

# CHAPTER 2: METHOD

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## 2.1 EVALUATION QUESTIONS

Component B is designed address seven evaluation questions relating to the uptake of services through the *Better Access* initiative:

- **Question 1:** To what extent has the *Better Access* initiative provided access to mental health care for people with mental disorders? Across all of Australia? Across all age groups?
- **Question 2:** To what extent has the *Better Access* initiative provided access to affordable care?
- **Question 3:** To what extent has the *Better Access* initiative provided equitable access to populations in need? (in particular people living in rural and remote areas, children and young people, older persons, Indigenous Australians, people from culturally and linguistically diverse backgrounds)
- **Question 4:** To what extent has the *Better Access* initiative provided evidence-based mental health care to people with mental disorders?
- **Question 5:** To what extent has the *Better Access* initiative provided interdisciplinary primary mental health care for people with mental disorders?
- **Question 6:** To what extent has the *Better Access* initiative impacted on the use of medications commonly prescribed for treatment of mental disorders, in particular antidepressant medications?
- **Question 7:** To what extent has the *Better Access* initiative impacted on related MBS services?

Questions 1 to 5 relate to the uptake of the *Better Access* item numbers during the first three years of their introduction. Questions 6 and 7 consider the two years prior to introduction of *Better Access* and two to three years following (depending on data availability).

## 2.2 DATA SOURCES

The data used in the Component B evaluation has been obtained from multiple sources. The contribution of each source to addressing the seven evaluation questions is shown in Table 2.1.<sup>b</sup>

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<sup>b</sup> It was originally planned that Evaluation Question 7 would also be informed by data from the Community Mental Health Care National Minimum dataset, which would be used to describe rates of use of public sector community mental health services. Unfortunately, it was not possible to obtain these data.

**Table 2.1** Relationship between the evaluation questions and key data sources

	Medicare Benefits Schedule data	Pharmaceutical Benefits Scheme data	Australian Bureau of Statistics Census data	Access to Allied Psychological Services projects' minimum dataset	2007 National Survey of Mental Health and Wellbeing
Question 1: To what extent has the <i>Better Access</i> initiative provided access to mental health care for people with mental disorders? Across all of Australia? Across all age groups?	✓		✓		
Question 2: To what extent has the <i>Better Access</i> initiative provided access to affordable care?	✓		✓		
Question 3: To what extent has the <i>Better Access</i> initiative provided equitable access to populations in need? (in particular people living in rural and remote areas, children and young people, older persons, Indigenous Australians, people from culturally and linguistically diverse backgrounds.	✓		✓		✓
Question 4: To what extent has the <i>Better Access</i> initiative provided evidence-based mental health care to people with mental disorders?	✓		✓		
Question 5: To what extent has the <i>Better Access</i> initiative provided interdisciplinary primary mental health care for people with mental disorders?	✓		✓		
Question 6: To what extent has the <i>Better Access</i> initiative impacted on the use of medications commonly prescribed for treatment of mental disorders, in particular antidepressant medications?	✓	✓	✓		
Question 7: To what extent has the <i>Better Access</i> initiative impacted on related MBS (and other) services?	✓		✓	✓	✓

The remainder of this chapter gives a brief description of the data sources used and the statistical methods employed in their analysis.

## 2.2.1 MEDICARE BENEFITS SCHEDULE DATA

### SCOPE OF DATA

Data on the activity of all providers making claims through the Medicare Benefits Schedule (MBS) is collected by Medicare Australia. The MBS items used in this report included the 29 *Better Access* MBS items plus 66 'other mental health' MBS items. The Data Analysis & Program Evaluation, Workforce Development Branch, Mental Health & Workforce Division of the Department of Health and Ageing provided a spreadsheet identifying all mental health MBS items as at 4 August 2008. One additional *Better Access* item was subsequently added – item 2702 (GP Mental Health Treatment Plan by a general practitioner who has not undertaken mental health skills training), which was introduced in January 2010. A summary of the mental health MBS items is provided in Table 2.2.

**Table 2.2** Mental health MBS items used in this report

<b>Program</b>	<b>Item group</b>	<b>MBS item numbers</b>
Better Outcomes in Mental Health Care	GP 3-Step Mental Health Care Plan (General Practice attendance) <sup>a</sup>	2574, 2575, 2577, 2578
	GP 3-Step Mental Health Care Plan (other non-referred attendance) <sup>a</sup>	2704, 2705, 2707, 2708
	GP Focussed Psychological Strategies	2721, 2723, 2725, 2727
<i>Better Access</i>	Psychiatrist	
	--Initial consultation <sup>b</sup>	296, 297, 299
	--Assessment and Management Plan <sup>b</sup>	291
	--Review of Management Plan <sup>b</sup>	293
	GP Mental Health Treatment	
	--Plan <sup>b</sup>	2710, 2702 <sup>e</sup>
	--Review <sup>b</sup>	2712
	--Consultation <sup>b</sup>	2713
	Psychological Therapy Services	
	--Clinical Psychologist <sup>b</sup>	80000, 80005, 80010, 80015, 80020
	Focussed Psychological Strategies (Allied Mental Health)	
	--Psychologist <sup>b</sup>	80100, 80105, 80110, 80115, 80120
	--Occupational Therapist <sup>b</sup>	80125, 80130, 80135, 80140, 80145
--Social Worker <sup>b</sup>	80150, 80155, 80160, 80165, 80170	
Chronic Disease Management	Community Case Conference – Psychiatrist	855, 857, 858, 861, 864, 866
Enhanced Primary Care	Enhanced Primary Care Plan	
	--Mental Health Worker	10956
	--Psychology Health Service	10968
Psychiatrist Items	Management Plan	
	--Assessment <sup>c</sup>	291
	--Review <sup>c</sup>	293
	Consultation	
	--Consulting room	300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 319
	--Hospital	320, 322, 324, 326, 328,
	--Other locations	330, 332, 334, 336, 338
	--Mixed	289 <sup>d</sup>
	Group Therapy	342, 344, 346
	Consultation with non-patient	348, 350, 352
	Telepsychiatry	353, 355, 356, 357, 358, 359 <sup>f</sup> , 361 <sup>f</sup>
	Consultation post-telepsychiatry	364, 366, 367, 369, 370
Electroconvulsive Therapy	14224	
Psychologist Items	Psychologist Consultation <sup>d</sup>	82000, 82015
Other	Family Therapy	170, 171, 172

Source: Department of Health and Ageing spreadsheet (personal communication); Adapted from AIHW (2009).<sup>18</sup>

<sup>a</sup> Item groups discontinued April 2007; <sup>b</sup> Commenced November 2006; <sup>c</sup> Commenced May 2005 and discontinued October 2006; <sup>d</sup> Commenced August 2008; <sup>e</sup> Commenced January 2010; <sup>f</sup> Commenced November 2007.

The MBS data used in this report were provided by the Medicare Financing and Analysis Branch of the Department of Health and Ageing. The data were extracted from a national dataset of all services rendered on a 'fee-for-service' basis for which Medicare benefits were paid. This dataset does not capture services provided to public patients in hospitals (where these are funded by state and territory governments), services provided through other publicly funded programs, or private services that are not subsidised by Medicare.

Data were extracted on two occasions during the course of this project. The first extraction included data for the period 1 October 2004 to 31 March 2009 and has regard to all claims processed up until April 2009. The second extraction included data for the period 1 January 2009 to 31 March 2010 and has regard to all claims processed up until April 2010. Footnotes to relevant tables have been used to denote the extraction to which data belong. Note that data provided in the first extraction were not revised in the second extraction to capture adjustments for late claims. The exception was data regarding the first quarter of calendar year 2009 which was included in both extractions, therefore the second extraction was used.

The data included counts of persons, services or benefits paid for MBS-subsidised mental health services received between 1 October 2004 and 31 March 2010. Most *Better Access* items were introduced on November 1 2006 (except 291 and 293 which were introduced on May 1 2005, and 2702 which was introduced on 1 January 2010), whereas the other mental health items included items existing prior to that date.

The data were provided in de-identified, aggregated format according to a set of specifications developed by the consultants based on the data required to address each evaluation question. Datafiles provided the relevant counts for various combinations of MBS items across various reference periods (usually quarterly or annual) in either of two formats: (1) Stratified by reference period, region, relative socio-economic disadvantage, gender and age group (0-14, 15, 16-17, 18-24, 25-34, 44-54, 55-64, 65-74, 75-74, and 85+ years); or (2) Stratified by reference period, Division of General Practice, gender and age group. Items were assigned to reference periods according to the date on which the service was provided, rather than the date on which the service claim was processed.

As most *Better Access* items were introduced on November 1 2006, counts provided for the December 2006 quarter will not contain data for most *Better Access* data items during October. The first quarter that provides complete coverage of *Better Access* uptake is the March 2007 quarter. A caveat to this effect has been included in tables that report quarterly data.

Data on services received includes: total services; total bulk-billed services; sum of fees charged; sum of benefits paid; total services for which a co-payment was paid; and sum of co-payments. For bulk-billed services the fee charged was set equal to the benefit paid.

#### METHODS USED TO DETERMINE AGE, GENDER, REGION, RELATIVE SOCIO-ECONOMIC DISADVANTAGE AND DIVISION OF GENERAL PRACTICE

Since consumers' demographic characteristics (namely, age group and address) can change during a reference period and thus result in an over-count of consumers, an 'updating' rule was applied. Date of birth, gender and patient postcode were obtained for each consumer from the last date of service record for the consumer (having regard to all mental health items) in the reference period. Age was derived as the age of the patient on the last mental health service the patient received in the reference period.

Regional data was based on the consumers' enrolment postcode and classified according to the Rural, Remote and Metropolitan Areas (RRMA) classification system.<sup>19, 20</sup> The RRMA allocates geographical areas into seven classes: Capital cities (RRMA category 1); Other metropolitan centres (2); Large rural centres (3); Small rural centres (4); Other rural centres (5); Remote centres (6); Other remote areas (7). To facilitate analysis and interpretation, RRMA categories were aggregated into five regions by combining classes 3 and 4 into 'Rural centres' and classes 6 and 7 into 'Remote areas'.

The Index of Relative Socioeconomic Disadvantage (IRSD)<sup>21</sup> was used as an area-based measure of relative socio-economic disadvantage. The IRSD is one of four Socio-Economic Indexes for Areas (SEIFA) produced by the ABS using census data. The IRSD score is calculated from socioeconomic characteristics of the residents of a locality relating to low income, low educational attainment, high unemployment, jobs in unskilled occupations, and other indicators of disadvantage such as Indigenous origin, public rental housing, and separated/divorced or single parent households. A concordance file obtained from the ABS website<sup>22</sup> was used to map consumer enrolment postcodes to IRSD quintiles, where quintile 1 = most disadvantaged localities and quintile 5 = least disadvantaged localities. Data for postcodes not represented in the ABS concordance file (e.g., PO Box postcodes) were classified as 'unknown'. In the Northern Territory, a significant number of Medicare claims are through PO Box postcodes (around 25 per cent).

Division of General Practice was based on the consumers' postcode, rather than the Division in which the provider practices. Since some enrolment postcodes overlap Division of General Practice boundaries, a concordance file<sup>23</sup> was used to allocate records to Divisions.

## 2.2.2 PHARMACEUTICAL BENEFITS SCHEME AND REPATRIATION PHARMACEUTICAL BENEFITS SCHEME DATA

### SCOPE OF DATA

Medicare Australia collects data on prescriptions funded through the Pharmaceutical Benefits Scheme (PBS) and Repatriation Pharmaceutical Benefits Scheme<sup>c</sup> (RPBS). Drugs captured by these Schemes are classified according to the Anatomical Therapeutic Classification (ATC) system developed by the World Health Organization.<sup>24,d</sup> The PBS and RPBS items used in this report included those relating to drugs in the following ATC Level 3 categories: (1) N05B Anxiolytics; and (2) N06A Antidepressants. The anxiolytic medications were Alprazolam, Bromazepam, Buspirone hydrochloride, Diazepam, Flunitrazepam, and Oxazepam. The antidepressant medications were Amitriptyline hydrochloride, Citalopram hydrobromide, Clomipramine hydrochloride, Desvenlafaxine succinate, Dothiepin hydrochloride, Doxepin hydrochloride, Duloxetine hydrochloride, Escitalopram oxalate, Fluoxetine hydrochloride, Fluvoxamine maleate, Imipramine hydrochloride, Lithium carbonate, Mianserin hydrochloride, Mirtazapine, Moclobemide, Nortriptyline hydrochloride, Paroxetine hydrochloride, Phenelzine sulfate,

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<sup>c</sup> Claims under the Repatriation Pharmaceutical Benefits Scheme (RPBS) have been included as they amount to approximately 5% of claims for mental health drugs.

<sup>d</sup> The current report uses the Schedule of Pharmaceutical Benefits version of the ATC classification system, which is slightly different from the WHO version. Notably, Lithium carbonate is classified as an Antidepressant in the PBS Schedule (rather than an Antipsychotic, as in the WHO version).

Reboxetine mesilate, Sertraline hydrochloride, Tranylcypromine sulfate, and Venlafaxine hydrochloride.

The PBS and RPBS data used in this report were provided by the Pharmaceutical Benefits Division of the Department of Health and Ageing. Data were extracted on two occasions during the course of this project. The first extraction included data for the period 1 October 2004 to 31 March 2009 and was undertaken in August 2009. The second extraction included data for the period 1 January 2009 to 31 December 2009 and was undertaken in June 2010. Footnotes to relevant tables have been used to denote the extraction to which data belong. Note that data provided in the first extraction were not revised in the second extraction to capture adjustments for late claims.

The data included counts of consumers making claims for mental health drugs subsidised by the PBS and RPBS, and the total number of prescriptions claimed, between 1 October 2004 and 31 December 2010.

The data were provided in de-identified, aggregated format according to specifications developed by the consultants based on the data required to address the relevant evaluation question. Datafiles provided the relevant counts for various combinations of mental health drug items across various reference periods (usually quarterly or annual) in the following format: stratified by reference period, Division of General Practice, contribution type (general or concessional)<sup>e</sup>, gender and age group (0-14, 15, 16-17, 18-24, 25-34, 44-54, 55-64, 65-74, 75-74, and 85+ years).

Items were aggregated into time periods according to the date on which the prescription was supplied, rather than the date of prescribing or that date on which the claim was processed. Records without a unique patient code were excluded from consumer-based analyses, but were included in prescription-based analyses.

#### METHODS USED TO DETERMINE AGE, GENDER, REGION, RELATIVE SOCIO-ECONOMIC DISADVANTAGE AND DIVISION OF GENERAL PRACTICE

Methods were the same as those described for the MBS data.

### 2.2.3 ATAPS MINIMUM DATASET

#### SCOPE OF DATA

The ATAPS minimum dataset captures routinely collected de-identified consumer-level and session-level information from the ATAPS projects that are currently being run by Divisions of General Practice under the BOiMHC program (see section 1.1 of this report for a description of BOiMHC). The dataset is managed by Strategic Data Ltd, data management subcontractors of the

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<sup>e</sup> There are 2 levels of co-payments: general (\$32.90) and concession (\$5.30) (as at January 1, 2009; <http://www.health.gov.au/internet/main/publishing.nsf/Content/health-pbs-general-pbs-co-payment.htm>). People who receive social security benefits because they hold a Pensioner card, a Health Care card or a Commonwealth Seniors Health card are eligible for the concession co-payment. Most are aged 65 and over. Military veterans covered by the RPBS pay the concession price. The PBS data do not include prescriptions where the average dispensed price is below the patient copayment.

Centre for Health Programs, Policy and Economics at the University of Melbourne as part of an ongoing evaluation exercise.

Counts of persons who had received psychological treatments under the ATAPS projects<sup>f</sup> were extracted from a consolidated datafile that captured session-level information including patient demographics (year of birth and gender) and referral characteristics (patient postcode at time of referral, GP postcode, Division of the referring GP) and date of psychological treatment session. Aggregated person counts were derived for each Division, stratified by reference period (quarterly or annual), gender and age group.

#### METHODS USED TO DETERMINE AGE, GENDER, REGION, RELATIVE SOCIO-ECONOMIC DISADVANTAGE AND DIVISION OF GENERAL PRACTICE

Age was calculated as the difference between session year and year of birth.

Geographical area classification for Divisions was sourced from the Division Benchmarking Tool developed by the Primary Health Care Research and Information Service.<sup>25</sup> The classification uses five categories based on the Rural, Remote and Metropolitan Areas (RRMA) classification. As a number of Statistical Local Areas (SLAs) contribute to each Division, allocation to the five RRMA categories takes this into account. The five categories were: (1) Metro (>95% of population in RRMA 1,2); (2) Metro/Rural (<95% of population in RRMA 1,2 & <95% in RRMA 3,4,5); (3) Rural (>95% of population in RRMA 3,4,5); (4) Rural/Remote (<95% of population in RRMA 3,4,5 & < 95% in RRMA 6,7); and (5) Remote (>95% of population in RRMA 6,7).

In the ATAPS datasets, Division of General Practice is assigned to each record according to the Division in which the referring GP practices. For consistency with other datasets in the current project a patient-based Division variable was derived from the patients' postcode, using a concordance file for mapping postcode to Division.<sup>23</sup> In instances where patient postcode was not available (approx. 9% of session records), Division was derived from the GPs postcode or Division.

#### 2.2.4 2007 NATIONAL SURVEY OF MENTAL HEALTH AND WELLBEING

The 2007 National Survey of Mental Health and Wellbeing (2007 NSMHWB) was conducted by the Australian Bureau of Statistics (ABS) between August and December 2007.<sup>26,27</sup> The 2007 NSMHWB is a nationally representative household survey of 8,841 Australians aged 16 to 85 years. Chapter 5 of this report uses a number of measures from the 2007 NSMHWB. These are described below.

The survey instrument was based on a modified version of the World Mental Health Survey Initiative version of the Composite International Diagnostic Interview (WMH-CIDI 3.0). Lifetime diagnoses of mental disorders were assessed by the WMH-CIDI 3.0 according to International Classification of Diseases (ICD-10)<sup>28</sup> criteria. Symptoms experienced during the 12 months prior

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<sup>f</sup> For the purpose of analysis the sample was restricted to consumers who received psychological services under the General, Telephone-CBT, and Postnatal depression ATAPS projects, as the diagnostic eligibility criteria are the same for these three programs. Consumers who received services under the Bushfires and Suicide early intervention ATAPS projects were excluded, due to the broader inclusion criteria of these projects. These latter projects accounted for only 2.7% of ATAPS sessions during the time period of interest.

to interview were also assessed, and combined with lifetime diagnosis information to determine 12-month disorder. The mental disorders assessed were: affective disorders (depression, dysthymia, and bipolar affective disorder); anxiety disorders (panic disorder, agoraphobia, social phobia, generalised anxiety disorder, obsessive-compulsive disorder and post-traumatic stress disorder); and substance use disorders (harmful use or dependence of alcohol or drugs).

The functioning module included a measure of 'Days out of role', defined as the number of days in the past 30 the respondent was unable to perform, or had to cut down on, their normal activities because of health problems. Psychological distress in the past 30 days was assessed with the Kessler Psychological Distress Scale (K10).<sup>29, 30</sup>

Suicidality in the past 12 months was assessed by presenting respondents with descriptions of three experiences – 'seriously thought about suicide' (suicidal ideation), 'made a plan for committing suicide' (suicide plan), and 'attempted suicide' (suicide attempt) – and asked if any of these experiences had happened to them in the past 12 months. Respondents were only asked about suicide plans and attempts if they reported suicidal ideation.

The service use module of the 2007 NSMHWB gathered information about respondents' 12-month and lifetime use of services for mental health problems. As part of this module, respondents were also asked whether they had been hospitalised for a mental health problem in the past 12 months.

## 2.2.5 POPULATION DENOMINATORS

Population estimates as at 30 June of each year of interest were provided by the Medicare Financing and Analysis Branch of the Department of Health and Ageing. The estimates were compiled from Australian Bureau of Statistics (ABS) estimated resident population (ERP) by gender, age (single year) and postal area data. Postal area data were used to map postal area data to Division of General Practice, and to IRSD and RRMA classification, using concordance files held by the Medical Benefits Division.

Aggregated population counts were provided in two formats, corresponding to the formats in which MBS and PBS data were requested: (1) stratified by Division of General Practice, gender and age range (0-14, 15, 16-17, 18-24, 25-34, 44-54, 55-64, 65-74, 75-74, and 85+ years); and (2) stratified by RRMA, IRSD, gender and age range<sup>6</sup>.

## 2.3 STATISTICAL METHODS

### 2.3.1 POPULATION RATES

Crude, age-standardised and age-specific rates are presented, as indicated, in this report. Rates are adjusted for age to facilitate comparisons between geographic regions and across time, because the age structures of populations may vary across time or between areas. Standardised rates were calculated using the direct standardisation method with the Australian estimated resident population (persons) as at 30 June 2001 as the standard population (as per ABS and

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<sup>6</sup> At the time of writing, these stratified population estimates were available for 2004 through 2008. 2008 data have been used as the population denominator for 2009 and the March 2010 quarter.

Australian Institute of Health and Welfare (AIHW) convention). For ease of interpretation, rates of *Better Access* uptake and other services are expressed per 1,000 population, unless noted otherwise.

### 2.3.2 DEFLATORS

Expenditure (benefits charged, fees charged and co-payments) on Medicare services was converted to 2009 dollars to adjust for inflation, using the ratio of Consumer Price Index values in each year to 2009.<sup>31</sup>

### 2.3.3 STATISTICAL ANALYSES

All analyses were undertaken using PASW Statistics version 17.0 (SPSS Inc., Chicago IL, 2009) and Stata version 11.0 (StataCorp LP, College Station TX, 2009).

#### PREDICTORS OF UPTAKE OF *BETTER ACCESS* AND OTHER SERVICES

Negative binomial rate regression models were used to examine predictors of uptake of *Better Access* and other services, using a range of aggregated datasets depending on the question being addressed. Negative binomial regression was selected because it is an efficient approach to analysis that allows for the overdispersion (i.e. where the variance is greater than the mean) that commonly characterises count data such as health service utilisation data. It also accommodates non-normal distributions that are also common in health service utilisation data, and thus avoids the need to transform non-normally distributed data in order to satisfy the assumptions of general linear model analyses.<sup>32</sup> In cases where overdispersion is not present, Poisson regression techniques are preferred. Hence for each of the models evaluated, the Pearson chi-square statistic ( $\chi^2$ ) was calculated. In all relevant cases the value of  $\chi^2$  divided by the number of observations (n) was greater than 1, which indicates overdispersion, hence the negative binomial model was considered more appropriate. The dependent variable is specified as the count of the health service measure of interest (e.g., number of persons using *Better Access* services or number of *Better Access* services used). The negative binomial rate regression model adjusts for the size of the population in each stratum of the dataset (e.g., a Division of General Practice) by incorporating the logarithm of the population size as an offset term. Thus, taking the exponent of each  $\beta$  regression coefficient provides the rate ratio (RR) for a one unit change in the corresponding independent variable.

#### TIME TRENDS IN UPTAKE RATES OF *BETTER ACCESS* AND OTHER SERVICES

Negative binomial regression models were also used to assess the magnitude and statistical significance of trends in uptake rates for *Better Access* and other services over time. In Chapters 3 and 4 these analyses examined trends in uptake of *Better Access* services (in total, and by various groupings) since the introduction of the initiative, and whether there has been a change in trend as the initiative has become more established. The period of interest for these analyses was from the March 2006 quarter (the first full quarter of *Better Access* operation) to the end of the March 2010 quarter (the most recent data available to us). The period of establishment of *Better Access* was defined as the first calendar year of operation (i.e., 2007) and the period post-establishment as being from 2008 onwards.

Three models were used (based on the procedure outlined by Chapman and colleagues<sup>33</sup>) reflecting the research questions outlined above: Model (a) estimates the trend (measured as the average quarterly change in rate) in uptake in the first calendar year of *Better Access*; Model (b) estimates the trend (measured as the average quarterly change in rate) in uptake after the first calendar year of *Better Access*; and Model (c) estimates the effect on trends in uptake pre- and post- the establishment period. In Model (c) the relative trends in pre/post rates are estimated by the interaction term in a model including terms for pre/post group, time and pre/post group by time.

In Chapters 8 and 9 negative binomial regression was used to examine trends in uptake of other services (i.e., use of antidepressant and anxiolytic medications as recorded on the PBS, non-*Better Access* MBS services, and ATAPS psychological services) before and after the introduction of *Better Access*, and whether there has been a change in trends in uptake of these services associated with the introduction of *Better Access*. The period of interest for these analyses was from the March 2004 quarter (two years prior to the first full quarter of *Better Access* operation) to the March 2009 quarter (for non-*Better Access* MBS services, and ATAPS psychological services) and the December 2009 quarter for PBS data. Because *Better Access* services were introduced part-way into the December 2006 quarter, models of trends pre/post *Better Access* exclude the December 2006 quarter.

Three models were used, reflecting the three research questions outlined above: Model (a) estimates the trend (measured as the average quarterly change) in uptake of relevant services before the introduction of *Better Access*; Model (b) estimates the trend in uptake of relevant services (measured as the average quarterly change in rate) in uptake after the introduction of *Better Access*; and Model (c) estimates the effect on trends in uptake of relevant services associated with the introduction of *Better Access*. In Model (c) the relative trends in pre/post rates are estimated by the interaction term in a model including terms for pre/post group, time and pre/post group by time.

## SYNTHETIC MODELLING OF POPULATION NEED (CHAPTER 5)

Chapter 5 uses a synthetic estimation and modeling approach to investigate whether *Better Access* services and expenditure are being distributed among Australian adults according to need. The procedure is based on previous studies<sup>34, 35</sup> and involves 5 steps:

Step 1: Defining geographic units.

Divisions of General Practice were chosen as the geographic unit for analysis. Divisions are funded by the Australian Government Department of Health and Ageing to co-ordinate local primary care services, and to improve the quality of general practice care and health outcomes for local communities.<sup>36</sup> As already described, the Medicare Financing and Analysis Branch of the Department of Health and Ageing provided population structure estimates for each of the 113 Divisions of General Practice in Australia. For the current analyses, the relevant population structures within each Division involved gender (male, female), age group (16-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84 years)<sup>h</sup> and section of

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<sup>h</sup> The age range was restricted to individuals aged 16 to 84 years because this is the group for which the full range of data required for analysis was available. The 2007 NSMHWB provided individual level information on adults aged 16 to 85 years. MBS *Better Access* service use data and population

state (capital cities, other metropolitan regions, remainder). This yielded 84 strata (2 gender x 14 age group x 3 section of state categories) within each Division.

Step 2: Deriving a measure of mental health need.

Level of adult population-based mental health need was modelled using data from the 2007 NSMHWB (see section 2.2.4 for an overview of the survey and explanation of the measures used in the current evaluation). For the current study, mental health need was defined as having at least one of the following: (1) an ICD-10 12-month affective, anxiety or substance use disorder; (2) 12-month symptoms (but no ICD-10 lifetime disorder); (3) any psychiatric hospitalisation in the past 12 months; (4) high or very high level of psychological distress on the K10 measure; (5) 7 or more days out of role; or (6) any suicidality in the past 12 months.

The approach to modelling mental health need was inclusive. That is, it took into consideration the groups to whom *Better Access* services are principally targeted (namely the common mental disorders including affective, anxiety and substance use disorders), as well as other factors that may prompt individuals to seek treatment. This decision was guided by a previous study which, using data from the 2007 NSMHWB, estimated that 81.7% of users of *Better Access* services provided by allied health professionals had a 12-month ICD-10 affective, anxiety or substance use disorder, and a further 11.5% of users had at least one other indicator of potential need (which included lifetime disorder, 12-month symptoms or lifetime hospitalisation for a mental disorder).<sup>37</sup> Definitions of mental health need based on diagnostic criteria alone were also considered, but were thought to be too restrictive in scope and to not fully represent the range of reasons for which people may use *Better Access* services.

Using age, gender, and section of state information collected by the 2007 NSMHWB, the rates of mental health need for each of the 84 population strata were calculated. By taking this population category data from the 2007 NSMHWB, and weighting each Division of General Practice according to its population structure, it was then possible to model the percentage of each Division with mental health need.

Step 3: Other explanatory variables.

A range of other Division-level variables were also obtained for consideration as independent variables in the analyses. These included:

- A measure of GP workforce supply. The supply measure was the count of full-time workload equivalence (FWE) of GPs in each Division in 2008-09. The GP FWE is a measure of workload that takes into account the differing working patterns of GPs. FWE is calculated by dividing each doctor's Medicare billing by the average billing of full-time doctors for the year. The FWE are allocated to the Division in which the GPs' services are claimed, thus accounting for instances where a GP has worked in more than one Division of General Practice. The GP FWE estimates were obtained from the Primary Health Care Research and Information Service website<sup>25</sup>, and are based on data from the Department of Health and Ageing.
- Indicators of potential to access services. These included: (1) eight State/Territory indicators (yes, no) specifying the state or territory in which each Division of General

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structure were available by single year of age up to 84 years, but were aggregated for all ages 85 years and above.

Practice is located; and (2) the percentage of the population in each Division living in a remote locality (as judged by RRMA categories 6 and 7). This measure was selected because, as shown in Chapter 3 of this report, the most marked differences in *Better Access* uptake rates are between people in remote locations as compared to all other locations.

- Measures of other Divisional characteristics. These included: (1) the percentage of Division population (aged 15 years and over) participating in the labour force; (2) the percentage of Division population unemployed; (3) the percentage of Division population living in localities of greater relative socioeconomic disadvantage (as defined by IRSED deciles 1 to 2). The latter measure was selected because it takes into account that the distribution of IRSD deciles in each Divisions varies. As shown in Chapter 3 of this report, the most marked differences in *Better Access* uptake rates tend to be between people in areas of greater socioeconomic disadvantage compared to all other locations. Information about the distribution of IRSD deciles by Division of General Practice was provided by the Medicare Financing and Analysis Branch of the Department of Health and Ageing.<sup>25</sup> All other measures of Division characteristics were obtained from the Public Health Information Development Unit website.<sup>38</sup>

#### Step 4: Defining the outcome measures.

Two outcome variables were derived: (1) total MBS-subsidised *Better Access* services received in 2009 (crude rate per 1,000 population); and (2) total MBS-subsidised allied health *Better Access* services received in 2009 (crude rate per 1,000 population). The Medicare Financing and Analysis Branch of the Department of Health and Ageing provided the *Better Access* service use and population data required to calculate these outcome variables for each of the 113 Divisions. Analyses were conducted using 2009 data, as these are assumed to better represent established *Better Access* utilisation patterns than earlier years.

#### Step 5: Data analysis.

A series of multivariate regression equations was developed (using Ordinary Least Squares regression) in which total *Better Access* services used and total allied health *Better Access* services used were predicted by mental health need and the other explanatory factors. The distributions of the two outcome measures were examined to assess whether they satisfied the assumption of normality for linear regression. The ratio of the skewness and kurtosis statistics to their standard errors indicated no significant departure from normality for either measure.

The best fitting models for the data were obtained using an hierarchical model-building process comprising 5 steps. Step 1 included the GP supply factor variable: GP FWE. Step 2 included the measures of potential to access services: remoteness, and state/territory. Step 3 included the measure of mental health need. Step 4 included other Division characteristics: labour force participation, unemployment, and relative socioeconomic disadvantage. The successive contribution of the variables in each step to the explanatory power of the model was examined using the  $R^2$  statistic. Variables that were associated with the outcome variables in univariate analyses at or below the 0.15 probability level were considered for inclusion in the models. In addition, each predictor was retained only if it contributed at least an additional 1% to the variance explained by the model. All candidate variables for analysis were screened for multicollinearity using standard regression diagnostics, including tolerance, variance inflation

factors, and variance decomposition proportions. With respect to outliers, extreme cases (standardised residuals > 3) were excluded from the final models.

Divisions of General Practice were weighted to reflect their population size. In an unweighted analysis, each Division of General Practice would have had equal bearing, regardless of its population size. However, as some Divisions are many times larger than others, it was considered that analyses should take this into account.

Data from the 2007 NSMHWB Basic Confidentialised Unit Record File, April 2009 version<sup>39</sup> were weighted to account for the differential probability of survey selection and to ensure conformity to known population distributions. Standard errors and 95% confidence intervals (CIs) were calculated using jackknife repeated replication to take account of the complex survey design.

## 2.4 ETHICS APPROVAL

The study received approval from The University of Melbourne's Health Sciences Human Ethics Sub-Committee (Ethics ID: 0930991) and The University of Queensland's Behavioural & Social Sciences Ethical Review Committee (#2009001396).