Deloitte.

General Practitioner workforce report 2019

Cornerstone Health Pty Ltd

November 2019

Deloitte Access Economics

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Acronym	Full name
ABS	Australian Bureau of Statistics
ACRRM	Australian College of Rural and Remote Medicine
AGPT	Australian General Practice Training
ASGS-RA	Australian Statistical Geography Standard – Remoteness Area
ATD	Australian trained doctor
BEACH	Bettering the Evaluation and Care of Health
DPA	distribution priority area
DVA	Department of Veterans' Affairs
FTE	full-time equivalent
GCCSA	Greater Capital City Statistical Area
GDP	gross domestic product
GP	general practitioner
HWA	Health Workforce Australia
MBS	Medicare Benefits Schedule
NHWDS	National Health Workforce Dataset
NIM	net internal movements
OTD	overseas trained doctor
RACGP	Royal Australian College of General Practitioners
SA3	Statistical Area Level 3
SRHS	Stronger Rural Health Strategy

cornerstone health

Foreword

29 November 2019

Cornerstone Health's purpose is to increase access to quality primary healthcare for all Australians. To meet that purpose, we establish primary healthcare facilities that are open 365 days a year from 7am to 10pm. These medical centres Medicare bulk bill where they are needed most - in fast growing urban areas such as Western Sydney and South-East Melbourne and outer metro Brisbane. Our continued challenge is to recruit doctors to meet the patient needs in these fast-growing areas.

The Deloitte Access Economics General Practitioner Workforce Report 2019 has found that Australia is heading for a significant undersupply of General Practitioners by 2030.

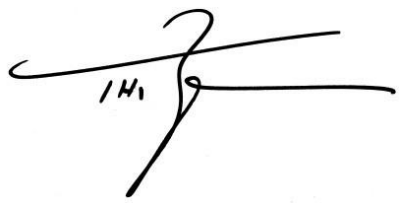
- The report highlights that there will be 37.5% increase in the demand for GP services between 2019 and 2030 (139.8 million increasing to 192.1 million).
- The report states that by 2030, there is projected to be a shortfall of 9,298 full-time GPs or 24.7% of the GP workforce. With the deficiency of GPs to be most extreme in urban areas with a shortfall of 7,535 full-time GPs or 31.7% by 2030.

The number of new general practitioners entering the market will not keep pace with increasing demand for healthcare. One of the determinants of the shortfall comes about because of limitations on the number of overseas trained doctors permitted to work in urban areas. The diversion of overseas trained doctors to rural, remote and regional areas will have unintended consequences for patients' access to healthcare in urban areas.

The undersupply of GPs is also driven by a lack of Australian trained graduates and the recent policy change that has significantly restricted the access to overseas trained GPs. We believe that there needs to be the right policy settings and incentives in place to encourage doctors to practice in areas of unmet need. It is critical that patients from these new urban hubs also have access to primary and preventative care, before they end up in hospital emergency departments. Indeed, overseas trained GPs are critical to supporting the primary healthcare needs of people in outer metropolitan areas.

The report found that 68.1% of GP services are currently demanded in urban areas however only 62.4% of GPs are in those areas. This will only get worse by 2030 as populations in those areas increase. We believe that this issue should be addressed now and not in 2030.

Our hope is that this report will assist and inform GP workforce policy for the benefit of all Australians.



Henry Bateman
Founder and CEO of Cornerstone Health Pty Ltd

Executive summary

This report forecasts the supply and demand of general practitioners (GPs) in Australia over the next decade to assist in delivering a sustainable GP workforce into the future. Ensuring an adequate supply of GPs in Australia is key to improving the health of Australians, with evidence identifying a positive correlation between the supply of GPs and reductions in mortality risk and hospital admission.[1,2] The report presents the result of a model constructed for this project that forecasts the supply and demand, by state/territory and urban/regional location, over 2019-2030.

In 2018, the Australian Government launched its *Stronger Rural Health Strategy* (SRHS). The SRHS has the objective of building a sustainable, high quality health workforce that is distributed across the country according to community need, particularly in rural and remote communities. A key part of the SRHS is to re-direct doctors from metropolitan areas to rural and remote areas, via limiting the number of overseas trained doctors (OTDs) who can practice in metropolitan areas, and increasing the number of registrars in regional areas.

However, the forecasting undertaken for this report has identified that both urban and rural areas will become progressively undersupplied over the ten years to 2030. Implementation of the SRHS policy to restrict OTDs practising in urban areas will exacerbate the underlying supply shortfall in these areas. The SRHS policy to increase registrar placements in regional areas will mitigate the supply shortfall in these areas, however additional work is necessary to fully address the shortfall.

Modelling the supply and demand of GPs in Australia

Modelling the GP workforce is a complex exercise, as not all GP services are delivered by specialist GPs in Australia, with a number of doctors working in general practice without a specialist qualification, working in a hospital, not currently in a training program, or not providing clinical services. For this report, the scope of GPs was limited to GPs who are vocationally registered and who provide services through the Medicare Benefits Schedule (MBS). GPs included in the model can be from within Australia (referred to as Australian trained doctors – ATDs), and also GPs who have migrated to Australia (referred to as OTDs).

This report defines the **supply** of GPs to be a function of the estimated opening stock of GPs in each period, plus relevant inflows and net of outflows. Supply inflows include new fellows and new registrars, as well inflows of OTDs. Supply outflows include deaths, retirements and outbound migration. Net movements from temporary workforce departures and returns, as well as intra-Australian population movements, were also included.

While **demand** is difficult to observe, it can partly be observed from changes in the factors driving demand (such as population growth) and changes in indicators of excess demand (such as waiting lists). As with other models of this nature, this report uses service utilisation to indicate demand for GP services, as utilisation is observable, noting that utilisation is not equivalent to demand.

The supply and demand projections presented in this report start from an assumed position of initial equilibrium in both urban and regional areas. Thus, future movements in supply and demand are relative to the initial position, and the analysis is undertaken holding all other factors constant. This report does not make a judgment on the adequacy of the current supply of GP services; rather it looks at the direction of future demand and supply pressures for the GP workforce relative to the current position.

It is important to note that a market economy such as Australia tends to adjust dynamically to changes in supply and demand to reallocate resources using price signals. For example, where the

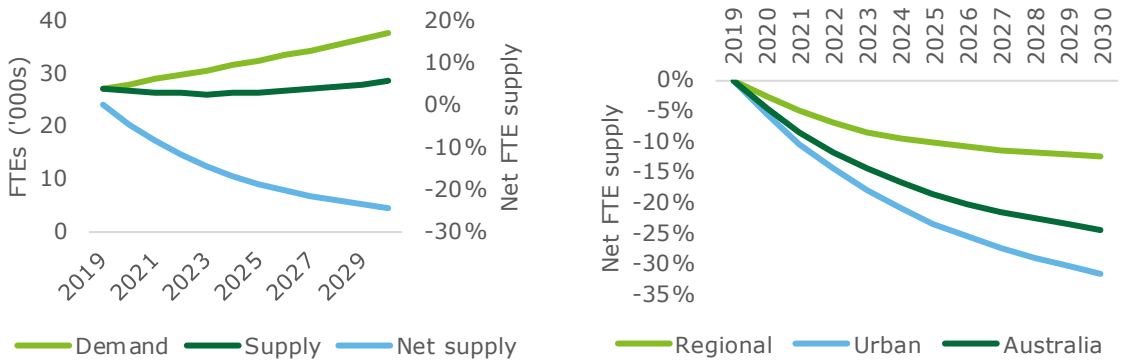
[1] Gill, D, & Sharpe, M, 'Frequent consulters in general practice: a systematic review of studies of prevalence, associations and outcome' (1999) *47*(2) *Journal of psychosomatic research* 115.
[2] Shi, L, & Starfield, B 'The effect of primary care physician supply and income inequality on mortality among blacks and whites in US metropolitan areas' (2001) *91*(8) *American journal of public health* 1246.

model shows demand exceeding supply over the period of analysis, in practice the market would be expected to adjust over time through increasing wages (increasing supply through encouraging new entrants to the workforce) and/or through increasing consumer prices (reducing demand) such as through increasing out-of-pocket costs or reducing bulk-billing rates.

Comparison of supply and demand

Starting from an initial equilibrium in 2019, demand for GP services is forecast to outpace supply, resulting in a widening shortfall of full-time equivalent (FTE) GPs from 2020 onwards. By 2030, there is projected to be a shortfall of 9,298 FTE GPs, or 24.7% of the workforce (see Chart i).

Chart i Supply and demand for FTE GPs in Australia (LHS) (by region, RHS), 2019 to 2030



Source: Deloitte Access Economics analysis. Net supply refers to supply minus demand.

By location, both urban and regional areas are assumed to be in equilibrium in 2019. By 2020, a deficit was forecast to emerge in both urban areas (5.7%, 995 FTE GPs) and a smaller deficit in regional areas (2.9%, 303 FTE GPs). This deficit is expected to widen over the forecast period, growing to 31.7% (7,535 FTE GPs) in urban areas and 12.7% (1,763 FTE GPs) in regional areas. Note that these results are the "base case" scenario, and have been conducted in the absence of the SRHS supply-side scenarios.

Over 2019-2030, growth in supply is constrained by a reduction in the average clinical hours supplied per GP per week from 34.1 hours in 2019 to 33.6 in 2030. While the number of GPs is forecast to grow by 6.0%, the supply of clinical hours will only grow by 4.5%, i.e. each GP will be supplying fewer hours on average. This is primarily driven by an increase in the proportion of female GPs in the workforce, and also by the workforce becoming younger. All other things being equal, an average female GP supplies fewer clinical hours than a male GP, and older GPs supply more clinical hours than younger GPs. In addition, female GPs temporarily exit the workforce at a greater rate than male GPs due to maternity leave.

Retirements and deaths among the existing cohort of GPs will also slow the supply growth rate, as inflows of new registrars are insufficient to offset these leakages. Recent evidence shows that the number of new registrars have decreased by approximately 20% since 2016.

Growth in demand will be primarily driven by increases in population size, and demographic shifts to older age groups who consume a relatively larger proportion of services. Growth in urban areas will be faster than in regional areas, reflecting population shifts towards urban areas.

The results of this analysis have shown that, all other things being equal, there will be a shortfall of GPs in Australia in 2030 relative to 2019, with new supply inflows failing to keep pace with increasing demand. While the SRHS policies will result in a smaller deficit of supply in regional areas, the SRHS restrictions to the supply of OTDs in urban areas will exacerbate the urban supply deficit. Additional action is needed to increase the supply of GPs, particularly in urban areas.

1 Introduction

General practitioners (GPs) are typically the first point of call for primary health care in Australia, and provided almost 150 million Medicare services to Australians in 2016-17 – more than five services per person per year (on average), with 84% of the population seeing a GP at least once each year.[3,4] Ensuring an adequate supply of GPs in Australia to meet demand is thus a crucial outcome for health workforce planning.

This report forecasts the supply and demand of GPs in Australia over the period 2019-2030 to assist in delivering a sustainable GP workforce into the future. The modelling methodology – outlined in Chapter 2 (supply-side) and Chapter 3 (demand-side) considers the future supply and demand separately for each jurisdiction, and for urban/regional areas within each jurisdiction using the Greater Capital City Statistical Area (GCCSA) classification.

This report is structured as followed:

- Chapter 1 provides an overview of GPs, and the policy context for the analysis.
- Chapter 2 outlines the main drivers influencing the supply of GPs, and explains the methodology used in the supply-side analysis.
- Chapter 3 discusses the main drivers affecting demand for GPs, and presents the methodology used in the demand-side analysis.
- Chapter 4 presents the results from the modelling, including scenario analysis.
- The Appendices provide detailed model inputs and outputs.

This report uses the GCCSA classification to describe areas of Australia. This classification represents the socioeconomic extent of each of the eight capital cities. The terminology used in this report to describe locations using the GCCSA classification – "urban" and "regional" – should not be confused with the "major cities" area used in the Australian Statistical Geography Standard – Remoteness Area (ASGS-RA) classification. While the urban GCCSA locations are often aligned with the ASGS-RA major city locations, some inner regional and outer regional locations are also captured within the GCCSA urban areas.

1.1 What is a general practitioner?

GPs are medical practitioners who perform a key role in primary and preventative health care, and are often the first medical professional a person sees for healthcare in Australia. GPs deliver healthcare, advice and education to their patients, and may also refer patients to other types of medical specialists.[5]

Modelling the GP workforce is a complex exercise, as not all GP services are delivered by specialist GPs in Australia, with a significant numbers of doctors working in general practice without a specialist qualification, or not currently in a training program. In Australia, GPs can include:[6]

- Fellows of the Royal Australian College of General Practitioners (RACGP) or Australian College of Rural and Remote Medicine (ACRRM).
- Registrars who have enrolled in a formal training pathway to GP Fellowship through the RACGP or ACRRM.
- Overseas trained doctors (OTDs), who can perform a number of different roles depending on their prior experience and training.

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[3] Australian Bureau of Statistics, *Patient Experiences in Australia: Summary of Findings, 2017-18,* Cat. No. 4839.0 (2018).
[4] The Royal Australian College of General Practitioners, *General Practice: Health of the nation 2018* (2018) <https://www.racgp.org.au/FSDEDEV/media/documents/Special%20events/Health-of-the-Nation-2018-Report.pdf>.
[5] Health Workforce Australia, *Health Workforce 2025 – Volume 3 – Medical Specialties* (November 2012).
[6] Health Workforce Australia, *Health Workforce 2025 – Volume 3 – Medical Specialties* (November 2012).

- Non-vocationally registered/non-specialist doctors working in general practice who are not training to be fellows of the RACGP or ACRRM.
- Doctors working in approved placements under section 3GA of the *Health Insurance Act 1973*. There are currently ten approved 3GA training or workforce programs available to doctors to provide services covered by Medicare, for example the More Doctors for Rural Australia Program.[7]
- Salaried medical practitioners providing general practice services, for example District Medical Officers.

The scope of this report is limited to modelling the supply and demand of vocationally registered GPs who provide services through the MBS, which includes specialists, registrars and OTDs who are either fellows of the RACGP and/or ACCRM, or who are in training to become fellows of the RACGP and/or ACCRM. As such, caution should be taken in comparing outputs from this report with other reports which have modelled the supply and demand of GPs, as the scope of GPs may differ.

1.2 The Australian GP workforce policy landscape

The most recent Australian Government forecasts for the supply and demand of GPs in Australia were published by Health Workforce Australia (HWA) in 2012. In the base case scenario, the report forecast a shortage of GPs (demand exceeding supply) in 2012 and 2018, with the position reversing by 2025 with a (small) surplus of supply. The two areas of significant concern highlighted in the report were the GP workforce's reliance on OTDs, and the unequal distribution of GPs across Australia. At the time this report was published, other indicators of supply were not considered to be of significant concern.[8] However, indicators such as GP waiting times, closed books, bulk-billing rates or un(der)employment rates can be useful to triangulate supply and demand balance or imbalance.

The Australian Government's 2018 *Stronger Rural Health Strategy* (SRHS) addresses some of the concerns raised in the HWA analysis. The SRHS has the objective of building a sustainable, high quality health workforce that is distributed across the country according to community need, particularly in rural and remote communities.[9] There are a number of incentives, targeted funding and bonding arrangements included as part of the SRHS. These include:

- Improved access to Australian Trained GPs – this initiative introduces a new Medicare Benefits Schedule (MBS) fee structure and identifies non-vocationally registered doctors as a distinct group for MBS GP item claiming purposes.
- Improved workforce planning tool – the Health Demand and Supply Utilisation Patterns Planning tool will provide a single source of data for workforce planners at the local, jurisdictional and national levels to inform decisions on where services and workforce are needed.
- Junior doctor training – this program creates two new streams to support training in rural primary care and in private hospitals: the Rural Primary Care Stream provides funding for educational support for junior doctors working and training in rural primary care settings; and the Private Hospital Stream provides salary support for junior doctors working in private hospitals. The two streams are intended to increase access to training in rural areas and the private system.
- OTDs in areas of doctor shortage – this program will regulate the number and locations of OTDs seeking to work in Australia.

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[7] Department of Health, *Medicare Billing Restrictions – Section 19AA* (2019) <https://www.health.gov.au/health-workforce/medicare-billing-restrictions/section-19aa>.
[8] While the average age was expected to increase, the replacement rate of new vocationally registered GPs was sufficient to cover the expected outflows from the workforce at the time. The four-year duration of training for GPs was assessed to be of minimal concern, given that the duration of training for other medical specialities is usually carried out over five to six years.
[9] Department of Health, *Stronger Rural health Strategy: factsheets* (2018) <https://www1.health.gov.au/internet/main/publishing.nsf/Content/stronger-rural-health-strategy-factsheets>.

- Rural bulk-billing incentives – under this initiative, metropolitan areas will no longer have access to incentives intended for rural and remote areas.
- Streamlining General Practice training – this initiative will implement new arrangements to simplify existing GP training and qualification pathways, and support non-vocationally registered doctors to attain specialist GP status. The nine current pathways to specialist GP status will be rationalised into two, which will be delivered through the RACGP and ACCRM.
- The Murray-Darling Medical Schools Network – this program establishes five rurally based university medical school programs in the Murray-Darling region of New South Wales and Victoria. The purpose of this program is to encourage medical students to stay in their communities while studying and training to become a doctor, which increases the likelihood that these doctors will continue to live and work in rural areas after their training.
- Workforce Incentive Program (WIP) – this will provide targeted financial incentives to encourage doctors to deliver eligible primary health care services in regional, rural or remote areas that have difficulty attracting and retaining doctors.[10]

As of 1 July 2019, the Department of Health implemented a new health workforce classification for GPs, known as Distribution Priority Areas (DPAs), which replaces the Districts of Workforce Shortage (which are still used for all other non-GP specialists). Instead of solely relying on a GP-to-population ratio, the DPA classification also considers gender, age demographics, and the socioeconomic indexes for areas (SEIFA) score in each GP catchment area. The DPA applies some blanket rules: inner metropolitan areas are automatically deemed non-DPA; areas classified as level 5-7 under the Modified Monash Model[11] are automatically deemed DPA; and the Northern Territory is automatically deemed DPA.

The *Health Insurance Act 1973* requires that OTD GPs must work in a DPA for a minimum of ten years in order to access Medicare benefits. However, there are a number of exclusions which allow some OTD GPs to reduce the amount of time spent working in a DPA. Limitations in the available data mean that it was not possible to model supply and demand for GPs at the DPA level. As discussed at the start of this chapter, the model analyses supply and demand for GPs in urban and regional locations using the GCCSA. It is important to note that DPAs are not limited to regional locations, with some DPAs being in capital cities.

[10] Department of Health, *Stronger Rural health Strategy: factsheets* (2018) <https://www1.health.gov.au/internet/main/publishing.nsf/Content/stronger-rural-health-strategy-factsheets>.
[11] The Modified Monash Model is a geographical classification system that uses population and geographical data to categorise metropolitan, regional, rural and remote areas according to both geographical remoteness and town size.

2 Supply of general practitioners

This chapter discusses the supply of GPs in Australia, and sets out the modelling approach utilised for estimating the number of GPs in Australia over 2019 to 2030.

There are a number of key factors which effect the supply of GPs in Australia. These include inflows of OTDs, the determinants of urban/rural locations for where GPs provide their services, the flow of new registrars, the impact of salaries on labour supply, and demographic movements in the workforce.

OTDs. Historically, Australian Government policy has targeted OTDs to address supply shortages in the GP workforce, particularly in rural communities. This policy has been successful in meeting its aims.[12] However, over the past two decades, OTDs have comprised the majority of rural GPs entering the workforce in both large regional and smaller rural and remote areas, and have provided a significant proportion of Medicare-funded services in these areas.[13]

Workforce distribution in rural and remote areas. Access to medical services in rural and remote areas is typically lower than in urban areas, and this is consistent in the GP market. While OTDs have historically been used to meet this shortfall, there are a number of reasons why the supply of Australian trained doctors (ATDs) in rural areas has been insufficient.

Shortages of GPs in rural and remote areas of Australia became increasingly noticeable in the 1990s, as a consequence of government policy in the 1980s to cap the number of university places provided for medical students. The consensus at the time was that rather than national shortages in the GP workforce, there was a maldistribution of GPs in rural and remote areas, in contrast to urban areas.[14] As evidence emerged in the early 1990s that a rural background and a positive rural training experience promoted the subsequent uptake of rural practice by trainees, the Australian Government introduce several initiatives for recruiting and training medical students in rural areas.[15] It was recently reported that the rural and remote GP workforce increased by 23% between 2010 and 2014, compared with a 4% increase in the rural and remote community population, and a 10% increase in the metropolitan GP workforce over the same period.[16] It is important to note that much of this increase is attributable to inflows of OTDs.

The *Medicine in Australia: Balancing Employment and Life* longitudinal survey of doctors has identified several factors that impact on the likelihood of a GP working in a rural location. GPs who spend at least six years of their childhood in a rural location are more than twice as likely as metropolitan-origin doctors to work in rural areas. The research has also demonstrated that vocational training for general practice in rural areas is associated with GPs continuing to work rurally for at least five years after vocational registration, with the effect being stronger for doctors

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[12] Department of Health, *International recruitment support and regulation* (2013) <https://www1.health.gov.au/internet/publications/publishing.nsf/Content/work-review-australian-government-health-workforce-programs-toc~chapter-6-managing-supply-health-workers-meet-community-needs~chapter-6-international-recruitment-support-regulation#footnote>.
[13] O'Sullivan, B, Russell, DJ, McGrail, MR and Scott, A, 'Reviewing reliance on overseas-trained doctors in rural Australia and planning for self-sufficiency: applying 10 years' MABEL evidence' (2019) 17(1) *Human resources for health* 8.
[14] Jolly R, *Medical practitioners: education and training in Australia* (15 July 2009) Parliament of Australia <https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BN/~/link.aspx?_id=4FB58821DB2B49F58743E7802D1C4ED3&_z=z>.
[15] Ranmuthugala, G, 'Rural recruitment and training promotes rural practice by GPs, but is it enough to retain them?' (2016) 205 *Medical Journal of Australia* 210.
[16] Rural Health Workforce Australia. Regional, rural and remote GP workforce trends: developing evidence-based health workforce policy (2014) <http://www.rhwa.org.au/client_images/1743949.pdf>.

with a childhood rural-origin.[17] GPs involved in hospital or procedural work are also likely to stay in rural practice for longer.[18]

Inflows of registrars. New GP registrars represent a key segment workforce, with approximately 1,039 ATDs and 409 OTDs commencing the first year of their training in 2019, out of a stock of 5,121 registrars. Historically, the number of medical school placements has been used as a policy lever to regulate the size of the GP workforce. However, recent evidence has shown that the number of GPs starting their registrar training has decreased by 20% since 2016, and there are vacant placements that are not taken up.[19] This may be due to wages for GPs failing to keep pace with wages in other medical specialties.

Over the past decade the income gap between GPs and specialists has continued to widen, reducing the financial attractiveness of general practice. In 2010, research identified that GPs earn about 32% less than specialists in Australia.[20] By 2015, specialists earned over twice the remuneration earned by GPs.[21] If potential income influences the career choices of those interested in medicine, then recruitment to general practice will be negatively affected.

Demographic changes in the GP workforce. There are a number of demographic changes taking part in the GP workforce, which include an increasing proportion of female GPs, GPs delaying retirement, and rural GPs ageing more quickly than urban GPs.

Between 2019 and 2030, the proportion of the GP workforce who are female is expected to increase from 46.3% in 2019 to 54.1% in 2030. The implications of this change – discussed further in Chapter 4 – are that the supply of clinical services by the workforce will decrease, all other things being equal. This change occurs as on average female GPs provide fewer clinical hours per person, and are more likely to take temporary absences from the workforce, for example for maternity leave.

A large proportion of GPs have continued to work beyond the traditional retirement age of 65 years, with the trend to later retirement known since at least 2005. This delay in GP retirement has been consistent with baby boomer trends in the general population.[22] However, recent literature suggests that many GPs are planning to retire earlier, reflecting an emerging trend among professionals and society generally, with reasons for earlier retirement including declining job satisfaction, excessive workload and increasing bureaucracy.[23]

2.1 Supply model methodology

This report defines the supply of GPs to be a function of the estimated opening stock of GPs in each period, plus relevant inflows and net of outflows. Analysis was undertaken for each five-year age cohort, gender, and location (urban and regional, for each jurisdiction).

For each age-gender-location cohort in the model, relevant inflows were modelled as:

- New domestic registrars of the RACGP and ACCRM.
- OTDs moving to Australia, comprising both registrars and new fellows.

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[17] O'Sullivan, B, Russell, DJ, McGrail, MR and Scott, A, 'Reviewing reliance on overseas-trained doctors in rural Australia and planning for self-sufficiency: applying 10 years' MABEL evidence' (2019) 17(1) *Human resources for health* 8.
[18] Russell, DJ, McGrail, MR, Humphreys, JS and Wakerman, J, 'What factors contribute most to the retention of general practitioners in rural and remote areas?' (2012) 18(4) *Australian Journal of Primary Health* 289.
[19] Australian Medical Association (2019), *Urgent action needed to ensure the future family doctor workforce* <https://ama.com.au/media/urgent-action-needed-ensure-future-family-doctor-workforce>.
[20] Cheng, TC, Scott A, Jeon S-H, Kalb G, Humphreys J and Joyce C, *What Factors Influence the Earnings of GPs and Medical Specialists in Australia? Evidence from the MABEL Survey* (2010) <https://melbourneinstitute.unimelb.edu.au/downloads/working_paper_series/wp2010n12.pdf>.
[21] Organisation for Economic Cooperation and Development, *Health at a Glance 2017*: *Chapter 8. Health Workforce: Remuneration of doctors (general practitioners and specialists),* OECD Indicators, OECD Publishing, Paris <http://www.oecd.org/health/health-systems/health-at-a-glance-19991312.htm>.
[22] Schofield, DJ and Beard, JR, 'Baby boomer doctors and nurses: demographic change and transitions to retirement' (2005) 183(2) Medical Journal of Australia 80.
[23] Brett, TD, Arnold-Reed, DE, Hince, DA, Wood, IK and Moorhead, RG, 'Retirement intentions of general practitioners aged 45–65 years' (2009) 191(2) *Medical Journal of Australia* 75.

- Net internal movements (NIM) from other Australian jurisdictions.

Relevant outflows were modelled as:

- Deaths
- Retirements
- Overseas departures (ODs)
- Registrars who fail to complete their specialist training
- Net temporary movements in the workforce – for example, females GPs going on maternity leave, and subsequently returning.

Thus, the supply model can be written as the following function:

$$S_{t+1} = S_t + OTD_t + NIM_t + Registrars_t - OD_t - Deaths_t - Ret_t - Temp_t - Registrar\ departure_t$$

where:

- S_{t+1} represents the closing stock of GPs in each period (t)
- S_t represents the opening stock of GPs in each period (t)
- OTD_t represents the inflow of OTDs in each period (t)
- NIM represents the NIM inflow within Australia in each period (t)
- Registrars represents the inflow of new registrars in each period (t)
- OD represents outflow of overseas departures in each period (t)
- Deaths represents the outflow of total deaths of GPs in each period (t)
- Ret represents the outflow of total retirements from the GP workforce in each period (t)
- Temp represents the outflow of net temporary movements from the GP workforce in each period (t)
- Registrar departure represents the outflow of registrars who fail to complete their specialist training in each period (t).

The **opening stock of GPs** was obtained from the National Health Workforce Dataset (NHWDS), stratified by state or territory, age, gender, and Statistical Area Level 3 (SA3). A concordance was then used to map from SA3 to GCCSA for each state and territory. The opening headcount was limited to GPs who are currently supplying clinical hours as a GP, meaning that the model excludes GPs who are working as administrators, teachers or educators, researchers, or in a hospital setting. Table A.1 provides the detailed model inputs for the opening headcount of GPs. The opening headcount in each period was defined as the closing headcount (Table A.2) from the previous period, aged by one year assuming a uniform distribution within five year age, gender, state/territory, and remoteness groups.

The NHWDS provided information on the number of GPs who were expected to **retire** in each period. The NHWDS contains information on how many more years GPs expect to be working for, stratified by gender, age, and state or territory. From this information, a probability of retirement was estimated for GPs in given state/territory, age and gender groups in each period. In the absence of sufficient data, it was conservatively assumed that the probability of retirement did not vary according to geographic remoteness area within states and territories. This probability was applied to the matched GP headcount in each period to estimate the number of retirements from the workforce. The transition to retirement was assumed to commence at 50 years of age, with the vast majority of people retired by the time they reach 80 years of age. Any GPs remaining in the modelled workforce were assumed to retire by the time they reached 85 years of age. Table A.3 provides the detailed model inputs for retirements from the GP workforce.

Data on **overseas departures, NIM** and **deaths** (Table A.4) were obtained from the Australian Bureau of Statistics (ABS) Series B population assumptions. These data were not specific to GPs, as this information is not collected for GPs. However, no evidence was identified to suggest that the general population and GPs would differ significantly on these variables.

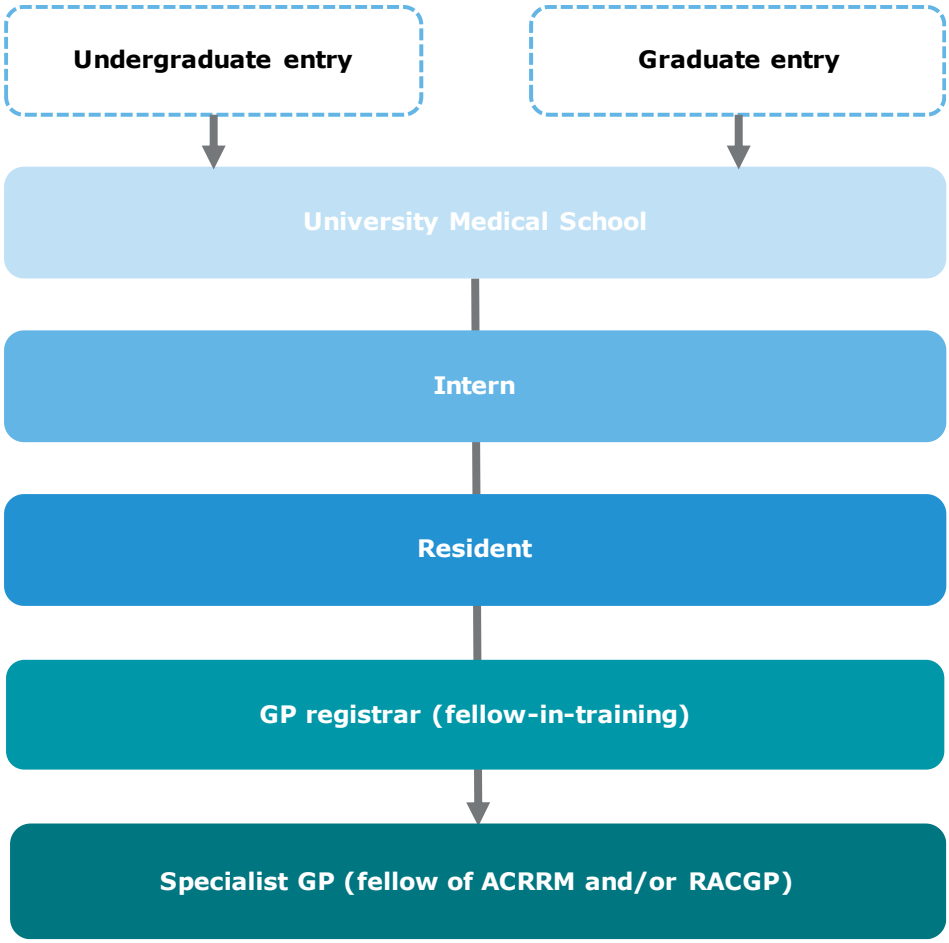
Net temporary movements from the workforce from the GP workforce were assumed to be equal to temporary departures from the GP workforce, net of subsequent re-entries to the workforce. Women were assumed to take time out of the workforce owing to pregnancy, childbirth, and childcare. In order to estimate the rate of temporary departures due to fertility, forecast

fertility rates were based on ABS (2017) Series B population assumptions. It was assumed that temporary departures lasted for approximately one year, and thereafter that 70%[24] of people taking temporary absences would return to the workforce.

The most complex inclusions in the supply function were the flow of **new fellows**, and the flow of **new registrars** in each period. As noted in Section 1.1, the scope of GPs in this report was limited to fellows and registrars. It is important to note that both of these types of GPs are comprised of both Australian GPs, and GPs who have trained overseas and who have migrated to Australia. As noted by HWA in their 2012 forecast of GP supply and demand in Australia, the Australian GP workforce is currently highly reliant on overseas flows of GPs in order to meet current levels of demand.

For ATDs, the path to becoming a registrar and then a fellow is shown in Figure 2.1.

Figure 2.1 GP pathway in Australia



Source: Deloitte Access Economics.

Candidates undertake a medical degree through one of the 21 university medical schools in Australia that are accredited by the Australian Medical Council. Following completion of an accredited medical degree, ATDs must apply for provisional registration so they can undertake a period of accredited intern training to become eligible for general registration. Interns are only able to work in accredited intern positions. Graduates in intern positions must satisfactorily complete compulsory terms in each of emergency medical care, medicine and surgery, plus a

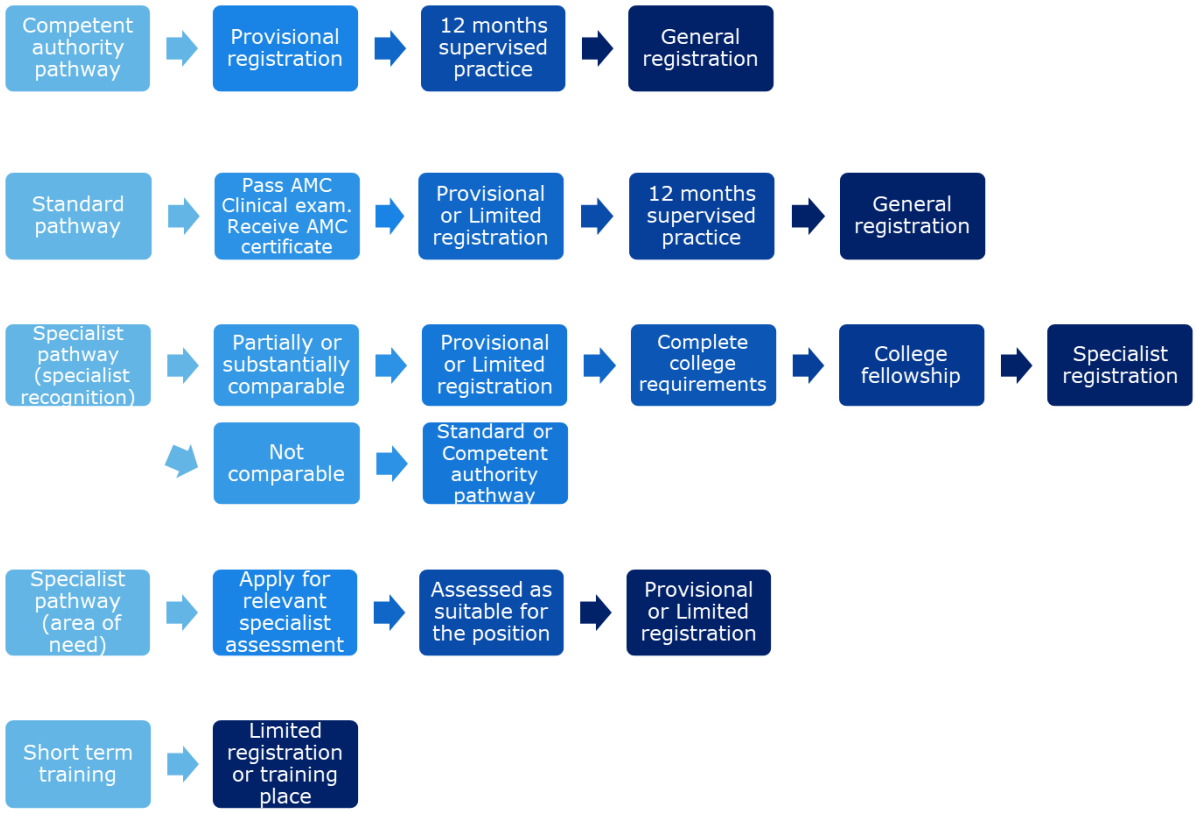
[24] GP-specific data on re-entry rates was not available. The 70% assumption is consistent with Deloitte Access Economics' standard approach to workforce modelling.

range of other approved terms.[25] Upon successful completion of an internship, general medical registration will be available through the Medical Board of Australia. Medical graduates typically continue to work in hospitals for 1-2 years prior to commencing as registrars in specialist pathways.[26]

The Australian General Practice Training (AGPT) Program is the standard training program for medical graduates wishing to pursue a career in general practice in Australia.[27] The AGPT program is three to four years of full-time training offered in urban, regional and rural locations nationally, delivered through regional training providers across Australia.[28] Successful completion of this program results in fellowship of the RACGP or the ACRRM.

OTDs who wish to work in Australia are assessed across five different pathways, as shown in Figure 2.2.

Figure 2.2 Assessment pathway for overseas doctors



Source: Adapted from Medical Board of Australia (2019).

The two main pathways for OTDs are the competent authority pathway, and the standard pathway. Applicants in these pathways have typically completed primary medical training in their country of origin, but have not completed specialist training. The competent authority pathway is for applicants from the United Kingdom, Canada, United States of America, New Zealand or Ireland. Candidates starting on this pathway are granted provisional registration, and after 12 months of supervised practice can apply for general registration.

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[25] Medical Board of Australia, *Australian and New Zealand medical graduates undertaking an accredited internship in Australia* (2018) <https://www.medicalboard.gov.au/registration/interns.aspx>.
[26] RACGP, *Journey towards general practice: via the RACGP vocational training pathway* (2019) <https://www.racgp.org.au/FSDEDEV/media/documents/Education/Registrars/Fellowship%20Pathways/FRACGP/Pathway-to-Fellowship.pdf>.
[27] Department of Health, *Australian General Practice Training* (2019) <http://www.agpt.com.au/>.
[28] Full details of the variations of GP specialist training programs can be found on the AGPT website. Department of Health, *Australian General Practice Training* (2019) <http://www.agpt.com.au/>.

The standard pathway is for applicants from all other countries. These candidates can apply for provisional registration (if they pass the clinical exam), or limited registration if they fail to pass the exam. Ultimately, this pathway leads to general registration once candidates have passed the clinical exam and completed 12 months of supervised practice.

OTDs who have completed specialist training in their country of origin can apply through:

- Specialist pathway for specialist recognition.
  - Candidates assessed as partially or substantially comparable receiving limited or provisional registration, and after meeting RACGP/ACCRM requirements are awarded their fellowship and can apply for specialist registration.
  - Candidates assessed as not comparable must take the competent authority pathway or standard pathway instead.
- Specialist pathway in an area of need. This pathway only provides provisional or limited registration, and does not automatically lead to specialist registration.
- Short-term training in a medical speciality. This is for OTDs who wish to undertake short-term training in Australia before returning to their country of origin.

Given the available data, for modelling purposes the following methods were used to estimate the flow of new registrars and fellows:

- The scope of GPs was limited to those who were vocationally registered, i.e. either on a fellowship pathway, or holding fellowships.
- Data for the flow of registrars, stratified by state or territory, gender, and ATD/OTD status was obtained for 2018 from NHWDS. The number of registrars was adjusted to 2019 by assuming growth in line with the increase in AGPT places from 2018 to 2019, and then stratified by age and geographic area based on proportions published in a representative registrar survey (Taylor et al., 2018).[29] Census population data were used to map from the ASGS-RA classification published by Taylor et al (2018) to GCCSA.
- After four years of training, it was assumed that 90% of GP registrars graduated their training and relocated to match the geographic distribution of GP fellows in 2019. The remaining 10% of GP registrars were conservatively assumed to exit the workforce. While there do not appear to be any publicly available data on the overall pass rate for GP registrar training programs, the estimated 10% dropout is not inconsistent with fellowship exam fail rates reported by RACGP.[30] In ageing the registrar workforce four years, it was assumed that registrars within five-year age groups followed a uniform distribution.
- For overseas trained fellows, data were obtained from the NHWDS on the flow of new overseas trained specialists in each year. Inputs were stratified by state or territory and gender, and it was assumed that the age and geographic distribution within state/territory matched that of the OTD workforce (Taylor et al., 2018). Census population data were used to map from ASGS-RA geographic classification published by Taylor et al (2018) to GCCSA.
- All OTDs are required to be on one of the pathways to practise medicine in Australia. As their first job, all OTDs must work in a DPA for a minimum period of ten years, noting that there are a number of exceptions to this requirement.[31] However, no data were identified which would enable OTDs to be allocated to a DPA. As such, locations of practice for OTD registrars and new fellows were allocated to GCCSA based on Census data.

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[29] Taylor, R, Clarke, L., and Edwards, D, *Australian General Practice Training Program: National Report on the 2018 National Registrar Satisfaction Survey* (2018) Australian Council for Educational Research. <http://www.agpt.com.au/GP-registrars/National-Registrar-Survey>.
[30] RACGP, *Exam Report 2019.1 OSCE* (2019) <https://www.racgp.org.au/getmedia/27284552-fb89-41bc-a722-0d46fda0afd3/OSCE-20191-Public-exam-report.pdf.aspx>; RACGP, *Exam Report 2019.1 AKT* (2019) <https://www.racgp.org.au/FSDEDEV/media/documents/Education/Registrars/Fellowship%20Pathways/Exams/AKT-20191-Public-exam-report.pdf>; RACGP, *Exam Report 2019.1 KFP* (2019) <https://www.racgp.org.au/FSDEDEV/media/documents/Education/Registrars/Fellowship%20Pathways/Exams/KFP-20191-Public-exam-report.pdf>
[31] Department of Health, *Medicare Billing Restrictions – Section 19AB* (2019) <https://www.health.gov.au/health-workforce/medicare-billing-restrictions/section-19ab>.

The annual intake of new registrars and OTDs between 2019 and 2030 are shown in Table A.5 and Table A.6, respectively.

2.2 Hours provided and FTEs

A weighted average number of clinical hours provided per week was estimated from NHWDS data for each age, gender, state/territory and remoteness level cohort. These detailed model inputs are summarised in Table A.8. The average number of clinical hours in each cohort was assumed to remain the same over 2019-2030. However, it is important to note that the shifting demographics – age, gender, state/territory and remoteness workforce structure – mean that the weighted average clinical hours per headcount change in each year.

As not every clinical GP works full-time, the headcount of GPs was converted to "full-time equivalent" (FTE) to better measure the volume of services supplied. For example, two part-time GPs might supply the same number of services as one FTE GP. From NHWDS, the average FTE GP was estimated to provide 36.5 clinical hours per week in 2017 and beyond (the latest period for which data were available). Assuming the average FTE GP works the equivalent of 46 weeks a year (after holidays, sick leave and other forms of leave), the estimated 36.5 clinical hours provided by the average FTE GP translates to 1,681 clinical hours per year. The number of clinical FTE GPs was then solved as the total number of clinical hours supplied by all clinical GPs in a given year, divided by 1,681 clinical hours per year.

2.3 Supply-side scenarios

The model incorporates baseline analysis, as well as two supply-side scenarios to reflect two elements of the SRHS policy (see discussion in Section 1.2). The first scenario – representing the *OTDs in areas of doctor shortage* policy – regulated the number of OTDs working in Australia by reducing flows of OTDs by up to 200 places, in each of the four years between 2019 and 2022. This scenario was based on the assumption that migrant flows would follow the same gender, age, state or territory, and remoteness group distribution as under the base case, and that groups could not have a negative inflow of migrants in any given period. The second scenario – representing the *Streamlining general practice training* policy – added an additional 100 registrars in regional areas in each year over 2021-2030. The results of these two scenarios are presented in Chapter 4.

2.4 Summary of supply modelling

Table 2.1 presents the closing (end of year) headcount of GPs and the clinical FTEs supplied, between 2019 and 2030 for urban and regional locations. Overall, closing headcount is estimated to increase by 6.0% over this period, compared to an increase in clinical FTE of only 4.5%, which is consistent with workforce feminisation and changes in age structure. Please see Appendix A for a detailed summary of supply-side results.

Table 2.1 Closing headcount and clinical FTEs supplied, 2019 to 2030

	2019	2023	2027	2030
Headcount ('000)				
Urban	18,476	17,290	17,450	18,104
Regional	10,634	10,939	11,852	12,757
Total	**29,110**	**28,229**	**29,303**	**30,861**
Growth rate from 2019		**-3.0%**	**0.7%**	**6.0%**
Clinical FTE ('000)				
Urban	16,948	15,649	15,691	16,246
Regional	10,217	10,415	11,271	12,141
Total	**27,165**	**26,063**	**26,962**	**28,387**
Growth rate from 2019		**-4.1%**	**-0.7%**	**4.5%**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

3 Demand for general practitioners

This chapter discusses the demand for GPs in Australia, and sets out the modelling approach utilised for estimating the number of GPs in Australia over 2019 to 2030.

Over the past two decades the number of services claimed per person has steadily increased for GP services, with per capita utilisation in 2016-17 approximately 11.5% higher than in 2001. In Australia, the demand for GP services are predominantly affected by the size of the population, income growth, and the prevalence of health conditions.

Population growth. Australia has one of the fastest growing populations of any developed country in the world.[32] The key factors impacting population size are fertility, net immigration, and mortality rates. By developed country standards, Australia has a relatively high fertility rate, around 1.7 babies per woman.[33] In addition, Australia has one of the highest rates of immigration in the world. United Nations' statistics show that on average between 2010 and 2015, net migration contributed 8 people per 1,000 residents per year. This is more than four times higher than the average for developed regions.[34]

Australia, like most high-income countries, has a large and growing elderly population with almost 15% of the population aged 65 years and over.[35] Life expectancy in Australia is among the highest in the world, with the average life expectancy increasing from 71.3 years to 80.5 years for males, and 78.3 years to 84.5 years for females, from 1980 to 2016.[36] Literature has shown that a person aged over 65 makes over 10 visits to a GP annually, more than double the rate of under-65 individuals.[37]

Increasing incomes. Health economics literature has demonstrated that per capita incomes are a key determinant of health care expenditure, with a positive relationship shown to exist between per capita income and per capita health care expenditure. Healthcare expenditure (including on GP services) tends to increase more than proportionately as incomes rises. The long-run elasticities of per capita real health care expenditure with respect to per capita real gross domestic product (GDP) have been found to be in the range of 1.207–1.252, implying that health care is a luxury good in Australia.[38]

Increase in chronic disease. The growing prevalence of chronic health conditions, coupled with improved treatment which reduces mortality from these conditions, increases demand for GP services in Australia. The most common chronic conditions in Australia are cardiovascular disease, cancer, chronic respiratory conditions, chronic musculoskeletal conditions, diabetes, and mental health conditions.[39] Just under half of Australians (47.3%) had one or more chronic conditions in

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[32] OECD (2016), OECD Factbook 2015-2016: Economic, Environmental and Social Statistics, OECD Publishing, Paris, https://doi.org/10.1787/factbook-2015-en.
[33] Australian Bureau of Statistics, *Births, Australia, 2017*, Cat. No. 3301.0 (11 December 2018).
[34] United Nations, '*World Population Prospects 2017*' (2017) <https://population.un.org/wpp/Download/Standard/Migration/>.
[35] Australian Institute for Health and Welfare, *Older Australia at a glance* (10 September 2018) <https://www.aihw.gov.au/reports/older-people/older-australia-at-a-glance/contents/demographics-of-older-australians>.
[36] Lopez, AD and Adair, T, 'Slower increase in life expectancy in Australia than in other high income countries: the contributions of age and cause of death.' (2019) 210(9) *Medical journal of Australia* 403.
[37] Family Medicine Research Center, *Care of older people in Australian general practice.* University of Sydney (2015) <http://sydney.edu.au/medicine/fmrc/publications/BEACH-feature-2015.pdf>.
[38] Ang, JB, 'The determinants of health care expenditure in Australia' (2010) 17(7) Applied Economics Letters 639.
[39] Australian Institute of Health and Welfare, *Australia's Health 2018*, Cat. No. AUS 221 (20 June 2018).

2017-18, an increase from 2007-08 when two-fifths (42.2%) of people had one or more chronic conditions.[40] In 2015-16, an estimated 40% of GP encounters involved management of at least one chronic health problem.[41]

Increase in mental health conditions. A recent survey of GPs reported that 62% disclosed mental health as the most common reason for patients visiting their GP, and the health issue that causes GPs most concern for the future.[42] The most recent ABS National Health Survey estimated there were 4.8 million Australians with a mental or behavioural condition in 2017–18, an increase from 4.0 million Australians in 2014-15.[43] According to the final *Bettering the Evaluation and Care of Health (BEACH)* data collection survey, around 12% of all GP encounters were mental health-related in 2015–16, an increase from 11% in 2007–08.[44] This translates to almost 18.0 million mental health-related estimated GP encounters, or approximately 0.8 encounters per person.[45]

3.1 Demand model methodology

Demand is extremely difficult to observe, but can at least be partly inferred from:

- Indicators of factors driving demand, such as changes in population growth and age structure, and income growth.
- Indicators of excess demand, such as waiting lists for patients.

The preferred measure of demand in this report is based on utilisation of services. Utilisation is closely aligned with demand, but not equivalent to demand. Utilisation rates are observable, as through Medicare statistics, but are driven by both the demand for and supply of services.

For this analysis, demand for GP services was calculated using Medicare Australia GP services and similar services funded by the Department of Veterans' Affairs (DVA). Data were stratified by calendar year, gender and age group of patient in receipt of service provision. Data were then split to urban and regional areas, based on Medicare item service data published by the Department of Health at the SA3 classification level.

The next stage of analysis involved converting historical services data to a measure of service utilisation, stratified by state/territory, gender, age, and remoteness level. To perform this conversion, services were divided by their matched population. Service utilisation rates per capita were then forecast for the 2019 to 2030 period of analysis using a variety of methods, and then multiplied out by matched population forecasts and average minutes per service to obtain an estimate of the total number of clinical GP hours demanded in Australia.

3.2 Population and demographic projections

Changes in the size and structure of the population are some of the main drivers of demand for GP services in Australia. The model relied on ABS (2018) population projections, which are based on observed trends in mortality, fertility, net overseas migration and interstate migration.[46] The Series B population projections from the ABS projections were used to model the demand for GPs in Australia.

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[40] Australian Bureau of Statistics, *National Health Survey: First Results, 2017-18,* Cat. No. 4364.0.55.001 (12 December 2018).
[41] Britt H, Miller GC, Henderson J, Bayram C, Harrison C, Valenti L, Pan Y, Charles J, Pollack AJ, Wong C, Gordon J. General practice activity in Australia 2015–16. General practice series no. 40. Sydney University Press, 2016. <purl.library.usyd.edu.au/sup/9781743325131>.
[42] RACGP health of the nation 2018 report
[43] Australian Bureau of Statistics, *National Health Survey: First Results, 2017-18,* Cat. No. 4364.0.55.001 (12 December 2018).
[44] Britt H, Miller GC, Henderson J, Bayram C, Harrison C, Valenti L, Pan Y, Charles J, Pollack AJ, Wong C, Gordon J. General practice activity in Australia 2015–16. General practice series no. 40. Sydney University Press, 2016. <purl.library.usyd.edu.au/sup/9781743325131>.
[45] Australian Institute of Health and Welfare, *Mental health services in Australia* (16 July 2019) <https://www.aihw.gov.au/reports/mental-health-services/mental-health-services-in-australia/report-contents/general-practice>.
[46] Australian Bureau of Statistics, *Population Projections, Australia, 2017 (base) – 2066*, Cat. No. 3220.0 (22 November 2018).

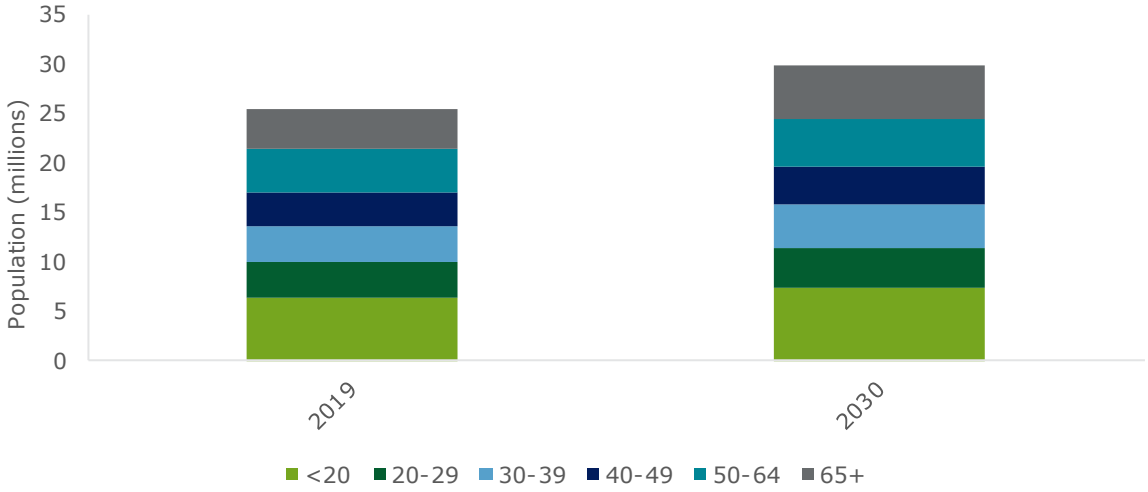
Population projections were stratified by the following factors:

- State or territory and further classified using GCCSA as:
  - Urban, if the region represented the capital city.
  - Regional, if the region represented the balance of state or territory.
- Five year age group, with 85 years or greater being the oldest age group modelled.
- Gender, male or female[47].

Demographic data were collated for calendar years with the GCCSA categories mapped to each state and territory in Australia. Each state and territory has an urban and regional area, with the only exception being the Australian Capital Territory, which is defined completely as an urban area of Australia.

As shown in Chart 3.1, the Australian population is forecast to grow from 25.4 million people in 2019 to 29.9 million in 2030 (a total increase of 17.6%). The group aged 65 years or older is expected to grow from 15.8% of the Australian population in 2019 to 18.1% in 2030.

Chart 3.1 Australian population by age group, 2019 to 2030



Source: Deloitte Access Economics analysis based on ABS (2019, 2018).

Over 2019 to 2030, the population is expected to become slightly more urbanised. The urban population is forecast to increase from 67.8% of the population in 2019 to 69.9% of the population in 2030.

3.3 Service utilisation

The utilisation rate for each Medicare item was calculated using the total number of services between 2000-01 and 2018-19 as supplied by Medicare statistics (Department of Human Services, 2019).[48] Medicare item data could only be extracted for each state/territory, age and gender group and not by GCCSA. GP items were limited to the Broad Type of Service provided by vocationally registered GPs, to align with the scope of GPs in the supply model.[49] Service utilisation analysis and projection was done separately for Item 23 (representing almost 80% of GP services), and all other items.

[47] No other gender category was included in the dataset.
[48] Department of Human Services, *Medicare Australia Statistics: Medicare item reports* (2019) <http://medicarestatistics.humanservices.gov.au/statistics/mbs_item.jsp>.
[49] These items were 3, 4, 23, 24, 36, 37, 44, 47, 193, 195, 197, 199, 585, 594, 599, 2497, 2501, 2503, 2504, 2506, 2507, 2509, 2517, 2518, 2521, 2522, 2525, 2526, 2546, 2547, 2552, 2553, 2558, 2559, 5000, 5003, 5010, 5020, 5023, 5028, 5040, 5043, 5049, 5060, 5063, 5067, 90020, 90035, 90043, 90051.

However, the Department of Health (2019) also publishes data on the number of services by item for the SA3 classification.[50] These were mapped from SA3 to GCCSA to stratify MBS services by state/territory, region (urban/regional), age and gender for each year between 2000-01 and 2018-19. Once the data were disaggregated, the number of services for each group was then divided by the corresponding population group for each region, age and gender stratification to determine the service utilisation rates per capita.

Services provided to individuals who qualify for a benefit under the DVA National Treatment Account are not included in Medicare data. As such, it was necessary to include these unreported services. To factor up demand for services provided to veterans, utilisation rates were calculated for the general population. These rates were then applied to the matched veteran population for each year between 2019 and 2030 – assuming that veterans access GP services at the same rate as the matched general population.

Where sparse data were provided by DVA, relevant ratios for each stratification were applied to the total forecasted number of veterans to stratify the veteran population by state/territory, region, age and gender. Stratifications for state/territory, age and gender were informed based on DVA (2019a), while stratification to GCCSA was based on DVA (2019b) assuming the urban/rural distribution was held constant from 2019.[51,52]

The number of services provided to veterans was then added to the total hours of care required by GPs in Australia. Overall, factoring up services for DVA veteran use resulted in a minor increase of 1.7 million services to total services demanded in 2019. Services to DVA veterans accounted for 1.3% of total GP services in 2019.

Overall, there were 90.8 million GP services reimbursed through MBS in 2001, which grew to 138.1 million by 2019 – an increase of 52.0%.[53] While most of this growth is attributable to underlying population growth, MBS service utilisation per capita grew by 15.2% over this period (from 4,713 services per 1,000 population in 2001 to 5,427 services per 1,000 population in 2019).

Table B.1 provides a detailed summary of MBS services demanded from 2001 to 2019 for each state/territory, age, gender, region, and item group.

3.4 Service utilisation projection methods

Historical service utilisation rates per capita were estimated between 2001 and 2019, based on MBS services data and Australian population data. The service utilisation rates were subsequently used to project trends in the need for service between 2020 and 2030 using a number of different forecast methods. The forecast methods included:

- Service utilisation growth was based on changes in real GDP per capita and income elasticity.
- Growth in service utilisation was based on the arithmetic average annual growth between 2001 and 2019.
- Growth in service utilisation was based on the geometric average annual growth between 2001 and 2019.
- The trend from a simple linear regression of service utilisation between 2001 and 2019 was applied to the utilisation rate in 2019.

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[50] Department of Health, *MBS data by ABS SA3* (2019) <https://www1.health.gov.au/internet/main/publishing.nsf/Content/MBS_Data_by_ABS_SA3>.
[51] Department of Veterans' Affairs (DVA), *DVA Treatment Population Statistics – Quarterly Report.* December 2018 (2019a). <https://www.dva.gov.au/about-dva/statistics-about-veteran-population>. Department of Veterans' Affairs
[52] Department of Veterans' Affairs (DVA), *DVA Veteran Profile by LGA* (2019b) <https://www.dva.gov.au/about-dva/statistics-about-veteran-population>.
[53] The model used Department of Health, *Appendix 2: Mapping of Medicare items to Broad Type of Service* for un-referred attendances by a vocationally registered GP (2019) <http://medicarestatistics.humanservices.gov.au/statistics/do.jsp?_PROGRAM=/statistics/std_btos_map&start_dt=0&end_dt=0>. This is a wider range of items than are used in the *Annual Medicare Statistics* for non-referred attendances by a GP/vocationally registered GP.

- Holding service utilisation rates constant from 2019 estimates.

Table B.2 provides a detailed summary of the forecast utilisation rates under each projection method.

Income growth
Income growth is an important driver of health care utilisation. The income elasticity of demand measures the responsiveness of demand for services to change in the income of people demanding the services, when all other factors are held constant. Based on desktop research, an estimated income elasticity of 1.23 relative to change in real GDP was used.[54]

It was assumed that over the period from 2019 to 2030, average incomes would continue to rise at their historical average rate. Data published by the ABS (2019) on real GDP per capita indicated that the average increase over 2001 to 2019 was 1.9% per annum.[55] Applying this rate to income elasticity of demand yielded an estimated annual increase in service utilisation rates of 2.6% per annum.

Average arithmetic annual growth
A common projection method is to assume that the future will look largely like the past. In doing so, the relevant trends and relationships are exogenous to the forecast approach. The average arithmetic annual growth was calculated as the average annualised rate of the difference in service utilisation from 2000-01 to 2018-19. At a national level, this yielded an average annual growth rate of approximately -0.4% per annum.

Average geometric annual growth
Similarly to the average arithmetic annual growth method, growing service utilisation rates per capita by a geometric average of historical growth rates assumes that the future will look largely like the past. However, a geometric average accounts for annual compounding and thus provides a more accurate or smoothed measure of the underlying change in service utilisation rates per capita from 2000-01 to 2018-19. At a national level, this yielded an estimated annual growth rate of approximately 1.4%.

Linear regression
A linear regression model was used to estimate the average change (slope) in service utilisation rates for each grouping over time. The model was a simple time series where service utilisation was the dependent variable and year was set as the only independent variable. The simple linear regression has advantages in its simplicity and ease of use when applying the results to many different subgroups. Using a linear regression to forecast service utilisation rates, an annualised growth rate was estimated at 6.5% per annum.

Constant service utilisation rates
The final forecasting scenario used examined the impact of population changes as the driving force behind increased service volumes. Specifically, service utilisation rates per capita were held constant. This means that growth in services comes primarily through an increase in the size of the population, and secondarily through the changing age structure of the population – with older age groups experiencing higher rates of per capita service utilisation. For the population younger than 65 years of age, an average 6,174 services were demanded in 2019 per 1,000 population – this compares to 14,101 services in the 65+ age group. At a national level, using this scenario yielded an average annual increase of 0.2% per annum.

Summary of methods
The forecast methods were compared using out-of-sample forecasting techniques between 2001 and 2019, so that it was possible to compare the accuracy of the forecasts generated using each method against the actual historical values.

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[54] Ang, JB, 'The determinants of health care expenditure in Australia' (2010) 17(7) Applied Economics Letters 639.
[55] Australian Bureau of Statistics, *Australian National Accounts: National Income, Expenditure and Product, March 2019*, Cat. No: 5206.0 (5 June 2019).

Given that there were 19 periods of historical data, the sample was split into a training sample that consisted of the years between 2001 and 2016. Each method was then used to forecast service utilisation per capita for 2017 to 2019 (three years), and the resulting forecasts were compared to the actual rates for 2017 to 2019.

The difference between the estimated values and the actual observations is referred to as mean square error. Forecast methods with lower mean square error indicate a better model fit. The mean square error for each method for the period from 2017 to 2019 is summarised in Table 3.1.

Table 3.1 Forecast performance by method

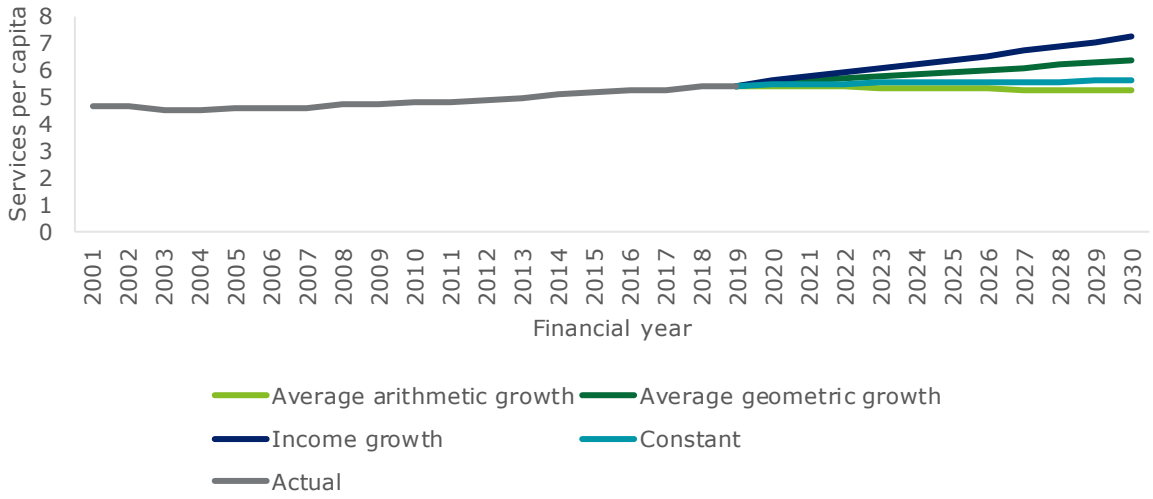
Forecast method	Mean square error
Average geometric annual growth	0.0068
Average arithmetic annual growth	0.0802
Linear regression	0.1970
Income growth	0.0276
Constant service utilisation	0.0337

Source: Deloitte Access Economics analysis.

Based on this analysis, an average geometric annualised growth rate was determined to offer the best model fitness – reflected in the lowest mean square error (0.0068).

Chart 3.2 provides a summary of services demanded per million population for each forecast method for Australia. The linear regression scenario is excluded from this graph, since the forecasted values were considered to be an outlier (exceeding 8 services per capita by 2030). The highest estimate of services demanded was provided by the linear regression, while the lowest estimate was obtained using average arithmetic growth.

Chart 3.2 Services demanded per million population – summary of projection methods



Source: Deloitte Access Economics analysis.

For the purposes of the summary, the base case results are presented using the average geometric growth trend given that it most closely approximated the historical changes, yielded the best fitness as measured by mean square error, and because it was in the middle of the range of services demanded in 2030.

Projected total services between 2019 and 2030, which include both MBS services and also those reimbursed by DVA, are summarised in Table B.3. The addition of DVA services increases the

overall number of services delivered, and changes the overall service utilisation rates when aggregated. This reflects the demographic structure of the DVA treatment population, which is slightly different from the profile of the general population accessing MBS service items. A summary of projected service utilisation rates per million population is provided in Table B.2.

3.5 Average minutes per service

As discussed at the start of this chapter, it is difficult to observe the true "demand" for GP services, and the approach used in models of this nature is to set demand and supply to be equilibrium in the first model period. As the supply of services is measured in clinical hours of services provided, and the demand for services is measured in the volume of clinical services provided, it was necessary to estimate the volume of clinical hours demanded.

The duration of each service can vary substantially. For example, a Level A consultation can last from a matter of minutes, through to a Level D consultation that can last for over an hour. For this analysis, the Medicare items provided by GPs were split into Item 23 (representing the large majority of GP services) and all other items.[56]

The BEACH study was a nationally representative study which collected data based on a sample of approximately 100,000 patient encounters. The most recent analysis is reported by Britt (2016) who publishes results of the BEACH study in 2015-16.[57] This reported an average time for all GP encounters of 14.9 minutes. Using the proportion of each type of service included in the sample, the average lengths of Item 23 and "all other items" was solved, and incorporated into the model.

The modelled equilibrium was adjusted by taking base estimates of service duration and weighting them to match current demand and supply for hours in each region, as shown in Table 3.2. This resulted in changes to average times per service.

Table 3.2 Average times (minutes) required per service

Service group	Base estimate	Adjusted estimate
Item 23, urban	14.5	17.3
Item 23, regional	14.5	22.3
Other, urban	16.3	19.4
Other, regional	16.3	25.0

Source: Deloitte Access Economics analysis; Britt et al. (2016).

3.6 Summary of demand modelling

Overall, there were 139.8 million services demanded in 2019 which increased to 192.1 million by 2030. This represents an overall growth of 37.5%. Per capita services demanded grew from 5.49 per capita in 2019 to 6.42 per capita in 2030 – an overall increase of 16.9% over the period.

The number of FTEs demanded is forecast to increase from 27,165 in 2019 to 37,685 in 2030 – an overall average annualised growth rate of 3.0%. This increase is likely to be most pronounced in urban areas, which are estimated to grow by 40.3% over the forecast period, compared to 36.1% in regional areas (Table 3.3). Detailed modelling results are provided in Appendix B.

[56] Items 3, 4, 24, 36, 37, 44, 47, 193, 195, 197, 199, 585, 594, 599, 2497, 2501, 2503, 2504, 2506, 2507, 2509, 2517, 2518, 2521, 2522, 2525, 2526, 2546, 2547, 2552, 2553, 2558, 2559, 5000, 5003, 5010, 5020, 5023, 5028, 5040, 5043, 5049, 5060, 5063, 5067, 90020, 90035, 90043, 90051.

[57] Britt H, Miller GC, Henderson J, Bayram C, Harrison C, Valenti L, Pan Y, Charles J, Pollack AJ, Wong C, Gordon J. General practice activity in Australia 2015–16. General practice series no. 40. Sydney University Press, 2016. <purl.library.usyd.edu.au/sup/9781743325131>.

Table 3.3 Summary of demand for GP services results, 2019 to 2030

	2019	2023	2027	2030
Services demanded (million)				
Urban	95.2	107.0	120.6	132.1
Regional	44.6	49.4	55.2	60.0
Total	**139.8**	**156.4**	**175.8**	**192.1**
Services per million population demanded				
Urban	5.52	5.74	6.05	6.32
Regional	5.43	5.81	6.26	6.65
Total	**5.49**	**5.76**	**6.11**	**6.42**
Clinical FTE ('000)				
Urban	16,948	19,116	21,641	23,782
Regional	10,217	11,378	12,749	13,904
Total	**27,165**	**30,494**	**34,390**	**37,685**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table 3.4 presents the year-on-year average growth rates for demand as measured by FTEs, as well as the number of services demanded (in total, and per capita).

Table 3.4 Demand growth rates (y.o.y., %), 2020 to 2030

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Demand (FTEs)	2.8	2.9	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1
GP services per capita	1.1	1.1	1.3	1.3	1.4	1.5	1.5	1.6	1.6	1.6	1.7
GP services demanded	2.8	2.8	2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.0
Population	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.3	1.3

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Appendix D provides detailed growth rates for supply and demand projections at the urban and rural level.

4 Comparison of supply and demand

This chapter builds on the analysis in Chapter 2 and Chapter 3 to forecast the supply and demand of GPs in Australia over 2019-2030.

In considering the results in this chapter, the reader should note that a market economy such as Australia tends to adjust dynamically to changes in supply and demand to reallocate resources using price signals. For example, where the model shows demand exceeding supply over the period of analysis, the market would adjust through increasing wages (increasing supply through encouraging new entrants to the workforce) and/or through increasing consumers prices (reducing demand) such as through increasing out-of-pocket costs or reducing bulk-billing rates. However, there can be significant time lags to increasing the supply of ATDs given the length of GP registrar training programs.

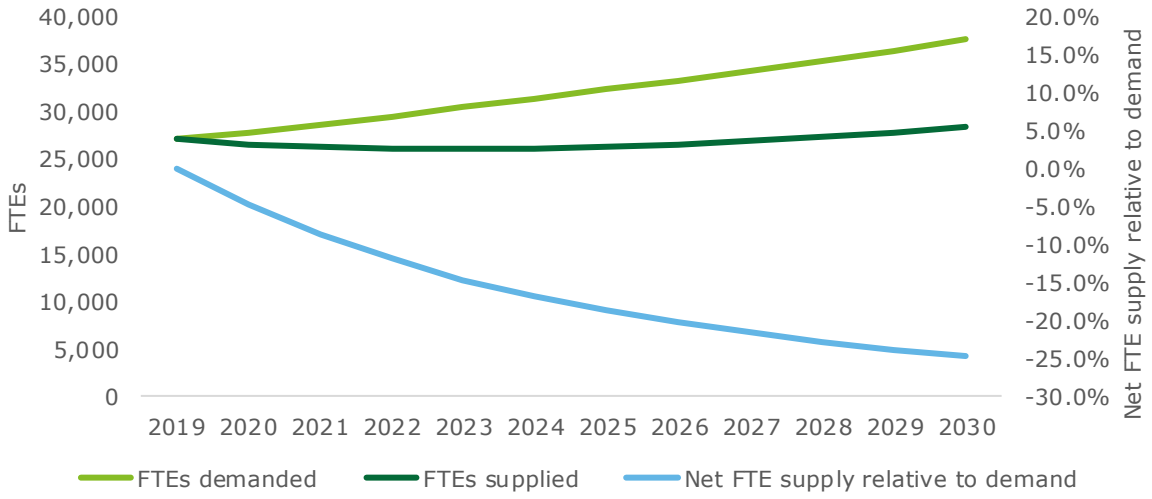
The supply and demand projections presented in this report start from a position of initial equilibrium. Thus, future movements in supply and demand are relative to the initial position, and the analysis is undertaken holding all other factors constant.

4.1 Aggregate analysis

Starting from an initial equilibrium in 2019, demand for GP services is forecast to outpace supply – resulting in a widening shortfall of FTE GPs from 2020 onwards. Chart 4.1 plots the number of FTE GPs demanded relative to FTEs supplied, as well as the percentage shortfall of FTE GPs relative to FTE GPs demanded. This shortfall is expected to reach 24.7% (or 9,298 FTE GPs) by 2030.

In per capita terms, the average Australian in 2019 demanded 1.8 hours of GP care per annum. This is forecast to grow to 2.1 hours per annum by 2030. Meanwhile, supply of GP clinical hours per person is estimated to decline to 1.6 hours per annum by 2030 from 1.8 hours per annum in 2019. This indicates an average annual shortfall for Australians of 31.3 minutes of GP care per year by 2030.

Chart 4.1 Supply and demand for FTE GPs in Australia, 2019 to 2030

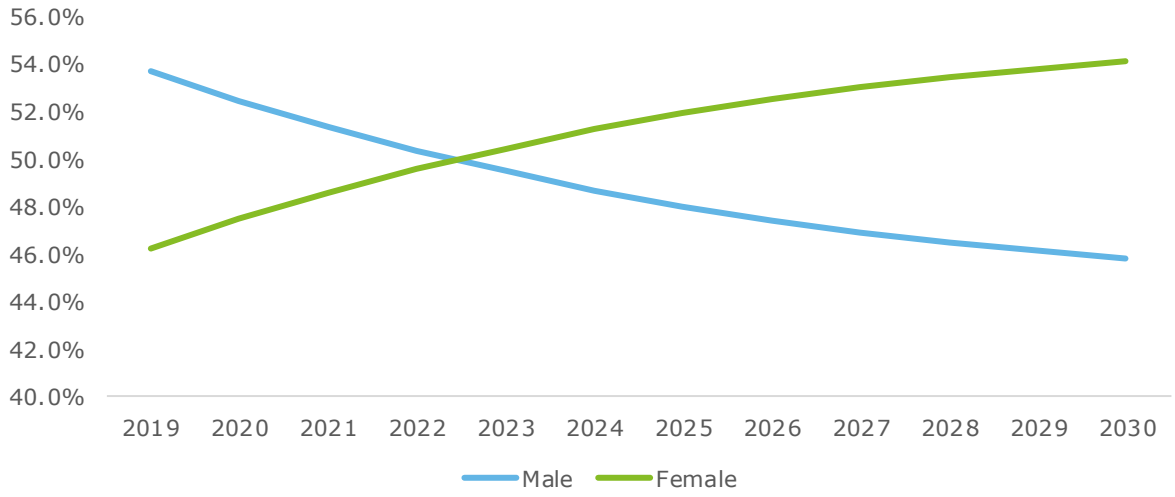


Source: Deloitte Access Economics analysis.

There are a number of factors underlying the slow growth in supply relative to demand. Over the forecast period, demographic changes in the GP workforce shift the male-female proportions in the

workforce towards females. In 2019, the female share of the workforce was estimated to be 46.3%, which was projected to increase to 54.1% by 2030 (Chart 4.2).

Chart 4.2 Share of the workforce by gender, 2019 to 2030



Source: Deloitte Access Economics analysis.

There are two broad implications of this change for the supply of FTE GPs. On average, a female GP will work fewer hours than a male GP – with average hours per clinician at 29.6 hours per week in 2019 for females compared to 37.9 hours per week for males. Thus, a greater proportion of female GPs will reduce the total number of clinical hours supplied, all other things being equal. Secondly, the model incorporates female GPs taking maternity leave, which further reduces the supply of clinical hours relative to male GPs. Rates of maternity leave are much higher in younger age groups.

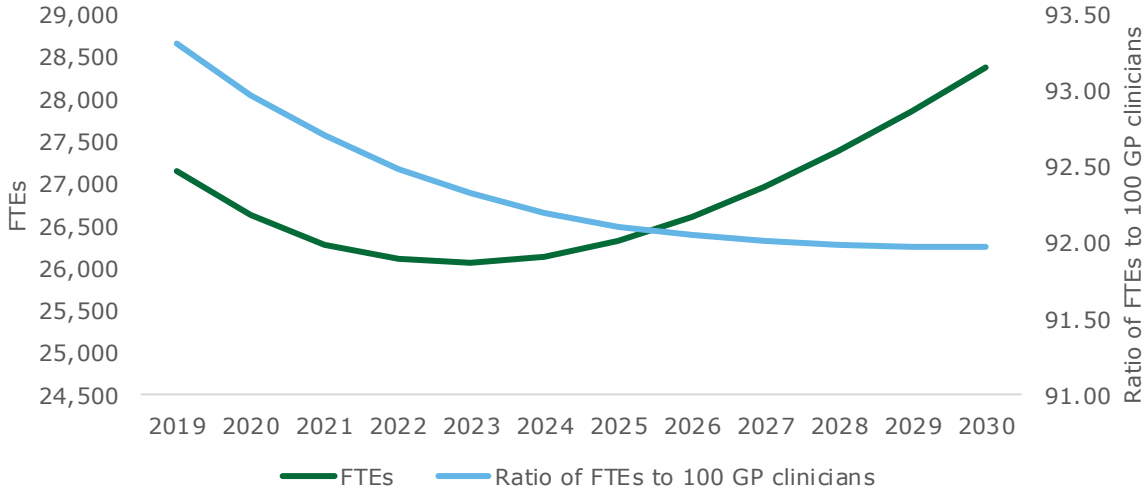
These findings are consistent with the RACGP's 2018 *Health of the Nation* report[58], which found that male GPs are likely to work more hours than female GPs. On average, a male GP saw 122 patients per week in 2018, compared to an average of 97 patients per week for female GPs. The RACGP's report also identified that female GPs are more likely than male GPs to work part-time.

Thus, while the overall headcount increases over the forecast period, the average clinical hours supplied per headcount is decreasing. Average weekly clinical hours per clinician are estimated to decline by 1.5% between 2019 and 2030, from 34.1 hours per week in 2019 to 33.6 hours per week in 2030. This reflects the demographic movements in the workforce and translates to a declining ratio of GP clinicians to GP FTEs (Chart 4.3).

As shown in Chart 4.3, the supply of FTE GPs is expected to decline by 3.0% between 2019 and 2022. However, beyond 2022 the supply of FTE GPs is expected to start growing – at an average annual rate of 1.1% per annum to the end of the period. The overall growth in the supply of FTE GPs is expected to increase by a total of 9.3% between 2022 and 2030 – which compares to 6.0% for the 2019 to 2030 period. The turning point reflects the time at which the growth in workforce exits slows, and is offset by growth in workforce entries.

[58] RACGP (2019), *General Practice: Health of the Nation 2018*, East Melbourne, Victoria.

Chart 4.3 Clinical hours supplied per FTE and GP headcount, 2019 to 2030

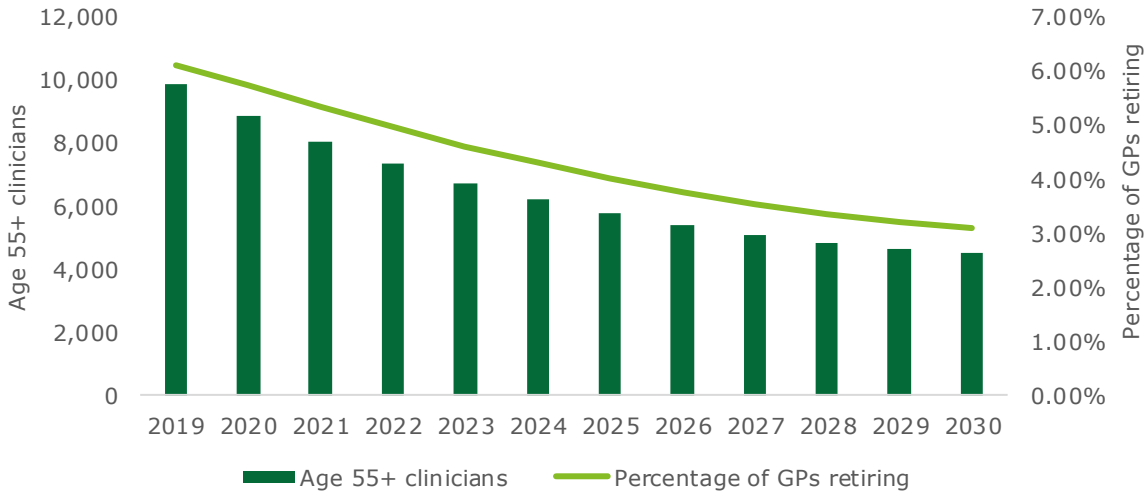


Source: Deloitte Access Economics analysis.

A further driver that is limiting supply growth in the GP workforce is a large number of workforce departures – primarily through retirements and deaths due to an aged workforce – which are expected to outstrip the supply of new registrar and overseas entrants to the workforce. The Australian Medical Association has recently identified that the number of applications for new registrars has declined by approximately 20% since 2016.[59]

Meanwhile, total retirements are expected to peak in 2019 at 1,779 before declining to 953 by 2030. In 2019, 33.9% of the GP workforce is aged over 55 years – this share of the workforce is expected to fall to 14.8% by 2030 as people retire and are replaced with younger clinicians. Similarly, there are estimated to be 144 GP deaths in 2019 which reduces to 78 deaths by 2030.

Chart 4.4 Retirements from the GP workforce, 2019 to 2030



Source: Deloitte Access Economics analysis.

[59] Australian Medical Association (2019), *Urgent action needed to ensure the future family doctor workforce* <https://ama.com.au/media/urgent-action-needed-ensure-future-family-doctor-workforce>.

The RACGP's *Health of the Nation* report identified that older GPs work longer hours than their younger counterparts.[60] As older GPs retire over the next decade and are replaced with younger counterparts, this will contribute to the reduction in average hours supplied per GP.

4.2 Urban/regional analysis

As shown in Table 4.1, by 2020 the model forecasted a deficit in both urban and regional areas from a starting point of equilibrium in both locations. This deficit was projected to become more pronounced by 2030, however the deficit was forecast to be more extreme in urban areas – with a deficit of 31.7% in urban areas compared to 12.7% in regional areas (Chart 4.5).

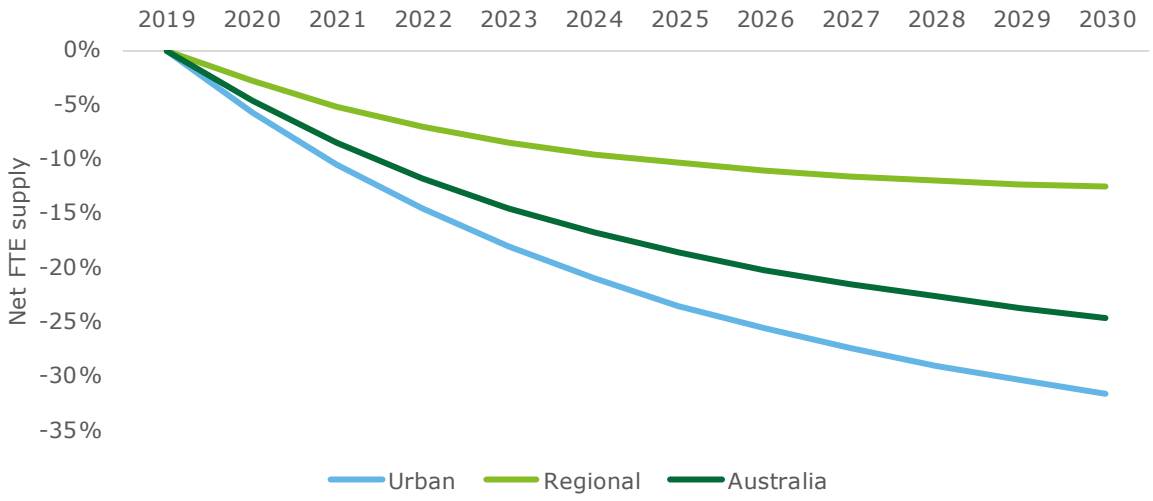
It is important to note that the analysis presented in Table 4.1 has been conducted in the absence of policies announced as part of the SRHS to offer more registrar positions in rural areas, and reduce the number of OTDs entering the urban market. Results under these scenarios are presented in Section 4.4.

Table 4.1 Supply and demand of FTE GPs in Australia, 2019 and 2030

	2019	2030
Urban		
Supply	16,948	16,246
Demand	16,948	23,782
Difference	**0**	**-7,535**
Regional		
Supply	10,217	12,141
Demand	10,217	13,904
Difference	**0**	**-1,763**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Chart 4.5 Comparison of FTEs supplied to FTEs demanded, by region, 2019 to 2030



Source: Deloitte Access Economics analysis.

[60] RACGP (2019), *General Practice: Health of the Nation 2018*, East Melbourne, Victoria.

There are a number of contributing factors to this forecasted geospatial workforce trend. Firstly, in 2019 68.1% of GP services are demanded in urban areas however only 62.4% of FTE GPs are located in urban areas – this reflects a mismatch of 5.7% in terms of workforce distribution.

On the supply side, a greater than proportionate share (when measured against the distribution of demand for services) of registrars and OTDs are expected to enter the workforce in regional areas. Meanwhile, growth in the demand for services in urban areas is expected to outstrip the growth in demand forecasted for regional areas. Over the period to 2030, average annualised growth in services demanded in urban areas were forecast to grow by 3.0%. This compares to a projected growth rate of 2.7% per annum in regional areas.

A share of this growth is due to forecast population increases – with urban area populations set to increase by an average of 1.8% per annum compared to 0.9% per annum in regional areas. Interestingly, service utilisation per capita rates are forecast to increase more rapidly in regional areas (at 1.9% per annum) compared to urban areas (1.2% per annum). This faster growth rate in regional areas is driven by a population that is ageing more rapidly, and may also reflect recent historical GP workforce growth being higher in regional areas.

4.3 State/territory analysis

Table 4.2 presents the results of the supply and demand forecasts by state, focusing on the net supply of GPs – defined as supply minus demand in each state or territory. In 2019, it was estimated that there was a deficit of GPs in New South Wales and Victoria. Over the period of analysis, deficits are expected for all states and territories by 2030 with the exception of the Northern Territory (which is expected to experience a surplus of 45.6%, 155 FTE GPs). This anomaly in the Northern Territory may be due to a strong locum workforce, and/or a relatively small population. The largest deficit in 2030 was forecasted for Victoria (39.9%, or 3,892 FTE GPs), following by New South Wales (27.8%, 3,406 FTE GPs) and Queensland (18.3%, 1,507 FTE GPs).

Table 4.2 Net supply of FTE GPs in Australia, by state or territory, 2019 and 2030

	2019	2030
NSW	-452	-3,406
VIC	-691	-3,892
QLD	203	-1,507
SA	284	-179
WA	330	-349
ACT	98	-19
TAS	25	-101
NT	203	155
Australia	**0**	**-9,298**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

4.4 Scenario analysis

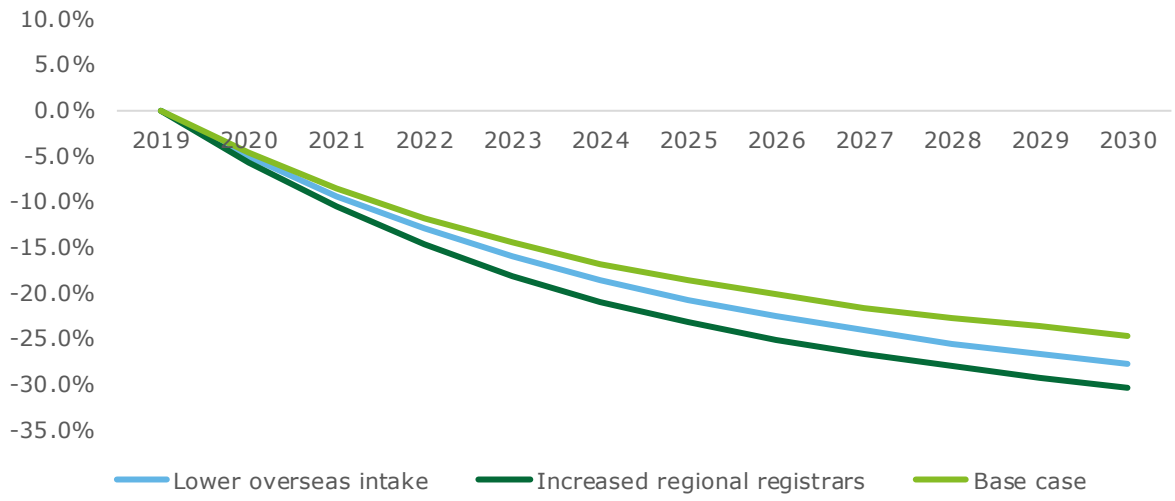
As discussed in section 2.3, two supply side scenarios were examined for their impact on the supply of GPs. The first of these scenarios was to reduce the OTD workforce by up to 200 places in urban areas[61]. As shown in Chart 4.6, this results in a more pronounced deficit of GPs in urban

[61] Note: when the supply of OTDs was reduced, the model capped individual cell sizes at zero, i.e. the number of GPs could not fall below zero. As such, the total reduction in OTDs under this scenario is less than 200 in each year.

areas. By 2030, this results in a deficit of 8,498 FTE GPs (or 36.0% relative to FTE GPs demanded) in urban areas.

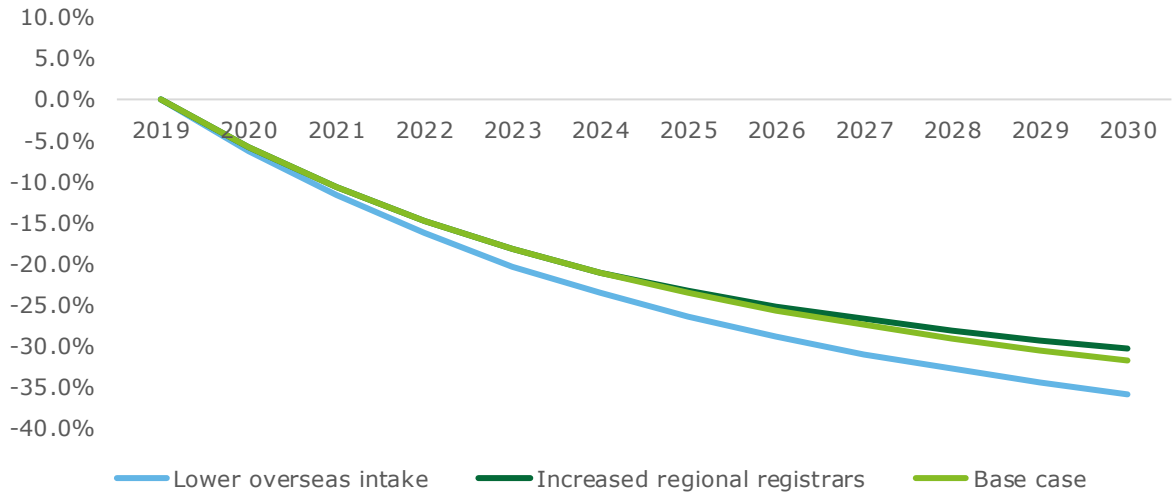
The second of these scenarios was to add 100 more ATDs to regional areas each year from 2021. As shown in Chart 4.7 and Chart 4.8, increasing the intake of regional registrars is forecast to result in a reduced deficit of GPs of 9.1% (1,265 FTE GPs) compared to a baseline of 12.7% (1,763 FTE GPs).

Chart 4.6 Net supply of FTE GPs, scenario analysis, 2019 to 2030



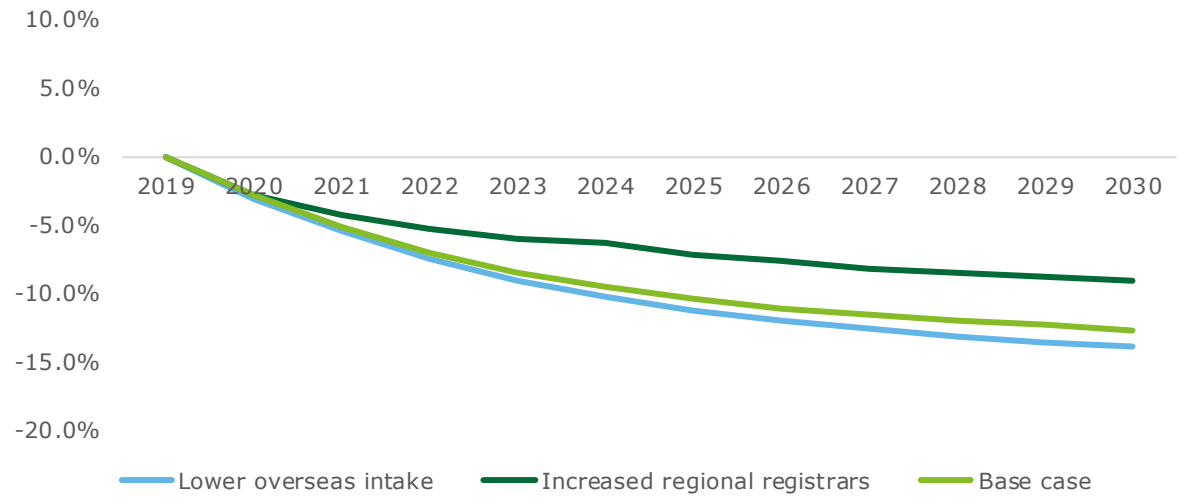
Source: Deloitte Access Economics analysis.

Chart 4.7 Net supply of FTE GPs, urban areas, scenario analysis, 2019 to 2030



Source: Deloitte Access Economics analysis

Chart 4.8 Net supply of FTE GPs, regional areas, scenario analysis, 2019 to 2030



Source: Deloitte Access Economics analysis.

5 Conclusion

Starting from an initial equilibrium in 2019, demand for GP services is forecast to outpace supply, resulting in a widening shortfall of FTEs from 2020 onwards. By 2030, there was projected to be a shortfall of 9,298 FTE GPs, or 24.7% of the workforce. Urban areas are forecasted to experience a shortfall of 7,535 FTEs, or 36.4 minutes of GP care per capita per annum. This compares to a shortfall of 19.7 minutes of GP care per capita per annum in regional areas.

These findings represent a continuation of the current geographical misalignment between supply and demand, and further movements over the decade to 2030 are expected to exacerbate this misalignment. Deloitte Access Economics' analysis has identified that 68% of GP services are currently demanded in urban areas (using the GCCSA classification), however only 62% of GPs (measured in FTEs) are located in those areas. A high level analysis using the ASGS-RA classification concurs with this analysis. Table 5.1 shows the distribution of demand and supply using the ASGS-RA system. While major cities have sufficient GPs to meet demand, the inner and outer regional areas – some of which are captured in the GCCSA "urban" areas – are currently under-supplied in terms of the GP workforce.

Table 5.1 ASGS-RA distribution of services and workforce, 2017

Region	MBS services (%)	GP clinicians (%)
Major cities	71.1	74.9
Inner regional	18.0	15.8
Outer regional	9.1	7.0
Remote	0.5	1.3
Very remote	1.2	0.9
Total	**100.0**	**100.0**

Source: Department of Health (2019). [62] Note: totals may not add due to rounding.

This current misalignment will be further exacerbated over the decade to 2030, with demand in urban areas growing faster than in regional areas, and new inflows of registrars and OTDs being concentrated in regional areas. A caveat to this is that per capita growth in demand will be faster in regional areas with a population that is ageing more rapidly. At a national level, the shortfall in net supply will be driven by changing demographics in the workforce (which reduce the average hours supplied per GP), insufficient inflows to replace workforce exits, and demand for services that grows faster than underlying population growth.

The policies announced as part of the SRHS will assist with reducing the under-supply in regional areas, noting that further action is needed to fully meet the need for GP services in these areas. However, further consideration needs to be given to increasing the supply of GPs in urban areas. In the short-term, removing the cap on OTDs working in urban areas can be used to quickly boost labour supply. Over the medium-long term, increasing registrar enrolments – particularly in urban areas – will assist with delivering a better geographical alignment of the GP workforce to meet demand.

[62] Department of Health. (2019). National Health Workforce Dataset. <https://hwd.health.gov.au/datatool.html> Department of Health. (2019). MBS Data by ABS SA3. <https://www1.health.gov.au/internet/main/publishing.nsf/Content/MBS_Data_by_ABS_SA3>.

Appendix A Detailed supply-side inputs

This Appendix contains detailed inputs for the supply-side model, which is discussed in Chapter 2.

Table A.1 GP workforce opening headcount, 2019

	2019
State/territory	
NSW	8,928
VIC	6,953
QLD	6,581
SA	2,327
WA	3,191
ACT	518
TAS	728
NT	478
Region	
Urban	19,029
Regional	10,676
Age	
25-29	2,012
30-34	1,832
35-39	3,981
40-44	2,775
45-49	3,989
50-54	3,510
55-59	3,903
60-64	3,442
65-69	1,984
70-74	1,588
75-79	395
80-84	293
Gender	
Male	16,346
Female	13,359
Total	**29,705**

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding.

Table A.2 GP workforce closing headcount, 2019 to 2030

	2019	2023	2027	2030
State/territory				
NSW	8,728	8,414	8,741	9,234
VIC	6,751	6,301	6,327	6,541
QLD	6,530	6,556	6,906	7,299
SA	2,257	2,129	2,181	2,285
WA	3,152	3,158	3,374	3,611
ACT	500	473	490	517
TAS	715	698	735	782
NT	478	500	548	592
Region				
Urban	18,476	17,290	17,450	18,104
Regional	10,634	10,939	11,852	12,757
Age				
25-29	2,332	2,050	2,062	2,126
30-34	2,215	3,204	3,553	3,734
35-39	4,465	5,013	5,708	6,126
40-44	2,846	4,116	5,043	5,623
45-49	4,078	3,998	4,615	5,192
50-54	3,303	3,106	3,218	3,501
55-59	3,431	2,267	1,948	1,956
60-64	3,022	1,967	1,408	1,239
65-69	1,623	1,243	861	689
70-74	1,291	790	541	414
75-79	293	343	243	183
80-84	210	133	103	79
Gender				
Male	15,639	13,974	13,756	14,154
Female	13,471	14,254	15,547	16,708
Total	**29,110**	**28,229**	**29,303**	**30,861**

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding.

Table A.3 GP workforce retirements, 2019 to 2030

	2019	2023	2027	2030
State / territory				
NSW	561	399	307	277
VIC	447	324	250	222
QLD	352	281	239	227
SA	147	103	79	72
WA	168	127	106	101
ACT	36	23	17	16
TAS	50	36	28	26
NT	17	13	12	12
Region				
Urban	1,210	884	695	628
Regional	569	424	345	326
Age				
25-29	0	0	0	0
30-34	0	0	0	0
35-39	0	0	0	0
40-44	0	0	0	0
45-49	0	0	0	0
50-54	222	208	216	236
55-59	431	285	246	248
60-64	381	246	176	156
65-69	329	257	179	144
70-74	263	160	110	85
75-79	88	109	79	61
80-84	66	41	32	25
Gender				
Male	1,174	785	567	483
Female	605	522	472	471
Total	**1,779**	**1,307**	**1,039**	**953**

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding.

Table A.4 GP workforce deaths, 2019 to 2030

	2019	2023	2027	2030
State / territory				
NSW	50	35	27	24
VIC	33	24	19	16
QLD	28	23	19	18
SA	11	8	6	6
WA	14	11	9	8
ACT	2	1	1	1
TAS	4	3	2	2
NT	3	2	2	2
Region				
Urban	99	71	56	50
Regional	45	35	30	28
Age				
25-29	1	1	1	1
30-34	1	2	2	2
35-39	4	4	4	5
40-44	4	5	6	7
45-49	8	7	8	9
50-54	10	9	9	10
55-59	17	11	9	9
60-64	22	14	10	8
65-69	21	15	10	8
70-74	27	16	10	7
75-79	12	13	9	7
80-84	16	10	7	5
Gender				
Male	113	77	58	50
Female	31	29	28	28
Total	**144**	**106**	**86**	**78**

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding.

Table A.5 GP workforce domestic registrar inflows, 2019 to 2030

	2019	2023	2027	2030
State/territory				
NSW	351	375	399	416
VIC	203	217	230	240
QLD	214	229	243	254
SA	83	89	95	99
WA	121	129	137	143
ACT	20	22	23	24
TAS	22	23	25	26
NT	25	27	29	30
Region				
Urban	550	588	625	652
Regional	489	522	556	579
Age				
25-29	0	0	0	0
30-34	273	292	310	323
35-39	292	312	332	346
40-44	292	312	332	346
45-49	75	81	86	89
50-54	75	81	86	89
55-59	31	34	36	37
60-64	0	0	0	0
65-69	0	0	0	0
70-74	0	0	0	0
75-79	0	0	0	0
80-84	0	0	0	0
Gender				
Male	398	425	452	472
Female	641	685	729	760
Total	**1,039**	**1,110**	**1,181**	**1,231**

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding.

Table A.6 GP workforce OTD inflows, 2019 to 2030

	2019	2023	2027	2030
State/territory				
NSW	221	236	251	262
VIC	161	172	183	191
QLD	181	193	206	214
SA	53	57	61	63
WA	113	120	128	133
ACT	14	15	16	17
TAS	21	23	24	25
NT	17	18	19	20
Region				
Urban	218	233	248	259
Regional	562	601	640	667
Age				
25-29	0	0	0	0
30-34	205	219	233	243
35-39	219	235	249	260
40-44	219	235	249	260
45-49	57	61	64	67
50-54	57	61	64	67
55-59	24	25	27	28
60-64	0	0	0	0
65-69	0	0	0	0
70-74	0	0	0	0
75-79	0	0	0	0
80-84	0	0	0	0
Gender				
Male	377	403	428	447
Female	404	432	459	479
Total	**781**	**835**	**888**	**926**

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding.

Table A.7 GP workforce total clinical hours (millions), 2019 to 2030

	2019	2023	2027	2030
State / territory				
NSW	14.4	13.7	14.1	14.9
VIC	10.2	9.5	9.5	9.8
QLD	10.2	10.2	10.7	11.3
SA	3.6	3.4	3.4	3.6
WA	4.8	4.7	5.1	5.4
ACT	0.7	0.7	0.7	0.7
TAS	1.0	1.0	1.0	1.1
NT	0.7	0.7	0.8	0.8
Region				
Urban	28.5	26.3	26.4	27.3
Regional	17.2	17.5	18.9	20.4
Age				
25-29	3.6	3.2	3.2	3.4
30-34	3.4	5.0	5.6	5.9
35-39	6.8	7.6	8.6	9.3
40-44	4.3	6.2	7.6	8.5
45-49	6.5	6.3	7.3	8.2
50-54	5.3	5.0	5.1	5.5
55-59	5.7	3.7	3.1	3.1
60-64	5.0	3.2	2.3	2.0
65-69	2.4	1.8	1.2	1.0
70-74	1.9	1.2	0.8	0.6
75-79	0.4	0.4	0.3	0.2
80-84	0.3	0.2	0.1	0.1
Gender				
Male	27.3	24.5	24.2	25.0
Female	18.4	19.3	21.1	22.7
Total	**45.7**	**43.8**	**45.3**	**47.7**

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding.

Table A.8 GP workforce average weekly clinical hours, 2019 to 2030

	2019	2023	2027	2030
State/territory				
NSW	35.9	35.4	35.2	35.1
VIC	33.0	32.8	32.7	32.7
QLD	33.9	33.7	33.6	33.6
SA	34.9	34.5	34.4	34.3
WA	33.0	32.6	32.6	32.6
ACT	31.6	30.5	30.1	30.1
TAS	31.1	30.5	30.5	30.6
NT	30.6	30.4	30.5	30.6
Region				
Urban	33.5	33.1	32.9	32.8
Regional	35.1	34.8	34.7	34.8
Age				
25-29	33.8	34.1	34.2	34.3
30-34	33.7	34.1	34.2	34.3
35-39	32.9	32.8	32.8	32.9
40-44	33.1	32.8	32.7	32.7
45-49	34.8	34.5	34.3	34.2
50-54	34.9	34.8	34.5	34.3
55-59	35.9	35.4	35.0	34.8
60-64	35.9	35.8	35.4	35.1
65-69	32.5	31.5	31.1	30.8
70-74	32.5	32.2	31.6	31.3
75-79	27.8	27.2	27.0	26.8
80-84	27.8	27.5	27.3	27.1
Gender				
Male	37.9	38.1	38.3	38.5
Female	29.6	29.5	29.5	29.5
Total	**34.1**	**33.7**	**33.6**	**33.6**

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding.

Table A.9 GP workforce FTEs supplied, 2019 to 2030

	2019	2023	2027	2030
State / territory				
NSW	8,575	8,148	8,409	8,865
VIC	6,098	5,649	5,661	5,853
QLD	6,054	6,046	6,359	6,721
SA	2,153	2,010	2,052	2,147
WA	2,844	2,817	3,007	3,225
ACT	433	395	404	427
TAS	607	583	612	654
NT	400	415	457	495
Region				
Urban	16,948	15,649	15,691	16,246
Regional	10,217	10,415	11,271	12,141
Age				
25-29	2,156	1,915	1,933	1,993
30-34	2,043	2,986	3,330	3,506
35-39	4,025	4,494	5,131	5,522
40-44	2,577	3,692	4,511	5,035
45-49	3,888	3,777	4,330	4,860
50-54	3,159	2,955	3,038	3,289
55-59	3,374	2,196	1,867	1,861
60-64	2,970	1,927	1,365	1,191
65-69	1,443	1,070	733	581
70-74	1,147	696	468	355
75-79	223	255	179	134
80-84	160	100	77	59
Gender				
Male	16,242	14,564	14,424	14,900
Female	10,922	11,500	12,538	13,487
Total	**27,165**	**26,063**	**26,962**	**28,387**

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding.

Table A.10 GP workforce supply function, 2019 to 2030

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Opening headcount	**29,705**	**29,068**	**28,616**	**28,332**	**28,199**	**28,202**	**28,327**	**28,557**	**28,880**	**29,282**	**29,751**	**30,275**
Net interstate migration	-3	-3	-2	-2	-1	0	0	1	1	2	2	2
AMG registrars	1,039	1,056	1,074	1,092	1,110	1,128	1,146	1,164	1,181	1,198	1,215	1,231
Overseas doctors	781	794	808	821	835	848	862	875	888	901	913	926
Deaths	-144	-132	-122	-114	-106	-100	-94	-89	-86	-82	-80	-78
Retirements	-1,779	-1,644	-1,519	-1,406	-1,307	-1,222	-1,149	-1,088	-1,039	-1,001	-973	-953
Overseas departures	-276	-272	-271	-270	-271	-272	-274	-277	-280	-283	-286	-288
Net temporary movements	-77	-81	-83	-85	-86	-86	-87	-87	-88	-89	-89	-90
Registrar departures	-136	-138	-140	-142	-145	-147	-150	-152	-155	-157	-160	-162
Closing headcount	**29,110**	**28,649**	**28,361**	**28,227**	**28,229**	**28,352**	**28,581**	**28,903**	**29,303**	**29,770**	**30,293**	**30,861**
Closing headcount assumed to retire before next period	-42	-33	-29	-28	-27	-25	-24	-22	-21	-19	-17	-16

Source: Deloitte Access Economics analysis of the NHWDS and 2016 Census. Note: totals may not add due to rounding. The closing headcount (less retirements) at the end of each year is the opening headcount at the start of the next year.

Appendix B Demand side summary

This Appendix contains detailed inputs for the demand-side model, which is discussed in Chapter 3.

Table B.1 MBS services demanded, 2001 to 2019

	2001	2005	2010	2015	2019
State / territory					
NSW	32.4	33.4	37.7	42.5	45.9
VIC	22.3	22.9	26.7	31.2	35.4
QLD	16.8	17.1	20.4	24.6	28.1
SA	7.6	7.3	8.2	9.0	9.8
WA	7.9	8.0	9.0	10.8	13.2
ACT	1.3	1.1	1.4	1.6	1.8
TAS	2.1	2.1	2.4	2.6	2.8
NT	0.5	0.5	0.6	0.9	1.0
Region					
Urban	62.1	63.1	72.4	83.9	94.2
Regional	28.8	29.3	33.8	39.3	43.8
Age					
0-4	7.2	6.9	8.1	8.4	9.2
5-9	3.4	3.1	3.6	4.3	4.8
10-14	3.4	3.2	3.7	3.9	4.6
15-19	4.6	4.3	4.7	5.0	5.3
20-24	4.5	4.4	5.1	5.7	6.1
25-29	5.5	5.0	6.1	7.1	8.0
30-34	5.8	5.6	5.7	7.0	7.9
35-39	6.0	5.7	6.6	7.1	8.6
40-44	6.0	6.0	6.4	7.5	7.8
45-49	6.4	6.6	7.4	7.8	8.8
50-54	6.1	6.0	6.9	7.8	8.1
55-59	6.1	7.1	7.7	8.8	9.6
60-64	4.9	5.4	7.0	7.8	8.6
65-69	5.6	6.3	7.3	9.4	10.1
70-74	5.3	5.1	5.7	6.9	8.7
75-79	4.4	5.0	5.8	7.3	8.4
80-84	2.8	3.6	4.6	5.2	5.8
85+	3.0	3.1	3.8	6.2	7.5
Gender					
Male	37.6	38.7	45.1	52.8	59.3
Female	53.2	53.7	61.1	70.4	78.7
Item group					
Item 23	74.2	72.8	82.7	89.3	96.0
Other	16.6	19.6	23.5	33.8	42.1
Total	**90.8**	**92.4**	**106.2**	**123.1**	**138.1**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table B.2 MBS service utilisation per capita rates, by projection method, 2019 to 2030

	2019	2023	2027	2030
Average arithmetic growth	5.43	5.38	5.30	5.26
Average geometric growth	5.43	5.76	6.11	6.41
Linear regression	5.43	5.98	7.09	8.81
Income growth	5.43	6.07	6.73	7.26
Constant	5.43	5.54	5.59	5.63

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table B.3 Total services (MBS plus DVA) demanded, 2019 to 2030

	2019	2023	2027	2030
State / territory				
NSW	46.4	51.6	57.6	62.6
VIC	35.7	40.6	46.1	50.7
QLD	28.6	32.3	36.5	39.9
SA	9.9	10.6	11.5	12.2
WA	13.4	15.0	17.0	18.8
ACT	1.9	2.1	2.3	2.5
TAS	2.8	3.1	3.4	3.6
NT	1.0	1.2	1.5	1.7
Region				
Urban	95.2	107.0	120.6	132.1
Regional	44.6	49.4	55.2	60.0
Age				
0-4	9.2	10.4	12.0	13.4
5-9	4.8	5.3	6.2	7.1
10-14	4.6	5.3	6.0	6.8
15-19	5.3	5.9	6.5	6.9
20-24	6.1	6.4	6.9	7.5
25-29	8.0	8.7	9.1	9.4
30-34	8.0	8.8	9.6	10.0
35-39	8.7	10.0	11.3	12.3
40-44	7.8	9.1	10.7	11.8
45-49	8.9	8.8	9.8	11.1
50-54	8.1	9.1	9.2	9.5
55-59	9.7	9.7	10.6	11.0
60-64	8.7	9.6	9.7	10.0
65-69	10.2	11.1	12.2	12.7
70-74	9.0	9.7	10.4	11.2
75-79	8.6	11.9	14.2	15.8
80-84	5.9	7.4	10.2	12.4
85+	8.3	9.3	11.2	13.2
Gender				
Male	60.5	68.6	78.1	86.3
Female	79.3	87.9	97.7	105.8
Item group				
Item 23	97.0	103.5	110.2	115.2
Other	42.8	52.9	65.6	76.9
Total	**139.8**	**156.4**	**175.8**	**192.1**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table B.4 Total services (MBS + DVA) demanded per capita, 2019 to 2030

	2019	2023	2027	2030
State / territory				
NSW	5.70	5.96	6.29	6.59
VIC	5.40	5.65	5.99	6.30
QLD	5.62	5.92	6.30	6.62
SA	5.65	5.89	6.18	6.45
WA	5.10	5.42	5.79	6.10
ACT	4.39	4.51	4.67	4.82
TAS	5.31	5.63	6.06	6.42
NT	4.08	4.65	5.37	6.02
Region				
Urban	5.52	5.74	6.05	6.32
Regional	5.43	5.81	6.26	6.65
Age				
0-4	5.67	5.99	6.52	7.08
5-9	2.96	3.18	3.50	3.81
10-14	2.95	3.18	3.50	3.81
15-19	3.52	3.60	3.72	3.83
20-24	3.49	3.56	3.67	3.78
25-29	4.17	4.27	4.42	4.56
30-34	4.19	4.31	4.45	4.59
35-39	4.85	5.11	5.41	5.65
40-44	4.87	5.12	5.43	5.69
45-49	5.28	5.45	5.65	5.82
50-54	5.28	5.46	5.65	5.82
55-59	6.28	6.40	6.54	6.66
60-64	6.26	6.37	6.51	6.63
65-69	8.36	8.41	8.51	8.60
70-74	8.49	8.45	8.50	8.57
75-79	11.69	12.86	13.85	14.68
80-84	11.80	12.69	13.92	14.82
85+	16.28	16.71	17.59	18.41
Gender				
Male	4.79	5.10	5.48	5.82
Female	6.18	6.42	6.73	7.00
Item group				
Item 23	3.81	3.81	3.83	3.85
Other	1.68	1.95	2.28	2.57
Total	**5.49**	**5.76**	**6.11**	**6.42**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table B.5 Clinical hours demanded (millions), 2019 to 2030

	2019	2023	2027	2030
State / territory				
NSW	15.2	16.9	18.9	20.6
VIC	11.4	13.0	14.8	16.4
QLD	9.8	11.1	12.6	13.8
SA	3.1	3.4	3.7	3.9
WA	4.2	4.7	5.4	6.0
ACT	0.6	0.6	0.7	0.7
TAS	1.0	1.1	1.2	1.3
NT	0.3	0.4	0.5	0.6
Region				
Urban	28.5	32.1	36.4	40.0
Regional	17.2	19.1	21.4	23.4
Age				
0-4	3.0	3.4	4.0	4.5
5-9	1.6	1.7	2.0	2.3
10-14	1.5	1.7	2.0	2.2
15-19	1.7	1.9	2.2	2.3
20-24	2.0	2.1	2.2	2.4
25-29	2.6	2.8	3.0	3.1
30-34	2.6	2.9	3.1	3.3
35-39	2.8	3.3	3.7	4.1
40-44	2.5	3.0	3.5	3.9
45-49	2.9	2.9	3.2	3.6
50-54	2.6	3.0	3.0	3.1
55-59	3.2	3.2	3.5	3.6
60-64	2.8	3.1	3.2	3.3
65-69	3.3	3.6	4.0	4.2
70-74	2.9	3.2	3.4	3.7
75-79	2.8	3.9	4.7	5.2
80-84	1.9	2.4	3.3	4.1
85+	2.8	3.1	3.8	4.4
Gender				
Male	19.7	22.4	25.7	28.4
Female	25.9	28.8	32.1	34.9
Item group				
Item 23	30.6	32.6	34.7	36.3
Other	15.1	18.6	23.1	27.1
Total	**45.7**	**51.3**	**57.8**	**63.3**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table B.6 FTEs demanded, 2019 to 2030

	2019	2023	2027	2030
State / territory				
NSW	9,026	10,072	11,269	12,271
VIC	6,790	7,738	8,824	9,745
QLD	5,851	6,609	7,492	8,229
SA	1,868	2,010	2,182	2,326
WA	2,514	2,819	3,219	3,574
ACT	335	372	413	446
TAS	582	638	702	755
NT	198	236	290	340
Region				
Urban	16,948	19,116	21,641	23,782
Regional	10,217	11,378	12,749	13,904
Age				
0-4	1,770	2,026	2,351	2,650
5-9	924	1,033	1,216	1,393
10-14	890	1,032	1,176	1,333
15-19	1,033	1,150	1,280	1,353
20-24	1,181	1,238	1,329	1,455
25-29	1,550	1,681	1,775	1,844
30-34	1,541	1,712	1,870	1,968
35-39	1,673	1,946	2,210	2,418
40-44	1,513	1,775	2,102	2,323
45-49	1,715	1,705	1,896	2,154
50-54	1,575	1,773	1,788	1,862
55-59	1,879	1,874	2,061	2,133
60-64	1,691	1,869	1,898	1,962
65-69	1,990	2,163	2,390	2,476
70-74	1,745	1,885	2,039	2,202
75-79	1,677	2,322	2,785	3,093
80-84	1,159	1,449	1,987	2,423
85+	1,658	1,862	2,237	2,645
Gender				
Male	11,737	13,351	15,274	16,926
Female	15,428	17,144	19,116	20,760
Item group				
Item 23	18,192	19,403	20,653	21,583
Other	8,973	11,091	13,736	16,102
Total	**27,165**	**30,494**	**34,390**	**37,685**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Appendix C Comparison of supply and demand

This appendix contains detailed outputs from Chapter 4.

Table C.1 FTEs (supplied minus demanded), base case, 2019 to 2030

Stratification	2019	2023	2027	2030
State / territory				
NSW	-452	-1,924	-2,860	-3,406
VIC	-691	-2,089	-3,163	-3,892
QLD	203	-563	-1,132	-1,507
SA	284	0	-130	-179
WA	330	-1	-211	-349
ACT	98	22	-9	-19
TAS	25	-55	-90	-101
NT	203	179	167	155
Region				
Urban	0	-3,468	-5,950	-7,535
Regional	0	-963	-1,478	-1,763
Total	**0**	**-4,431**	**-7,428**	**-9,298**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table C.2 FTEs (supplied minus demanded), greater intake of regional registrars, 2019 to 2030

Stratification	2019	2023	2027	2030
State / territory				
NSW	-452	-1,825	-2,653	-3,128
VIC	-691	-2,034	-3,051	-3,744
QLD	203	-475	-943	-1,250
SA	284	14	-101	-139
WA	330	17	-174	-299
ACT	98	22	-9	-19
TAS	25	-47	-72	-76
NT	203	181	172	162
Region				
Urban	0	-3,468	-5,790	-7,228
Regional	0	-679	-1,040	-1,265
Total	**0**	**-4,147**	**-6,830**	**-8,493**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table C.3 FTEs (supplied minus demanded), lower migrant intake in urban areas, 2019 to 2030

Stratification	2019	2023	2027	2030
State / territory				
NSW	-445	-2,037	-3,083	-3,706
VIC	-683	-2,171	-3,325	-4,109
QLD	196	-677	-1,347	-1,791
SA	284	-34	-194	-262
WA	326	-68	-334	-509
ACT	98	12	-28	-44
TAS	23	-70	-118	-138
NT	201	165	144	126
Region				
Urban	0	-3,846	-6,675	-8,498
Regional	0	-1,032	-1,609	-1,935
Total	**0**	**-4,878**	**-8,284**	**-10,433**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table C.4 Clinical hours (supplied minus demanded, millions), base case, 2019 to 2030

Stratification	2019	2023	2027	2030
State / territory				
NSW	-0.8	-3.2	-4.8	-5.7
VIC	-1.2	-3.5	-5.3	-6.5
QLD	0.3	-0.9	-1.9	-2.5
SA	0.5	0.0	-0.2	-0.3
WA	0.6	0.0	-0.4	-0.6
ACT	0.2	0.0	0.0	0.0
TAS	0.0	-0.1	-0.2	-0.2
NT	0.3	0.3	0.3	0.3
Region				
Urban	0.0	-5.8	-10.0	-12.7
Regional	0.0	-1.6	-2.5	-3.0
Total	**0.0**	**-7.4**	**-12.5**	**-15.6**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table C.5 Clinical hours (supplied minus demanded, millions), greater intake of regional registrars, 2019 to 2030

Stratification	2019	2023	2027	2030
State / territory				
NSW	-0.8	-3.1	-4.5	-5.3
VIC	-1.2	-3.4	-5.1	-6.3
QLD	0.3	-0.8	-1.6	-2.1
SA	0.5	0.0	-0.2	-0.2
WA	0.6	0.0	-0.3	-0.5
ACT	0.2	0.0	0.0	0.0
TAS	0.0	-0.1	-0.1	-0.1
NT	0.3	0.3	0.3	0.3
Region				
Urban	0.0	-5.8	-9.7	-12.1
Regional	0.0	-1.1	-1.7	-2.1
Total	**0.0**	**-7.0**	**-11.5**	**-14.3**

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table C.6 Clinical hours (supplied minus demanded, millions), lower migrant intake in urban areas, 2019 to 2030

Stratification	2019	2023	2027	2030
State / territory				
NSW	-0.7	-3.4	-5.2	-6.2
VIC	-1.1	-3.6	-5.6	-6.9
QLD	0.3	-1.1	-2.3	-3.0
SA	0.5	-0.1	-0.3	-0.4
WA	0.5	-0.1	-0.6	-0.9
ACT	0.2	0.0	0.0	-0.1
TAS	0.0	-0.1	-0.2	-0.2
NT	0.3	0.3	0.2	0.2
Region				
Urban	0.0	-6.5	-11.2	-14.3
Regional	0.0	-1.7	-2.7	-3.3
Total	**0.0**	**-8.2**	**-13.9**	**-17.5**

Source: Deloitte Access Economics analysis.

Appendix D Annual growth rates

This Appendix presents the annual growth rates for supply and demand projections, which are discussed in Chapter 2 and Chapter 3, respectively.

Table D.1 Growth rates (yoy, %), Australia, 2020 to 2030

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
High level supply and demand											
Demand (FTEs)	2.8	2.9	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1
Supply (FTEs)	-1.9	-1.3	-0.7	-0.2	0.3	0.7	1.1	1.3	1.6	1.7	1.9
Detailed supply components											
Opening headcount	-2.1	-1.6	-1.0	-0.5	0.0	0.4	0.8	1.1	1.4	1.6	1.8
Net interstate migration	-8.9	-31.5	-18.9	-40.7	-63.9	-138.2	625.0	51.9	9.8	9.1	4.7
AMG registrars	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.4
Overseas doctors	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.4
Deaths	-8.1	-7.8	-6.9	-6.4	-6.1	-5.6	-5.1	-4.4	-3.7	-3.0	-2.4
Retirements	-7.6	-7.6	-7.4	-7.0	-6.6	-6.0	-5.3	-4.5	-3.7	-2.8	-2.0
Overseas departures	-1.2	-0.5	-0.3	0.2	0.5	0.8	0.9	1.3	0.9	1.0	1.0
Net temporary movements	5.6	3.0	1.7	1.0	0.7	0.6	0.7	0.8	0.7	0.9	1.0
Registrar departures	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.5
Detailed demand components											
Population	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.3	1.3
GP services per capita	1.1	1.1	1.3	1.3	1.4	1.5	1.5	1.6	1.6	1.6	1.7
GP services demanded	2.8	2.8	2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.0

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table D.2 Growth rates (yoy, %), urban, 2020 to 2030

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
High level supply and demand											
Demand (FTEs)	3.0	3.0	3.1	3.1	3.1	3.1	3.2	3.2	3.2	3.2	3.2
Supply (FTEs)	-2.9	-2.3	-1.6	-1.1	-0.6	-0.1	0.3	0.6	0.9	1.2	1.4
Detailed supply components											
Opening headcount	-3.1	-2.5	-1.9	-1.3	-0.8	-0.3	0.1	0.5	0.8	1.0	1.3
Net interstate migration	-9.6	-12.9	-9.5	-12.3	-6.7	-8.4	-21.3	-10.8	1.7	1.2	2.3
AMG registrars	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.4
Overseas doctors	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.4
Deaths	-8.9	-8.5	-7.5	-7.1	-6.7	-6.2	-5.8	-5.0	-4.4	-3.7	-3.0
Retirements	-7.9	-7.7	-7.5	-7.2	-6.7	-6.2	-5.6	-4.9	-4.1	-3.3	-2.6
Overseas departures	-2.4	-1.7	-1.3	-0.7	-0.4	0.0	0.2	0.6	0.3	0.4	0.5
Net temporary movements	7.2	3.8	2.0	1.1	0.7	0.6	0.7	0.7	0.7	0.8	0.9
Registrar departures	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.5
Detailed demand components											
Population	2.0	2.0	1.9	1.9	1.8	1.8	1.7	1.6	1.6	1.6	1.6
GP services per capita	0.8	0.9	1.1	1.1	1.2	1.3	1.4	1.4	1.4	1.5	1.5
GP services demanded	2.9	2.9	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

Table D.3 Growth rates (yoy, %), regional, 2020 to 2030

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
High level supply and demand											
Demand (FTEs)	2.6	2.7	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9
Supply (FTEs)	-0.3	0.3	0.8	1.2	1.6	1.9	2.1	2.3	2.4	2.5	2.6
Detailed supply components											
Opening headcount	-0.5	0.0	0.5	1.0	1.4	1.7	2.0	2.2	2.3	2.4	2.5
Net interstate migration	-10.3	5.8	-3.4	3.3	11.3	4.9	2.7	5.7	4.7	4.3	3.3
AMG registrars	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.4
Overseas doctors	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.4
Deaths	-6.2	-6.4	-5.6	-5.2	-4.8	-4.3	-3.9	-3.1	-2.5	-1.8	-1.2
Retirements	-7.0	-7.4	-7.2	-6.8	-6.2	-5.5	-4.7	-3.8	-2.8	-1.8	-0.9
Overseas departures	0.7	1.4	1.4	1.7	1.8	2.0	2.0	2.2	1.7	1.7	1.7
Net temporary movements	4.1	2.3	1.3	0.8	0.6	0.7	0.8	0.9	0.8	0.9	1.0
Registrar departures	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.5
Detailed demand components											
Population	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7
GP services per capita	1.5	1.6	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.1
GP services demanded	2.5	2.6	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8

Source: Deloitte Access Economics analysis. Note: totals may not add due to rounding.

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