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Psychology Supply and Demand Model - Methodology Paper

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List of Acronyms and Abbreviations

ABS	Australian Bureau of Statistics
AFHW	Australia's Future Health Workforce
Ahpra	Australian Health Practitioner Regulation Agency
APC	Admitted Patient Care
CMHC	Community Mental Health Care
DMS	Derived Major Specialty
ERP	Estimated Resident Population
FTE	Full-Time Equivalent
GLM	Generalised Linear Model
GP	General Practitioner
MBS	Medicare Benefits Schedule
MeSHWPoD	Medical Specialist Health Workforce Prediction of Demand
NAP	Non-Admitted Patient
NEP	National Efficient Price
NHCDC	National Hospital Cost Data Collection
NHWDS	National Health Workforce Datasets
NMHSPF	National Mental Health Service Planning Framework
NNAPD	National Non-Admitted Patient Database
NWAU	National Weighted Activity Unit
PBA	Psychology Board of Australia
PHDB	Private Hospital Data Bureau
PLIDA	Personal Level Integrated Data Asset
SA4	Statistical Area 4

1.0 Introduction

This paper provides the methodology used for the supply and demand model for the psychology workforce. It aims to quantify the supply and demand for psychologists between 2024 and 2038 using data collected from several sources between 2018 and 2023.[1]

2.0 Modelling Overview

2.1 Scope

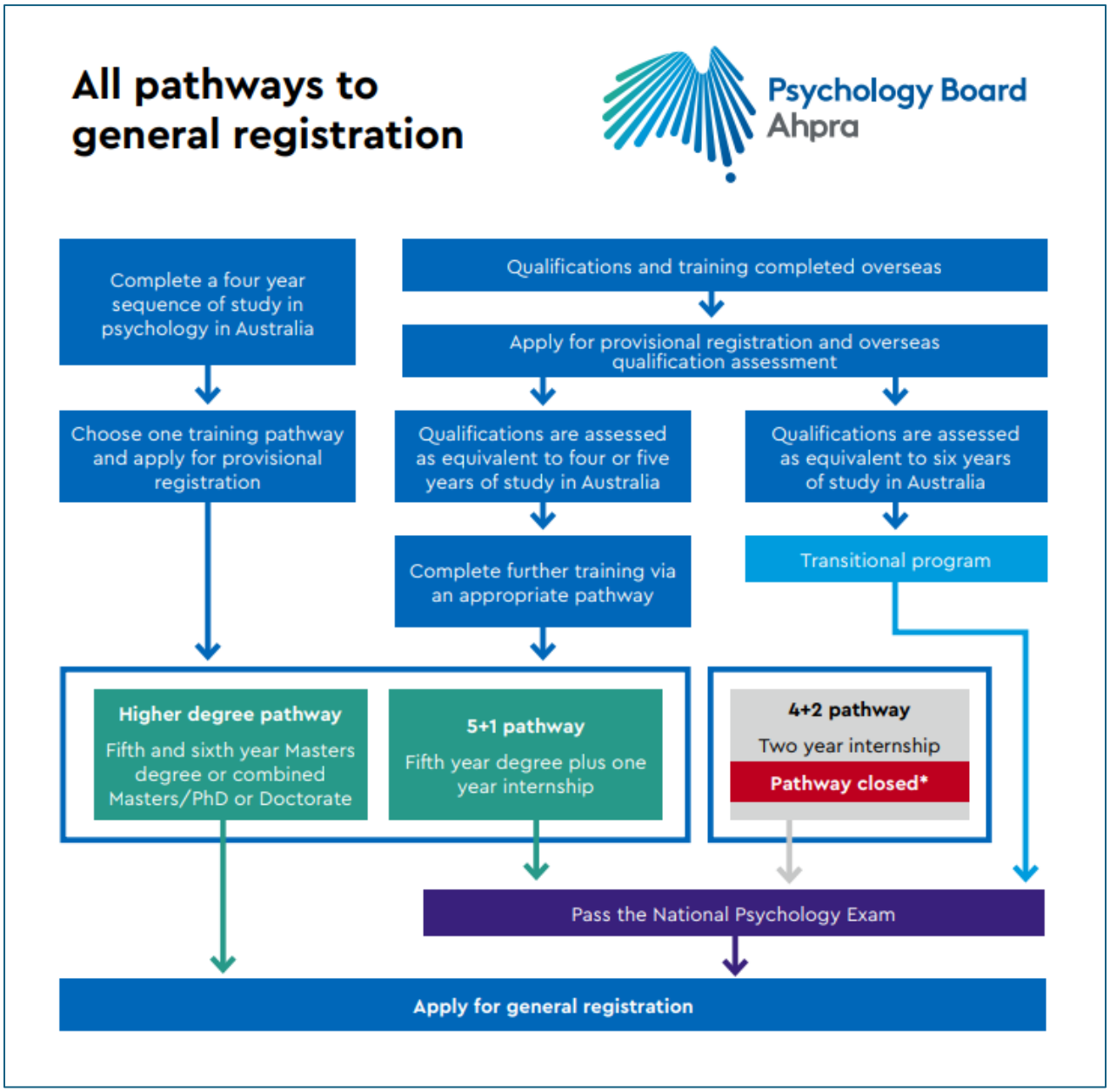
In Australia, psychologists must be registered with the Psychology Board of Australia (PBA) to practise. There are different registration types corresponding to different levels of training and experience: general registration, provisional registration and non-practising registration. The details of programs of study approved by the PBA that lead to different types of registration as psychologist can be found here: Approved programs of study.

Most psychologists have general registration. To become eligible for general registration, an individual must complete a six-year sequence of education and training. This typically consists of a four-year board-approved accredited program in psychology, followed by a further two years of board-approved education and training, completed while registered as a provisional psychologist. Fourth-year graduates can choose from the higher degree pathway or the 5+1 internship pathway.

Internationally trained psychologists seeking to work in Australia must apply for provisional registration and assessment of overseas qualifications. Overseas trained psychologists assessed as having completed the equivalent of 6 years of study in Australia are required to undertake a transitional program. Figure 1 shows the various pathways to obtaining general registration as a psychologist in Australia.

[1] The workforce projections have been estimated over a 15-year period, rather than the 25-year horizon used in medical supply and demand studies, due to relatively shorter training pipeline for psychologists.

Figure 1: Pathways to general registration



*Pathway closed to new applicants on 30 June 2022.

This study focuses on modelling the supply of and demand for psychologists who hold either general or provisional registration. For the purposes of the modelling, psychologists are classified into 3 groups:

1. Trainee provisional psychologists
2. Psychologists working in heath settings and
3. Psychologists working in other settings.

Trainee provisional psychologists are those with provisional registration undertaking their 5th and 6th year of study in Australia as identified by the board pathway. The remainder of the provisionally registered psychologists (as identified by their board pathway) were those on the Transitional program. These are internationally qualified psychologists whose qualifications were assessed as equivalent to 6 years of study in Australia). Psychologists with general registration and those on the Transitional program were categorised as working in health settings or other settings based on the combination of the area and setting of their job.

Psychologists in health settings and other settings are defined as those having general registration (or provisional registration on the Transitional program) and the combinations of job setting and job area are outlined in Table 1.

Table 1: Description of psychologist categories for modelling

Category	Job setting	Job area
Psychologist in health settings	• Solo private practice • Group private practice • Medical centre/GP Practice • General practitioner (GP) practice • Other private practice • Community mental health service • Community drug and alcohol service • Rehabilitation/physical development service • Other community health care service • Correctional service • Aboriginal health service • Aboriginal Community Controlled health service • Other Aboriginal health service • Outpatient service • Residential aged care facility • Residential mental health care service • Other residential health care facility	• Mental health intervention • Behavioural assessment • Counselling • Neuropsychological/ cognitive assessment • Physical health/ rehabilitation • Psychology management/ administration • Educational/ developmental • Other

Category	Job setting	Job area
Psychologist in other settings	All remaining combinations of job setting and job area. Includes settings such as: • Disability services • Commercial/business service • Schools/tertiary/other educational facility • Defence forces • Other government department/agency Sports centre/clinic	

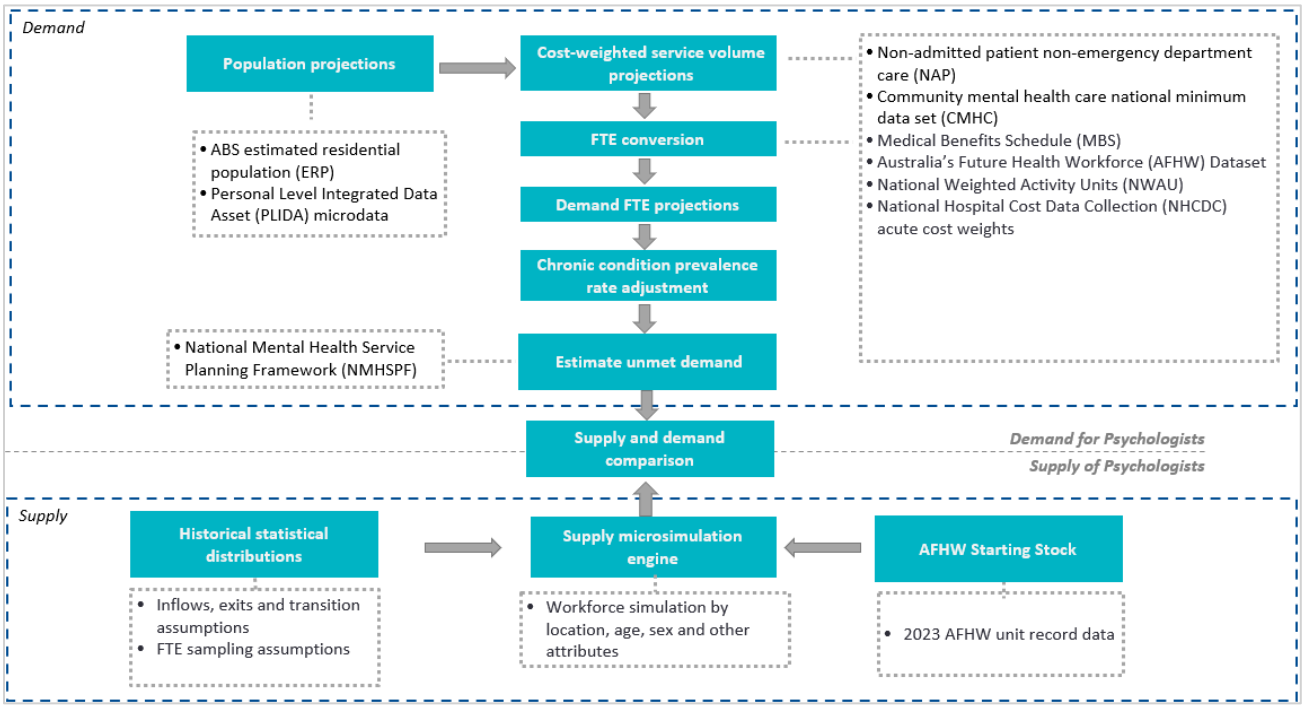
Due to data constraints, demand modelling is limited to psychology services delivered in health settings. As a result, supply projections for psychologists in other settings and trainee provisional psychologists are presented without corresponding demand estimates.

Modelling has been undertaken at the Statistical Area 4 (SA4) geography (where data availability permitted). However, results will be published at state and territory level, with their aggregation forming the national results.

3.0 Psychology modelling process overview

Figure 2 provides an overview of the modelling process. The following sections explains the steps in further detail.

Figure 2: Overview of the psychology modelling process



4.0 Psychology Supply

The 2014 to 2023 Australia's Future Health Workforce (AFHW) data on psychologists is used to model supply. The model uses the microsimulation approach where attributes such as entries and exits to the workforce and psychologist Full-Time Equivalent (FTE) are modelled distinctly. The supply methodology begins by identifying the current stock of psychologists, analysing their demographic profile and historically observed work patterns. Statistically significant predictors of future psychology workforce supply (such as age, sex, etc.) are selected, and their historical distributions are measured to allow the development of a microsimulation model.

The microsimulation works at a yearly time-step, tracking the progressing psychologists throughout their career. Each year, it accounts for new entries, removes psychologists who take temporary or permanent leave, and simulates transitions of psychologists between geographic locations. The following sections describe how each component is defined and modelled.

The baseline projections assume an initial equilibrium between supply and demand in the base year, **2023**.

4.1 Key data inputs

The key dataset used for the psychology supply modelling is extracted from the following data source:

#	Source	Description and use in model
1	Australia's Future Health Workforce (AFHW) dataset	The AFHW datasets are created from the National Health Workforce Datasets (NHWDS) for modelling purposes. A sequence of rules (supply criteria) is applied to each NHWDS to determine which practitioners meet the definition of supply for each profession (and sub-groups where applicable). The headcount and workload of these practitioners, along with other variables required for modelling, are included, derived or imputed in the AFHW datasets. The AFHW dataset contains unit record data on psychologists, including demographic variables and information on their career (such as hours worked which is converted to FTE).

4.2 Historic and starting stock

The AFHW data is a unit record longitudinal dataset, where each respondent is assigned a unique identifier that can be linked across multiple years. To be in scope, psychologists must be:

1. registered as a psychologist with PBA/Australian Health Practitioner Regulation Agency (Ahpra) with general or provisional registration [2]
2. working in psychology in Australia, including those on extended leave
3. working clinical hours in psychology.

[2] In April 2020, Ahpra established the pandemic response sub-register to bolster the health workforce during the COVID-19 pandemic by allowing temporary registration of practitioners. These practitioners have been excluded from the scope of modelling.

4.2.1 Total Hours (Full-Time Equivalent)

Total hours (clinical and non-clinical)[3] of psychologists are used in modelling supply. If a psychologist is employed but on extended leave (defined as a period of over 3 months), their hours are halved for simplicity, assuming they worked an average of 6 months during the year.

One FTE is defined as 38 self-reported weekly average hours in the AFHW dataset (across 46 weeks in the year).

4.3 Measuring entries, exits and transitions

The AFHW dataset enables tracking of individuals as they age, relocate, progress in their careers and transition in and out of the workforce. Historical data relating to entries, exits and transitions is used to determine future trends based on the analysis of historical demographic probabilities and distributions.

The demographic probabilities and distributions are sampled to understand the effects of age, sex, state of primary workplace and place of initial qualification on workforce patterns.

4.3.1 New entries

New entries into the psychology workforce include individuals entering as domestic graduates and internationally trained psychologists.

A new entry is defined as a psychologist who is within the scope of 'supply' in the base year, but not within 'supply' in previous 4 years.

There is no publicly available data on the number of domestic graduates and internationally trained psychologists entering the workforce. As a result, the AFHW dataset is used to identify new entries. In the supply model, it is assumed that the number of new entries remains constant over the projection period. For psychologists in health settings and other settings, the new entries are based on the average number of new entries over 2019 to 2023. For trainee provisional psychologists, new entries are based on the number of new entries observed in 2023.[4]

4.3.2 Exits and re-entries

Exits from the psychology workforce are determined using historical AFHW data by tracking individual psychologist's participation over time. Psychologists who appear in the AFHW data in

[3] Clinical hours are defined as hours reported in clinical roles which involve direct patient care. Non-clinical hours are defined as hours reported in non-clinical roles (including teacher, researcher, administrator including managers) that do not involve direct patient care.

[4] In April 2020, Ahpra established the pandemic response sub-register to bolster the health workforce during the COVID-19 pandemic by allowing temporary registration of practitioners. This sub-register concluded in April 2022. Practitioners who wished to continue practicing after its closure could apply for formal registration on the main register through a transition pathway. Consequently, there was a temporary increase in provisional registrants in 2021 and 2022, which returned to 2020 levels by 2023. Therefore, new entries for trainee provisional psychologists are based on 2023 data.

one year but not the next are classified as having exited the workforce. Exits are modelled by age, sex, place of initial specialist qualification and state of primary workplace as covariates.

These one-period exits are further classified as temporary or permanent exits:

- **Temporary exits**: refers to a psychologist who leaves the workforce after working for at least one reporting period (i.e. one year) but returns to the psychology profession within a 4-year period.[5] The point of re-entry is estimated based on the rate at which psychologists who leave the workforce return in subsequent years. The modelling of re-entry probabilities includes the same covariates as exits i.e. age, sex, place of initial specialist qualification and state of primary workplace.
- **Permanent exits**: refers to a psychologist who, after working for at least one reporting period (i.e. one year), leaves the workforce and does not return within a 4-year period.

4.3.3 Interstate transitions

Interstate movement of psychologists is estimated based on the probability of psychologists changing their primary place of work from one state/territory to another. Covariates used to determine transition rates and destinations are the current state of the psychologist's primary workplace, sex, age and place of initial specialist qualification.

4.3.4 Estimating full-time equivalent (FTE) of entries, re-entries and transitions

The number of FTE each psychologist works is a central component of the model. FTE is a measure which can vary significantly between individuals and years. One FTE is defined as 38 self-reported weekly average hours worked.

To account for the variations in FTE across different demographic group of psychologists, the simulated psychology workforce FTE distribution is estimated by age, sex and state of primary workplace. This is done by:

1. Re-sampling an existing psychologists FTE annually to reflect their demographic attributes, as it may change from year to year. Additionally, their FTE is adjusted by a time-dependent modifier based on changes to the average FTE observed over the past 5 years.
2. Additional FTE adjustments, in the form of a series of multipliers, is then applied to a psychologist FTE, following one of the workforce status changes below:
    - a workforce exit or entry, or

[5] The 4-year period is used because practice considerations become less relevant beyond that timeframe. This approach is used for both historical and future workforce exits.

- a change in state of workplace

These adjustments are applied after the new FTE re-sampling has been applied. This is because the adjustments effectively adjust for breaks in regular employment.

4.4 Supply Modelling

A microsimulation process is used to project supply for psychologists. An overview of this process is shown in Figure 3 below. The supply model uses the following attributes:

1. FTE based on 38 hours per week
2. sex
3. age
4. place of initial qualification (domestic or international)
5. primary work location (state, SA4).

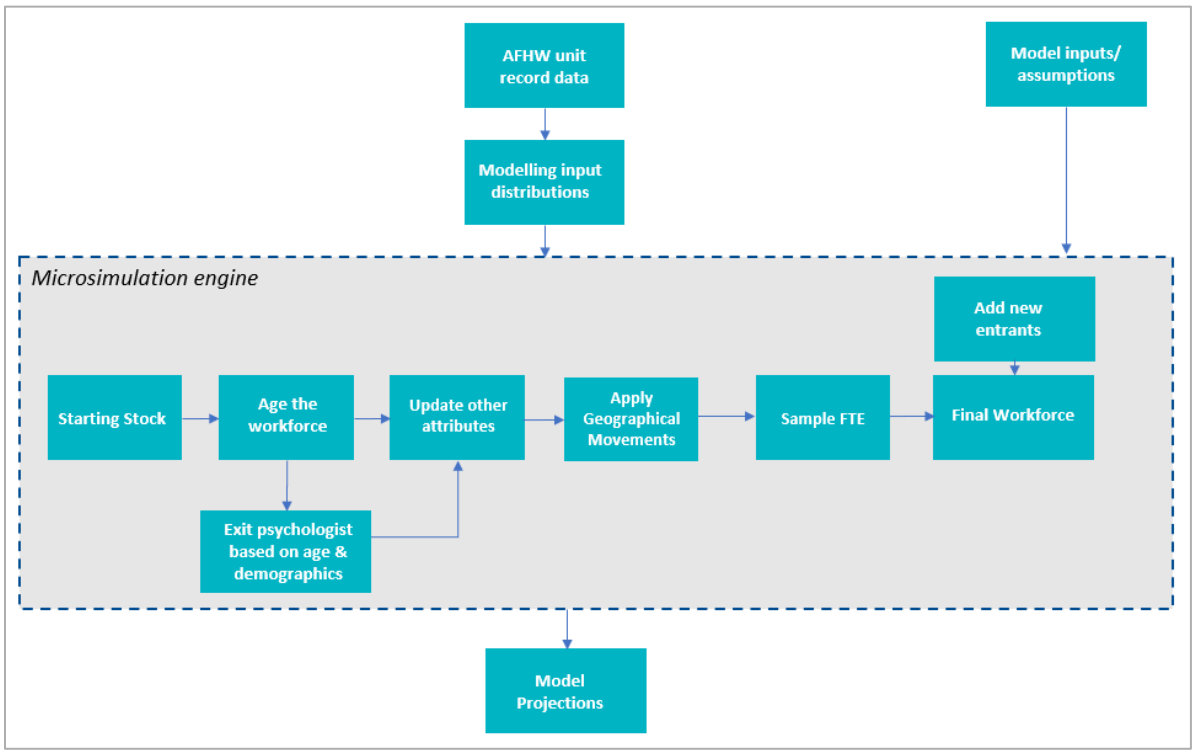
In each iteration of the microsimulation:

1. The workforce is aged, and some psychologists exit the workforce based on their age, sex, specialty graduation country and state of primary workplace.
    a) Exits are sampled to determine if the exit is permanent or temporary.
    b) Psychologists that temporarily exit will re-enter the workforce during a subsequent period of up to 4 years, in accordance with the historical distribution of re-entries following up to 4 periods of absence.
2. Geographical movements are applied to psychologists based on historic state/territory migration patterns broken down by sex, age, place of initial specialist qualification and state/territory of primary workplace.
3. FTE is updated based on smoothed historical FTE year-on-year changes by age, unless a psychologist:
    a. geographically transitions to a different state/territory or
    b. returns from a temporary exit.
4. Psychologists that are flagged for re-entry are brought back into the workforce based on a re-entry probability, which is determined by factors such as age, place of initial qualification and state/territory of primary workplace. The FTE for re-entering psychologists is sampled from a distribution modelled on historical AFHW data.
5. New psychologists are added to the workforce either as:
    a. a domestic graduate or
    b. an internationally trained psychologist.

6. The modelling process iterates annually, where the number of psychologists in the following year is calculated as the number of psychologists in the current year, minus the number of psychologists exiting and transitioning-out, plus those entering the workforce and transitioning-in in the new year. In other words:

$$\text{Supply}_{(t+1)} = \text{Supply}_{(t)} - \text{Exits}_{(t+1)} + \text{Entries}_{(t+1)} + \text{Net transitions while staying employed}_{(t+1)}$$

Figure 3: The supply microsimulation process



4.5 Assumptions

#	Caveat/Limitation	Description and implications
1	Static sampling assumptions	The microsimulation module applies static sampling distributions based on historical data from 2019 to 2023 to simulate projected behaviour, except for average FTE distribution which is adjusted based on historical trends.

#	Caveat/Limitation	Description and implications
2	New entries	The supply model assumes the number of newly qualified domestic and international psychologists entering the workforce will remain constant throughout the projection period. For psychologists in health settings and other settings, the new entries are based on the average number of new entries over 2019 to 2023. For trainee provisional psychologists, new entries are based on the number of new entries observed in 2023.[6]
3	COVID-19 impact	The effects of the COVID-19 pandemic on affected years (2020-2021) remains unclear and will be clarified with further analysis of updated data. The potential impact of the pandemic on workforce supply is still unknown.
4	Technological change	Technological improvements during the projection period that may affect workforce FTE in providing care are not considered.

5.0 Psychology Demand

Demand is measured in terms of observed utilisation of psychology services which captures expressed (observed) service demand for psychology services within health settings. Historical patterns of usage are examined and used to estimate the future demand for psychologists in health settings, accounting for differences in service demand across various age groups and geographies. Estimation of future demand for psychology services also considers the Australian Bureau of Statistics (ABS) Population Projections.

As mentioned previously, demand modelling is limited to psychological services delivered in health settings.

The model, known as the Medical Specialist Health Workforce Prediction of Demand (MeSHWPoD) is used by the Department of Health, Disability and Ageing (the Department) to provide demand projections for the specialist workforce. The MeSHWPoD method is adapted to model psychology demand.

For further details on MeSHWPoD methodology with worked examples, please refer to ***Attachment A***.

[6] See footnote 4.

5.1 Unmet demand

Unmet demand for psychology services occurs when there are not enough psychology services to meet the needs of people who require them. This study uses the National Mental Health Service Planning Framework (NMHSPF) to estimate the level of unmet demand.[7]

The NMHSPF provides estimates of prevalence of mental health conditions by severity (mild, moderate or severe) and age-group, which are then used to define smaller populations – referred to as "need groups".

For each need group, a care profile is assigned where the number of mental health services the group will need is estimated, including the:

- proportion of individuals within the needs group requiring a specific service
- number of services needed
- length of time each service takes (in minutes or days)
- workforce type delivering the service (e.g. individual psychologist or team/bed-based care).

This information together with the formulas outlined in the Technical Appendices for the NMHSPF is used to estimate unmet demand.[8]

To estimate the unmet demand for psychologists in health settings not covered by the NMHSPF, such as community drug and alcohol services and correctional services, the study uses similar unmet demand proportions as those included in the framework.

Additionally, within the NMHSPF, the demand for psychologists in certain settings is categorized under 'Tertiary Qualified unspecified' (TQ unspecified) along with other allied health professions. Of the TQ unspecified service activities, 92.5% of those funded by the Commonwealth government or jointly by the Commonwealth and state governments are allocated to psychologists. This allocation is based on the analysis of the proportion of Better Access services claimed by psychologists in the MBS data.[9]

For services funded solely by state governments, 7.9% is allocated to psychologists, as recommended by the University of Queensland. This recommendation is based on the level of services attributed to psychologists reported in the Mental Health Establishment data.

[7] Australian Institute of Health and Welfare, NMHSPF model - National Mental Health Service Planning Framework, 2024, accessed 5 March 2025.
[8] Diminic, S., Page, I., Gossip, K., Comben, C., Wright, E., Pagliaro, C., John, J. & Wailan, M. 2023. Technical Appendices for the Introduction to the National Mental Health Service Planning Framework – Commissioned by the Australian Government Department of Health. Version AUS V4.3. The University of Queensland, Brisbane, accessed 5 March 2025.
[9] Department of Health, Disability and Ageing, 2025, Better Access Initiative, accessed 6 March 2025.

5.2 Key data inputs

The key datasets used for the psychology demand modelling are extracted from the following sources:

#	Source	Description and use in model
1	Medical Benefits Schedule (MBS) data	Contains data on patients billed through the MBS, including patient demographics such as age, sex, location, service provider location, the specific MBS item and benefit paid. A hospital flag indicator is used to exclude any MBS services delivered in hospitals to avoid overlap with Admitted Patient Care (APC) data/Private Hospital Data Bureau (PHDB) data.
2	National Non-Admitted Patient Database (NNAPD)	Contains data on services provided to non-admitted patients in Australian public hospitals, including the types of services provided, service delivery settings and selected patient characteristics. This data collections exclude non-admitted patient services provided during emergency department care and to admitted patients.
3	Community Mental Health Care Database (CMHC)	Contains service contact data at the patient level for public sector specialised community mental health services. This data collection excludes admitted patient mental health care services, support services that are not specialised mental health care services (e.g. accommodation support services), and services provided by non-government organisations and residential care services.
4	Population and household projections based on ABS data	Population and household projections developed by the Department based on ABS Series B population projections and the ABS Census household distribution type. Population projections by age group, sex, geography and year.
5	National Weighted Activity Unit (NWAU)	NWAU is used as part of the National Funding Model and is a measure of health service activity expressed as a common unit, against which the National Efficient Price (NEP) is paid. It provides a way of comparing and valuing

#	Source	Description and use in model
		each public hospital service, including emergency care, subacute care, admitted care and non-admitted care, weighted for clinical complexity.
6	National Hospital Cost Data Collection (NHCDC)	NHCDC public sector, collected through the states and territories, is an annual and voluntary collection of public hospital data. The NHCDC is used to develop the national efficient price, which determines the level of funding public hospitals receive annually.

5.3 How services for psychologists are defined

Defining services within the scope of practice for psychologists is done using dataset-specific methods, explained below.

5.3.1 MBS data and Derived Major Specialty

A provider may have more than one registered specialty with Medicare. The Derived Major Specialty (DMS) classification provides a single specialty, derived to represent the major/highest qualification and/or major activity of a provider during the observed period according to the type of services delivered. Psychology services from MBS data are derived using the DMS group(s) for psychologists.

More specifically, DMS codes have 3 progressive levels. The first level is determined solely by the provider's highest registered specialty. The second and third levels are determined by the provider's qualifications and major services provided.

Providers who are classified as DMS level 3: Psychologist – Clinical or Psychologist – Non-Clinical, are identified as in-scope for the psychology demand model.

5.3.2 NNAPD data

To determine in-scope outpatient psychology services within the NNAPD data, the Non-Admitted Services Classification (Tier 2) is used. Tier 2 categorises a hospital's non-admitted services into classes which are generally based on the nature of the service provided and the type of clinician providing the service.

Table 3: In-scope Tier 2 classification codes for psychology NNAPD data

Tier 2 classification	Description
20.04	Developmental Disabilities
40.14	Neuropsychology
40.29	Psychology

5.4 Definition of Demand Activity

Psychology services from each data source are grouped into 3 categories:

1. MBS billings
2. Public Hospital Non-admitted (NNAPD) and
3. Community mental health care.

It is worth noting that the number of services alone is not a sufficient metric for comparison, as each require varying levels of resources, particularly in terms of workforce effort. This measure does not consider the severity of conditions, complexity of procedures, or degree of workforce input required.

To address this, services or separations are converted into a more universal metric known as units of demand activity. This metric is weighted to better represent the relative effort required by psychologists for each service and allows for a more accurate comparison of resource use within each category.

5.4.1 MBS billings

The weighting factor is calculated as the benefits paid for in-scope services (year x provider location x patient sex x patient age x patient location) divided by the reference cost which is the average benefit paid for in-scope services for a given specialty and year. The number of services is then multiplied by this weighting factor to calculate the weighted demand activity.

An adjustment is applied to psychology telehealth items in the historical data used in the demand activity projections. Previous analysis undertaken relating to the telehealth impact on FTE estimation indicated that telehealth items required 20% less FTE than the equivalent face to face items. This 20% adjustment factor is applied across all telehealth items claimed by psychologists in the historical data.

5.4.2 Public Hospital Non-admitted (NNAPD)

The NNAPD services are weighted using NWAU cost-weights published by the Tier 2 classification.

5.4.3 Community Mental Health Care (CMHC)

Unlike other datasets, CMHC data does not break down by practitioner type, and there is no existing cost-weighting system for these services. As a result, CMHC activity cannot be cost-weighted, and modelling relies solely on the number of services provided.

Additionally, psychologist-specific activity within CMHC must be estimated. Using the Mental Health Service Planning Framework (MHSPF) v4.3, we have determined the proportion of clinical community treatment activity attributable to psychologists, based on the distribution of services across patient age groups (see Table 4).

Table 4: Psychologist allocation in community mental health treatment by patient age group (sourced from MHSPF v4.3)

Age group	Psychologist allocation
0-11 years	15.0%
12-24 years	16.0%
25-64 years	9.0%
65+ years	9.0%

5.5 Projection of Demand Activity

The process of projecting the count of services over the forecast period consists of the following key steps:

1. Calculate and project service utilisation using a Generalised Linear Model (GLM) - The covariates in the GLM model include year, patient age group, patient sex, and patient/provider location. Population projections are used for estimation of the population at risk.
2. Demand activity projections are then converted to FTE by comparing the demand values against the supply FTE from AFHW dataset for a specified reference base year. Specifically, the base year supply FTE is divided by the base year demand activity to yield an FTE-to-activity ratio, which is then multiplied by the demand projections for each forecast year. This forms the baseline projection.
3. To incorporate mental health prevalence rate to the model, the projected FTE is adjusted with the projected change in mental health prevalence rate.

5.6 Assumptions

#	Caveat/Limitation	Description and implications
1	COVID-19 impact	While the effects of COVID-19 are not explicitly modelled, they are implicitly captured in two ways: 1. The most recent hospital and MBS data, available through to 2022, reflect pandemic-related shifts in service demand, which influence the model's future projections. 2. The inclusion of COVID-19 telehealth and telephone MBS item codes reflects some of the adjustments made during the pandemic.

#	Caveat/Limitation	Description and implications
		However, the model may not fully reflect the long-term shifts in demand patterns resulting from the pandemic.
2	Community Mental Health Care (CMHC) data	In the absence of an existing cost-weighting system for CMHC services, only the number of services provided will be used in the model. Additionally, psychologist-specific activity within CMHC is estimated using the Mental Health Service Planning Framework (MHSPF) v4.3.
3	Combining different data sources	MBS services are converted to FTE using Private FTE from AFHW data, and NAP and CMHC services are combined and converted to FTE using public FTE. Differences in data collection methods and definitions across these sources could introduce inconsistencies.
4	Estimation of unmet demand for psychologists in health settings not in-scope of NMHSPF	To estimate the unmet demand for psychologists in health settings not covered by the NMHSPF, such as community drug and alcohol services and correctional services, we use similar unmet demand proportions as those included in the framework.
5	Allocation of Tertiary Qualified (TQ) unspecified service activity to psychologists	Within the NMHSPF, the demand for psychologists in certain settings is categorized under 'Tertiary Qualified unspecified' (TQ unspecified) along with other allied health professions. Of the TQ unspecified service activities, 92.5% of those funded by the Commonwealth government or jointly by the Commonwealth and state governments are allocated to psychologists. This allocation is based on the analysis of the proportion of Better Access services claimed by psychologists in the MBS data.[10]

[10] Department of Health, Disability and Ageing, 2025, Better Access initiative, accessed 6 March 2025.

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All information in this publication is correct as at April 2026.