National MHSPF Mental Health Service Planning Framework

Technical Appendices for the NMHSPF

June 2023 - V4 . 3

Population Based Planning for Mental Health

Acknowledgment

This document builds on earlier NMHSPF model development and documentation commissioned by the Australian Government Department of Health and developed by New South Wales Ministry of Health (Phase 1, 2011-2013) and The University of Queensland (Phase 2, 2016; Phase 3, 2018-2021).

Suggested citation

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.

CONTENTS

APPENDIX 1 – NMHSPF BRIEF FOR PLANNERS

Introduction to the National Mental Health Service Planning Framework and its role in regional mental health service planning

What is the National Mental Health Service Planning Framework?

The National Mental Health Service Planning Framework (NMHSPF) is an evidence-based framework designed to help users at the state and territory (jurisdiction), Primary Health Network (PHN) and Local Hospital Network (LHN) level plan, coordinate and resource mental health services to meet population needs. The development of the NMHSPF commenced under the Fourth National Mental Health Plan (2009) and has involved input from over 250 experts in mental health or service modelling from around Australia in multiple phases of refinement. This has included representatives from the medical, nursing, allied health, consumer and carer fields, the NGO sector, peak bodies and research organisations. The Fifth National Mental Health and Suicide Prevention Plan (2017) and the National Mental Health and Suicide Prevention Agreement (2022) endorsed the continuing development of the NMHSPF and the release of NMHSPF planning tools to support integrated mental health service planning and the development of joint regional mental health and suicide prevention plans.

The NMHSPF provides a comprehensive model of the mental health service types and resources required to meet the needs of a given population, across the full spectrum from community focused programs to promote mental health and prevent the onset of mental health problems, to the most intensive services for people with severe disorders. The specific interventions required by individuals with mental health problems and mental illness are described across ages and levels of severity, showing the complementary roles, functions and target groups appropriate for the primary, private, public and nongovernment sectors. The NMHSPF Planning Support Tool (NMHSPF-PST) enables estimates of the services required by a particular geographic catchment to be generated for forward planning years, including estimates of the numbers of people requiring different types of treatment or care, the workforce required to deliver these services and the associated costs.

How can service planners get access to the NMHSPF and NMHSPF-PST?

The NMHSPF is a sophisticated model and successful application requires a sound understanding of its structure, underlying assumptions and limitations, as well as the development of appropriate skills in using the NMHSPF-PST. To limit the risk of unskilled and inappropriate use of the NMHSPF, access to the NMHSPF materials and NMHSPF-PST has been restricted to employees of PHNs, LHNs and jurisdictions whose organisation has entered into a licence agreement and who have completed the required training. As of 2019, more than 200 users had completed training under the initial 3-stage training model. A revised online training model was released in late 2021.

How is the NMHSPF applied in regional planning?

The NMHSPF provides a strong foundation for integrated regional planning across the primary health, specialised mental health and non-government sectors through its modelling of the full spectrum of needs and establishment of a consistent taxonomy and definitions of required service

types. At the local level the NMHSPF provides a nationally endorsed estimate for services, against which available service capacity can be compared to inform identification of priorities for planning and service development. Good knowledge of the available service system and patterns of use is required to complete this process. At this stage, NMHSPF estimates reflect the age, rurality and Indigenous profile of the specific catchment. Other variations in geographic or demographic attributes of the particular population are not adjusted for. Adjustments to address these factors need to occur as a second stage of planning, based on local knowledge of the catchment population and service context. It is important that planners recognize this need for interpretation and application of the NMHSPF outputs to the local context and have access to appropriate knowledge and information about the target population and service system to undertake this process.

To assist licensed users to conduct comparative analyses against NMHSPF outputs, the Australian Institute of Health and Welfare and The University of Queensland have undertaken projects to map data from existing national mental health data collections to the NMHSPF outputs, and enable reporting of these results at the PHN, LHN and SA3 level.

Is ongoing support provided to users of the NMHSPF?

The Australian Institute of Health and Welfare provides general support to licenced users of the NMHSPF via a dedicated email (NMHSPF.aihw@aihw.gov.au).

APPENDIX 2 – PROJECT CONTRIBUTORS

The National Mental Health Service Planning Framework (NMHSPF) has been developed with the input and expertise of hundreds of individuals around Australia, including epidemiologists, service managers and planners, public and private sector clinicians, community sector professionals, consumers, carers, academics and other technical experts. Without the generous contributions of these individuals, this work would not have been possible. Below is a list of the project teams and contributors involved in the model's development from 2011 to 2021. The contributors listed have provided varying levels of input from information and data sharing via email to attendance at NMHSPF expert panel meetings. Contributors listed may not endorse the current NMHSPF model. We also thank additional anonymous participants who have contributed to online surveys relating specific modelling questions.

Many inputs to the NMHSPF are based on data provided by various data custodians including the Australian Institute of Health and Welfare (AIHW), Australian Bureau of Statistics (ABS) and jurisdictions. We thank all organisations who have contributed data to ensure the NMHSPF outputs are based on a strong foundation of Australian data.

NMHSPF Phase 1, 2011-13

Project Team

Brian Woods, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Judith Burgess, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Cath King, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Kevin Fjeldsoe, Mental Health Alcohol and Other Drugs Branch, QLD Health
Marie Kelly, Mental Health Alcohol and Other Drugs Branch, QLD Health
Anna Kollias, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Karissa Maxwell, Mental Health Alcohol and Other Drugs Branch, QLD Health
Harry Perlich, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Ravneet Ram, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Meredith Sims, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Linda Smith, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Lauren Stocks, Mental Health Alcohol and Other Drugs Branch, QLD Health

Executive Group

David McGrath, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Bill Kingswell, Mental Health and Other Drugs Directorate, QLD Health
Brenton Alexander, Department of Health
Eddie Bartnik, Mental Health Commission, Western Australia
Richard Bromhead, Policy and Government Relations, ACT Government Health Directorate
David Davies, Mental Health and Substance Abuse, South Australia
Karleen Edwards, Department of Health, Victoria
Nick Goddard, Department of Health and Human Services, Tasmania
Bronwyn Hendry, Department of Health and Families, Northern Territory

David Mackay, Mental Health and Drug Treatment Division, Department of Health
Frances Pagdin, Department of Health and Families, Northern Territory
Alan Singh, Department of Health
Paul Smith, Mental Health Drugs & Regions Division, Department of Health, Victoria

Modelling, Working Group and Reference Group Members

Julie Anderson, MHCA National Register Mental Health Consumer & Carer Representative
David Barton, Southern Health, Melbourne Health, Victoria
Bridget Bassilios, School of Population Health, The University of Melbourne
Michael Berk, Deakin University Chair in Psychiatry at Barwon Health, Victoria
Joyce Bowden, Mental Health Service, Northern Territory
Bill Buckingham, Mental Health Information Development
Peter Burnett, North Western Mental Health, Victoria
Alison Calear, Centre for Mental Health Research, Australian National University
Joe Calleja, Richmond Fellowship of Western Australia
Rob Carter, Deakin Health Economics, Deakin University, Victoria
Helen Christensen, Black Dog Institute, The University of NSW
Peter Collicoat, Mental Health Services, Albury Wodonga Health, Victoria
Mark Dadds, School of Psychology, The University of NSW
Frances Dark, Rehabilitation Services, Princess Alexandra Hospital, Queensland
Sandra Diminic, School of Population Health, The University of Queensland
Brett Emmerson, Metro North Mental Health Services, Royal Brisbane and Women's Hospital
Jane Gunn, Department of General Practice, The University of Melbourne
Patrick Hardwick, National Mental Health Consumer & Carer Forum
Meredith Harris, School of Population Health, The University of Queensland
Sam Harvey, School of Psychiatry, The University of NSW
Ian Hickie, Brain and Mind Institute, The University of Sydney
Felice Jacka, School of Medicine, Deakin University
Anthony Jorm, Melbourne School of Population Health, The University of Melbourne
Robert Knowles, National Mental Health Commissioner, Mental Health Council of Australia
Beth Kotze, Mental Health Children and Young People, NSW Ministry of Health
Melissa Lee, Mental Health ACT, ACT Health Directorate
Louise McCutcheon, Orygen Youth Health, Victoria
Eileen McDonald, National Mental Health Consumer & Carer Forum
Helen McGowan, NMHAS-Mental Health, Older Adult Program, Western Australia
Roderick McKay, South Western Sydney Local Health District
Gemma McKeon, School of Psychology, The University of Queensland
David Meldrum, Mental Illness Fellowship of Australia, South Australia
Cathy Mihalopoulos, Deakin Population Health SRC, Faculty of Health, Deakin University
Philip Mitchell, School of Psychiatry, The University of NSW
Judi Morris, Mental Health Commission, Western Australia
Noel Muller, National Mental Health Consumer & Carer Forum
Moira Munro, Perth Clinic, Western Australia
Gerard Naughtin, Mind Australia, Victoria

Heather Nowak, MHCA National Register Mental Health Consumer & Carer Representative
Mark Oakley-Browne, Statewide and Mental Health Services
Quinn Pawson, Prahran Mission, Victoria
Joe Petrucci, Cairns and Hinterland Mental Health and ATOD Service, Queensland
Daniel Rock, North Metropolitan Area Health Service, Western Australia
Perminder Sachdev, School of Psychiatry, The University of NSW
Louise Salmon, COPMI Initiative, Sydney Registry of the Family Court of Australia
Gail Sant, MHCA National Register Mental Health Consumer & Carer Representative
Dan Siskind, Princess Alexandra Hospital, Queensland
Meg Smith, Mental Health Association of NSW
Simon Stafrace, Alfred Health, Victoria
Gavin Stewart, Applied Epidemiology
Amelia Traino, Mental Health and Substance Abuse Division, SA Health
Theo Vos, School of Population Health, The University of Queensland
Harvey Whiteford, Psychiatry and Population Health, The University of Queensland
Derek Wright, Recovery Solutions Group, New Zealand
Lily Wu, MHCA National Register Mental Health Consumer & Carer Representative

Other Direct Contributors

Philip Burgess, School of Population Health, The University of Queensland
Georgia Carstensen, School of Population Health, The University of Queensland
Terence Cheng, Faculty of Business and Economics, The University of Melbourne
Sandra Davidson, Department of General Practice, The University of Melbourne
Grant Devilly, School of Applied Psychology and Griffith Health Institute Griffith University
Tara Donker, Black Dog Institute, The University of NSW
Laura Hart, School of Psychological Science, La Trobe University
David Hartman, Townsville Child and Youth Mental Health Service
Samantha Hollingworth, School of Pharmacy, The University of Queensland
Margaret Jones, CAMHS, Child and Adolescent Mental Health
Jayashri Kulkarni, Monash Alfred Psychiatry Research Centre, Melbourne
Stuart Lee, Monash Alfred Psychiatry Research Centre, Melbourne
Christopher Lilley, Sunshine Coast and Youth Mental Health Service
Caroline Marshall, Queensland Centre for Mental Health Research
Siân McLean, School of Psychological Science, La Trobe University
Caroline Moul, School of Psychology, The University of NSW
Susan J Paxton, School of Psychological Science, La Trobe University
Katherine Petrie, Black Dog Institute, The University of NSW
Nicola Reavley, Melbourne School of Population and Global Health, The University of Melbourne
Grant Sara, InforMH, NSW Ministry of Health
Michael Sawyer, Women's and Children's Hospital, North Adelaide
Roman Scheurer, Queensland Centre for Mental Health Research
Titia Sprague, Mental Health Children and Young People, NSW Ministry of Health
Nickolai Titov, Department of Psychology, Macquarie University

NMHSPF Phase 2, 2016

Project Team

Harvey Whiteford, School of Public Health, The University of Queensland
Sandra Diminic, School of Public Health, The University of Queensland
Ides Wong, School of Public Health, The University of Queensland
Kevin Fjeldsoe, Queensland Centre for Mental Health Research, Queensland
Kate Gossip, School of Public Health, The University of Queensland
Meredith Harris, School of Public Health, The University of Queensland
Elizabeth Leitch, School of Public Health, The University of Queensland
Judith Burgess, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Harry Perlich, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Ravneet Ram, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Suzanna Rona, Mental Health and Drug and Alcohol Office, NSW Ministry of Health

Steering Group

Colleen Krestensen, Australian Government, Department of Health
Bill Buckingham, Australian Government, Department of Health
Aaron Groves, SA Health
Nicole Jarvis, Australian Government, Department of Health
Bill Kingswell, Mental Health, Alcohol and Other Drugs Branch, QLD Health
Karin Lines, NSW Ministry of Health
Michael Moltoni, Mental Health Commission, Western Australia
Paul Smith, Department of Health and Human Services

Panel Members

Julie Anderson, MHCA National Register Mental Health Consumer & Carer Representative
Bridget Bassilios, School of Population Health, University of Melbourne
Tarun Bastiampillai, Mental Health Strategy, South Australia Health
Peggy Brown, Mental Health Directorate, NT Department of Health
Ellen-Jane Browne, Mental Health and Drugs Branch, Department of Health and Human Services, VIC
Bill Buckingham, Commonwealth Department of Health
Judith Burgess, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Peter Burnett, North Western Mental Health, Victoria
Anna Davis, Mental Health Alcohol and Other Drugs Branch, Queensland Health
Kevin Fjeldsoe, Mental Health Alcohol and Other Drugs Branch, Queensland Health
Jacinta George, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Aaron Groves, South Australia Health
Jane Gunn, Department of General Practice, The University of Melbourne
Melissa Heywood, Mental Health Directorate, NT Department of Health
Jan Kealton, Queensland Mental Health Commission
Beth Kotze, Mental Health Children and Young People, NSW Ministry of Health
Karissa Maxwell, Mental Health Alcohol and Other Drugs Branch, Queensland Health

Paul Mayers, ACT Health Directorate
Brett McDermott, James Cook University
Helen McGowan, WA Health
Roderick McKay, Mental Health, Drug and Alcohol Office, NSW Ministry of Health
David Meldrum, Mental Illness Fellowship of Australia, South Australia
Michael Moltoni, Mental Health Commission, Western Australia
Gerard Naughtin, Mind Australia, Victoria
Quinn Pawson, Prahan Mission, Victoria
Harry Perlich, Mental Health and Drug and Alcohol Office, NSW Ministry of Health
Giuseppe Scollo, Mental Health and Drugs Branch, Department of Health & Human Services, VIC
Dan Siskind, Princess Alexandra Hospital, Queensland
Gavin Stewart, Consultant, Applied Epidemiology
Nickolai Titov, Mindspot, Macquarie University
Darren Turner, Mental Health, Alcohol and Drug Directorate, Tasmanian Government

Other Direct Contributors

Susan Anderson, beyondblue
Shol Blustein, South Eastern Melbourne PHN
Mark Burke, beyondblue
Bella Burns, beyondblue
Stephen Carbone, Policy, beyondblue
Jessica Frame, Ten Year Mental Health Plan Implementation, Victorian DHHS
De Fraser, beyondblue
Jenny Galloway, Health Information and Reporting Branch, Victorian DHHS
Margaret Grigg, Victorian DHHS
Erica Grundell, Mental Health Branch, Victorian DHHS
Craig Guscott, Victorian DHHS
Bronwyn Hall, beyondblue
Matthew Hercus, Mental Health Branch, Victorian DHHS
David Kavanagh, Faculty of Health, Queensland University of Technology
Megan Lawrance, North Coast PHN
Anna Love, Victorian DHHS
Carolyn Nikoloski, beyondblue
Petrina O'Connor, Mental Health Branch, Victorian DHHS
Wendy Pannach, North Coast PHN
Shane Perera, beyondblue
Bruce Prosser, System Design, Victorian DHHS
Issac Reid, System Design, Victorian DHHS
Lachlan Rimes, Health Information and Reporting Branch, Victorian DHHS
Daniel Rock, Western Australian Primary Health Alliance
Vahid Saberi, North Coast PHN
Giuseppe Scollo, Mental Health Branch, Victorian DHHS
Tonita Taylor, Brisbane North PHN
Claire Thomas, Mental Health Branch, Victorian DHHS

Ian Thomas, Health Information and Reporting Branch, Victorian DHHS
Chris Wood, South Eastern Melbourne PHN

NMHSPF Phase 3, 2018-21

Project Team

Sandra Diminic, School of Public Health, The University of Queensland
Kate Gossip, School of Public Health, The University of Queensland
Imogen Page, School of Public Health, The University of Queensland
Charlotte Woody, School of Public Health, The University of Queensland
Elizabeth Leitch, School of Public Health, The University of Queensland
Kevin Fjeldsoe, Consultant
Zoe Rutherford, School of Public Health, The University of Queensland
Julie John, School of Public Health, The University of Queensland
Claudia Sparti, School of Public Health, The University of Queensland
Eryn Wright, School of Public Health, The University of Queensland
Harvey Whiteford, School of Public Health, The University of Queensland
Katrina Voigt, Queensland Centre for Mental Health Research
Laura Corcoran, School of Public Health, The University of Queensland

Other Direct Collaborators

Fiona Charlson, School of Public Health, The University of Queensland
Fiona Davidson, Forensic Mental Health, Queensland Centre for Mental Health Research
Holly Erskine, School of Public Health, The University of Queensland
Alize Ferrari, School of Public Health, The University of Queensland
Ed Heffernan, Forensic Mental Health Group, Queensland Centre for Mental Health Research
Bill Kingswell, Clinical Excellence Division, QLD Health
Carla Meurk, Forensic Mental Health Group, Queensland Centre for Mental Health Research
Harry Perlich, Consultant
Damian Santomauro, School of Public Health, The University of Queensland
Gavin Stewart, Consultant
Elissa Waterson, Forensic Mental Health Group, Queensland Centre for Mental Health Research

Panel Members

Sue Andrews, Gurriny Yealamucka Primary Health Care Service
Rikki Battersby, Advisor for Youth Mental Health
Robyn Bradley, Wide Bay HHS
Tracey Brand, Central Australian Aboriginal Congress Aboriginal Corporation
Peter Brann, Eastern Health Victoria, Monash University
Jennifer Brew, Mental Health and Palliative Care, Australian Institute of Health and Welfare
Thomas Brideson, NSW Ministry of Health
Bill Buckingham, Independent Consultant, Buckingham & Associates
Amelia Callaghan, Orygen – The National Centre of Excellence in Youth Mental Health

Andrew Chanen, Orygen – The National Centre of Excellence in Youth Mental Health
Jackie Curtis, South Eastern Sydney LHD, NSW Health
Mrigendra Das, Top End Mental Health Service, NT Department of Health
Nicole Dickson, Aftercare
Jordan Frith, Youth mental health advocate
Lauren Gale, Royal Flying Doctor Service
Sandy Gillies, Western Queensland PHN
Helen Goodwin, Northern Sydney LHD, NSW Health
Aaron Groves, Department of Health and Human Services, Tasmania
Bronwyn Hall, Beyondblue
Mark Hall, State Forensic Mental Health Service, WA Health
Ed Heffernan, Queensland Forensic Mental Health Service, QLD Health
Ernest Hunter, Consultant
Michael Hyde, Carer Representative, QLD Health
Leila Kavanagh, Department of Health and Human Services, Tasmania
Ranjit Kini, Top End Mental Health Service, NT Department of Health
Beth Kotze, Western Sydney LHD, NSW Health
David Lawrence, University of Western Australia
Roxxanne Macdonald, Youth mental health advocate
Tobias Mackinnon, Justice and Forensic Mental Health Network, NSW Ministry of Health
Roland Main, WA Country Health Service
Ahmed Mashhood, Forensic Mental Health Service, ACT Health
Rod McKay, Health Education and Training Institute NSW
Brian McKenny, Country Mental Health Service SA
Michael Mitchell, Specialist Aboriginal Mental Health Service WA
Vera Morgan, The University of Western Australia
Danielle Nagle, Justice Health Service, ACT Health
Narain Nambiar, Forensic Mental Health Service, SA Health
Darren Neillie, Community Forensic Outreach Service, QLD Health
Sharon North, QLD Health
Wayne Oldfield, National Mental Health Consumer and Carer Forum
Viki Pascu, State Forensic Mental Health Service, WA Health
David Perkins, Centre for Rural and Remote Mental Health
Debra Rickwood, headspace
Grant Sara, The University of Sydney
Tim Slade, The University of New South Wales
Gavin Stewart, Applied Epidemiology
Danny Sullivan, Forensicare Victoria
Elizabeth Tate, State Forensic Mental Health Service, WA Health
Elissa Waterson, Queensland Forensic Mental Health Service, QLD Health
Erica Williams, Youth mental health advocate
John Wilson, Nganampa Health Council SA

Other Direct Contributors

Mathew Anderson, Institute for Urban Indigenous Health
Lucy Beardall, beyondblue
Lisa Brophy, University of Melbourne
Gurdip Chima, Mental Health Branch, Victorian DHHS
Frankie Clive, North Queensland PHN
Liz Craig, Gippsland PHN
Louisa Degenhardt, National Drug & Alcohol Research Centre
Sophie Dodd, beyondblue
Dylan Foley, beyondblue
Mark Goddard, Western Queensland PHN
Matthew Hamilton, Orygen
Elisabeth Hoehn, Queensland Centre for Perinatal and Infant Mental Health
Jennifer Inglis, Darling Downs and West Moreton
Naomi Kikkawa, Queensland Centre for Perinatal and Infant Mental Health
Nick Kowalenko, NSW Ministry of Health
Erica Mackay, Central Queensland, Wide Bay, Sunshine Coast PHN
Leshay Maidment, Institute for Urban Indigenous Health
Patrick McGorry, Orygen
Libby Moreton, Queensland Centre for Perinatal and Infant Mental Health
Carmel Nelsen, Institute for Urban Indigenous Health
Catherine Rawlinson, Queensland Centre for Perinatal and Infant Mental Health
James Scott, UQ Centre for Clinical Research
Marianna Serghi, Institute for Urban Indigenous Health
Beimop Tapim, Torres and Cape HHS
Sean Taylor, Top End Health Services
Andrew Thompson, Orygen
Julian Trollor, University of New South Wales
Philip Williams, Gold Coast PHN
Patricia Yusia, Torres Strait Regional Authority

APPENDIX 3 – MODEL DEVELOPMENT

Background

Epidemiological data consistently show that about 20 per cent of the population experience a level of symptoms and disruption of functioning that warrants a formal diagnosis of mental illness. In contrast, both epidemiological and service data consistently show that only about 1 per cent of the population receive interventions from specialist public sector mental health services. More than 60% of people experiencing mental health problems do not access any health services for their health problems or mental health problems, and of those who do, general practitioners provide services to the greatest proportion of them.[1]

The formal clinical definitions of mental illness have developed significantly since the release of the third edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-III) (American Psychiatric Association, 1980) which, for the first time, specified the symptoms and the severity levels and impairment of functioning needed to assign a formal diagnosis. Since that time, epidemiology, research, and clinical services have had a consistent set of definitions that allow evidence from one field to be related to that from another. Nevertheless, the huge gap between the prevalence reported in population studies and treated prevalence, has raised the question of whether epidemiologists and service providers were talking about the same illnesses and disorders. If we were to meet the prevalence reported in population studies, we would need to increase the mental health budget 20 times to meet need, which would represent 40 per cent more than current mental health expenditure levels. Equally, it is unlikely that the majority of the untreated portion of people with mental illness are as ill as those receiving services. Forty-five per cent of people receiving inpatient services are receiving care under involuntary treatment provisions, and in order to do so, the stringent criteria of a medico-legal assessment process must be satisfied. It is thus unlikely that a large number of equivalently ill people exist untreated in the population.

The key challenge faced in developing the NMHSPF model was therefore to come to grips with the gap between population and service data, and construct a framework for dealing with the whole spectrum of mental illnesses. The NMHSPF is not the only model that has attempted this, and it builds on the work done by the NSW Ministry of Health in the development of the Mental Health Clinical Care and Prevention (MH-CCP) Planning Model. However, the traditional route has been to try to define “serious” mental illness as the focus for services, or the “priority population”. The unfortunate consequence of this approach is that other levels of illness, perhaps the early and more preventable stages, or those where intervention might reduce disability and consequent service demand, are not attended to. Most models of this type deal only with direct mental health care service delivery. The NMHSPF incorporates mental health promotion and prevention, and also considers mental health care for levels of illness and disability that may be classified as “moderate” in terms of severity and disability as well as “mild” or “at risk” groups. The difficulty in this approach is the historical legacy of services focused at only one end of the spectrum - there is little evidence for what service provision ought to be for the other groups.

[1] Australian Bureau of Statistics. Mental Health and Wellbeing Profile of Adults. Canberra: Commonwealth of Australia, 1998. (ABS Cat No 4326.0).

The National Mental Health Strategy in designing the National Minimum Data Set—Mental Health Care[2] sought to answer five general questions, summarised as: 'Who receives what services from whom, at what cost, and with what effect?'[3] That is important information, but does not consider service need. The important distinction between prevalence and service utilisation is that we also need to know who needs services, and what services are appropriate for each defined need group. The NMHSPF model is a first attempt to bridge that gap for the whole of Australia. It is built from a set of explicit and quantified statements of "who needs what services from whom", based on prevalence of illness in a standard 100,000 population and an assumed standard of care over a 12-month period.

The NMHSPF model suggests an appropriate average standard of mental health care for all people with diagnosable illness, and a standard of promotion and prevention services for those at general or specific risk. The model also tries to identify the workforce that is most appropriate to provide the services – typically as an input of expertise in collaborative partnerships and consultation/liaison. Judgements regarding mental health care needs in the contexts of a recovery framework inform these decisions.

Assembling the information

The most useful way of structuring the information needed to build a quantitative model is to follow the processes of epidemiologically-based needs assessment, indicating where evidence exists, and where evidence is needed. Although it is easy to agree on a comprehensive needs-based planning model in principle, there are many factors to deal with in creating a practical tool that can be used for planning real health services.

Typically, the relevant evidence and data on incidence, prevalence, efficacy, efficiency, remission and relapse after treatment, and costs, is missing or limited in scope and detail.

In all health systems there is a degree of misalignment of need, demand, and supply, and often there is much better evidence on supply (utilisation) than on either of the other factors. Supply is driven by many factors other than need and demand, and there may be a degree of inappropriate supply included in it, sometimes called "met un-need".

Unmet demand may sometimes be directly visible in terms of waiting lists and waiting times for specific services. It may also be visible indirectly, in terms of pressure on relevant services, or even in the form of inappropriate use of other services (as, for example, the use of acute beds for Nursing Home type patients, or demand on Emergency Department services). However, levels of demand may also be invisible until a new service becomes available. Demand is also driven by factors other than need.

---

[2] Department of Health and Aged Care. Mental health information development: National information priorities and strategies under the Second National Mental Health Plan 1998-2003. (First edition June 1999). Canberra: Commonwealth of Australia, 1999.

[3] Leginski W, Croze C, Driggers J, Dumpman S, Geersten D, Kamis-Gould E, Namerow J, Patton R, Wilson N, Wurster C. Data standards for mental health decision support systems: A report of the task force to revise the data content and system guidelines of the mental health statistics improvement program. Washington: National institute of Mental Health, US Department of Health and Human Services, 1989. Available from: http://www.mhsip.org/mhsiptest/documents/fn-10.htm

The most critical measure for estimating need, namely level of illness in the population to be served, may be inferred from epidemiological studies, but there is no simple translation between levels of illness and the need for specific types of services. Moreover, detailed local population data on illness are rarely available, may be too expensive to obtain, and are rarely obtainable frequently enough to serve as a guide to how well need is being met.

The most critical data for estimating the impact of interventions are rarely available at all, let alone in a form useable for modelling. Papers that compare mental health care and specify detailed care over a time period are rare enough. Those that identify the target population in a way that can be linked to population epidemiology are also rare, partly because the populations in clinical trials are often highly selected on characteristics rarely measured in population studies. Those that follow up patients for any length of time to assess recurrence/relapse rates or report the duration of illness at diagnostic levels (illness density), either with or without treatment interventions, are extremely rare.

To assemble mental health data from different sources into a coherent picture typically requires an apparatus to bridge across different measuring instruments, diagnostic systems and groupings, resources expressed in different units, and care systems in which the scope of "mental health" is unclear so that global resource estimates are meaningless. It can be done, but it is very time consuming.

Modelling principles

Stemming from experience in other modelling processes and also from decisions made by the NMHSPF Executive and Modelling Groups, a collection of modelling 'principles' were identified early in the project, to help inform a consistent approach to modelling across all of the Project Groups.

The principles are:

- Modelling is based on a generic population of 100,000 and not all of them are unwell. The model uses populations of 100,000 for convenience because some mental illness conditions are very rare, and some services are required only rarely. It is simply easier (and less error-prone) to work with whole numbers rather than the fractions that would result if we used percentages (that is, a base population of 100).
- The model uses the Standard Australian Population data from the census as a reference point because these numbers are fixed. Each jurisdiction has its own way of producing local population projections for other years. The use of ABS population Series B data was recommended (Series B largely reflects current trends in fertility, life expectancy at birth, net overseas migration and net interstate migration, whereas Series A and Series C are based on high and low assumptions for each of these variables respectively).
- Use publicly available data wherever possible (e.g. AIHW, jurisdictional data) and avoid primary data analysis due to the extensive time this requires.
- Be very clear on how assumptions, issues and decisions are made with rationale. Avoid applying false precision if the data does not support it.
- Provide clarity for the scope of decisions. For example, does a decision apply to all diagnoses in an age group, or all age groups, but only one diagnosis, for only one specific diagnosis and age or for all groups?

- Note that the scope of the NMHSPF project was to model those services that generally lie within the responsibility of the mental health sector. This approach is not trying to be exclusive of other services, but should rather be considered as one piece of the larger 'jigsaw' of service needs. A national model has already been developed for the Drug and Alcohol sector, called the Drug and Alcohol Service Planning Model. Other service sectors are responsible for their own modelling and together with this mental health model, will better estimate services for individuals. Consider for example, services for people with comorbid mental health and drug issues. The NMHSPF models the mental health components of care for that individual. The Drug and Alcohol Service Planning Model models components of care relevant to the drug and alcohol sector. Each model indicates the need for the other model, without double counting the resourcing.
- Corporate and clinical governance (e.g. sector development, quality and safety, research, workforce development etc.) were considered overhead costs towards the end of the modelling process.
- Similarly, both drug therapy and care coordination are costed as activities which fall under specific service elements. Drug therapy can be measured systematically by counting dosage and care coordination can be counted in units of time.
- Care profiles were developed by first considering age, then severity, then diagnosis. For example, the specialist ambulatory services might search for care profiles relevant to youth (or a subset of youth if necessary), and then look at moderate severity and then consider the diagnoses within that group and whether they require different care profiles.
- Consider service elements in terms of function rather than location or format of a service. The NMHSPF does not prescribe how a service is provided, and may represent the public, private or community managed providers. A default funder label has been assigned to each element assist users but is able to be modified to reflect local service configurations.
- Consider the perception of members in what they would describe or judge to be mild, moderate or severe illnesses. Different health professionals and service environments tend to influence perception, and so the material on the definition of severity is provided to ensure consistency in the modelling process across the groups.

Additional modelling principles were subsequently developed for both the Aboriginal and Torres Strait Islander NMHSPF model and the Rural NMHSPF model, see **Appendices 14 & 15** for detail.

Methods and evidence

Development and refinement of NMHSPF model inputs such as estimates of service need, required care types and service model parameters has occurred through a structured, mixed-methods approach gathering and synthesising the best available evidence. For each modelling question, the method has included scoping reviews of published papers, reports and data; analysis of available survey and administrative datasets; requests for information on service delivery models from various service providers; consultation with individual experts; and consensus from expert group discussions and Delphi surveys (**Figure 1**).

The NMHSPF was developed under a staged process as shown in **Figure 2**, recognising the need for ongoing refinement to incorporate new evidence and maintain clinical currency. This process of iterative development and refinement in consultation with stakeholders is consistent with the general development cycle for mental health systems and general healthcare models.[4]

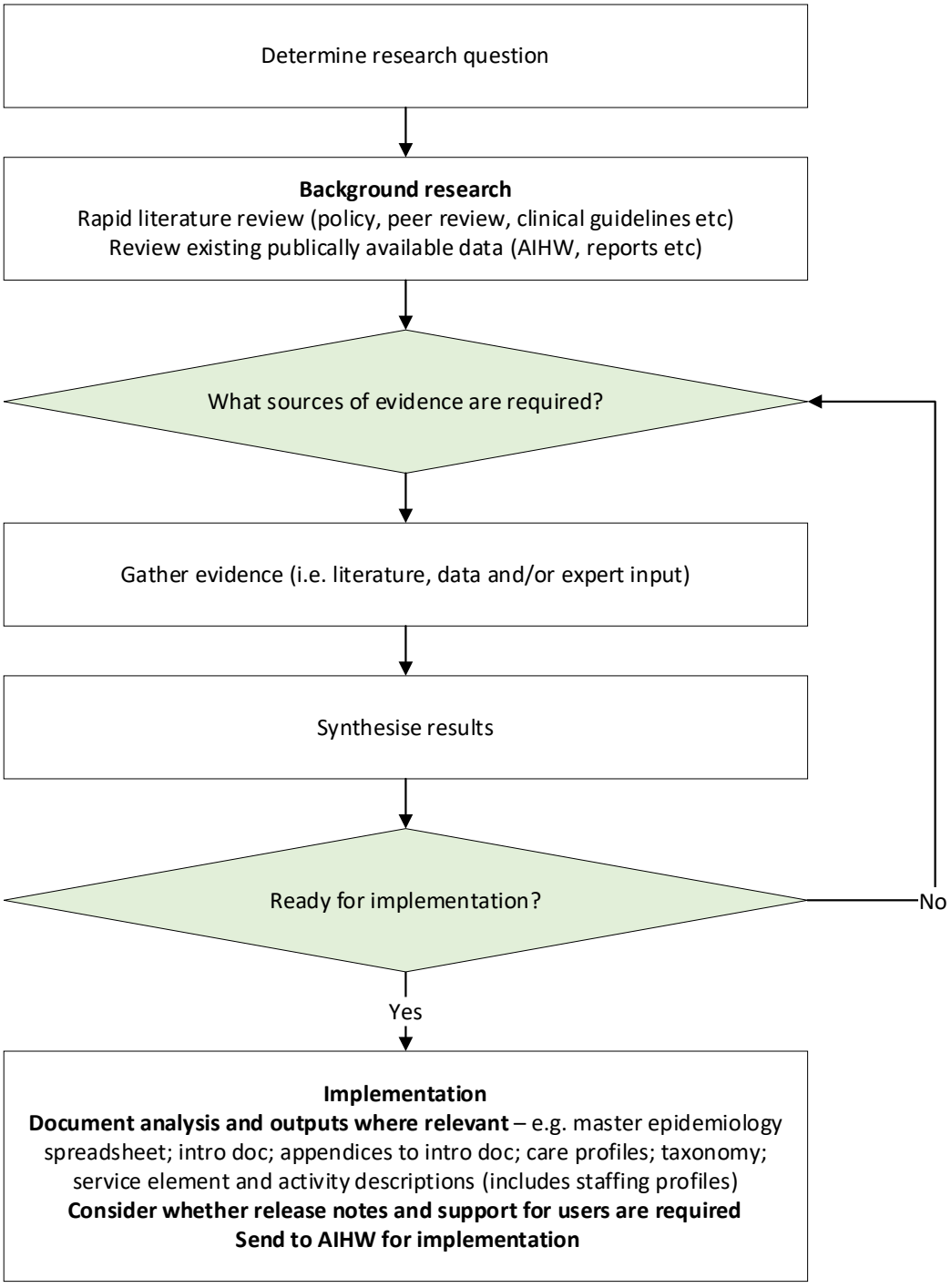


Figure 1. NMHSPF model development process

[4] Whiteford H, Bagheri N, Diminic S, et al. Mental health systems modelling for evidence-informed service reform in Australia. Australian & New Zealand Journal of Psychiatry. 2023. https://doi.org/10.1177/00048674231172113

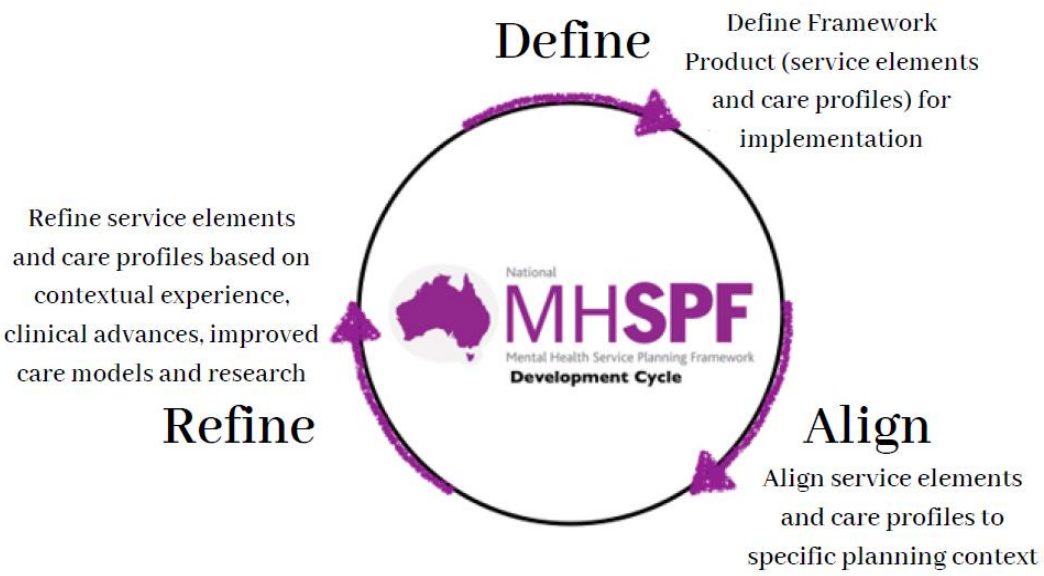


Figure 2. The NMHSPF refinement process

Glossary

This glossary explains key terms related to the NMHSPF described in this document and is provided as a quick reference point to return to as needed.

Age group	The age groups modelled in the NMHSPF include: 0-4 years, 5-11 years, 12-17 years, 18-24 years, 25-64 years, 65+ years and 65+ BPSD (behavioural and psychological symptoms of dementia).
Annual readmission rate	Annual readmission rate describes the proportion of bed days attributable to a second or subsequent admission for an individual within the planning year. See also: 'Modelling parameters'
Annual service hours per FTE	Number of annual service hours available for each workforce type within each different setting, based on calculation of the weeks worked per year (accounting for leave), average working hours per week, and consumer-directed service delivery time. See also: 'Modelling parameters'
Base price	Base price reflects the wages paid to employees for the activity. These do not yet have oncost and overhead rates added and the latter are applied during modelling calculations to arrive at the total service cost that is presented in the NMSHPF-PST reports. See also: 'Final price', 'Oncost rate' and 'Overhead rate'
Bed cost per day	Bed cost per day in the context of a NMHSPF-PST output, represents the FTE price divided by the number of beds. It provides an indication of the bed day costing produced by the NMHSPF.

Bed days	Bed days refers to the total number of occupied bed days.
Beds	Beds in the NMHSPF-PST refers to the number of mental health beds required (accounting for required annual bed days and modelled occupancy rates), including all bed types of the bed-based services modelled in the NMHSPF.
Behavioural and psychological symptoms of dementia (BPSD)	Behavioural and psychological symptoms of dementia (BPSD), as used in the NMHSPF, refers to older adults with dementia who are experiencing behavioural or psychological symptoms that require care from mental health services. In the NMHSPF, resource estimates are reported on separately for BPSD and for older adults with other mental health needs. This means that 65+ MH (mental health) and 65+ BPSD are discrete groups within the 65+ total population. For Aboriginal and Torres Strait Islander populations, the NMHSPF '65+ BPSD' group is modelled inclusively for ages 55+, due to evidence of higher rates of dementia at younger ages for Aboriginal and Torres Strait Islander peoples.
Care profiles	The care profiles describe the average mix of mental health services required by a need group over a 12-month period. The care profiles describe what services are needed (based on the NMHSPF taxonomy), the proportion of the group in need, the average number of occasions of service required, the average duration for each occasion of service, the required workforce category or type, and the nominal funder. See also: 'Need group' and 'Top-ups'
Care profile population	Care profile population in the NMHSPF-PST is the total number of people within a selected care profile need group, based on the modelled need group rate for each care profile applied to the user-selected population catchment(s). See also: 'Need group' and 'Epidemiology rate per 100,000'
Client-related staff hours	Client-related staff hours in the NMHSPF refer to the total hours of care delivered by a workforce provider(s) (whether face-to-face or indirect). Staff hours may differ from client hours where group-based services are being delivered. For example, if a service provider runs a one-hour group session for six consumers, and a one-hour individual session with one consumer, the total client-related staff hours are two hours. See also: 'Hours of client demand' and 'Staff ratio'
Comparative analysis	A comparative analysis is an approach used to compare NMHSPF resource estimates to data on current service delivery. It can help mental health service planners to identify gaps in service delivery and priorities for future planning and investment.
Consumer service delivery time	Consumer service delivery time is the quantity of time shown in the care profiles, which includes all activity related to the care of an individual with mental illness (whether face-face or indirect). It includes any time spent on an activity directly

	relating to an individual (e.g. face to face care, writing notes, individual care planning and liaison). A rate of 67% has been established for this time in the public sector specialist ambulatory service elements. For Individual Practitioners in the private sector, a rate of 85% has been established for this time. In the community support sector, the rates of consumer service delivery time vary according to role and nature of service provision as advised by stakeholders. Bed-based teams do not include a rate for consumer service delivery time as the productivity of the team is determined by the roster associated with the bed-based service modelling parameters. See also: 'Other time'
Children of parents with mental illness (COPMI)	Children of parents with mental illness, as used in the NMHSPF, refers to children and adolescents aged below 18 years who live with a parent or parents who have moderate to severe mental illness. These selective prevention need groups are modelled to provide targeted psychoeducation and support for these children due to their increased risk of developing mental health issues.
Demand	The NMHSPF demand rate is the proportion of people with a mental health problem who currently use, want to use, or should use individually-tailored mental health services. The demand rate varies by severity level and age group.
Element population	ELEMENT POP or element population in the NMHSPF-PST is the number of people modelled as requiring a particular service element. Element population outputs from the NMHSPF-PST should be used with caution and with reference to the care profile contents. Summing element populations across service elements is not reliable, as the same people can receive multiples service types within a care profile and so this can easily lead to double-counting of consumers. See also: 'Care profile population'
Epidemiology rate per 100,000	Rate per 100,000 of the age-specific population who are in the need group for that care profile, and therefore have a demand for the modelled mental health care in that care profile. See also: 'Need group' and 'Care profile population'
Final price	Final price reflects the total workforce cost, inclusive of the base wages paid to employees, employment oncosts (e.g. superannuation, workers compensation, penalty rates), and operational overhead costs (e.g. human resources, payroll, IT). See also: 'Base price', 'Oncost rate' and 'Overhead rate'
Flexible Funding Fool	The Flexible Funding Pool in the NMHSPF (also known as brokerage) is a modelled additional cost on top of mental health service workforce/operations to cover the cost associated with purchasing household goods and services, community/recreational activities and access to general health services (e.g.

	dentists) that lie beyond the scope of mental health services. This has been highlighted as an important tool that facilitates access to services beyond the mental health sector where individuals with mental illness are often excluded, and to enable services modelled in the NMHSPF to respond to the population's needs in a more coordinated, responsive and timely way. The Flexible Funding Pool is modelled as adding 1% to the quantity of Individual Support and Rehabilitation services (for both consumers and carers) as a top-up across the model. In rural areas, the Flexible Funding Pool has been modelled at 10% as a means of increasing the total funding supplied to community support sector services.
FTE	See 'Workforce FTE'
FTE PRICE$	FTE PRICE$ in the NMHSPF-PST provides an indication of the cost to deliver mental health care based on the number of workforce FTEs and includes associated salaries, oncosts and organisational overheads.
FTES/BED	FTES/BED in the NMHSPF-PST are calculated by dividing the total workforce FTE estimate by the estimated number of required beds, to provide an indication of the intensity of staffing for each bed type.
Hours of client demand	Hours of client demand in the NMHSPF refer to the total hours of care received by or relating to individual service users (consumers or carers). Client hours may differ from staff hours where group-based services are being delivered. For example, if a service provider runs a one-hour group session for six consumers, and a one-hour individual session with one consumer, the total hours of client demand are seven hours. See also: 'Client-related staff hours'
Indicated prevention	Indicated prevention, as used in the NMHSPF, includes people experiencing symptoms of mental illness or indicators of distress which do not meet threshold for a formal mental illness diagnosis, but who may require intervention to prevent progression to a formal diagnosis and to manage distress.
Intensive care	Intensive care is used in the NMHSPF to denote a secure bed-based service. There are intensive care bed-based service elements in the acute, sub-acute and non-acute service categories within the specialised bed-based mental health care services stream in the NMHSPF taxonomy.
Medical	Medical refers to the NMHSPF workforce category that includes medically trained professionals providing mental health care, such as psychiatrists and general practitioners. Registrars and junior medical officers are included only in the context of team-based staffing profiles.
Medical unspecified	See ''Workforce type' unspecified'

MILD	MILD, as used in the NMHSPF, refers to people who have diagnosed mental illness that has a low impact on their day-to-day lives. For example, their mental illness does not impact heavily on their ability to attend school or work and maintain healthy relationships.
Modelling parameters	Modelling parameters refer to the NMHSPF modelled workforce and operational inputs attached to each service element that allow the care profile contents to be calculated through into NMHSPF-PST resource outputs such as beds and workforce FTEs. In the NMHSPF, this refers to the annual readmission rate, occupancy rate, workforce hours per occupied bed day, workforce distribution, annual service hours per FTE, oncost rate, and overhead rate. These are modelled at desirable, efficient rates which may not reflect current practice in a particular service. See also: 'Annual readmission rate', 'Occupancy rate', 'Workforce hours per occupied bed day', 'Workforce distribution', 'Annual service hours per FTE', 'Oncost rate', and 'Overhead rate'
MODERATE	MODERATE, as used in the NMHSPF, refers to people who have a diagnosed mental illness that has a moderate impact on their day-to-day lives. They may experience problems with psychosocial functioning that impede their ability to attend school or work, carry out household responsibilities or maintain healthy relationships.
National Mental Health Service Planning Framework (NMHSPF)	The NMHSPF is a needs-based population planning model for mental health services in Australia.
Need group	The need groups represent groups of people who experience a similar level of severity, functional impairment and complexity associated with their mental disorder. They are likely to need a similar mix and level of mental health care over a 12-month period.
NMHSPF documentation package	The NMHSPF documentation package includes technical documents to support users' understanding and application of the NMHSPF. The documents include: • Introduction to the NMHSPF • Technical Appendices to the NMHSPF • NMHSPF Taxonomy • NMHSPF Service Element and Activity Descriptions • NMHSPF Epidemiology Flowcharts • NMHSPF Care Profiles • NMHSPF Service Element and Activity Modelling Parameters • NMHSPF Planning Support Tool User Guide

NMHSPF Planning Support Tool (NMHSPF-PST)	The NMHSPF Planning Support tool (NMHSPF-PST) is a tool hosted in an online Tableau environment that summarises the outputs of the NMHSPF model. The NMHSPF-PST draws on inputs from the NMHSPF, along with population data, to produce resource estimates to support service planning in Australia. Its Standard Reports can be adapted to answer a range of planning questions.
Occasions of service (OOS)	Number of occasions of service refers to the counting of the overall number of sessions or contacts needing to be provided to clients, of varying duration. In the NMHSPF-PST this reflects the occasions of service modelled in each care profile.
Occupancy rate	Reflects the proportion of beds that are expected to be used at any one time within a bed-based service. Modelled occupancy rates in the NMHSPF vary by bed type and reflect expert advice on appropriate service operation. See also: 'Modelling parameters'
Oncost rate	Oncosts include employment costs tied to an individual provider but beyond the base salary, such as superannuation, workers compensation and penalty rates. The NMHSPF includes modelled oncost rates for each workforce type within each service setting and team. See also: 'FTE PRICE$' and 'Modelling parameters'
Other costs/ OTHER PRICES$	Other costs or OTHER PRICES$ include top-up costs that are not tied to a particular workforce, such as subsidised psychotropic medication prescription costs via the Pharmaceutical Benefits Scheme (based on current national average utilisation), payment for Indigenous cultural consultation services for Indigenous peoples of all ages across the mental health system, delivery of neurostimulation procedures such as electroconvulsive therapy and transcranial magnetic stimulation, and population promotion/prevention program costs. See also: 'Top-ups'
Other time	Other time refers to any workforce activities that are not specifically related to an individual consumer/carer. This includes travel, professional activities (meetings, evaluation, performance monitoring, supervision, training), business meetings, service evaluation, program planning and research. A rate of 33% has been established for other time in the public sector specialist ambulatory teams. For Individual Practitioners in the private sector, a rate of 15% has been established for this time. In the community support sector, the rates of other time vary according to role and nature of service provision as advised by stakeholders. Bed-based teams do not include a rate for other time as the productivity of the team is determined by the roster associated with the bed-based service modelling parameters. See also: 'Consumer service delivery time'
Overhead rate	The overhead rate in the NMHSPF reflects the additional costs to run a mental health service on top of mental health workforce-specific costs (base wages and

	oncosts). Common overhead costs include program administration and leadership and other corporate supports which may include quality assurance, human resources, payroll, finance, information technology and communication services. Facilities will also require varying levels of maintenance and cleaning and some may be leased. Community residential or hospital based services also have costs associated with security, catering, laundry and utilities. Additionally, clinical services, such as various investigations and pharmaceuticals, need to be considered. For mobile community based services, transport and vehicles (including maintenance) represent a significant cost. Workforce education and program evaluation may also be included in overhead costs. The NMHSPF does not include the cost of capital works to build or establish new services. The NMHSPF modelled overhead rates vary by service setting and reflect 'best estimates'. These generally range from 20-30% depending on setting and are higher for bed-based services. Rural service elements are modelled with 50% higher overhead costs to account for increased needs for centralised recruitment, policy development, quality and safety and communication and travel costs. See also: 'Modelling parameters'
Peer Worker	Peer worker refers to the NMHSPF workforce category that includes roles that must be performed by someone with lived experience as a mental health service consumer or carer of an individual(s) with mental illness.
Peer Worker unspecified	See ''Workforce type' unspecified'
% pop applicable	% pop applicable in the care profiles refers to the proportion of that particular need group who are likely to require the particular service element or activity in each line of a care profile.
Primary and Specialised Clinical Ambulatory Mental Health Care Services	The Primary and Specialised Clinical Ambulatory Mental Health Care Services taxonomy service stream in the NMHSPF represents primary and ambulatory care by a specialist clinical professional to an individual with a diagnosis of mental illness or other mental health problems. Primary mental health care services are general access and often involve presentations to general practitioners. Specialised clinical ambulatory services are generally a secondary service that requires a referral from another professional.
Private service delivery costs	Private costs refer to the estimated costs for providers that work in private practice settings, such as providers of Medicare Benefits Schedule services or Primary Health Network commissioned services. These costs in the NMHSPF have been applied to all services with the C'Wealth or Private Insurer funder types. See also: 'Team/bed-based service delivery costs'

Relapse prevention	Relapse prevention, as used in the NMHSPF, includes people who do not currently have a mental disorder but have previously had a mental disorder and therefore may need contact with mental health services to remain well.
Residential services	Residential settings or services are community places that provide specialised mental health care on an overnight basis in a domestic-like environment where staff are on site for 24 hours per day. Bed-based residential service resourcing modelled in the NMHSPF-PST excludes the bed costs of residential facilities that are staffed for less than 24 hours per day. The associated service element 'Non Acute – Adult (<24 hour support)(Residential, non-MH)' is indicated in some care profiles but not included in cost estimates, as the NMHSPF assumes the housing is not provided by mental health services. The NMHSPF models the associated mental health clinical and psychosocial support hours required by people who may live in these settings as community services within a range of care profiles. Therefore, the NMHSPF models the staffing hours and costs associated with delivering services to these <24 hour staffed beds, but not the bed cost.
Selective prevention	Selective prevention, as used in the NMHSPF, specifically includes children of parents with mental illness (COPMI) in need of contact with mental health services due to their elevated risk of mental health problems. See also: 'Children of parents with mental illness (COPMI)'
Separations	Separations in the NMHSPF-PST refer to the number of modelled separate admissions, including readmissions, in a financial year. Separations in this context, are not equivalent to the number of people requiring bed-based care, as some people may have more than one admission with the year.
Service delivery costs	See 'FTE PRICES$'
SEVERE – Complex	Severe – Complex, as used in the NMHSPF, refers to people who have a diagnosed mental illness that has high impact on their day-to-day lives. They have severe, persistent, or episodic mental illness and many experience significant social and environmental stressors.
SEVERE – Standard	Severe – Standard, as used in the NMHSPF, refers to people who have a diagnosed mental illness that has a high impact on their day-to-day lives. They experience lower risks and/or fewer problems with their psychosocial functioning than those in the SEVERE - Complex category.
Severity distribution	The severity distribution for the NMHSPF divides the estimated total prevalence rate of mental illness in each diagnostic group (e.g. psychosis, affective disorders) and age group into different levels of severity of MILD, MODERATE and SEVERE illness. The NMHSPF has a specific way of defining severity which may differ from other sources. In the NMHSPF, SEVERE, MODERATE and MILD refer to the intensity of mental health service needs for people with a formally diagnosed

	mental illness, which is more closely related to role impacts and impairment in psychosocial functioning than clinical symptoms.
Service Activity (in the taxonomy)	Service activity is the fifth and final level in the NMHSPF taxonomy. Service activities are sub-types of a service element. For example, within the service element Care Coordination and Liaison, there is a service activity for Rural Therapy Liaison.
Service Category (in the taxonomy)	Service category is the third level in the NMHSPF taxonomy. There are a series of categories within each service stream. These categories help group similar service elements and activities together. For example, there is a service category for Structured Psychological Therapies and within that category are a range of related service elements.
Service Element (in the taxonomy)	Service element is the fourth level in the NMHSPF taxonomy. The service elements (and service activities) are used to model service needs in the care profiles. Each service element relates to a specific aspect or type of mental health care. For example, there are service elements for different types of Structured Psychological Therapies (SPT) including SPT – Brief Intervention, SPT Low Intensity Intervention, SPT – Individual, and SPT – Family.
Service Group (in the taxonomy)	Service group is the first level in the NMHSPF taxonomy. There are two groups that divide the services into either population-based universal services or services tailored to individual needs.
Service Stream (in the taxonomy)	Service stream is the second level of the NMHSPF taxonomy. The service streams include: mental health promotion, mental illness prevention, primary and specialised clinical ambulatory mental health services, specialised mental health community support services, specialised bed-based mental health care services, and medications and procedures. See also: 'Primary and Specialised Clinical Ambulatory Mental Health Care Services', 'Specialised Mental Health Community Support Services', and 'Specialised Bed-Based Mental Health Care Services'
Specialised Mental Health Community Support Services	The Specialised Mental Health Community Support Services taxonomy service stream in the NMHSPF represents services that are predominately non-clinical in nature, and are largely centred on community based outreach services, with some group support and crisis respite residential access.
Specialised Bed-Based Mental Health Care Services	The Specialised Bed-Based Mental Health Care Services taxonomy service stream in the NMHSPF represents all specialist mental health services that require overnight care in a hospital or community-based residential setting, with the exception of Residential Crisis and Respite Services (which appears in the Specialised Mental Health Community Support Services Stream).
Staff ratio	The ratio of staff to clients (e.g. if the staff ratio is 1 then there is one staff member to every client; if the staff ratio is 0.2 there is one staff member to every

	5 clients). The staff ratio is included for each line of a care profile and is used in the calculations of client-related staff hours and workforce FTEs.
Structured Psychological Therapies (SPT)	Structured Psychological Therapies in the NMHSPF are interventions which include a structured interaction between a participant and a qualified mental health professional(s) using a recognised, psychological method, such as cognitive behavioural techniques, family therapy or psycho-education counselling. These are recognised, structured or published techniques for the treatment of mental and emotional illnesses.
Taxonomy	The taxonomy provides a comprehensive list of the core components of a mental health service system. The taxonomy has a hierarchical structure with five levels: service group, service stream, service category, service element, and service activity. Each service element and activity are associated with a clear definition to provide a common language for mental health services in Australia.
Team/bed-based service delivery costs	Team/bed-based costs refer to the estimated costs for providers working in team settings, such as in jurisdictional health departments and mental health community support services. These costs in the NMHSPF have been applied to all services with the State or CW & St funder types. See also: 'Private service delivery costs'
Tertiary Qualified (TQ)	Tertiary Qualified refers to the NMHSPF workforce category that includes university trained (or equivalent) providers with a minimum three-year Bachelor degree in a discipline related to mental health care.
Tertiary Qualified (TQ) Other	Tertiary Qualified (TQ) Other refers to professionals that are university trained (or equivalent) with a minimum three-year Bachelor degree in disciplines other than mental health care. This includes professionals such as physiotherapists, exercise physiologists, dieticians, speech therapists and pharmacists, as well as tertiary qualified program managers/supervisors employed in the mental health community support sector.
Tertiary Qualified (TQ) unspecified	See ''Workforce type' unspecified'
Top-ups	Top-ups are standalone resource estimates. Unlike a care profile, the top-ups are not associated with one specific need group, instead these resource estimates may apply across multiple need groups or be estimated as a standalone cost or activity. An example of a top-up is Respite, which models resources associated with different types of respite care needed to support the families and carers of individuals in any of the need groups in the NMHSPF. Items modelled as top-ups include: triage and assessment conducted by the public sector; consultation and liaison services to general hospital wards and emergency departments; inpatient admissions for children and adolescents (0-17 years); additional medical and specialist care required for people with SEVERE

	eating disorders; additional care coordination and support required for parents with a SEVERE mental illness; additional monitoring requirements for certain psychotropic medications; high intensity packages of individual support and rehabilitation; Indigenous cultural consultation; respite care; neurostimulation therapies; and PBS/RPBS-subsidised medication costs.
Vocationally Qualified (VQ)	Vocationally Qualified (VQ) refers to the NMHSPF workforce category that includes professionals primarily part of a non-clinical workforce (i.e., not a university-trained clinician) with a TAFE level qualification up to Advanced Diploma level in mental health or a related area. Includes technicians or coaches trained to deliver low-intensity psychological interventions (who may possess, but do not require, a tertiary qualification).
Vocationally Qualified (VQ) unspecified	See ‘‘Workforce type’ unspecified’
Workforce distribution	Indicates how the overall workforce FTE for a service element (particularly bed-based and multidisciplinary team-based services) are split across different workforce types, such as occupational therapist, psychiatrist, registered nurse, or consumer peer worker. See also: ‘Modelling parameters’
Workforce FTE	Workforce FTE provides an estimate of the number of full-time equivalent workforce needed to deliver the required mental health care. The workforce FTE is calculated from the care profiles and associated modelling parameters.
Workforce hours per occupied bed day	Describes the number of workforce hours per day that are required to adequately staff an occupied bed. This modelling parameter varies depending on the bed type in the NMHSPF. See also: ‘Modelling parameters’
‘Workforce type’ unspecified	‘Workforce type’ unspecified in the NMHSPF is a catch-all term to designate that any or a range of qualified professionals under that workforce category (i.e. medical, TQ, VQ, peer worker) may provide the identified service.

APPENDIX 4 - EPIDEMIOLOGY

12-month mental disorder prevalence estimates

The NMHSPF has R code which combines data from a variety of sources with specific assumptions to estimate the 12-month prevalence of mental disorders in the Australian population by age group and intensity of service needs. For all NMHSPF age groups apart from 0-4 and 5-11 years, the disorder prevalence estimates are based on the Global Burden of Disease (GBD)[5] prevalence estimates for Australia. As these have been modified for the purposes of NMHSPF modelling they will henceforth be referred to as "NMHSPF-modified GBD estimates". The 0-4 age group prevalence is determined using data from the Longitudinal Study of Australian Children (LSAC)[6] and the 5-11 years age group prevalence uses estimates from the Australian Young Minds Matter (YMM)[7] survey. The overall process is as follows:

1. Obtain estimates of prevalence by mental disorder diagnosis from GBD (for 12+ years) or overall from other Australian surveys (for 0-4 and 5-11 years).
2. Adjust GBD estimates:
    a. Adjust point prevalence estimates for major depressive disorder and anxiety disorders to 12-month estimates using GBD adjustment factors.
    b. Adjust schizophrenia prevalence estimates to represent overall non-affective psychosis prevalence estimates using an adjustment factor derived from the Survey of High Impact Psychosis (SHIP)[8].
    c. Adjust personality disorder prevalence estimates (which in GBD represent non-comorbid personality disorder prevalence) so that they represent all personality disorder prevalence, using an adjustment factor from the 1997 National Survey of Mental Health and Wellbeing (NSMHWB)[9].
    d. Re-label conduct disorder cases over the age of 18 as antisocial personality disorder.
3. Use MH-CCP severity splits[10] to divide cases in each diagnostic group and age group into different levels of severity (related to functioning), as an indicator of service needs.
4. Sum across severity-specific estimates to obtain overall prevalence estimates by level of service need (regardless of specific diagnosis), adjusting for comorbidity between disorders (see the following sections for more detail).

[5] Global Burden of Disease Study 2017 (2018). "Global Burden of Disease Study 2017 (GBD 2017) Results." Retrieved 11 November, 2018, from http://vizhub.healthdata.org/gbd-compare/.
[6] Australian Institute of Family Studies. (2018). Longitudinal Study of Australian Children Data User Guide – December 2018. Melbourne: Australian Institute of Family Studies
[7] Lawrence, D., et al. (2015). The Mental Health of Children and Adolescents. Report on the second Australian Child and Adolescent Survey of Mental Health and Wellbeing. Canberra, Department of Health.
[8] Morgan, V. A., et al. (2012). "People living with psychotic illness in 2010: The second Australian national survey of psychosis." Australian & New Zealand Journal of Psychiatry 46(8): 735-752.
[9] Henderson, S., et al. (2000). "Australia's mental health: an overview of the general population survey." Australian & New Zealand Journal of Psychiatry 34(2): 197-205.
[10] NSW Ministry of Health, Mental Health Clinical Care and Prevention Model: a population mental health model MH-CCP Version 1.11, July 2001.

5. Add in the estimated additional proportion of the population in each age group who would not have been captured by population mental health surveys (e.g. those with intellectual disability, dementia, living in residential aged care, or homeless) but have mental disorders.

The final step in this process is to use a modifier to adjust for expected demand for individually tailored mental health services within each service need level. The NMHSPF models contact with services for 100% of SEVERE, 80% of MODERATE and 50% of MILD cases of mental illness. This modifier is based on a best estimate for service demand using available survey data, rounded up to account for desired increases in population mental health literacy and help-seeking. It is important to note that it is expected that those with a mental illness who do not have a demand for individually tailored mental health services may be accessing other forms of help. This may include self-help materials such as books and websites (which do not require clinician input) or seeking support from family and friends. Alternatively, these individuals may choose not to access treatment as their illness may spontaneously remit and they may not be experiencing any significant disability from their illness, despite meeting the threshold for a diagnosis.

The following sections provide additional details required to understand how 12-month prevalence has been estimated for the NMHSPF, including prevalence, severity distribution, comorbidity, and survey excluded groups. **Table 1** is a summary of data sources used for this modelling.

Table 1. Summary of data sources used to determine 12-month prevalence of mental disorders by NMHSPF age groups

Age group	Prevalence	Severity distribution	Comorbidity adjustment factor
0 to 4	LSAC and YMM, see prevalence section.	MH-CCP severity distribution, see **Table 3**.	None required.
5 to 11	Total prevalence from YMM survey.	MH-CCP severity distribution, see **Table 3**.	None required.
12 to 17	NMHSPF-modified GBD estimates.	MH-CCP severity distribution, see **Table 3**.	YMM, see **Table 4.**
18 to 24	NMHSPF-modified GBD estimates.	MH-CCP severity distribution, see **Table 3**.	1997 NSMHWB (Kessler scores), see **Table 5**.
25 to 64	NMHSPF-modified GBD estimates.	MH-CCP severity distribution, see **Table 3**.	1997 NSMHWB (Kessler scores), see **Table 5**.
65+	NMHSPF-modified GBD estimates.	MH-CCP severity distribution, see **Table 3**.	1997 NSMHWB (Kessler scores), see **Table 5**.
65+ BPSD	SDAC, ACFI	MH-CCP severity distribution, see **Table 3**.	1997 NSMHWB (Kessler scores), see **Table 5**.
Survey excluded groups	SDAC, ABS, SHS, ACFI, see survey excluded groups section.	NMHSPF default severity splits by age, see **Table 3**.	None required.

ABS: Australian Bureau of Statistics population estimates, ACFI: Aged Care Funding Instrument data, BSPD: behavioural and psychological symptoms of dementia, GBD: Global Burden of Disease prevalence estimates for Australia, LSAC: Longitudinal Study of Australian Children, MH-CCP: NSW Mental Health Clinical Care and

Prevention model, NSMHWB: National Survey of Mental Health and Wellbeing, SDAC: Survey of Disability, Ageing and Carers, SHS: national data on Specialist Homelessness Services, YMM: Young Minds Matter survey

Prevalence in children

For adolescents, adults and older adults (aged 12+ years), the prevalence estimates are NMHSPF-modified GBD estimates. However, for infants and children (aged 0-11 years), the NMHSPF Epidemiology Expert Panel indicated that GBD prevalence estimates were not appropriate. There are many reasons the GBD prevalence estimates for 0-11 years were not deemed appropriate for use in the NMHSPF.

Why were GBD prevalence estimates not used for 0-11 years?

- There is very little survey data included in GBD models for those that are very young.
    - To meet criteria for inclusion in GBD analysis, prevalence data for a disorder must be derived using formal diagnostic guidelines i.e. DSM or ICD criteria. Population-representative survey data detecting diagnosable disorders is not always available at very young ages (e.g. between 0 to 4 years).
    - GBD estimates the prevalence of 'any' anxiety disorder. This makes use of prevalence data from population-representative surveys capturing at least three anxiety sub-types. Not all of these surveys will capture anxiety disorders occurring in the very young (e.g. separation anxiety disorder) which may be surveyed and reported on as individual disorders.
- A minimum age of onset is used as a prior setting in the GBD estimation of prevalence. This is typically informed by expert advice and the available epidemiological data for each disorder (e.g. anxiety disorders and major depressive disorder modelling begin at age three years).
- GBD modelling involves running a full epidemiological parameter model where prevalence estimates for a disorder are informed and internally consistent with the incidence, remission and excess mortality associated with that disorder. Where rates of remission are highest at younger ages (e.g. anxiety disorders) this will result in an equivalent decrease in the estimated prevalent cases which cannot be observed in raw prevalence survey data.
- YMM used single informant (parent report) to estimate prevalence of ADHD in children. This resulted in much higher prevalence than what is found in other surveys and countries, so a covariate included in GBD to account for this lowered the prevalence of ADHD from YMM accordingly.

GBD estimates prevalence along a curve, beginning and ending at set ages. Unless incidence at birth is specified, prevalence starts at 0%, then is guided by the available data along the increasing prevalence slope for that disorder. The rate at which prevalence increases is dependent on the age of onset specified and the available age-specific data for that location.

Because of these differences, prevalence of mental illness in the 0-4 and 5-11 years age groups has been estimated using alternative data sources. The prevalence for the 5-11 years age group has been directly estimated using YMM survey data. Obtaining an estimate of prevalence for the 0-4 years age group was less straight forward.

Estimating prevalence for infants and children aged 0-4 years

Many challenges exist when attempting to obtain a clear picture of infant and child mental health in Australia. These arise through variations in classification systems, difficulties in making a formal diagnosis at very young ages, varying diagnostic tools and differences in study methodologies.[11]

- In 2015 an international review[12] was published which found that approximately 17% of all children will have a mental disorder at some point within the period of birth to age six years. This estimate cannot be used for the NMHSPF, as 5-year prevalence would overestimate the 12-month prevalence of mental disorders (and, where possible, Australian estimates are preferred for the NMHSPF).
- Another way of identifying the number of infants who may be at risk of developing mental health problems is to look at the prevalence of mothers experiencing postnatal depression and anxiety. Using this method, Perinatal Anxiety and Depression Australia[13] identified that up to 14% of infants may be at risk of developing a mental illness. This indicates that the 12-month prevalence of diagnosed mental disorders for Australian infants would be below 14% (as not all of those at risk will develop a diagnosis). Parents with mental illness and their families have also been accounted for in other areas of the NMHSPF, so it is best to not use this method to avoid double counting.
- A study of the Copenhagen Child Cohort in 2000,[14] which used the International Classification of Diseases (ICD-10) and Diagnostic Classification Zero to Three (DC 0-3), looked at the prevalence of mental health problems in children. This study found diagnoses in 16-18% of children aged one and half years. Although this study does provide prevalence estimates for this age group, it is based on a small (n=306) cohort of children, from a specific location (Copenhagen), and cannot be relied on to produce Australian estimates for the NMHSPF.
- Another approach is to look at risk factors, such as current adversities, as an indicator of potential mental illness. Segal et al.[15] used LSAC data to estimate mental health service need in this way and found that between 5.5-6.1% of Australian children aged 0-5 years would have a need for mental health services. As the NMHSPF applies demand rates after estimating prevalence, it is likely that this quantification of need underestimates the overall prevalence of disorders for this age group.
- The YMM survey found that 8.4% of children aged four years had a mental illness diagnosis in the previous 12 months.

After considering the various approaches and caveats listed above, the NMHSPF Epidemiology Expert Panel preferenced the use of Australian data to estimate prevalence for the 0-4 years age group. Prevalence estimates for this group have been generated using LSAC data for 0-3 years, using

[11] Morgan, B., et al. (2018). "Introducing the National Workforce Centre for Child Mental Health." Family Matters.
[12] von Klitzing, K., et al. (2015). "Mental Disorders in Early Childhood." Continuing Medical Education.
[13] Perinatal Anxiety and Depression Australia. (2017) After birth. Melbourne: Perinatal Anxiety and Depression Australia.
[14] Skovgaard, A. M., et al. (2007). "The prevalence of mental health problems in children 1½ years of age - the Copenhagen Child Cohort 2000." Journal of Child Psychology and Psychiatry 48(1): 62-70.
[15] Segal, L., et al. (2018). "A needs-based workforce model to deliver tertiary-level community mental health care for distressed infants, children, and adolescents in South Australia: a mixed-methods study." The Lancet Public Health 3(6): e296-e303.

"high" and "very high" Brief Infant Toddler Social Emotional Assessment (BITSEA) scores as a conservative proxy for diagnosis, and YMM for age four years using ICD diagnosis data (**Table 2**). Note: there are also non-diagnostic groups in the NMHSPF which provide resources for infants and children at risk of developing a mental disorder (selective and indicated prevention groups).

Table 2. Prevalence estimates for the 0-4 years age group*

Age	Total prevalence (95%CI)
0-23 months	10.7% (7.9 – 14.5)
2 years	10.7% (7.9 – 14.5)
3 years	10.9% (7.7 – 15.2)
4 years	8.41% (6.1 – 11.5%)
Total 0-4 years	10.4% (9.9-11.0)

*Notes: age 2yrs group prevalence has been applied to the 0-23 months group. Estimates for 0-23 months, 2yrs and 3yrs have been taken from the LSAC dataset, using "high" and "very high" scores on the BITSEA problems scale as a proxy measure for diagnosis.

Severity distribution

The severity distribution for the NMHSPF divides cases in each diagnostic group and age group into different levels of severity (related to functioning), as an indicator of service needs (**Table 3**). These splits are based on the MH-CCP model.

Comorbidity

To adjust for comorbidity, survey data have been used to calculate an adjustment factor that is the ratio of the sum of 'cases' at each severity level by disorder, assuming no comorbidity, and the actual number of cases at each severity level, regardless of disorders. The 0-4 and 5-11 years age groups do not require a comorbidity adjustment as the overall prevalence (accounting for comorbidity) was obtained directly for these groups. For the 12-17 years age group YMM data has been used to determine the comorbidity adjustment (see **Table 4**), and for 18+ years age groups 1997 NSMHWB data has been used for the comorbidity adjustment (see **Table 5**).

Table 3. MH-CCP[16] severity distribution

	Age group	MILD	MODERATE	SEVERE
Anxiety disorders	All ages	57%	29%	14%
Affective disorders	All ages	57%	29%	14%
ADHD	All ages	57%	29%	14%
Eating disorders	All ages	57%	29%	14%
Personality disorders	All ages	65%	32%	3%
Psychosis	All ages	0%	0%	100%
BPSD	All ages	49%	29%	22%
Default splits*	0 to 4 years	61%	26%	14%
	5 to 11 years	71%	21%	8%
	12 to 17 years	64%	26%	10%
	18 to 24 years	65%	25%	10%
	25 to 64 years	65%	25%	10%
	65+ years	66%	26%	9%

*to be applied to any additional disorders, and excluded groups prevalence estimates

Table 4. Comorbidity adjustment for 12-17 years group (using YMM data)[17]*

	MILD	MODERATE	SEVERE
Anxiety disorders	2.58%	2.17%	2.25%
Major depression	0.97%	1.79%	2.28%
Conduct disorder	0.60%	0.89%	0.64%
ADHD	3.21%	1.93%	1.19%
Total (sum of above)	7.36%	6.78%	6.36%
Any disorder	6.36%	4.72%	3.33%
Adjustment factor (total/any disorder)	1.16	1.44	1.91

*Using YMM severity measure.

[16] NSW Ministry of Health, Mental Health Clinical Care and Prevention Model: a population mental health model MH-CCP Version 1.11, July 2001.
[17] Zubrick, S. R., et al. (2015). Measuring Severity of Mental Disorders with the Young Minds Matter Parent/Carer-Reported Impact Items: Technical Report. Perth, Australia,, Centre for Child Health Research, University of Western Australia.

Table 5. Comorbidity adjustment for 18+ years age groups (using 1997 NSMHWB data)*

	MILD	MODERATE	SEVERE
Anxiety disorders	5.0%	2.7%	1.4%
Affective disorders (including bipolar)	2.6%	1.8%	1.2%
Personality disorders	3.4%	1.9%	0.9%
Total (sum of above)	11%	6.4%	3.5%
Any disorder	9.1%	4.0%	1.8%
Adjustment factor (total/any disorder)	1.2	1.6	1.9

*Using Kessler scores

Adjustments for survey exclusions

As GBD data are based on national household surveys, prevalence estimates have also been adjusted in the NMHSPF to account for populations that would not be well captured in household surveys but that would have higher rates of mental illness than the general community and require a mental health service intervention. One of these groups consists of those aged 65+ with behavioural and psychological symptoms of dementia (BPSD); for this group, resource estimates are reported on separately from people aged 65+ years with other mental health needs. This means that 65+ MH (mental health) and 65+ BPSD are discrete groups within the 65+ total population and estimates of population need and required resourcing should therefore be added together to obtain total demand and resourcing for the 65+ population.

A review of national mental health surveys identified that populations were likely to be excluded from surveys if they did not live in households (e.g. homeless, living in residential aged care facilities) or had an identified cognitive impairment that would prevent survey participation (e.g. intellectual disability, dementia).[18] Other populations potentially under-sampled in these surveys may include those with autism spectrum or substance use disorders, although there is little evidence to confirm the magnitude of any under-sampling.

For each of the above identified populations, a review of published and grey literature was conducted to identify representative Australian and international data sources providing either published estimates or raw data that could be requested and analysed. The literature review sought to identify:

1. Population estimates of people with mental illness and the factor of interest (e.g. proportion of Australians who are homeless and have mental illness);

OR

2. Populations estimates for the sub-population (e.g. proportion of Australians who are homeless); PLUS

[18] Wright E, Pagliaro C, Page I & Diminic S (2023) A review of excluded groups and non-response in population-based mental health surveys from high-income countries. Social Psychiatry and Psychiatric Epidemiology. https://doi.org/10.1007/s00127-023-02488-y

3. Estimates of the rate of mental illness comorbidity within that sub-population (e.g. proportion of homeless people who have mental illness).

Selected experts were consulted out of session to identify other data sources and test approaches. Based on expert panel discussions, it was assumed that 100% of people not living in households or with cognitive impairment would be excluded from GBD mental illness prevalence estimates.

Published studies identified as potentially relevant presented wide variability in sample sizes, sampling methods, and definitions of the sub-populations and mental illness. In each case, the Australian data source or sources with large, representative samples that aligned most closely with the intended scope of sub-populations and NMHSPF mental illness were chosen as the preferred inputs for modelling.

Homelessness

The 2016 Australian Census data was used to identify the proportion of the Australian population that is homeless on any given day.[19] An initial literature review conducted to determine the rate of mental illness among homeless populations found wide variability in study sample sizes, sampling methods, and definitions of homelessness and mental illness. Ultimately, the national data on Specialist Homelessness Services (SHS) for 2017-18 was used as it was nationally representative and the only source that provided the rate of mental illness among homeless people by age.[20]

Table 6 summarises the findings of this work including the rate of homeless people with mental illness by age group per 100,000 age-specific population in Australia. These people would have been excluded from population-based mental health surveys and have therefore been added to the overall total prevalence rates for mental illness in each age group.

There were a number of limitations to using the SHS dataset:

- It only includes specialist homelessness service users and therefore may be missing some homeless people;
- Numbers are only reported for “mental health issue” which is broadly defined and includes self-reported measures; and
- Rates of mental illness by age group include people at risk of homelessness, though this would likely have little effect on prevalence as the overall rates were 31.7% excluding people at risk of homelessness and 33.6% for all SHS clients.

[19] Australian Bureau of Statistics. *20490DO001_2016 Census of Population and Housing: Estimating homelessness, 2016*. 2018 27 June 2019]; Available from: https://www.abs.gov.au/AUSSTATS/subscriber.nsf/log?openagent&20490do001_2016.xls&2049.0&Data%20Cubes&104CAB1DD2062422CA2582D30012B550&0&2016&24.07.2018&Latest.

[20] AIHW. *Data tables: National: Specialist homelessness services annual report 2017-18*. 2019 27 June 2019]; Available from: https://www.aihw.gov.au/reports/homelessness-services/specialist-homelessness-services-2017-18/data.

Table 6. The number of homeless people with mental illness by age group per 100,000 age-specific Australian population, calculated using the 2016 Australian Census data on homelessness and SHS mental illness prevalence rates

Age group	Total number of homeless people and people living in caravan parks or improvised dwellings[21]	Total population, Australia[22]	Proportion of population that is homeless[23] (%)	Proportion of homeless population with a mental illness[24] (%)	Rate per 100,000 population
12 to 17	3,896	1,722,919	0.23	27.2	61.5
18 to 24	8,758	2,290,440	0.38	36.5	139.6
25 to 64	50,733	12,742,424	0.40	35.2	140.1
65+	10,805	3,682,878	0.29	16.8	49.3

Notes: Total number of homeless people and the proportion of the population that is homeless refer to people experiencing primary and secondary homelessness, and those living in caravan parks and other improvised dwellings. They do not include people at risk of homelessness or living in overcrowded dwellings. However, the proportion of homeless population with a mental illness does include people who are at risk of homelessness as those numbers could not be separated out by age. Age groups for the Census data and SHS populations do not match exactly and mental illness is not reported for SHS clients under the age of 10.

Residential aged care facilities (RACF)

Data from the Aged Care Funding Instrument (ACFI) were requested via the AIHW on the prevalence of mental illness in RACFs, as well as comorbid dementia and mental illness (a proxy for behavioural and psychological symptoms of dementia; BPSD), by NMHSPF age groups. The data were converted into rates per 100,000 population for the NMHSPF.

Dementia – BPSD (community)

Data were sourced from the 2015 Survey of Disability, Ageing and Carers (SDAC),[25] using the long term health conditions reported by participants or key informants for the household. Participants were included where they:

- Had both dementia and mental illness; and
- Were living in households (as opposed to RACFs).

[21] Australian Bureau of Statistics. *20490DO001_2016 Census of Population and Housing: Estimating homelessness, 2016*. 2018 27 June 2019];
[22] Ibid
[23] Ibid
[24] AIHW. *Data tables: National: Specialist homelessness services annual report 2017-18*. 2019 27 June 2019];
[25] Australian Bureau of Statistics. Survey of disability, aging and carers (SDAC): Household survey questionnaire. Canberra: ABS, 2015.

Table 7 presents the survey data by age group, converted into a rate per 100,000 population for use in the NMHSPF.

Table 7. Prevalence of comorbid dementia and mental illness (BPSD) in households, by age group (2015 SDAC)

Age group	Survey population	Estimated population, Australia	Prevalence % (95%CI)	Rate per 100,000 population
25-64 years	17	6,427	0.04 (0.02 – 0.07)	51.9
65+ years	189	21,546	0.6 (0.5 – 0.9)	607.6
Total (all ages)	206	27,973	0.1 (0.09 – 0.2)	NA

The proportion of persons with comorbid dementia and mental illness dwelling in households equated to 28.5% of all persons with dementia dwelling in households.

Intellectual disability (community)

Two different data sources were identified for determining the prevalence of mental illness among people with an intellectual disability. These included the 2015 SDAC and a data linkage study from Western Australia.[26]

The 2015 SDAC provides data on long term health conditions reported by participants or key informants for the household. Participants were included where they:

- Did not have dementia;
- Had both an intellectual disability and mental illness; and
- Were living in households.

Table 8 presents the survey data by age group, converted into a rate per 100,000 population for use in the NMHSPF. According to the 2015 SDAC,[27] the total national prevalence of intellectual disability across households and other facilities was 0.65%. Of all individuals with intellectual disability living in households, 40% had a comorbid mental illness, i.e. 0.25% prevalence (**Table 8**).

[26] Morgan, V. A., Leonard, H., Bourke, J., & Jablensky, A. (2008). Intellectual disability co-occurring with schizophrenia and other psychiatric illness: population-based study. British Journal of Psychiatry, 193(5), 364-372.

[27] Australian Bureau of Statistics. Survey of disability, aging and carers (SDAC): Household survey questionnaire. Canberra: ABS, 2015.

Table 8. Prevalence of comorbid intellectual disability and mental illness (without dementia) in households, by age group (2015 SDAC)

Age group	Survey population	Estimated population, Australia	Prevalence % (95%CI)	Rate per 100,000 population
0-4 years	1	543	0.04 (0.00 – 0.3)	36.0
5-11 years	14	5,352	0.3 (0.1 – 0.6)	266.4
12-14 years	11	4,064	0.5 (0.2 – 0.9)	480.7
15-19 years	12	3,872	0.3 (0.1 – 0.6)	275.2
20-24 years	11	3,534	0.2 (0.1 – 0.5)	222.6
25-64 years	90	32,014	0.3 (0.2 – 0.3)	258.5
65+ years	31	7,715	0.23 (0.15 – 0.34)	217.5
Total (all ages)	170	57,094	0.25 (0.21 – 0.29)	N/A

The WA population-based linkage study provided linked data on comorbid intellectual disability (from the WA intellectual disability register) and mental illness, as measured by contact with psychiatric services (public sector inpatient and ambulatory services plus private hospitals). According to this study, 31.7% of individuals with intellectual disability had contact with psychiatric services. The 13,295 WA residents with intellectual disability captured in this cohort represent roughly 0.68% of the 2003 WA population. Data from this study provided validation of the SDAC estimates, with estimates of 0.65-0.68% of the population having an intellectual disability and 32-40% of those having a comorbid mental illness.

Overall, these rates of intellectual disability captured in both data sources seem lower than expected, although there is no one perfect data source. Examples from other references:

- 2.9% national prevalence for intellectual disability from the ABS (2012 SDAC), defined as “difficulty learning or understanding things”; the scope of this question is much broader.
- 1.3% national prevalence for intellectual disability from the 1998 SDAC based on long-term health conditions.[28]
- 0.6% prevalence in NSW of people with intellectual disability who had contact with disability services.[29]
- 0.21% national prevalence of idiopathic developmental intellectual disability from GBD; not comparable due to other causes of intellectual disability being classified elsewhere.

[28] White, P., Chant, D., Edwards, N., Townsend, C., & Waghorn, G. (2005). Prevalence of Intellectual Disability and Comorbid Mental Illness in an Australian Community Sample. Australian & New Zealand Journal of Psychiatry, 39(5), 395–400.

[29] Reppermund S, Srasuebkul P, Heintze T, et al. Cohort profile: a data linkage cohort to examine health service profiles of people with intellectual disability in New South Wales, Australia. BMJ Open 2017;7:e015627.

Autism spectrum disorder

Autism spectrum disorder (ASD) as a primary diagnosis has been excluded from NMHSPF prevalence estimates since it is viewed as the primary responsibility of the disability sector rather than mental health system. About half of individuals with ASD have a comorbid intellectual disability,[30] and any mental illness in this population would be covered by the intellectual disability modelling. According to expert advice, other individuals with ASD may still be less likely to respond to mental health surveys than people without ASD, but there is little data available to quantify this effect. It was decided that most need would be covered by the intellectual disability and general population estimates and that no further modelling would be done separately for those individuals with ASD and mental illness but no intellectual disability.

Substance use disorders

A review of existing Australian and international literature was conducted to identify rates of non-response among people with substance use disorders. This was to be used in conjunction with findings on the rates of substance use disorders in Australia and the prevalence of mental illness among people with substance use disorders to adjust the NMHSPF estimates. Only one international source of information on non-response rates could be identified: "The US National Comorbidity Survey Replication (NCS-R): design and field procedures". While the study found that initial non-responders had slightly higher rates of substance use problems than initial responders, the difference was not significant.[31] Given the paucity of data available to determine the proportion of people with a substance use disorder who would not participate in household surveys and not already be captured in the other non-response groups, a decision was made to avoid making any adjustments for this group.

Summary of prevalence for excluded groups

The resulting estimates of mental illness prevalence in groups excluded from household surveys are shown by population in **Table 9** and overall by severity level in **Table 10**.

[30] Hwang YI, Srasuebkul P, Foley KR, Arnold S, Trollor JN. Mortality and Cause of Death of Australians on the Autism Spectrum. Autism Research 12: 806–815, 2019.

[31] Kessler, R.C., et al., *The US National Comorbidity Survey Replication (NCS-R): design and field procedures.* International Journal of Methods in Psychiatric Research, 2004. **13**(2): p. 69-92.

Table 9. Prevalence of mental illness in groups excluded from household surveys, by age group

	Age group	Total
MENTAL HEALTH		
Living in community with intellectual disability (SDAC)	0-4	0.036%
	5-11	0.266%
	12-17	0.377%
	18-24	0.237%
	25-64	0.259%
	65+	0.218%
Homeless (ABS and SHS)	0-4	0.000%
	5-11	0.000%
	12-17	0.062%
	18-24	0.140%
	25-64	0.140%
	65+	0.049%
Living in residential aged care (ACFI)	0-4	0.000%
	5-11	0.000%
	12-17	0.000%
	18-24	0.000%
	25-64	0.028%
	65+	1.387%
BPSD		
Living in community with dementia (SDAC)	25-64 BPSD	0.052%
	65+ BPSD	0.608%
Living in aged care with dementia (ACFI)	25-64 BPSD	0.011%
	65+ BPSD	1.284%
TOTAL	25-64 BPSD	0.063%
	65+ BPSD	1.892%

Table 10. Survey excluded group total prevalence by age groups (mental health)

Age group	Total	MILD	MODERATE	SEVERE
0-4	0.036%	0.022%	0.009%	0.005%
5-11	0.266%	0.189%	0.055%	0.022%
12-17	0.438%	0.282%	0.115%	0.042%
18-24	0.376%	0.244%	0.095%	0.038%
25-64	0.427%	0.277%	0.108%	0.043%
65+	1.654%	1.088%	0.422%	0.144%

Prevalence results

Table 11 shows the overall estimated proportion of the population with demand for mental health services by severity and age group used in the NMHSPF.

Table 11. NMHSPF estimates of population with demand for mental health services by age and severity level

Age group	SEVERE	MODERATE	MILD	TOTAL
0 to 4	1.4%	2.2%	3.1%	6.7%
5 to 11	1.2%	2.4%	5.2%	8.9%
12 to 17	2.3%	5.2%	7.9%	15.4%
18 to 24	2.9%	6.0%	9.6%	18.5%
25 to 64	2.7%	5.4%	8.6%	16.7%
65+	1.6%	3.7%	6.0%	11.3%
65+ BPSD*	0.4%	0.4%	0.5%	1.3%
All ages	2.3%	4.7%	7.6%	14.6%

* This estimate of BPSD is based on comorbid dementia and mental illness in residential aged care and the community.

Mental health service needs in individuals without a current diagnosis

Additional analyses were undertaken to account for the mental health service needs of individuals across all age groups who do not meet criteria for a past year mental health diagnosis but may have other indicators of service need, such as a past history of mental illness, mental health symptoms, distress, impairment and perceived need for services.

Selective prevention for children living with parents with mental illness (0 – 17 years)

Care profiles for children living with parents who have moderate to severe mental illness (children of parents with mental illness, COPMI) are included in the NMHSPF model. These children are not included in prevalence estimates as they do not have an active diagnosis of mental illness themselves. However, it is acknowledged that because of the increased risk for developing mental health issues in these children, services for children of parents with a mental illness (COPMI) are a core part of mental health services. The care modelled is not directed at the parent with the mental illness as their care is dealt with elsewhere in the model, but is rather the additional care required to provide psychoeducation and support to the child. If the child has their own diagnosis of mental illness in conjunction with their COPMI status, then they are included in the COPMI modelling plus another care profile for the care of their own illness.

The COPMI packages are applied to children and adolescents within three age groups (0-4, 5-11 and 12-17 years). This care aims to build resilience in the child, monitor their wellbeing, and have a plan in place should the parent have an acute episode. The numbers of children and parents falling into these groups were derived from commissioned work conducted by QCMHR in 2013.

The numbers of parents with a mental illness living with dependent children aged 0-17 years and the numbers of children per family were extracted and modelled from the 2007 NSMHWB and the 2010 SHIP surveys. Children were included in the selective prevention groups if they were deemed at high or extreme risk. This produced the rates shown in **Table 12**.

Table 12. NMHSPF estimates of the number of children living with parents with a moderate to severe mental illness

Deemed risk level for child	Description of family composition	Estimated number of children, Australia 2012	Prevalence of 0-17 years % (95%CI)	Rate per 100,000 population
High risk	Couple family, one parent with SEVERE illness	94,411	1.8%	4,900
	Couple family, one parent with MODERATE illness and other parent also has mental illness	55,504	1.1%	
	Sole parent with MODERATE illness	104,743	2.0%	
Extreme risk	Couple family, one parent with SEVERE illness and other parent also has mental illness	17,683	0.3%	1,700
	Sole parent with SEVERE illness	68,740	1.3%	
TOTAL				6,600

COPMI populations may remain in the care profile for multiple consecutive years without needing the same care every year. The Phase 2 Expert Panel agreed that the number of years that service is received within age span would be modelled based on key intervention points, focused around entering and leaving different levels of school as well as changes in the parent's mental illness or family situation. The number of years requiring an intervention in each age group was modelled as 1.5 times the minimum number of intervention points for high risk (3 intervention points in each age group), and twice the minimum for extreme risk (4 intervention points in each age group). For each age group these were converted into a percentage of COPMI requiring intervention (demand rate) using the total number of years in the age span (e.g. for high risk 0-4 years, 3 intervention points ÷ 5 year age span = 60%; **Table 13**).

Table 13. Demand rates for 0-17 years selective prevention (COPMI) need groups

Age group	High risk	Extreme risk	Total	Rate per 100,000 population
0 to 4	60%	80%	65%	4,300
5 to 11	43%	57%	47%	3,076
12 to 17	50%	66%	54%	3,572

Indicated prevention and relapse prevention services for children and adolescents (5-17 years)

An analysis of prevalence and service use was undertaken using the 2013-14 Young Minds Matter (YMM) survey to estimate the number of children and adolescents (i.e. 5-11 years and 12-17 years) requiring indicated prevention and relapse prevention services in a 12-month period.[32] The following definitions of indicated prevention and relapse prevention were used:

- *Indicated prevention:* young people with the required number of symptoms for a DSM-IV disorder without impairment and/or young people with less than the required number of symptoms for a DSM-IV disorder (i.e., at least half but less than that required for diagnosis) with impairment (i.e., mild, moderate, or severe).
- *Relapse prevention*: young people with a lifetime mental disorder diagnosis but without a 12-month mental disorder diagnosis

Health service use was defined as:

- seen a health professional in the last 12-months (i.e., GP, paediatrician, psychiatrist, psychologist, nurse, social worker, occupational therapist, counsellor/family therapist);
- received help from a hospital emergency/outpatient/inpatient service; and/or
- received help from a specialist child and adolescent mental health service (i.e., CAMHS/CYMHS, headspace, or another community child and youth health service).

Separately, the proportion of young people who did not use a health service (as defined above) but did use a school-based service, was investigated. School-based services included the following:

- referred to/engaged in individual/group counselling at school;
- attended a special school or placed in a special class;
- made a visit to a school nurses; and/or
- used 'other' school-based services.

Questions pertaining to perceived need asked about perceived need for medication and counselling. Parent-reported data was used to estimate service use/need among 5-11 year olds; parent- and

[32] Pagliaro C, Pearl M, Lawrence D, Scott JG, Diminic S. Estimating demand for mental health care among Australian children and adolescents: Findings from the Young Minds Matter survey. Australian & New Zealand Journal of Psychiatry. 2022;56(11):1443-1454. https://doi.org/10.1177/00048674211069874

youth-reported data was used to estimate service use/need among 12-17 year olds. However, only 13-17 year olds responded to questions pertaining to service use and perceived need.

Service demand was equal to the aggregate of: (1) used a health service; (2) did not use a health service but used a school-based service and needed more help; or (3) did not use a health or school-based service but perceived a need for help.

Table 14 presents the size of the indicated prevention and relapse prevention need groups.

Table 14. Proportion of children and adolescents in each need group and the proportion in each need group requiring services

Age group	Need group	Prevalence (%)	Service need (%)	Service need (Rate per 100,000 population)
5-11	Indicated prevention[a]	9.8	30.7	3,008.6
5-11	Relapse prevention[b]	5.2	47.6	2,475.2
12-17	Indicated prevention[c]	9.7	46.2	4,481.4
12-17	Relapse prevention[b]	8.2	56.2	4,608.4

[a] parent-reported responses to seven 12-month DISC-IV modules with/without accompanying 'severity'
[b] parent-reported lifetime mental disorder diagnosis in the absence of a parent-reported 12-month DISC-IV diagnosis
[c] parent- and youth-responses to 12-month DISC-IV modules with/without accompanying 'severity'

Indicated prevention (18-24 years)

The 2007 NSMHWB[33] was analysed to estimate the number of young adults (18-24 years) who do not meet criteria for a 12-month or lifetime diagnosis of mental illness but have symptoms of mental illness and functional impairment, requiring an indicated prevention service response. Final prevalence and demand estimates are provided in **Table 15**. The method involved:

Defining impairment levels

Unfortunately there are no standardised cut-offs to determine which scores on the World Health Organization's Disability Assessment Schedule (WHODAS) indicate low versus high functional impairment. In lieu of this we used the mean 12 item WHODAS scores (WHODAS12) of individuals with mild, moderate and severe mental illness (ISEVAUS) to determine cut-offs for the two impairment levels. Individuals who had substance and alcohol use disorder symptoms only were excluded.

- Low impairment was defined as a mid-point between the mild and moderate groups (WHODAS score > 10 – 15)
- High impairment was defined as a mid-point between moderate and severe groups (WHODAS score > 15)

[33] Australian Bureau of Statistics. 2007 National Survey of Mental Health and Wellbeing. Canberra: ABS, 2007.

Need groups

We used the following definitions of indicated prevention to create two need groups:

- Indicated prevention - low impairment: young adults with less than the required number of symptoms for an ICD-10 disorder with 'low' impairment.
- Indicated prevention - high impairment: young adults with less than the required number of symptoms for an ICD-10 disorder with 'high' impairment.

Demand for mental health services

Individuals who had either had **used a mental health service** in the past 12 months or reported a **perceived need for services** were included.

Mental health service use was defined as having had a consultation with any mental health professional for mental health in the past 12 months (box 1) or having been admitted overnight or longer to hospital for a mental health condition in the past 12 months.

Perceived need was measured using the Perceived Need for Care Questionnaire. Participants who had reported not seeing a mental health professional in the past 12 months but reported wanting to use services were included (box 2)[34].

Box 1. In scope mental health professionals

- Consultation with a GP for mental health in the past 12 months
- Consultation with a psychiatrist for mental health in the past 12 months
- Consultation with a psychologist for mental health in the past 12 months
- Consultation with a mental health nurse for mental health in the past 12 months
- Consultation with other specialist mental health professional for mental health in the past 12 months
- Consultation with specialist doctor or surgeon for mental health in the past 12 months
- Consultation with other general health professional for mental health in the past 12 months
- Consultation with an alternative therapist for mental health in the past 12 months

Box 2. In scope mental health services

- Medicine or tablets
- Psychotherapy – discussion about causes that stem from the past
- Cognitive behaviour therapy – learning how to change your thoughts, behaviours and emotions
- Counselling – help to talk through your problems
- Help to sort out housing or money problems
- Help to improve your ability to work, or to use your time in other ways
- Help to improve your ability to look after yourself or your home
- Help to meet people for support or company

[34] Excludes those who only reported wanting 'information about mental illness, its treatment, and available services'.

As a limitation to this analysis, the 2007 NSMHWB included three measures that could be used to determine the extent to which health problems affected participants in the past 30 days: the WHODAS, Australian Assessment of Quality of Life and two questions relating to 'days out of role' due to health problems. None of these measures have validated cut-offs that indicate clinically significant functional impairment. Additionally, these measures assess global functioning and are not focussed solely on the impact of symptoms of mental illness. The WHODAS was chosen for the analysis as it was deemed the best approximation of functional impairment related to mental illness.

Table 15. Final prevalence and demand estimates (18-24 years)

Need group	Prevalence (%)	Demand for services (%)	Total young adults, 2018	Rate per 100,000 population
Indicated prevention (low impairment)	1	79.7	18,845	797.0
Indicated prevention (high impairment)	1.4	38.7	12,811	541.8

Indicated prevention (25+ years)

The 2007 NSMHWB[35] was analysed to estimate the size of the indicated prevention need group for the 25-64 years and 65+ years age groups in the NMHSPF. The method involved:

1. Identifying individuals who do not have a lifetime diagnosis but do have some other need for treatment e.g. 12-month affective or anxiety symptoms (but no lifetime diagnosis), a reaction to a traumatic event in the past 12 months, or lifetime hospitalisation for a mental health problem.
2. Of this group, determining how many have a demand for mental health services (**Table 16**). Demand is defined as having either expressed need for services (by having used services for a mental health problem in the past 12 months) or having a perceived unmet need for services in the past 12 months (measured using the Perceived Need for Care Questionnaire).

Table 16. Patterns of treatment for those with other indicators of need–percentage of subsample

Age group	Percentage (95% CI)			
	Population distribution	Received treatment	Persons with unmet need	Total demand
25-64 years	5.8 (0.5)	19.3 (2.6)	4.7 (1.3)	23.9 (2.5)
65+ years	5.0 (0.5)	11.4 (3.8)	0.0	11.4 (3.8)

Table 17 indicates the indicated prevention need group size for adults.

[35] Australian Bureau of Statistics. 2007 National Survey of Mental Health and Wellbeing. Canberra: ABS, 2007.

Table 17. Indicated prevention need group modelling

Age group	Rate per 100,000 population	Total persons, 2019
25-64 years	1,386	204,794
65+ years	570	23,019

Relapse prevention (18+ years)

The 2007 NSMHWB was analysed to estimate the size of the 18-24 years, 25-64 years and 65+ years relapse prevention populations in the NMHSPF. The method included:

1. Identifying individuals with a lifetime ICD-10 affective or anxiety disorder but no 12 month symptoms.
2. Of this group, determining how many have a demand for mental health services (**Table 18**). Demand is defined as having either expressed need for services (by having used services for a mental health problem in the past 12 months) or having a perceived unmet need for services in the past 12 months (measured using the Perceived Need for Care Questionnaire).

Table 18. Patterns of treatment for those with a lifetime diagnosis of affective and/or anxiety disorders but no 12-month symptoms – percentage of subsample

Age group	Percentage (95% CI)			
	Population distribution	Received treatment	Persons with unmet need	Total demand
18-24 years	10.6 (1.0)	7.2 (2.1)	5.8 (2.2)	13.0 (2.8)
25-64 years	16.6 (0.8)	14.2 (1.5)	1.0 (0.3)	15.3 (1.5)
65+ years	12.0 (0.9)	8.5 (1.9)	0.0	8.5 (1.9)

Table 19 provides the relapse prevention need group sizes for adults by age group.

Table 19. Relapse prevention need group modelling

Age group	Rate per 100,000 population	Total persons, 2018
18-24 years	1,378	32,583
25-64 years	2,540	333,836
65+ years	1,020	41,191

One limitation of this need group analysis is that the modelling represents a narrow view of relapse prevention (i.e. only those with a lifetime diagnosis of affective and/or anxiety disorder). Future work should consider capturing the relapse prevention service needs of individuals with past diagnoses of low prevalence disorders.

Service need among Aboriginal and Torres Strait Islander populations

Due to the current lack of nationally representative mental disorder diagnostic prevalence data for Indigenous Australians, the Epidemiology Expert Panel agreed to use a range of rate ratios as multipliers to adjust the non-Indigenous (base) prevalence estimates to account for the greater need for mental health services for Aboriginal and Torres Strait Islander peoples. Analysis of service utilisation and survey data has been used to inform the multipliers. Because the severity distribution is estimated to be different for Indigenous Australians compared to non-Indigenous, a different approach has been used for severe vs. moderate and mild disorders. The modifiers also differ across age groups, as the data sources did not span across all NMHSPF age groups.

Utilisation of state specialist services across inpatient and ambulatory care was used to determine a multiplier for the severe group across all age groups. For moderate and mild groups, different multipliers were used to estimate needs across different age groups (see **Table 20**). See **Figure 3** for a visual depiction of how each modifier was used to estimate final prevalence rates. **Table 21** provides the expected service demand rates by age group and severity level for Indigenous populations. A care profile for the new Indicated Needs (social and emotional wellbeing) group will need to be developed in the future. Some key features of this group may include: non-clinical focus, should be modified at a local level based on the needs of specific communities, care coordination, advocacy and outreach.

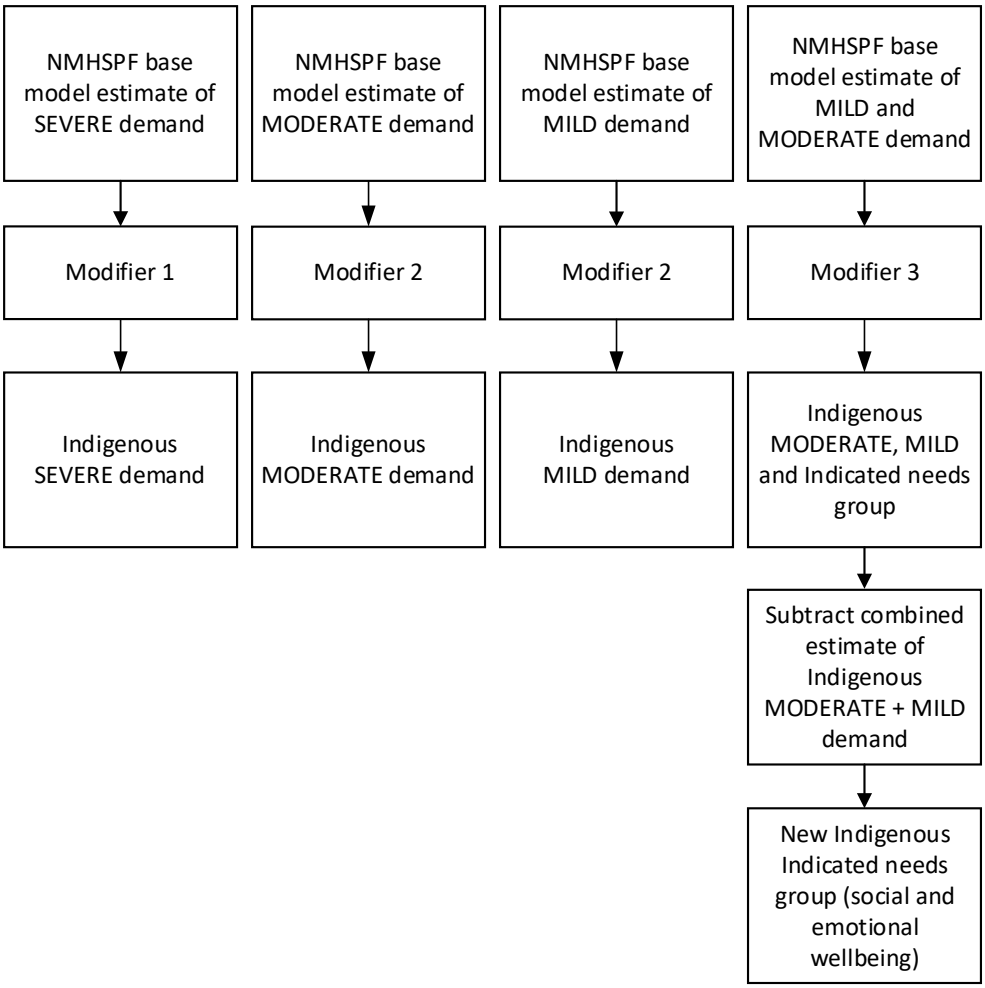


Figure 3. Visual depiction of how NMHSPF modifiers from Table 19 are used to determine Indigenous demand estimates

Table 20. Modifiers (multiplier rates) used to estimate the higher prevalence of mental illness for Indigenous Australians in the NMHSPF

	Modifier 1		Modifier 2				Modifier 3	
Age group	SEVERE	Source	MODERATE	Source	MILD	Source	Sum of MILD, MODERATE and new indicated prevention	Source
0-4	3.0	2016-19 AIHW[36] data on utilisation of public sector mental health services - specialised clinical mental healthcare	1.5	Based on 2021 EEP[37] advice and unpublished data	1.5	Based on 2021 EEP advice and unpublished data	2	Based on 2021 EEP advice and unpublished data
5-11	3.0		1.5		1.5		2	
12-17	2.5		2.0		2.0		2.5	
18-24	3.0		2.01	UQ analysis of NATSIHS[38] and NHS[39] data - rate ratio for self-reported diagnosis (18-64 years)[40]	2.01	UQ analysis of NATSIHS and NHS data - rate ratio for self-reported diagnosis (18-64 years)	2.35	UQ analysis of NATSIHS and NHS data - rate ratio for high/very high distress (18-64 years)
25-64	3.9		2.01		2.01		2.35	
65+	1.7		1.92	UQ analysis of NATSIHS and NHS data - rate ratio for self-reported diagnosis	1.92	UQ analysis of NATSIHS and NHS data - rate ratio for self-reported diagnosis	2.15	UQ analysis of NATSIHS and NHS data - rate ratio for high/very high distress (65+)
65+ BPSD	2.5	Estimate of multiplier for dementia prevalence based on existing literature	2.5	Estimate of multiplier for dementia prevalence based on existing literature	2.5	Estimate of multiplier for dementia prevalence based on existing literature	-	-

[36] Australian Institute of Health and Welfare
[37] Epidemiology Expert Panel
[38] National Aboriginal and Torres Strait Islander Health Survey
[39] National Health Survey
[40] Page I, Ferrari A, Slade T, Anderson M, Santomauro D, Diminic S. (2022). Estimating the difference in prevalence of common mental disorder diagnoses for Aboriginal and Torres Strait Islander peoples compared to the general Australian population. Epidemiology and Psychiatric Sciences, 31, E44. https://doi.org/10.1017/S2045796022000233

Table 21. Expected service demand rates by age group and severity level (Indigenous NMHSPF model)

Age group	SEVERE	MODERATE	MILD	**TOTAL**
0-4	4.2%	3.2%	4.7%	**12.2%**
5-11	3.6%	3.7%	7.8%	**15.1%**
12-17	5.9%	10.3%	15.7%	**31.9%**
18-24	8.8%	12.1%	19.2%	**40.1%**
25-64	10.3%	10.9%	17.4%	**38.5%**
65+	2.6%	7.2%	11.5%	**21.3%**
65+ BPSD	1.1%	1.1%	1.2%	**3.3%**

APPENDIX 5 – DEVELOPMENT OF NEED GROUPS

From service demand to need groups for care profiles

Service utilisation data and other research were used to apportion the population across non-diagnostic categories (e.g. Promotion, Prevention, Selective prevention, Indicated prevention and Relapse prevention) and diagnostic positive categories of MILD, MODERATE and SEVERE levels of illness in the context of specific need groups.

The structure is not dissimilar to a 'tree diagram' where the total population is split into the broad severity categories and then from there are further broken down into smaller populations – need groups. The bottom row of the tree diagram seen in **Figure 4** represents the smallest population component that will be applied to one care profile.

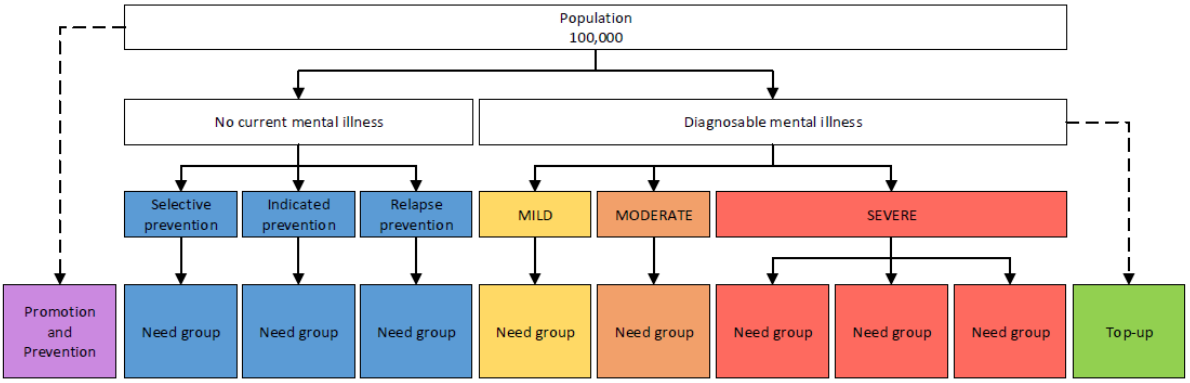


Figure 4. Conceptual representation of a NMHSPF epidemiology flow chart

The range of need groups is largely informed by the nature of the care required by each group. For example, the variance in the type of care required by individuals within MILD or MODERATE mental illness groups is very minimal compared to that provided for those with SEVERE mental illnesses. This is largely because people in the first two categories do not require any bed-based services and due to comparatively high functioning relative to those diagnosed with SEVERE mental illnesses, do not require as much clinical input or community support services.

For those populations with SEVERE mental illness, several divisions of population have been made on the basis of:

- The format of care (e.g. individual versus group-based options)
- Key differences in the characteristics of the population (e.g. Standard versus Complex needs)
- Key differences in the quantity or type of care accessed (ambulatory services only versus combination of bed-based and ambulatory, differing acuity of service provision); and
- Population splits as determined by research.

'Standard' and 'Complex' groups were developed to better account for the diversity in individuals' psychosocial complexity. The distinction between standard and complex is shown in the specification of care and description of the treatment group. In most cases, the complex care profile will have a longer assessment, more clinical support and more psychosocial interventions, where required.

'Complex', as used in the NMHSPF, reflects additional issues that result in the need for more mental health care. This may include additional issues relating to physical health needs (e.g. liver disease), social circumstances (e.g. housing or welfare needs), behavioural complexities, co-morbid diagnoses (e.g. drug or alcohol problems) or multiple mental health diagnoses. Note that the term 'complex' does not refer to the classification of severity of illness as this is determined by definition in the epidemiology.

In most cases, each population down the tree is extracted from the source population (i.e. the lowest level populations would aggregate up to equal the population quantum at the next level up). This approach avoids double counting the prevalence.

In addition to the need groups there are also populations or blocks of standalone care called 'top-ups'. These populations are usually an additional piece of modelling that applies above and beyond the standard epidemiological categories because they represent care that applies to all people across the model (e.g. Emergency Department care, Respite care, Triage) or may apply as an additional service need to a specific population. Therefore, all top-ups are modelled as an addition to the population splits as they stand alone from other aspects of the modelling.

Is there capacity in the modelling to recognise the episodic nature of mental illness?

The approach to NMHSPF modelling has ample capacity to integrate or recognise the episodic nature of mental illness. Although for simplicity the model is presented as if individual people are spending a whole twelve month period in a particular "need group" and receiving a particular "care profile", technically "person-years" of care are modelled, not people. The model represents the total volume of care over a year, and builds up an estimate of that total by dividing it across "index examples" of people who (for example) have a SEVERE illness requiring an acute inpatient admission in a year, and others who do not, and assigning the average amount of ambulatory and other care to each. By ensuring that the total numbers are consistent with the prevalence data and with utilisation data moderated by the judgements of expert panels, we use this as a way of making sure we have covered the total volume of services. This should not be confused with how that volume of services would be spread over actual consumers on a case-by-case basis.

It is important users understand how this "averaging" of person-years of care works, because it is the only feasible way to model the complexities of the system. For example, an Average Length of Stay (ALOS) of 14 days adequately represents the volume of stays between 1 and 90 days in inpatient care in Australia. It should never be interpreted as meaning that every individual person stays exactly 14 days.

The particular issue of concern seems to be based on the idea that whatever is defined in the model is a particular type of service that would be funded for a particular individual. An example is the four or five levels of the Housing and Accommodation Support Initiative (HASI) in NSW. While it is true that individuals (and funded places) were contracted for specific levels of support, it was soon recognised that the community support sector (e.g. psychosocial support services provided by non-government organisations) needed the flexibility to allocate resources more flexibly in relation to people's changing needs. That does not alter the fact that we need to estimate the total demand across all levels of support. It is generally more convenient for all concerned to divide this into sub-tasks where multiple levels of support are each designed separately, and we estimate the numbers

needing each separately, as a device for calculating the total demand. Again, how it is allocated to individuals in practice is an implementation and operational issue.

Need for acute bed-based care

The NMHSPF requires the quantification of the total number of people by age group requiring acute bed-based care, by type of hospital bed (psychiatric or general unit).

Due to the absence of a strong evidence base for any particular level of bed-based services, the NMHSPF models requirements for acute beds based on national average current utilisation, which should be updated to reflect changes in demand over time as mental health services in the community are expanded.

The NMHSPF recognises that some individuals will require more than one acute admission to a hospital bed within a 12-month period. Therefore, national separations data has been combined with the average ratio of separations to people across jurisdictions (see below) to inform the number of people in the NMHSPF needing acute and sub-acute bed-based care.

Custom extracts of hospital activity data, including total number of separations and number of people separated in the year were obtained from each jurisdiction for the financial years 2015-16 and 2016-17 to calculate a ratio of average annual separations per person. Each item was stratified by bed type (public acute psychiatric; public acute general with primary mental health diagnosis; private psychiatric if available), NMHSPF age group (0-4, 5-11, 12-17, 18-24, 25-64 and 65+ years), Indigenous status and year.

Data were provided by the AIHW on (a) national overnight admitted mental health separations with and without specialised care, and (b) national overnight admitted non-mental health separations with a secondary mental health diagnosis. Data were stratified by NMHSPF age group (0-4, 5-11, 12-17, 18-24, 25-64 and 65+ years), hospital sector (public; private) (see **Table 22**) and principal diagnosis (see **Table 23**) for the year 2017-18. Population estimates from the ABS for 2017-18 were used to calculate separations per 100,000 age-specific population for each NMHSPF age group (0-4, 5-11, 12-17, 18-24, 25-64, 65+ years and 65+ BPSD).

Table 22. Separation category to NMHSPF bed-based need type

Hospital sector	Mental health separation	With specialised psychiatric care	NMHSPF bed need
Public	Yes	Yes	Acute psychiatric
Private	Yes	N/A	Acute psychiatric
Public	Yes	No	Primary diagnosis in general acute bed
Public	No, secondary mental health diagnosis	No	Secondary diagnosis in general acute bed

Table 23. Principal diagnosis groupings in AIHW data request

ICD-10 codes	Diagnostic group	Application to NMHSPF
F00–F09, G30	Dementia, Alzheimer's and other organic mental disorders	0-64 years: Included for acute psychiatric beds only; 65+ years: Included for acute psychiatric beds and primary diagnosis in general beds within the BPSD need groups
F10–F19, F55, F70-F89	Substance use, intellectual and developmental disorders	Included for acute psychiatric beds; Excluded as primary/ secondary diagnosis in general acute beds
F20–F49, F51-F54, F59-F69, F90-F99, other	Psychotic, mood, anxiety, personality, behavioural and other disorders	Included
F50	Eating disorders	Used as separate estimate of need for specialist eating disorders beds (acute psychiatric only) Included with other mental disorders as primary/ secondary diagnosis in general acute beds

The conversion ratios from separations to persons were calculated using national average for 2015-17 data provided by jurisdictions (see **Table 24**) while the total number of separations was provided for 2017-18 by AIHW. Before any calculations were undertaken, the data from both sources was first rolled up into higher-level age groupings (i.e. 0-17 and 18-64 years) to improve relatively small samples in child and youth age groups. A decision was made to account for the differences in bed use between Indigenous and non-Indigenous populations elsewhere in the modelling.

The total number of people requiring acute bed-based care per bed type and age group were calculated using the following formula:

$$\text{Total number of people requiring acute bed-based care} = \frac{\text{Total national separations}}{\text{Separations per person ratio}}$$

For the 65+ age group for both mental health and BPSD, the 2016 Expert Panel advised that an additional 20% of need should be added to current utilisation of acute psychiatric beds to meet needs for older adults who are currently admitted to general beds but should be in specialised care. This need was subtracted from the primary diagnosis in a general acute bed total. See **Table 25** for

estimated national average number of people per 100,000 age-specific population using acute bed-based care.

Table 24. National average separations per person by bed type and age group, 2015-17

Bed type	Age	Separations per person
Acute psychiatric	0–17	1.54
Acute psychiatric	18–64	1.57
Acute psychiatric	65+	1.48
Public acute general	0–17	1.31
Public acute general	18–64	1.37
Public acute general	65+	1.30

Note: Data on private hospitals was unavailable for three jurisdictions and excluded from one jurisdiction.

Table 25. Estimated national average number of people per 100,000 age-specific population using acute bed-based care, by bed type and age

Bed type	Age group						
	0-4	5-11	12-17	18-24	25-64	65+	65+ BPSD
Acute psychiatric	9.4	13.5	336.3	655.3	584.2	333.3	94.4
General beds PDMH	152.6	18.7	135.1	112.3	96.4	54.5	483.0
General beds SDMH	17.0	25.1	120.7	153.3	184.0	542.7	n/a
Eating disorders	0	0.3	17.4	24.2	4.5	0.3	0

PDMH: primary diagnosis mental health; SDMH: secondary diagnosis mental health

It should be noted that the separations data used to calculate the number of people requiring acute bed-based care in the NMHSPF reflect current national average utilisation and do not account for any potential increases or reductions in demand that may be achieved when or if NMHSPF resource estimates are implemented on the ground to expand the range of available services.

Perinatal mental illness (18-64 years)

The number of mothers with severe mental illness during the 12 months following giving birth was estimated to quantify a need group for specialist perinatal mental health services. A report by the Royal College of Psychiatrists[41] suggests that between 3-5% of the delivered population will require the services of a specialised perinatal community mental health team. Based on this, a rate of 4%

[41] Oates, M. (2015). Perinatal mental health services. Recommendations for the provision of services for childbearing women. CR197. Royal College of Psychiatrists.

was applied to the total births in Australia (for mothers aged 18-24 years and 25-64 years) to estimate the size of the perinatal mental illness need group (**Table 26**).

Table 26. Perinatal mental illness need group modelling

Age group	Rate per 100,000	Total people (2019)
18-24 years	71.40	1,707
25-64 years	74.72	9,954

Importantly, there was no nationally representative Australian data to estimate how many mothers with severe mental illness would need access to specialised perinatal mental health inpatient services (i.e., mother-baby units). Future work should consider obtaining national data from state and territory health departments.

Further, the current modelling only accounts for the demand for services for mothers, future work should investigate quantifying the demand for perinatal services for fathers.

First episode psychosis (12-24 years)

Separate need groups are modelled in the NMHSPF for young people experiencing first episode psychosis. Data analysis estimated the number of young people (aged 12-24 years) requiring access to specialist first episode psychosis services within a 12-month period and how those young people would be split into intensive and maintenance need groups.

A scan of the literature was undertaken to identify estimates for the incidence of first episode psychosis. An Australian research paper, *Treated incidence of first-episode psychosis in the catchment area of EPPIC between 1997 and 2000*[42], was selected and used to derive estimates for the incident cases of first episode psychosis in two age group (12-17 years and 18-24 years).

To determine need group sizes, data was required on common first episode psychosis illness trajectories corresponding to the likely service response required over three years of care (e.g. requiring an intensive service response or maintenance service response). Data from the research paper, *Investigating trajectories of social recovery in individuals with first-episode psychosis: a latent class growth analysis*[43], was selected and used to determine illness trajectories.

Modelling was undertaken using a three year approach. In any given year, the intensive need group will include all incident cases in the current year, plus some proportion of the incident population from the previous two years who still require an intensive service response based on their trajectory group. The maintenance need group will include the remainder of incident cases from previous years who no longer require an intensive service response. The trajectories have been broken out over three years in order to determine the number of cases in each need group in any given year (see **Table 27**). **Table 28** displays the first episode psychosis need group sizes based on this modelling approach.

[42] Amminger, GP et al. (2006) Treated incidence of first-episode psychosis in the catchment area of EPPIC between 1997 and 2000. Acta Psychiatrica Scandinavia: 114; 337-345.
[43] Hodgekins, J. et al. (2015). Investigating trajectories of social recovery in individuals with first-episode psychosis: a latent class growth analysis. The British Journal of Psychiatry, 207, 536-543.

Table 27. First episode psychosis trajectory data source details

Study	Hodgekins et al. (2015)		
Location	UK		
Sample age	14-35 years		
Instrument	Time use survey		
Outcomes classified*	Low stable	Moderate-increasing	High-decreasing
Outcome definition	Reflecting individuals with high levels of social disability at baseline which remained relatively stable and below the non-clinical range over the study period	Reflecting individuals with a moderate level of social disability at baseline which improved over the study period into the non-clinical range	Reflecting individuals who were not socially disabled at baseline (scoring above the non-clinical range) and, despite a large decrease, maintained their level of functioning within the non-clinical range throughout the 12-month study period
Proportion of sample (as reported in study)	66%	27%	7%
Trajectory split across three years			
Year 1	Intensive	Intensive	Intensive
Year 2	Intensive	50% intensive 50% maintenance	Maintenance
Year 3	Intensive	25% intensive 75% maintenance	Maintenance

Table 28. First episode psychosis need groups

Age group	Incidence		Need group	Rate per 100,000 population	Total population, Australia 2018
	Rate per 100,000	Total population, Australia 2018			
12-17 years	74	1,286	Intensive	185	3,245
			Maintenance	35	614
18-24 years	159	3,752	Intensive	400	9,465
			Maintenance	76	1,792

A review of the literature on incidence of first episode psychosis showed that rates varied greatly based on the location and the inclusion criteria of the studies. Additionally, the Epidemiology Expert Panel (2018-19) advised that treated incidence rates would likely underestimate the demand as not all who should be in treatment are.

The EPPIC was established in 1992 and is considered a best-practice service that has strong referral systems and other features that support the identification of individuals within the catchment area that may require first episode psychosis services. Therefore, the Epidemiology Expert Panel had high confidence that the treated incidence rates reported in the paper would be a robust estimate.

EPPIC is a specialised service for 15-29 year olds therefore the estimated rate per 100,000 people for the 12-17 years NMHSPF age group actually only reflects incidence for 15-17 year olds. Future data on treated incidence on 12-14 year olds should be incorporated if this becomes available.

For illness trajectories, data from a service in the UK has been used. The Youth Expert Panel (2019-20) advised that it would be preferable to use Australian data, however this was explored and suitable Australian data was ultimately unavailable at the time of analysis.

APPENDIX 6 – TOP-UP MODELLING

Top-ups are standalone resource estimates that sit alongside care profiles, which cannot be limited to a specific group of individuals or person counts. Their modelling is largely based on incidence or service utilisation rather than population prevalence. Various sources of data are used to determine the quantum of service utilisation. The standalone items include:

- Triage and assessment conducted by the public sector;
- Mental health-related presentations to emergency departments (ED);
- Consultation and liaison services (to general hospital or paediatric beds for individuals with primary or secondary mental illness diagnoses);
- Acute psychiatric inpatient admissions for children and adolescent (5-17) age groups;
- Additional medical and specialist care required for people with SEVERE eating disorders;
- Resources to deliver neurostimulation therapies;
- Additional care coordination and support required for parents with a SEVERE mental illness;
- Additional monitoring requirements for certain psychotropic medications;
- Costs to provide PBS/RPBS-subsidised psychotropic medications;
- High intensity packages of Individual Support and Rehabilitation (ISR) provided in the community or in <24 hour supported residential places;
- Respite care;
- Flexible Funding Pool; and
- Indigenous cultural consultation (including Indigenous Elders and Traditional Healers) (details in **Appendix 15**).

Further explanation on some of this care is provided in the next sections. Top-ups are clearly identified in the epidemiology flowcharts and care profile descriptions.

Triage and assessment

This is a top-up that accounts for assessment and triage functions usually provided by public sector acute care teams for individuals with no further treatment in the public sector for the calendar year (including assessment only for people referred to another service or with no diagnosis).

To model the TRIAGE top-up, a data extract was obtained from the 2013-14 Community Mental Health Care National Minimum Dataset (CMHC NMDS) on registered and unregistered community contacts and contact duration nationally, by age group. Registered contacts were split by clients who had only 1, versus >1 contact day in that year.

For each NMHSPF age group, the TRIAGE top-up 'population' represents the number of contacts for clients with 1 contact day only, plus the number of unregistered contacts. Total unregistered contacts were applied proportionally across age groups based on the age distribution of contacts for registered clients with only 1 contact day. These figures were converted into a rate per 100,000 age-specific population using the corresponding 2013-14 ABS Australian Estimated Resident population for that age group.

The proportion of contacts allocated to each line in the care profile was based on the proportion of contacts coming from registered versus unregistered clients. The average duration for these registered and unregistered contacts was also extracted from the CMHC NMDS. This was rounded up

by about 40% to include some time for note writing and care coordination and liaison associated with the contact.

Emergency department consultation liaison

To estimate demand for mental health consultation liaison services to the emergency department for all NMHSPF age groups, utilisation estimates were used in the absence of estimated benchmarks for best practice. There is no distinction between the mental health care provided in a general Emergency Department and a specialist area of an Emergency Department such as a Psychiatric Emergency Care Centre (PECC).

The analysis was conducted using data provided by the AIHW. The number of mental health related emergency department presentations (2017-18 financial year), grouped by the age of the care recipient, were transformed into a rate per 100,000 population for each NMHSPF age group. Estimates were then adjusted to account for cases of hospitalised intentional self-harm (2017-18 financial year). **Table 29** displays the demand by age group calculated using this method.

Table 29. Estimates of demand for ED consultations liaison top-ups for each NMHSPF age group

Age group	Rate per 100,000 population[a]		
	Mental health related emergency department presentations	Cases of hospitalised intentional self-harm	Total demand
0 – 4	50.9	5.4	56.3
5 – 11	167.1	4.1	171.2
12 – 17	1,425.4	179.6	1,605.0
18 – 24	1,950.9	182.5	2,133.4
25 – 64	1,358.9	110.4	1,469.3
65+	334.0	60.0	394.0
65+ BPSD	500.2	-	500.2

[a] based on the 2018 estimated resident population provided by the Australian Bureau of Statistics

Hospital consultation and liaison services

These top-ups are for consultation liaison services by specialist mental health providers to general hospital, paediatric or obstetric beds, where the person has a primary or secondary diagnosis of mental illness.

The top-ups represent the estimated total number of people in each NMHSPF age group with a primary or secondary diagnosis of mental illness (F20-F54, F59-F69, F90-F99) who had an overnight admitted separation from a public general hospital bed (i.e. without specialised psychiatric care) based on 2017-18 national hospital activity data provided by AIHW. Separation counts were converted to estimated person counts using supplied 2015-17 jurisdictional data on the number of unique persons versus separations, converted to a rate of average annual separations per person for

ages 0-17, 18-64 and 65+ years in public general beds. See also **Appendix 5** need for acute bed-based care.

Acute inpatient admissions (5-17 years)

These top-ups are for admissions to acute inpatient services in specialist mental health units for certain age groups, specifically acute and intensive care hospital stays for 5-11 and 12-17 years. Inpatient admissions for other age groups and bed types are modelled within care profiles.

The top-ups represent the estimated total number of people aged 5-11 and 12-17 years who had an overnight admitted mental health separation from a public hospital with specialised psychiatric care or from a private hospital based on 2017-18 national hospital activity data provided by AIHW. Separation counts were converted to estimated person counts using supplied 2015-17 jurisdictional data on the number of unique persons versus separations, converted to a rate of average annual separations per person for ages 0-17 years in public and private acute psychiatric beds. See also **Appendix 5** need for acute bed-based care.

Infants aged 0-4 years who had an overnight admitted mental health separation in a public or private acute psychiatric unit are assumed to be covered by the larger number of mother-baby inpatient unit stays modelled within the adult Perinatal need groups.

Eating disorder support (12-64 years)

This top-up is to provide additional support to individuals with SEVERE eating disorders. The top-up sizes were estimated from GBD 2019 Australian prevalence rates for eating disorders.

The Youth Expert Panel (2019-20) endorsed that the top-up should be specifically for young adults with SEVERE eating disorders. This approach has subsequently been used for the 12-17 and 25-64 years age groups. The level of demand for this top-up is presented in **Table 30**.

Table 30. Eating disorder support top-up modelling

Age group	Prevalence of SEVERE eating disorders (%)	Rate per 100,000 population	Total people (2018)
12-17	0.15	145.1	2,590
18-24	0.35	352.7	8,339
25-64	0.17	169.1	22,532

Neurostimulation therapies (18+ years)

This top-up is for individuals requiring neurostimulation therapies, including electroconvulsive therapy (ECT) and transcranial magnetic stimulation (TMS), over the course of one year.

Estimating need for ECT: Data on same day separations for ECT for the financial year 2017-18 was provided by the AIHW. The Youth Expert Panel (2019-20) advised there was no evidence to indicate that young adults require different access to ECT than the general adult population. Therefore, need for ECT was modelled based on current utilisation for the 18-24, 25-64 and 65+ age groups.

The Royal Australian and New Zealand College of Psychiatrists clinical guidelines suggest a course of 6-12 ECT treatments. It has been assumed that each individual would receive an average of 8 separations to make up a single treatment course. Therefore, the number of people requiring ECT has been calculated as the number of total separations for same day admissions for ECT, divided by 8. The top-up modelling based on this analysis is provided in **Table 31**.

Estimating need for TMS: There is currently no nationally reported data on the utilisation of TMS in Australia. The Youth Expert Panel (2019-20) advised that optimal utilisation of TMS would be in the order of 2-3 times the current utilisation rate of ECT. This has been modelled at a rate of two times the current utilisation of ECT for all adult age groups (**Table 31**).

Table 31. Neurostimulation therapies top-up modelling

Age group	Rate per 100,000 population (ECT only)	Rate per 100,000 population (ECT+ TMS)	Total people (2019)
18-24 years	7.4	22.21	531
25-64 years	12.47	37.40	4,982
65+ years	20.83	62.50	2,523

Medicare funding for TMS is expected to come into effect in late 2020 or early 2021, which will greatly reduce costs to consumers. Future work could examine data on the utilization of TMS through the Medicare Benefits Schedule to review/update the number of individuals modelled as needing TMS in the NMHSPF.

Parenting support (18-64 years)

This top-up provides additional support to individuals (18+ years) with severe mental illness who are living with dependent children under the age of 18 years.

The basic assumptions applying to this group are that parents with mental illness will require their own care profile (i.e., they are already included within a NMHSPF need group) and will also receive the care provided through this additional top-up for parenting support. The top-up provides specific care to parents/caregivers with mental illness, to provide additional support where there are children aged 0-17 to be considered. Note that the normal care required to manage their mental health issues is covered by other care profiles as appropriate and that this top-up only deals with the additional support required for the parenting role. The top-up largely provides Care Coordination and Liaison to organise care for the child or children. As this is a top-up it would be combined with the appropriate severe care profile for the parent/caregiver. The child would also be receiving a selective prevention (COPMI) care profile.

This top-up is modelled only for parents with a SEVERE mental illness. It is recognised that the 12-17 age group may also include parents with severe mental illness, however the numbers are very low and the expert opinion was that this care can be provided within the severe ambulatory care profile for the 12-17 age group.

The 2007 NSMHWB and 2010 SHIP survey data were analysed to estimate the number of adults aged 18-24 and 25-64 years, with severe mental illness, who have children aged 0-17 years living in the same household. The estimates from SHIP were applied to the prevalence of psychosis and estimates from the NSMHWB were applied to the prevalence of severe affective and anxiety

disorders as per the NMHSPF prevalence analysis. It was assumed that each survey enumerated a discrete population of people with severe disorders, so estimates from the two surveys were added together. The estimated level of need for this top-up is provided in **Table 32**.

Table 32. Parenting support top-up modelling

Age group	Rate per 100,000	Total people (2019)
18-24 years	552.80	13,223
25-64 years	869.15	115,795

Medication monitoring (12+ years)

Some specialised psychotropic medications, such as clozapine, require additional monitoring for individuals prescribed the medication in order to monitor and manage side effects. This top-up provides for the additional monitoring related to use of antipsychotic and mood stabiliser medications.

To estimate the number of individuals requiring additional medication monitoring above other psychotropic medications, reports detailing antipsychotic dispensing (based on PBS data) from the Australian Commission on Safety and Quality in Health Care were analysed. The reports detail PBS prescription dispensing rates per 100,000 for people aged 0-17 years, 18-65 years and 65+ years from 2016-17. The definition of antipsychotic medications provided in the Safety and Quality reports is based on the PBS listings of medications; this includes both first and second-generation antipsychotics (including lithium).

These published prescription dispensing rates were applied to estimate the size of the medication monitoring top-ups (**Table 33**). The dispensing rate for 0-17 year olds was converted into a rate for 12-17 years and the dispensing rate for the 18-64 years age group was applied to both the young adult (18-24 years) and adult (25-64 years) age groups.

Table 33. Medication monitoring top-up modelling

Age group	Rate per 100,000	Total people (2019)
12-17 years	1,397	24,942
18-24 years	2,074	49,612
25-64 years	2,074	276,315
65+ years	3,594	145,138

It is acknowledged that there is off-label use of antipsychotic medication types among older adult populations, which may be contributing to the higher dispensing rate. These high rates are generally considered to be undesirable (rather than a “should be” model), however for those already on antipsychotic medications, review and monitoring by a mental health professional will be required.

Medication costs

This top-up provides an estimate of the total national cost of PBS/RPBS subsidised prescriptions for all ages for the following drug classes: antidepressants; anxiolytics; hypnotics and sedatives; psychostimulants, agents used for ADHD and nootropics; and antipsychotics.

Available data on pharmaceutical costs indicates gross usage with little understanding of how and to whom the psychiatric medications are being prescribed. Prescriptions for mental illness specific populations cannot be measured by counting the prescriber as most are from the GP and their client base is broad; a very high proportion of antidepressants are prescribed by GPs (approximately 85%), with a similar practice for antipsychotics. Prescribing patterns are also far from what is accepted as optimal clinical treatment, and psychotropic medications may legitimately be used for non-psychiatric conditions.

Expert Working Group (EWG) Members (2011-13) identified that estimating a proportion of people in each care profile that would benefit from prescription medication would be the ideal approach, but that it would require careful estimation and need substantial clinical advice that would highlight appropriate use of medication. Pragmatically, EWG members agreed to use a top down approach using available data to estimate psychotropic medication costs. Prescription medications are therefore modelled in the NMHSPF as an All Ages top-up representing an overhead cost. Demand for PBS/RPBS-subsidised mental health-related medications is modelled based on utilisation in the absence of estimates of desirable use.

Method

To determine the size of each top-up, 2018-19 PBS data for the number of and expenditure on mental health-related prescriptions by type of medication prescribed was obtained from the AIHW. An average cost per medication class was calculated by dividing total expenditure by the number of medications prescribed (**Table 34**). Costs relate to an average across all age groups.

Table 34. Medication costs top-up 2018-19 (All ages)

Medication Type	Cost per prescription ($)	Rate per 100,000
Antipsychotics	70.60	60,641
Anxiolytics	9.51	10,072
Hypnotics and sedatives	8.05	6,356
Antidepressants	11.45	4,809
Psychostimulants used for ADHD	54.87	14,568
Total	-	96,446

Individual support and rehabilitation (18-64 years)

While Individual Support and Rehabilitation (ISR) is included in many care profiles, the very high intensity ISR required by small numbers of adults (18-64) and older adults (65+) has been modelled separately in a number of top-ups.

These top-ups include individual support services provided to the person wherever they are living, this can include people who are homeless. These include support provided in the community or in <24 hour supported residential places. Examples of services delivered include:

- Assist people to self-manage their own recovery and build on their interests, aspirations and strengths to live full and active lives
- Develop skills to improve competence and confidence in community living
- Improve health and well-being
- Improve independence and resilience
- Prevent relapse and limit severity of any crisis engage the person with desired community and social activities
- Reduce social and physical dislocation by assisting people to sustain suitable housing and to develop improved social relationships
- Increase opportunities to participate in the workforce
- Reduce demand on acute and emergency services.

Respite care

This top-up provides mental health-related respite care services for carers. Note the age groups for the top-up are related to the age of the person with mental illness, not the carer.

To estimate 12-month demand for this top-up, the 2015 Survey of Disability, Ageing, and Carers (SDAC) was analysed. Demand estimates were based on reports of using respite care in the past 3 months, and unmet need for respite care, among primary carers of main recipients of care with a mental illness and psychological disability, grouped by age group of the recipient of care. This approach assumed that the number of people needing respite care in any 3-month period would be similar to the number over the course of a whole year. The method was as follows:

1. Percentage estimates of need for respite were divided by the total population estimate (derived from the 2015 SDAC) for each corresponding age group; the resulting estimates were converted into a rate per 100,000 population.

2. The rate per 100,000 from the SDAC 0 – 24 age group was then applied to the NMHSPF 0–4, 5–11, 12–17 and 18–24 years age groups, and the rates per 100,000 from the SDAC 25–64 and 65+ age groups were applied to the corresponding NMHSPF 25–64 and 65+ age groups (**Table 35**).

The contents of each respite top-up were modelled as the same for all age groups as the SDAC data on utilisation of respite care numbers were too small for age-specific estimates.

The proportion of people in each top-up using the three types of respite care was derived from the SDAC 2009 weighted numbers of people who reported using “residential respite”, “day-care centre” or “in-home respite” (i.e. flexible respite). The number of people in SDAC using “other” respite services was spread equally across these three types.

An average length of stay of 10 days was applied to residential respite (based on an unpublished review of crisis residential services in Queensland). An average annual duration of 60 hours was applied to day respite based on Siskind et al.[44]. This was converted into 7.5 days at 480 minutes (8 hours) per day. Duration estimates were not readily available for flexible respite. It was assumed to be the in-home/community equivalent of day respite, and was therefore modelled with the same annual duration (i.e. 7.5 days at 480 minutes).

Table 35. Proportion of persons in each NMHSPF age group for whom their primary carer required respite care

Age group	Care profile	Rate per 100,000	Total Australian population (care profile) (2016)
0 – 4	SEV_Respite	165.0	2,627
5 – 11	SEV_Respite	165.0	3,509
12 – 17	SEV_Respite	165.0	2,856
18 – 24	SEV_Respite	165.0	3,805
25 – 64	SEV_Respite	94.4	12,153
65+	SEV_Respite	283.9	10,273

Questions pertaining to the use of respite care related to the last 3 months and are therefore not a perfect representation of 12-month demand. Nonetheless, this was the best estimate in the absence of other data sources.

Additionally, there may be shared responsibility with general aged care respite for consumers with mental illness aged 65+ years. Likewise, there may be special issues of availability of respite care for children 0-17 years. However, the default funder labelling for the respite top-ups assigns these services as mental health funded.

Flexible funding pool

The Flexible Funding Pool could also be known as Brokerage. It was highlighted as an important tool that facilitates access to services beyond the mental health sector where individuals with mental illness are often excluded. It was also noted that the model adequately covers the act of brokering in the context of coordinating services in the specialist ambulatory care taxonomy items or otherwise as core business of both community support and clinical workers.

Therefore, the flexible funding pool does not pertain to full time equivalent (FTE) workforce, but rather the cost associated with purchasing household goods and services, community/recreational activities and access to general health services (e.g. dentists) that lie beyond the scope of mental health services (as agreed by the Executive Group on 5 July 2013).

[44] Siskind, D., Harris, M., Buckingham, B., Pirkis, J., & Whiteford, H. (2012). Planning estimates for the mental health community support sector. Australian and New Zealand Journal of Psychiatry, 46(6), 569-580.

In order to quantify the brokerage adequately, it is modelled as adding 1% to the quantity of Individual Support and Rehabilitation services (for both consumers and carers) as a top-up across the model. In rural areas, the Flexible Funding Pool has been modelled at 10% as a means of increasing the total funding supplied to community support sector services.

APPENDIX 7 – TAXONOMY DEVELOPMENT

The aim of the taxonomy development process was to establish a 'standard' range of service elements that reasonably reflect the core service components of the mental health service system, and also result in the development of a consistent language across Australia when describing services.

The NMHSPF modelling process involved documenting the total requirements of a mental health service system from well-defined building blocks. The first task was to establish a range of service elements common to all jurisdictions that were considered necessary components to a comprehensive mental health care system. To provide structure for this work, a Jurisdictional Service Mapping process was conducted in 2011 which established a common language for current service provision, and a draft Taxonomy of mental health service elements was developed. This Taxonomy was modified throughout the modelling process as required.

Early in the NMHSPF Project, a series of workshops were conducted in all States and Territories to review the range of current mental health care services provided and develop a common language for each service function. Given that each State and Territory structures their services differently and sometimes has unique service characteristics relevant only to their jurisdiction, the mapping process was valuable in determining the common service elements that are generally considered to make up a comprehensive mental health service system.

The taxonomy and service elements have been updated over NMHPSF development phases as new modelling for different age groups and populations has been developed.[45,46] The taxonomy now contains six streams, four of which are for services tailored to individual needs (primary and specialised clinical ambulatory mental health services; specialised mental health community support services; specialised bed-based mental health care services; and medications and procedures), and two of which are for population-based universal services (mental health promotion and mental illness prevention). Further details on the development of the mental health promotion and mental illness prevention streams are provided below.

Promotion and prevention streams

Mental health promotion and prevention interventions are key components of an evidence-based mental health framework. Promotion and prevention initiatives incorporate broad social interventions, such as policy and environment, as well as skills and knowledge enhancement for children, adolescents, adults and older adults.

The modelling for promotion and prevention activity commenced approximately half-way through the Phase 1 project with the Promotion and Prevention Working Group (PPWG). A group of

[45] Gossip K, John J, Comben C, Page I, Erskine HE, Scott JG, Diminic S. (2021). Key service components for age-appropriate mental health service planning for young adults. Early Intervention in Psychiatry, 16(10), 1085-1093. https://doi.org/10.1111/eip.13253

[46] Page IS, Leitch E, Gossip K, Charlson F, Comben C, Diminic S. (2022). Modelling mental health service needs of Aboriginal and Torres Strait Islander peoples: a review of existing evidence and expert consensus. Australian and New Zealand Journal of Public Health, 46(2), 177-185. https://doi.org/10.1111/1753-6405.13202

professionals with expertise in these areas was sourced in addition to the three existing Expert Working Groups.

The method for identifying and quantifying promotion and prevention activity differed significantly from the rest of the NMHSPF Taxonomy. This was largely due to the fact that some promotion and prevention activities are not easily quantified in time and workforce type and it is difficult to measure the efficacy of some interventions (e.g. self-help internet or telephone support).

Therefore, the Promotion and Prevention Working Group commenced the modelling process with a workshop that identified a diverse range of promotion and prevention activity. Members then reviewed published research and considered it in the context of an evidence based classification system and whether the outcomes of the research supported the interventions for inclusion in the NMHSPF Taxonomy.

Upon review, service elements were either:

- Added to the taxonomy if shown to be efficacious;
- Not included in the taxonomy but highlighted for further research if research was inconclusive and the intervention was supported by the PPWG membership;
- Not included in the taxonomy because research reported ineffectiveness of the intervention or the research was entirely absent and was not otherwise supported by the PPWG membership.

All the details were included in the Service Element and Activity Descriptions document. Those service elements that were not included in the taxonomy were also detailed.

In terms of quantifying the activity, the promotion and prevention service elements were treated in various ways. The members agreed to model promotion and prevention as individual care profiles in each age group, including only the service category level taxonomy items, each with a dollar figure. Later it was agreed to roll up these dollar amounts and represent it at the service stream level only i.e. Promotion, and Prevention.

Jurisdictional ambulatory programs mapping

To support planning for state and territory clinical ambulatory (community) mental health service teams and programs, relevant service elements and activities labelled as State-funded within care profiles for relevant populations have been grouped into “programs” designed to align with common community team or program structures within jurisdictions. The programs are used in reporting resource estimates for these services in the NMHSPF-PST. **Table 36** describes the care profile components that have been aligned with each program type.

Table 36. Mapping of care profile taxonomy items to programs for jurisdictional clinical ambulatory mental health services

Program Name	Program Inclusion/ Description
COPMI and school-based early intervention	Includes all State-funded taxonomy items included in the COPMI and Indicated Prevention care profiles for persons aged 0-17 years.
Infant and child	Includes all State-funded primary and specialised clinical ambulatory mental health services contained in the Severe Standard and Severe Complex care profiles for those aged 0-11 years. This includes the following taxonomy items: - Clinical Community Treatment Team – Rural - Clinical Community Treatment Team - Child (0-11 years) - Day Program Team - Child and Youth (0-24 years)
Youth	Includes all State-funded primary and specialised clinical ambulatory mental health services and peer support services for persons aged 12-24 years. The services from the following care profiles are included: - 12MSEV_Standard - 12MSEV_Complex - 18MSEV_Standrad - 18MSEV_Complex - 18MSEV_Perinatal - 18MTOP_Parenting - 18MTOP_MEDS_Monitoring
Adult continuing care and MITT	Includes all State-funded clinical services from the primary and specialised clinical ambulatory mental health services stream of the taxonomy for adults (25-64 years) in the following care profiles: - 25MSEV_Standard - 25MSEV_Complex - 25MSEV_Perinatal - 25MTOP_MEDS_Monitoring - 25MTOP_Parenting For rural populations, this program also includes the function of the Acute Care Team.
Older persons	Includes all State-funded primary and specialised clinical ambulatory mental health services for older adults (65+ years) in the following care profiles: - 65MSEV_Complex - 65MSEV_RACF - 65MTOP_MEDS_Monitoring - 65BSEV_Complex - 65BSEV_Sub-acute_Hospital - 65BSEV_Sub-acute_RACF
Acute Care Services	Includes the State-funded taxonomy items ‘Acute Care Team’ for all age groups (0-4,5-11,12-17,18-24,25-64, 65+, 65+ BPSD).

Program Name	Program Inclusion/ Description
Consultation liaison	Includes the State-funded taxonomy items 'Consultation Liaison - Rural Hospital and Emergency Department', 'Consultation Liaison - Emergency Department (Hospital)' and 'Consultation Liaison - General (Hospital)' and State-funded activity in CL_ED and CL_Hospital top-ups for all age groups (0-4, 5-11, 12-17, 18-24, 25-64, 65+, 65+ BPSD).
Eating disorders top up	Includes all State-funded taxonomy items in the eating disorders top-ups for ages 12-17, 18-24 and 25-64 years.
First episode psychosis	Includes all State-funded services within the primary and specialised clinical ambulatory mental health services stream of the taxonomy contained in the first episode psychosis care profiles (maintenance and intensive) for age groups 12-24 years.
Consultation Liaison - Specialist Rural Outreach	Includes the support for rural clinical community treatment teams that may be provided via a hub.

APPENDIX 8 – WORKFORCE CATEGORIES AND TYPES

There are four workforce categories and a range of workforce types used in the NMHSPF to assign a provider (team or individual) against each line in the care profiles (**Table 37**). The overall approach to modelling the workforce in each care profile item was to identify the particular Workforce Type wherever possible. However, where there was no consensus of expert opinion on Workforce Type, the higher-level Workforce Category was used.

The Aboriginal and Torres Strait Islander expert panel highlighted the importance of appropriate workforce for delivery of services to Aboriginal and Torres Strait Islander Peoples. Service modelling must include Aboriginal and Torres Strait Islander workers and provide culturally safe environments. A lack of cultural understanding in the mental health service workforce and processes which do not reflect cultural difference significantly impede access, contribute to communication challenges and negatively impact on engagement with treatment for Aboriginal and Torres Strait Islander peoples. The availability of an Aboriginal and Torres Strait Islander workforce within mental health services is critically important in improving access and cultural safety for Aboriginal and Torres Strait Islander peoples, facilitating engagement with community and fulfilling particular roles that require specific cultural knowledge. See **Appendix 15** for specific workforce details for Aboriginal and Torres Strait Islander peoples.

Peer workers

Consumer and carer roles within the mental health sector are a rapidly evolving workforce. The NMHSPF has conceptualised consumer and carer roles into two areas; roles that can be performed by consumers and carers and those that must be performed by consumers and carers.

Roles that must be performed by consumers and carers have been modelled in the context of individual peer work, group-based peer work and also included in the staffing profiles for bed-based services and specialist ambulatory teams.

Outside of those roles, feedback from consumers, carers and community support service providers advised that all teams should have access to the experience of a peer worker and that it would be inappropriate to nominate one role within the team to a peer worker as it would depend on their qualifications and experience (as with any other mental health worker). Therefore, roles that can be performed by consumers and carers are modelled within a generic workforce mix of tertiary and vocationally qualified staff, where an appropriately trained consumer or carer may fulfil any of those roles, alongside people with other skills, qualifications and experience within a team.

The practical outcome of this approach is that the amount of peer work modelled only represents that which must be performed by peer workers. It is highly desirable for all service settings and teams to have access to and input from an experienced peer worker and so an overall higher ratio of peer work FTE to other FTE is recommended.

It should also be noted that due to the evolving nature of the peer workforce, the current peer work FTE targets in the modelling can be considered aspirational compared to current rates and will require significant investment to expand the workforce.

Table 37. Workforce categories and types in the NMHSPF

Workforce category	Description	Workforce type
Medical	Medically trained professionals providing mental health care. Registrars and junior medical officers are included only in teams.	General Practitioner
		Psychiatrist
		Junior Medical Officer
		Registrar
		Other Medical Specialist
Tertiary Qualified	University trained (or equivalent) with a minimum three year Bachelor degree in a discipline related to mental health care. 'Other' includes other professionals such as physiotherapists, exercise physiologists, dieticians, speech therapists, pharmacists, and tertiary qualified program managers/supervisors employed in the community support sector.	Nurse Practitioner
		Registered Nurse
		Psychologist
		Occupational Therapist
		Social Worker
		Other TQ (e.g. Pharmacist)
		Indigenous Mental Health Clinician
Vocationally Qualified	Primarily a non-clinical workforce (i.e. not a university trained clinician) with a TAFE level qualification up to Advanced Diploma level in mental health or a related area. Includes technicians or coaches trained to deliver low-intensity psychological interventions (who may possess, but do not require, a tertiary qualification).	Enrolled Nurse
		VQMH Worker
		VQ Other
		Indigenous Mental Health Worker
		Low Intensity Worker
Peer Worker	Roles that must be performed by someone with lived experience as a mental health service consumer or carer of an individual(s) with mental illness.	Consumer Peer Worker
		Carer Peer Worker
		Indigenous Peer Worker

Vocationally qualified workers

'Vocationally Qualified' Mental Health Workers are employed in a diversity of roles, with different levels of responsibility. In the current service environment, these workers are largely employed in community support services or as support officers in specialist public and private mental health services. This category also includes the work of Enrolled Nurses, and technicians or coaches trained to deliver low-intensity psychological interventions (who may possess, but do not require a tertiary qualification). Currently, these workers may or may not have a formal qualification (e.g. Certificate

IV in Mental Health) and feedback from stakeholders recognised that experience is still highly regarded.

However, given that the model is based on what 'should be' and after considering the trend towards formal qualification in the workforce industry, it was agreed to define this workforce as being primarily a non-clinical workforce (that is, not a university trained clinician such as nurse, psychologist, occupational therapist or social worker) with a TAFE level qualification up to Advanced Diploma level in a mental health or related subject area. As per the discussion above, Peer workers with appropriate qualifications are included within the context of Vocationally Qualified Mental Health Workers.

Tertiary qualified workers

For the purposes of the NMHSPF, Tertiary Qualified workers are those that are university trained (or equivalent) with a minimum three-year Bachelor degree in a discipline related to mental health care. This category largely performs a specialist clinical function and so is most commonly modelled across the primary, specialist ambulatory and bed-based services. The most common professions modelled include nurses, psychologists, social workers and occupational therapists.

'Tertiary Qualified – Other' includes other professional care such as dietetics, exercise physiology, physiotherapy, speech therapy, pharmacy and professionals assisting with communication issues (not related to cultural background). In the community support sector, there are also tertiary qualified workers who act in the roles of program manager or supervisor who may have a community services related degree that would also be included in the 'Other' category.

The Nurse Practitioner was modelled separately to other nursing roles, as although the numbers are quite low, they have a different cost. Similarly, in keeping with the level of qualification between vocationally qualified and tertiary qualified workers, Enrolled Nurses fit in the category of Vocationally Qualified workers.

Medical workforce

The NMHSPF models two professionals in the medical workforce: General Practitioner (GP) and Psychiatrist. Significant discussion was conducted around the costs between trainee psychiatrists, junior medical officers and registrars. Because of the impact of supervision and workforce development issues, these other medical workers are included only in the context of teams in both specialist ambulatory and bed-based services. All other interventions that orient towards a single medical practitioner have been allocated to either a GP or Psychiatrist.

Medical students are not included anywhere in the modelling as they are not paid, are supernumerary to the modelled workforce and their supervision requirements are incorporated in the context of overhead costs for the service.

APPENDIX 9 – RESOURCE FORMULAS

To estimate bed requirements, workforce hours, workforce FTEs and costs, the NMHSPF model uses data from the care profiles, modelling parameters, service delivery cost inputs and the formulas shown in **Table 38**. Each is a standalone formula that includes the full sequence of variables required to calculate specific outputs (i.e., separations, bed days, workforce FTEs etc.). The first three formulas relate to bed requirements; formulas 4-9 are used to calculate workforce requirements and 10-12 are used to calculate estimated costs.

Bed-Based Services

Bed-based Services (formulas 1-3 in **Table 38**) are defined as overnight care in a hospital or residential setting where staff are on site 24 hours per day. The model estimates the total number of separations, bed days and beds required for a given population.

Workforce Requirements

There are four workforce categories and a range of workforce types used in the NMHSPF to build teams and assign a provider against each line in the care profiles. The overall approach to modelling the workforce in each care profile item was to identify the particular workforce type where possible. A summary of the workforce categories and workforce types can be found in **Appendix 8**.

Workforce requirements are calculated using formulas 4-9 in **Table 38**. The formulas can be used to determine hours of client demand, client-related staff hours and workforce FTEs, taking into account the consumer to staff ratio for group-based services, the amount of time spent on consumer-directed versus other activities, working hours and staff leave. See below for a definition of “client-related staff hours”.

Costs

For each workforce category, there is a default setting of national cost with options for local input by the user. The national costs have been determined as an average cost per workforce type, including base salaries, employment on-costs and overhead costs to run the service. See **Appendix 10** for detail on the method used to estimate salary parameters.

Some modelled items (e.g. medications, cultural consultation and ECT) have associated fixed costs, rather than specific workforce requirements. For these items, the total cost is calculated by multiplying the number of prescriptions or sessions by the estimated base cost.

Table 38. Formulas used to calculate outputs from the NMHSPF model

1. Separations	number of people * proportion requiring service * occasions of service * (1 + annual readmission rate)
2. Bed days	number of people * proportion requiring service * occasions of service * (1 + annual readmission rate) * number of days
3. Beds	number of people * proportion requiring service * occasions of service * (1 + annual readmission rate) * number of days / (365 * occupancy rate)
4. Hours of client demand (bed-based services)	number of people * proportion requiring service * occasions of service * (1 + annual readmission rate) * number of days * 24
5. Hours of client demand (ambulatory services)	number of people * proportion requiring service * occasions of service * number of minutes / 60
6. Client-related staff hours (bed-based services)	number of people * proportion requiring service * occasions of service * (1 + annual readmission rate) * number of days * workforce hours per occupied bed day * staff ratio * workforce distribution
7. Client-related staff hours (ambulatory services)	number of people * proportion requiring service * occasions of service * number of minutes / 60 * staff ratio * workforce distribution
8. Workforce FTEs (bed-based services)	number of people * proportion requiring service * occasions of service * (1 + annual readmission rate) * number of days * workforce hours per occupied bed day * staff ratio * workforce distribution / annual service hours per FTE
9. Workforce FTEs (ambulatory services)	number of people * proportion requiring service * occasions of service * number of minutes / 60 * staff ratio * workforce distribution/ annual service hours per FTE
10. Service delivery costs ($) if salary type = base price	Workforce FTEs * annual salary * oncost rate * (1 + overhead rate)
11. Service delivery costs ($) if salary type = final price	Workforce FTEs * annual salary
12. Other costs	number of services * proportion requiring service * occasions of service * base cost

Key: The colours in the formulas above are to show where this information can be found (Care Profiles; Service Element and Activity Modelling Parameters Document; Technical Appendices), see **Table 39** for more detail.

Table 39. Descriptor and detail of where relevant components of NMHSPF formulas can be found

Name	Document and location	Descriptor
Number of people	CPs – "Age specific epidemiology per 100K"	Rate per 100,000 of the age-specific population who are in the need group for that care profile.
Number of services	CPs – "Age specific epidemiology per 100K"	Rate per 100,000 of services required in the top-up.
Proportion requiring service	CPs – "% pop applicable"	Proportion of the need group who require that particular activity.
Occasions of service	CPs – "No. of occasions of service"	Number of occasions of service for that particular activity.
Number of days	CPs – "activity duration" (activity measure will be days)	The duration of the bed-based activity.
Number of minutes	CPs – "activity duration" (activity measure will be minutes)	The duration of the ambulatory activity.
Staff ratio	CPs – "staff ratio"	The ratio of staff to clients (e.g. if the staff ratio is 1 then there is one staff member to every client; if the staff ratio is 0.2 there is one staff member to every 5 clients).
Base cost	CPs – "activity duration" (activity measure will be dollars)	The cost of the activity.
Annual readmission rate	MPs – in additional parameters tab - "annual readmission rate"	Describes the proportion of bed days attributable to second or subsequent admissions for an individual within the planning year.
Occupancy rate	MPs – in additional parameters tab - "Occupancy rate"	Reflects the proportion of beds that are expected to be used at any one time within a bed-based service.
Workforce hours per occupied bed day	MPs – in additional parameters tab - "Workforce hours per occupied bed day"	Describes the number of workforce hours per day that are required to adequately staff an occupied bed.

Workforce distribution	MPs – in "Workforce distribution" tab	Indicates how the overall FTE are split across different workforce types for a particular service element.
Annual service hours per FTE	MPs – in "Annual service hours per FTE" tab	Number of annual service hours available for each workforce type within each different setting, based on calculation of the weeks worked per year (accounting for leave), average working hours per week, and consumer-directed service delivery time, i.e. the proportion of staff time spent on activities directly relating to an individual e.g. face to face care, writing notes, individual care planning and liaison.
Oncost rate	MPs – in "Oncost rate" tab	Oncost rate for each workforce type within each different setting. Oncosts include employment costs beyond the base salary such as superannuation, workers compensation and penalty rates.
Overhead rate	MPs – in additional parameters tab - "Overhead rates"	Includes program administration and leadership and other corporate supports which may include quality assurance, human resources, payroll, finance, information technology and communication services. Facilities will also require varying levels of maintenance and cleaning and some may be leased. Modelled standardised rates in the NMHSPF are generally: • Community support sector services 20.0% • Public-sector community mental health services 22.5% • Bed-based services located in hospitals 30.0% • Bed-based services located in residential settings 25.0%
Annual salary	TA – In salaries section	Annual base salary or final cost per workforce type.

CPs = Care profiles; MPs = Service Element and Activity Modelling Parameters Document; TA = Technical Appendices

Modelling parameters development

The Service Element and Activity Modelling Parameters Document includes all relevant modelling parameters for each service element and activity in the NMHSPF. For bed-based and team services, there are separate modelling parameters for each service element in the Taxonomy, in addition to individual worker-based elements. Sole practitioners are modelled as individual workforce in a 'one person' team usually without after hours or weekend work.

In developing the modelling parameters, consideration was given to the diversity in which specific programs are delivered. For example, in the sub-acute services, there was considerable difference in the balance of clinical and community support staff that provided the different forms that these services take. Wherever possible, the modelling parameters were based on existing evidence-based models of care (such as staffing profiles from existing services). Where this was not possible (e.g. community support services), significant stakeholder consultation was conducted to determine a reasonable 'average' workforce distribution and modelling parameters.

The specialised mental health community support team parameters presented a significant challenge as the diversity in program format, target group and associated criteria was great. In Phase 1, two workshops were held in Sydney and Melbourne with stakeholders to consider how best to develop a generic national profile for these services. The work from the workshops was later tabled with the Project membership including the Consumer and Carer Reference Group for additional validation. The Group based peer work modelling parameters were developed by the NMHSPF Consumer and Carer Reference Group. The Aboriginal and Torres Strait Islander modelling parameters were developed by the Aboriginal and Torres Strait Islander Expert Panel and were refined by consulting with representatives who work in or manage similar service models. The Rural modelling parameters were developed by the Rural Expert Panel.

Although services may differ, it was also found that often the workforce mix did not differ significantly. For example, individual support and rehabilitation services in the community support stream had a similar profile to that of both flexible respite and family support. There were significant differences in the ratio of business hours and after-hours time, but greater similarity in the roles and pay levels of the team.

It should be noted therefore, that the tool is primarily concerned with a quantum of hours, proportion of business and after hours work and pay rates. Users can determine the expertise and skill mix required by each of those roles relevant to their specific program area.

Team based modelling parameters

In the NMHSPF model, some care is modelled as delivered via a team rather than an individual. This approach has many advantages:

- It allows for an aggregated function across a number of professionals. For example, in a bed-based service, a variety of professionals will undergo many activities in the course of a day. The team profile allows all of the time for each professional to be modelled and avoids having to consider every single task that occurs in one day of mental health care.
- It also allows greater detail in the resource modelling, including a range of levels for each workforce type (capturing registrars, and different levels of nursing for example). A service

element based on a team profile is therefore counted in either days or hours and incorporates all care performed by the team (e.g. assessment, review, medication administration, psychotherapy, peer support etc.) without the need to specify all the care as separate items in a care profile.

- The team represents an 'average' resource to perform a function. In reality, services may come in many forms, with specific entry and exit criteria and target populations that may influence the workforce mix required to perform that particular service (e.g. may influence the clinical versus non-clinical components of the care). The team modelling parameters aim to provide an overall average that is a reasonable estimate of the resources required across all formats that the service may take.
- The team-based modelling also better reflects current clinical practice and the benefits of coordinated mental health care delivered by multidisciplinary teams.

There are three sets of team based profiles in alignment with the three streams in the NMHSPF Taxonomy: Ambulatory, Bed-Based and Community Support, as well as a profile for Individual workforce services (see **Table 40**).

Table 40. Team based modelling

Ambulatory Teams
Acute Care Services
Consultation Liaison - General (Hospital)
Consultation Liaison - Emergency Department (Hospital)
Consultation Liaison – Rural Hospital and Emergency Department
Consultation Liaison – Specialist Rural Outreach – Child and Youth (0-24 years)
Consultation Liaison - Specialist Rural Outreach - Adult (25-64 years)
Consultation Liaison - Specialist Rural Outreach - Older Adult (65+ years)
Clinical Community Treatment Team - Child (0-11 years)
Clinical Community Treatment Team - Youth (12-24 years)
Clinical Community Treatment Team - Adult (25-64 years)
Clinical Community Treatment Team - Older Adult (65+ years)
Clinical Community Treatment Team - Rural
Clinical Community Treatment Team - Indigenous
Primary Care Team – Indigenous
Day Program Team - Child and Youth (0-24 years)
Day Program Team - Adult (25-64 years)
Lifestyle Interventions – Individual and Group
Bed-based Teams
Acute - Perinatal and Infant Mental Health (Hospital)
Acute - Child (0-11 years) (Hospital)
Acute - Youth (12-24 years) (Hospital)
Acute - Adult (25-64 years) (Hospital)
Acute - Older Adult (65+ years BPSD) (Hospital)
Acute - Older Adult (65+ years) (Hospital)
Acute - Intensive Care Service (Hospital)
Acute - Adult Eating Disorders (18-64 years) (Hospital)
Acute - Rural (Hospital)

Step Up/Step Down - Youth (12-24 years) (Residential)
Step Up/Step Down - Adult and Older Adult (25+) (Residential)
Sub-Acute Rehabilitation - Youth (18-24 years) (Residential)
Sub-acute Rehabilitation Adult and Older Adult (25+ years) (Residential)
Sub-Acute Rehabilitation - Older Adult (65+ years) (Hospital)
Sub-Acute Intensive Care Service (Hospital)
Sub-Acute Rehabilitation – Rural – Adult (Residential or Hospital)
Non-Acute - Youth (18-24 years) (Residential)
Non-Acute - Adult and Older Adult (25+ years) (Residential)
Non-Acute - Older Adult (65+ years) (Hospital/Nursing Home Based)
Non-Acute - Intensive Care Service (Hospital)
Non-Acute - Intensive Care - Older Adult (65+) (Hospital)
Indigenous Hospital Add On
Community Support Teams
Group Support and Rehabilitation
Group Based Consumer Peer Support
Group Based Carer Peer Support
Individual Support and Rehabilitation
Residential Crisis & Respite Services
Flexible Respite
Day Respite
Family Support Services
Group Carer Support Services
Individual Carer Support Services

Individual workforce modelling parameters

Individual workforce services in the primary care and specialist ambulatory streams also have modelling parameters, but they are simply modelled as a team of one with a quantum of occasions of service and duration (see **Table 41**).

Table 41. Individual workforce

Individual Workforce Services
Individual Practitioners – Private
Individual Practitioners – Team/bed-based

Client-related staff hours

The NMHSPF makes assumptions about optimal proportions of staff time dedicated to consumer service delivery time versus other time.

Consumer service delivery time is the quantity of time shown in the care profiles, which includes all activity related to the care of an individual with mental illness (whether face-face or indirect). It includes any time spent on an activity directly relating to an individual (e.g. face to face care, writing notes, individual care planning and liaison). A rate of 67% has been established for this time in the

public sector specialist ambulatory service elements. For Individual Practitioners in the private sector, a rate of 85% has been established for this time.

All other non-individually focused time is considered 'Other Time'. This includes travel, professional activities (meetings, evaluation, performance monitoring, supervision, training), business meetings, service evaluation, program planning and research. A rate of 33% has been established for other time in the public sector specialist ambulatory teams. For Individual Practitioners in the private sector, a rate of 15% has been established for this time.

In the community support sector, the rates of Consumer Service Delivery Time and Other Time vary according to role and nature of service provision as advised by stakeholders. Bed-based teams do not include the Consumer Service Delivery Time or Other Time as the productivity of the team is determined by the roster in association with the bed-based service modelling parameters.

Bed-based modelling considerations

Bed-based services are defined as overnight care in a residential setting where staff are on site for 24 hours per day. The model estimates the demand for beds/places for a given population. Bed-based service parameters include:

- Availability %
- Occupancy Rate %
- Annual Readmission Rate %

The length of stay of an admitted patient is measured in bed days. A same-day patient is allocated a length of stay of one day. Bed days for an overnight or multi-day stay exclude leave days.

The bed-based stream of the taxonomy includes beds that are not provided by specialist mental health services because if they were unavailable, it would result in an increase of the demand for specialist mental health beds. However, the resources for these non-mental health beds are not counted or costed in the NMHSPF-PST, as the financial burden usually lies beyond the mental health budget. There are no bed-based teams for the non-mental health care services beds. The non-mental health beds are specified in some care profiles only, alongside care provided by mental health consultation liaison services. These non-mental health beds include:

- Acute medical/surgical bed (Hospital, non-MH)
- Acute paediatric bed (Hospital, non-MH)
- Non-Acute - Adult (<24 hour support) (Residential)(non-MH)

Readmission adjustment to bed requirements

In order to determine the proportion of additional bed days required in NMHSPF modelling to account for readmissions in a 12-month period (on top of the initial lengths of stay modelled in specific care profiles), a review of existing literature was undertaken. This review found very little evidence at the population-level to show that a reduction in acute hospital readmission and utilisation rates would be achievable even with improvements to other mental health services. It is likely that there is unmet need in the community that may be accommodated if existing bed capacity is freed up by supportive community and transitional care for some individuals. Based on these findings, the 2018-19 Epidemiology Expert Panel concluded that the NMHSPF should draw on utilisation data to model expected levels of readmission.

Custom extracts of hospital activity data including total occupied bed days and occupied bed days related to subsequent admissions to the same bed type within the year were obtained from each jurisdiction for the financial years 2015-16 and 2016-17. Each item was stratified by bed type (public acute psychiatric; public acute general with primary mental health diagnosis; private psychiatric if available), NMHSPF age group (0-4, 5-11, 12-17, 18-24, 25-64 and 65+ years), Indigenous status and year. The proportion of additional bed days per bed type and age group were calculated using the following formula:

$$\text{Proportion of additional bed days} = \frac{\text{Readmission bed days}}{\text{(Total occupied bed days - Readmission bed days)}}$$

Rates for each NMHSPF age group were rolled up into higher-level groupings (0-17, 18-64 years) to improve relatively small samples in child and youth age groups (**Table 42**). Public acute and private acute beds data were combined to align with the single service element used in the NMHSPF taxonomy. A decision was made to account for the differences in bed use between Indigenous and non-Indigenous populations elsewhere in the modelling. **Table 43** provides a summary of the bed-based parameters by bed type.

These rates reflect current population needs and do not account for any potential improvements in readmission bed day numbers that may be achieved when or if NMHSPF resource targets are implemented on the ground to expand the range of available services.

Table 42. National average hospital data by bed type and age group, 2015-17

Bed type	Age	Ratio of additional readmission days
Acute psychiatric	0–17	0.60
Acute psychiatric	18–64	0.58
Acute psychiatric	65+	0.43
Public acute general	0–17	0.39
Public acute general	18–64	0.49
Public acute general	65+	0.30

Note: Data on private hospitals was unavailable for three jurisdictions and excluded from one jurisdiction. Data on readmission bed days was unavailable from two jurisdictions.

Table 43. Summary of NMHSPF bed parameters

Bed Type	Available Bed Days - per bed in a year	Occupancy	Annual Readmission Rate
Acute - Perinatal and Infant Mental Health (Hospital)	365	85%	58%
Acute - Child (0-11 years) (Hospital)	365	85%	60%
Acute - Youth (12-24 years) (Hospital)	365	85%	60%
Acute - Adult (25-64 years) (Hospital)	365	85%	58%
Acute - Older Adult (65+ years BPSD) (Hospital)	365	85%	43%
Acute - Older Adult (65+ years) (Hospital)	365	85%	43%
Acute - Intensive Care Service (Hospital)	365	85%	58%
Acute - Adult Eating Disorders (18-64 years) (Hospital)	365	85%	58%
Acute - Rural (Hospital)	365	85%	58%
Step Up/Step Down - Youth (12-24 years) (Residential)	365	85%	10%
Step Up/Step Down - Adult and Older Adult (25+ years) (Residential)	365	85%	10%
Sub-Acute Rehabilitation - Youth (18-24 years) (Residential)	365	85%	10%
Sub-Acute Rehabilitation - Adult and Older Adult (25+ years) (Residential)	365	85%	10%
Sub-Acute Older Adult (65+ years) (Hospital)	365	85%	10%
Sub-Acute Intensive Care Service (Hospital)	365	85%	10%
Sub-Acute Rehabilitation – Rural (Residential or Hospital)	365	85%	10%
Non-Acute – Youth (18-24 years) (Residential)	365	95%	0%
Non-Acute - Adult and Older Adult (25+ years) (Residential)	365	95%	0%
Non-Acute - Older Adult (65+ years) (Hospital/Nursing Home Based)	365	95%	0%
Non-Acute - Intensive Care Service (Hospital)	365	95%	0%
Non-Acute - Intensive Care Service Older Adult (65+) (Hospital)	365	95%	0%

Scope of bed-based service modelling

Bed-based costs

Bed costs in the NMHSPF model are driven by salaries, with the addition of oncost rates (28%) and administration costs (10%). Hotel costs (food, linen, etc.), cleaning, electricity, etc. are included in

the overheads. This may not cover all the costs associated with a specialist mental health inpatient or other residential service, such as capital costs. The NMHSPF model does not use a nominal bed price such as bed day cost in calculating the cost of providing bed-based services. However, this can be derived for comparison from the outputs of the NMHSPF-PST (i.e., total bed cost and total bed days).

What about facilities (buildings)?

Capital works is not included in detail in the modelling. What the model does indicate is how many beds of various types might be required, and the workforce associated with them.

The term "facility" makes a distinction between the architectural arrangements designed to support or facilitate the provision of a particular type of care, as distinct from the skilled clinical workforce who actually provide it. While the design of facilities has been organised and standardised to a high degree, it is much harder to find definitions of the people who make the facility operate.

As background to considering NMHSPF service element definitions, the Australasian Health Facility Guidelines (AusHFG)[47] is worth looking at, if only because it shows why we have not dealt with Capital Works in detail in the modelling. Anyone aiming to build a facility to house new services can refer to specific AusHFG numbered guidelines for the design of:

- 132 Child and Adolescent Mental Health Unit
- 133 Psychiatric Emergency Care Centre (PECC)
- 134 Adult Acute Mental Health Inpatient Unit
- 250 Ambulatory Mental Health Unit

For other types of mental health facilities the AusHFG provides design modules or similar general health facilities that can guide design.

What of 24x7 or 365-day care or continuous care?

A number of care profiles covering 24 x 7 care are modelled within the framework. These cater to people who need very long stay non acute residential care, 24 hr/day staffed, provided in various settings, often as co-locations with relevant hospital or generic services. People may remain in these units for lengthy periods however opportunities are sought where possible to achieve discharge to a less restrictive environment such as a generic nursing home place. Note the NMHSPF is a recovery based model with the principle that people do get better.

Why is housing not counted in Individual Support and Rehabilitation Services?

Mental health services provide Individual Support and Rehabilitation Services, so the NMHSPF model counts the hours of care provided, however the housing is not provided by mental health services so it is not included. While some jurisdictions currently fund Non-Acute – Adult (<24 hour support) (Residential) (non-MH) facilities from their mental health budgets, most jurisdictions are moving away from funding these types of beds. Therefore, the NMHSPF models the staffing hours and costs associated with delivering services to these beds but not the bed cost.

[47] http://www.healthfacilityguidelines.com.au/default.aspx

APPENDIX 10 – COST MODELLING

The NMHSPF models total estimated service delivery costs for all resources (workforce FTE, consumables and medications) in the care profiles and top-ups. In order to produce dollar value estimates from the NMHSPF-PST, the agreed notional national salaries for modelled workforce types and other base costs for top-up items are used.

Default national costs for each workforce category and type have been determined as an average cost per workforce type by picking a pay point that is reasonable and then adding an estimate of oncost and overhead rates, as reflected within the modelling parameters. The workforce cost figures are further rounded up/down as appropriate to reinforce they are not exact. Prices obtained from different years of data have been inflated by 3% per year to an equivalent base costing year.

Salary costs were estimated using two different approaches for staff working in team-based and bed-based services under an employee model, and those working as private practitioners generally under private practice fee-for-service arrangements. Base salaries reflect the wages paid to employees. Final prices reflect the total workforce cost inclusive of employment and operational costs. The application of specific base or final salaries to each item in a care profile is based on the corresponding funder label, as per **Table 44**.

Table 44. Type of salary price input applied based on funder label

Funder label from care profile	Setting from NMHSPF-PST price selector
C'Wealth	Private
Private insurer	Private
State	Team/bed-based
CW & St	Team/bed-based
Non-MH	Team/bed-based

There are options for the user to input their own salaries specific to their local needs in the NMHSPF-PST and to turn inflation of prices each year on or off at selected rates. This means that the dollar values are indicative only, and each user can then modify as required. See **Table 45** for notional average staff prices.

These notional prices are not intended as a wage setting activity, or to be used by jurisdictions for budgeting. Wages for individuals will reflect many other factors including variations of awards across jurisdictions, and the individual specifics: seniority of the position, if they are working as an individual practitioner or in a team, individual hours, overtime, on call, other penalty rates and allowances etc.

Table 45. Notional national average staff prices used in NMHSPF-PST

Workforce type	Notional price (2021)	
	Team/bed-based	Private
PEER WORKER	$74,000	$74,000
Consumer Peer Worker	$74,000	$74,000
Carer Peer Worker	$74,000	$74,000
Indigenous Peer Worker	$74,000	$74,000
VOCATIONALLY QUALIFIED	$54,000	$54,000
Enrolled Nurse	$74,000	$74,000
VQMH Worker	$54,000	n/a
VQ Other	$60,000	n/a
Indigenous MH Worker	$60,000	$54,000
Low Intensity Worker	n/a	$72,000
TERTIARY QUALIFIED	$108,000	$160,000*
Indigenous MH Clinician	$108,000	$133,000*
Nurse Practitioner	$141,000	$158,000*
Registered Nurse	$94,000	$132,000*
Psychologist	$108,000	$160,000*
Social Worker	$101,000	$133,000*
Occupational Therapist	$101,000	$133,000*
TQ Other	$94,000	$133,000*
MEDICAL	$323,000	$266,000*
General Practitioner	$323,000	$266,000*
Psychiatrist	$329,000	$309,000*
Other Medical Specialist	$329,000	n/a
Registrar	$141,000	$141,000
Junior Medical Officer	$215,000	$215,000

*final price inclusive of all employment and operational costs

Costs for team/bed-based services

Aside from other vocationally qualified workers, notional national workforce prices for team/bed-based services have been modelled based on average national (AIHW) pricing data from the Mental Health Establishments National Minimum Data Set 2010-11, where available (**Table 46**). AIHW salary rates include penalty rates so cannot be used directly as there is little information on the boundaries of base rate and penalties included. Queensland and NSW pay rates are very similar and so as two large jurisdictions, using the NSW wage rates was considered to be a reasonable comparison point to start with. The 75th percentile from NSW Award rates were built up to include oncosts and overheads, and then compared with the AIHW NSW all-inclusive rates. Above midpoint rates were selected to account for senior positions. The proportion between the NSW base rate and NSW total with oncosts and overheads was then applied in reverse to the total AIHW rates to determine the likely AIHW national base salary for each workforce type. Psychiatrist, Other Medical Specialist and

Medical Officer prices include significant costs of Visiting Medical Officers. Nurse Practitioners are calculated at 45% more than the national average for nurses (based on Award rates).

For community support sector services, the modelling parameters were developed on advice from stakeholders, including the determination of roles in the context of the Social, Community, Home Care and Disability Services (SCHADS) Award. In general, the community support sector workforce prices are combinations of the following award rates: midpoint between SCHADS level 3 pay point 1 and level 4 pay point 4 for Vocationally Qualified Mental Health Worker, SCHADS Awards SCSE Level 5 pay point 1 for Vocationally Qualified Other (used as a VQ supervisor or team leader, and therefore a higher-paid, more senior position,) and L 6.2 for Tertiary Qualified Other (Program Manager).

Note: Indigenous workforce types (see **Appendix 15** for detail) are allocated the equivalent non-Indigenous workforce prices.

Prices for general practitioners in team/bed-based services were originally based on private MBS funding but were updated to align with the team/bed-based Medical Unspecified pricing to better reflect specific cases where a general practitioner is employed within a state/territory-funded mental health team.

Table 46. Method used to derive notional national average staff prices for team/bed-based services for 2011

#	NMHSPF Staff Category	#	NMHSPF Staff Type	2010–11 Average Salary (Australia) $	Est. Markup due to Oncosts and Penalty Rates %	2010–11 Average Salary (Australia) less Oncosts and Penalty Rates	Proposed 2010-11 Base Price (rnd'd) $
A	B	C	D	E	F	G = E - (E * F)	H = Round (G)
1.	Peer Worker	1.	Consumer Peer Worker	61,393	9%	56,459	55,000
	Peer Worker	2.	Carer Peer Worker	65,144	9%	59,908	55,000
2.	Vocationally Qualified	3.	MH Worker	49,983	23%	40,707	40,000
	Vocationally Qualified	4.	Other (Vocationally Qualified)	SCHADS Awards rates used			45,000
	Vocationally Qualified	5.	Enrolled Nurse	70,480	28%	55,015	55,000
3.	Tertiary Qualified	6.	Nurse Practitioner	Nurse Salary + 45% (Awards)			105,000
	Tertiary Qualified	7.	Nurse	91,167	28%	71,163	70,000
	Tertiary Qualified	8.	Social Worker	82,178	8%	76,066	75,000
	Tertiary Qualified	9.	Psychologist	87,222	8%	80,735	80,000
	Tertiary Qualified	10.	Occupational Therapist	82,166	8%	76,056	75,000
	Tertiary Qualified	11.	Other (Tertiary Qualified)	77,029	8%	71,300	70,000
4.	Medical	12.	General Practitioner	Medicare payment rates and QCMHR estimates of direct person related hours.			240,000
	Medical	13.	Psychiatrist	273,372	12%	243,131	245,000
	Medical	14.	Specialist Other	273,372	12%	243,131	245,000
	Medical	15.	Registrar	118,638	12%	105,514	105,000
	Medical	16.	Medical Officer	179,155	12%	159,336	160,000

Notes

1. Average (Australia) salary data (col. E) is based on reported jurisdictional data, compiled by the AIHW. Prices for staff types - Other Vocationally Qualified, Nurse Practitioner and General Practitioner are not identified in the AIHW data (see note 6. for more detail on these staff types).

2. AIHW average salaries data (col. E) are current prices as at 2010–11.

3. AIHW average salaries are calculated for each staff type as follows:
   national total salaries / national total FTE.

4. An estimate of the oncosts and penalty (markup) rates included in the average salary (Australia) data has been derived (col. F) using weighted FTE and markup data from the NMHSPF. The markup has been removed (col. G) from the average salary (Australia) amounts, and then rounded (col. H) to the nearest $5,000, for use as a notional national average base price (excl. the GP price which is a final price).

5. The 2010/11 average salary for Psychiatrists and Other Medical Officers includes the prorated cost of Visiting Medical Officers payments - this is why their prices are significantly more than jurisdiction's base salary rates.

6. i. The Other Vocationally Qualified staff price is based on the Social, Community, Home Care And Disability Services (SCHADS) Industry Award 2010 - Social and community services employee level 5 pay point 1 $878.69 per week.
   ii. Nurse Practitioners are calculated at 45% more than the national average for nurses (based on Award rates).

Costs for private (individual practitioner) services

General practitioner

The salary for GPs has been modelled using MBS data (**Table 47**). The most commonly used MBS item for GPs, item 23, was used to calculate GP salaries assuming an average session duration of 15 minutes, a work week of 42 hours and 90% of their time spent on clinical hours (based on data from the 2018 Health of the Nation Report).

The model only captures the cost of a GP that is related to the estimated expenditure (i.e. benefits paid) from the Commonwealth government. Additional government funding, gap payments from patients or payments from Private Health Insurance have not been included in the pricing of GPs. There is no separate additional cost for overheads, etc.

Table 47. Calculation of General Practitioner Price (2021)

Step	Item Description	Person Related Hours & Medicare Cost Data	Item Type
A	Person related hours worked per week	37.8	hrs
B	No. of Medicare sessions per hour	4	qty
C	Cost of Medicare item 23	$38	$
D	Weekly earnings	$5,775.84	$ (A x B x C)
E	Weeks worked per year	46	wks
F	Annual earnings	$265,688.64	$ (D x E)

Psychiatrist

A salary cost per clinical FTE for psychiatrists was calculated using the AIHW Mental Health Workforce Dataset and the Australian Government Medicare expenditure on and fees charged for ($'000) mental health-specific services, current and constant prices, by provider type, 1984–85 to 2018-19 (**Table 48**). Cost per clinical FTE was calculated using the total national Medicare expenditure for services provided by psychiatrists and the total national number for clinical FTE psychiatrists in private practice settings.

The model only captures the cost of a psychiatrist that is related to the estimated expenditure (i.e. benefits paid) from the Commonwealth government. Additional government funding, gap payments from patients or payments from Private Health Insurance have not been included in the pricing of psychiatrists. There is no separate additional cost for overheads, etc.

Table 48. Calculation of Private Psychiatrist Price (2018)

Step	Item Description	AIHW Workforce and Medicare data	Item Type
A	Clinical FTE	1,269	FTE
B	Medicare expenditure - psychiatrist	$358,300,201.40	$
C	Average annual expenditure	$282,392.97	$ (B / A)

Nurse practitioner

The salary for Nurse Practitioners (NPs) has been modelled using MBS data (**Table 49**). The most commonly used MBS item for NPs, item 82210, was used to calculate NP salaries assuming an average session duration of 20 minutes and 1,500 clinical working hours per year or 32.6 clinical hours per week, 46 weeks per year.

The model only captures the cost of a NP that is related to the estimated expenditure (i.e., benefits paid) from the Commonwealth government. Additional government funding, gap payments from patients or payments from Private Health Insurance have not been included in the pricing of NPs. There is no separate additional cost for overheads, etc.

Table 49. Calculation of Nurse Practitioner Price (2021)

Step	Item Description	Person Related Hours & Medicare Cost Data	Item Type
A	Person related hours worked per week	32.6	hrs
B	No. of Medicare sessions per hour	3	qty
C	Cost of Medicare item 82210	$35.15	$
D	Weekly earnings	$3,437.67	$ (A x B x C)
E	Weeks worked per year	46	wks
F	Annual earnings	$158,175.00	$ (D x E)

Registered nurse

A salary cost was obtained from the costing data provided in the 2012 Evaluation of the Mental Health Nurse Incentive Program where the nurse worked 35 hours per week for 46 weeks per year (**Table 50**). Under this model, the nurse receiving 100% of the sessional rate was selected to account for the total cost of the service rather than compensation to the clinician which may vary based on work arrangements. As the sessional rate for mental health nurses under this model remained the same until the funding transitioned to PHNs in 2016, 2016 has been used as the base year.

Table 50. Calculation of Private Registered Nurse Price (2016)

Step	Item Description	Person Related Hours & Medicare Cost Data	Item Type
A	Work hours per week	35	hrs
B	Weeks worked per year	46	wks
C	Annual salary	$110,400	$

Tertiary qualified: psychologist and TQ-unspecified

A salary cost per clinical FTE for psychologists and TQ-unspecified providers was calculated based on MBS psychology item costs and duration for clinical psychologists, item 80010, and other registered psychologists, item 80110, using a 38.8-hour work week with 85% of their time spent on clinical hours for 46 working weeks per year (**Table 51**). An average weighted salary was calculated based on the proportion of total psychology services delivered by each type of practitioner from 2016 to 2019.

The model only captures the cost of a psychologist that is related to the estimated expenditure (i.e., benefits paid) from the Commonwealth government. Additional government funding, gap payments from patients or payments from Private Health Insurance have not been included in the pricing of psychologists. There is no separate additional cost for overheads, etc.

Table 51. Calculation of Private Psychologists and TQ-Unspecified Providers Price (2021)

Step	Item Description	Person Related Hours & Medicare Cost Data	Item Type
A	Hours worked per week	38.8	hrs
B	Percentage of provider time spent on person	85%	%
C	Person related hours worked per week	32.98	Hrs (A x B)
D	No. of Medicare sessions per hour	1	qty
E	Cost of Medicare items 80010 and 80110	$128.40 and $87.45	$
F	Weeks worked per year	46	wks
G	Average proportion of all psychology services delivered by clinical psychologists	44%	%
H	Annual earnings	$160,258.57	$ (C x D x E x F) – calculated separately and averaged for clinical psychologist and registered psychologist

Tertiary qualified: Indigenous MH clinicians, occupational therapists, social workers and TQ-other

A salary cost per clinical FTE for tertiary qualified providers including Indigenous mental health clinicians, occupational therapists, social workers and TQ-other providers was calculated based on the MBS psychology item cost and duration for other registered psychologists, item 80110, using a 38.8-hour work week with 85% of their time spent on clinical hours for 46 working weeks per year (**Table 52**).

The model only captures the cost of a psychologist that is related to the estimated expenditure (i.e., benefits paid) from the Commonwealth government. Additional government funding, gap payments from patients or payments from Private Health Insurance have not been included in the pricing of psychologists. There is no separate additional cost for overheads, etc.

Table 52. Calculation of Private Tertiary Qualified Providers Including Indigenous MH Clinicians, Occupational Therapist, Social Worker and TQ-Other Staff Price (2021)

Step	Item Description	Person Related Hours & Medicare Cost Data	Item Type
A	Hours worked per week	38.8	hrs
B	Percentage of provider time spent on person	85%	%
C	Person related hours worked per week	32.98	Hrs (A x B)
D	No. of Medicare sessions per hour	1	qty
E	Cost of Medicare items 80110	$87.45	$
F	Weeks worked per year	46	wks
G	Annual earnings	$ 132,668.65	$ (C x D x E x F)

Low Intensity Worker

Low intensity workers modelled in the NMHSPF are based on the costings for staff employed under the NewAccess program.

Primary Health Networks (PHNs) that have implemented the NewAccess program were contacted for salary data for the staff providing low intensity structured psychological therapy (SPT) services. One PHN reported that their NewAccess coach salaries were costed at a SCHADS level 3 or 4 salary, while many others reported using the *beyondblue* NewAccess costing tool. A version of this NewAccess costing tool was made available by *beyondblue* for reference.

As SCHADS salary levels are updated regularly, the midpoint between levels 3 and 4 was used to calculate the salary for low intensity workers as opposed to the fixed salary used in the NewAccess costing tool. Management, supervisory and overhead costs were calculated according to the updated NewAccess costing tool, plus 3% per year for inflation.

Peer workers, medical, other medical specialists and registrars

Prices for these workforce types in both team/bed-based and private services were modelled using AIHW data (see above).

Overhead costs

Overhead costs are represented as a proportion on top of salary costs and can be found in the NMHSPF Service Element and Modelling Parameters document. The definition of overhead costs considers variation across service settings. Overhead costs for bed-based services will vary across hospital and community residential settings as do costs for services provided in the community by the public mental health sector and community support sector.

Common overhead costs include program administration and leadership and other corporate supports which may include quality assurance, human resources, payroll, finance, information technology and communication services. Facilities will also require varying levels of maintenance and cleaning and some may be leased. Community residential or hospital based services also have costs associated with security, catering, laundry and utilities. Additionally, clinical services, such as

various investigations and pharmaceuticals, need to be considered. For mobile community based services, transport and vehicles (including maintenance) represent a significant cost.

Workforce education and program evaluation have also been included (note: the Modelling Group allocated an additional 2% to the community support sector specifically for this purpose).

The model recognises that there will be a myriad of arrangements in place to deliver and charge for the costs identified, with varying levels of efficiency. After consulting with members of the expert working groups and service providers in a number of jurisdictions, the following standardised rates have been established for the model. They represent 'best estimates' of costs for these overheads.

- Community support sector services 20.0%
- Public-sector community mental health services 22.5%
- Bed-based services located in hospitals 30.0%
- Bed-based services located in residential settings 25.0%

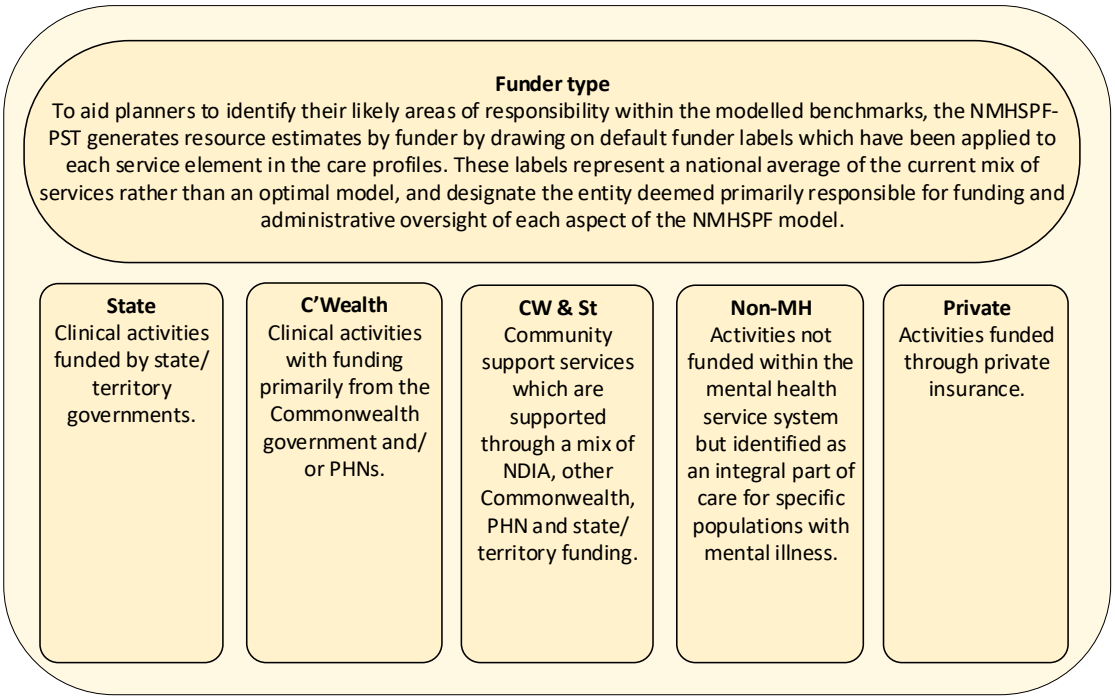
Notes:

1. The rates for bed-based residential services do not consider income associated with legislated or informal charges for accommodation and rehabilitation services.
2. In rural areas overhead costs have been increased by 50% to account for increased needs for centralised recruitment, policy development, quality and safety and communication and travel costs.

APPENDIX 11 – DEFAULT FUNDER LABELS

In the default funder options labelling, some general principles were followed:

- Prevention and promotion activities have been assigned to C'Wealth as an interim measure, as the funding allocation for these services was based on Commonwealth expenditure. These services are also likely to be funded through states and territories.
- In general, MILD and MODERATE care profiles have been assigned to C'Wealth.
- Responsibility for clinical services in SEVERE care profiles has been split between C'Wealth, Private Insurer and State, acknowledging that a proportion of people with SEVERE illnesses are primarily managed in the private sector. Generally, the more complex SEVERE populations have been assigned to State.
- 24 hour staffed bed-based services were almost always assigned to State, including services which might be provided in partnership with the aged care sector, to ensure these resources were counted and costed in NMHSPF-PST outputs.
- Pharmacotherapy prescription for more severe groups who typically receive services within the public sector was labelled State, while pharmacotherapy prescription and review for less severe care profiles and conducted by GPs was labelled C'Wealth.
- Early psychosis care profiles were assigned primarily to State. However, it should be acknowledged that the Commonwealth is likely to continue to play a role in funding specialist youth early psychosis services through Primary Health Networks, so adjustment may be required.
- Non-clinical activities, including those in the Specialised MH Community Support Services stream of the Taxonomy, have been assigned CW & St.
- Activities funded outside of the mental health system have been labelled Non-MH.



APPENDIX 12 – SELECTED CARE PROFILE MODELLING

This section contains more detailed supporting information for the data sources and modelling informing selected care profile content and groups. In developing the required services for each need group, a number of data sources were used alongside expert input. The modelling and caveats for some of these items are described in more detail below. Further modelling information is noted in relevant care profile descriptions.

Structured psychological therapies

General Principles

Structured psychological therapies (SPT) were allocated to need groups in care profiles based on a 'should' model, which assumes that service delivery is driven by need and efficacy. This means that the number of occasions of service modelled is based on expert opinion on best practice for a group with that level of severity and complexity. It does not take into account barriers to accessing services (e.g. location, cost, session caps), or likely dropout rates for individuals who do not finish a whole course of therapy. It should be acknowledged that previous studies show substantial early discontinuation both in Australia and internationally for these types of therapies, for a variety of reasons.

Clinician Moderated Web-based Psychological Interventions

Clinician Moderated Web-based Psychological Interventions in the NMHSPF were modelled on data provided by MindSpot from early 2016. At that time MindSpot had two treatment options available to consumers regarding the degree of contact they wished to receive from the clinician. The Standard model of service delivery included weekly contact from the clinician while the Optional Guided or Consumer Directed Care model offered consumers the option of less intensive clinician guidance. The NMHSPF uses an average of these two models.

Over the course of the 10-week program this equates to an average clinician time of 25 minutes for the initial assessment, followed by 100 minutes spread across the 10 treatment sessions. This modelling was applied to appropriate Indicated Prevention, Relapse Prevention, Mild and Moderate care profiles in the 12+ age groups.

There is emerging evidence to suggest that further investment in the development and testing of clinician moderated web-based psychological interventions for people with severe mental illness is required to determine the clinical efficacy of this treatment modality as an alternative or adjunct to face-to-face care. It was recommended by the Phase 2 Expert Panel (2016) that, considering the emerging evidence base, it would not be appropriate to model this type of psychological intervention for people with severe mental illness as a separate intervention.

Although the severe population is likely to benefit from clinician moderated web-based psychological interventions, the expert consensus was that people with severe mental illness are likely to require a greater intensity of clinician input compared to other populations. Within severe care profiles, the existing activities modelled for clinicians working individually or in teams may include delivery of a variety of evidence-based therapies, including web-based therapies.

Similarly, unmoderated web-based psychological interventions may be prescribed by a clinician as part of a package of care within the activities modelled in the NMHSPF. These interventions may also be accessed directly by people with a range of needs, including those with no mental illness through to those with severe mental illness. These unmoderated interventions are included in the Promotion and Prevention streams of the Taxonomy.

It should also be noted that due to the anticipated expansion of services such as Clinician Moderated Web-based Psychological Interventions and modelling of all SPT at ideal rates, the NMHSPF model is expected to predict a significant increase in the Tertiary Qualified workforce.

SPT Low Intensity Interventions

SPT Low Intensity Interventions in the NMHSPF were modelled on unpublished data provided by beyondblue evaluating the NewAccess program. NewAccess is a model, similar to the UK IAPT program, of providing low intensity cognitive behavioural therapy interventions to people with milder symptoms of mental illness, within a stepped care service framework. 'Coaches', who do not require clinical training but may have a relevant background, are trained specifically in delivering the structured interventions.

Data provided on the NewAccess model included an initial face to face or telephone assessment (45-60 minutes), 5 face to face or telephone coaching sessions (30 minutes each) and a follow up telephone assessment 4 weeks post program completion (30 minutes). The NMHSPF takes the average of all this time and models SPT Low Intensity Interventions at 7x35 minutes with a 'Low Intensity Worker' coach. The coaches delivering these services receive frequent supervision from a Tertiary Qualified professional with a mental health background (e.g. mental health nurse, psychologist, social worker). The costing for the supervisor's time has been built into the salary of the 'Low Intensity Worker' as an overhead cost.

SPT Low Intensity Interventions have been used in appropriate Indicated Prevention, Relapse Prevention and Mild care profiles in the 18+ age groups. The unpublished data provided by beyondblue indicated that there are a small portion of consumers who do not complete the full course of treatment that the NewAccess model offers. However, as noted above attrition has not been considered in the NMHSPF modelling.

Due to the anticipated expansion of low intensity psychological interventions within a stepped care framework, the number of 'Low Intensity Workers' in this service area modelled by the NMHSPF is expected to be significantly higher than current rates and may require investment to develop this workforce.

APPENDIX 13 – MODELLING FOR WHOLE CATCHMENTS

The addition of new modelling to account for Aboriginal and Torres Strait Islander and Rural/Remote populations resulted in four possible population inputs for each catchment area (i.e. Rural/Indigenous, Rural/non-Indigenous, Urban/Indigenous, Urban/non_Indigenous). **Figure 5** shows how the NMHSPF model generates estimates for a whole catchment which includes all four population inputs. The technical details of adjustments to the base NMHSPF model which have been applied for rural populations can be found in **Appendix 14** and those for Aboriginal and Torres Strait Islander Peoples in **Appendix 15**.

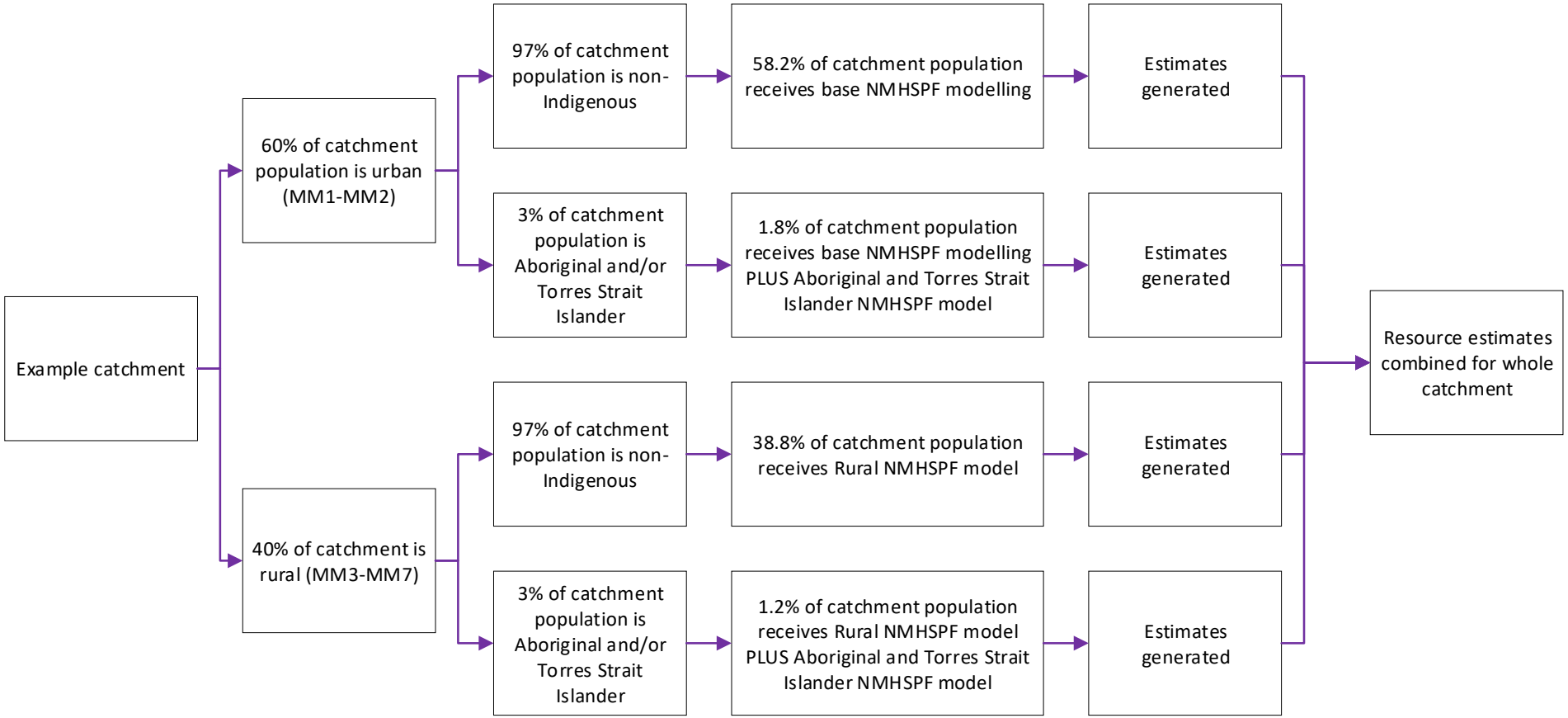


Figure 5. How the NMHSPF model generates estimates for a whole catchment which includes Aboriginal and Torres Strait Islander and Rural populations

APPENDIX 14 – MODELLING FOR RURAL AND REMOTE POPULATIONS

Background

Users of the NMHSPF expressed the need for the model to address the service needs of rural and remote populations more precisely. The base NMHSPF model uses a national average population-based structure to generate resource estimates and as such does not take into account variation for populations who differ from the national average, such as rural and remote populations. Variations may include differences in relative demand for mental health services, the types of service models implemented, and/or the resources required for service delivery.

This technical appendix summarises the development of the rural NMHSPF model, and outlines the modifications to the base NMHSPF model which have been implemented to better reflect the needs of rural and remote populations. Although this work includes modelling adjustments for all rural and remote populations, separate modelling was not able to be undertaken to meet the unique needs of very remote populations. These populations require tailored local responses and a national model would be inappropriate. Note however, that very remote populations are included in the model described below and adjustments from the rural NMHSPF model are applied to these populations.

Methods

Between March 2018 and March 2019, work was undertaken by The University of Queensland to enhance the base NMHSPF model to better reflect the needs of rural and remote populations. The focus of this process was to identify key areas of difference between the mental health service requirements of the general population and those for delivering appropriate and accessible mental health care to people in rural and remote areas. These key areas of difference were then translated into elements that could be incorporated within the architecture and processes of the NMHSPF.

This work was also informed by the findings of the Senate Inquiry into the Accessibility and Quality of Mental Health Services in Rural and Remote Australia (the inquiry).[48]

Scope

This work only considered mental health services tailored to individual needs (e.g. not population-based mental health promotion or mental illness prevention activities) and was focussed on the needs of the general adult population (aged 18-64). This work was limited to using the structures and concepts already established within the NMHSPF and did not have capacity to undertake development of a completely separate or new approach to modelling service requirements.

Notably, suicide prevention in rural and remote areas is an important priority;[49] however, the NMHSPF does not currently model specific suicide prevention programs for targeted groups of people. The base NMHSPF model includes individually-tailored interventions that, although not specifically labelled as suicide prevention, should positively impact on suicide rates. These interventions are mainly focussed on early assessment and access to treatment.

[48] Senate Community Affairs Committee Secretariat. (2018). *Accessibility and quality of mental health services in rural and remote Australia.* Canberra: Commonwealth of Australia.
[49] Ibid

Literature review

A rapid literature review was conducted to identify the prevalence of mental illness in rural and remote communities and the key issues affecting mental health services in rural and remote areas.

Expert panel

An expert panel was convened for four meetings to guide the project team in the process of developing principles to adapt the base NMHSPF model to better suit the specific needs of rural and remote populations. The expert panel was asked to consider the fundamental issues affecting rural and remote service delivery and to provide modelling options based on their experience, best practice examples and evidence responding to these issues.

Additional consultation

In 2021, additional consultation was undertaken with available members of the 2018-19 Rural and Remote Expert Panel and the 2019-20 Youth Expert Panel to determine how best to incorporate within the model the needs of young adults living in rural areas.

Service Modelling

Based on the findings of the literature review and feedback from the expert panel, new service elements and staffing profiles for rural-specific services were developed. Rules for adjusting base NMHSPF modelling were also developed.

Classifying rurality

Several systems for classifying rurality were considered for the purposes of NMHSPF modelling including:

- Modified Monash Model (MMM);
- Accessibility and Remoteness Index of Australia (ARIA+);
- Australian Statistical Geography Standard – Significant Urban Area (ASGS-SUA); and
- Australian Statistical Geography Standard – Remoteness Area (ASGS-RA).

Initial discussions narrowed down the options to the ASGS-RA and the MMM. The MMM is a seven-level classification system used for health workforce planning to categorise areas according to geographical remoteness and town size. In contrast to the ASGS-RA, the MMM is able to further differentiate inner and outer regional areas based on the local population size. As a result of this advantage, the expert panel endorsed the decision to implement the MMM as the preferred method for classifying rurality in this context.

Integration with base NMHSPF model

For implementation into the NMHSPF, a binary split of urban and non-urban (i.e. rural and remote) has been applied to the MMM. A split considering MM1-MM2 as urban and MM3-MM7 as non-urban was endorsed by the expert panel.[50]

When catchments tagged as non-urban are selected for generating resource estimates using the NMHSPF-PST, the rural NMHSPF model is automatically applied to the catchments. However, it is likely

[50] Further details on MMM levels can be accessed through the following URL: https://www.health.gov.au/health-workforce/health-workforce-classifications/modified-monash-model

that some catchments will contain both urban and non-urban areas, in which case estimates using the rural NMHSPF model are provided for the proportion of the population residing within the rural area (**Figure 6**).

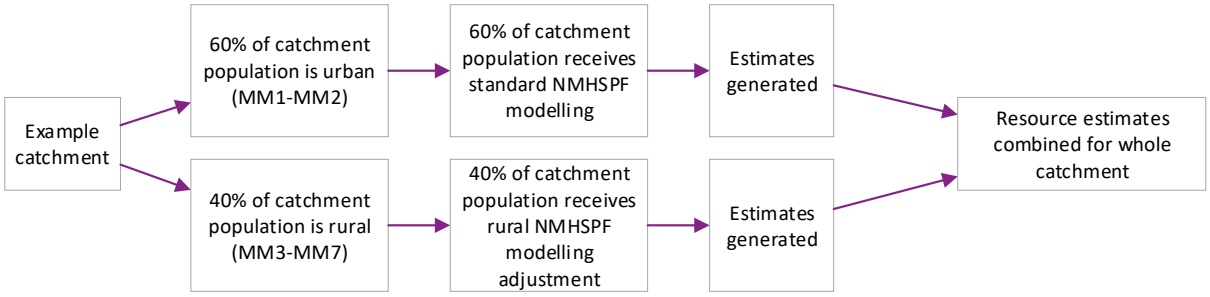


Figure 6. Example of how resource estimates would be applied for catchments containing rural and urban areas.

Epidemiology

The findings of the inquiry noted that rates of mental illness in rural and remote and urban populations are similar, however, people living in rural and remote areas have comparatively low rates of access to mental health services.[51] It was suggested that there is a direct relationship between restricted access and poor mental health outcomes, including suicide. These findings are also consistent with literature identified through the literature review. As such, the decision was made to utilise the base NMHSPF model national average population-based epidemiology for the rural NMHSPF model.

Key principles guiding rural service modelling

In consultation with the expert panel, a set of key principles to guide the development of new rural service elements and staffing profiles was developed. The principles are as follows:

- The range and quantum of services available in rural and remote areas should be at least equal to that provided to urban populations (even though the service delivery models will be different).
- Modelling should aim to respond to the barriers to access to services through use of evidence based service models.
- The application of urban planning models in rural and remote settings fails to respond to the unique challenges associated with developing and maintaining efficient and effective local services.
- The program structures, service models and funding arrangements used in standard (urban) models do not work in rural and remote settings.
- At a local level, there is a need for improved service integration and coordination.
- A challenge for service modelling in this context is to provide service models which improve the likelihood that rural and remote communities will be better able to access services.

With these principles in mind, the expert panel suggested the following services as a priority for rural areas, and that the rural NMHSPF model should include access to:

[51] Senate Community Affairs Committee Secretariat. (2018). *Accessibility and quality of mental health services in rural and remote Australia*. Canberra: Commonwealth of Australia.

- 24-hour specialist support particularly in times of crisis;
- Services in rural hospitals and in particular emergency departments;
- Safe transport and emergency transfers;
- Telemedicine and e-mental health;
- Individualised care coordination and family support services; and
- Community engagement and education programs.

These issues are generally consistent with those reported in the inquiry.[52] It is important to note that the aim of these modifications is not to make up for existing gaps in service availability, but rather to focus on modelling what a good service in a rural or remote area would require.

Rural service modelling

This section outlines the key differences between the base (i.e. urban) and rural NMHSPF models. The rural NMHSPF model includes a suite of new service elements, as well as the application of adjustments to the base NMHSPF model.

New service elements and activities:

- Consultation Liaison – Specialist Rural Outreach;
- Consultation Liaison – Rural Hospital and Emergency Department;
- Acute – Rural (Hospital);
- Sub-Acute Rehabilitation – Rural (Residential or Hospital);
- Clinical Community Treatment Team – Rural; and
- Care Coordination and Liaison – Rural Therapy Liaison.

Modelling adjustments:

- Increased overhead costs for public and community support sector services;
- Increased time for care coordination and liaison and extended family therapy provided through state funded services;
- Increased time for assessments, monitoring and ongoing management, and care coordination and liaison in primary care;
- Allocation of time for facilitating increased uptake and access to structured psychological therapies (including e-mental health); and
- Increased time for family support activities provided through the community support sector, including peer work, family support, and flexible respite.

The changes are outlined in detail below, grouped by the sector through which the services are provided.

Public sector services

Context

In developing a public sector service model for rural areas, the aim of discussions with the expert panel was to identify innovative models that would support the provision of the same types of services that are available to those living in urban settings in a way that would be feasible in rural locations.

[52] Senate Community Affairs Committee Secretariat. (2018). *Accessibility and quality of mental health services in rural and remote Australia.* Canberra: Commonwealth of Australia.

The expert panel identified a hub and spoke model as the best option to build service capacity, stability and reliability and was best suited to respond to the challenges previously described. The hub and spoke model "arranges service delivery assets into a network consisting of an anchor establishment (hub) which offers a full array of services, complemented by secondary establishments (spokes) which offer more limited service arrays, routing patients needing more intensive services to the hub for treatment".[53]

This model provides a structure for workforce arrangements that are different from the standard urban modelling. For example, using the hub and spoke allows for much of the mental health specialist workforce to be based within the hub, which is likely to have less difficulty recruiting a workforce who can provide coordinated, reliable specialist input to the rural areas as required. Additionally, it allows for mental health services to operate on the ground within rural areas with the support of hub, rather than requiring individuals to travel to a larger area to receive any mental health service.

The rural NMHSPF model for public sector services describes a range of clinical, professional and operational supports provided in a flexible way through the hub. It is understood that the hub would support local services and their associated populations in a flexible way, which would allow a continuing focus on local service development. Resources could be deployed from the hub to local services as opportunities arose for local employment or service development.

This model operates in South Australia and has provided relatively stable, reliable and integrated local bed-based and community-based services over a long period.[54] The model, its associated service elements and staffing profiles are underpinned by an understanding that while decentralisation of service delivery is always the goal, it needs to be managed in a way that can ensure service stability, efficiency and effectiveness.

Where appropriate and available, it may be preferable to deliver public sector bed-based services in rural areas using the Hospital in the Home model.[55] This model allows consumers to remain close to their families and communities and to reduce complexities associated with community dislocation. For example, within rural spokes, population sizes would generally be insufficient to support youth specific bed-based services. Young adults could be admitted to general adult bed-based services in the spokes, however this can potentially be traumatic and detrimental to recovery if not carefully managed. Young adults could be admitted to youth-specific bed-based services in the hub, however this may cause problems associated with community dislocation. A Hospital in the Home model may address these issues by providing an appropriate clinical response while young adults are supported within their usual home environment. However, it is acknowledged that Hospital in the Home will not be suitable for everyone and that youth specific hub services should be used where needed (i.e. due to risk, comorbidity or other complexity).

Service element descriptions

Consultation Liaison – Specialist Rural Outreach

This service element allows for the provision of medical support, discipline-specific professional support, 24-hour clinical support and governance to be provided to rural areas through a centralised

[53] Elrod, J.K., & Fortenberry, J.L. (2017). The hub and spoke organization design: an avenue for serving patients well. *BMC Health Services Research, 17*(Suppl 1), 457 (p.26).
[54] NMHSPF Rural and Remote Expert Panel (2018-19)
[55] 2021 Consultation with members of the NMHSPF Rural and Remote and Youth Expert Panels.

hub (located in a large regional or urban area). The inclusion of this service element allows for workforce to be reallocated from rural areas into hubs where they can provide support to the rural area as required.

Acute – Rural (Hospital)

In the base NMHSPF model, acute units are modelled as having 24 beds. However, these would be inefficient and unrealistic to operate in rural areas due to smaller population size and decreased workforce availability. In addition to the difficulties with economies of scale of services in rural areas, expert panel members noted there were consistently high rates of admission of people with mental health problems to rural general hospitals, where specialist inpatient services are not available.[56]

In response, a service element describing a 6-bed rural acute unit within rural general hospitals has been included in the rural NMHSPF model. These services are delivered by multidisciplinary teams, including psychiatrist/registrar input. This unit is for adults (ages 18-64), although older or younger individuals may be admitted by exception. Specialist inpatient units for children, adolescents and older adults are located in larger service centres (e.g. the hub). These acute units are supported by larger regional units for patients with complex needs and by specialist sub-acute and non-acute services usually located in major service centres. This model is based on acute service models operating in New South Wales and South Australia; evidence from New South Wales suggests these units operate as stable and effective services when co-located with rural general hospitals.[57]

Sub-Acute Rehabilitation – Rural (Residential or Hospital)

A flexible rural sub-acute model has been included within the rural NMHSPF model to reflect the smaller population size and decreased workforce availability in rural areas. These units may serve a step-up or step-down function and may be located on a hospital campus or integrated within the community, with an average unit size of 10 beds. This service is for adults (ages 18-64) although older or younger individuals may be admitted by exception. All populations accessing this rural unit will receive a 15% increase to their base (i.e. urban equivalent) length of stay. This model is based on sub-acute service models operating in New South Wales and South Australia; evidence from New South Wales suggests these units operate as stable and effective services.[58]

Consultation Liaison – Rural Hospital and Emergency Department

Specialist, extended-hours consultation liaison services have been included in the rural NMHSPF model for large regional hospitals (based on a size of approximately 100 total beds). These consultation liaison services are delivered to all individuals presenting to the emergency department and requiring a mental health response. These services also respond to individuals already admitted to hospital and requiring assessment or treatment of a mental health problem by local mental health teams (primarily medical and nursing staff), who are supported by specialist staff in the hub. This has been modelled as a mix of onsite and remote services, ensuring access to specialist mental health services at all hours. A model similar to this is currently in place in New South Wales, which provides 24-hour emergency

[56] NMHSPF Rural and Remote Expert Panel (2018-19)
[57] Daly, S., & Kirby, S. (2015). *Far West Mental Health Recovery Centre: a partnership model of recovery focused mental health inpatient care.* Paper presented at the 13th National Rural Health Conference, Darwin, NT.
[58] Ibid

assessment and triage via teleconference or video link in order to support the local management of mental health presentations.[59]

Clinical Community Treatment Team – Rural

To address issues of economies of scale and workforce availability, a rural clinical community treatment team has been included in the rural NMHSPF model. This rural team is based on a generic model and operates primarily as a generalist mental health service; due to smaller population sizes and workforce availability in rural areas, it is not feasible to run age-specific teams. Instead, age specific services are provided via telehealth by the hub or by specialised visiting service providers. Additionally, it is not feasible for rural teams to operate on an extended hours basis (as their urban counterparts do); this rural team operates during business hours, with after-hours support provided through the rural emergency department or the hub.

To account for rural case complexity and travel demands, the expert panel suggested caseloads should not exceed 20 active cases. Staffing for the rural team is modelled at the same rate as the community team in the base model. This service element is based on the model operating in South Australia.[60] In general terms this is a model which has operated in various forms throughout rural Australia for some time; however its association with a central support hub is new.

The expert panel also suggested that in rural areas, public sector community teams are often seen as the only resource for providing education and community outreach. In response, for the rural community team the ratio of staff to team leader was adjusted from approximately 30 staff per team leader to 15 staff per team leader. This adjusted ratio allows more time for team leaders to engage in community development and educational activities.

Modelling adjustments

Increased overhead costs

The expert panel was of the view that direct care time rates do not need to be varied in rural areas, however increasing overhead costs helps to address the increased need for centralised recruitment, policy development, quality and safety and communication and travel costs. The public sector overhead costs have been increased by 50%. These increases are reflected as overhead costs in all staffing profiles in the rural NMHSPF model.

Additional time for care coordination and liaison and family support

In rural areas, the capacity of public sector services required enhancement in order to respond to the increased need for Care Coordination and Liaison and family support (in the form of SPT Extended Intervention – Family). Care profiles in the base model were constructed on the understanding that public sector teams undertake care coordination and liaison and deliver structured psychological therapies at a standard rate as part of their normal work; however additional support is required for populations where these activities are particularly challenging, such as in rural areas. In response, a 20% increase on the base NMHSPF model duration for these activities has been included in the rural NMHSPF model.

[59] Saurman, E., Lyle, D., Perkins, D., & Roberts, R. (2014). Successful provision of emergency mental health care to rural and remote New South Wales: an evaluation of the Mental Health Emergency Care-Rural Access Program. *Australian Health Review, 38(*1), 58-64.
[60] NMHSPF Rural and Remote Expert Panel (2018-19)

Implementation

Table 53 provides the rules that guide allocation of resourcing for service elements to be either within the rural area or within the hub. Note that for community teams, any resourcing located within the hub is labelled as the service element Consultation Liaison – Specialist Rural Outreach. For bed-based services, any beds operated within the hub retain their base NMHSPF model service element name but are flagged to say they are operated out of the hub. The application of the new service elements and modelling adjustments for public sector rural teams and individual practitioners is highlighted in **Table 54**, **Table 55** and **Table 56**.

Table 53. Allocation of services to hub

Age group	Proportional split	
	Beds	Community teams*
0-11 years	100% of base NMHSPF model resourcing go to hub	85% of base NMHSPF model resourcing remains in rural area (as new rural service element) 15% of resourcing goes to hub (as base NMHSPF model service element)
12-24 years	<u>For Acute – Youth Unit and Acute – Intensive Care Unit:</u> 25% of base NMHSPF model resourcing remains in rural area (as new rural service element) 75% of resourcing goes to hub (as base NMHSPF model service element) <u>For Step Up/Step Down and Sub Acute Rehabilitation:</u> 70% of base NMHSPF model resourcing remains in rural area (as new rural service element) 30% of resourcing goes to hub (as base NMHSPF model service element) <u>For all other service elements:</u> 100% of base NMHSPF model resourcing goes to hub	85% of base NMHSPF model resourcing remains in rural area (as new rural service element) 15% of resourcing goes to hub (as base NMHSPF model service element)
25-64 years	<u>For Acute – Adult Unit and Acute – Intensive Care Unit:</u> 50% of base NMHSPF model resourcing remains in rural area (as new rural service element) 50% of resourcing goes to hub (as base NMHSPF model service element) <u>For Step Up/Step Down and Sub Acute Rehabilitation:</u> 100% of base NMHSPF model resourcing remains in rural area (as new rural service element) <u>For all other service elements:</u> 100% of base NMHSPF model resourcing goes to hub	75% of base NMHSPF model resourcing remains in rural area (as new rural service element) 25% of resourcing goes to hub (as base NMHSPF model service element)
65+ years	100% of base NMHSPF model resourcing goes to hub	80% of base NMHSPF model resourcing remains in rural area (as new rural service element) 20% of resourcing goes to hub (as base NMHSPF model service element)

* Includes state funded individual items that are typically delivered by community teams

Table 54. Application of new public sector service elements and modelling adjustments to beds for rural populations

	Service elements		Rule/modification	Replacement service element(s)
	IF any of the following service elements appear…	*AND are funded by…*	*THEN…*	
Acute	Acute - Adult (25-64 years) (Hospital)	State	Allocate 50% of originally modelled service element population to new rural service element/staffing profile as new line Remaining 50% of originally modelled service element population allocated to existing service element as new line with note to say it should be operated out of hub	Acute – Rural (Hospital)
	Acute – Intensive Care Service (Hospital) (Note: 25-64 years only)			
	Acute - Youth (12-24 years)(Hospital)	State	Allocate 25% of resources to new rural service element/staffing profile as new line Remaining 75% allocated to existing service element as new line with note to say it should be operated out of hub	Acute – Rural (Hospital)
	Acute – Intensive Care Service (Hospital) (Note: 12-24 years only)			
	Acute – Intensive Care Service (Hospital) (Note: 65+ years only, incl BPSD)	State	Add new line with of existing service element at same quantity with note to say it should be operated out of hub	N/A
	Acute - Child (0-11 years) (Hospital)			
	Acute – Perinatal and Infant Mental Health (Hospital)			
	Acute – Older Adult (65+ years BPSD)(Hospital)			
	Acute – Older Adult (65+ years)(Hospital)			
Sub-Acute	Step Up/ Step Down – Adult and Older Adult (25+ years) (Residential) (Note: 25-64 years only)	State	Replace with rural sub-acute service element/staffing profile as new line and increase modelled length of stay by 15%	Sub-Acute Rehabilitation – Rural (Residential or Hospital)
	Sub-Acute Rehabilitation - Adult and Older Adult (25+ years) (Residential) (Note: 25-64 years only)			
	Step Up/Step Down - Youth (12-24 years)(Residential)	State	Allocate 70% of resources to new rural service element/staffing profile as new line and increase modelled length of stay by 15% Remaining 30% allocated to existing service element as new line with note to say it should be operated out of hub	Sub-Acute Rehabilitation – Rural (Residential or Hospital)
	Sub-Acute Rehabilitation - Youth (18-24 years) (Residential)			
	Step Up/ Step Down – Adult and Older Adult (25+ years) (Residential) (Note: 65+ years only)	State	Add new line with of existing service element at same quantity with note to say it should be operated out of hub	N/A

	Sub-Acute Rehabilitation – Adult and Older Adult (25+ years) (Residential) (Note: 65+ years only)			
	Sub-Acute Intensive Care Service (Hospital)			
	Sub-Acute Rehabilitation – Older Adult (65+ years)(Hospital)			
Non-Acute	Non Acute - Youth (18-24 years) (Residential)	State	Add new line with of existing service element at same quantity with note to say it should be operated out of hub	N/A
	Non Acute - Adult and Older Adult (25+ years) (Residential)			
	Non-Acute Intensive Care Service (Hospital)			
	Non Acute - Older Adult (65+ years) (Hospital/Nursing Home Based)			
	Non Acute - Intensive Care - Older Adult (65+ years) (Hospital)			

Table 55. Application of new public sector service elements and modelling adjustments to community teams for rural populations

	Service elements		Rule/modification	Replacement service element(s)
	IF any of the following service elements appear…	*AND are funded by…*	*THEN….*	
Child & Youth (0-24 years)	Clinical Community Treatment Team - Child (0-11 years)	State	Add new line for rural team service element with 85% of originally modelled resources	Clinical Community Treatment Team – Rural
	Clinical Community Treatment Team - Youth (12-24 years)		Add new line for hub service element with 15% of originally modelled resources	Consultation Liaison – Specialist Rural Outreach
	Acute Care Team	State	Add new line for rural team service element with 85% of originally modelled resources with note added to specify it was "rural replacement for Acute Care Services"	Clinical Community Treatment Team – Rural
			Add new line for hub service element with 15% of originally modelled resources with note added to specify it was "rural replacement for Acute Care Services"	Consultation Liaison – Specialist Rural Outreach
	Day Program Team - Child and Youth (0-24 years)	State	Retain existing service element but add note to say it should be operated out of hub	N/A
Adult (25-64 years)	Clinical Community Treatment Team - Adult (25-64 years)	State	Add new line for rural team service element with 75% of originally modelled resources	Clinical Community Treatment Team – Rural
			Add new line for hub service element with 25% of originally modelled resources	Consultation Liaison – Specialist Rural Outreach
	Acute Care Team	State	Add new line for rural team service element with 75% of originally modelled resources with note added to specify it was "rural replacement for Acute Care Services"	Clinical Community Treatment Team – Rural
			Add new line for hub service element with 25% of originally modelled resources with note added to specify it was "rural replacement for Acute Care Services"	Consultation Liaison – Specialist Rural Outreach
	Day Program Team - Adult (25-64 years)	State	Retain existing service element but add note to say it should be operated out of hub	N/A
Older adult (65+ years)	Clinical Community Treatment Team - Older Adult (65+ years)	State	Add new line for rural team service element with 80% of originally modelled resources	Clinical Community Treatment Team – Rural
			Add new line for hub service element with 20% of originally modelled resources	Consultation Liaison – Specialist Rural Outreach

	Acute Care Team	State	Add new line for rural team service element with 80% of originally modelled resources with note added to specify it was "rural replacement for Acute Care Services"	Clinical Community Treatment Team – Rural
			Add new line for hub service element with 20% of originally modelled resources with note added to specify it was "rural replacement for Acute Care Services"	Consultation Liaison – Specialist Rural Outreach
All ages	Consultation Liaison – General (Hospital)	State	Substitute with the new rural CL service element/staffing profile	Consultation Liaison – Rural Hospital and Emergency Department
	Consultation Liaison – Emergency Department			

Table 56. Application of new public sector service elements and modelling adjustments to individual practitioners in the public sector

Service elements		Rule/modification
IF any of the following service elements appear…	*AND are funded by…*	*THEN…*
Care Coordination and Liaison	State	Increase activity time by 20%
SPT Family		

Primary care services

Context

Previous research has suggested that mental health services are a core component of primary care services and should be locally available in all rural and remote areas with more than 500 residents.[61] However, service utilisation data demonstrates that people living in rural and remote areas have reduced rates of access to specialist mental health services provided within primary care by general practitioners (GP), private psychologists and psychiatrists.[62]

In addition to the poor access for consumers, GPs also report limited access to specialist consultations to support decision making for more severe cases. This lack of support to GPs often leads to otherwise unnecessary referrals to specialist public sector services or general hospitals. Evidence of this can be found in the diagnostic profiles of public sector caseloads in rural and remote communities which are often characterised by lower than expected rates of severe and complex problems.

Service element descriptions

Care Coordination and Liaison – Rural Therapy Liaison

Support to enable increased uptake of services provided via telehealth and e-mental health services was proposed as a potential mechanism to help improve access to specialist mental health services in primary care. The expert panel reported that the use of non-clinical staff to promote uptake and facilitate access to e-mental health programs was an effective model.

A new service activity (under the service element Care Coordination and Liaison) for this purpose has been created.

Modelling adjustments

Additional time for assessments

In order to respond to the inherent complexity of mental illness in rural and remote areas (e.g. related to social isolation or different family structures), a 20% increase in duration for all mental health assessments (both brief and comprehensive) has been included in the rural NMHSPF model.

Additional time for Monitoring and Ongoing Management

A lack of integration between primary care and public sector care in rural and remote settings was highlighted by the expert panel. This lack of integration can result in individuals falling through 'gaps' in the system and losing contact with services. In practice, mental health nurses have been successfully working within primary care settings to provide specialist support to GPs to manage

[61] Thomas, S. L., Wakerman, J., & Humphreys, J. S. (2015). Ensuring equity of access to primary health care in rural and remote Australia - what core services should be locally available? *International Journal for Equity in Health, 14*(111), 1-8.

[62] AIHW. (2018). Mental health services in Australia. Retrieved from https://www.aihw.gov.au/reports/mental-health-services/mental-health-services-in- australia/report-contents/medicare-services/interactive-data

more severe cases of mental illness.[63,64,65] In addition to the clinical expertise these nurses offer, they also fulfil an important role in helping to coordinate clinical and non-clinical services for individuals and their families.

In order to support rural GPs in the management of individuals with severe mental illness presenting to primary care (and in the absence of other specialist mental health services), the provision of services by mental health nurses in rural areas has been increased. This has been incorporated as a 20% increase in the duration of each occasion of Monitoring and Ongoing Management provided by registered nurses in primary care in the rural NMHSPF model.

Additional time for Care Coordination and Liaison

The expert panel also suggested resources should be modelled to increase the provision of care coordination and liaison to populations who require more support. This has been included in the rural NMHSPF model as a 20% increase in duration of each occasion of Care Coordination and Liaison provided in primary care.

Additional time for Family Support Services

There is a need for additional support for the families and carers of individuals accessing mental health services through primary care in rural and remote areas. This has been incorporated as a 20% increase in the duration from the base NMSHPF model of each occasion of SPT Extended Intervention - Family delivered through primary care in the rural NMHSPF model.

Additional support to enable access to services

Additional support has been incorporated to allow both registered nurses and vocationally qualified workers to promote and facilitate access to structured psychological therapies and clinician moderated web-based psychological interventions (e-mental health programs). To incorporate this function in the rural NMHSPF model, two new occasions of Care Coordination and Liaison – Rural Therapy Liaison have been added for each line of SPT in a care profile (including Clinician Moderated Web-Based), modelled at 10% of the duration from the base NMHSPF model SPT.

Implementation

The application of the new service elements and modelling adjustments for primary care is highlighted in **Table 57**.

[63] Lakeman, R., & Bradbury, J. (2013). Mental health nurses in primary care: quantitative outcomes of the Mental Health Nurse Incentive Program. *Journal of Psychiatric and Mental Health Nursing, 21*(4), 327-335.
[64] Meehan, T., & Robertson, S. (2014). Impact of the Mental Health Nurse Incentive Programme on patient functioning. *International Journal of Mental Health Nursing, 24*(1), 75-81.
[65] Zhao, Y., Russell, D. J., Guthridge, S., Ramjan, M., Jones, M. P., Humphreys, J. S., & Wakerman, J. (2019). Costs and effects of higher turnover of nurses and Aboriginal health practitioners and higher use of short-term nurses in remote Australian primary care services: an observational cohort study. *BMJ Open, 9*, e023906.

Table 57. Application of new public sector service elements and modelling adjustments to individual practitioners in primary care

Service elements		Rule/modification
IF any of the following service elements appear…	*AND are funded by…*	*THEN…*
Care Coordination and Liaison	Commonwealth OR Non-MH	Increase duration by 20% for each item delivered by Medical, GP, Psychiatrist, RN, NP, or TQ.
Brief Mental Health Assessment		
Comprehensive Mental Health Assessment		
Review +/- Ongoing Management		
Centre Based Review +/- Ongoing Management		
Home Based Review +/- Ongoing Management		
SPT Family		
Clinician Moderated Web-based Psychological Interventions	Commonwealth	Add new line for CCL - Rural Therapy Liaison delivered by an RN modelled at 10% of activity time to same population. AND Add new line for CCL - Rural Therapy Liaison by VQ modelled at 10% of activity time to same population.
Structured Psychological Therapies		

Community support sector services

Context

A number of key issues for the community support sector exist in rural and remote areas including:[66,67]

- Need for higher overhead costs;
- Need for flexible funding;
- Need for longer term contracts;
- Need for improved service coordination and integration across sectors; and
- Need to avoid duplication or over servicing.

These issues are mostly focussed on implementation factors, which are outside of the scope of the NMHSPF. However, higher levels of resourcing have been included in the rural NMHSPF model to reflect the greater needs for family support amongst rural and remote populations and to help support the financial stability of rural community support sector services.

Modelling adjustments

Additional time for family support

The base NMHSPF model includes a range of family and carer support services provided by peer workers and by vocationally qualified staff working as part of a team in the community support sector. As described for state-funded services and primary care, there is a need for additional family

[66] NMHSPF Rural and Remote Expert Panel (2018-19)
[67] Senate Community Affairs Committee Secretariat. (2018). *Accessibility and quality of mental health services in rural and remote Australia.* Canberra: Commonwealth of Australia.

support in rural and remote communities. This increased support has been modelled as a 20% increase on the duration modelled for relevant activities in the base NMHSPF model.

The service elements affected by this increased demand include:

- Family Support Services
- Individual & Group Carer Support
- Flexible Respite
- Individual Peer Work (Consumer and Carer)

Increased overhead costs

Additional funding has been modelled for community support sector services in rural areas due to the increased costs associated with rural and remote service delivery. This funding should be provided in flexible ways in order to meet the variable demands seen in rural and remote areas. The overhead costs modelled for these services has been increased by 50%. These increases are reflected in the team staffing profiles in the rural NMHSPF model.

Flexible Funding Pool

The base NMHSPF model allows for the establishment of a Flexible Funding Pool, which enables services to respond to the population's needs in a more coordination, responsive and timely way. The expert panel suggested the use of the Flexible Funding Pool in the rural NMHSPF model as a means of increasing the total funding supplied to community support sector services by 10%. Note this is additional to the 50% increase in overhead costs.

Implementation

The application of the modelling adjustments for rural community support sector services is highlighted in **Table 58**.

Table 58. Application of modelling adjustments to community support sector services

Service elements		Rule/modification
IF any of the following service elements appear…	*AND are funded by…*	*THEN…*
Individual Peer Work	Commonwealth & State OR Non-MH	Increase activity time by 20%.
Individual Carer Peer Work		
Individual Carer Support Services		
Group Carer Support Services		
Family Support Services		
Flexible respite		
Flexible funding pool	N/A	Increase total funding supplied to community support sector services by 10% provided as a line item labelled Flexible funding pool.

Implementation notes

Intersection with Aboriginal and Torres Strait Islander NMHSPF model

This work has been carried out alongside the development of an urban Aboriginal and Torres Strait Islander NMHSPF model. In the case of a population being both Aboriginal and Torres Strait Islander and residing in a rural or remote location, the modifications based on residing in a rural or remote area are applied first, and the modifications for Aboriginal and Torres Strait Islander populations are applied to the new baseline set by the rural NMHSPF model.

Salary costs

Initially an adjustment to salary costs for workforce in rural areas was flagged for inclusion in the rural NMHSPF model, however the expert panel advised that as each jurisdiction operates under different arrangements, it would be most reasonable to not modify the standard salary reference tables. Adjustments can be made by users in order to reflect the various arrangements by jurisdiction.

Very remote areas

Although populations in very remote areas are in scope for the rural NMHSPF model, specific modelling for very remote areas was not undertaken. The expert panel advised that the delivery of services to small populations in very remote locations is inherently complicated and unique, tailored responses are often required. Adjustments can be made by users in order to locally adapt outputs of the model to suit local circumstances in very remote areas.

Outstanding issues

A number of areas were highlighted as being important by the expert panel for inclusion in the rural NMHSPF model, but were unable to be included. Firstly, there was a desire to include transport costs for aeromedical retrievals of individuals in mental health crisis who cannot be safely managed by the services available in their rural area. However, data to suggest the quantum of resource to model this inclusion were not available.

Additionally, the expert panel highlighted the need to consider the specific needs of children, adolescents, youth and older adults in rural and remote areas. Although these populations do receive the adjustments included in the rural NMHSPF model, this model is based on a general adult population and does not reflect any possible differences in demand for services or service delivery models for these specific age groups.

APPENDIX 15 – MODELLING FOR ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES

Background

Differences in the prevalence of mental illness and the types of interventions required by Aboriginal and Torres Strait Islander Peoples mean the resource estimates produced by the base NMHSPF model are less reliable in regions of Australia where the population includes significant proportions of Aboriginal or Torres Strait Islander Peoples. This appendix summarises the enhancements which have been made to the NMHSPF to better reflect the needs of Aboriginal or Torres Strait Islander Peoples. These enhancements will henceforth be referred to as the urban Aboriginal and Torres Strait Islander NMHSPF model.

Methods

Between April 2018 and March 2019, work was undertaken by the University of Queensland to enhance the base NMHSPF model to better reflect the needs of Aboriginal and Torres Strait Islander Peoples. This work focused on identifying key areas of difference between the mental health service requirements of the general population and those for delivering culturally appropriate mental health care to Aboriginal and Torres Strait Islander Peoples and translating these into elements that could be incorporated within the architecture and processes of the NMHSPF.

The NMHSPF describes the resources required to provide a comprehensive mental health service system for a given population across the spectrum from whole of population mental health promotion activities to intensive interventions for people with severe and persistent mental illness. However, the current revisions have been limited to considering the specific interventions modelled for individuals who are experiencing mental health problems or mental illness to address their mental health treatment and support needs.

Information to support revisions to the NMHSPF was drawn from a review of the available literature and data sources, as well as expert advice.[68] A review was conducted of published literature relating to the prevalence of mental illness and mental health problems in Aboriginal and Torres Strait Islander populations; service needs and models of care; and other issues impacting on delivery of mental health services to Aboriginal and Torres Strait Islander Peoples. A series of four meetings were conducted with a panel of experts in the delivery of mental health care to Aboriginal and Torres Strait Islander Peoples, including service providers from Aboriginal Community Controlled services, public mental health services and an Aboriginal consumer. Additional consultation processes were conducted to gain input from Torres Strait Islander people and urban Aboriginal and Torres Strait Islander population stakeholders.

The focus of expert panel discussion was on identifying key areas of difference between Aboriginal and Torres Strait Islander Peoples' mental health needs and the services or interventions required to address these needs, including identifying examples of best practice, desirable service models, and

[68] Page IS, Leitch E, Gossip K, Charlson F, Comben C, Diminic S. (2022). Modelling mental health service needs of Aboriginal and Torres Strait Islander peoples: a review of existing evidence and expert consensus. Australian and New Zealand Journal of Public Health, 46(2), 177-185. https://doi.org/10.1111/1753-6405.13202

related data sources. This information was used to define ways in which modelling within the base NMHSPF model (based on national average population requirements) should be modified using the existing modelling components of the NMHSPF (i.e. workforce types, service elements and staffing profiles).

There was a high degree of consistency in the views expressed by the individual expert panel members, and the recommendations of the expert panel were widely supported within supplementary consultations. The modelling enhancements developed through this process are outlined in the following sections.

Two key principles, developed in consultation with the expert panel, underpinned these enhancements:

1. The aim of the urban Aboriginal and Torres Strait Islander NMHSPF model is not to make up for existing gaps in service availability, but rather to focus on modelling what a good service for Aboriginal and Torres Strait Islander Peoples would require.
2. Aboriginal and Torres Strait Islander Peoples will require the interventions modelled in the base NMHSPF model, plus the new enhancements – there should be no deductions made from the interventions and resource requirements identified in the base modelling.

See **Table 59** for a summary of modelling rules.

Aboriginal and Torres Strait Islander workforce

The expert panel highlighted the importance of appropriate workforce for delivery of services to Aboriginal and Torres Strait Islander Peoples. Service modelling must include Aboriginal and Torres Strait Islander workers and provide culturally safe environments. A lack of cultural understanding in mental health service staff and processes which do not reflect cultural difference significantly impede access, contribute to communication challenges and negatively impact on engagement with treatment for Aboriginal and Torres Strait Islander Peoples. The availability of Aboriginal and Torres Strait Islander staff within mental health services is critically important in improving access and cultural safety for Aboriginal and Torres Strait Islander Peoples, facilitating engagement with community and fulfilling particular roles that require specific cultural knowledge.

In response, three Aboriginal and Torres Strait Islander specified workforce categories have been included within the NMHSPF:

- Aboriginal and/or Torres Strait Islander clinician within the Tertiary Qualified workforce category
- Aboriginal and/or Torres Strait Islander worker within the Vocationally Qualified workforce category
- Aboriginal and/or Torres Strait Islander peer worker (consumer and carer) within the Peer workforce category.

These workforce types should be available in primary care settings, such as Aboriginal Community Controlled Health Services, and in public sector community and inpatient mental health services, both as individual practitioners and within teams. Both NSW and WA have workforce strategies

targeting the development and recognition of degree-qualified Aboriginal mental health practitioners, and a range of vocationally qualified roles have been established in other states.[69]

Although specific Aboriginal and Torres Strait Islander workforce and roles are included within the NMHSPF, it is important to note there are two caveats to this. Firstly, there must be capacity for individual consumer choice, as not all Aboriginal or Torres Strait Islander Peoples may prefer to be seen by these workforce types when available. Secondly, while the availability of Aboriginal and Torres Strait Islander workers has been shown to improve health service access and outcomes for Aboriginal and Torres Strait Islanders, it should not be assumed that these are the only staff who should be responsible for providing care to an Aboriginal or Torres Strait Islander person. Cultural awareness and understanding of local community beliefs and customs should be a core competency of all mental health service staff and a requirement for delivery of culturally appropriate treatment by mental health services.

Peer workforce

While the value of lived experience is increasingly being recognised in mental health services, the expert panel noted that hierarchies have developed within the peer workforce which focus on formal qualifications and act as a barrier to the participation of Aboriginal and Torres Strait Islander Peoples as peer workers. The expert panel believed that there are currently few (if any) Aboriginal and Torres Strait Islander Peoples employed in mental health services across Australia on the basis of their lived experience. It was recommended that a broader understanding of lived experience be applied to Aboriginal and Torres Strait Islander peer workers which valued the specific experience of mental health problems within the context of local cultural beliefs and practices, rather than formal qualifications.

Workforce targets

It was acknowledged that in an ideal world, Aboriginal and Torres Strait Islander Peoples would constitute a proportion of all workforce types across the mental health workforce commensurate with the overall population profile. However in the context of the current low rates of representation of Aboriginal and Torres Strait Islander Peoples in the health workforce, specifying a workforce target is seen as necessary to provide a standard against which to measure progress and drive sustained workforce development. Currently recognised targets suggested by panel members were:

- One Aboriginal and/or Torres Strait Islander practitioner per 400 Indigenous population identified in the Ways Forward Report as a goal across all sectors;[70]
- One Aboriginal and/or Torres Strait Islander practitioner per 1000 Indigenous population for the NSW public mental health sector.

Based on these targets and discussion with the expert panel, an Aboriginal and Torres Strait Islander mental health workforce target within the range of 1 practitioner per 500 Indigenous population (staffing for all sectors) to 1 practitioner per 1000 Indigenous population (public sector staffing only)

[69] NMHSPF Aboriginal and Torres Strait Islander Expert Panel (2018-19)
[70] Commonwealth of Australia. Ways Forward: National Aboriginal and Torres Strait Islander Mental Health Policy National Consultancy Report. Canberra: Australian Government; 1995.

should be established as a standard against which the total new workforce identified in the NMHSPF could be evaluated.[71]

Recognising cultural practices and perspectives

In providing culturally appropriate care, mental health service systems should recognise and respect cultural perspectives on mental illness and incorporate access to traditional cultural practices that support Aboriginal and Torres Strait Islander Peoples' understanding of spiritual and cultural aspects of mental illness and social emotional wellbeing. Traditional healers and elders are key members of Aboriginal and Torres Strait Islander communities who are recognised as having knowledge and expertise in applying traditional practices. The Western Australia Mental Health Act recognises the role of elders and traditional healers and provides for their inclusion in processes of assessment and treatment of people with mental illness who are receiving care under the provisions of that legislation.

To reflect these needs, cultural consultation is included within the NMSHPF taxonomy as a service element and included in modelling as a top-up allocation to services for Aboriginal and Torres Strait Islander populations to ensure that there are adequate resources are identified for engagement of cultural consultants where required.

Involving family and community in care

The significant role of family and community must be recognised in all aspects of care. Individualised approaches to mental health treatment are considered inappropriate for Aboriginal and Torres Strait Islander Peoples and emphasis must be placed on understanding the individual and illness in the context of family and community, culture, relationships and responsibilities. Aboriginal and Torres Strait Islander family structures are different from those of the non-Indigenous community and have particular needs in terms of involvement in care.

Active engagement of families should be a core component of all aspects and phases of treatment. For people with severe disorders, engagement with the family is often a key mechanism for connecting with the consumer and facilitating access to assessment, as well as negotiating engagement with aspects of treatment such as admission to inpatient care or relapse prevention. Family involvement is especially important in contexts where coercive treatment is required, such as involuntary treatment or detention in secure environments.

In order to increase capacity for services to involve carer, families and community in the care of an Aboriginal or Torres Strait Islander individual, the following modelling adjustments have been included in the urban Aboriginal and Torres Strait Islander NMHSPF model:

1. Increases to the level of resourcing identified for Care Coordination and Liaison activities, through which families and carers participate in the planning and delivery of care.
2. Doubling of resourcing included in the base NMHSPF model to interventions which target the needs of the family, through family and carer support.

[71] NMHSPF Aboriginal and Torres Strait Islander Expert Panel (2018-19)

Care coordination and liaison

Having a person-centered approach and ensuring linkages across multiple agencies involved in caring for an individual or family is critically important for Aboriginal and Torres Strait Islander Peoples. Data shows that Aboriginal and Torres Strait Islander Peoples have higher rates of physical illness, chronic disease, injury and substance use; higher rates of disability than the Australian average; and higher rates of social disadvantage and engagement with agencies such child protection or the justice system.[72] Care coordination is a key component of providing culturally appropriate care for Aboriginal and Torres Strait Islander Peoples, due to the increased need to actively engage with family and community in all aspects of care and to coordinate services across multiple agencies in providing comprehensive treatment responses for people with potentially complex health and social issues.

For these reasons, the resources allocated for care coordination and liaison in the urban Aboriginal and Torres Strait Islander NMHSPF model are double what is included in the base NMHSPF model. Delivery of care coordination and liaison is a key role for the specified Aboriginal and Torres Strait Islander workers.

Family and carer support

Enhancement is also required of support for Aboriginal and Torres Strait Islander carers due to the different age profile and kinship arrangements operating within Aboriginal and Torres Strait Islander communities. Extensive kinship networks and associated obligations within Aboriginal and Torres Strait Islander communities may result in carers supporting multiple family members and others with significant mental health needs. In addition, the expert panel advised that in many communities there are often lower numbers of older people which means the caring roles sometimes fall on younger family members.

Allocations of service elements relevant to carer support within the base NMHSPF model have been increased for Aboriginal and Torres Strait Islander Peoples by doubling the modelled resources for the service elements Family Support Services, Carer Peer Support and Structured Psychological Therapy (Family) within care profiles for the urban Aboriginal and/or Torres Strait Islander NMHSPF model. Family and carer support services have also been added to a wider range of care profiles to ensure these elements are modelled in all care profiles for Aboriginal and Torres Strait Islander Peoples with moderate and severe level disorders.

Tailoring services to meet the particular needs of Aboriginal and Torres Strait Islander peoples

Expert advice highlighted that in some areas, different approaches and strategies will be required for the delivery of culturally appropriate services to Aboriginal and Torres Strait Islander Peoples than what is included within the base NMHSPF model. These include providing additional time to establish rapport and build trust, engaging with complex network relationships, understanding cultural and community influences on wellbeing, and adopting holistic approaches to dealing with mental health needs including addressing comorbidities and interactions between mental health and

[72] Australian Institute of Health and Welfare. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2015. Canberra: AIHW; 2015.

social factors. The importance of connection to country was also raised as a factor in low rates of access to residential services and which impacts where services are delivered.

People with behavioural and psychological symptoms of dementia

Expert advice identified the need to model services for Aboriginal and Torres Strait Islander Peoples with behavioural and psychological symptoms of dementia (BPSD) at an earlier age threshold (55 years) due to evidence of higher rates of dementia at younger ages for Aboriginal and Torres Strait Islander Peoples (note: in the base model they are considered for ages 65+ years).[73] Caring for people with BPSD is particularly difficult for Aboriginal and Torres Strait Islander communities due to a range of factors including the high rates of physical health comorbidity and potentially a reduced availability and capacity of carers. It was noted that mental health workers can play an integral role in educating families and others regarding appropriate treatment and support for people with BPSD. Transport was also identified as a significant barrier to delivering culturally appropriate care for Aboriginal and Torres Strait Islander people with BPSD. This is particularly important where residential care is required in a location removed from family, such that transport is essential in maintaining contact with community and return to country, aspects of care which are considered crucial for older Aboriginal and Torres Strait Islander peoples with BPSD.

Therefore, the urban Aboriginal and Torres Strait Islander NMHSPF model estimates demand levels for services for people with BPSD and calculates resources based on a population age threshold of 55 years instead of 65 years as used in the base NMHSPF model.

Resources for assessment

A review of the resources allocated for assessment in the base NMHSPF model indicated that modelling of this service element is not appropriate for Aboriginal and Torres Strait Islander Peoples. The panel described the process of gaining trust and establishing rapport as very important when engaging Aboriginal and Torres Strait Islander Peoples and requiring substantially more time than what is modelled within the base NMHSPF model. Cultural and language issues may be significant barriers requiring additional time to assess and overcome. Assessment requires understanding of the cultural context of the individual and behaviour, such that clinicians need adequate time to be able to develop understanding of local people, relationships and community to be able to provide a culturally appropriate service to the individual.

Evidence of increased time required for assessment of Aboriginal and Torres Strait Islander Peoples was drawn from the Medical Benefits Schedule (MBS) of item numbers and rebate levels. Items specifically identified for assessment of health status of Aboriginal and Torres Strait Islander peoples by general practitioners are rebated at higher rates, indicating a higher time commitment required, and can be repeated at more frequent intervals than the equivalent items for the general patient population.[74]

For the urban Aboriginal and Torres Strait Islander NMHSPF model assessment allocations that are specifically identified in care profiles have been enhanced to provide longer and more frequent assessment sessions. As assessment is also incorporated within team functions in care profiles at

[73] Li SQ, Guthridge SL, Eswara Aratchige P, Lowe MP, Wang Z, Zhao Y, et al. Dementia prevalence and incidence among the Indigenous and non-Indigenous populations of the Northern Territory. Medical Journal of Australia. 2014;200(8):465-9.
[74] NMHSPF Aboriginal and Torres Strait Islander Expert Panel (2018-19).

higher levels of severity, resourcing of relevant teams have also been increased. The increase applies to state funded services delivered by clinical community treatment teams to provide capacity to deliver culturally appropriate assessment. The modelling adjustment consists of supplementing the clinical community treatment team staffing with additional Aboriginal and Torres Strait Islander resources equivalent to 30% of the total hours of client demand hours originally modelled. Relevant teams are the Clinical Community Treatment Teams (all ages), Acute Care Services, and Consultation-Liaison - Emergency Department.

Aboriginal and Torres Strait Islander staff in inpatient settings

Currently, Aboriginal and Torres Strait Islander Peoples have significantly higher rates of admission to inpatient treatment (147.5 per 10,000) than non-Indigenous Australians (64.4 per 10,000), based on separations from overnight admitted patient specialised mental health care (2016-17).[75] The panel advised that data on patterns of utilisation of inpatient care in WA show evidence of reduced episodes of care and lengths of stay for Aboriginal people since the introduction of the Specialised Aboriginal Mental Health Service, which provides in-reach cultural support to Aboriginal people admitted to public inpatient care.[76] To account for this, for any given catchment, additional staffing has been modelled for all bed-based services of one Aboriginal and Torres Strait Islander position per 1500 occupied bed days predicted for Aboriginal and Torres Strait Islander Peoples.

Primary mental health teams

The base NMHSPF models services for people with mild and moderate mental health problems as being delivered within standard private sector primary health services settings. In contrast, it was identified that Aboriginal Community Controlled Health Organisations (ACCHOs) provide culturally appropriate primary mental health care and have flexible staffing and funding arrangements which provide capacity to provide a holistic, comprehensive primary care approach. This includes providing multidisciplinary interventions and more pro-active engagement of health workers with the local community. This approach includes encouraging participation in health checks and screening services; providing early advice on health issues and treatment options; and identifying and facilitating access to care for those with mental health problems. It was noted that in assigning roles only to medical and tertiary qualified workforce categories, the base NMHSPF model does not reflect the significant role taken by Aboriginal Health Workers and Social and Emotional Wellbeing Workers in assessment, treatment and monitoring of people with mental health problems, or in the broader cultural assessment that occurs in collaboration with assessments by non-Indigenous staff.

As approximately 50% of Aboriginal and Torres Strait Islander Peoples utilise community-controlled health services for primary care,[77] it was recommended that a team approach be modelled for up to 50% of the services likely to be delivered in a primary health setting for Aboriginal and Torres Strait Islander peoples. A primary clinical team staffing profile was therefore developed to include tertiary qualified, vocationally qualified and peer Aboriginal and Torres Strait Islander staff, and used to replace 50% of the existing and enhanced assessment items to be delivered by GP and Tertiary

[75] Australian Institute of Health and Welfare. Mental health services in Australia 2018 [updated 22 March 2019. Available from: https://www.aihw.gov.au/reports/mental-health-services/mental-health-services-in-australia/data#page2.
[76] NMHSPF Aboriginal and Torres Strait Islander Expert Panel (2018-19).
[77] Panaretto KS, Wenitong M, Button S, Ring IT. Aboriginal community controlled health services: leading the way in primary care. Medical Journal of Australia. 2014;200(11):649-52.

Qualified workforce types in primary care settings. This change has the effect of introducing Vocationally Qualified Aboriginal and Torres Strait Islander mental health workers and peer workers into the mix of services that are likely to be funded by the Commonwealth and delivered through the primary care and private sectors. This model is consistent with currently available funding both through the MBS, which includes rebates for services delivered by Aboriginal and Torres Strait Islander health workers, and other funding streams to ACCHOs through direct government grants and Primary Health Network (PHN) commissioning which could support employment of these workers.

Particular needs of children and adolescents

The expert panel highlighted that as more than 50% of the Aboriginal and Torres Strait Islander population are currently aged under 21 years, the needs of this target group are particularly important and potentially more urgent and different from the base NMHSPF model than that of older Aboriginal and Torres Strait Islander Peoples. It is also important to have appropriate mental health care during the perinatal and early childhood periods to support young parents and their infants and children.

Experts advised that mental health problems are not always recognised in Aboriginal and Torres Strait Islander children, as schools are frequently unable to determine what is a mental health problem versus a behavioural problem. Rigid exclusion policies are often enacted which act against the interests of the child and reduce opportunities for positive intervention. Aboriginal and Torres Strait Islander children have high levels of school drop-out and there is currently no mechanism for accessing those who have disengaged from the education system. Disengagement from school is frequently associated with interaction with police, such that indicated prevention is very important to help divert people away from juvenile justice system. Aboriginal and Torres Strait Islander youth also have low levels of engagement with youth mental health services (e.g. headspace), but high rates in general youth services (e.g. YETI in Far North Queensland).

The expert panel flagged that modelling needs to include more flexible pathways and mechanisms for identifying and engaging young Aboriginal and Torres Strait Islander Peoples in care and recognising the importance of peer networks and support for Aboriginal and Torres Strait Islander children and youth. The base NMSHPF modelling of interventions for children and youth with mild and moderate disorders is very individualised, which the panel advised is not appropriate for Aboriginal and Torres Strait Islander young people. It was suggested that more group-based options should be considered, potentially facilitated by youth workers to foster peer engagement and peer networks.

It is proposed that a more intensive review of the needs of Aboriginal and Torres Strait Islander children and adolescents should be conducted. Advice should be sought from people with specific expertise regarding the mental health needs of Aboriginal and Torres Strait Islander children and young people. Until more specialised advice can be obtained, the general enhancements outlined previously have been extended to all age groups, including children and adolescents. This will provide substantial increases in the resources modelled as required for Aboriginal and Torres Strait Islander children and adolescents.

Revising estimates of mental health need and demand

Aboriginal and Torres Strait Islander populations have disproportionately higher burdens of mental illness compared to non-Indigenous populations.[78] Additionally, in Australia, Aboriginal and Torres Strait Islander populations have significantly higher rates of suicide,[79] incarceration,[80,81] and they are 14 times more likely to be homeless compared to non-Indigenous Australians.[82,83] Aboriginal and Torres Strait Islander populations are more than twice as likely as non-Indigenous Australians to be hospitalised for mental and substance use disorders.[84] Even though these indicators signal the need for improved planning and service provision for mental disorders, there is surprisingly little data available on community prevalence of mental disorders in Aboriginal and Torres Strait Islander populations. See **Appendix 4** for further detail on modelling adjustments made to account for the higher level of population mental health service need for Aboriginal and Torres Strait Islander populations.

[78] King M, Smith A, Gracey M. Indigenous health part 2: the underlying causes of the health gap. Lancet. 2009; 374:76-85.
[79] Australian Institute of Health and Welfare. Australia's Health, 2014. Canberra: AIHW; 2014
[80] Australian Bureau of Statistics. Prisoners in Australia - 2012. Canberra: ABS; 2012.
[81] Australian Institute of Health and Welfare. The health of Australia's prisoners - 2012. Canberra: AIHW; 2013.
[82] Australian Bureau of Statistics. Census of Population and Housing: estimating homelessness, 2011. Canberra: ABS; 2012.
[83] Australian Bureau of Statistics. Census of Population and Housing: characteristics of Aboriginal and Torres Strait Islander Australians, 2011. Canberra: ABS; 2012.
[84] Australian Institute of Health and Welfare, *Australia's Health*, 2014. 2014, AIHW: Canberra.

This table outlines the rules for modifying the existing NMHSPF-PST to include enhancements for Aboriginal and Torres Strait Islander Peoples. The rules for modifying existing service elements found in the base NMHSPF model are listed in the table below. In some cases the expert panel believed that certain care profiles needed the addition of service elements not currently modelled. These additions are also summarised in the table below.

Table 59. Modelling rules for Aboriginal and Torres Strait Islander enhancements

If population is Aboriginal and Torres Strait Islander, the following changes apply:

Category	Relevant existing service element(s) and activities	Funder	Rule/modifications	New service element(s)/ staffing profiles/ workforce types
Epidemiology				
Epidemiology adjustment			Increase existing epidemiology (overall prevalence estimates) by 2.5x. Adjust non-Indigenous prevalence estimates accordingly.	
Assessments				
Assessment	Brief Mental Health Assessment	State/CW OR Non-MH	Whenever any of the relevant service elements appear increase activity duration by 15mins and increase frequency by 1.25x. Allocate half of population percent receiving commonwealth funded assessments provided by GP – Medical or Tertiary Qualified staff to Aboriginal and Torres Strait Islander primary team staffing profile (note exceptions for 65+ and 65+BPSD). Note: TQ neuropsychologist in 65+ age group not allocated to primary team due to specialised nature of intervention required. GP- Medical for 65+ BPSD not allocated to primary team due to significant cognitive and physical health intervention components.	Aboriginal and Torres Strait Islander primary team staffing profile.
	Comprehensive Mental Health Assessment	State/CW OR Non-MH		

Care Coordination and Liaison				
Care Coordination and Liaison	Care Coordination and Liaison	State/CW	Whenever any of the relevant service elements appear duplicate existing resource allocation. Where existing staff allocation is Tertiary Qualified, allocate this enhancement to Aboriginal and/or Torres Strait Islander vocationally qualified worker (Indigenous specific role). Add care coordination and liaison to all SEV and MOD_B care profiles where not currently modelled across all age groups – see age specific spreadsheets (note: where CCL is delivered by a team this has been enhanced elsewhere and an addition is not required)	Aboriginal and/or Torres Strait Islander vocationally qualified worker.
Consultation liaison	Consultation Liaison – General (Hospital)	State	Whenever any of the relevant service elements appear duplicate existing resource allocation and allocate this enhancement to Aboriginal and/or Torres Strait Islander vocationally qualified worker (Indigenous specific role).	
	Consultation Liaison – Emergency Department (Hospital)	State		
Family and carer support				
Family and carer support	Individual Carer Support Services	CW & St	Whenever any of the relevant service elements appear duplicate existing resource allocation. Add family and carer support elements to MOD and SEV_AMB care profiles where not currently modelled across all age groups – see age specific spreadsheets.	
	Individual Carer Peer Work	CW & St		
	SPT Extended Intervention - Family	State/CW		
	Family Support Services	CW & St		

Teams				
State Community Teams	Acute Care Services	State	Whenever any of the relevant service elements appear increase hours of client demand by 30% on top of existing level. Allocate the additional hours to Aboriginal and Torres Strait Islander specialist team staffing profile (TQ and VQ positions in this team are Indigenous specific roles).	Aboriginal and Torres Strait Islander specialist team staffing profile.
	Clinical Community Treatment Team - C&A - 0-17 years	State		
	Clinical Community Treatment Team - Adult - 18-64 years	State		
	Clinical Community Treatment Team - Older Adult 65+ years	State		
Other Primary team functions	Centre Based Monitoring & Ongoing Management	CW	Whenever any of the relevant service elements appear allocate half of resourcing to Aboriginal and Torres Strait Islander primary team staffing profile (TQ and VQ positions in this team are Indigenous specific roles).	Aboriginal and Torres Strait Islander primary team staffing profile
	Monitoring & Ongoing Management	CW		
Inpatient				
			Add 1 Aboriginal and/or Torres Strait Islander specific FTE (50% TQ, 50% VQ) per 1500 bed days occupied by an Aboriginal and/or Torres Strait Islander person.	Aboriginal and/or Torres Strait Islander vocationally qualified worker. Aboriginal and/or Torres Strait Islander tertiary qualified worker.

Application of enhancements in planning

The modifications outlined in this document have been modelled so that they can be added to the base NMHSPF model. Resource estimates including these modifications are derived according to the size of the Aboriginal and Torres Strait Islander population within the target group for a given catchment (see **Figure 7**).

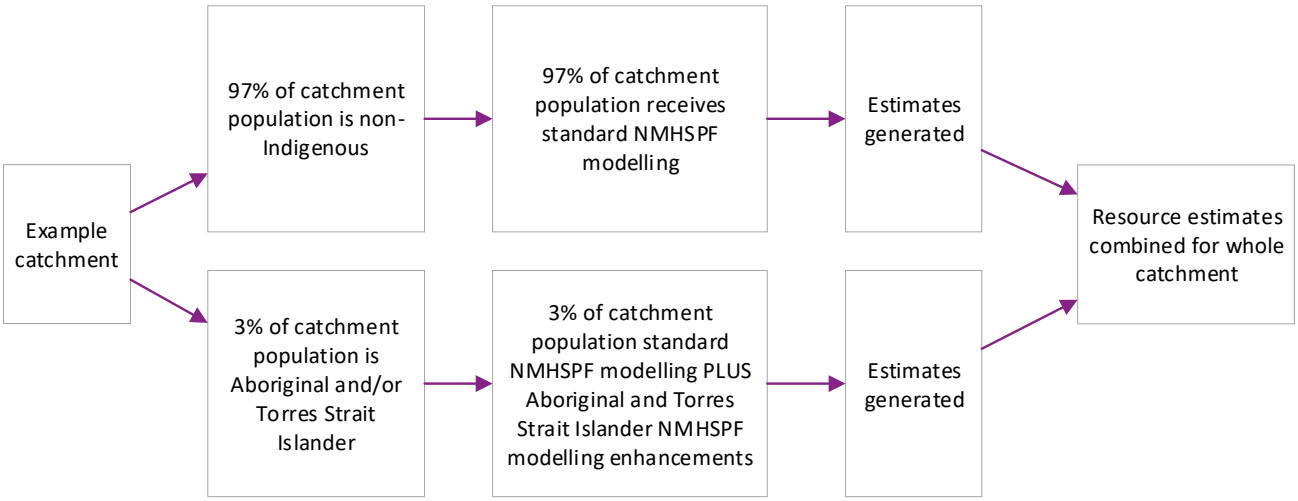


Figure 7. Application of Aboriginal and Torres Strait Islander population modifications to the base NMHSPF model

By splitting the catchment population into Aboriginal and Torres Strait Islander Peoples versus non-Indigenous populations, the base NMHSPF modelling is applied to the proportion of the population who are not Aboriginal and Torres Strait Islander. However, as the Aboriginal and Torres Strait Islander population had nominally been included in the original estimation of national average prevalence and service needs, consideration was given to whether deductions should be made from the national average model to adjust for the removal of the Aboriginal and Torres Strait Islander population. It was decided that no such deduction should be made based on the small size of the Aboriginal and Torres Strait Islander population (less than 4% of the national population). In addition, it was acknowledged that Aboriginal and Torres Strait Islander Peoples' needs were likely to have been be underrepresented in the original NMHSPF modelling due to low rates of participation in the household surveys which had informed the epidemiological analysis underpinning the national average model.

Intersection with rural and remote modelling

This work has been carried out alongside the development of rural and remote modelling for the NMHSPF. In the case of a population being both Aboriginal and Torres Strait Islander and residing in a rural or remote location, the modifications based on residing in a rural or remote area are applied first, and the modifications for Aboriginal and Torres Strait Islander populations are applied to the new baseline set by the rural and remote modifications. See Introduction to the NMHSPF document for detail of the overall NMHSPF model structure.

Future work

This work constitutes the first stage of development of modifications to the NMHSPF to better reflect the needs of Aboriginal and Torres Strait Islander peoples. A number of areas have been identified as requiring further research and modelling work to continue the development of a more comprehensive model of services required to meet the mental health needs of Aboriginal and Torres Strait Islander peoples. Areas requiring review include:

- Improved modelling of services for Aboriginal and Torres Strait Islander children, adolescents and youth as previously discussed;
- Promotion and prevention initiatives to identify appropriate community-level interventions which build resilience and social emotional wellbeing, and targeted suicide prevention strategies for Aboriginal and Torres Strait Islander communities;
- Aboriginal and Torres Strait Islander Peoples in the justice and corrective services systems; and
- Modelling integrated responses for mental health and alcohol and other drug misuse as rates of comorbidity are particularly high for Aboriginal and Torres Strait Islander Peoples.