Deloitte Access Economics

Review of the Rural Medical Workforce Distribution Programs and Policies

Department of Health and Ageing

17 August 2011

Deloitte.

Contents

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Glossary of acronyms

5YOTDS	Five Year Overseas Trained Doctor Scheme
ABS	Australian Bureau of Statistics
ACCRM	Australian College of Rural and Remote Medicine
AIHW	Australian Institute of Health and Welfare
ARIA	Accessibility/Remoteness Index of Australia
ASGC-RA	Australian Standard Geographic Classification (remoteness area)
ATD	Australian trained doctor
BMP	Bonded Medical Places scheme
CSP	Commonwealth Supported Place
DIAC	Department of Immigration and Citizenship
DOHA	Department of Health and Ageing
DWS	District of Workforce Shortage
FARGP	Fellowship of Advanced Rural General Practice
FGAMS	Foreign Graduate of an Accredited Medical School
FTE	full time equivalent
FWE	full time workload equivalence
GP	general practitioner
GPET	General Practice Education and Training (Limited)
GPRIP	General Practice Rural Incentives Program
IMG	International Medical Graduate cross ref OTD
MDANZ	Medical Deans Australia and New Zealand
MRBS	Medical Rural Bonded Scholarship scheme
MTRP	Medical Training Review Panel
PGY	post graduate year
RACGP	Royal Australian College of General Practitioners
RAMUS	Rural Australia Medical Undergraduate Scholarship
RRIG	Rural Relocation Incentive Grant
RRP	Rural Retention program
RRIPS	Registrars Rural Incentive Payment scheme
SLA	Statistical Local Area

Note: IMG is the term preferred by doctors, in preference to OTD, hence this terminology is used in this report. Moreover, in the modelling of clinicians, FGAMSs once trained become IMGs (not ATDs), due to visa conditions. Note also that through the report, 'registrars' incorporate clinicians training toward specialist positions, including general practice.

Executive summary

Deloitte Access Economics was commissioned by the Department of Health and Ageing (DoHA) to project medical workforce supply by geographic distribution to 2020, assessing the impacts of rural incentives and providing a manipulable model.

Methods

Core modelling of rural workforce dynamics was performed in Excel, with the workforce categorised as general practitioners (GPs), non-GP specialists and other clinicians (mainly hospital specialists and specialists-in-training). The workforce was modelled by age group (<35 years, 35-44, 45-54, 55-64, 65+), gender, and by regionality (ASGC-RA1, 2, 3, 4-5). Workforce was also split by Australian citizens and others – international medical graduates (IMGs) and foreign graduates of accredited medical schools (FGAMSs) remaining in Australia. For statistics which were not based on other geographical measures, concordances were used to convert to RAs.

Inflows to the model were estimated, for graduates (Australian citizens and FGAMSs), using data from DoHA and from Medical Deans Australia and New Zealand (MDANZ). Graduates were distinguished by whether they were in the 25% of places allocated to the Bonded Medical Places (BMP) scheme or, additionally, to the Medical Rural Bonded Scholarship (MRBS) scheme. Where these graduates locate and the speciality or otherwise that they practice was determined by data on stated preferences together with historical patterns.

Similarly, the location, clinician type, age and gender of inflows of IMGs were determined by assumptions about preferences and historical patterns. These assumptions are detailed in Chapter 2 and reflect the impacts of the Five Year Overseas Trained Doctor Scheme (5YOTDS) and other initiatives. This chapter also details graduate attrition rates, and doctor exit rates through retirements of those aged 65+ (14% per annum) and those younger (0.5% per annum), based on AIHW medical workforce data and previous Access Economics estimates.

The impacts of the General Practice Rural Incentives Program (GPRIP) in incentivising doctors to work in RA2-5 were modelled based on budget data and assumptions about length of stay of these doctors in rural areas.

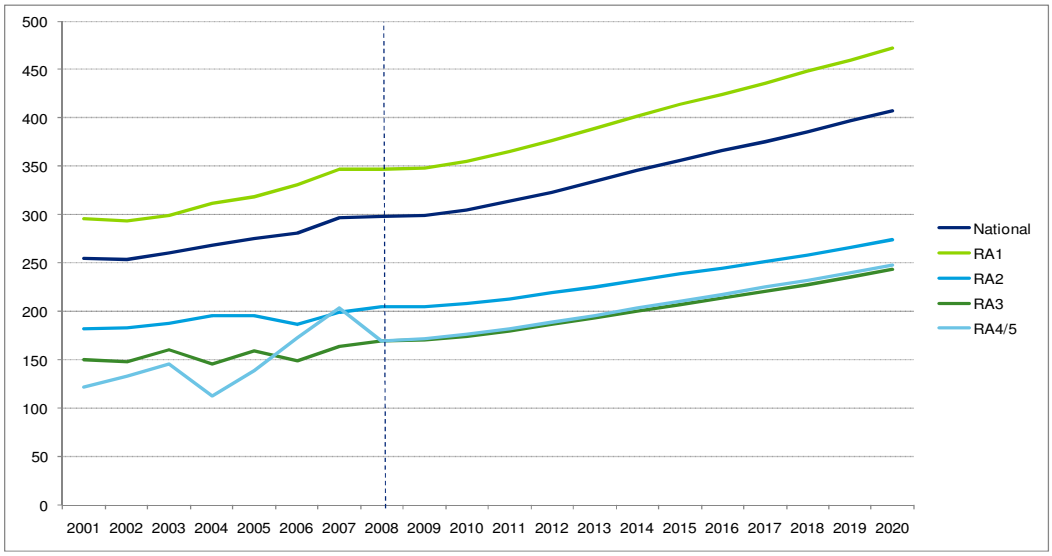
AIHW data on hours worked by age group and gender were used to convert headcounts to full time equivalent (FTE) doctors.

Analysis of historical data suggests that Commonwealth programs appear to have been successful in increasing clinician-to-population ratios in RA2-5 and in attracting foreign doctors into rural and remote areas. Non-citizen GPs accounted for a larger share of doctors in all non-metropolitan areas in 2008 than in 2001. In remote and very remote areas (RA4-5), temporary and permanent resident doctors account for almost a quarter of the GP workforce, compared to less than 5% in major cities.

Projection findings

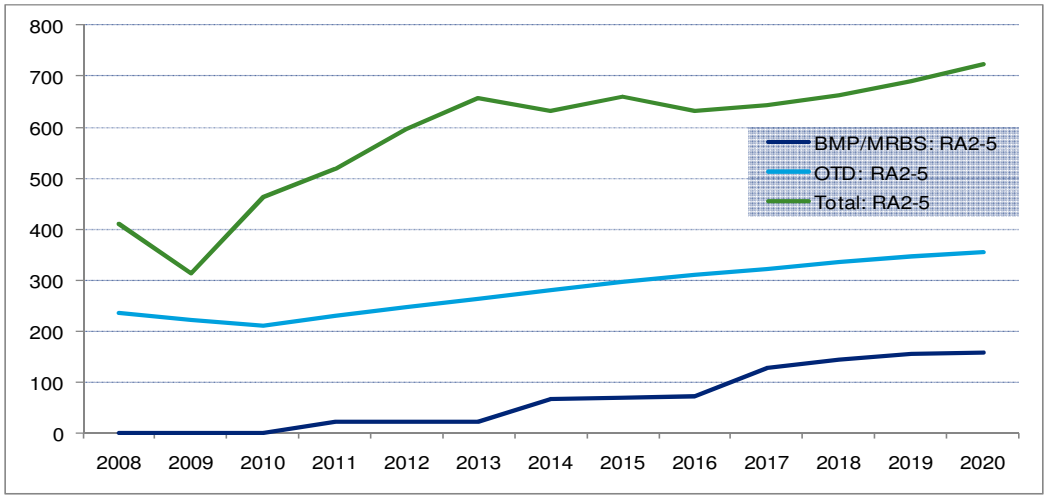
Barring unforeseen major changes to these programs, Deloitte Access Economics forecasts that serviceability levels should continue to improve in rural and remote regions over the coming decade in terms of headcount (Chart i), increasing nationally from around 300 currently to over 400 per 100,000 population by 2020. Almost half this increase is expected to be from OTDs, with a smaller but increasing contribution from domestic bonded programs. Of the total increase in rural and remote clinicians between 2011 and 2020 (6,413 doctors in total), 13% (858) will be from bonded programs, 47% (2,986) from OTDs and 40% (2,569) from other sources (non-bonded Australian trained doctors).

Chart i: Clinicians (headcount) per 100,000 population, by ASGC-RA, 2012 to 2020



Source: DoHA, 2011b, and Deloitte Access Economics.

Chart ii: Year-on-year growth of clinicians by source, 2008 to 2020 (RA2-5)



Source: Deloitte Access Economics.

Deloitte Access Economics

1 Background

Deloitte Access Economics was commissioned by the Department of Health and Ageing (DoHA) to provide a detailed analysis of the interactions between a range of rural medical workforce distribution programs and policies and the likely combined impact on future medical workforce. The analysis has the following seven areas of scope:

- project medical workforce supply by geographic distribution through IMG recruitment arrangements with a requirement to work in rural or other areas under 19AB exemptions (over 2 to 5 and 5 to 10 years);
- project medical workforce supply by geographic distribution through bonded medical student programs with return of service obligations (over 2 to 5 and 5 to 10 years);
- project expected rates of medical practitioners leaving rural and remote areas, and separately the workforce through retirement;
- assess the impact of rural incentives;
- assess the interactions between these projections and current measurements of districts of workforce shortage (DWSs);
- undertake sensitivity analysis against each of the projections outlined above, projecting the workforce change with a range of different assumptions; and
- provide a manipulable model that the department could use for further analysis.

1.1 Structure of this report

The report is structured as follows:

- the remainder of this chapter provides a contextual background in terms of policy, and definitional classification of the rural medical workforce;
- Chapter 2 comprises a summary of the methodology adopted in this review, including data assimilation and the modelling approach;
- Chapter 3 presents results – modelling outputs in the base case and under a 'shock' scenario, including with sensitivity analysis; and
- Chapter 4 presents discussion and conclusions.

1.2 Policy context of this review

The Australian Government aims to ensure the health workforce has the capacity to meet the health needs of all Australians by providing incentives to increase the supply and quality of medical professionals, with most aimed at increasing the workforce in rural and remote areas. These include recruitment, education, training, and distribution programs for the medical workforce, nursing workforce and for allied health professionals.

The national health workforce strategic framework (AHMC, 2004) provided a set of principles guiding Australia's future health workforce policy and planning. An underlying

principle of the framework was to achieve a health workforce that was distributed to achieve equitable health care and outcomes for all Australians, regardless of location.

There are workforce shortages across a range of health professions. Shortages have been quantifiably analysed in a range of reports including those by the Australian Medical Workforce Advisory Committee who estimated shortages of between 80 to 1,300 GPs in 2002 (AMWAC, 2005). The then Department of Employment and Workplace relations also identified shortages in a number of areas (DEWR, 2005) including hospital and retail pharmacists, pathologists, sonographers, diagnostic radiographers and psychiatrists.

These shortages are more pronounced in rural and remote areas. There exists a maldistribution of health workers in Australia with the supply of health workers falling considerably with remoteness. According to DoHA (2008), the average number of full-time equivalent (FTE)[1] general practitioners (GPs) per 100,000 population varied from over 100 in the better serviced cities, to 25.3 in very remote areas.

Shortages led to a number of policy responses from the Australian Government including increasing the number of professional entry education and vocational training places for medicineand a greater reliance on overseas medical practitioners. The number of university intake places for medicine was set to rise by 30% between 2001 and 2009 (Productivity Commission, 2005), and Australia is currently experiencing the resultant increase in the number of graduates from Australian medical schools. Since 2004, COAG decisions and other policy changes have more than doubled with estimated medical graduates in 2014 of 3,786. However, while gains have been made, a maldistribution of health workers remains, and access to medical professionals by the population in regional and remote areas continues to be below the access in major cities.

The Australian Government continues to address the supply and distribution of Australia's health workforce by developing and implementing a number of initiatives to recruit and retain the medical workforce in districts of workforce shortage (DWSs). These programs and policies apply to rural and remote areas, and the population of Australian trained doctors (ATDs), international medical graduates (IMGs) [2] and foreign graduates of accredited medical schools (FGAMS), and include:

- the Bonded Medical Places (BMP) scheme;
- the Medical Rural Bonded Scholarship (MRBS) scheme ;
- the General Practice Rural Incentives Program (GPRIP);
- the five year Overseas Trained Doctor Scheme (5YOTDS); and
- arrangements as they relate to Section 19AB of the Health Insurance Act 1973.

Collectively, these programs and policies involve requirements or return of service obligations for participants to practise in DWSs and/or rural and remote regions, for varying durations[3].

[1] FTE is a measure of service provision that takes into account hours worked, rather than just headcount. One measure of FTE is FWE – see later footnote.

[2] The terminology preferred by OTDs – equivalent meaning.

[3] BMP can practice in outer metro DWS and inner metro depending on their specialty

1.3 Regional medical workforce – key definitions

1.3.1 Medical categories

We define a medical practitioner according to the Australian Institute of Health and Welfare (AIHW, 2011) as a person who has worked mainly, or only, in their state of registration, in medicine, whose primary employment role was to diagnose physical and mental illness, disorders and injuries and prescribe medications and treatments that promote or restore good health[4]. In this report we differentiate between those who are ATDs, IMGs or FGAMS, as well as by medical specialty. An ATD is an Australian or New Zealand citizen[5], by birth or permanent residency who has received their primary medical qualification within Australia. As defined by DoHA an IMG is a person whose primary medical qualification was not obtained from a medical school located in Australia. DoHA defines a FGAMS as a person who received their primary medical qualification from a medical school within Australia, and who was not a permanent resident or Australian citizen when they were first enrolled. For simplicity in this analysis we distinguish FGAMSs and ATDs in student flows, but flow FGAMS graduates into IMG stocks in the clinician modelling, since Section 19AB restrictions apply similarly to both (Section 1.4.4).

In this report we distinguish the following categories of medical practitioners.

Specialists

Specialists are medical practitioners whose qualification was awarded by or is equivalent to that awarded by a relevant specialist professional college in Australia, and the doctor is allowed to practice in their field of specialisation. A specialist works primarily within private practice or hospitals.

General practitioners (GPs)

A GP is defined as a medical practitioner whose main area of clinical practice was primary medicine or family health care. A GP may be self-employed or work within a practice. General practice is a recognised specialty. Under the *Health Insurance Act 1973*, access to some programs and Medicare rebates applies only to medical practitioners registered under Section 3F Vocationally Registered General Practitioners.

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[4] Medicare has a different definition of medical practitioner, however, this is not used in this report because Medicare data was unavailable.

The definition of GP used in the report is that of AIHW, primary care practitioner. This definition of GP differs from that under the *Health Insurance Act 1973*. This definition was implemented through the report, based upon the lack of suitable data from Medicare.

[5] Persons who enter Australia under a New Zealand passport are considered to be a temporary resident of Australia under the *Migration Act 1958*. From 1 April 2010 those doctors that were New Zealand permanent resident or citizens at the time that they enrolled in an Australian Medical Council accredited medical school in Australia or New Zealand will no longer be classified as overseas trained doctors, and therefore will not be subject to s19AB of the Act (http://www.health.gov.au/internet/otd/publishing.nsf/Content/work-s19AB%20factsheet-factsheet).

'Other' medical workforce

'Other' includes medical practitioners who have achieved general registration but are not registered as a GP or specialist. This includes hospital non-specialists, specialists in training, and other clinicians. A hospital non-specialist is a medical practitioner mainly employed in a salaried position in a hospital who does not have a recognised specialist qualification and who is not in training to gain a recognised specialist qualification. It includes specialists in-training, resident medical officers, career medical officers and other salaried hospital practitioners (AIHW, 2011). A specialist in training (or registrar) is a medical practitioner who has been accepted by a specialist medical college into a training position supervised by a member of the college. 'Other clinician' is a clinical job function in medicine that is not a GP, hospital non specialist, specialist or specialist in training and may include providing primary care services.

1.3.2 Australian Standard Geographic Classification – Remoteness Areas (ASGC-RA)

The ASGC-RA is a classification system measuring remoteness of different geographical areas. The categories are listed in Table 1.1. The Department applies the RA classification system to a number of workforce incentives, where eligibility is generally from RA2 to RA5.

Table 1.1: ASGC-RA area classification after 2010

ASGC-RA Classification	Category	Average ARIA index value
RA1	Major Cities of Australia	0 to 0.2
RA2	Inner Regional Australia	Greater than 0.2, less than or equal to 2.4
RA3	Outer Regional Australia	Greater than 2.4, less than or equal to 5.92
RA4	Remote Australia	Greater than 5.92, less than or equal to 10.53
RA5	Very Remote Australia	Greater than 10.53

Source: http://www.health.gov.au/internet/otd/Publishing.nsf/Content/RA-intro.

Remoteness Areas (RAs) are aggregations of the ABS Collection Districts, which share common characteristics of remoteness. The RA classification covers the whole of geographic Australia. The criteria for remoteness areas are based on the Accessibility/Remoteness Index of Australia (ARIA), where remoteness is calculated using the road distance to the nearest urban centre in each of five classes based on population size.[6]

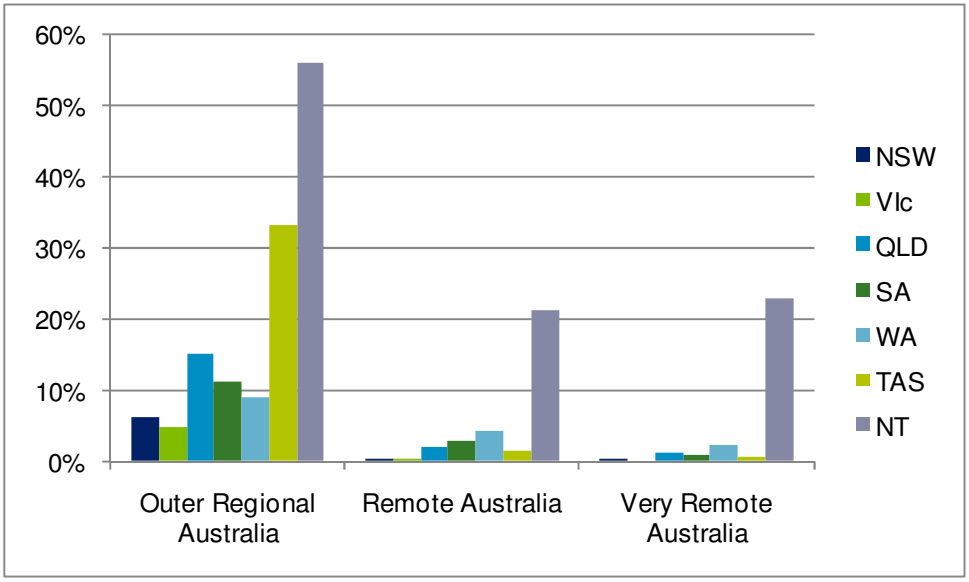
According to the ASGC-RA classification, 88% of Australia's population lives in major cities (RA1, 69%) and inner regional areas (RA2, 20%)[7], while 12% of the population lives in outer

[6] ARIA + scores are first calculated for each urban centre, in 1km square grids. These are then added together, covering the whole geography of Australia. Each grid carries a score of remoteness from an index of scores ranging from zero through to 15. RAs are created by averaging the ARIA + scores within Collection Districts, and aggregating the Collection Districts in the five RA categories based on the averaged ARIA+ score (http://www.doctorconnect.gov.au/internet/otd/publishing.nsf/Content/Ra-intro, http://abs.gov.au/AUSSTATS/abs@.nsf/lookup/1216.0Contents12005).

[7] Throughout the report, numbers may not sum exactly to totals due to rounding.

regional (RA3, 9%), remote (RA4, 1%) and very remote (RA5, 1%), with substantial differences between states. None of the Northern Territory population lives in RA1 or RA2, compared to 81.8% of Queenslanders and 93.2% of the population of New South Wales. Chart 1.1 shows proportions of the population by jurisdiction living in RA3, RA4 and RA5 for 2010.

Chart 1.1: State population in rural and remote areas, ASGC-RA3-5



Source: ABS and Deloitte Access Economics. Note: ACT not included, as there is no RA3-5 population within this Territory.

1.3.3 Districts of Workforce Shortage (DWSs)

DoHA defines a DWS as a geographical area where the population need for healthcare has not been met. Population needs are unmet if residents have access to Medicare services less than that of the national average. DoHA determines whether an area is given DWS status largely by its doctor to population ratio, based on ABS statistical local area (SLA) population data and Medicare Australia billing data for full time equivalent (FTE)[8]. A location is deemed to be a DWS for a medical specialty if it falls below the national average for the provision of medical services for the specialty, based on the latest Medicare billing statistics[9].

As indicated in Chart 1.2, a significant proportion of statistical local areas (SLAs) are demarcated as DWSs. In 2005, 61% of SLAs in RA3 were classified as DWSs and 68% in RA4. During the five year period, 2005 to 2010, all RA5 SLAs have been regarded as DWSs (DoHA,

[8] The GP headcount is the number of general practitioner for whom at least on Medicare service was processed during the year. FTE is a modified count of doctors that takes into account the partial contribution of doctors who work less than full-time. FTE is calculated by dividing each doctor's Medicare billing by the average billing of full-time doctors for the year, with the FTE figure for each doctor capped at one. That is, a doctor with 50% of the average billing for full-time doctors is is counted as 0.5, while doctors billing at or above the average are counted as one. (DoHA, 2011d)

[9] http://www.health.gov.au/internet/main/publishing.nsf/Content/work-pr-dws-fact

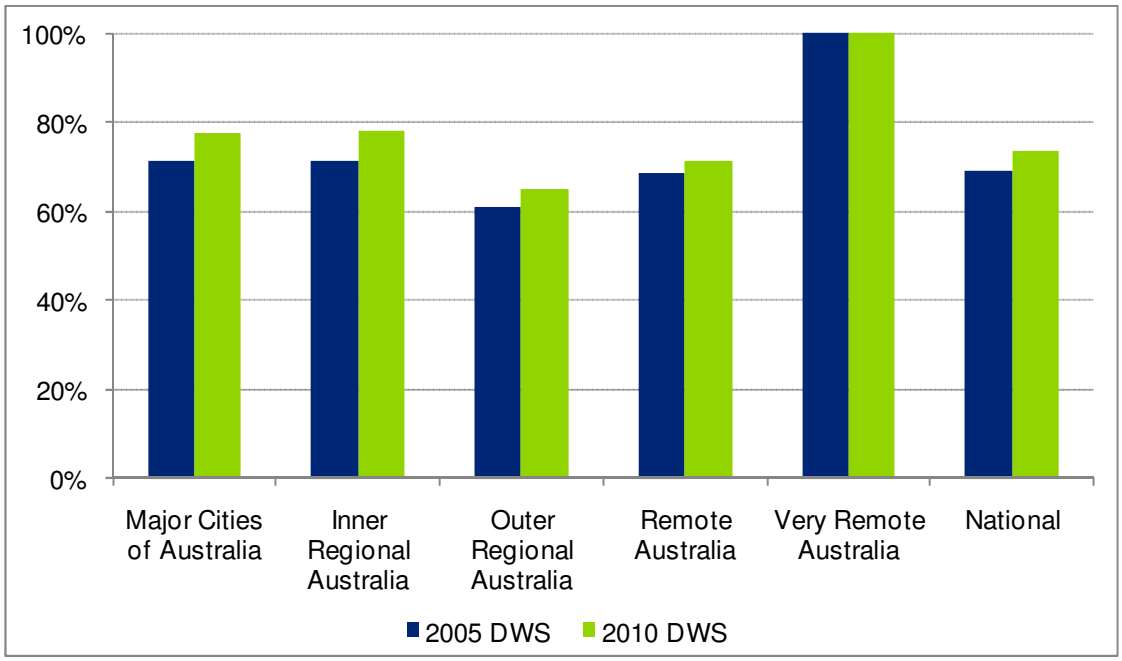
2011d). Despite rural incentive programs, the share of DWSs has risen in all RA1-RA4 areas, and hence nationally, from 68% to 72%.

DWS's have increased in all regions of Australia, since 2005 (except in very remote Australia which was at 100% already).. This indicates that rural workforce programs have not reduced the number of DWS in rural and remote areas. However, it is possible that in the absence of rural workforce programs, the increase in DWS may have been greater.

- Deloitte Access Economics was not able to assess the impact of rural workforce programs on DWS, as actual numbers of medical specialists for DWS areas was not provided. That is, without knowing how far below average a DWS is, it is not possible to tell whether a given increase in medical workers would change its status.
- Given that DWS are based on national averages, it is counter-intuitive that the number of DWS should be increasing in all regions simultaneously. However, without access to the underlying data, Deloitte Access Economics is unable to explain this apparent anomaly.

The current DWSs throughout Australia are illustrated in Figure 1.1.[10]

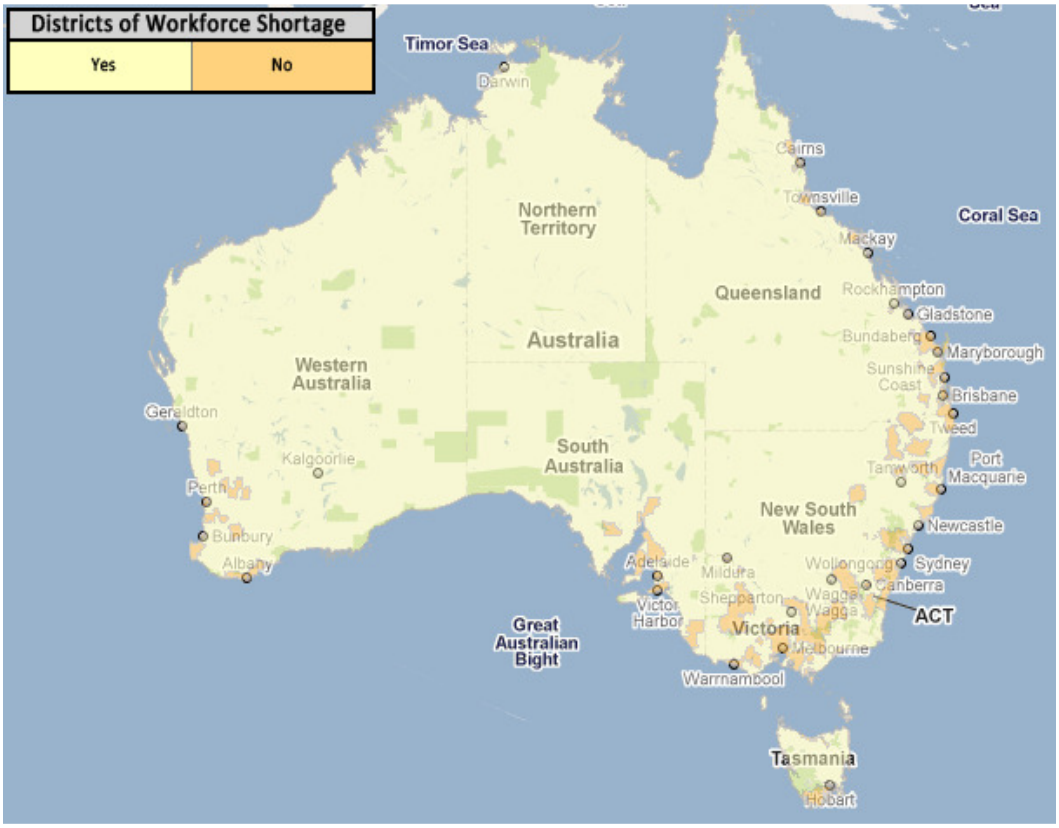
Chart 1.2: Proportion of SLAs reported as DWSs, by ASGC-RA



Source: DoHA 2011d and Deloitte Access Economics.

[10] Other considerations of DWS status include whether a doctor is replacing an existing doctor, evidence that the employer is an Indigenous specific primary health care service funded by the Office of Aboriginal and Torres Strait Islander Health, or if a large proportion of the practice's patients are from surrounding locations which are considered to be DWSs.

Figure 1.1: Map showing districts of workforce shortage

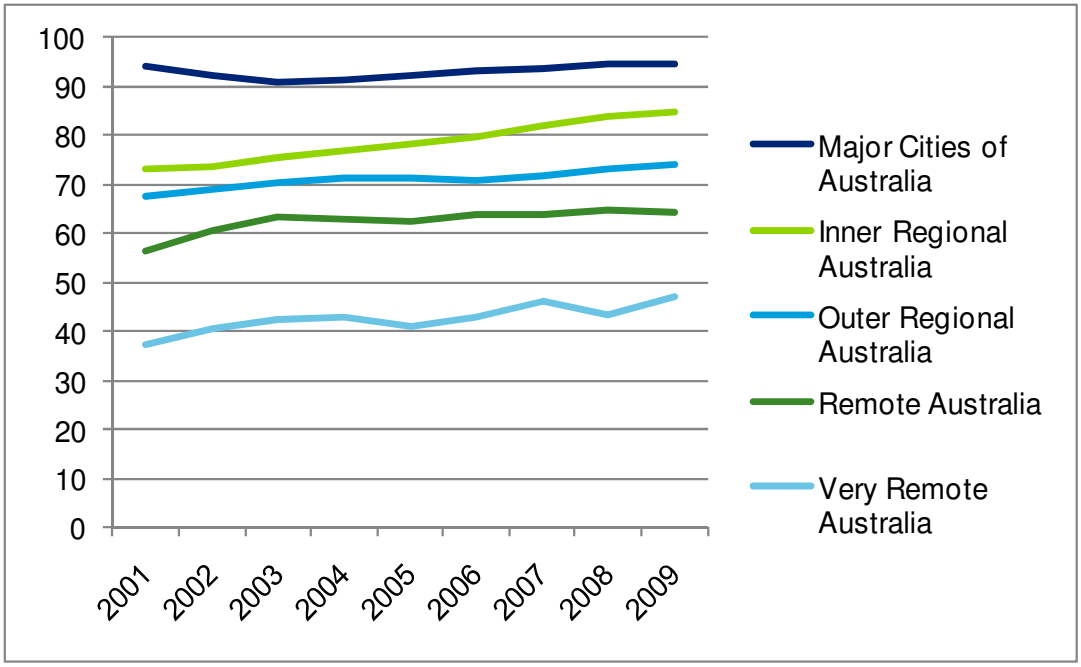


Source: http://www.doctorconnect.gov.au/internet/otd/publishing.nsf/Content/locator# accessed April 2011. Used with permission.

Chart 1.3 shows access to GP services between 2001 and 2009 by Remoteness Area (RA), measured by the number of FWE GPs per 100,000 people, with descending ratios as remoteness increases from RA1 to RA5. There has been some convergence between RA1 and RA2-5, but RA3-5 continues to have substantially less access to GP medical services than the other two RAs.

Although the number of DWSs has increased, the level of service provision has also increased in RAs 2-5. This situation is apparent, as the DWS formula uses a national average level of servicing which changes with fluctuations in service provision, making it difficult to provide an accurate picture of the areas which face constant shortage of service provision.

Chart 1.3: GPs: FWE per 100,000 population



Source: DoHA, 2010c; Deloitte Access Economics.

1.4 Regional workforce programs and policies

1.4.1 Bonded Medical Places (BMP) Scheme

BMP scheme positions are allocated to 25% of all first year Commonwealth supported medical places, with application and selection managed by the Universities. The scheme currently provides around 680 additional Commonwealth supported places each year. Following medical qualification, internship and achievement of Fellowship of a specialist medical college, including general practice, applicants will work in a district of workforce shortage for a period of time equal to the duration of their medical degree, referred to as Return of Service Obligations[11]. Australian Citizens and Permanent Residents are eligible to apply for the scheme. Since January 2010, locations where BMP doctors are eligible to work has been determined according to the ASGC-RA classification system and areas classified as DWS. Eligible locations are those categorised as outer metropolitan areas of RA1, and RA2 to RA5[12].

1.4.2 Medical Rural Bonded Scholarship (MRBS) Scheme

The MRBS provides 100 additional Commonwealth supported medical places each year. In 2011, MRBS students will receive $24,594 which is indexed annually, tax free. This amount is received annually for the duration of their degree. Application and selection is

[11] The duration of the Return of Service may be scaled downwards depending on the remoteness of the location where medical services are provided. In addition, up to half of the return of service obligations can be undertaken during prevocational and vocational training.

[12] Some inner metro areas may be considered DWS for this scheme, depending on the specialty.

determined by the Universities, Upon accepting the position, applicants agree to work in a rural or remote area for a period of six continuous years[13]. The return of service obligation commences following the applicant's medical qualification and achievement of Fellowship of a specialist medical college, including general practice. Australian Citizens and Permanent Residents are eligible to apply for the scheme. The ASGC-RA classification system is used to determine eligible locations where MRBS doctors may complete their return to service obligations, with eligible locations being RA2-5.

1.4.3 General Practice Rural Incentives Program (GPRIP)

GPRIP commenced in July 2010. The program combines two previously separate retention programs available to GPs and Registrars, together with a third component:

- GP component (formerly known as the rural retention program);
- registrar component (formerly known as the registrars rural incentive payment scheme); and
- Rural Relocation Incentive Grant (RRIG).

GPRIP is structured so as to be inclusive of a broader medical workforce population base at different stages of career progression. Discrete financial incentives, allocated to participants in semi-annual instalments, facilitate short term (half year) to longer term (greater than five year) relocations of general practitioners to rural and remote regions of Australia. To qualify, medical practitioners must meet the continuous service requirements[14] and must be working in eligible locations. Eligible locations are determined by the ASGC-RA classification system categorised as RA2-5[15].

1.4.4 IMG and FGAMS arrangements

Section 19AB of the Health Insurance Act 1973 applies to both IMGs and FGAMS who gained their first medical registration on or after 1 January 1997. These individuals have restrictions on access to Medicare provider numbers, and must work in DWSs for a minimum period of ten years (the ten year moratorium requirement) – commencing the date of first medical registration in Australia.

Temporary and permanent resident OTDs in general practice may reduce their ten year moratorium requirement by applying under the five year overseas trained doctor scheme (5YOTDS[16]). Applicants to this program agree to work in a designated rural or remote region of Australia for a period of five (or as few as three) years, after which provider number restrictions are exempted by the Department. During the program, applicants are required to obtain Fellowship of the Royal Australian College of General Practitioners

[13] The duration of time spent in practice may be scaled downwards depending on the remoteness of the location where medical services are provided.

[14] Continuous service requirements for the GP component and RRIG are four active quarters in every 8 quarters, the Registrar component allows up to 52 calendar weeks may elapse between eligible training placements e.g. for leave reasons. Where the gap is longer than 52 weeks, the payment level reverts to the base level for the relevant RA category.

[15] Some training places in RA1 are eligible under the Registrar component if authorised by the regional training provider.

[16] 5YOTDS can also be reduced through application of scaling.

(RACGP) or the Australian College of Rural and Remote Medicine (ACRRM), obtain citizenship and meet jurisdictional requirements of the state or territory scheme, incorporating national registration requirements.

1.4.5 Impact of policies

Medical Deans Australia and New Zealand (MDANZ) has reported an increasing number of domestic and international full fee paying (or FGAMS) medical graduates, which is predicted to peak by 2014, up 59% on 2009 (DoHA, 2010a; MDANZ, 2010a). The numbers of international full fee paying medical students are set by universities with no Commonwealth or other jurisdictional involvement. How this may impact on the distributional and geographical profile of medical workforce through rural and remote Australia is not well understood. As indicated in Table 1.2, the term of obligation or requirement for the different rural and remote workforce distribution programs varies in duration (which for both BMP scheme and MRBS scheme commences following achievement of Fellowship). Difficulties lie in determining whether doctors recruited through these programs remain in a particular region, transfer laterally, or drop out of the relevant programs. Given the typical timeframes of medical qualification (Table 1.3), substantial latitude exists for lateral transfer of medical workforce, in and out of DWS regions.

Table 1.2: Term of obligation or requirement for rural and remote workforce program

Program	Term of obligation / requirement
Bonded Medical Places Scheme	4-6 years (length of medical degree)*
Medical Rural Bonded Scholarship Scheme	6 years (continuous)+
Five Year Overseas Trained Doctor Scheme	3-5 years (RRMA contingent)
Section 19AB (other)	10 years

Source: * DoHA, 2010a. + Scaling may apply (DoHA, 2011e).

Table 1.3: Typical timeframes for medical qualification

Training stage	# years	Cumulative # years
Medical student	5-6	5-6
Intern (PGY1)	1	6-7
General registration	-	-
Junior/resident medical officer (PGY2)	1	7-8
Senior medical officer (PGY3-4)	2	8-10
Specialist trainee/registrar	4-6	8-16
Medical specialist		12-17
Sub-speciality training		12-17

Source: DoHA, 2008a.

To 2010, of the 168 IMGs who had completed their 5YOTDS commitments, approximately 70% (118) continued working in the rural practices under which they served their obligation (RHWA, 2010). Further information about doctor and population dynamics can be taken from the 2001 and 2006 census data. Over these census periods, population per FTE GP ratios decreased across the board in rural and remote Australia, but at the same time,

major city ratios increased by 10.2% (RHWA, 2010). In total, the FTE to population ratios increased 3.2% nationally, albeit GP to patient ratios were consolidating across regional Australia within this time window, notwithstanding in some RAs they remain excessive (depicted in Table 1.4).

Table 1.4: Population per FTE GP by ASGC-RA classification, Census 2001 and 2006

	RA1	RA2	RA3	RA4	RA5	Average
2001	999	1,459	1,606	1,909	3,441	**1,137**
2006	1,101	1,301	1,425	1,604	2,490	**1,173**
% change	**10.2%**	**(10.8%)**	**(11.3%)**	**(15.5%)**	**(27.6%)**	**3.2%**

Source: RHWA, 2010

These and similar flows in medical workforce have important implications for prospective projections in relation to DWSs, and in ensuring that adequate access is maintained for rural and remote Australian populations over coming years.

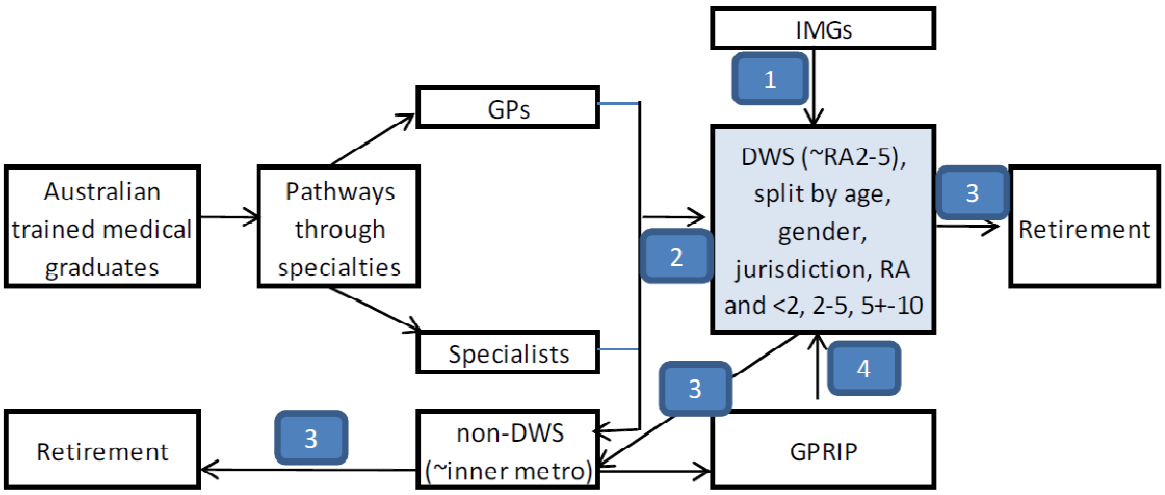
2 Methods and data

2.1 Modelling overview

Core modelling of rural workforce dynamics was performed in Excel. Figure 2.1 illustrates the flows of ATDs and IMGs through the various pathways over time. The blue numbered squares in the figure represent how the different Tasks from the RFQ were modelled.

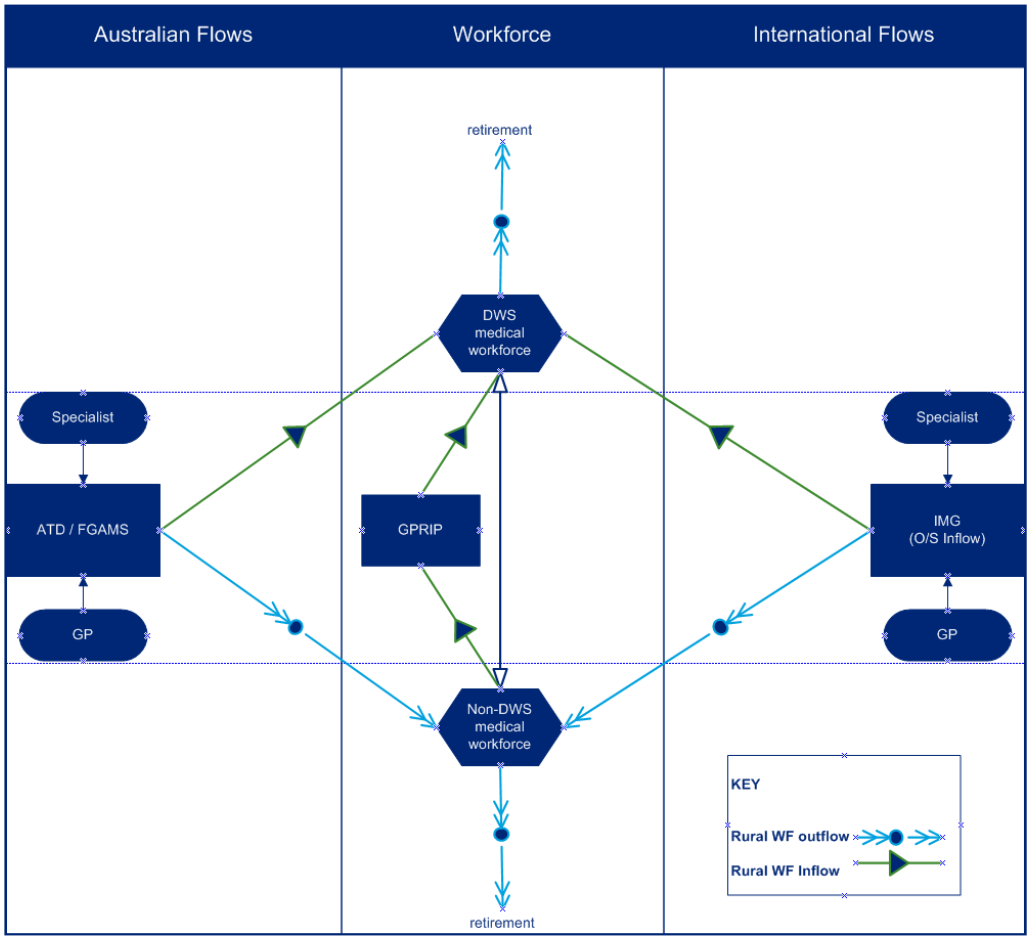
- Task 1 illustrates projections of medical workforce supply by geographic distribution through IMG recruitment arrangements into DWSs (over 2 to 5 and 5+ to 10 years).
- Task 2 illustrates projections of medical workforce supply by geographic distribution through bonded medical student programs into DWSs (for similar periods).
- Task 3 is represented by flows out of the pool of DWS doctors to non-DWS areas or, separately, to retirement. Non-DWS doctors also retire, as shown.
- Task 4 is mapped by doctors who come on GPRIP from non-DWS to DWS areas, and this flow can be 'shocked' in the model by changing the 'impact' parameter to simulate the introduction of GPRIP. A 'shock' in a model means simulating the effects of a change in a key parameter. The effects relative to the base case are referred to as a 'scenario'.

Figure 2.1: Flowchart schematic of modelling framework showing project scope tasks



An alternative schematic highlighting the rural inflows and outflows is provided in Figure 2.2.

Figure 2.2: Schematic distinguishing rural inflows and outflows



2.2 Population data and projections

The Deloitte Access Economics demographic model (DAE-Dem) models population by individual year of age, sex and regional distribution in Australia. Key factors built into DAE-Dem include female fertility rates, human mortality rates, and migration patterns –both intra-domestic and international, based on ABS data (ABS, 2008, 2010a, 2010b, 2010c). DAE-Dem model is a robust forecasting tool, which projects the future path of Australia's population, and has been used here to project Australian population to 2020 from a base year of 2008, stratified by the following factors:

- state / territory jurisdiction;
  - NSW
  - VIC
  - QLD
  - SA
  - WA
  - TAS
  - NT
  - ACT

- ASGC-RA;
  - RA1: Major cities of Australia
  - RA2: Inner regional Australia
  - RA3: Outer regional Australia
  - RA4: Remote Australia
  - RA5: Very remote Australia
- year: 2008 to 2020; and
- age group
  - <65 years of age
  - 65 years or greater.

Data were collated for calendar years in the format presented in Table 2.1, with the ASGC-RA categories mapped to each state and territory through Australia. NT has no RA1-2, ACT has no RA3-5, and Vic has no RA5.

Table 2.1: State and Territory by ASGC-RA applicability

ASGC-RA	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Major cities of Australia	X	X	X	X	X			X
Inner regional Australia	X	X	X	X	X	X		X
Outer regional Australia	X	X	X	X	X	X	X	
Remote Australia	X	X	X	X	X	X	X	
Very remote Australia	X		X	X	X	X	X	

Note: An "X" indicates applicability.

2.3 Student and doctor inflows

Headcount data for ATDs, FGAMSs and IMGs were used to determine starting 'stocks' and future Australian medical workforce inflows. Data for the initial years, 2008 through 2010, were obtained from three principle sources (DoHA, 2010a; MDANZ 2010b; MDANZ 2011), stratified by:

- state / territory jurisdiction;
  - NSW
  - VIC
  - QLD
  - SA
  - WA
  - TAS
  - NT

    - ACT
- year: 2008 to 2020;
- age: students <35, and doctors: <35, 35-44, 45-54, 55-64, 65+; and
- sex: male, female.

ATDs were further stratified by training program:

- bonded: those students enrolled on Federal bonded schemes, including BMP scheme and MRBS scheme; and
- other: Commonwealth supported places (CSPs), full fee paying domestic students [17](e.g. those not eligible for the Higher Education Contribution Scheme), and students on other State bonded medical scholarship programs.

Using existing data from 2008 to 2010, projections were made for each year from 2011 to 2020. Core assumptions underlying projections were:

- on medical school intake, ATDs were aged five years before graduating and entering the medical workforce;
- distribution of the medical workforce by type (GP, non-GP specialist, other clinician) was dictated by both the existing spread, as well as intention (MDANZ, 2010c).
- Federal bonding program projections assumed:
    - MRBS enrolments remain unchanged at 100 places per year, and graduation rates equate to enrolment rates; and
    - BMP enrolments reflect a quarter of CSPs, as currently.

2.3.1 Projecting ATD medical student inflows (headcount)

Initially, ATD medical graduate headcounts were projected to 2020. This calculation took into consideration **existing graduates** in the system, ATDs due to **commence** medical education, and ATDs due to **graduate**. Drop-out rates were also factored into the calculation.

Projecting student commencements

Linear growth rates were calculated for ATDs commencing medical studies. Although data were available for 2000 to 2010, a noticeable flat trajectory was observed for the last three years. As ATD entry into tertiary medical courses is primarily dictated by Federal policy agreed with the universities (PL, 2006), we assumed this linear trend would continue, yielding growth per annum of 0.08% on average projected to 2020.

Projecting graduates

Data made available by request from MDANZ (2011a) estimated a significant increase in domestic graduates, from 2,264 in 2010 to 3,227 by 2015. These estimates reflect recent changes in the tertiary medical system, notably an increase in post-graduate entry and increases in intakes in earlier years.

[17] Most domestic fee paying places have been converted to CSPs, a small number of unis retain fee paying and some have now commence with full fee paying graduate programs outside the DEEWR restrictions.

To project the number of graduates from 2016 to 2020, graduation rates from available data 2000 to 2010 (MDANZ, 2010b) were compared to commencement rates, with a 6 year delay. Historical data estimated a 95% graduation rate following 6 year delay on commencements, which appears reasonable given course adjustments.

Projected ATD graduation rates (year t) were then calculated by multiplying the graduation rate (95%) to 6-year-prior medical student commencements (year t-6). Following 2015, with the above ATD graduation rate applied, an initial volumetric decrease in graduates was projected, which accords with the findings of the 13th Medical Training Review Panel (MTRP) report (DoHA, 2010a). This reflects the flattening in commencements together with the longer (double-degree) courses.

Projecting drop-out rates

Extrapolated medical students were calculated for the years 2007 to 2010 from actual medical students numbers, based on the following formula:

***Formula 1**: Extrapolated Medical Students (year t) = Actual Medical Students (year t-1) + commencements (year t) – graduations (year t-1)*

This formula slightly overestimates medical student numbers historically, reflecting the drop-out rate, which during the four year period averaged approximately 1.25%, and is consistent with observations in the field (DoHA, 2010b).

ATD medical student headcount

Taking the above factors into consideration, total ATD medical student headcount was calculated as follows:

***Formula 2:** ATD student headcount (year t) = [ATD student headcount (year t-1) + commencements (year t) – graduations (year t-1)] * (1 – drop-out rate)*

Extrapolation to jurisdiction, gender and training program

Projections for total ATD medical student headcount were estimated by jurisdiction, sex and training program (bonded and otherwise) as follows.

- **Female proportion**: was calculated from data for the years 2006 to 2010 (MDANZ 2010b, 2011b), with this five year average applied to subsequent calculations.
- **Bonding proportions by jurisdiction**: were based on averages for the years 2008 to 2010 (MDANZ 2010b, 2011b). Total bonding was calculated to represent a constant for MRBS scheme places (480), and a 25% rate of total CSPs for BMP scheme. Total bonding places were then split by female proportions. This leads to an average annual output of 100 MRBS scheme bonded graduates.
- **Total ATD medical students by jurisdiction**: were calculated from average data by jurisdiction for the three years 2008 to 2010 (MDANZ 2010b, 2011b).

2.3.2 Projecting FGAMS inflows (headcount)

Data for the years 2008 to 2010 were obtained from three principle sources (DoHA, 2010a; MDANZ 2010b; MDANZ 2011) and projections made from 2011 to 2020, with core assumptions being:

- FGAMS age five years and then enter the medical workforce;
- 30% of FGAMS will leave upon graduation, and return home (Ian Crettenden, Executive Director, Health Workforce Australia, pers. comm., 3 June 2011); and
- entry into the medical workforce and choice of specialty (GP, non-GP specialist, other clinician) was estimated from the existing spread as well as intention (MDANZ, 2010c).

As with the ATD medical graduate projections, FGAMS headcount projections to 2020 took into consideration **existing graduates**, **commencements, graduates** and **drop-out rates**.

Projecting student commencements

Linear growth rates were calculated for FGAMS commencing medical studies. Data were available for 2000 through 2010, and linear trend analysis returned an R^2=0.9183, yielding growth per annum of 3.37% on average projected to 2020.

Projecting graduates

Data from MDANZ (2011a) estimated a steady increase in FGAMS graduates, from 512 in 2010 to 567 by 2015. These estimates include the recent changes in the tertiary medical system, with the same impacts as for ATD students.

To project the number of graduates from 2016 to 2020, the same method was used as for ATDs, yielding a 95% graduation rate following 6 year delay on commencements.

Projected FGAMS graduation rates (year t) were then calculated by multiplying the graduation rate (95%) to 6-year-prior medical student commencements (year t-6). Following 2015, with the above FGAMS graduation rate applied, an initial volumetric decrease in graduates was projected, again (like ATDs) in accord with the 13th MTRP report (DoHA, 2010a).

Projecting drop-out rates

Extrapolated medical students were calculated for the years 2007 to 2010 from actual medical students numbers, based on Formula 1 in Section 2.3.1.

The drop-out rate estimated over the four year period averaged approximately 1.25%, consistent with observations in the field (DoHA, 2010b).

FGAMS medical student headcount

FGAMS student headcount was calculated as follows, mirroring Formula 2 above:

Formula 4: *FGAMS student headcount (year t) = (FGAMS student headcount (year t-1) + commencements (year t) – graduations (year t-1)) * (1 – drop-out rate)*

Extrapolation to jurisdiction, gender and training program

Projections for total FGAMS student headcount were estimated by jurisdiction and sex.

- **Female proportion**: was calculated from the five-year average of data for the years 2006 – 2010 (MDANZ 2010b, 2011b), mirroring the method for ATDs.
- **Total FGAMS students by jurisdiction:** were calculated from average data for the three years 2008 to 2010 (MDANZ 2010b, 2011b), also mirroring the ATD method.

2.3.3 Projecting IMG inflows (headcount)

Projections of IMGs to 2020 were predicated on three constituent flows:

- FGAMS graduates;
- temporary residents; and
- permanent residents.

FGAMS graduates were estimated to 2020, and have been discussed in Section 2.3.2. Temporary resident IMGs were calculated based on temporary medical work visas issued by the Department of Immigration and Citizenship (DIAC), and published in the 13th MTRP (DoHA, 2010a). These data revealed no clear temporal relationship, so the projections were held constant at the latest (2009) number of temporary medical working visas granted (Visa classes 422, 442 and 457). Settlers, or permanent resident IMGs, were calculated as the residual arising from total permanent and temporary clinicians, published in AIHW medical labour force surveys (AIHW, 2001 to 2008), minus FGAMS graduates and temporary resident IMGs. Thus:

Formula 5: *Settler IMGs = total IMG clinicians – FGAMS graduates – temporary resident IMGs*

Five year average year-on-year growth for settler (permanent resident) IMGs, 2003 to 2008, was calculated at 8.1%.[18] This growth rate was applied to the latest (2008) settler data, and projected through to 2020. Core assumptions underlying IMG projections include:

- IMGs are assumed to enter Australia as medical doctors bearing qualifications for GP or non-GP specialist categories.
- IMGs were expected to enter the medical workforce immediately on entry into Australia; and
- IMGs were assumed to disseminate in proportions according to existing GP and non-GP specialist categories[19].

[18] 8.1% agreed broadly with net overseas migration rates that we estimated as a cross-check from ABS data of 9.9% (ABS, 2010b).

[19] Deloitte Access Economics (2011) *Review of the International Recruitment Scheme*, report to Department of Health and Ageing, draft report finding based on DoHA (2010c) data.

2.4 Workforce projections

Data for the years 2001 to 2008 were sourced from AIHW (2001-2008) and DoHA (2010c). With the exception of 2001 in some instances, complete data sets were available on GP headcount for data stratified by:

- jurisdiction * sex;
- jurisdiction * age group;
- ASGC-RA * sex;
- ASGC-RA * age group;
- jurisdiction * citizenship; and
- ASGC-RA * citizenship.

For total clinicians, only national totals were available for age group and RA, although jurisdiction * citizenship was available from 2003. No citizenship data were available for non-GP specialists. The 'other' category was bereft of data totals for two reasons: (1) from 2006 an additional category was added for 'other clinician', which complicated this category; and (2) complete data were only available for hospital non-specialists, and not specialists in-training. Table 2.2 presents a summary of the source data available for the medical workforce categories – GP, non-GP specialists, other clinicians, total clinicians.

Table 2.2: Source data headcount availability by medical workforce categories

Data category	GP[1]	Non-GP specialist[2]	Other clinician	Total clinicians[2]
Jurisdiction * age group	By sex[a]	By sex[a]	-	National totals only
ASGC-RA * age group	By sex[a]	ASGC-RA totals only	-	ASGC-RA totals only
Jurisdiction * citizenship	Available>\#	-	-	Available<
ASGC-RA * citizenship	Available\#	-	-	-

Source: 1: DoHA, 2010c & AIHW, 2001-2008; 2: AIHW, 2001-2008. "-" indicates data set not available. [a] Only totals were available for 2001 data. > Available from 2002. < Available from 2003. # rates extrapolated from DoHA 2010c data set.

'Other clinicians' were estimated as the residual of total clinicians less GPs and non-GP specialists where data were available. Where detailed splits were not available and could not be derived, GP splits were applied.

DoHA GP workforce data were disaggregated by citizenship and by country of primary medical qualification. In contrast, the AIHW data series for GPs was only disaggregated by residency (Australian citizenship, versus permanent/temporary resident status). We estimated values for the AIHW data series by applying rates observed in GP workforce data for Australian or foreign training status, by jurisdiction, and by geographical region (ASGC-RA).

2.4.1 Australian citizen projections

For clinician projections in this report, Australian citizen clinicians were defined as Australian citizens who had received their primary medical qualification within Australia. All other clinicians were regarded as IMG clinicians, of foreign non-native status.

Projections of Australian citizens (Australian native status) were estimated based on existing Australian citizen clinicians, and inflow from Australian medical graduates. The estimation and projection of ATD medical graduates was discussed in Section 2.3.

Graduate jurisdictional and geographical preference rates

Australian citizen graduates' jurisdictional and geographical preferences were derived from 2009 MDANZ medical student exit questionnaires (MDANZ, 2011a) and applied to those entering the workforce as citizen clinicians each year to 2020.

Attrition rates

An attrition rate was applied to projections for clinicians, comprising two constituent factors: (1) retirement rates; and (2) labour workforce outflows due to other reasons (e.g. to work overseas, or to raise families). Access Economics (2008) previously estimated annual workforce departure rates for clinicians (including due to mortality and illness) at 0.5%. Linear forecasting of data from the AIHW Medical labour force survey 2008 (AIHW, 2010) suggests that by 2020, 7.23% of the national medical workforce will be represented by those aged 65 or greater. Adjusting for this, average retirement for those aged greater than 65 was estimated at 14.06% per annum.

Age groups

Graduate inflows were assumed to disseminate into the under 35 age group, while attrition rates were assumed to apply at 0.5% across all age groups, with remaining retirements then tapering to exit all remaining doctors between ages 65 and 85 and also achieve an overall annual retirement rate of 14.06%.

Gender splits

Incoming graduate flows were allocated gender proportions based on six year average commencement rates from student commencement data (MDANZ, 2010a, 2010b, 2011b), as discussed in Section 2.3. Otherwise, gender proportions for jurisdictions and geographic regions were applied based on the previous period proportions.

2.4.2 IMG projections

Within this report, IMG clinicians were defined to include inflows of FGAMSs (recall Section 1.3.1). Projections of IMG clinicians were estimated based on existing IMG clinicians, the inflow from FGAMS medical graduates, and offshore permanent and temporary resident inflows. The estimation and projection of FGAMSs has been discussed in Section 2.3.2 and the inflows of IMGs in Section 2.3.3.

Graduate jurisdictional and geographical preference rates

As with the Australian citizen graduates, FGAMSs' jurisdictional and geographical preferences were derived from 2009 MDANZ medical student exit questionnaires (MDANZ, 2011a) and applied to those entering the workforce as IMG clinicians each year to 2020.

Attrition rates

As with the Australian citizen clinicians, annual retirements (14.06%) and other exits (0.5% per annum) were based on (Access Economics, 2008) and AIHW medical workforce data (AIHW, 2010), for a total medical workforce proportion represented by those aged greater than 65, based upon forecasts.

Age groups

Graduate (FGAMS) inflows were assumed to disseminate into the under 35 age group, while attrition rates were assumed to follow the same age distribution as for Australian citizens.

Gender splits

Incoming graduate (FGAMS) and permanent/temporary IMG inflows[20] were allocated gender proportions based on six year average commencement rates from student commencement data MDANZ (MDANZ, 2010a, 2010b, 2011b), as discussed in Section 2.3. Otherwise, gender proportions for jurisdictions and geographic regions were applied based on the previous period proportions.

2.4.3 Projection splits by GP, non-GP specialist and other clinician

In the last two sections 2.4.1 and 2.4.2, total clinicians were projected by age group, gender, jurisdiction, RA and ATD/IMG. This section explains the further split of projected workforce by GP, non-GP specialist and other clinicians.

GP splits were based on the following assumptions.

- Australian citizen graduate inflows were applied in proportion to the previous period ratio of GPs to total clinicians.
- FGAMS graduate inflows were also applied in proportion to the previous period ratio of GPs to total clinicians.
- IMG permanent/temporary inflows were applied in proportion to the previous period ratio of GPs to the sum of GP and non-GP specialists. Although a large number of IMGs are recruited specifically to work in rural hospitals as 'other clinicians'[21], most go on within a few years, if they stay in Australia, to work as specialists (GP or non-GP), so this approach saves modelling the middle step, which would add substantial complexity for little gain.

[20] Permanent / temporary IMG inflows were mapped to FGAMS due to lack of other data.

[21] These IMGs undertake supervised training in hospital settings in order to meet college requirements/pass Fellowship exam

Non-GP specialist splits were based on the following assumptions.

- Australian citizen graduate inflows were applied in proportion to the previous period ratio of non-GP specialists to total clinicians.
- FGAMS graduate inflows were also applied in proportion to the previous period ratio of non-GP specialists to total clinicians.
- IMG permanent/temporary inflows were applied in proportion to the previous period ratio of non-GP specialists to the sum of GP and non-GP specialists.

Other clinician splits (hospital non-specialists, specialists-in-training and others) were based on the following assumptions.

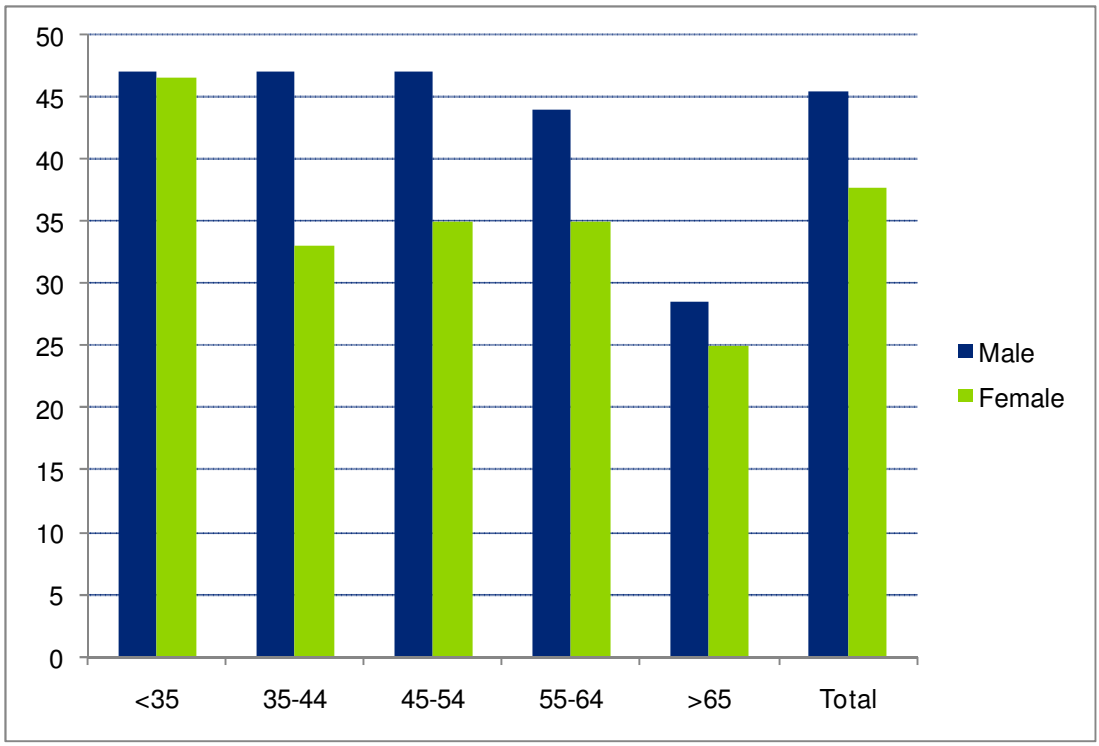
- Australian citizen graduate inflows were applied in proportion to the previous period ratio of other clinicians to total clinicians.
- FGAMS graduate inflows were also applied in proportion to the previous period ratio of other clinicians to total clinicians.
- No IMG permanent/temporary inflows were assumed to accumulate to "other clinicians". IMGs are assumed to be fully qualified on entry into Australia, or shortly after, and then to enter their specialist field.
- Additionally, given extrapolative assumptions for jurisdiction and geographical area estimates, amid the absence of hard data sources, "other clinicians" was occasionally treated as a residual.

2.5 Other methodological issues

2.5.1 Calculation of full-time equivalent

Full-time equivalent (FTE) doctor estimates were calculated from AIHW workforce data (AIHW, 2010), with average weekly medical practitioner hours estimated at 45.4 for males, and 37.7 for females, for an average number of 42.7 hours worked per week. Average weekly hours, by age group and gender for 2008, are presented in Chart 2.1. Percentages were estimated for hours worked by gender and age group, relative to average hours for medical practitioners as a whole, and these percentages were multiplied through clinician numbers to obtain FTE.

Chart 2.1: Medical practitioners average weekly hours, 2008



Source: AIHW, 2010.

2.5.2 GPRIP

Data on GPRIP was inaccessible during the project time frame. Given the absence of data on GPRIP, we assumed continuation of previous programs under the current programmatic umbrella of GPRIP, which include the registrars rural incentive payment scheme (RRIPS) and rural retention program (RRP). These two program arms constitute retention incentive payments targeted at other clinician and GP categories, respectively.

Both the RRIPS and RRP were assumed to follow a linear growth trajectory, based on the relationships derived from historical data, since program inception (RRIPS: 2000-2001; RRP: 1999-2000). We estimated growth by five and 60 clinicians respectively, tapering off to 2020.

Additionally, using source data (DoHA, 2011b), we estimated a payment growth of 2.54% in RRIPS during the period 2001 to 2010. RRIPS and RRP were assumed to follow a linear payment growth to 2020 of some $0.96m per annum and $1.3m per annum, respectively.

2.5.3 Bonding

As described in Section 2.3, total bonding was calculated to represent 100 placements per year for MRBS shceme. BMP scheme was estimated based on a 25% rate of total CSP places, with program enrolment estimated based on average course duration of five years (DoHA, 2011a). Distribution into geographic regions was based on preferences declared in MDANZ exit surveys (Table 2.3).

Table 2.3: Preferred geographical location of future practice, Australian medical graduates

ASGC-RA	Preference (%)
RA2	43.92
RA3	40.00
RA4-5	16.08
Total	100

Source: MDANZ, 2011a.

2.5.4 The 5YOTDS

Drawing on historical data from DoHA (2008c, 2011c), the 5YOTDS was assumed to follow a linear growth trajectory, based on the relationship derived from historical data over twelve years, tapering in later years. We estimated initial growth by 19 clinicians, with growth tapering off to 10 clinicians by 2020.

Drawing on DoHA data, we assumed IMG GP participants select regions based on average geographical distribution rates (DoHA, 2010c), as presented in Table 2.4.

Table 2.4: Average IMG GP geographical practice, RA2-5, 2001-2008

ASGC-RA	Preference (%)
RA2	55.47
RA3	32.70
RA4-5	11.83
Total	100

Source: DoHA, 2010c; and Deloitte Access Economics.

2.5.5 Sensitivity analysis

When the model is 'shocked' to show the impact of changes in policy and parameter change, the scenario results were presented with the discrete set of output tables for absolute clinician number change and by population, by ASGC-RA.

Five parameters were tested, with 'high' and 'low' (+/-10%) case differences in output tables relative to the base case reported for each sensitivity analysis run:

1. The IMG 5YOTDS projections, with respect to enrolment;
2. The bonded student number projections, with respect to attrition;
3. The leakage rates to through workforce leaving, and to retirement; and
4. The impact parameter for GPRIP, with respect to RRIPS and RRP payment growth.

3 Results and sensitivity analysis

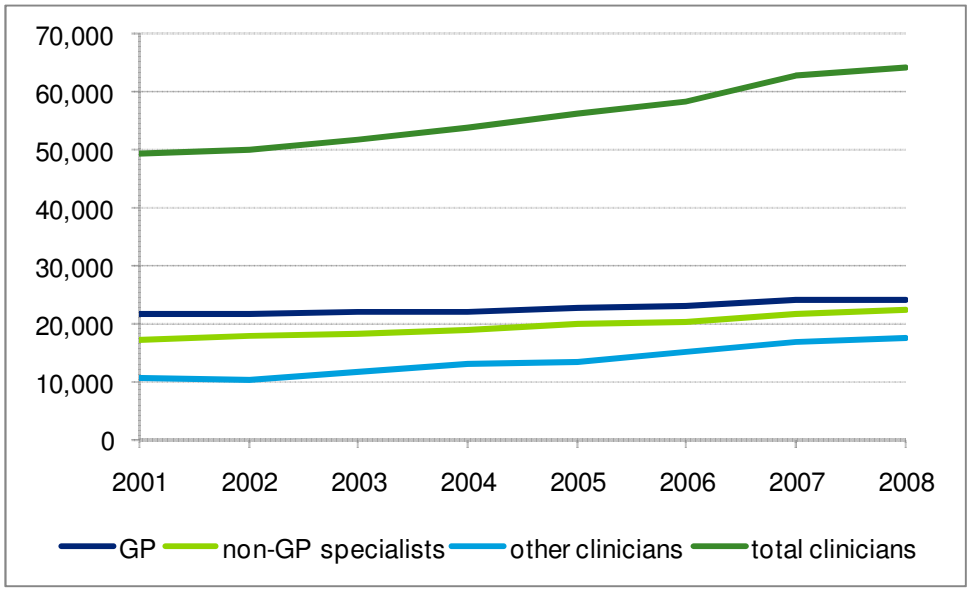
3.1 Current medical workforce distribution

The findings are reported by each of the three medical workforce categories – GPs, non--GP specialists and other clinicians (hospital non-specialists, specialists-in-training and others).

3.1.1 Clinician categories by jurisdiction

From 2001 to 2008, there was a 30% increase in total clinicians from approximately 49,000 to 64,000. Generally, there were more GPs than non-GP specialists and other clinicians in all jurisdictions (Chart 3.1).

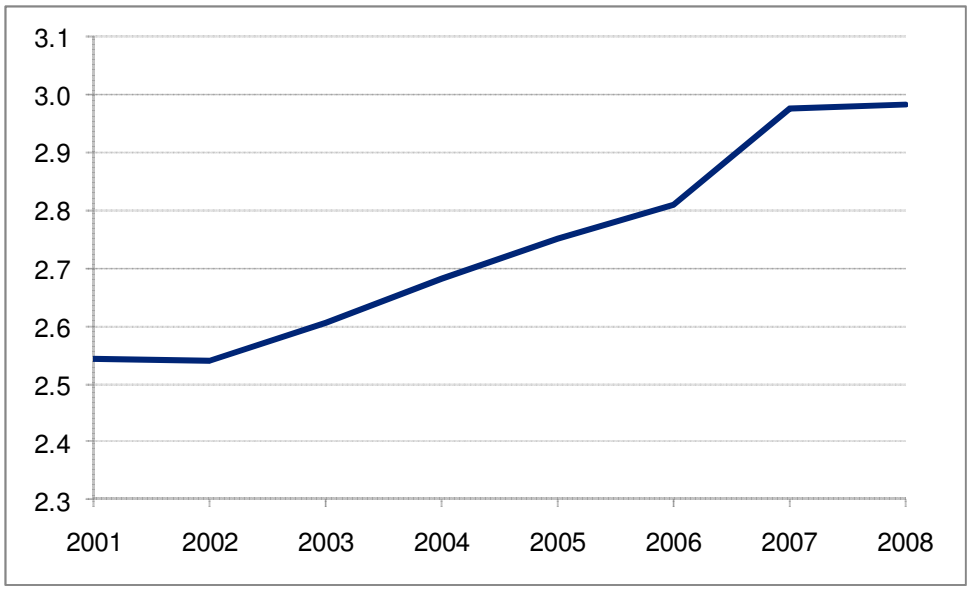
Chart 3.1: National medical workforce headcount by clinician category



Source: AIHW, 2001-2008.

In contrast, since population grew only 10% from 2001 to 2008, total clinicians per 1,000 residents increased from 2.5 to almost 3.0 (Chart 3.2).

Chart 3.2: Clinician headcount per 1,000 Australian population



Source: AIHW, 2001-2008; ABS 3218.0.

Nationally, GP numbers grew by 11%, non-GP specialists by 31% and other clinicians by 66% (Table 3.1). The ACT experienced most rapid growth (78%) – driven by increases in 'other clinicians from 132 to 740), followed by Queensland (58%) and WA (45%). Tasmania's medical headcount fell 12%. GP growth was most rapid in Queensland (40%), with a fall in NSW and ACT.

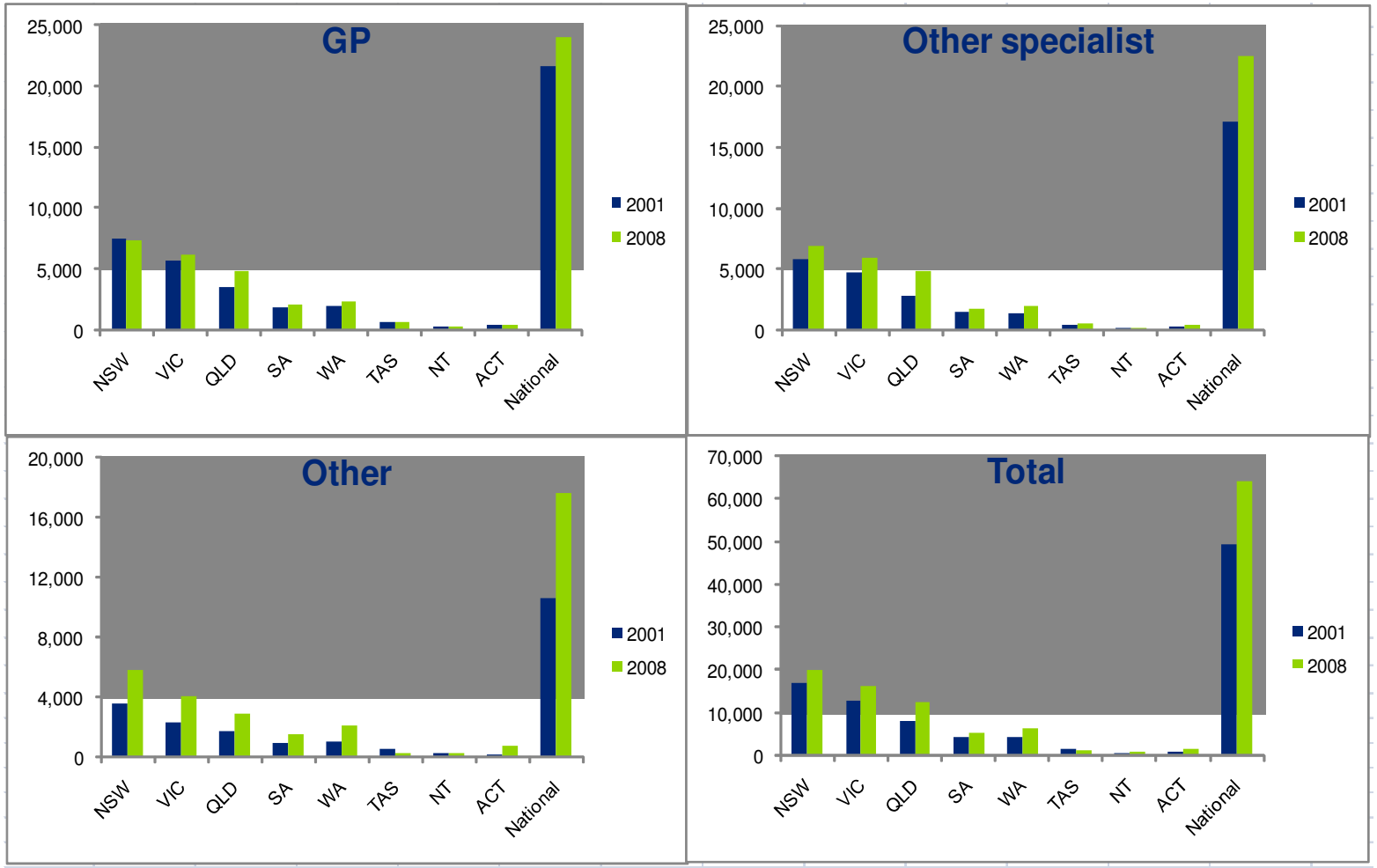
Table 3.1: Clinician headcount by category and jurisdiction, and % growth

	GP	Non-GP specialists	Other clinicians	Total
2001				
NSW	7,522	5,872	3,577	16,970
VIC	5,612	4,747	2,336	12,695
QLD	3,455	2,769	1,710	7,935
SA	1,830	1,472	946	4,248
WA	1,957	1,412	1,058	4,427
TAS	615	382	574	1,571
NT	259	124	265	649
ACT	420	346	132	898
National	**21,671**	**17,124**	**10,598**	**49,392**
2008				
NSW	7,334	6,945	5,848	20,127
VIC	6,196	5,882	4,028	16,106
QLD	4,834	4,819	2,875	12,528
SA	2,013	1,706	1,506	5,225
WA	2,285	2,001	2,137	6,423
TAS	662	494	225	1,381
NT	301	172	255	728
ACT	409	451	740	1,600
National	**24,030**	**22,470**	**17,617**	**64,117**
% change 2001 to 2008				
NSW	-2	18	63	19
VIC	10	24	72	27
QLD	40	74	68	58
SA	10	16	59	23
WA	17	42	102	45
TAS	8	29	-61	-12
NT	16	39	-4	12
ACT	-3	30	461	78
National	**11**	**31**	**66**	**30**

Source: Deloitte Access Economics calculations based on AIHW, 2001-2008 and ABS 3218.0.

With Tasmania being a notable exception, there has been at least some growth in all clinician categories in each jurisdiction (Chart 3.3).

Chart 3.3: Clinician headcount by clinician category and jurisdiction



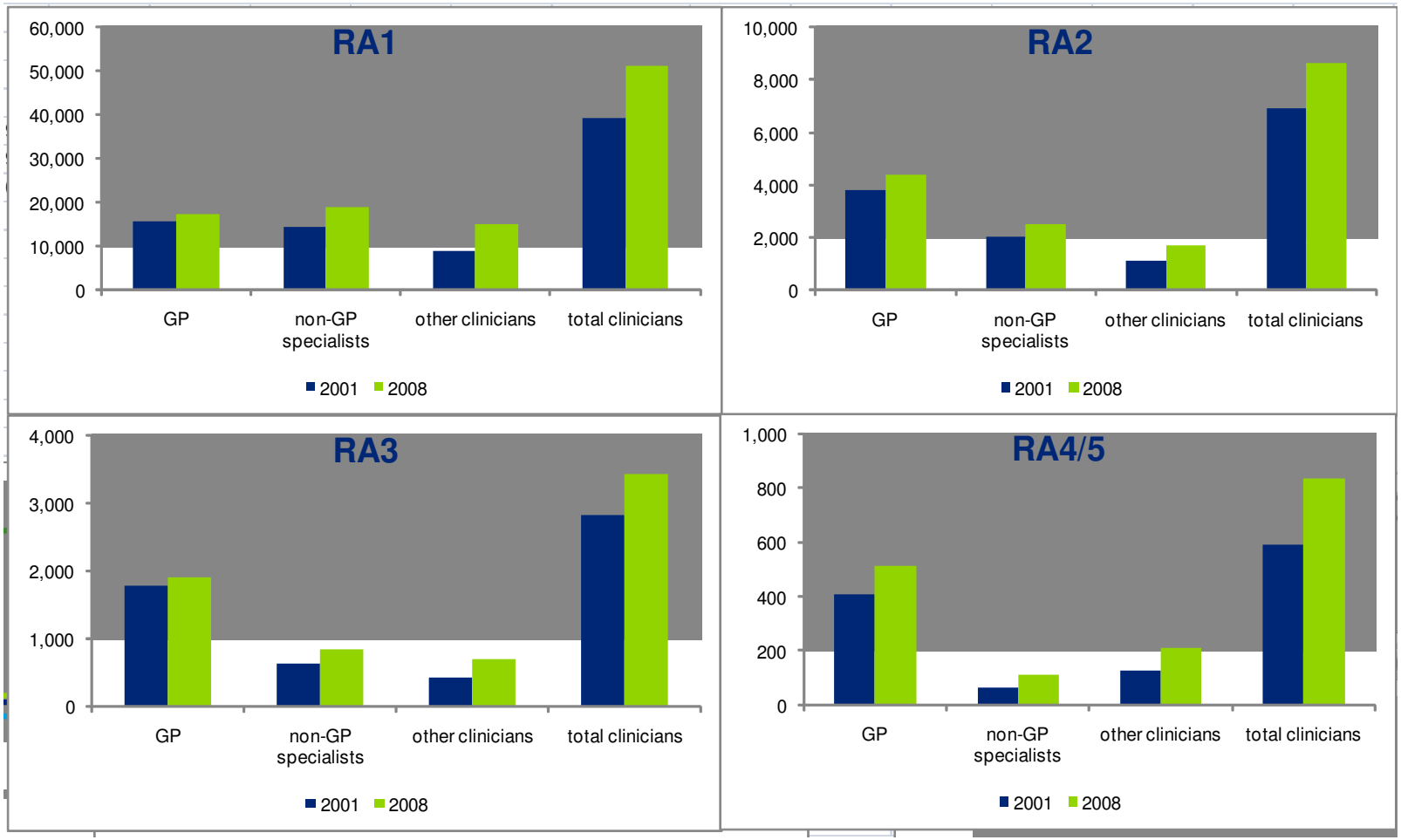
Source: AIHW, 2001-2008.

3.1.2 Clinician categories by geographic region (RA)

Total headcounts for clinician categories by ASGC-RA geographic region are presented for 2001 to 2008 in Chart 3.4. Total clinician headcount increased from 39,058 to 51,195 in RA1 between 2001 and 2008, from 6,917 to 8,650 in RA2, from 2,826 to 3,437 in RA3, and from 592 to 835 in RA4-5. While the number of GPs and non-GP specialists was almost the same in RA1, the ratio of non-GP specialists to GPs steadily declined with RA. Moreover, in RA4-5 there were more 'other' clinicians than numbers of non-GP specialists.

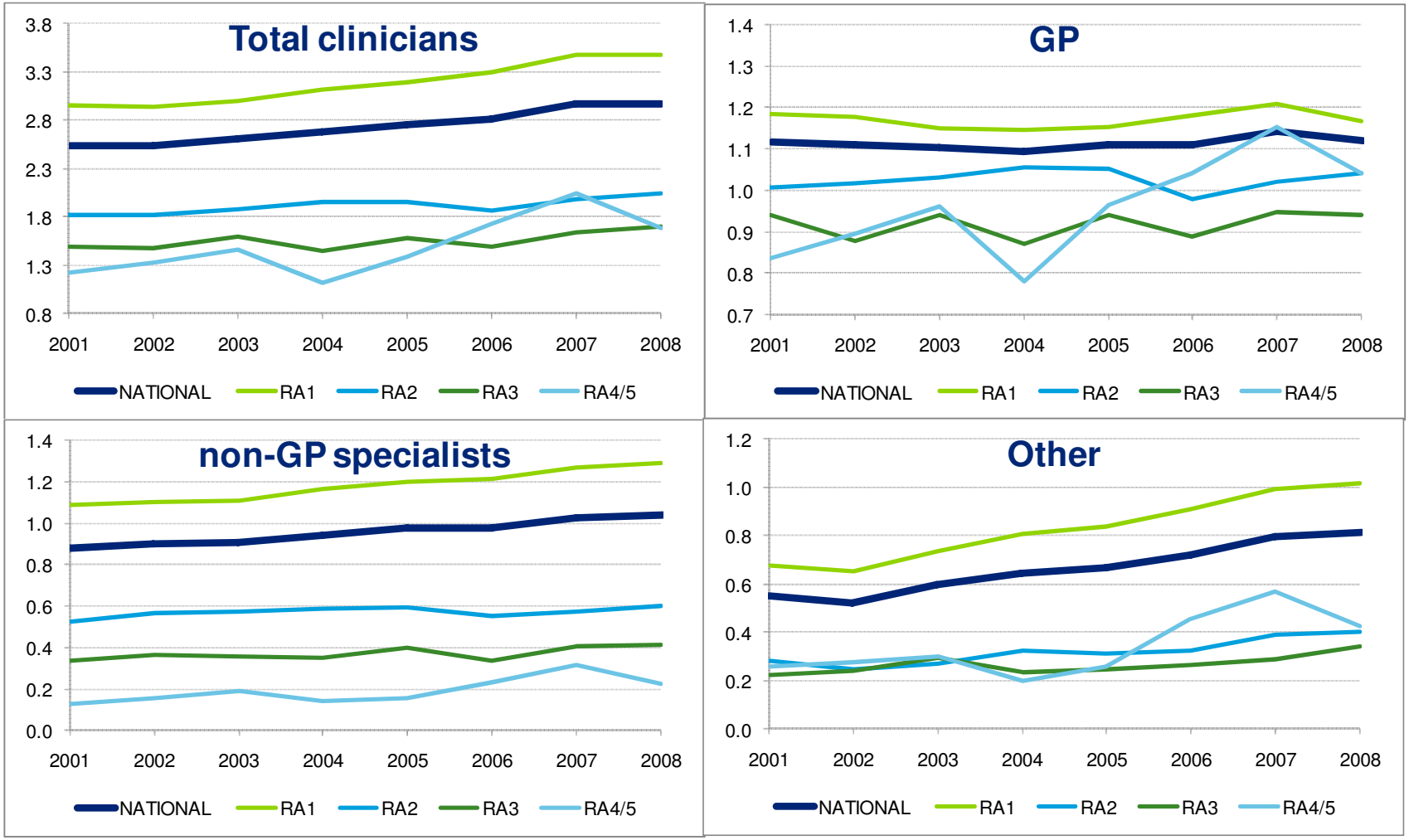
There has been an overall encouraging trend in clinician-population ratios in regional Australia (Chart 3.5), suggesting that rural workforce programs are having an impact. For RA4 and RA5, there was growth in all clinician categories. Consistent growth in GP-population ratios were observed, improving by 25%, while non-GP specialists-population ratios showed a particularly strong improvement of 79% over the period.

Chart 3.4: Clinician headcount by RA and clinician category



Source: AIHW, 2001-2008.

Chart 3.5: Clinician headcount per 1000 Australian population by RA and clinician category



Source: AIHW, 2001-2008; ABS 3218.0.

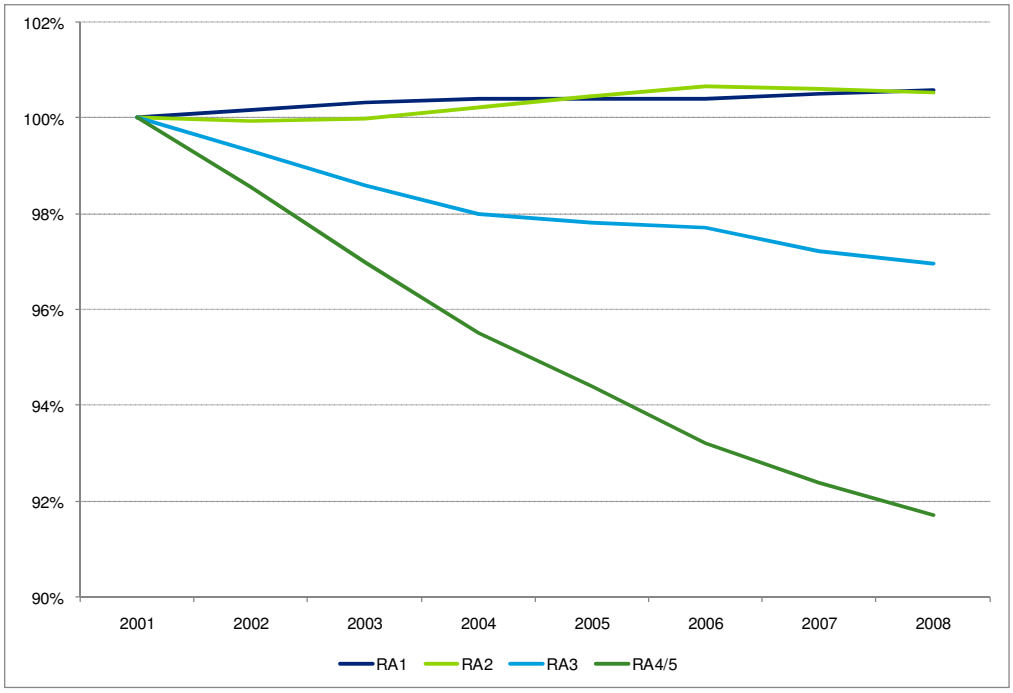
Australia is experiencing a demographic shift from the bush to the city - the percentage of people living in outer regions has diminished substantially (Chart 3.6). However, the absolute number of people living in remote areas has not declined (Table 3.1) – which indicates the increase in doctor population ratios discussed above is to more doctors rather than to declining regional population.

Table 3.2: Australian population by RA ('000)

	2001	2002	2003	2004	2005	2006	2007	2008
RA1	13,232	13,418	13,603	13,772	13,955	14,162	14,435	14,739
RA2	3,807	3,851	3,902	3,955	4,018	4,086	4,157	4,239
RA3	1,889	1,899	1,909	1,919	1,941	1,967	1,993	2,028
RA4-5	486	485	483	481	482	483	487	493
National	**19,413**	**19,651**	**19,895**	**20,127**	**20,395**	**20,698**	**21,072**	**21,499**

Source: ABS, 2010c.

Chart 3.6: Change in share of national population by RA

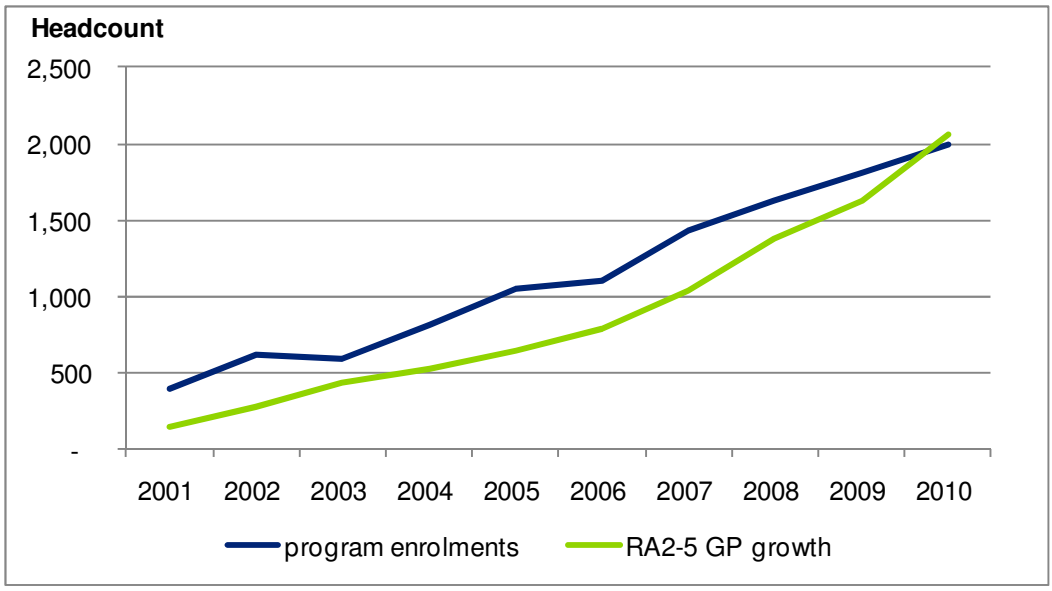


Source: ABS, 2010c; and Deloitte Access Economics.

The number of people recruited to rural workforce programs in aggregate[22]- BMP scheme- and the increase in rural workforce shows an almost one to one correlation (Chart 3.7), suggesting that doctors are moving to the country largely because of the existence of these programs.

[22] This includes complete numbers for 5YOTDS, RRIPS, RRP, BMP scheme and MRBSS, although some of these are recent and will not have significant impact yet.

Chart 3.7: Commonwealth program enrolments and RA2-5 GP growth

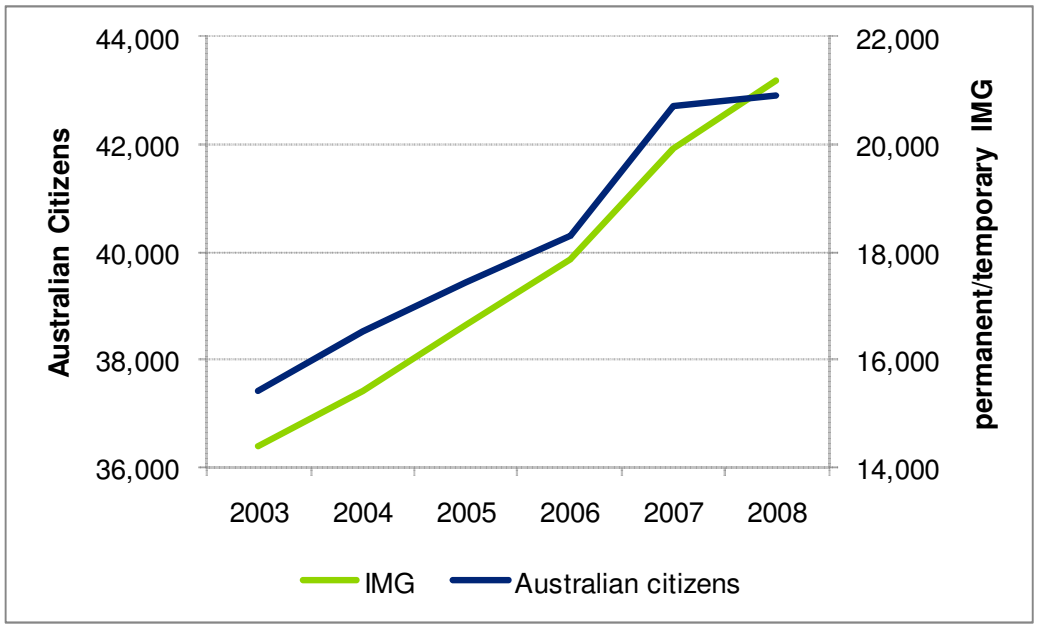


Source: DoHA 2008c, 2010c, 2011a, 2011b, 2011c; ABS, 2010c; and Deloitte Access Economics.

3.1.3 Medical workforce distribution by citizenship status

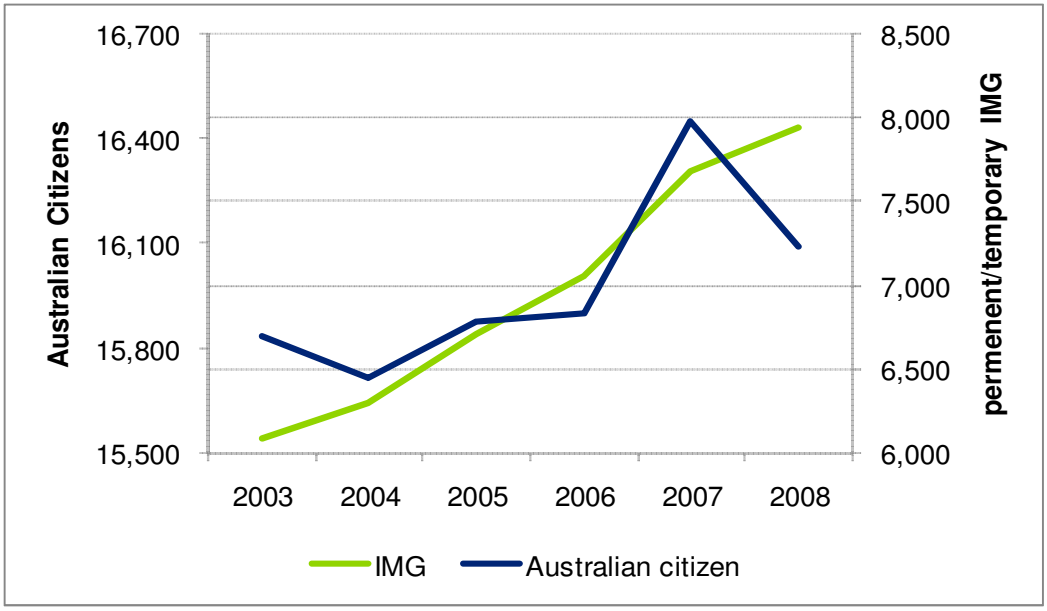
The foreign trained clinical workforce has been growing faster (in percentage terms) than the Australian trained workforce (Chart 3.8). Australian citizen clinicians increased by 15%, in contrast to permanent/temporary IMG clinicians who increased by 47% during the same five year time frame, 2003-2008. Similar trends were observed for GPs as for all clinicians (Chart 3.9).

Chart 3.8: Total clinician headcount by citizenship status



Source: AIHW, 2001-2008.

Chart 3.9: GP headcount by citizenship status



Source: AIHW, 2001-2008.

However, this increase in foreign clinicians is not distributed evenly across states and territories. There were marked recent increases in permanent/temporary IMG GPs who were practising in Queensland, South Australia, Western Australia and Tasmania (Table 3.3, Table 3.4). But Victoria experienced a significant outflow. The distribution of Australian citizen GPs did not change markedly, apart from an exodus from the NT.

Table 3.3: Change in GP headcount since 2003 for Australian citizens, by jurisdiction

	2003	2004	2005	2006	2007	2008
NSW	100%	106%	108%	105%	98%	97%
VIC	100%	100%	101%	102%	108%	107%
QLD	100%	96%	100%	102%	121%	131%
SA	100%	98%	100%	100%	102%	103%
WA	100%	98%	99%	119%	136%	106%
TAS	100%	105%	104%	96%	103%	101%
NT	100%	50%	70%	93%	101%	89%
ACT	100%	111%	113%	111%	93%	104%

Source: AIHW, 2001-2008.

Table 3.4: Change in GP headcount since 2003 for non-citizens, by jurisdiction

	2003	2004	2005	2006	2007	2008
NSW	100%	99%	104%	97%	92%	96%
VIC	100%	101%	98%	55%	48%	33%
QLD	100%	87%	97%	100%	113%	147%
SA	100%	94%	117%	117%	134%	150%
WA	100%	92%	89%	141%	180%	185%
TAS	100%	89%	179%	123%	157%	136%
NT	100%	75%	104%	109%	117%	113%
ACT	100%	68%	114%	90%	84%	91%

Source: AIHW, 2001-2008.

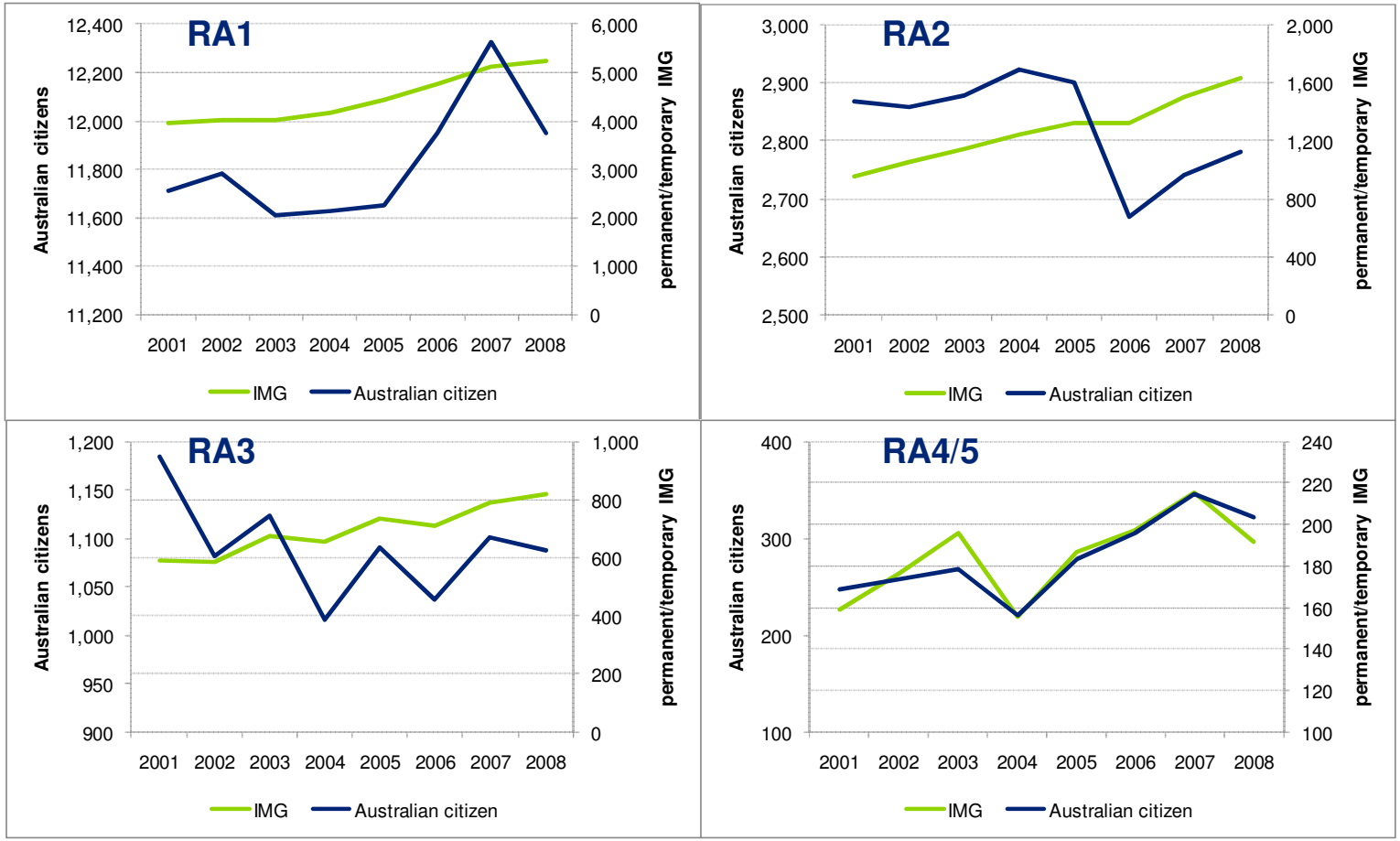
Like many people, most foreign doctors like to live in or near cities. Over 75% of permanent/temporary IMG GPs practise in major Australian cities or inner regional Australia (Table 3.5). Presumably, as it is a service obligation for them, most of these IMGs will be working in DWS areas. However, the impact of rural bonded visa schemes has led, over the eight years to 2008, to a substantial increase (38%) in foreign doctors living in rural and remote areas. Indeed, close to a quarter of GPs in RA4-5 are now permanent/temporary IMGs. So while Australian doctors are moving out of the Northern Territory, their foreign counterparts are moving in.

Table 3.5: Permanent and temporary resident GPs as % of total

ASGC-RA	2001	2002	2003	2004	2005	2006	2007	2008
RA1	5.68%	5.32%	5.67%	5.37%	5.31%	4.87%	4.75%	4.96%
RA2	7.87%	7.13%	7.06%	7.08%	8.07%	7.55%	8.88%	9.24%
RA3	11.33%	10.80%	11.01%	13.09%	13.75%	14.12%	11.97%	14.92%
RA4-5	17.95%	20.94%	26.37%	21.33%	22.13%	21.69%	22.61%	24.83%
National	6.78%	6.44%	6.81%	6.52%	6.84%	6.41%	6.62%	6.95%

Source: AIHW, 2001-2008.

Chart 3.10: GP medical workforce headcount by RA and citizenship status



Source: AIHW, 2001-2008.

3.2 Medical workforce projections

The base case assumes that the medical workforce programs currently undertaken by DoHA will continue in their present format. Actual data are used until 2008, and projections are made through to 2020.

3.2.1 Consultations

Health Workforce Australia (HWA) recently projected medical workforce numbers through to 2025. Their projections suggest an adequate supply of GPs over the next ten years, but then a serious shortage due to retirements. A five-year survey conducted by the Rural Doctors Workforce Agency (RDWA) in South Australia suggests that retirement rates for GPs may lie between 10 to 15%[23], which is consistent with our calculations (see Section 2.4). Indeed, the RDWA 2007 GP survey suggested that, of the 26% of GPs who intended to leave their rural practices within the next five years, a quarter would retire from medical workforce completely, and another quarter would migrate to major metropolitan areas (RDWA, 2007).

Consultation with RHWA further suggested that the 10 Year Moratorium allows GPs to practice within RA1 outer metropolitan regions under DWS requirements.

The RHWA also estimates that from the 2011 medical student pool of approximately 3,000 graduates, only 80 (or 2.7%) will pursue rural careers. A significant contributor to this outcome is that rural students comprise less than 30% of medical school places. The RHWA noted that some incentivisations programs such as the relocation component of GPRIP are only eligible for those not subject to the 10 year Moratorium.

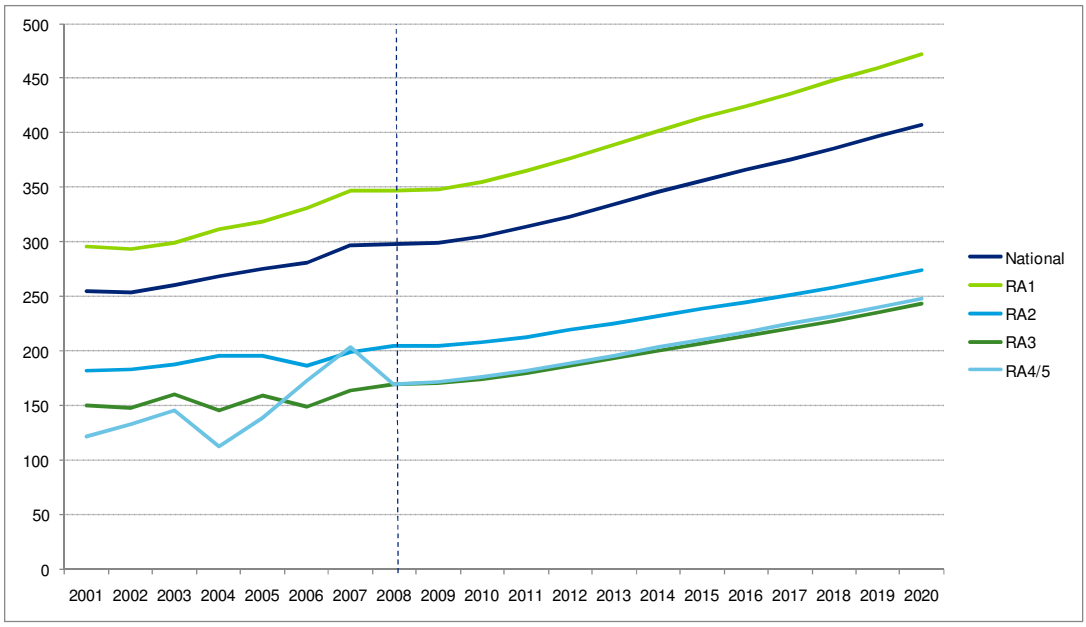
3.2.2 Projections by RA

Total Clinicians

Chart 3.11 shows that people living in RA2-5 have considerably less access to medical services than the national average. Further, access to medical services becomes increasingly worse with remoteness. On current trends, national clinician to population ratios should increase steadily, along with ratios in all geographic areas, through 2020.

[23] Pers. comm. Ian Crettenden, HWA, and Kim Webber, CEO RHWA, 5 May 2011). The HWA study assumes retirement for those aged 60 or over.

Chart 3.11: Total clinicians per 100,000 population by RA



Source: DoHA, 2011b, and Deloitte Access Economics.

Scenarios for changed levels offshore IMG inflow

The contribution of IMGs to medical workforce may change in future years. The default scenario (Chart 3.11) assumed continued growth in IMG numbers from 490 in 2009, to 2,529 by 2020. The data underlying the chart above is presented in tabular form in Table 3.6.

Sensitivity testing includes scenarios where aggregate inflow of offshore IMGs remains constant (Table 3.7), slows from 2009 levels to zero by 2020 (Table 3.8), and sinks to zero immediately following 2009 (Table 3.9).

For example, were the inflow of offshore IMGs to remain constant at 2009 levels through 2020, the total clinicians per 100,000 would be expected to fall to around 88% of currently forecast levels. A similar reduction in clinician to population ratios would be expected throughout all geographic areas (RA 2-5).

Similarly, should the inflow of offshore IMGs sink to zero come 2010, and remain so through 2020, the total clinicians per 100,000 would be expected to fall to around 83% of currently forecast levels across RA 2-5.

These scenarios suggest that while future diminution of offshore IMGs inflow would substantially reduce clinical service provision in regional Australia.

Table 3.6: Total clinicians per 100,000 population – IMG aggregate growth scenario

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
National	298	300	306	314	324	335	346	357	366	376	387	397	409
RA1	347	349	356	366	377	390	403	415	426	437	449	461	473
RA2	204	205	208	213	219	225	232	239	245	251	258	266	273
RA3	170	171	175	180	186	193	200	207	213	220	228	235	243
RA4/5	169	172	177	182	189	196	203	211	218	225	232	240	248

Source: Deloitte Access Economics calculations. Note: scenario of aggregate IMG growth.

Table 3.7: Total clinicians per 100,000 population – IMG constant scenario

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
National	298	300	304	310	317	325	332	340	345	349	353	358	362
RA1	347	349	354	361	369	378	387	395	401	406	411	415	420
RA2	204	205	207	210	214	218	223	227	230	233	236	238	241
RA3	170	171	173	177	182	187	192	196	200	204	207	210	214
RA4/5	169	172	175	179	184	189	195	200	204	207	211	214	217

Source: Deloitte Access Economics calculations. Note: scenario of IMG inflow held constant at 2009 levels.

Table 3.8: Total clinicians per 100,000 population – IMG inflow slowing scenario

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
National	298	300	304	309	316	323	330	336	339	343	346	348	350
RA1	347	349	353	360	367	376	384	391	395	398	402	404	407
RA2	204	205	207	210	213	217	221	224	226	228	230	232	233
RA3	170	171	173	177	181	186	190	194	197	200	202	204	207
RA4/5	169	172	175	179	183	188	193	197	200	203	206	208	210

Source: Deloitte Access Economics calculations. Note: scenario of IMG inflow slowing to zero by 2020, from 2009.

Table 3.9: Total clinicians per 100,000 population – IMG inflow zero from 2010 scenario

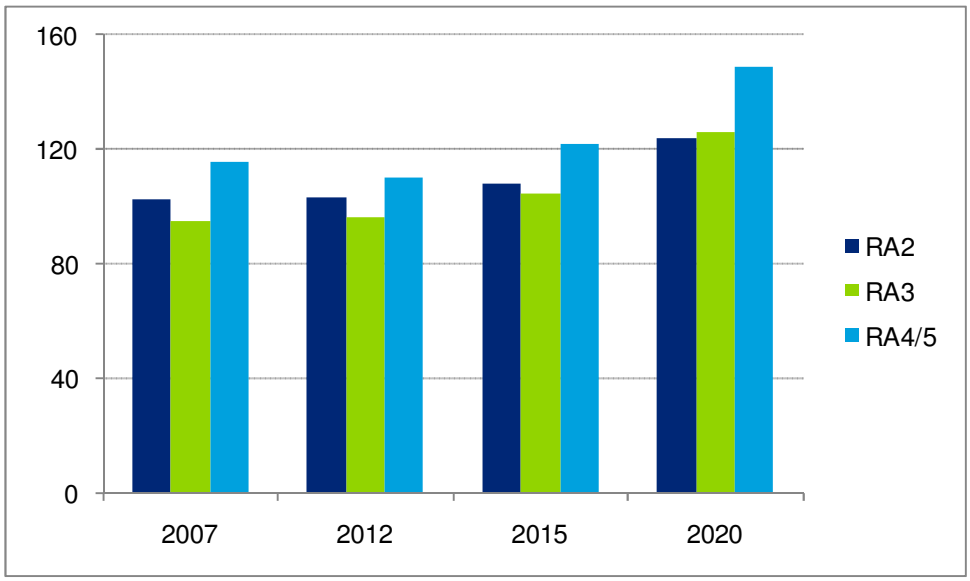
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
National	298	300	302	306	311	316	322	328	331	334	336	339	341
RA1	347	349	351	356	361	368	375	381	385	388	391	394	396
RA2	204	205	206	207	210	213	216	219	220	222	224	225	227
RA3	170	171	172	175	178	182	185	189	192	194	196	199	201
RA4/5	169	172	174	177	180	184	188	192	195	197	200	202	205

Source: Deloitte Access Economics calculations. Note: scenario of zero IMG inflow from 2010.

General practitioners

These results for total clinicians are reflected in changes to GPs by region. As illustrated in Chart 3.12 the number of GPs per 100,000 population is projected to increase across rural and remote Australia, with greater growth in RA3 and RA4-5.

Chart 3.12: GPs per 100,000 population by RA

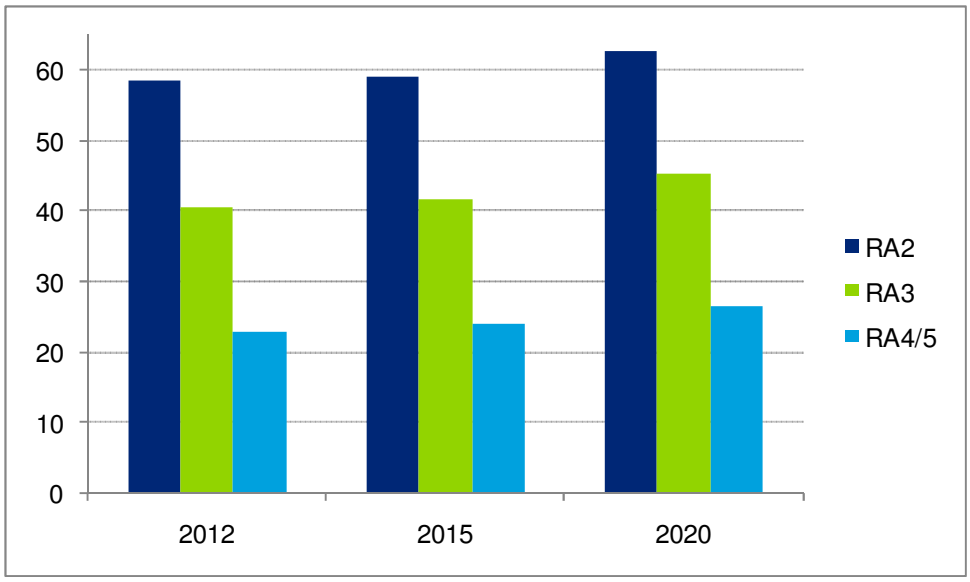


Source: DoHA, 2011b, and Deloitte Access Economics.

Non-GP Specialists

Of a concerning note, however, the reverse would appear to be true for non-GP specialists (Chart 3.13), and other clinician categories. Indeed, it would appear that access to specialists (other than GPs) in rural and remote will remain impaired, with access to these specialists services particularly constrained in remote and very remote Australia.

Chart 3.13: Non-GP specialists per 100,000 population by RA



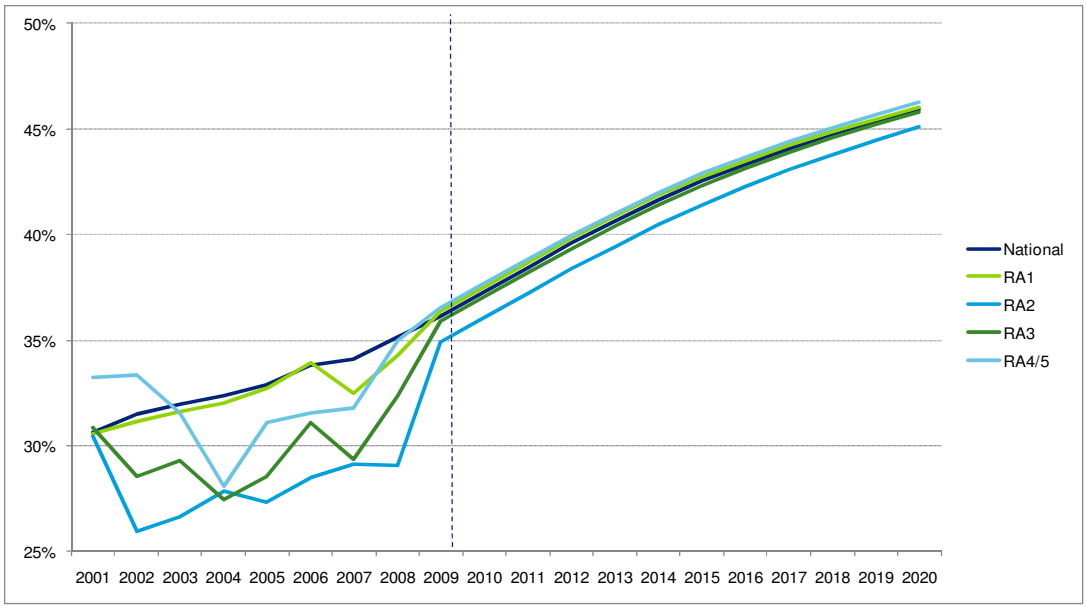
Source: Deloitte Access Economics.

Taken together, while on a national average, clinician to population ratios are projected to increase through 2020, this is not necessarily mirrored through all clinician categories, with growth in GPs largely leading to the improvements.

3.2.3 Feminisation

There is an increasing trend in the proportion of female clinicians in the medical workforce, projected to 2020 across geographic regions (Chart 3.14). This may indicate an ongoing willingness of female practitioners to move to the country after they have completed their medical training, and is consistent with greater proportions of female medical graduate students (MDANZ, 2010a).

Chart 3.14: Proportion of female medical practitioners: by ASGC-RA, 2001-2020



Source: DoHA, 2011b, and Deloitte Access Economics

These overall changes are reflected in both GP and non-GP specialist clinician populations.

The proportion of female clinicians employed within urban and rural Australia is projected to remain relatively stable (Table 3.10). The proportion of female non-GP specialists (relative to all female non-GP specialists) in major cities is expected to stay quite high at 85% compared to around 73% for GPs, reflecting the nature of non-GP specialist practice – which is largely urban-focused due to the need for economies of scale and hospital settings – as well as lifestyle preferences of non-GP specialists.

Table 3.10: Proportion of female clinicians by ASGC-RA and clinician category

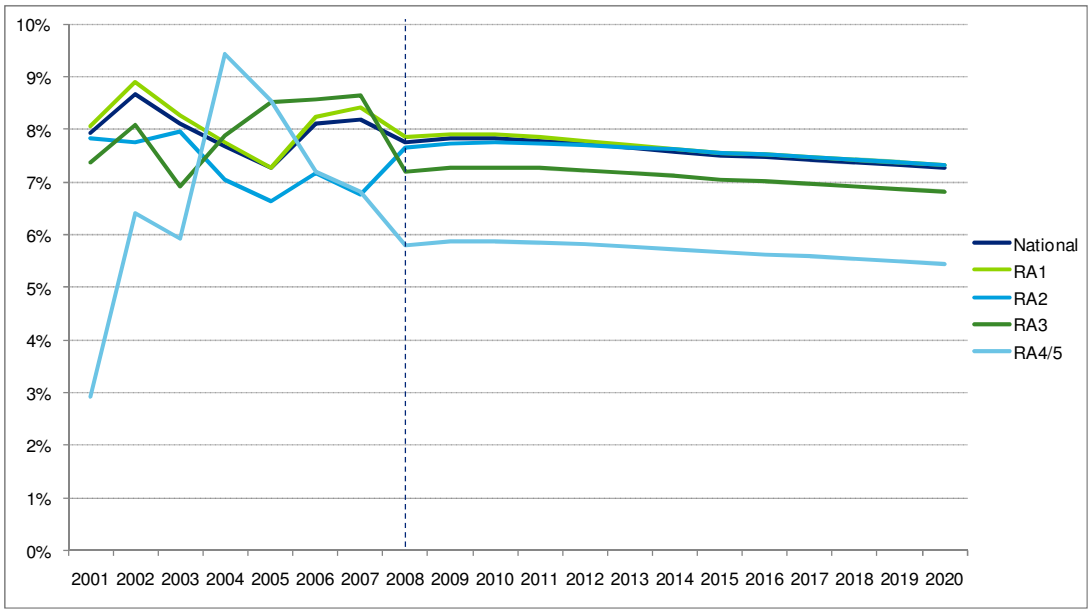
	GP			Non-GP specialist		
	2012	2015	2020	2012	2015	2020
RA1	74	74	73	85	85	85
RA2	17	17	17	11	11	11
RA3	7	7	8	4	4	4
RA54/5	2	2	2	1	1	1

Source: DoHA, 2011b and Deloitte Access Economics

3.2.4 Medical practitioners aged 65+

The ageing of the medical workforce in urban and rural Australia is estimated to remain relatively stable, estimated to approximately 7.23% by 2020 (Chart 3.15). Clinicians aged 65 years or older within remote and very remote Australia is estimated to remain around 2% lower than the national average, consistent with the needs of this specific demographic.

Chart 3.15: Proportion of medical practitioners aged 65+, by ASGC RA

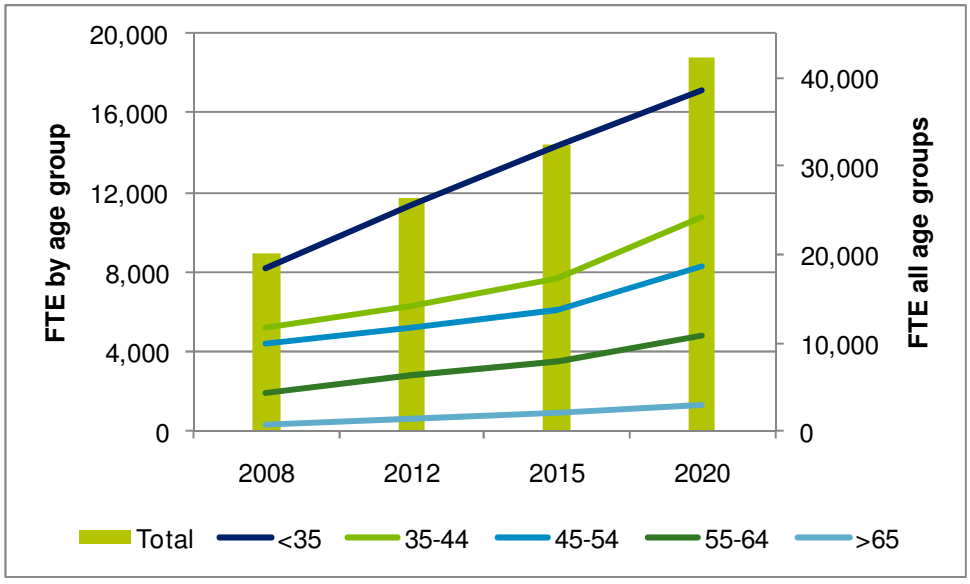


Source: DoHA, 2011b and Deloitte Access Economics

3.2.5 Full-time equivalent workforce participation

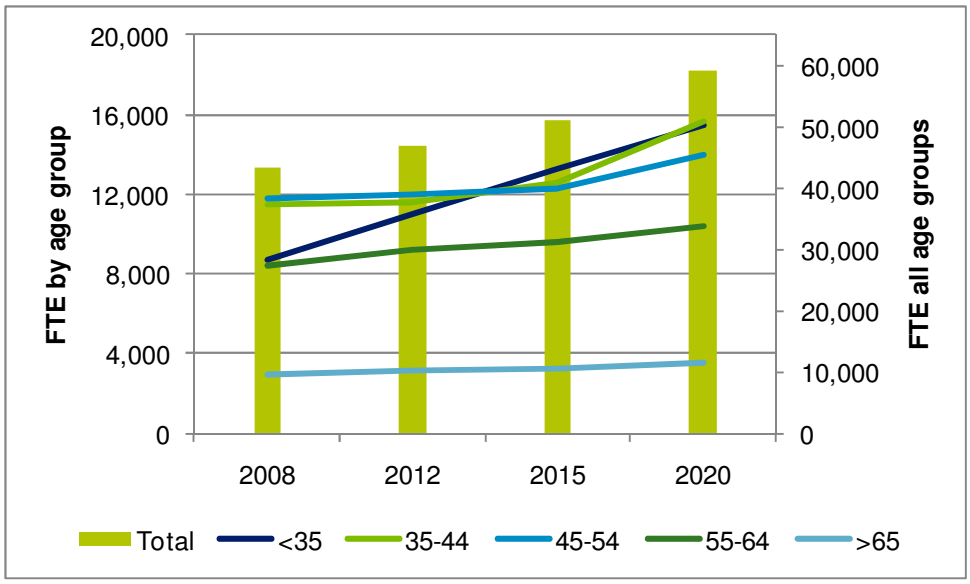
FTE workforce participation is projected to increase for both male and female clinicians from a 2008 baseline to 2020 (Chart 3.16, Chart 3.17). A more dramatic increase in FTE for female clinicians is expected, accounted for by strong growth in participation by clinicians aged under 35 years of age. Participation for female clinicians showed clear stratification by age group, as participation mirrors age, such that younger female clinicians consistently worked more than older female clinicians. In contrast, male clinicians showed overlap in workforce participation for those aged less than 35 years of age, up to those aged 54.

Chart 3.16: Female clinician FTE



Source: AIHW 2010, and Deloitte Access Economics.

Chart 3.17: Male clinician FTE



Source: AIHW 2010, and Deloitte Access Economics.

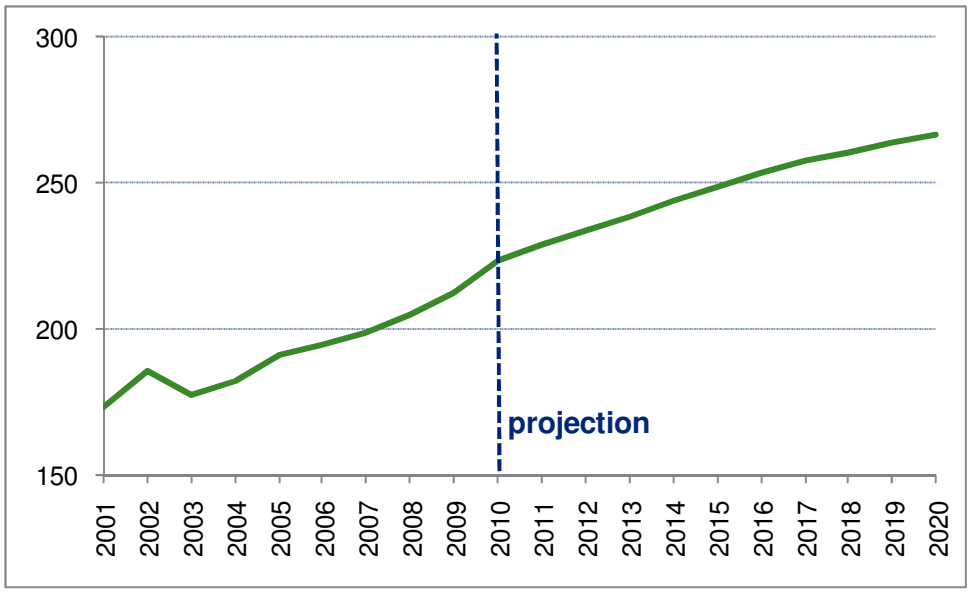
3.2.6 Rural incentive programs

Rural incentive programs in the form of the GP component of the GPRIP (formerly known as rural retention program, RRP) and the registrar component of GPRIP (formerly known as the Registrars Rural Incentive Payment Scheme, RRIPS) have been projected to 2020.

3.2.6.1 Registrar component of GPRIP

DoHA (2011b) estimates that RRIPS made payments of $73.2 million to 1,940 registrars over a ten year period to 2010. Using a tapered nine year linear growth trend, we estimate that enrolment in the registrar component of GPRIP will expand by 19% by 2020, to 266 registrars (Chart 3.18). Based upon historical preference rates (DoHA, 2010c), RRIPS is estimated to account for the relocation of 31 registrars from RA1 to RA4/5, and 87 registrars from RA1 to RA3 during 2020.

Chart 3.18: Projected enrolment in registrar component of GPRIP

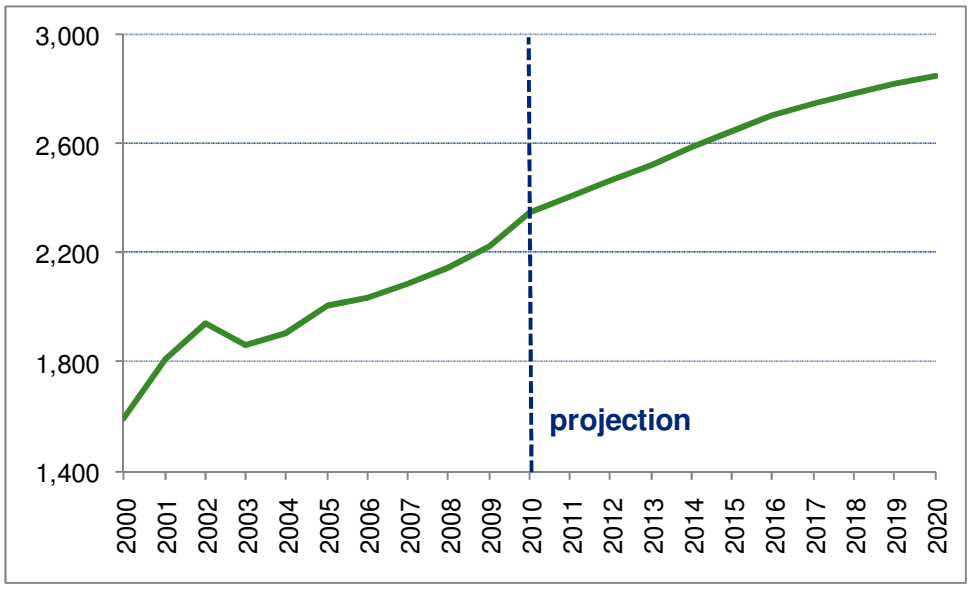


Source: DoHA, 2011b, and Deloitte Access Economics.

3.2.6.2 GP component of GPRIP

Data provided by DoHA (2011b) estimated that the RRP made payments of $204 million to 21,967 GPs over the 11 year period to 2010, with payments made to GPs under RRP having risen by 55% over the period 2000 to 2010. Using a tapered linear growth trend, we estimated that enrolment in the GP component of GPRIP would expand by 22% to 2020 (Chart 3.19). Based on historical preference rates (DoHA, 2010c), RRP is estimated to account for the relocation of 337 GPs from RA1 to RA4/5, and 933 GPs from RA1 to RA3 during 2020.

Chart 3.19: Projected enrolment in GP component of GPRIP



Source: DoHA, 2011b, and Deloitte Access Economics.

3.2.7 Bonding programs

The BMP and MRBS schemes commenced in 2004 and 2001, respectively. Given the exiting medical training profiles for students, most of those students who first enrolled in these programs are yet to return their service obligations.

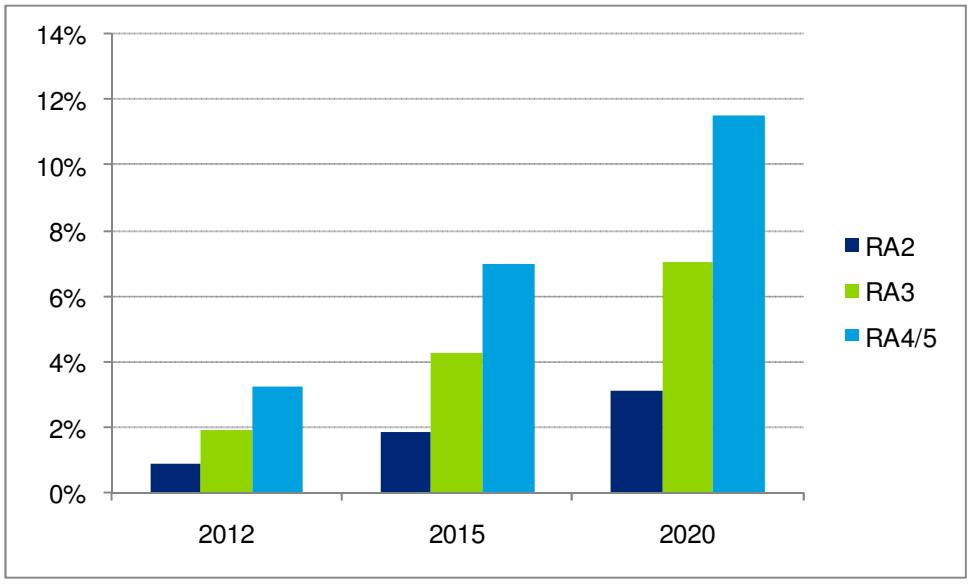
3.2.7.1 MRBS Scheme

Enrolments in MRBS scheme were projected to remain stable at 100 commencing students per year to 2020. A small number of students enrolled in the MRBS at inception commenced their return of service obligations from 2010, assuming an average course of five years duration, followed by an additional five years training toward GP or other specialisation.

Students participating in the MRBS scheme may choose to return their service obligation in RA2 to RA5 geographical regions, depending on the specialty undertaken. Based on DoHA (2011a) and preferred future locations by Australian medical student graduates (MDANZ, 2011a), we estimate that over the ten year period 2011 to 2020, 156 Australian medical graduates will return service obligations in RA4-5. Some 388 additional Australian medical graduate clinicians are estimated to return obligations within RA3 regions, while 426 will return obligations in RA2[24].

The contribution of MRBS scheme toward clinicians practising in RA4-5 is projected to increase from 3.3% in 2012 to 7.3% for 2015, increasing to 12% by 2020 (Chart 3.20). The greatest contribution is in RA4-5.

Chart 3.20: Projected contribution of MRBS scheme: proportion of total clinicians by ASGC-RA



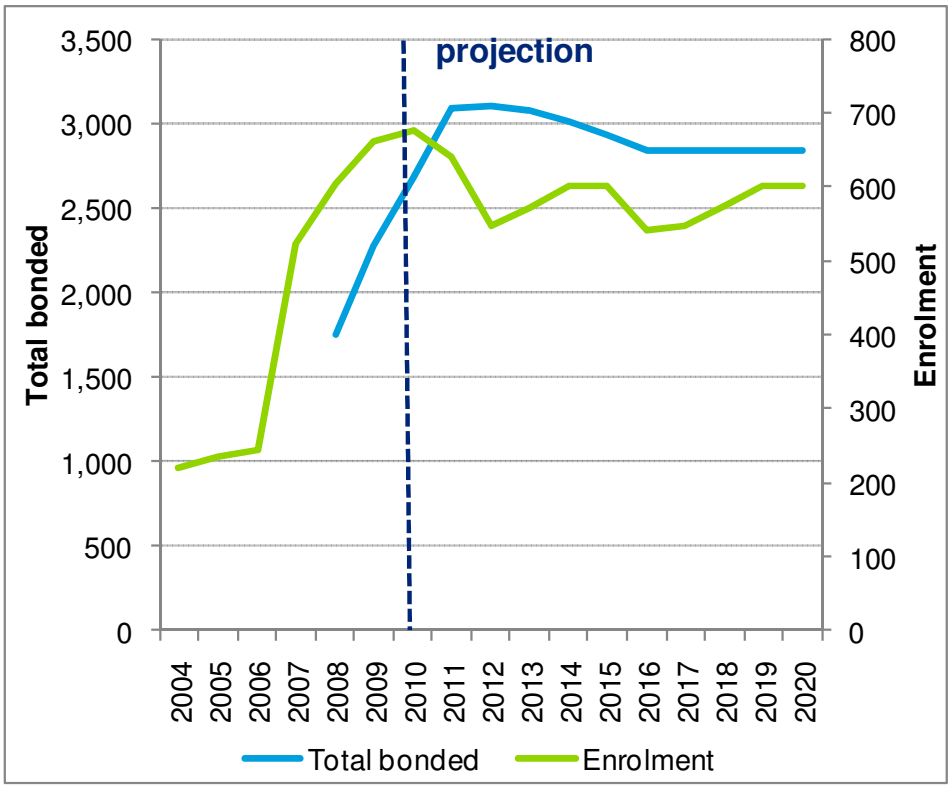
Source: DoHA, 2011a; MDANZ, 2011a; and Deloitte Access Economics.

[24] The BMP scheme will produce its first rural placements in 2014, who will then have to stay in place for six years, thus any participants who subsequently return to urban areas will not be captured in the model timeframe.

3.2.7.2 BMP Scheme

As discussed in Section 2.3, BMP scheme enrolments are a function of total CSP medical places, at a constant 25%. Given our projections for total Australian medical school places, we projected BMP enrolment to remain relatively stable at approximately 700 places per year to 2020 (Chart 3.21). Total Australian medical students enrolled onto BMP were projected to rise through 2012, peaking at 3,106, before tapering off to approximately 2,840 by 2020 (Chart 3.21). Students enrolled onto BMP scheme at inception will be expected to commence their return of service obligations from 2014, assuming an average course of five years duration, followed by an additional five years training toward specialisation.

Chart 3.21: Projected enrolment into BMP scheme and total students

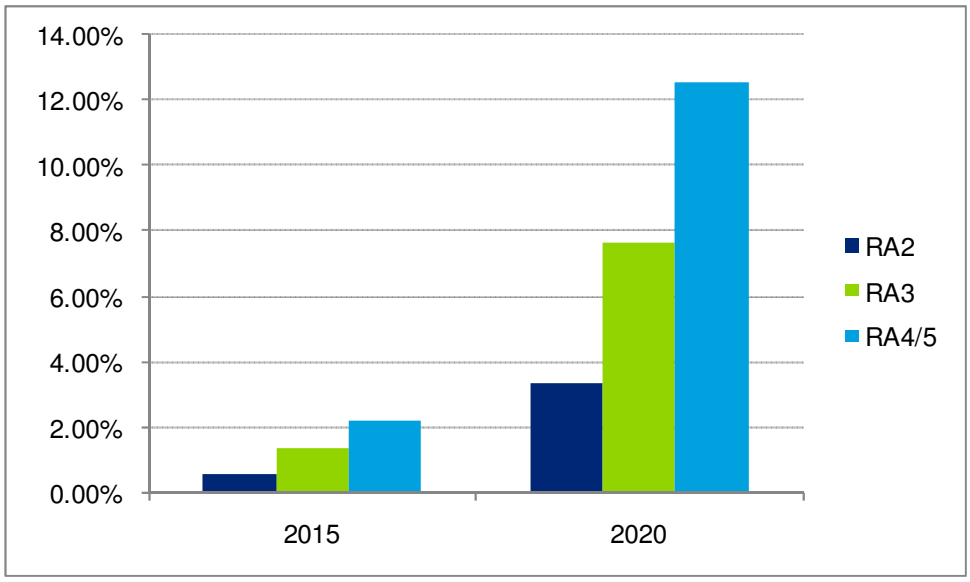


Source: DoHA, 2011a; and Deloitte Access Economics.

Students participating in the BMP scheme are required to return service obligations in a DWS, which can be in any region. Assuming that BMP scheme bonded Australian medical student graduates acquire DWS positions according to their placement preferences across RA1-5 (MDANZ, 2011a and DoHA, 2011a), we estimate that over the seven year period 2014 – 2020, 170 Australian medical graduates will return service obligations in RA4-5. In other regions, 422 additional Australian medical graduate clinicians are estimated to return obligations within RA3, while 463 will return obligations in RA2.

As a proportion of total clinicians projected to practice in RA4-5 across 2015 and 2020, the contribution of BMP scheme to is estimated to increase from 2.31% in 2015 to 13.03% by 2020 (Chart 3.22). The greatest contribution is projected for RA4-5.

Chart 3.22: Projected cumulative contribution of BMP scheme: proportion of total clinicians

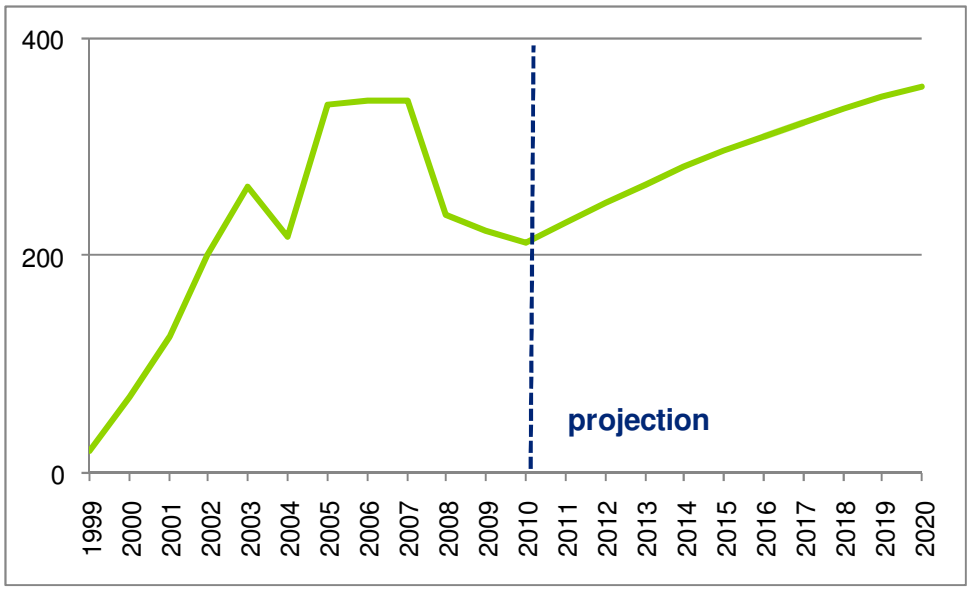


Source: DoHA, 2011a; MDANZ, 2011a; and Deloitte Access Economics.

3.2.7.3 5YOTDS

IMG participants in the 5YOTDS agree to work in specific geographic regions within their jurisdiction, thus reducing their ten year moratorium service obligation. . We projected participation in the 5YOTDS to increase steadily, tapering to enrolment levels greater than the historical maximum. Enrolment is estimated to reach 296 participants by 2015, and 356 by 2020 (Chart 3.23).

Chart 3.23: Projected enrolments in 5YOTDS



Source: DoHA, 2008c, 2011c; and Deloitte Access Economics

We estimate that 433 IMGs enrolled into 5YOTDS will practise as GPs in RA4-5 over the course of 2008 to 2020. Annually, this reflects an average 5.3% of total projected GPs in RA4-5 (Chart 3.25), and approximately 10% of IMG GPs within RA4-5, by 2020 (Chart 3.24). From 2008 to 2020, the 5YOTDS is further estimated to contribute 1,196 and 2,209 IMGs to RA3 and RA2 regions (Chart 3.24), respectively, reflecting an average 4.1% and 3.1% of total GPs practising within these geographic regions (Chart 3.25)[25].

Chart 3.24: Projected cumulative total of 5YOTDS participants

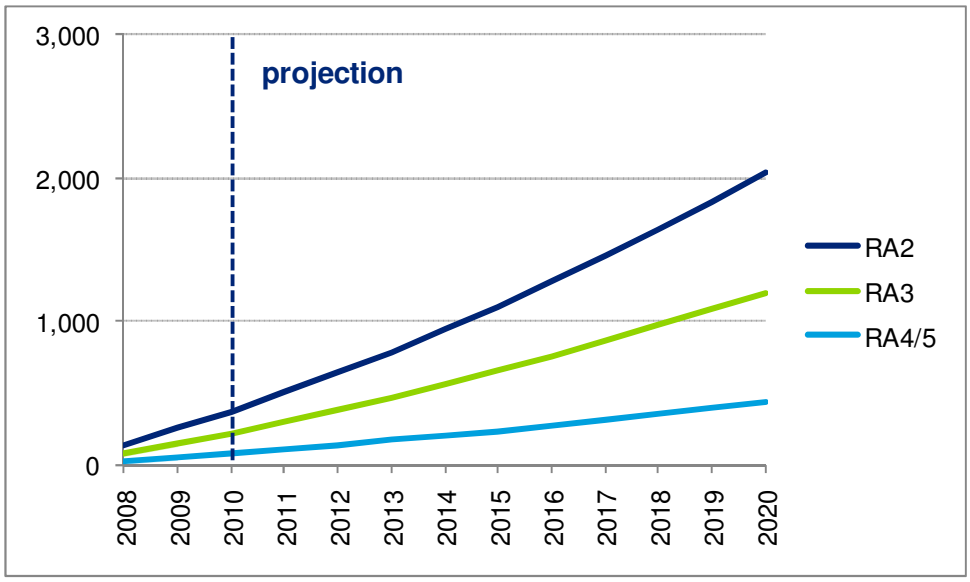
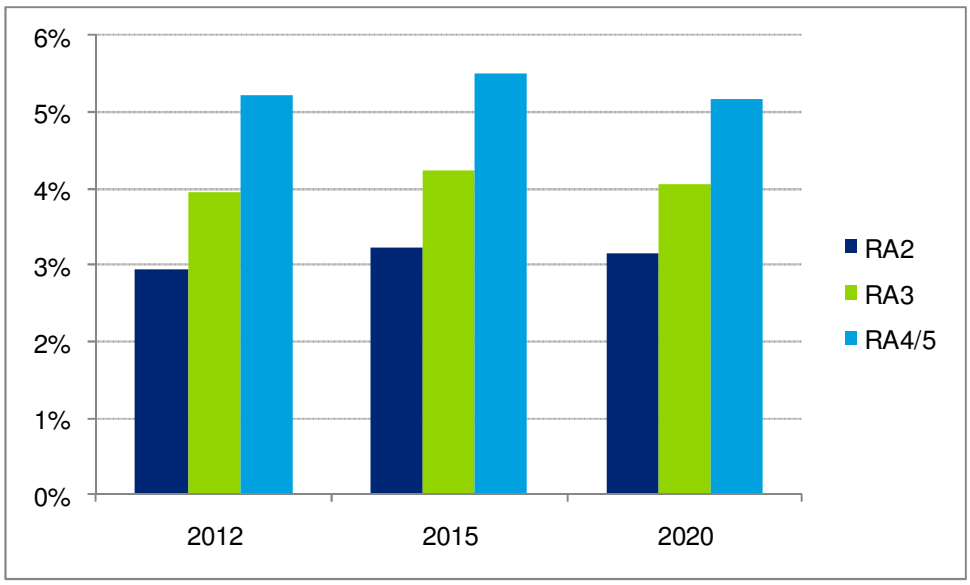


Chart 3.25: Projected 5YOTDS participation as proportion of total GPs



Source: DoHA, 2008c; and Deloitte Access Economics

[25] It is assumed that 5YOTDS participants do not return to their country of origin after their tenure is finished.

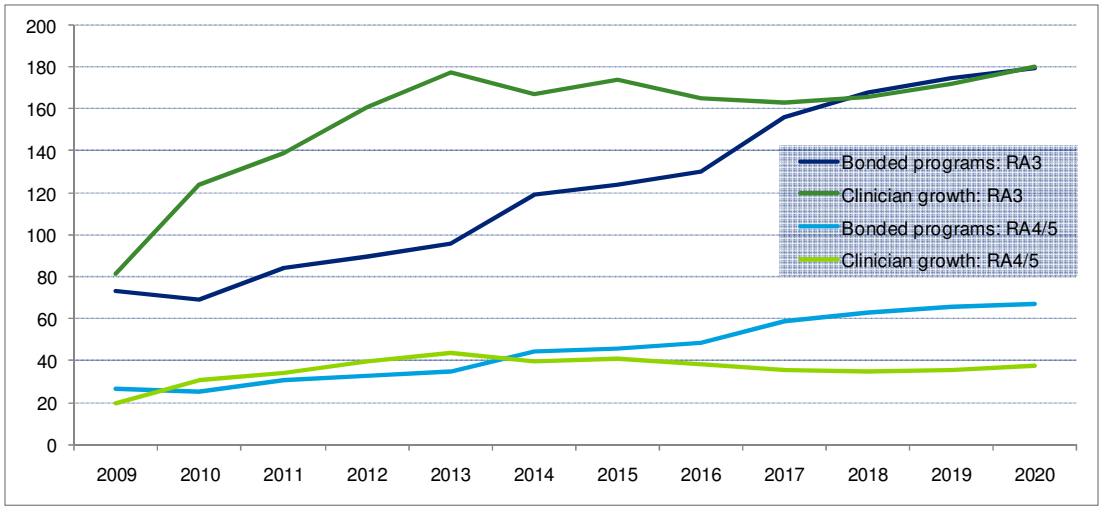
3.2.7.4 Expected effect of bonding programs for clinicians entering and leaving regional Australia

Growth in regional RA3 and RA4/5 clinician numbers which are attributable to bonding programs, as well as those expected from the model during 2009 through 2020, are presented in Chart 3.26.

Bonding programs are expected to generate strong growth clinicians within RA3. By 2017, convergence between estimated clinician growth and clinicians attracted by bonding programs is expected, as clinicians migrate out of RA3 and, presumably, back to urban areas.

A similar pattern of nominal convergence is expected in remote and very remote Australia, regions where volatility in clinician numbers is typical. While bonded programs are expected to generate solid clinician growth in these regions, lower relative overall clinician growth would suggest that a greater number of clinicians are leaving regional Australia to practise in more regional areas.

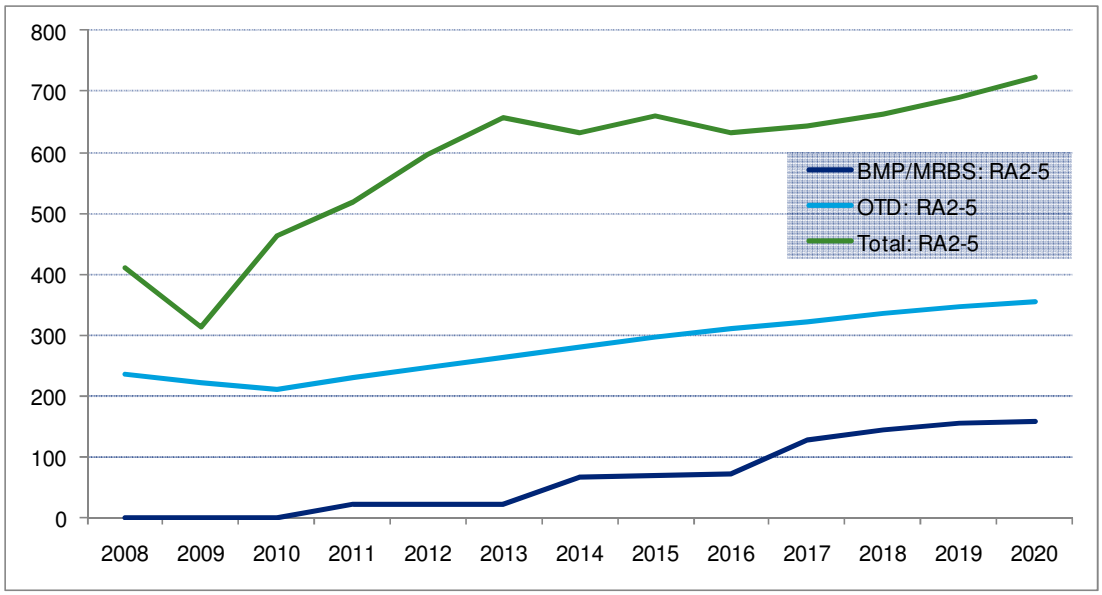
Chart 3.26: Bonding program clinician and total clinician year-on-year growth



Source: Deloitte Access Economics. Note: Factors in attrition rates of 20% for BMP scheme, and 15% for MRBS scheme.

From 2008 (the earliest year OTD figures are available) through to 2020, OTDs are expected to account for around half of the increase in clinicians in rural and remote areas (Chart 3.27). This is expected to be a considerably larger contribution than that from the bonded programs, which will supply rural placements from 2011 onwards. (The "other" category in Table 3.11 is primarily non-bonded Australian citizen clinicians.)

Chart 3.27: Year-on-year growth of clinicians by source, 2008 to 2020 (RA2-5)



Source: Deloitte Access Economics. Note: includes attrition rates of 20% for BMP scheme, and 15% for MRBS scheme.

Table 3.11: Clinician year-on-year growth by OTD and bonding programs

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
BMP/MRBS	0	0	0	22	22	22	68	68	72	127	145	154	157
OTD	237	223	211	230	248	265	281	296	310	323	335	346	356
Other	172	90	252	268	326	369	283	295	250	193	183	190	212
Total	**409**	**313**	**463**	**520**	**596**	**656**	**631**	**659**	**632**	**642**	**662**	**690**	**724**

Source: Deloitte Access Economics. Note: Factors in attrition rates of 20% for BMP scheme, and 15% for MRBS scheme. Numbers may not sum exactly to totals due to rounding.

3.3 Sensitivity analysis

The following sensitivity analysis assumes if a program sends fewer clinicians to rural and remote areas that there is an equal and offsetting increase in clinicians in DWS's located in ASGC-RA1. It is assumed that any such vacant positions are not filled by any clinicians who migrate to rural and remote regions without program incentives.

3.3.1.1 5YOTDS

The 5YOTDS was shocked for a +/-10% impact on enrolments, from 2011 to 2020 (Table 3.12). A 10% increase of enrolment in 5YOTDS is projected to result in an additional IMG GPs practising in a DWS, across RA2-5. This is mainly RA2 (49 more GPs), with an additional 29 and 10 IMG GPs practising in RA3 and RA4-5, respectively. In 2020 we estimate such an increase would generate an additional 3 GP clinicians, per million population within RA4-5.

Table 3.12: Impact of +/-10% enrolment shock on 5YOTDS

	GP clinician change on base			GP clinician:10^6 population change on base		
	2012	2015	2020	2012	2015	2020
-10%: RA2	-2	-5	-8	0	-1	-2
-10%: RA3	-1	-3	-5	-1	-1	-2
-10%: RA4/5	0	-1	-2	-1	-2	-3
+10%: RA2	2	5	8	0	1	2
+10%: RA3	1	3	5	1	1	2
+10%: RA4/5	0	1	2	1	2	3

Source: Deloitte Access Economics.

3.3.1.2 Bonding programs

BMP scheme and MRBS scheme were both shocked for a +/-10% impact on attrition baseline rates, from 20% for BMP scheme and 25% for MRBS scheme (Table 3.13). A 10% increase of attrition from BMP scheme and MRBS scheme programs is projected to result in a significant increase in clinicians practising in ASGC-RA1, with commensurate decrease through other geographic regions. From 2011 to 2020, this increase in attrition would involve 276 ex-bonded clinicians substituting RA1 for RA2-5, with 44 fewer clinicians practising in RA4-5. Throughout the 2017-2020 period, we estimate an annual attrition of between 10 and 15 clinicians per million population would be observed within RA4-5.

Table 3.13: Impact of +/-10% attrition shock on BMP scheme and MRBS scheme

	Total clinician change on base			Total clinician:10[6] population change on base		
	2012	2015	2020	2012	2015	2020
-10%: RA1	-6	-22	-51	0	-1	-3
-10%: RA2	3	10	23	1	2	4
-10%: RA3	3	9	21	1	4	9
-10%: RA4/5	1	4	8	2	7	15
+10%: RA1	6	22	51	0	1	3
+10%: RA2	-3	-10	-23	-1	-2	-4
+10%: RA3	-3	-9	-21	-1	-4	-9
+10%: RA4/5	-1	-4	-8	-2	-7	-15

Source: Deloitte Access Economics

3.3.1.3 Medical workforce labour leaving and retirement

The medical workforce was shocked for a +/-10% impact on attrition rates from 2011 to 2020 (Table 3.14). A 10% increase of medical workforce attrition (to 0.55%) is projected to result in the additional loss of 2,736 clinicians from the medical workforce, including 35 clinicians from RA4-5. We estimate that there would be 10 fewer clinicians per million population in RA4-5 by 2020.

Table 3.14: Impact of +/-10% medical workforce attrition

	Total clinician change on base			Total clinician:10[6] population change on base		
	2012	2015	2020	2012	2015	2020
-10%: RA1	107	193	351	7	12	20
-10%: RA2	18	32	59	4	7	12
-10%: RA3	7	13	23	3	6	10
-10%: RA4/5	2	3	6	3	6	10
+10%: RA1	-107	-192	-349	-7	-12	-20
+10%: RA2	-18	-32	-59	-4	-7	-12
+10%: RA3	-7	-13	-23	-3	-6	-10
+10%: RA4/5	-2	-3	-6	-3	-6	-10

Source: Deloitte Access Economics

3.3.1.4 Rural incentive programs

The RRIPS and RRP programmatic components of GPRIP were shocked for a +/-10% impact on enrolment rates (Table 3.5, Table 3.10), from 2011 to 2020. A 10% increase in enrolments onto RRP would lead to an estimated additional 36 GP clinicians practising within RA4/5, throughout the period 2011 to 2020. Significantly, such an increase in enrolment would generate substitution of 308 GP clinicians out of RA1 and into more rural geographic regions. In contrast, a 10% increase in RRIPS program enrolment would have a minimal impact upon rural clinician distribution, as only an additional 25 registrars would relocate to more rural geographic regions during the 2011 to 2020 period.

Table 3.15: Impact of +/-10% enrolment shock on RRP

	GP clinician change on base			GP clinician:10^6 population change on base		
	2012	2015	2020	2012	2015	2020
-10%: RA2	-7	-17	-28	-1	-4	-6
-10%: RA3	-4	-10	-17	-2	-4	-7
-10%: RA4/5	-1	-4	-6	-3	-7	-11
+10%: RA2	7	17	28	1	4	6
+10%: RA3	4	10	17	2	4	7
+10%: RA4/5	1	4	6	3	7	11

Source: Deloitte Access Economics

Table 3.16: Impact of +/-10% enrolment shock on RRIPS

	Other clinician change on base			Other clinician:10^6 population change on base		
	2012	2015	2020	2012	2015	2020
-10%: RA2	-1	-1	-2	0	0	0
-10%: RA3	0	-1	-1	0	0	-1
-10%: RA4/5	0	0	-1	0	-1	-1
+10%: RA2	1	1	2	0	0	0
+10%: RA3	0	1	1	0	0	1
+10%: RA4/5	0	0	1	0	1	1

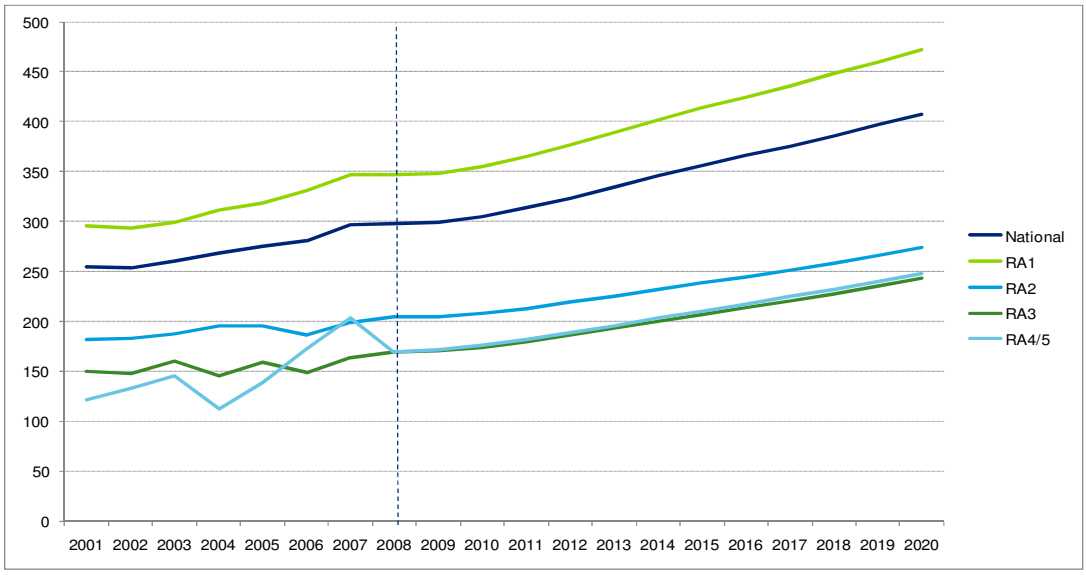
Source: Deloitte Access Economics

4 Discussion and conclusions

Clinician to patient ratios in rural and remote Australia have been increasing in recent years. This is not due to reduction in potential patients, as the absolute population in remote areas has increased (Table 3.2). Thus, it would appear that Commonwealth programs and policies targeted toward increasing clinician growth in remote Australia are having some impact (Chart 3.7, Chart 3.10).

Within remote and very remote regions of Australia, total clinicians, and GPs particularly, are projected to increase significantly during the years 2011 to 2020 (Chart 3.11). Indeed, medical access within regional Australia is projected to show sustained growth through to 2020. In large part, these projections appear to be due to Commonwealth programs and policies. Enrolment in GPRIP programs (RRIPS and RRP equivalents, (Chart 3.18, Chart 3.19) is estimated to progressively increase, along with enrolment in the 5YOTDS (Chart 3.23), and stable enrolment in bonding programs (Chart 3.21). As a proportion of total GPs within regional Australia, these programs are projected to make significant contributions within RA4-5 (Chart 4.1).

Chart 4.1: Clinicians (headcount) per 100,000 population, by ASGC-RA, 2012 to 2020



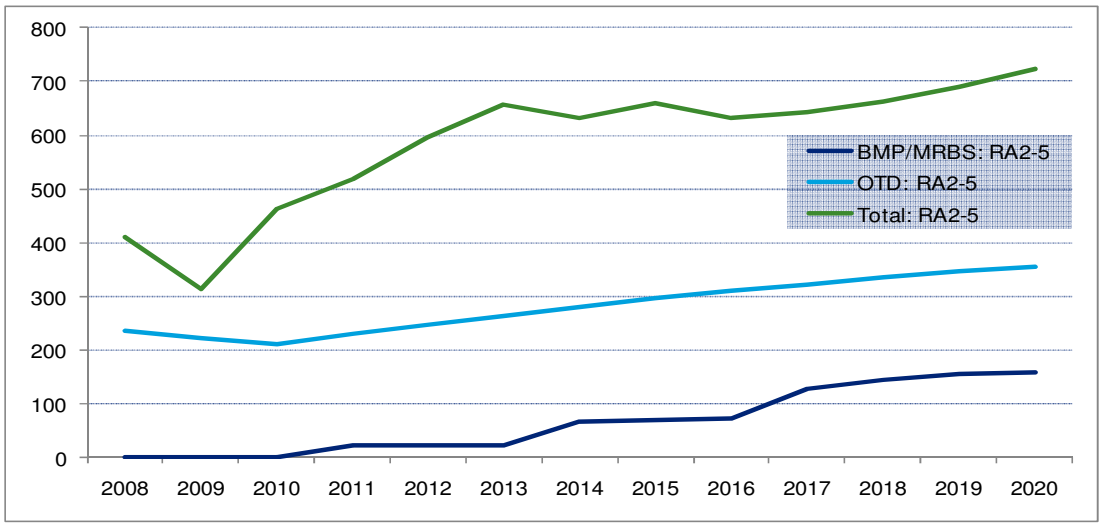
Source: DoHA, 2011b, and Deloitte Access Economics.

The upshot of these projections suggests that Commonwealth programs will make real contributions toward encouraging qualified medical workforce participation in rural and remote Australia. Moreover, these programs would appear to be doing so at rates in excess of regional population growth, thus giving rise to improved access to medical services in regional Australia. Indeed, most of the increase in the rural medical workforce appears to be a result of these programs (see Chart 3.7).

The OTD programs are expected to make a considerably larger contribution to rural and remote clinician placements over the foreseeable future than are domestic bonding programs. However, there is smaller but increasing contribution from domestic bonded

programs. Of the total increase in rural and remote clinicians between 2011 and 2020 (6,413 doctors in total), 13% (858) will be from bonded programs, 47% (2,986) from OTDs and 40% (2,569) from other sources (non-bonded Australian trained doctors).

Chart 4.2: Year-on-year growth of clinicians by source, 2008 to 2020 (RA2-5)



Source: Deloitte Access Economics. Note: includes attrition rates of 20% for BMP scheme, and 15% for MRBS scheme.

References

Australian Bureau of Statistics (ABS), 2008, *3105.0.65.001 - Australian historical population statistics, 2008*, Commonwealth of Australia, Canberra.

- 2010a, 3201.0 - Population by age and sex, Australian States and Territories, Jun 2010, Commonwealth of Australia, Canberra.
- 2010b, 3101.0 - Australian Demographic Statistics, Sep 2010, Commonwealth of Australia, Canberra.
- 2010c, 3218.0 – Regional population growth, Australia, 2009-10, Commonwealth of Australia, Canberra.
- 2011, 6401.0 - Consumer Price Index, Australia, Mar 2011, http://www.abs.gov.au/ausstats/abs@.nsf/mf/6401.0, accessed 16-May-2011.

Access Economics (AE) 2008, The value and business of Australian health care, 26 November 2008, Canberra, Australia.

Australian Health Ministers' Conference (AHMC) 2004, National Health Workforce Strategic Framework, April, Sydney.

Australian Institute of Health and Welfare (AIHW), 2001, Medical labour force 2001 Cat. No. HWL 28, Canberra.

- 2004, Medical labour force 2002, Cat. No. HWL 30, Canberra.
- 2005, Medical labour force 2003, Cat. No. HWL 32, Canberra.
- 2006, Medical labour force 2004, Cat. No. HWL 39, Canberra.
- 2007, Medical labour force 2005, Cat. No. HWL 41, Canberra.
- 2008, Medical labour force 2006, Cat. No. HWL 42, Canberra.
- 2009, Medical labour force 2007, Cat. No. HWL 45, Canberra.
- 2010, Medical labour force 2008, Cat. No. AUS 131, Canberra.

Australian Medical Workforce Advisory Committee (AMWAC) 2005, *The General Practice Workforce In Australia; Supply and Requirements to 2013,* AMWAC Report 2005.2, August.

Department of Health and Ageing (DoHA) 2008a, *Report on the Audit of Health Workforce in Rural and Regional Australia April 2008*, Commonwealth of Australia, Canberra.

- 2008b, *Ageing and Aged Care in Australia, May 2008*, Commonwealth of Australia, Canberra.
- 2008c, *Medical Training Review Panel 11th Report*, Commonwealth of Australia, Canberra.
- 2009, *Annual Report 2008-09: Performance reporting*, Commonwealth of Australia, Canberra.
- 2010a, *Medical Training Review Panel 13th Report*, Commonwealth of Australia, Canberra.

- 2010b, *A national health and hospitals network: further investments in Australia's health*, Commonwealth of Australia, Canberra.
- 2010c, *General practice workforce statistics, October 2010*, Commonwealth of Australia, Canberra.
- 2010d, *General Practitioner Component - Fact Sheet, Last updated 24/08/2010*, http://www.doctorconnect.gov.au/internet/otd/publishing.nsf/Content/program-gpcomp-factsheet, accessed: 16-May-2011.
- 2010e, *Rural Relocation Incentive Grant - Fact Sheet, Last updated 14/01/2010*, http://www.doctorconnect.gov.au/internet/otd/publishing.nsf/Content/program-rrig-factsheet, accessed: 16-May-2011.
- 2011a, *BMP scheme and MRBS scheme statistical data, program inception to 2010*, data by request.
- 2011b, *RRP and RRIPS statistical data, program inception to 2010*, data by request.
- 2011c, *Five year OTD scheme enrolments, 2008-2011*, data by request.
- 2011d, *Districts of workforce shortage, 2005 Q4 – 2010 Q3*, data by request.
- 2011e, *The Scaling Initiative - Questions and Answers*, http://www.health.gov.au/internet/main/publishing.nsf/Content/work-st-mrb-scal, accessed 04 July 2011.

Medical Deans Australia and New Zealand (MDANZ) 2010a, *Table 4-5: Domestic and International Medial School Graduates 1996-2009*, http://www.medicaldeans.org.au/statistics/annualtables, accessed 24 March 2011.

- 2010b, *Table 1-5: Student statistics, 2006-10*, http://www.medicaldeans.org.au/statistics/annualtables, accessed 26-April-2011.
- 2010c, *2009 medical students exit questionnaire: national data report, May 2010,* http://www.medicaldeans.org.au/wp-content/uploads/2009_EQ_Natonal_Report.pdf, accessed 18-April-2011.
- 2011a, *2009 medical students exit questionnaire: national data report, May 2010: by Australian and foreign students;* data by request.
- 2011b, *2010 medical student statistics*, data by request.

NSW Rural Doctors Network (NSW RDN), 2011, *Five year overseas trained doctors scheme: eligible locations, categories, and time frames*, http://www.nswrdn.com.au/client_images/665737.pdf, accessed: 16-May-2011

Parliamentary Library (PL) 2006, *Bills Digest no. 28 2006–07, Higher Education Legislation Amendment (2006 Budget and Other Measures) Bill 2006,* http://www.aph.gov.au/library/pubs/bd/2006-07/07bd028.htm, accessed 04 July 2011.

Productivity Commission (PC) 2005, *Australia's Health Workforce,* Research Report, Canberra.

Rural Doctors Workforce Agency (RDWA) 2007, *Rural and Remote General Practice Workforce Participation and Medical Practice Composition in South Australia:*

Findings from the Rural General Practitioner Survey 2006 and Rural Medical Practice Survey 2006, June 2007

Rural Health Workforce Australia (RHWA) 2010, *Parliamentary inquiry into overseas trained doctors: the 10-year moratorium*, South Yarra, Australia.

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