period (with dark red indicating substantial decline in excess of 0.25 NMs per 1000 population, in excess of 0.1 PT per 1000 population, and in excess of 0.25 GPs per 1000 population), and blue regions have seen their ratios increase throughout the period. White regions have seen very little change in their ratios compared to

the national average. In general, remote area averages have become comparatively worse, although western parts of Queensland have improved.

Red regions have seen their PT ratios decline throughout the period (with dark red indicating substantial decline in excess of 0.1 PT per 1000 population). In general, remote area averages have become comparatively worse, although western parts of Queensland have stayed about the same. There are a few clusters of improved ratios, including in the Mid North of South Australia and the Mid North Coast of New South Wales.

In relation to GPs, red regions have seen their ratios decline throughout the period (with dark red indicating substantial decline in excess of 0.25 GPs per 1000 population). There have been increases in ratios in different parts of the country (with a number of 'increase' regions in New South Wales), and ratios in Queensland have been fairly stable. However, Western Australia, South Australia, Victoria and Tasmania are dominated by regions where GP-population ratios have decreased.

Figure 2 NMs, PTs and GPs per 1000 population ratios compared with their national averages for 2011

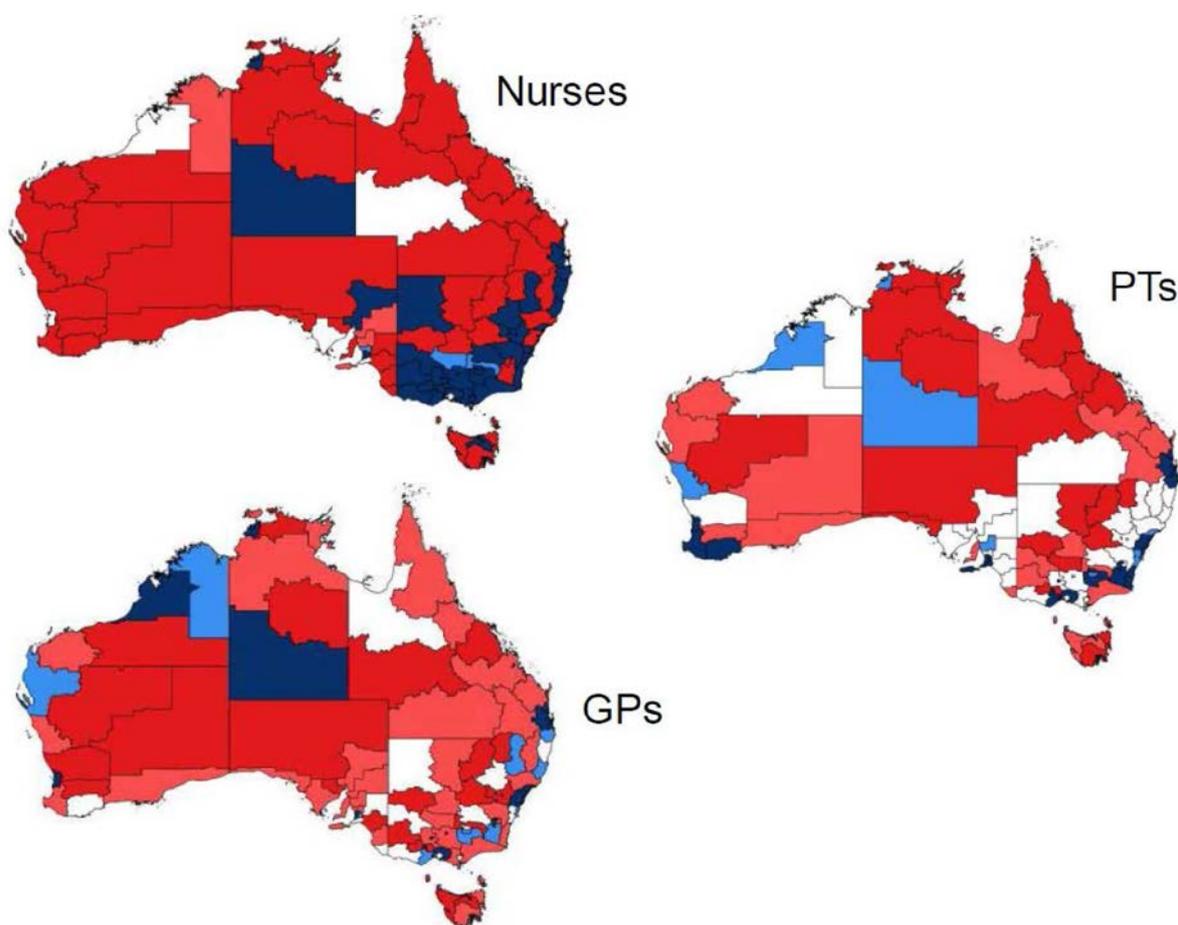


Figure 3 Changes in NM, PT and GP-population ratios 1986-2011 relative to their national averages

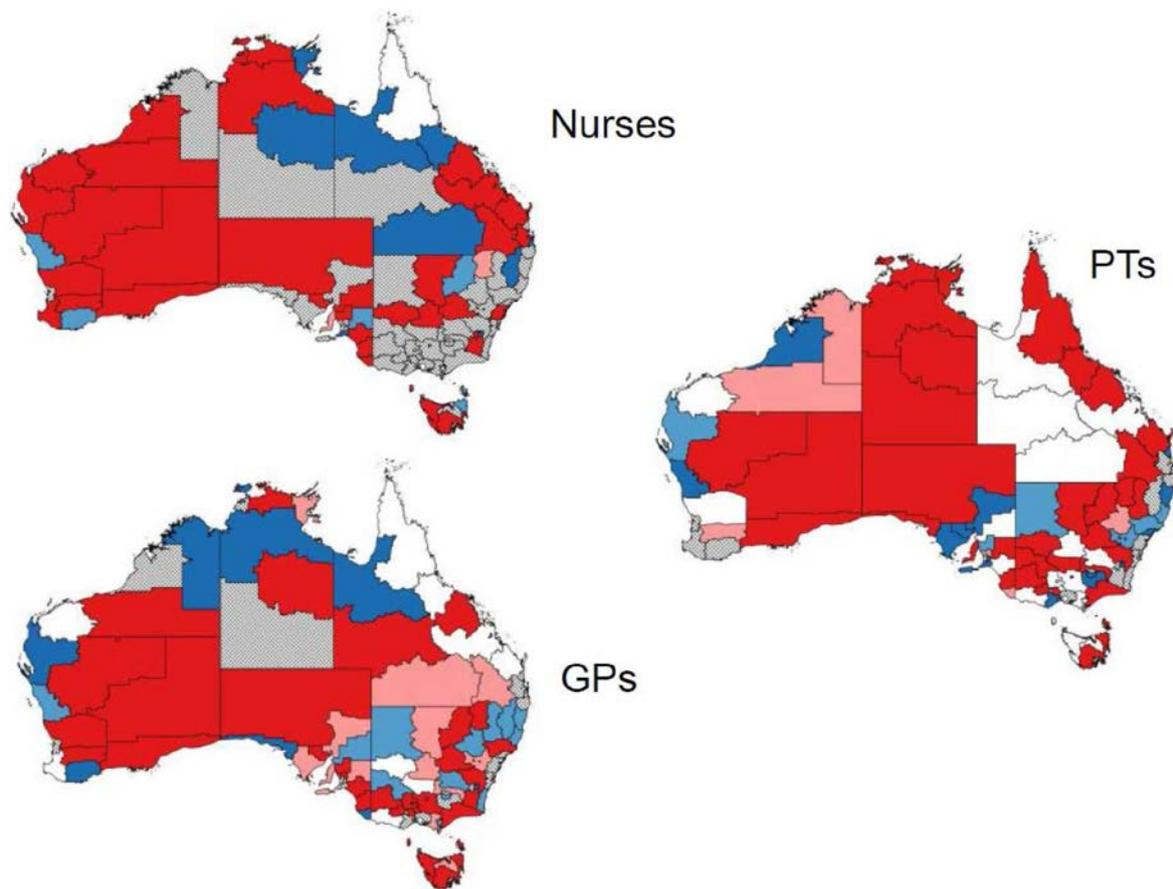
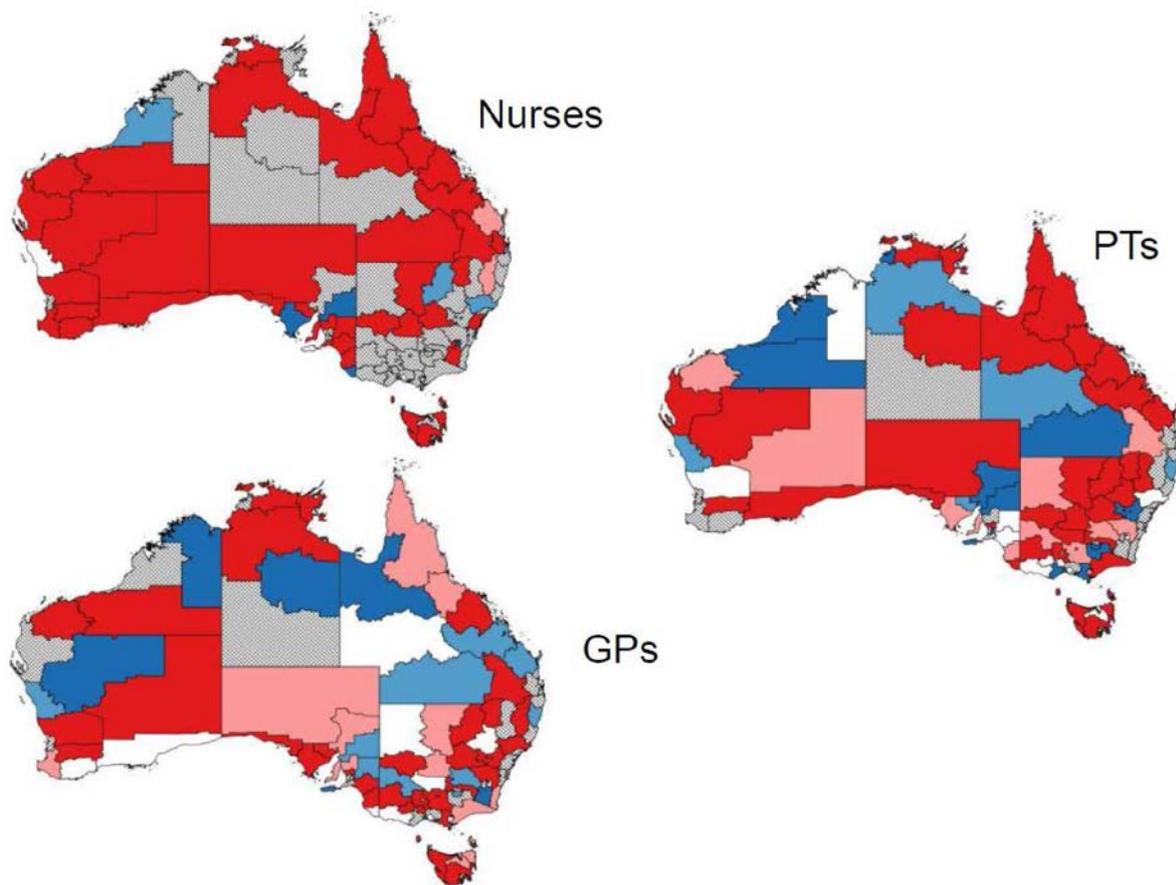


Figure 4 repeats Figure 3, but just for the period 1996-2011 (1996 representing the start of the major policy attention to rural health workforce issues). Outside the south eastern corner of Australia, where NM ratios have typically been above average for the entire period, there has generally been a worsening of performance relative to the national average.

For PTs, the pattern remains one of patchy improvement and persisting workforce deficits in many rural and remote areas. There have been some improvements in southern Queensland and the north west of Australia, and Central Australia has had above average ratios since 1996.

Lastly, for GPs, two regions in the north of New South Wales, and the Gascoyne region in Western Australia, had increased their GP-population ratios to or above the national average by 1986 and subsequently. South Australia, Tasmania, and Victoria experienced mostly declines in GP-population ratios during the 1996-2011 period, while results in the other States were patchy.

Figure 4 Changes in NM, PT and GP-population ratio 1996-2011 relative to their national averages



Commentary

Rural and remote areas continue to be relatively under-served by Australia's GP workforce. Despite substantial investment in workforce programs at least since the mid-1990s, there 'gap' between service levels in urban (metropolitan and regional in this analysis) and rural (and remote) areas has not closed, and increased substantially between 2006 and 2011 as the Australian medical workforce dramatically expanded. Over the period considered in this research, many rural and remote areas which were already poorly served at the start became (relatively) even more so. It is possible that nurses in NSW and Victoria fill gaps arising from shortages of GPs, although this potential compensation effect is not evident in other states since these states show shortages for all three professions. There have, however, been areas of relative improvement in service levels which may be explained by local conditions (such as the likely investment by mining companies in health and medical services in some parts of Queensland and Western Australia in the early 2000s) and/or by the results of various policies or programs. While most policies and programs have been intended to operate either nationally or State-wide, some initiatives such as rural clinical education have been highly localised, and others may have had different impacts in different places as a result of local implementation processes (Divisions of General Practice as an example). The data present a series of snapshots, and the differences between Figure 3 and Figure 4 suggest that the situation is dynamic and that many regions experience periods of substantial service increase and decrease over even relatively short periods of time. The task is therefore not only to understand why some regions improve between particular points in time, but how persistent improvements are likely to be.

Opportunities for future development and research

The next stage in this research might be to identify regions of particular interest (because they have experienced persistent improvement or have been unable to sustain improvements) and examine their workforce characteristics more closely. For example, rural vocational training program initiatives such as the 30 new regional training hubs for specialty training in medicine⁵ are promising for rural and remote GPs, although these may be equally needed for professions other than medicine to facilitate interprofessional learning and practice that, in turn, could enhance health workforce recruitment and retention (including that of GPs). An Australian case study by Munoz and colleagues showed that interprofessional training and strong networks together with social capital links are of great benefit.⁶ Rural training may then need to go together with organisational development within a region, professional networks and career options.⁷ The success of such an integrated approach will depend on policy guided leadership and professional and education systems to go beyond traditional health professional education and incentives, and to engage with rural communities and broader community health and development interests.

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Presenter

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