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Prepared for the Independent Hospital Pricing Authority

## Mental Health Costing Study

### Final Report

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The Mental Health Costing Study (MHCS) was conducted for the Independent Hospital Pricing Authority (IHPA) by a Consortium led by HealthConsult Pty Ltd that included Health Policy Analysis Pty Ltd, Health Outcomes International Pty Ltd, and Mr Sebastian Rosenberg as a specialist advisor on the mental health sector.

On behalf of the Consortium, HealthConsult would like to thank the many individuals and organisations that contributed to the MHCS, particularly the staff at the participating study sites and state/territory health authorities; staff at IHPA; and members of the Mental Health Costing Study Steering Committee.

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## List of Abbreviations

ABF	Activity Based Funding
AHPCS	Australia Hospital Consumer Costing Standards
AIHW	Australian Institute of Health and Welfare
ALOS	Average Length of Stay
AMHCC	Australian Mental Health Care Classification
APMHC NMDS	Admitted Consumer Mental Health Care National Minimum Data Set
APHA	Australian Private Hospital Association
CBIS	Community Based Information System
CHA	Catholic Health Australia
CIMHA	Consumer Integrated Mental Health Application
CL	Consultation Liaison
CMHC NMDS	Community Mental Health Care National Minimum Data Set
CPLG	Consortium Project Leadership Group
CV	Coefficient of Variation
DQA	Data Quality Assurer
DQAF	Data Quality Assurance Framework
DRS	Data Request Specification
ECT	Electroconvulsive therapy
FAQ	Frequently Asked Questions
FMT	Fieldwork Management Teams
HITH	Hospital In The Home
IHPA	Independent Hospital Pricing Authority
IQR	Interquartile range
LOS	Length of Stay
MDC	Major Diagnostic Category
MH-CASC	Mental Health Classification and Services Cost Project
MHCS	Mental Health Costing Study
MHCSSC	Mental Health Costing Study Steering Committee
MHIC	Mental Health Intervention Classification
MHE	Mental Health Establishment
MHWG	Mental Health Working Group
MoH	NSW Ministry of Health
NAC	NHCDC Advisory Committee
NHCDC	National Hospital Cost Data Collection
NMDS	National Minimum Data Set
NOCC	National Outcomes and Casemix Collection
NSW	New South Wales
NT	Northern Territory
POS	Provision of Service
RMHC NMDS	Residential Mental Health Care National Minimum Data Set
RVU	Relative Value Unit
Qld	Queensland
SA	South Australia
Tas	Tasmania
UQ	University of Queensland
Vic	Victoria
WA	Western Australia

## Executive Summary

HealthConsult, as leader of a Consortium, was engaged in February, 2014 by the Independent Hospital Pricing Authority (IHPA) to undertake the mental health costing study (MHCS) to inform the development of a new mental health classification – the Australian Mental Health Care Classification (AMHCC). The aim of the AMHCC is to improve the clinical meaningfulness of the way mental health care services are classified.

### AIM OF THE STUDY

The aim of the MHCS was to produce a robust consumer level data set that is representative of mental health services provided in Australia that includes characteristics of the consumers and measures of the costs of providing mental health services.

### METHODOLOGY

A prospective collection of activity and cost data was undertaken between 1<sup>st</sup> July and 31<sup>st</sup> December 2014, in 26 mental health services (including four private hospitals), across five Australian states and territories: New South Wales (NSW), Victoria (Vic), Queensland (Qld), Western Australia (WA) and South Australia (SA). The detailed data request specification (DRS) drew on data already being collected by sites to meet national minimum data set (NMDS) collections, supplemented by three additional data elements: phase of mental health care, first recent episode of mental health care, and mental health intervention. The sites were supported by study site coordinators funded by IHPA as well as the Consortium's fieldwork management teams (FMTs) who provided on-site training as required and maintained regular contact with the coordinators. Support was also provided through the use of the study-specific website that included frequently asked questions (FAQs) and up-to-date versions of the study documentation. Each study site was responsible for producing their own cost data, using guidance provided in the MHCS costing methodology manual. To ensure the preservation of the privacy and confidentiality of the MHCS data, national ethics approval was obtained and secure data transfer arrangements were implemented.

### REPRESENTATIVENESS OF THE MHCS DATA

Analysis showed that the MHCS data set is broadly representative for age, sex, Indigenous status and length of stay (LOS) characteristics when compared to the NMDSs for admitted and community mental health services. There is a higher proportion of episodes in the MHCS data set that are classified as involuntary 'legal status' in both the admitted and community setting.

The range of mental health services involved in the MHCS was compared to the Mental Health Establishment (MHE) data set. The analysis confirmed that the MHCS data obtained from admitted and community settings is representative of mental health services provided in Australia in these settings.

Due to the low number of episodes in residential mental health services in the MHCS, limited analysis on the residential setting is presented in this report. It is likely, due to very small sample size, that the population in the residential setting in MHCS is not representative of the national population. Although the volume of residential data were too small for publication, the gathered data remains a valuable input into the AMHCC development process.

### OVERVIEW OF THE MHCS DATA SET

The MHCS has generated a significant volume of data, much greater than the previous study on mental health costs in Australia (the Mental Health Classification and Services Cost (MH-CASC) project) in 1996. The MHCS generated costed data on 30,645 individual consumers and 58,219 episodes of care

(of which 12,370 were admitted episodes, 45,826 were community episodes and 203 were residential episodes. In comparison, the MH-CASC project captured 18,002 individual consumers, and 20,553 episodes of care (of which 5,449 were admitted episodes and 14,049 were community episodes).

Two MHCS data sets have been provided to IHPA to support the development of the AMHCC. The ‘activity’ data set is a collection of all the activity data gathered by the study sites which may be used to conduct further investigation into consumer characteristics and interventions provided in the various settings. The ‘costed activity’ data set is a collection of the activity records matched to costed data at either the episode level, phase/service contact level or both. Hence, the ‘costed activity’ data set does not include un-costed activities and so contains fewer records than the ‘activity’ data set.

### **ANALYSIS OF THE MHCS DATA SET**

A high-level analysis of the data gathered in the MHCS focused on the three new data elements. The purpose of this analysis was to describe the data contained within the MHCS data set, noting that IHPA will undertake a detailed statistical analysis to develop the AMHCC. No cost analysis of the MHCS residential mental health services data set is presented due to the small volume of data from two sites.

#### ***Phase of care***

Phase of care was defined as the ‘primary goal of care that is reflected in the consumer’s mental health treatment plan at the time of collection, for the next stage in the consumers care. It reflects the prospective assessment of the primary goal of care, rather than a retrospective assessment.’ Phase of care had five values in the data domain including acute, functional gain, consolidating gain, intensive extended and initial assessment. Phase of care data were gathered across all three service settings.

In the admitted setting, the predominant phase of care assigned to consumers was ‘acute’ with the proportion varying from 100 percent in the private sites to 43 percent in Qld. For public sector sites, the national average cost per phase ranged from \$15,700 for ‘consolidating gain’ through to \$22,518 for ‘functional gain’. When looking at cost per bed day, the national average cost within phase ranged from \$1,073 for ‘intensive extended’ through to \$1,278 for ‘functional gain’. At the state level, ‘consolidating gain’ had the lowest cost per bed day in all states except NSW. The high degree of consistency in the rank order of cost per phase and cost per bed day within phase across states, suggests that the phase of care data element has the potential to explain cost variation in the admitted setting.

In the community setting, analysis of the data suggested that there was a systematically different assignment of phase of care in NSW sites relative to sites in other states. About one third of all community service contacts were assigned to ‘acute’ in NSW, compared to the average across all study sites of 18.1 percent. For public sector sites, the national average cost per service contact by phase of care type ranged from \$214 for ‘consolidating gain’ through to \$433 for ‘initial assessment’. The national rank order of average cost per service contact for the phase types is not replicated for all states. For example, ‘consolidating gain’ had the lowest cost per service contact in NSW only, whereas the ‘functional gain’ phase had the lowest cost per service contact in all other jurisdictions. The pattern of phase of care assignment in the community setting was not as consistent as in the admitted setting.

In the residential setting, although difficult to draw any substantial conclusions about phase of care due to the small volume of data, the majority of phases assigned were ‘functional gain’ or ‘consolidating gain’.

***Mental health intervention***

The collection of mental health intervention data used the Mental Health Intervention Classification (MHIC) codes developed by the Australian Institute of Health and Welfare (AIHW). The business rule was that MHIC codes should be assigned for any mental health specific interventions, as defined by the AIHW MHIC in any setting in which they occurred.

There was high variation in the use of MHIC codes across sites. Analysis of the admitted setting data shows that, on average, there were 69.9 MHIC codes recorded per admitted episode, which represents 3.3 MHIC codes recorded per day of stay. There was significant variability between the jurisdictions, from 37.8 MHIC codes per episode in Qld to 267.5 MHIC codes per episode in SA. Analysis of the community setting data shows that, on average, there were 10.4 MHIC codes reported per episode, and 1.8 MHIC codes per service contact. As seen in the admitted data, there was significant variation in the number of MHIC codes per episode, ranging from 6.5 in NSW to 52.8 in SA.

***First recent episode***

First recent episode was defined to record whether a consumer had received a mental health intervention from the mental health services organisation within the previous five years. In the admitted setting, 78 percent of consumers had a first recent episode of mental health care provided by the study site. This proportion varied by jurisdiction, from 63 percent for the private sector sites up to 95 percent in WA. Consumers with no first recent episode were found to have a higher average cost at the phase level for every phase type, except for 'intensive extended'. Although the focus changed slightly from the original proposition of 'first episode of psychosis', the data lends support to the proposition that the first episode of mental health care requires more resources in the admitted setting.

In the community setting, 61 percent of consumers had a first recent episode, which varied by jurisdiction from 28 percent in WA to 79 percent in the private sites. In contrast to the admitted setting, consumers with no first recent episode had a lower average cost per service contact for every phase type in the community setting. Closer analysis of the data shows that there is considerable spread in the costs, with no real pattern. This observation correlates with the qualitative feedback from sites that first recent episode may not be a cost driver in terms of cost per community service contact.

**CONCLUSION**

The MHCS has generated a significant data set on mental health activity and cost to underpin development of the AMHCC. Initial analysis of the data shows that there is variation in the activity and costs data generated by the MHCS, both between and within the participating states. However, it is important to recognise that variation in the data is not unique to the MHCS and the measured variation should not cause stakeholders to be concerned about whether the data in the MHCS data set is suitable for use in the development of the AMHCC.

To illustrate, when considering the variation in the activity data, it is important to recognise that a number of data elements were used for the first time in the MHCS. It is reasonable to expect that there would be some initial variation in the interpretation of these new data elements. The initial analysis suggests that at least some of the new data elements have potential for use in the new mental health classification system, and that there is some additional data development work to be done to refine the concepts tested in the MHCS. It is understood that IHPA is already progressing this work through pilot data collection exercises associated with the development of the AMHCC.

When considering the variation in the cost data, the measured differences are consistent with what might be expected. To demonstrate, mental health data from the National Hospital Cost Data collection (NHCDC), which is used in numerous IHPA activities including the determination of the National Efficient Price and the ongoing development of the AR-DRG classification system, were compared to the cost variation in the MHCS data set. This work confirmed that for the states involved



in the MHCS, the level of cost variation at both the episode level and bed day level is consistent in the MHCS and NHCDC data sets. The analysis also observed that some of the variation in the MHCS data set is due to the relatively higher costs measured in Qld sites. However this elevated level does not create a problem in terms of the development of the AMHCC, as it is the relativities in the cost that are more important than absolute cost for classification development work. Systematically higher absolute costs in one state can be taken into account by the AMHCC developers when formulating the classifications models.

Overall, it is acknowledged that the MHCS data set has some weaknesses, but it also has many strengths. It is most comprehensive set of costed mental health episodes that has been produced in Australia. The issues with respect to the activity data are being addressed through the pilot sites involved in the development of the AMHCC. The NHCDC comparative analysis has demonstrated that measured variation in costs does not imply errors in the costing process. Rather, the cost variation seen in the final MHCS data set is likely to be due to many factors including differences in consumer characteristics, service models, locations of services as well as the applied costing practices (noting that a standardised methodology was produced and promulgated to study sites).

The principal purpose of the AMHCC system is to explain as much as possible of the variation in measured cost using consumer characteristics data. If there was no variation in the measured costs, then there would be no need for a classification system. The MHCS data provides a strong foundation for the necessary classification system development work.

## Introduction

HealthConsult, as leader of a Consortium, was engaged on 12<sup>th</sup> February, 2014 by IHPA to undertake the MHCS to inform the development of the AHMCC. This Chapter briefly summarises the context for the study, the objectives and presents the participating sites.

### 1.1 STUDY CONTEXT

At the time of commissioning the MHCS, there had been a number of national mental health-specific data collections and one classification system developed and implemented in Australia, including:

- Admitted Consumer Mental Health Care (APMHC) NMDS;
- Community Mental Health Care (CMHC) NMDS;
- Residential Mental Health Care (RMHC) NMDS;
- Mental Health Establishments (MHE) NMDS;
- National Outcomes and Casemix Collection (NOCC); and
- Mental Health Classification and Services Cost (MH-CASC) project (one-off study).

None of these data collections nor the MH-CASC system were widely accepted within the mental health sector as suitable for use in ABF. Accordingly, in 2012, consistent with its responsibilities for specifying the classification and data collection methodologies associated with implementing national ABF, IHPA commissioned a Consortium led by UQ to develop a recommended definition for mental health services that could be consistently applied for ABF purposes within the mental health sector and between states/territories. The resultant definition and cost drivers for mental health services project consisted of two stages:

- Stage A – Defining mental health services; and
- Stage B – Analysis of cost drivers, including recommended framework for classification development.

The UQ project resulted in 28 recommendations arising from Stages A and B. As part of this work, UQ concluded that ‘a comprehensive costing study was required to progress ABF in the mental health sector, as much of the data (particularly the cost data) was of poor quality and other variables identified as important cost drivers, for example, consumer clinical ratings, were either incomplete or not collected at critical points in the overall episode of mental health care’.

### 1.2 AIMS AND OBJECTIVES OF THE MHCS

As a result of the UQ work, IHPA commissioned the HealthConsult-led Consortium to undertake the MHCS for a defined period (prospective data collection for between three and six months, depending on study site) at a sample of Australian public hospitals, community mental health services, and four private hospitals. IHPA specified that the sample should include a mix of mental health consumer types and service locations to ensure a representative set of costs was collected.

The aim of the study was to produce a robust consumer level data set that is representative of mental health services provided in Australia that includes:

- characteristics of the consumers; and
- measures of the costs of providing mental health services.

IHPA specified that the principal use of the data set was to underpin the development of the AHMCC that can be used to progress ABF for mental health services. The classification development work was not part of the MHCS; it is being undertaken by IHPA. It is important to state that the MHCS was not intended to produce costs weights, nor to develop a funding model for mental health services; these tasks represent subsequent work that will also be undertaken by IHPA.

### 1.3 MENTAL HEALTH CARE TYPE DEFINITION

IHPA specified that the scope of the MHCS was to be consistent with the mental health care type definition approved by the Pricing Authority, which is:

*Mental health care is care in which the primary clinical purpose or treatment goal is improvement in the symptoms and/or psychosocial, environmental and physical functioning related to a consumer's mental disorder.*

*Mental health care:*

- *is delivered under the management of, or regularly informed by, a clinician with specialised expertise in mental health;*
- *is evidenced by an individualised formal mental health assessment and the implementation of a documented mental health plan; and*
- *may include significant psychosocial components including family and carer support.'*

Psychogeriatric care was considered within scope of the costing study, as it is covered by this definition.

Given that the mental health care type was not in use in routine data collections at the time of the study, clinicians at study sites needed to determine prospectively, in the data collection period, whether the services provided met the definition of the mental health care type. All the services where this determination was positive were considered to be within the MHCS scope.

### 1.4 MENTAL HEALTH SERVICES INCLUDED IN THE STUDY

Table 1.1 shows the sites that participated in the MHCS, in terms of the settings from which they delivered services, and the population groups primarily targeted by the services. There were 26 mental health services that participated in the MHCS across five States (NSW, Qld, WA, SA and Vic (only one private sector site)). Admitted, community and residential mental health service settings were covered in the sample, as were all major target population groups. The representativeness of the MHCS site sample compared to the national landscape of mental health services is examined in Chapter 3. It is important to note that although 25 study sites were originally signed up to the MHCS, at the study site close-out visits there was a request to split Concord Centre for Mental Health from the Croydon Community Mental Health Service, and hence data for 26 study sites are presented in this report.

Also, in reviewing the report, readers should note that the 26 study sites are referred to as 'parent sites'. Many of these sites were large health services with multiple service outlets. Accordingly, to improve the homogeneity and relevance of data comparisons between sites, 'child sites' were defined for a number of the parent sites to distinguish between the types of mental health services provided and/or the target population for those services at the parent site. As shown in Table 1.1, the MHCS included 144 mental health services, when defined at the level of child sites.

Table 1.1: Overview of mental health services that participated in the MHCS

Jurisdiction	#	Name of Study Site	No. of child sites	Settings			Target Populations				Start date of data collection
				Admitted	Residential	Community	C,A&Y	F	G	O	
NSW	1	Hornsby Ku-Ring-Gai Hospital	12	✓	✗	✓	✓	✗	✓	✓	11/08/2014
	2	Royal North Shore Hospital	8	✓	✗	✓	✓	✗	✓	✗	13/08/2014
	3	Macquarie Hospital	9	✓	✗	✓	✗	✗	✓	✓	06/08/2014
	4	Concord Centre for Mental Health	14	✓	✗	✓	✓	✗	✓	✓	01/08/2014
	5	Croydon Community MH Service	6	✗	✗	✓	✗	✗	✓	✗	01/08/2014
	6	Wagga Wagga Base Hospital and Murrumbidgee Community Mental Health	24	✓	✗	✓	✓	✗	✓	✓	04/08/2014
	7	The Children's Hospital at Westmead	4	✓	✗	✓	✓	✗	✗	✗	08/10/2014
	8	The Forensic Hospital	6	✓	✗	✗	✗	✓	✗	✗	08/10/2014
<b>Subtotal NSW</b>			<b>83</b>	<b>✓</b>	<b>✗</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>-</b>
Qld	9	Gold Coast HHS	14	✓	✗	✓	✓	✗	✓	✓	08/07/2014
	10	Central Queensland HHS	4	✓	✗	✓	✓	✗	✓	✗	08/07/2014
	11	Townsville HHS	3	✓	✗	✓	✓	✗	✓	✗	08/07/2014
	12	West Moreton HHS	9	✓	✗	✓	✓	✓	✓	✓	08/07/2014
	13	Metro North HHS	4	✓	✗	✓	✗	✗	✓	✓	22/07/2014
<b>Subtotal Qld</b>			<b>34</b>	<b>✓</b>	<b>✗</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>-</b>
WA	14	Broome Regional Hospital	3	✓	✗	✓	✓	✗	✓	✗	01/08/2014
	15	Albany Regional Hospital	4	✓	✗	✓	✓	✗	✓	✓	04/08/2014
	16	Graylands Selby-Lemnos and Special Care Health Service	1	✓	✗	✗	✗	✗	✓	✗	01/07/2014
	17	Fremantle Hospital	5	✓	✓	✓	✗	✗	✓	✓	28/07/2014
	18	Sir Charles Gairdner Hospital	1	✓	✗	✗	✗	✗	✓	✗	01/08/2014
<b>Subtotal WA</b>			<b>14</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✗</b>	<b>✓</b>	<b>✓</b>	<b>-</b>
SA	19	Glenside Hospital	3	✓	✗	✗	✗	✗	✓	✗	28/07/2014
	20	Noarlunga Mental Health	2	✗	✓	✗	✗	✗	✓	✗	28/07/2014
	21	Eastern Community Mental Health Centre	2	✗	✗	✓	✗	✗	✓	✗	28/07/2014
	22	Lyell McEwin Hospital	2	✓	✗	✗	✗	✗	✓	✓	27/07/2014
<b>Subtotal SA</b>			<b>9</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✗</b>	<b>✗</b>	<b>✓</b>	<b>✓</b>	<b>-</b>
Private	23	Perth Clinic (WA)	1	✓	✗	✓	✗	✗	✓	✗	01/09/2014
	24	Toowong Private Hospital (Qld)	1	✓	✗	✓	✗	✗	✓	✗	01/09/2014
	25	St John of God Pinelodge Clinic (Vic)	1	✓	✗	✓	✗	✗	✓	✗	17/09/2014
	26	St John of God Richmond Hospital (NSW)	1	✓	✗	✓	✗	✗	✓	✗	17/09/2014
<b>Subtotal Privates</b>			<b>4</b>	<b>✓</b>	<b>✗</b>	<b>✓</b>	<b>✗</b>	<b>✗</b>	<b>✓</b>	<b>✗</b>	<b>-</b>
<b>Total all sites</b>			<b>144</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>-</b>

Source: Data Return A Mental Health Costing Study 2014/2015. C, A & Y = child, adolescent and youth; G = General; O = Older Persons; F = Forensic.

The project methodology intended that all sites start data collection on the 1<sup>st</sup> July, 2014. However due to nomination and contractual delays only one site started data collection on the 1<sup>st</sup> July, 2014. The private hospitals sites did not start until September. In addition, two sites were added in October (i.e. Children's Hospital at Westmead and the Forensic Hospital) to improve the study's coverage of paediatric and forensic mental health services.

## Project methodology

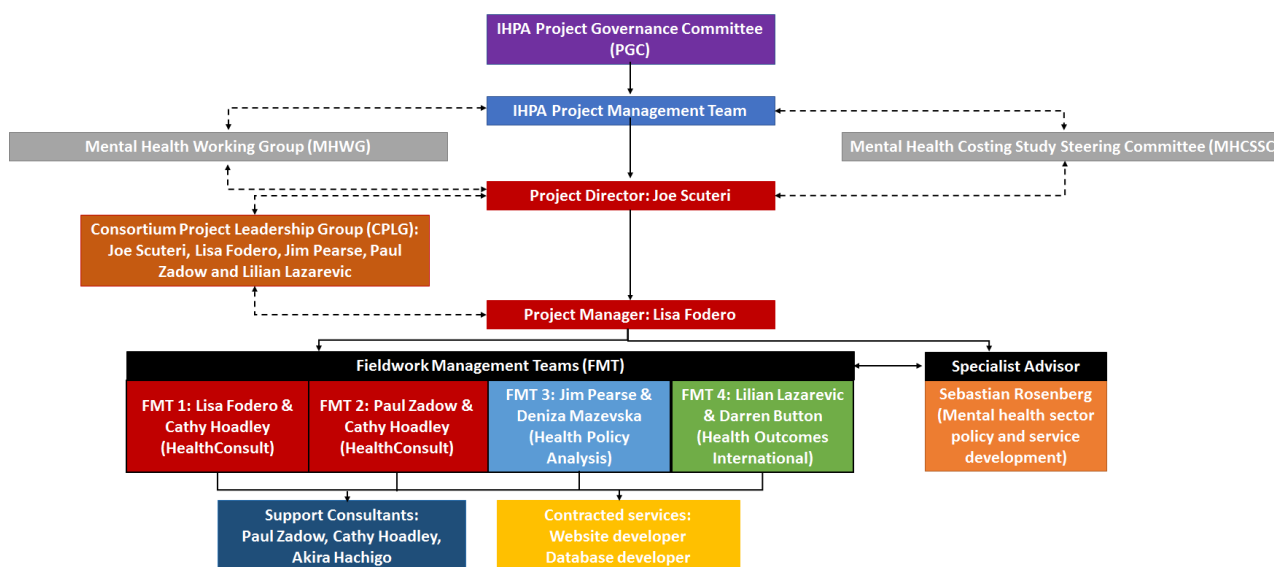
This Chapter describes the project management and governance arrangements, as well as the key features of the project methodology. It is important to note that the MHCS was supported by extensive study-specific infrastructure. The developed infrastructure is described in the Chapter, but not reproduced, as it has been separately provided to IHPA.

### 2.1 PROJECT MANAGEMENT AND GOVERNANCE ARRANGEMENTS

The key features of the project management and governance arrangements included:

**Project management and governance structure:** the study team was led by Joe Scuteri (Project Director) and Lisa Fodero (Project Manager). The key project governance groups were the Mental Health Costing Study Steering Committee (MHCSSC) and the Mental Health Working Group (MHWG). The project management and governance structure is shown in Figure 2.1.

Figure 2.1: Mental Health Costing Study project governance and management structure



**Fieldwork management:** support for the 26 study sites was provided by four, two-person FMTs. This approach ensured that there was always back-up available for the site management process. A portfolio management approach was used. All communications between the project team and study site/jurisdiction health authority staff was via the assigned FMT, so that study sites could be assured of a single point of contact. All sites in a jurisdiction were assigned to the same FMT, so the health authority officers also had the same contact point.

**Study site support:** a key objective of the study was to build capacity in ABF related work in the participating sites. To achieve this aim, a close monitoring approach was adopted to provide technical and project support to study sites. Members of the FMTs were based in Sydney and Adelaide, which gave rapid and, if necessary, onsite access to training and support for study sites in those jurisdictions. Study sites in the other jurisdictions were allocated to the FMTs to evenly balance the workload, and travel budgets were assigned to the FMTs to allow on-site training and support to be provided in locations where there were no resident Consortium project team members.

**Consistent issues resolution:** a Consortium Project Leadership Group (CPLG) was established that included representatives of the organisations in the Consortium that provided the greatest resource input. The CPLG was responsible for resolving project issues that arose; and included the leaders of all four FMTs to ensure that the impact of issues on all study sites was considered. This group was heavily engaged in the design stage (i.e. in the development of the study infrastructure) and early implementation stage (i.e. through the generation of FAQs). For the more complex issues, the CPLG referred matters to the MHCSSC for advice (e.g. adaption of focus of care concept for the phase of care data element, etc.).

## 2.2 STUDY SITE RECRUITMENT

IHPA invited study site nominations in mid-March 2014. The invitation letters were sent to all State and Territory health authorities, as well as the Australian Private Hospitals Association (APHA) and Catholic Health Australia (CHA). The intention was to recruit up to 25 study sites based on the developed site sampling strategy, which proposed the distribution of sites by state/territory, type of hospital (i.e. public hospital (general and specialist mental health facilities) or private hospital), location (i.e. metropolitan and regional), type of community based health service (i.e. non-residential and residential).

Nominated sites were asked to complete an initial feasibility assessment questionnaire, which gathered the information needed to assess whether the site was in a position to successfully complete the study. The questionnaire included information about the availability of resources, systems and data at the site. Key requirements were that sites were prepared to appoint a study site coordinator (funding support was provided by IHPA), sites either had access to, or were prepared to acquire, software to undertake the patient level costing (consistent with the capacity building objective of the MHCS, the patient level costing of the mental health services provided at the site in the data collection period was done by study site (or state health authority staff), not by the Consortium; and that sites already participated in national mental health data collections, preferably including the NOCC.

Having regard to the feasibility assessment results, IHPA together with HealthConsult, the state/territory health authorities and representatives of the private sector aimed to ensure that the full spectrum of mental health services were included in the study. All sites that initially enrolled in the MHCS completed the data collection for the agreed period, with the exception of the Northern Territory site (which withdrew in August 2014, after collecting MHCS data set for about two months, due to the study site coordinator leaving and not being replaced) and Gold Coast HHS (which was unable to provide cost data by the study cut-off date due to complications with the installation of a new costing software package during the period in which the MHCS was conducted).

## 2.3 STUDY SITE INFRASTRUCTURE

The HealthConsult-led Consortium developed extensive study infrastructure, which specified in detail the project methodology including the roles and responsibilities of staff at the study sites, the required activity and cost data, the costing methodology to be applied, and the types and level of support available to the study sites. This section describes each component of study infrastructure.

### 2.3.1 *The Mental Health Costing Study Manual*

The MHCS Manual was available throughout the study via the MHCS website hosted from the HealthConsult website [www.healthconsult.com.au](http://www.healthconsult.com.au). It was a comprehensive and always up-to-date reference document for sites participating in the study. The Manual incorporated:

- **Part A: Overview of the study.** Part A set the context for the study, described the project management and governance arrangements, stakeholder engagement strategies, and key features of the study design; articulated the roles of responsibilities of the study sites and the Consortium; defined the scope of the study including the mental health care type definition and the types of

services included in the study; and provided an overview of the data collection and data management (e.g. data security, integrity, transfer) arrangements and the data quality assurance process.

- **Part B: Site Implementation Plan.** Part B was developed to assist study site coordinators to manage and conduct the processes associated with the study at the site. Execution of the Implementation Plan was the responsibility of the allocated FMT, but the study site coordinator also had a major role in bringing together the resources at site level to ensure that the study could be successfully completed. The document described the key activities to be undertaken, and by who, at the 'set-up' phase, in the 'data collection' phase and in the 'close-out' phase.
- **Part C: Data Request Specification (DRS).** Part C defined the types of data to be collected for the study; set out the timing of the required data submissions; presented the data model; and defined a series of tables (one for each specified Data Return) which described the details (e.g. data element definitions, values in the data domain, formats) of each data element required in each Data Return.
- **Part D: Costing methodology.** Part D described the key costing principles to be applied in the MHCS (the costing was done by, or on behalf of, study sites; not by the Consortium), provided guidance on each step of the costing process and on how to apply the relevant standards in the Australian Hospital Patient Costing Standards (AHPCS) Version 3.1.
- **Part E: Training Manual.** Part E described at a higher level (than the detailed Parts of the MHCS Manual) all aspects of the study to assist study site coordinators to navigate the infrastructure developed to support implementation of the MHCS.
- **Part F: Data Quality Assurance Framework (DQAF).** Part F described the quality assurance processes to be applied by the Consortium on both activity and costs data submitted by study sites. It specified the data element validation and logic tests to be applied to the activity data; the activity data reconciliation tests; the process for analysing the distribution of responses to selected activity data elements; a series of tests to be applied to validate each sites costing data; and the assessment process to be applied to assess the degree of compliance with the AHPCS at each study site.

All parts of the MHCS Manual were 'live' documents on the MHCS website and were updated throughout the study to ensure that, where further clarity could be added, it was; and where errors or anomalies were identified, they were corrected.

### *2.3.2 The Mental Health Costing Study Training Modules*

Ten training modules were developed as PowerPoint presentations (also available as PDF) and rolled out in stages throughout the study. All modules were available on the MHCS website (except for Module Ten as it was tailored to each study site). The training modules covered:

- **Module One: Overview of the study.** Module One outlined the key aspects of the MHCS including the aim of the study, the mental health care type definition, services in-scope, overview of the Data Returns and data submission time points, a description of the three new data elements, description of the study costing methodology, role of the FMTs and study site coordinator, and the different types of support available to the study sites (e.g. FMTs, training modules, website, etc.).
- **Module Two: Communication and support processes.** Module Two outlined the role of the FMTs (and their contact details), when FMTs would visit the sites and the purpose of each visit, the scope of mental health services to be included in the MHCS, the activity data that needed to be collected, the FMTs role in supporting the generation of the cost data, the cost and activity data submission time points, the process to ensure consistent issue resolution, and the different types of support available to the study sites (e.g. FMTs, training modules, website, etc.).
- **Module Three: New data elements.** Module Three outlined the three new data element concepts, the purpose and importance of collecting the new data elements, and a detailed description of each new data element, its definition, the applicable data domains, and the data collection points relevant to each new data element.

- **Module Four: Data collection, extraction and transfer.** Module Four outlined the processes available for data collection (e.g. manual vs extracted from source systems), data extraction considerations for sites, processes sites should follow in preparing their data post extraction but prior to submission to the Consortium, the timing of data submission, the IHPA approved data transfer processes available to sites, and the quality assurance process to be applied to any submitted data.
- **Module Five: DRS – Community.** Module Five summarised the information in the DRS (Part C of MHCS Manual) to focus only on the types of data required on consumers who received services from community mental health services.
- **Module Six: DRS – Admitted.** Module Six summarised the information in the DRS (Part C of MHCS Manual) to focus only on the types of data required on consumers who were admitted to mental health services.
- **Module Seven: Costing methodology.** Module Seven summarised the information presented in Part D of the MHCS Manual – Costing Methodology.
- **Module Eight: One-off costing studies.** Module Eight described at a high level the various one-off costing studies that sites needed to consider undertaking to ensure their costing process was more complete and robust. There were six one-off costing studies proposed by the Consortium to improve the quality of the costing process. Module Eight introduced sites to the intent of each study with the details and required templates provided in Part D of the MHCS Manual – Costing Methodology.
- **Module Nine: Data quality assurance.** Module Nine summarised the contents of Part E of the MHCS Manual – DQAF and described the development, supply and use of the Data Quality Assurer (i.e. the Microsoft Access Database developed by the Consortium and provided to sites to quality assure aspects of their data prior to submission).
- **Module Ten: Study close-out.** Module Ten was developed to be presented as part of the close-out visits to sites by FMTs. As the individual site presentations contained data that were specific to the study site (i.e. they included the ‘first cut’ of the final data set by site), they were not made available on the MHCS website (site-specific feedback from the close-out visits was used to modify the final data set prior to submission to IHPA).

### *2.3.3 The Mental Health Costing Study Website*

A study-specific website, at [www.healthconsult.com.au](http://www.healthconsult.com.au), was developed to act as a communication vehicle throughout the study. The website had publicly accessible sections (general study information) and secure access sections limited to MHCS participants. The website was regularly updated throughout the study. The content of the secure access sections of the website was governed by website forum rules developed by the Consortium. In order to access the restricted part of the website, individuals needed to complete the MHCS website application form, which enabled a unique username and password to be assigned to an individual, and a signature was automatically attached to any person making a post on the discussion forum. The rules also meant that questions/comments were not uploaded to the website until the website manager approved the comment/post, which was always within six hours of the post.

The information on the publicly accessible section of the MHCS website included:

- **Overview tab:** provided a brief overview of the intentions and objectives of the MHCS.
- **About the study tab:** provided an overview of the key study design features.
- **Scope tab:** described the scope of mental health services included in the study (i.e. those that meet the definition of mental health care type).
- **Project team tab:** listed the Consortium members and their individual roles in the study, and provided contact details of the FMT members, including a list of the sites that each FMT was responsible for supporting.



- **Study sites tab:** listed all the sites participating in the MHCS, and was the portal tab for sites to enter the restricted access section of the website by providing a user specific username and password.

The information on the restricted access section of the MHCS website included:

- **Documentation tab:** provided access to the most recent versions of each part (i.e. Parts A-F) of the MHCS Manual (in Word and PDF). In addition, Excel versions of the templates to assist in data collection for any of the six proposed one-off costing studies were available.
- **Training modules tab:** provided access to the most recent versions of each of the developed training modules (i.e. Modules One to Nine).
- **Discussion Forum tab:** provided individuals at study sites, state/territory health authorities, IHPA or the Consortium (with an allocated username and password) with an open forum to post questions, comments or general information. Where questions were asked of the Consortium, responses were provided within 48 hours.
- **FAQ tab:** where questions posed, at any time during the study, by any individual involved in the study (i.e. Consortium, study site staff, IHPA and/or state/territory health authority staff) were posted and a response provided by the Consortium. Due to the vast number of FAQs, this tab was structured by topic area, and included:
  - Part A. General;
  - Part B. Staff Data Return (Return B);
  - Part C. Service level cost return (Return C);
  - Part D. Phase of care;
  - Part E. First recent mental episode of mental health care;
  - Part F. Mental Health Intervention Codes (MHIC);
  - Part G. Admitted consumer episodes;
  - Part H. Community mental health episodes;
  - Part I. Community mental health service contacts;
  - Part J. Community residential episodes;
  - Part K. Consultation and liaison; and
  - Part L. Clinical measures.

## 2.4 SUPPORT PROVIDED TO STUDY SITES

The HealthConsult-led Consortium provided support via the two person FMTs that were allocated to all participating sites throughout the study, commencing with the completion of the feasibility assessment questionnaire and concluding with the study close-out visits. Access to the FMTs was through the site visits, phone, email and the MHCS website.

Each site recruited a study site coordinator, with funding support provided by IHPA. The coordinator was the key point of contact for the allocated FMT except in NSW where the key point of contact for FMTs and NSW study site coordinators was a coordinator based at the NSW Ministry of Health (MoH). All arrangements relating to a sites participation in the MHCS were made through the study site coordinator, or in the case of NSW via the state level coordinator based at the MoH.

FMTs attended most sites, in person, at least four times during the study, including:

- **Visit 1:** This visit involved initial set up and training with staff to be involved in the MHCS including the study site coordinator as well as mental health clinicians, costing practitioners, representatives from the state health authority, etc. The majority of these visits were undertaken in June/July 2014 except for the private sites, which were undertaken in August 2014.
- **Visit 2:** This visit involved providing onsite training to the study site coordinator and the costing practitioners on the MHCS costing methodology, and identifying which of the six proposed one-off

costing studies would need to be undertaken by each site. This visit also enabled the FMTs to work with study site coordinators onsite to answer any questions, and to provide any additional training needed. The majority of these visits were undertaken in September/October 2014, except for the private sites which were not visited on this round; instead the allocated FMT spent time training the subcontracted private site costing practitioner.

- **Visit 3:** This visit was tailored to the needs of the sites in each jurisdiction. In some jurisdiction, the visit consisted of a workshop that was attended by representatives of each site and the state health authority. At the workshops, issues with the study were discussed and learning shared across the sites. In other jurisdictions, the visits were to individual sites, as it was considered there would be more value in addressing data collection issues at site level, rather than holding a workshop. Due to the later start of data collection, there was no equivalent of Visit 3 in the private sector, just ongoing contact via telephone and email.
- **Visit 4:** This visit involved sharing the preliminary analysis of the draft final data set with study sites with the aim of addressing any issues/queries raised through preparation of the presentations. These visits were undertaken at all sites between late May and early July 2015.

In addition, FMTs held regular teleconferences (varied from weekly to monthly) with study sites, either at an individual site level or at jurisdictional level. Nationally, fortnightly MHCS teleconferences were hosted by IHPA following commencement of the data collection.

Finally, the data quality assurance process also generated substantial interaction between FMTs and study sites. After each data submission made by sites, the data quality assurance process was applied, which involved checking the data integrity across multiple levels (e.g. level 1 included compliance with the DRS, level 2 included linking of data across Data Returns, etc.). This process produced a study site-specific error report, which identified issues that sites were requested to correct prior to the next data submission. FMTs discussed resolution of the issues raised in these reports extensively with study sites.

## Representativeness of the MHCS data set

This Chapter presents an analysis of selected data elements in the MHCS data set compared to national mental health data sets in order to determine the representativeness of the MHCS data set at the consumers' characteristics level and the mental health services organisation level. In reviewing the analysis, readers should note that no purposeful sampling was undertaken for the MHCS, rather sites were determined as a result of a nomination process, and an assessment by the Consortium project team of study feasibility at that site.

### 3.1 COMPARISON OF CONSUMER POPULATION IN 'SAMPLE' TO 'NATIONAL' POPULATION

In order to assess if the consumer population represented by the MHCS sites set is representative of the national mental health consumer population, various national data sets were analysed including:

- The **Admitted Patient Mental Health Care National Minimum Data set** (APMHC NMDS 2012/13). This data set was analysed at the completed episode level. In order to determine the consumer population (denominator) in the admitted setting, those episodes within the APMHC NMDS data for 2012/13 within Major Diagnostic Categories (MDC) 19 and 20<sup>1</sup> together with episodes with at least one psychiatric care day were identified. These episodes were considered to be the most likely to meet the mental health care type definition. The identified episodes were then summarised by the relevant characteristic to represent the denominator for each of the consumer characteristics that was considered.
- The **Community Mental Health Care National Minimum Data set** (CMHC NMDS 2012/13). This data set was analysed at a consumer level or the service contact level. The CMHC NMDS 2012/13 was used to determine the consumer population (denominator) in the community setting. The identified service contacts were then summarised by the relevant consumer characteristic to represent the denominator for each of the consumer characteristics that was considered.

Due to the small volume of costed residential mental health service episodes in the MHCS final data set, no residential data comparison analysis is presented. Although no comparative analysis is presented, it is the Consortium's understanding that the residential mental health service episodes in the MHCS final data set will be used by IHPA in the development of the AHMCC.

The balance of this section uses these national mental health data sets to examine key consumer characteristics in the MHCS data set ('sample') against the corresponding data from the 'national' mental health care population.

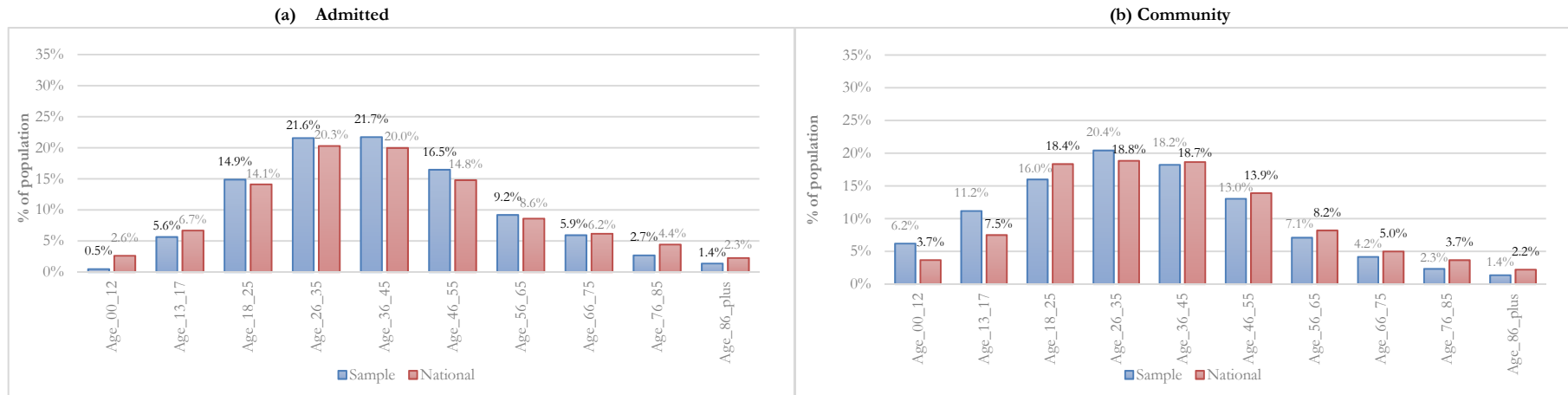
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<sup>1</sup> MDC 19 – Mental disease and disorders and MDC 20 – Alcohol/drug use and alcohol/drug use induced organic mental disorders

3.1.1 Representativeness of the sample data set in terms of consumer age profile

Figure 3.1 presents the consumer age group profile, by setting, from the MHCS sample population compared to the age group profile of the national mental health care population.

Figure 3.1: Consumer age group profile by setting



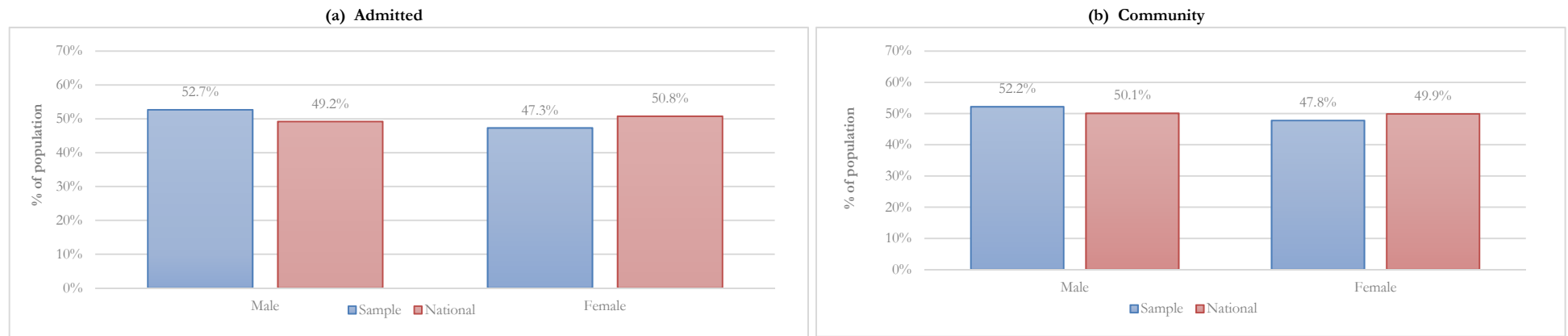
Source: ‘Sample’ from the HealthConsult MHCS data set 2015 – Data Return D and ‘National’ from APMHC NMDS 2012/13 and CMHC NMDS 2012/13.

In the admitted setting (see Figure 3.1(a)) there is good representation of age groups from ‘13-17’ to ‘66-75’ but a low proportion of episodes of ‘0-12’ (reflective of the inclusion of only one children’s hospital in the MHCS) and ‘76 plus’ in the sample population compared to the national population. In the community setting (see Figure 3.1(b)) there is good representation of age groups above ‘18-25’ but a higher proportion of episodes of consumers aged ‘0-12’ and ‘13-17’. Overall the age profile of the admitted and community sample population is considered to be representative of the national population.

3.1.2 Representativeness of the sample data set in terms of consumer sex profile

Figure 3.2 presents the consumer sex profile, by setting, from the MHCS sample population compared to the sex profile of the national mental health care population.

Figure 3.2: Consumer sex profile by setting



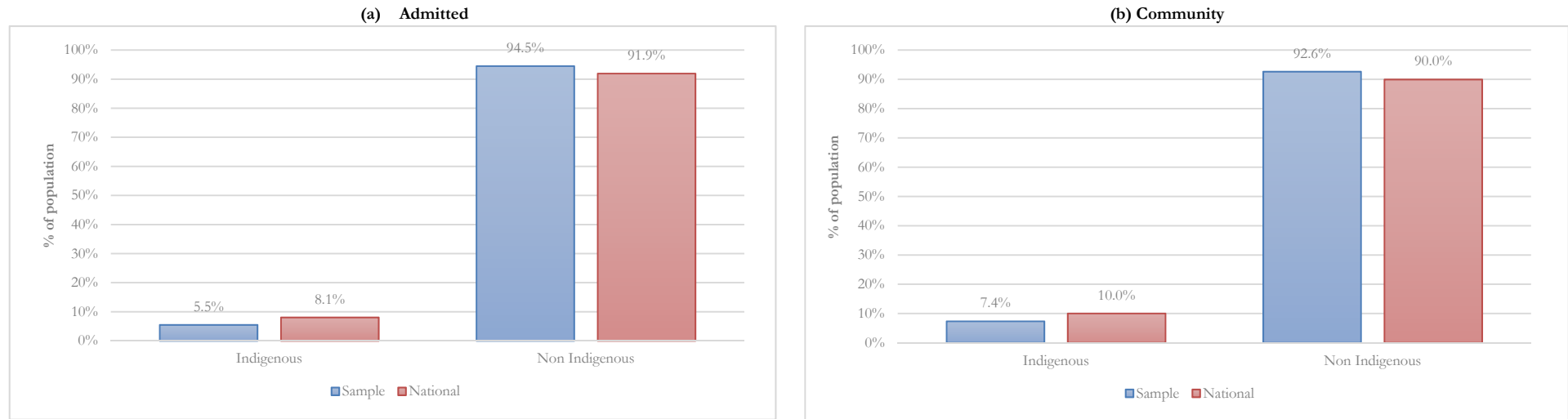
Source: 'Sample' from the HealthConsult MHCS data set 2015 – data Return D and 'National' from APMHC NMDS 2012/13 and CMHC NMDS 2012/13.

Analysis at the consumer sex profile shows that there are very similar proportional splits between male and female in the sample compared to the national population in both the admitted (see Figure 3.2 (a)) and community (see Figure 3.2 (b)) settings.

**3.1.3 Representativeness of the sample data set in terms of consumer Indigenous status profile**

Figure 3.3 presents the consumer Indigenous status profile, by setting, from the MHCS sample population compared to the Indigenous status profile of the national mental health care population.

**Figure 3.3: Consumer Indigenous status profile by setting**



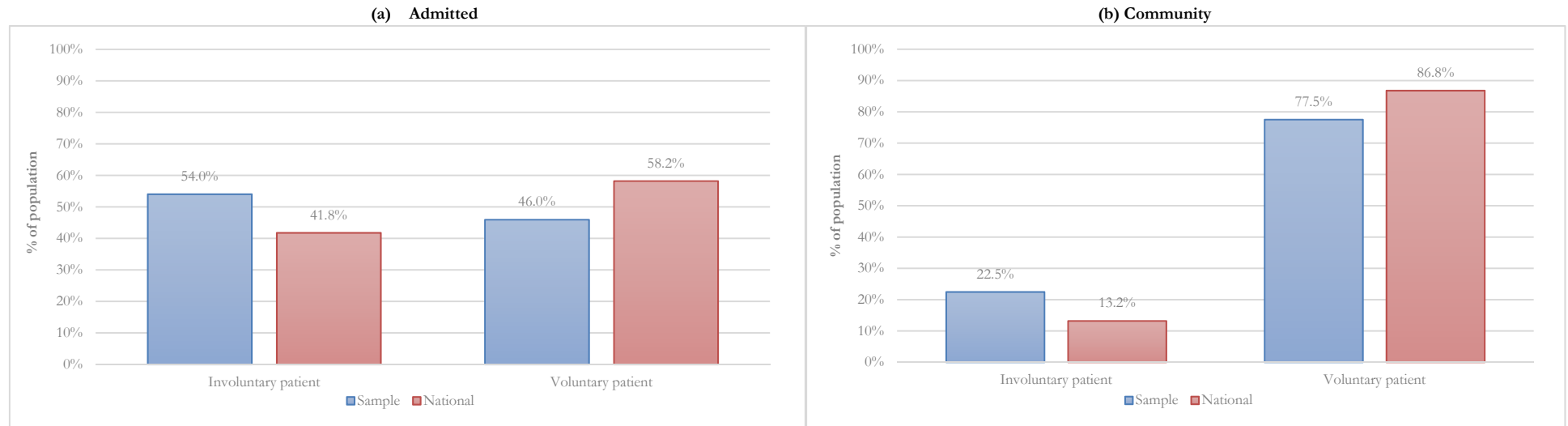
Source: 'Sample' from the HealthConsult MHCS data set 2015 – Data Return D and 'National' from APMHC NMDS 2012/13 and CMHC NMDS 2012/13.

Analysis of Indigenous status profile shows that there are very similar proportional splits between Indigenous and non-Indigenous populations in the MHCS sample compared to national population in both the admitted (see Figure 3.3 (a)) and community (see Figure 3.3 (b)) settings.

**3.1.4 Representativeness of the sample data set in terms of consumer legal status**

Figure 3.4 presents the consumer legal status profile, by setting, from the MHCS sample population compared to the consumer legal status profile of the national mental health care population.

**Figure 3.4: Consumer legal status profile by setting**



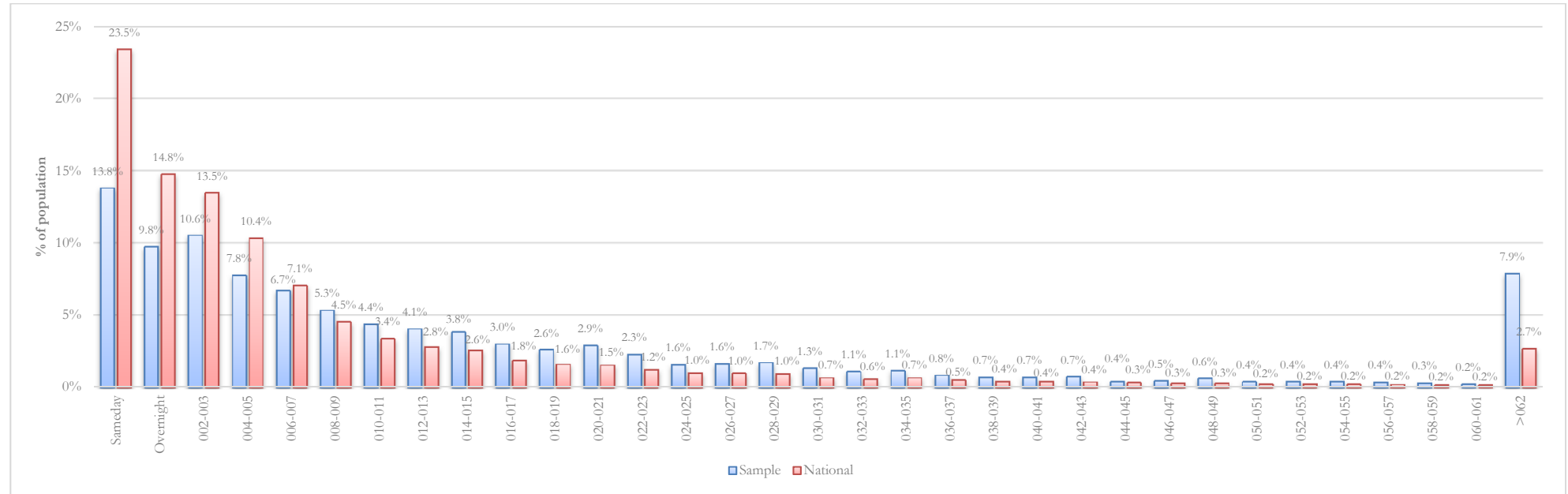
Source: 'Sample' from the HealthConsult MHCS data set 2015 – Data Returns D, E and F' 'National' from AMHC NMDS 2012/13 and CMHC NMDS 2012/13.

Legal status is defined as either a person being treated on an 'involuntary' or 'voluntary' basis under the relevant state/territory mental health legislation, at any time during the episode of care. In both the admitted (see Figure 3.4 (a)) and community (see Figure 3.4 (b)) setting, there is a higher proportion of episodes that are involuntary in the MHCS sample compared to the national population. The higher proportion of admitted episodes that are involuntary is driven by the five Qld sites. The higher proportion of community episodes that are involuntary is driven by three Qld and two NSW sites.

3.1.5 Representativeness of the sample data set in terms of consumer LOS profile

Figure 3.5 presents the consumer LOS profile in the admitted setting from the MHCS sample population compared to the LOS profile of the national mental health care population.

Figure 3.5: Consumer LOS profile – admitted episodes



Source: 'Sample' from the HealthConsult MHCS data set 2015 – Data Returns D and E1; and 'National' from AMHC NMDS 2012/13.

Figure 3.5 shows that the MHCS sample has a lower proportion of same-day episodes, as well as lower proportions of episodes with between one and seven days stay than the national population, with the biggest difference being for same-day episodes. Closer examination of the same-day episodes in the national population shows that the difference is driven by a substantially higher proportion of episodes with a Principal Diagnosis of F10.0 – Mental and Behavioural Disorder due to use of alcohol, acute intoxication. It is likely that at least some of these episodes would not meet the mental health care type definition (and hence not expected in the MHCS sample), but have been identified as part of the denominator population as they are classified into MDC 20.

Also of note is the higher proportion of >62 day stay episodes in the MHCS sample population, as well as a high proportion of between 10 and 31 day stay episodes. Overall the MHCS sample population shows similar LOS characteristics to the national population. The ALOS is slightly shorter for the national population, due to the relatively higher proportion of episodes with LOS of between one and nine days stay, and an associated relatively lower proportion of episodes between 10 and 40 days stay.



### 3.2 COMPARISON OF THE SERVICES INCLUDED IN MHCS COMPARED TO NATIONAL MENTAL HEALTH SERVICES

This section compares mental health service level characteristics data variables (e.g. volume of provided services, number of consumers, expenditure, etc.) in the MHCS data set (extracted from Data Return A)<sup>2</sup> to the corresponding data available in national data sets. The principal national data set used in this comparative analysis is the MHE data set 2012/2013. As private mental health services/hospitals are not contributors to the MHE they are not included in this analysis. It is important to note that the MHE data set made available for this analysis did not include services in Vic and WA.

#### 3.2.1 Representativeness of the available beds and number of episodes – admitted setting

Table 3.1 presents the average available beds and the number of admitted episodes by state/territory in the sample compared to the national population.

**Table 3.1: Average available beds and number of episodes for admitted consumers in the MHCS sample compared to national population data – admitted setting**

State/Territory	Average available beds for admitted mental health consumers				Sample proportion	Number of admitted episodes				
	Sample study sites (2013/14)		National (2012/2013)			Sample study sites (2013/14)		National (2012/2013)		Sample proportion
	N	% of total	N	% of total		N	% of total	N	% of total	
NSW	658	58%	2,669	55%	25%	7,970	45%	36,458	52%	22%
Vic	-	0%	-	0%	n.a.	-	0%	-	0%	n.a.
Qld	259	23%	1,455	30%	18%	4,542	26%	22,490	32%	20%
WA	142	12%	-	0%	n.a.	3,581	20%	-	0%	n.a.
SA	85	7%	452	9%	19%	1,687	9%	6,871	10%	25%
Tas	-	0%	131	3%	0%	-	0%	1,935	3%	0%
ACT	-	0%	70	1%	0%	-	0%	1,435	2%	0%
NT	-	0%	40	1%	0%	-	0%	1,097	2%	0%
<b>Total</b>	<b>1,144</b>	<b>100%</b>	<b>4,817</b>	<b>100%</b>	<b>21%*</b>	<b>17,780</b>	<b>100%</b>	<b>70,286</b>	<b>100%</b>	<b>20%*</b>

Source: 'Sample' HealthConsult MHCS data set 2015 – Data Return A; 'National' available beds for admitted mental health consumers from 'MHE 2012/13; and 'National' admitted episodes from APMHC NMDS 2012/13. Note tables may not add due to rounding errors. \*Sample representativeness calculation does not include WA in the numerator as no 'national' data were available.

Table 3.1 shows that for states where there are study sites and national population data available, the MHCS study sites represent 21 percent (1,002/4,817) of the available mental health beds for admitted consumers. In terms of admitted episodes, the MHCS study sites represent 20 percent (14,199/70,286) of the national total of admitted episodes. In terms of both beds and episodes the sample data set is considered representative of public mental health service organisations in at least three of the four participating states (NSW, Qld and SA). Of note, for public mental health services, four states/territories (Vic, Tas, ACT and NT) are not represented in the MHCS final data set.

<sup>2</sup> Note: Data Return A is reported service characteristic data for 2013/14 not actual activity data collected in the six months of the MHCS

**3.2.2 Representativeness of the proportion of consumers and service contacts – community setting**

Table 3.2 presents the number of consumers and service contacts by state/territory in the sample compared to the national population for the community setting.

**Table 3.2: Number of consumers and service contacts in the MHCS sample compared to ‘national’ population data – community setting**

State/Territory	Number of consumers				Sample representativeness	Number of service contacts				Sample representativeness
	Sample study sites		National			Sample study sites		National		
	N	% of total	N	% of total		N	% of total	N	% of total	
NSW	47,163	53%	485,908	68%	10%	322,801	40%	2,474,916	50%	13%
Vic	-	-	-	-	-	-	-	-	-	-
Qld	31,373	35%	115,565	16%	27%	323,163	40%	1,459,060	29%	22%
WA	7,134	8%	-	-	-	89,278	11%	-	-	-
SA	3,009	3%	83,615	12%	4%	72,731	9%	639,965	13%	11%
Tas	-	-	7,795	1%	-	-	-	75,330	2%	-
ACT	-	-	16,270	2%	-	-	-	267,887	5%	-
NT	-	-	9,827	1%	-	-	-	64,131	1%	-
<b>Total</b>	<b>88,679</b>	<b>100%</b>	<b>718,980</b>	<b>100%</b>	<b>11%*</b>	<b>807,973</b>	<b>100%</b>	<b>4,981,289</b>	<b>100%</b>	<b>14%*</b>

Source: ‘Sample’ HealthConsult MHCS data set 2015 – data Return A and ‘National’ MHE 2012/13. Note tables may not add due to rounding errors. \* Sample representativeness calculation does not include WA in the numerator as no national data were available.

Table 3.2 shows that in terms of the number of consumers that attend study sites (excluding WA from the numerator), the MHCS data set represents about 11 percent (81,545/718,980) of the national population. In terms of community service contacts provided by the study sites (again excluding WA from the numerator), the MHCS data set represents about 14 percent (718,695/4,981,289) of the national community mental health care population. Thus, in terms of both the number of consumers and number of service contacts, the sample data set is considered representative of public community mental health service organisations in at least three of the four participating states (NSW, Qld and SA). Of note, for public mental health services, four states/territories (Vic, Tas, ACT and NT) are not represented in the MHCS final data set.

**3.2.3 Representativeness of proportion of expenditure – admitted setting**

Table 3.3 presents the total expenditure by state/territory in the sample compared to the national mental health care population for the admitted setting.

**Table 3.3: Total expenditure in the MHCS ‘sample’ sites compared to national population data – admitted setting**

State/Territory	Sample study sites (2013/14)		National (2012/2013)		Sample representativeness
	\$'000	% of total	\$'000	% of total	
NSW	49,370	26%	812,607	41%	6%
Vic	-	-	326,782	16%	0%
Qld	69,300	37%	372,176	19%	19%
WA	55,906	30%	278,068	14%	20%
SA	12,630	7%	130,118	7%	10%
Tas	-	-	39,716	2%	0%
ACT	-	-	22,019	1%	0%
NT	-	-	17,820	1%	0%
<b>Total</b>	<b>\$187,206</b>	<b>100%</b>	<b>\$1,999,306</b>	<b>100%</b>	<b>9%</b>

Source: ‘Sample’ from the HealthConsult MHCS data set 2015 – Data Return A; ‘National’ from AIHW, 2012/13 expenditure on mental health services (national data represents the total of public psychiatric hospitals and specialised psychiatric units or wards in public acute hospitals). Note that tables may not add due to rounding errors.

Table 3.3 shows that the study sites in the MHCS data set represent about 9 percent (187,206/1,999,306) of the ‘national’ population expenditure on mental health services in the admitted setting. For the participating states, the coverage proportions vary from 6 percent in NSW through to 20 percent in WA. Thus, the sample population is considered representative for participating states, although within the sample population, there is under-representation of admitted setting mental health services in NSW.

### 3.2.4 Representativeness of the proportion of expenditure – community setting

Table 3.4 presents the total expenditure by state/territory in the sample compared to the national mental health care population for the community setting.

**Table 3.4: Total expenditure in the MHCS sample sites compared to national population data – community setting**

State/Territory	Sample study sites (2013/14)		National (2012/2013)		Sample representativeness
	\$'000	% of total	\$'000	% of total	
NSW	\$14,684	12%	\$498,676	28%	3%
Vic	-	-	\$401,606	22%	0%
Qld	\$80,327	64%	\$401,981	22%	20%
WA	\$25,732	20%	\$248,024	14%	10%
SA	\$5,256	4%	\$156,997	9%	3%
Tas	-	-	\$36,050	2%	0%
ACT	-	-	\$35,660	2%	0%
NT	-	-	\$23,509	1%	0%
<b>Total</b>	<b>\$125,999</b>	<b>100%</b>	<b>\$1,802,504</b>	<b>100%</b>	<b>7%</b>

Source: ‘Sample’ from the HealthConsult MHCS data set 2015 – Data Return A; ‘National’ from AIHW, 2012/13 expenditure on mental health services. Note tables may not add due to rounding errors.

Table 3.4 shows that the study sites in the MHCS data set represent about 7 percent (125,999/1,802,504) of the national population expenditure on mental health services in the community setting. For the participating states, the sample representativeness varies from 3 percent in NSW and SA through to 20 percent in Qld. Thus, the sample population is considered representative for participating states, although within the sample population, there is under-representation of community setting mental health services in NSW and SA.

## Analysis of the MHCS data set – Activity Data

This Chapter presents a high-level analysis of the activity data gathered in the MHCS (the detailed analysis is being done in the context of developing the AMHCC). The focus of the analysis is on the three new data elements (i.e. phase of care, mental health intervention and first recent episode of mental health care). The purpose of this analysis is to describe the activity data contained with the MHCS data set.

### 4.1 ‘ACTIVITY’ AND ‘COSTED ACTIVITY’ DATA BY STUDY SITE

For the purposes of the descriptive analyses presented in this report, two data sets have been defined (i.e. ‘activity’ and ‘costed activity’). Both data sets have been provided to IHPA to support classification development, as may be appropriate. The ‘activity’ data set represents the data submitted by sites after cleaning to ensure that what was reported against each data element complies with the DRS. The ‘costed activity’ data set reflects the subset of records where the costed data could be matched to the activity data at either the episode level, phase/service contact level or both (i.e. un-costed activities are the sole reason for exclusion in the ‘costed activity’ data set). The two *principal* reasons that the ‘costed activity’ data set has fewer records than the ‘activity’ data set is that some sites provided activity data for services that were not in-scope for costing purposes (so no match was possible) or the delayed collection of the new data elements meant a number of episodes had no associated phases of care recorded, which meant these episodes were not costed to the phase, and hence not included in the ‘costed activity’ data set. Table 4.1 presents the data by parent site by jurisdiction that is included in both MHCS data sets.

**Table 4.1: Comparison of the number of episodes and phases in the MHCS data set by parent site**

Study site	Consumers		Admitted				Consultation Liaison		Community				Residential			
	Activity	Costed activity*	Episodes		Phases		Activity	Costed activity	Episodes		Contacts <sup>6</sup>		Episodes		Phases	
			Activity	Costed activity	Activity	Costed activity			Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity
Children’s Hospital Westmead	946	833	93	89	112	108	775	29	886	765	8,065	6,503	-	-	-	-
Concord Centre for Mental Health	1,165	2155	3135	3060	3760	3745	32	32	2,061	1,167	1,849	1,817	-	-	-	-
Croydon Community Mental Health Service	1,416	1841	-	-	-	-	-	-	24,848	24,781	24,783	-	-	-	-	-
Hornsby Ku-Ring-Gai Hospital	4,032	2022	600	500	600	500	-	-	1,674	1,556	57,869	50,376	-	-	-	-
The Forensic Hospital	133	131	133	131	154	150	-	-	-	-	-	-	-	-	-	-
Macquarie Hospital	315	285	343	301	459	446	-	-	-	-	-	-	-	-	-	-
Royal North Shore Hospital	3,165	1651	543	446	543	446	-	-	1,884	1,237	25,033	22,639	-	-	-	-

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Study site	Consumers		Admitted				Consultation Liaison		Community				Residential			
	Activity	Costed activity*	Episodes		Phases		Activity	Costed activity	Episodes		Contacts <sup>6</sup>		Episodes		Phases	
			Activity	Costed activity	Activity	Costed activity			Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity
Wagga Wagga Base Hospital and Murrumbidgee Community Mental Health	3,391	2016	494	479	494	486	52	14	1,927	1,615	53,929	22,367	-	-	-	-
<b>NSW Total</b>	<b>14,563</b>	<b>10,934</b>	<b>5,341</b>	<b>5,006</b>	<b>6,122</b>	<b>5,881</b>	<b>859</b>	<b>75</b>	<b>33,280</b>	<b>31,121</b>	<b>171,528</b>	<b>103,702</b>	-	-	-	-
Central Queensland HHS	2,935	2516	566	518	1133	1102	-	-	3,384	2,422	43,086	10,755	-	-	-	-
Gold Coast HHS	6,951	0	2041	0	5312	0	-	-	7,420	-	116,303	-	-	-	-	-
Metro North HHS	2,168	2038	1600	1473	1189	1188	-	-	1,262	1,020	16,958	16,876	-	-	-	-
Townsville HHS	1,035	809	141	94	325	237	-	-	1,081	758	15,702	11,466	-	-	-	-
West Moreton HHS	5,387	4665	1059	978	2263	2256	-	-	6,225	3,742	74,664	61,187	-	-	-	-
<b>Qld – Total</b>	<b>18,476</b>	<b>10,028</b>	<b>5,407</b>	<b>3,063</b>	<b>10,222</b>	<b>4,783</b>	-	-	<b>19,372</b>	<b>7,942</b>	<b>266,713</b>	<b>100,284</b>	-	-	-	-
Albany Regional Hospital	1,558	1555	385	257	403	309	383	383	3,228	1,863	9,890	9,503	-	-	-	-
Broome Regional Hospital	178	108	143	141	393	393	130	-	66	-	4,889	-	-	-	-	-
Fremantle Hospital	3,690	2054	657	465	1196	1095	-	-	7,149	1,864	31,361	5,872	97	27	71	20
Graylands Selby-Lemnos and Special Care Health Service	510	510	592	592	1093	1093	-	-	-	-	-	-	-	-	-	-
Sir Charles Gairdner Hospital	561	545	651	626	1131	1088	-	-	-	-	-	-	-	-	-	-
<b>WA – Total</b>	<b>6,497</b>	<b>4,772</b>	<b>2,428</b>	<b>2,081</b>	<b>4,216</b>	<b>3,978</b>	<b>513</b>	<b>383</b>	<b>10,443</b>	<b>3,727</b>	<b>46,140</b>	<b>15,375</b>	<b>97</b>	<b>27</b>	<b>71</b>	<b>20</b>
Eastern Community Mental Health Centre	2,144	2139	0	0	0	0	-	-	1,852	1,758	31,968	31,320	-	-	-	-
Glenside Hospital	384	266	416	275	344	315	-	-	-	-	-	-	-	-	-	-
Lyell McEwin Hospital	342	316	373	337	639	601	-	-	-	-	-	-	-	-	-	-
Noarlunga Mental Health	262	162	0	0	0	0	-	-	-	-	-	-	260	176	358	262
<b>SA – Total</b>	<b>3,132</b>	<b>2,883</b>	<b>789</b>	<b>612</b>	<b>983</b>	<b>916</b>	-	-	<b>1,852</b>	<b>1,758</b>	<b>31,968</b>	<b>31,320</b>	<b>260</b>	<b>176</b>	<b>358</b>	<b>262</b>
SJoG Richmond Clinic	532	501	333	332	333	332	-	-	272	215	2,163	2,134	-	-	-	-
Toowong Private Hospital	332	324	292	292	292	292	-	-	88	76	1,910	1,910	-	-	-	-
SJoG Pinelodge Hospital	455	395	290	290	290	290	-	-	312	236	2,111	2,111	-	-	-	-
The Perth Clinic	1,008	1008	654	654	654	654	-	-	779	751	10,330	10,330	-	-	-	-
<b>Private – Total</b>	<b>2,327</b>	<b>2,228</b>	<b>1,569</b>	<b>1,568</b>	<b>1,569</b>	<b>1,568</b>	-	-	<b>1,451</b>	<b>1,278</b>	<b>16,514</b>	<b>16,485</b>	-	-	-	-
All public	42,668	28,617	13,965	10,762	21,543	15,558	1,372	458	64,947	44,548	516,349	250,681	357	203	429	282
<b>All sites</b>	<b>44,995</b>	<b>30,845</b>	<b>15,534</b>	<b>12,330</b>	<b>23,112</b>	<b>17,126</b>	<b>1,372</b>	<b>458</b>	<b>66,398</b>	<b>45,826</b>	<b>532,863</b>	<b>267,166</b>	<b>357</b>	<b>203</b>	<b>429</b>	<b>282</b>

Source: HealthConsult MHCS data set 2015. \* Final consumer counts are based on the Data Return G that can be matched to the Data Return E1/E2/E3/E1A/F/E3A files.<sup>6</sup> Service contact counts are based on number of unique MHNCSID/PersonID/SerConID combinations. This matching was required as some sites provided a new line of data for the same service contact for different StaffID, MHIC etc.

The MHCS has generated a significant volume of data, much greater than the previous sentinel study on mental health costs in Australia (the MH-CASC project), which undertook data collection from 1<sup>st</sup> September to 30<sup>th</sup> November, 1996. By way of comparison, the MHCS has generated costed data ('costed activity') on 30,845 individual consumers (18,002 in MH-CASC); and 58,359 episodes of care (20,553 in MH-CASC) of which 12,330 were admitted episodes (5,449 in MH-CASC), 45,826 were community episodes (14,049 in MH-CASC) and 203 were residential (1,055 in MH-CASC). MHCS also attempted to

count and cost Consultation Liaison (CL) services. Study sites found this task difficult, which resulted in only 458 costed CL contacts. Overall, MHCS has much greater numbers of admitted and community episodes than MH-CASC, although a lower number of residential episodes.

#### 4.2 OVERALL VOLUMES OF ‘ACTIVITY’ AND ‘COSTED ACTIVITY’ DATA BY SELECTED STUDY SITE CHARACTERISTICS

As part of the data quality assurance process, the submitted information was reviewed to ensure that the distribution of records received was consistent with aggregated analysis at the matched site level (matching was at the child site level). ‘Matched site level’ analysis was undertaken by setting (e.g. admitted, community or residential); target population (e.g. child, adolescent and youth, general, older persons and forensic); and location of service (e.g. metropolitan and non- metropolitan). A full listing of how sites were classified (at the child level) can be found in Appendix A. Table 4.2 presents the data by category in the ‘activity’ and ‘costed activity’ data sets.

**Table 4.2: Comparison of the number of episodes and phases by category by setting in the ‘activity’ and ‘costed activity’ data set**

Category	Consumers		Admitted				Consultation Liaison		Community				Residential			
	Activity	Costed activity	Episodes		Phases		Activity	Costed activity	Episodes		Contacts		Episodes		Phases	
			Activity	Costed activity	Activity	Costed activity			Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity
<b>Target Population</b>																
Child, Adolescent and Youth	5,804	3,952	562	359	1,047	734	809	51	5,539	3,841	91,763	39,941	0	0	0	0
General	35,588	24,911	14,259	11,452	20,102	14,906	547	394	57,202	40,435	419,620	217,854	357	203	429	282
Older person	2,047	1,158	466	279	1,014	541	16	13	2,134	1,228	19,880	8,115	-	-	-	-
Forensic	1,556	824	247	240	948	944	0	0	1,522	322	1,600	1,256	-	-	-	-
<b>Service location</b>																
Metropolitan	35,898	23,841	13,805	10,841	20,363	14,598	807	61	56,711	39,168	405,367	213,075	357	203	429	282
Non-Metropolitan	9,097	7,004	1,729	1,489	2,748	2,527	565	397	9,686	6,658	127,496	54,091	-	-	-	-

Source: HealthConsult MHCS data set 2015.

Table 4.2 demonstrates that the MHCS data set is spread across three dimensions of site characteristics. Consistent with sample characteristics, consumers (for whom episodes have been costed) are distributed across the defined target groups with (excluding forensic services):

- 13.2 percent of the activity was provided by services classified in the child, adolescent and youth target population group (compared to 32 percent in the general population, see ABS, 3235.0 Population by Age and Sex, Regions of Australia, 30 June 2013);
- 83 percent of the consumer activity was provided by services classified in the adult target population group (compared to 53 percent in the general population); and
- 3.9 percent of the consumer activity was provided by services classified in the older person target population group (compared to 14 percent in the general population).

There is also a spread of consumers (for whom episodes have been costed) from metropolitan and non-metropolitan areas, with:

- 77.3 percent of the consumer activity is provided by services in metropolitan areas (compared to 71 percent in the general population, see AIHW, 3218.0 Regional Population Growth, Australia, 2014); and
- 22.7 percent of the consumer activity is provided by services in non-metropolitan areas (compared to 29 percent in the general population).

### 4.3 PHASE OF CARE

Phase of care data was gathered across all three service settings (i.e. admitted, ambulatory/community and residential). Phase of care was defined as the ‘primary goal of care that is reflected in the consumer’s mental health treatment plan at the time of collection, for the next stage in the consumer’s care. It reflects the prospective assessment of the primary goal of care, rather than a retrospective assessment.’ Phase of care had five values in the data domains including 1 – acute, 2 – functional gain, 3 – consolidating gain, 4 – intensive extended and 5 – initial assessment. The business rules for the collection of phase of care varied by setting. In the admitted and residential setting, phase of care was to be collected on day of admission, then every subsequent 14 days post admission, then at discharge. In the community/ambulatory setting, phase of care was to be collected for each service contact. The following sections examine the distribution of the reported phase of care data in the three settings, and then some overall observations about the use of the phase of care data element are made.

#### 4.3.1 Analysis of phase of care in the admitted setting

Table 4.3 presents the distribution of phases of care that were assigned to the admitted consumers receiving services by jurisdiction.

**Table 4.3: Profile of phase of care – admitted episodes by jurisdiction**

Jurisdiction	Acute		Functional Gain		Intensive Extended		Consolidating Gain		Initial Assessment		Not Stated		Total	
	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total
NSW	4,875	83%	214	4%	661	11%	121	2%	10	0.2%	0	0%	5,881	100%
Qld	2,059	43%	1,451	30%	576	12%	400	8%	297	6%	0	0%	4,783	100%
WA	1,986	50%	549	14%	505	13%	717	18%	176	4%	45	1%	3,978	100%
SA	646	71%	162	18%	39	4%	49	5%	19	2%	1	0.1%	916	100%
<b>All public</b>	<b>9,566</b>	<b>62%</b>	<b>2,376</b>	<b>15%</b>	<b>1,781</b>	<b>11%</b>	<b>1,287</b>	<b>8%</b>	<b>502</b>	<b>3%</b>	<b>46</b>	<b>0.3%</b>	<b>15,558</b>	<b>100%</b>
Private	1,568	100%	-	0%	-	0%	-	0%	-	0%	-	0%	1,568	100%
<b>All sites</b>	<b>11,134</b>	<b>65%</b>	<b>2,376</b>	<b>14%</b>	<b>1,781</b>	<b>10%</b>	<b>1,287</b>	<b>8%</b>	<b>502</b>	<b>3%</b>	<b>46</b>	<b>0.3%</b>	<b>17,126</b>	<b>100%</b>

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding.

Table 4.3 shows that the predominant phase of care assigned to consumers in the admitted setting was ‘acute’ (62 percent). In NSW (83 percent) and SA (71 percent), the majority of phases of care were assigned ‘acute’. For the Qld and WA, 43 percent and 50 percent of consumers respectively had an ‘acute’ phase of care assigned, suggesting that these services cater for a mix of phases. For the private sites, ‘acute’ phase of care was the only phase assigned.



### 4.3.2 Analysis of phase of care in the community setting

Table 4.4 presents the distribution of phases of care that were assigned to the ambulatory/community consumers receiving services by jurisdiction.

**Table 4.4: Profile of phase of care – community service contacts by jurisdiction**

Jurisdiction	Acute		Functional Gain		Intensive Extended		Consolidating Gain		Initial Assessment		Not Stated		Total	
	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total
NSW	35,196	34%	17,562	17%	11,975	11%	17,655	17%	2,149	2%	20,056	19%	104,593	100%
Qld	6,029	6%	18,167	18%	3,301	3%	11,157	11%	4,129	4%	57,501	57%	100,284	100%
WA	1,748	11%	2,980	19%	1,286	8%	2,391	15%	3,363	22%	3,765	24%	15,533	100%
SA	2,648	9%	7,222	23%	1,832	6%	4,086	13%	912	3%	14,620	47%	31,320	100%
<b>All public</b>	<b>45,621</b>	<b>18%</b>	<b>45,931</b>	<b>18%</b>	<b>18,394</b>	<b>7%</b>	<b>35,289</b>	<b>14%</b>	<b>10,553</b>	<b>4%</b>	<b>95,942</b>	<b>38%</b>	<b>251,730</b>	<b>100%</b>
Private	3,013	18%	11,544	70%	149	0.9%	1,426	9%	93	0.6%	260	2%	16,485	100%
<b>All sites</b>	<b>48,634</b>	<b>18%</b>	<b>57,475</b>	<b>21%</b>	<b>18,543</b>	<b>7%</b>	<b>36,715</b>	<b>14%</b>	<b>10,646</b>	<b>4%</b>	<b>96,202</b>	<b>36%</b>	<b>268,215</b>	<b>100%</b>

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding. Note some service contacts have multiple phases recorded due to multiple staff involved in same service contact.

Review of Table 4.4 suggests a systematically different assignment of phase of care in NSW relative to the other jurisdictions. About one third (34 percent) of all community service contacts were assigned to ‘acute’ in NSW, compared to the average across all sites of 18 percent. This difference suggests that the nature of the services in the NSW community sites was different to other jurisdictions (i.e. they are targeted more at ‘acute’ consumers), or there were differences in the way in which the phase of care data element was interpreted. From the data it is difficult to be certain about cause and effect, but given the difficulties reported by sites in interpreting phase of care, it is considered that at least part of the difference is due to variation of practices for recording the data element. This conclusion is further reinforced by the fact that a high proportion of service contacts had no phase of care captured and/or assigned (36 percent). The ‘not stated’ rate was highest in Qld, which reflects the way phase of care was captured by these study sites (refer to Chapter 5, section 5.2).

### 4.3.3 Analysis of phase of care in the residential setting

Table 4.5 presents the distribution of phases of care that were assigned to the residential care episodes by state.

**Table 4.5: Profile of phase of care – residential care episodes by state**

Jurisdiction	Acute		Functional Gain		Intensive Extended		Consolidating Gain		Initial Assessment		Not Stated		Total	
	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total
WA	3	15%	7	35%	4	20%	6	30%	-	0%	-	0%	20	100%
SA	20	8%	194	74%	14	5%	28	11%	5	2%	1	0.4%	262	100%
<b>All sites</b>	<b>23</b>	<b>8%</b>	<b>201</b>	<b>71%</b>	<b>18</b>	<b>6%</b>	<b>34</b>	<b>12%</b>	<b>5</b>	<b>2%</b>	<b>1</b>	<b>0.4%</b>	<b>282</b>	<b>100%</b>

Source: HealthConsult MHCS ‘Costed activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding.

Due to the small number of episodes from residential care mental health services being included in the ‘costed activity’ data set, it is difficult to draw any substantial conclusions about the phase of care data element in that setting. From the data available, the great majority of reported phases were ‘functional gain’, which is consistent with expectations for a residential care mental health service.

4.3.4 Analysis of number of Phase of Care

Phase of care was a new concept introduced for the MHCS, in line with the UQ recommendations. The collection of phase of care data in the MHCS is regarded as the first step in a process of refining the data element with a view to its potential ongoing usage. To provide further insight into the use of phase of care in the MHCS, Table 4.6 examines the frequency of use in the admitted, community and residential mental health care settings.

In reviewing the data, it should be noted that not all costed phases had corresponding costed episodes. As phase of care was adopted as the most granular unit for costing purposes, costed phases of care for which there was no corresponding costed episode were not removed from the ‘costed activity’ data set, so as to maximise the quantum of data available for classification development. Also of relevance is that the data model that underpinned the DRS did not require there to be an open community episode for a consumer to receive a service contact from a community based mental health service provider (as this reflects the situation in practice). Taking these issues into account, the number of costed episodes for which there are complete phase of care is less than what is shown in Table 4.1, but these records provide the most information on how the phase of care data element was used, and are the basis for Table 4.6.

Table 4.6: Average, and distribution of the number of phase changes per episode by jurisdiction and service setting

Jurisdiction	Episodes by number of Phases of Care changes												Total Episodes	Average Phase of Care changes / Episode
	0		1		2		3		4		5+			
	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total	N	% of total		
<b>Total Admitted Episodes</b>	<b>8,139</b>	<b>76%</b>	<b>1,860</b>	<b>17%</b>	<b>424</b>	<b>4%</b>	<b>147</b>	<b>1%</b>	<b>72</b>	<b>1%</b>	<b>120</b>	<b>1%</b>	<b>10,762</b>	<b>0.4</b>
NSW	4,454	90%	324	7%	140	3%	33	1%	12	0.2%	5	0.1%	4,968	0.2
Qld	868	54%	518	32%	94	6%	46	3%	34	2%	56	4%	1,616	0.9
WA	823	41%	894	45%	156	8%	53	3%	21	1%	54	3%	2,001	0.9
SA	426	70%	124	20%	34	6%	15	3%	5	1%	5	1%	609	0.5
Private	1,568	100%	0	0%	0	0%	0	0%	0	0%	0	0%	1,568	0.0
<b>Total Community Episodes</b>	<b>10,408</b>	<b>52%</b>	<b>2,273</b>	<b>11%</b>	<b>1,758</b>	<b>9%</b>	<b>913</b>	<b>5%</b>	<b>830</b>	<b>4%</b>	<b>3,917</b>	<b>20%</b>	<b>20,099</b>	<b>3.6</b>
NSW	3,674	59%	373	6%	454	7%	179	3%	258	4%	1,314	21%	6,252	5.2
Qld	3,016	42%	1,029	14%	818	12%	436	6%	330	5%	1,515	21%	7,144	3.1
WA	2,690	73%	509	14%	226	6%	108	3%	49	1%	86	2%	3,668	0.6
SA	238	14%	135	8%	155	9%	135	4%	158	9%	936	53%	1,757	7.8
Private	790	62%	227	18%	105	8%	55	4%	35	3%	66	5%	1,278	1.0
<b>Total Residential Episodes</b>	<b>140</b>	<b>75%</b>	<b>32</b>	<b>17%</b>	<b>11</b>	<b>6%</b>	<b>3</b>	<b>2%</b>	<b>0</b>	<b>0%</b>	<b>2</b>	<b>1%</b>	<b>188</b>	<b>0.5</b>
WA	7	58%	3	25%	1	8%	1	8%	0	0%	0	0%	12	0.7
SA	133	76%	29	17%	10	6%	2	1%	0	0%	2	1%	176	0.5

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that this analysis is based on fewer episodes than Table 4.1 as only episodes that had completely matched cost data at the episode and phase levels were used.

Review of Table 4.6 shows that no phase change was recorded for 76 percent of episodes in the admitted setting. This proportion varied across jurisdiction from as low as 41 percent in WA to as high as 100 percent in the private sector, where consumers were always assigned to the ‘acute’ phase of care. At the other end of the spectrum, five or more phase changes were recorded in 4 percent of the admitted episodes in Qld, with WA being the only other

jurisdiction to record above 1 percent. Overall, excluding the private sector, where there was no phase change, the average number of phase changes per episode in the admitted setting ranged from 0.2 in NSW through to 0.9 in Qld and WA.

In the community setting, no phase change was recorded for a much lower 52 percent of episodes. Again, there was very wide variation in this proportion across jurisdictions ranging from a low of 14 percent in SA to a high of 73 percent in WA. Consistent with the observation that there were many more phase changes for community episodes, five or more phase changes were recorded in 53 percent of community episodes in SA with the minimum being 2 percent in WA. Overall, the average number of phase changes per episode in the community setting ranged from 0.6 in WA to 7.8 in SA, a much wider spread than for the admitted setting. Finally, the limited available data for the residential setting mirror the results for the admitted setting.

This analysis should be balanced with feedback from study sites around the difficulties in interpreting and collecting the phase of care data element. For admitted episodes it appears that about one in four episodes can be expected to have one or more phase changes, and it is possible that these changes are significant in terms of consumer cost (a factor to be examined more closely in the classification development process). It appears that about one in two community episodes can be expected to have one or more phase changes so the concept may be very significant in classification development, especially if the classification will be at the episode rather than service contact level. Finally, as the MHCS represented the first test of the phase of care concept, further data development work is being undertaken by IHPA as part of the classification development and other downstream processes.

#### 4.4 MENTAL HEALTH INTERVENTION CLASSIFICATION

Another new data element specific to the MHCS was the collection of mental health intervention data using the mental health intervention classification (MHIC) codes developed by the AIHW. The business rule was that MHIC codes should be assigned for any mental health specific interventions as defined by the AIHW MHIC in any setting in which they occurred. The following sections examine the distribution of the intervention data in the three settings (i.e. admitted, ambulatory/community and residential), and then some overall observations about the mental health intervention data element are made.

##### 4.4.1 Average number of MHIC codes per phase of care in the admitted setting

Table 4.7 presents the average number of MHIC codes recorded per episode, per phase of care and per day of stay in the admitted setting.

**Table 4.7: Average number of MHIC codes per episode, per phase and per day of stay – admitted setting**

Jurisdiction	Average number of MHIC codes per episode	Average number of MHIC codes per Phase of Care					Average number of MHIC codes per bed day
		Acute	Functional Gain	Intensive Extended	Consolidating Gain	Initial Assessment	
NSW	42.5	18.1	152.0	124.5	62.1	9.2	2.0
Qld	37.8	19.5	26.8	40.8	25.9	9.1	1.6
WA	114.4	90.7	23.9	48.1	25.3	12.2	6.9
SA	267.5	223.3	83.4	104.3	24.7	35.5	11.9
<b>All public</b>	<b>67.8</b>	<b>47.3</b>	<b>41.3</b>	<b>75.3</b>	<b>28.9</b>	<b>11.2</b>	<b>3.2</b>
Private	83.7	83.3	-	-	-	-	4.3
<b>All admitted</b>	<b>69.9</b>	<b>52.4</b>	<b>41.3</b>	<b>75.3</b>	<b>28.9</b>	<b>11.2</b>	<b>3.3</b>

Source: HealthConsult MHCS 'Costed Activity' data set 2015. Please note that numbers in the above tables may not add due to rounding.

The data show that, on average, there were 69.9 MHIC codes recorded per admitted consumer episode, which represents 3.3 MHIC codes recorded per day of consumer stay. There was significant variability between the jurisdictions, from 37.8 MHIC codes per episode in Qld to 267.5 MHIC codes per episode in SA. The same variation can be seen in the average MHIC codes per day of stay, which ranges from 1.6 per day in Qld to 11.9 per day in SA. Examining the average number of MHIC codes collected by phase of care also reveal wide variation. For example, study sites in NSW recorded well below the national average MHIC codes per ‘acute’ phase of care (18.1 compared to 52.4) but much closer to, although still below, average for the other phase of care types. In contrast, study sites in SA recorded well above national average MHIC codes per intervention for ‘acute’ phases of care (222.3 compared to 52.4) ranging through to below average for the ‘consolidating gain’ phase of care (24.7 compared to 28.9).

**4.4.2 Number of MHIC codes per phase of care in the community setting**

Table 4.8 presents the average number of MHIC codes per episode, per phase of care and per service contact in the community setting.

**Table 4.8: Average number of MHIC codes per episode, per phase and per service contact – community setting**

Jurisdiction	Average number of MHIC codes per episode	Average number of MHIC codes per Phase of Care						Average number of MHIC codes per service contact
		Acute	Functional Gain	Intensive Extended	Consolidating Gain	Initial Assessment	Not Stated	
NSW	6.5	2.9	1.1	1.2	1.6	3.8	1.5	1.9
Qld	14.5	1.3	1.2	1.3	1.2	1.2	1.1	1.1
WA	11.4	3.7	3.4	2.9	3.5	3.9	0.0	2.7
SA	52.8	4.5	2.6	2.8	3.0	7.1	2.6	3.0
<b>All public</b>	<b>10.2</b>	<b>2.8</b>	<b>1.6</b>	<b>1.5</b>	<b>1.8</b>	<b>3.1</b>	<b>1.4</b>	<b>1.8</b>
Private	16.7	1.1	1.3	1.2	2.1	1.2	1.1	1.3
<b>All Community</b>	<b>10.4</b>	<b>2.7</b>	<b>1.5</b>	<b>1.5</b>	<b>1.8</b>	<b>3.1</b>	<b>1.4</b>	<b>1.8</b>

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding.

That data show that, on average, there were 10.4 MHIC codes reported per episode and 1.8 MHIC codes per service contact. As seen in the admitted data, there was significant variation in the number of MHIC codes per episode, ranging from 6.5 in NSW to 52.8 in SA. Variability in MHIC codes per service contact ranged from 1.1 in Qld to 3.0 in SA. Across the phases of care, most MHIC codes were recorded for the ‘initial assessment’ phase (average 3.1, ranging from 1.2 in Qld and the private sector, through to 7.1 in SA). This variation reflects the qualitative feedback received from the study sites and the FMTs which suggested different levels of emphasis were placed on the collection of mental health intervention data.

**4.4.3 Number of MHIC per Phase of care in the residential setting**

Table 4.9 presents the average number of MHIC codes per episode, per phase of care and per bed day in the residential setting.

**Table 4.9: Average number of MHIC codes per episode, per phase and per day of stay – residential setting**

Jurisdiction	Average number of MHIC codes per episode	Average no. of MHIC codes per phase					Average number of MHIC codes bed day
		Acute	Functional Gain	Intensive Extended	Consolidating Gain	Initial Assessment	
WA	6.6	7.3	12.9	3.0	9.2	-	0.4
SA	55.9	14.8	43.6	67.9	3.5	5.2	2.9
<b>All Residential</b>	<b>49.3</b>	<b>13.8</b>	<b>42.6</b>	<b>53.4</b>	<b>4.5</b>	<b>5.2</b>	<b>2.6</b>

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding.

As already stated, these data are drawn from a small sample size, so they must be cautiously interpreted. Notwithstanding the small number of sites, there is a significant difference in the average number of MHIC codes per episode of 6.6 in WA to 55.9 in SA. The overall difference is mirrored across all the phases of care except ‘consolidating gain’, where WA reports 9.2 MHIC codes per phase and SA reports only 3.5.

**4.4.4 Frequency of use of MHIC codes by setting**

The MHIC codes that were collected during the MHCS were categorised into 11 major groupings. The proportion of reported MHIC codes falling into each grouping across the three settings is presented in Table 4.10.

**Table 4.10: MHIC groupings by setting**

MHIC grouping	Admitted (%)	Community (%)	Residential (%)
Assessment and Review	34.2%	29.5%	34.5%
Detoxification from alcohol and other drugs	0.3%	0.1%	0.0%
Emergency interventions	0.7%	0.0%	0.1%
Interventions Specific to Aboriginal liaison team	0.1%	0.0%	0.0%
Pharmacotherapy prescription	4.4%	0.2%	0.0%
Pharmacotherapy review	3.4%	4.8%	0.5%
Security	3.1%	0.0%	0.0%
Service coordination interventions	15.8%	40.3%	17.2%
Structured psychological therapies	17.8%	13.7%	7.3%
Therapies using agents not elsewhere classified	0.2%	0.1%	0.0%
Other interventions not elsewhere specified	20.1%	11.2%	40.3%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding.

Table 4.10 shows that, in the admitted setting, assessment and review (34.2 percent) was the most used category, followed by other interventions not elsewhere specified (20.1 percent), structured psychological therapies (17.8 percent) and service coordination interventions (15.8 percent). In the community setting, the category with the highest frequency of use was service coordination interventions (40.3 percent), followed by assessment and review (29.5

percent) and structured psychological therapies (13.7 percent). In the residential setting, the most used category of MHIC codes was other interventions not elsewhere specified (40.3 percent). These data are difficult to interpret, except to combine with the qualitative feedback, through which most study sites reported that the MHIC codes were not comprehensive (i.e. there were many mental health service interventions missing) which resulted in the higher than desired use of ‘other interventions not elsewhere specified’ category.

Breaking the data down further, Table 4.11 presents the top 10 MHIC codes used in the admitted setting, which represented 49 percent of all MHIC codes used in that setting. Consistent with the qualitative feedback from sites, the most frequently used MHIC code was 9011 ‘Other interventions not elsewhere specified’. MHIC codes 1021.04, 1021.01, 1041 and 1999 are all part of the assessment and risk review MHIC grouping category. 8011.01, 8011.02, 8011.05 and 8011.AA<sup>3</sup> are part of the service coordination interventions and 3061 is part of the structured psychological therapies category.

**Table 4.11: Top 10 MHIC Codes – Admitted**

No.	MHIC Code	MHIC Description	Count of MHIC	% of total
1	9011	Other interventions not elsewhere specified	93,963	10.9%
2	1021.04	Risk Assessment	72,462	8.4%
3	1021.01	Mental health assessment	59,789	6.9%
4	8011.02	Liaison with other professionals	34,397	4.0%
5	1041	Physical assessment	30,324	3.5%
6	8011.01	Case conferencing	27,936	3.2%
7	8011.05	Other service coordination	28,817	3.3%
8	8011.AA	Ad Hoc/other review	24,593	2.9%
9	3061	Skills training - Individual	25,157	2.9%
10	1999	Other assessment	24,193	2.8%
N/A	N/A	Other MHIC codes	439,734	51.1%
<b>Total all admitted sites</b>			<b>861,365</b>	<b>100.0%</b>

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding.

Table 4.12 presents the top 10 MHIC codes used in the community setting, which represented 67 percent of all MHIC codes used in the community setting. MHIC codes 8011.01, 8011.05, 8011.02 and 8011.AA are part of the service coordination interventions. Again ‘other interventions not elsewhere specified’ features second on the list. Codes 1021.08, 1021, 1021.04, 1021.01, and 1021.07 are all part of the assessment and risk review category of MHIC codes. Note that codes 1021.04 and 1021.01 also featured in the top 10 for the admitted setting (numbers two and three, see Table 4.11).

<sup>3</sup> MHCS specific MHIC code included in a study sites final data set (i.e. not part of AIHW published code list)

**Table 4.12: Top 10 MHIC Codes – Community**

No.	MHIC Code	MHIC Description	Count of MHIC	% of total
1	8011.01	Case conferencing	93,171	19.7%
2	9011	Other interventions not elsewhere specified	36,322	7.7%
3	1021.08	Development of a further action plan	35,983	7.6%
4	8011.05	Other service coordination	28,188	5.9%
5	8011.02	Liaison with other professionals	24,955	5.3%
6	1021	Comprehensive mental health assessment	24,023	5.1%
7	8011.AA	Ad Hoc/other review	23,521	5.0%
8	1021.04	Risk Assessment	20,628	4.4%
9	1021.01	Mental health assessment	16,292	3.4%
10	1021.07	Assessment summary and clinical formulation	14,103	3.0%
N/A	N/A	Other MHIC codes	156,631	33.1%
<b>All community sites</b>			<b>473,817</b>	<b>100.0%</b>

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding.

Table 4.13 presents the top 10 MHIC codes used in the residential setting, which represented 93 percent of all MHIC codes used in that setting. As with the admitted setting, ‘other interventions not elsewhere specified’, was the most frequently used MHIC code (40.3 percent of all codes). Of the other codes in the top 10, MHIC codes 8011.02 and 8011.05 are part of the service coordination interventions. Codes 1021.01, 1021.05, 1021.07, 1021.04, and 1041 are all part of the assessment and risk review category of MHIC codes and 3031 and 3061.00 are part of the structured psychological therapies category.

**Table 4.13: Top 10 MHIC Codes – Residential**

No.	MHIC Code	MHIC Description	Count of MHIC	% of total
1	9011	Other interventions not elsewhere specified	4,039	40.3%
2	8011.02	Liaison with other professionals	1,142	11.4%
3	1021.01	Mental health assessment	842	8.4%
4	1021.05	Medication Assessment	1,128	11.3%
5	8011.05	Other service coordination	561	5.6%
6	1021.07	Assessment summary and clinical formulation	713	7.1%
7	1021.04	Risk Assessment	337	3.4%
8	3031	Psychoeducation - Individual	224	2.2%
9	1041	Physical assessment	173	1.7%
10	3061.00	Skills training - Individual	163	1.6%
N/A	N/A	Other MHIC codes	691	6.9%
<b>All residential sites</b>			<b>10,013</b>	<b>100.0%</b>

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding.

Review of these data strongly supports the qualitative assessment made by the study sites, that considerable refinement of the MHIC is required before it can be confidently used to record mental health interventions. This assertion is borne out by the fact that one code, 9011 ‘Other interventions not elsewhere specified’, ranked first in frequency of use in the admitted and residential care setting and second in the community setting. This finding also lends support

to the advice provided by some stakeholders that the AIHW had originally developed the MHIC for use in the community setting, and there had been no data development work nor pilot testing done in relation to its potential use in the admitted or residential settings.

#### 4.5 FIRST RECENT EPISODE OF MENTAL HEALTH CARE

The final new data element specific to the MHCS was the collection of data on first recent episode of mental health care. First recent episode was defined to record whether the consumer had received a mental health intervention from the same mental health services organisation within the previous five years. Two options were provided for in the DRS to report this data element. One option was named *Date of discharge* from most recent mental health episode and the second (preferred option) named *first recent episode of mental health care*. The former was the date (month and year) when the most recent admitted, ambulatory or residential care episode delivered by the mental health organisation of the service unit reporting the current episode was completed. The latter is whether a consumer has presented to the mental health service organisation in the last five years for care that meets the definition of the mental health care type. Only one of these data elements was required to be reported for each episode in the MHCS, and the data were study site dependent.

Table 4.14 presents the proportion of consumers that had a first recent episode (i.e. seen by study sites within the past five years) compared to consumers with no prior episode (or not seen by study site for more than five years).

**Table 4.14: Proportion of consumers that had a prior first recent episode of mental health care by setting**

Jurisdiction	Number of admitted consumers		% of admitted consumers with a prior first recent episode	Number of community consumers		% of community consumers with a prior first recent episode	Number of residential consumers		% of residential consumers with a prior first recent episode
	Yes, had a prior first recent episode	No prior first recent episode		Yes, had a prior first recent episode	No prior first recent episode		Yes, had a prior first recent episode	No prior first recent episode	
NSW	3,657	1,349	73%	18,757	12,364	60%	-	-	0%
Qld	2,502	561	82%	5,843	2,099	74%	-	-	0%
WA	1,972	109	95%	1,034	2,693	28%	5	22	19%
SA	458	154	75%	1,227	531	70%	133	43	76%
<b>All public</b>	<b>8,589</b>	<b>2,173</b>	<b>80%</b>	<b>26,861</b>	<b>17,687</b>	<b>60%</b>	<b>138</b>	<b>65</b>	<b>68%</b>
Private	993	575	63%	1,005	273	79%	-	-	0%
<b>All sites</b>	<b>9,582</b>	<b>2,748</b>	<b>78%</b>	<b>27,866</b>	<b>17,960</b>	<b>61%</b>	<b>138</b>	<b>65</b>	<b>68%</b>

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Please note that numbers in the above tables may not add due to rounding.

Review of the data shows that, in the admitted setting, overall 78 percent of consumers had a first recent episode of mental health care provided by the study site. This proportion varied by jurisdiction, from 63 percent for the private sites up to 95 percent in WA. In the community setting, 61 percent of consumers had a first recent episode, which varied by jurisdiction from 28 percent in WA to 79 percent in the private sites. In the residential setting, 68 percent of consumers had a first recent episode, which varied greatly by jurisdiction from 19 percent in WA to 76 percent in SA. Across all settings, most consumers had been seen by the study sites within the last five years. Qualitative feedback from study sites suggests that, most commonly, this data element was system determined (i.e. the consumer had previously been registered with, and had been provided with treatment and care by, the mental health service) and, as such, could be expected to be reasonably accurate.



## Analysis of the MHCS data set – Cost Data

This Chapter presents a high-level analysis of the cost data generated by the MHCS. As with activity data, the focus is on the new data elements phase of care and first recent episode of mental health care. Descriptive analysis has not been presented using the MHIC codes due to the variable quality of this data element. The cost data analysis does not include the residential setting as there were only two study sites (i.e. to preserve confidentiality of individual sites). No cost data has been excluded/trimmed from the analysis presented in this Chapter as the purpose is to describe the data contained in the MHCS data set. The detailed analysis of cost drivers, and any trimming of the data that may be considered, is being done in the context of developing the AMHCC by IHPA.

In reviewing this Chapter, readers should recall that, as part of the capability building focus of the MHCS, the costing was done by, or on behalf of the study sites, according to the standardised costing methodology specified by the Consortium (i.e. Part D of the MHCS Manual). FMTs were responsible for working with study sites to quality assure the submitted data, and considerable resources were invested in this process. As a further quality assurance check, this Chapter also discusses the identified cost variation in the MHCS data set and presents a comparative analysis to the Round 17 NHCDC data set.

### 5.1 OVERALL VOLUMES OF COST DATA ACCOUNTED FOR IN THE MHCS

Table 5.1 summarises the quantum of costs accounted for in the MHCS data set for the admitted and community settings.

**Table 5.1: Costs accounted for in the MHCS for admitted and community settings**

Jurisdiction	Admitted			Community		
	Total Cost	Number of episodes	Average cost per episode	Total Cost*	Number of service contacts	Average cost per service contact
NSW	\$111,488,258	5,006	\$22,271	\$15,224,356	103,702	\$147
Qld	\$142,611,776	3,063	\$46,560	\$35,799,554	100,284	\$357
WA	\$51,562,781	2,081	\$24,778	\$7,233,363	15,375	\$470
SA	\$14,447,704	612	\$23,607	\$4,316,644	31,320	\$138
<b>All public</b>	<b>\$320,110,518</b>	<b>10,762</b>	<b>\$29,745</b>	<b>\$62,573,917</b>	<b>250,681</b>	<b>\$250</b>
Private	\$15,635,372	1,568	\$9,972	\$2,116,575	16,485	\$128
<b>All sites</b>	<b>\$335,745,890</b>	<b>12,330</b>	<b>\$27,230</b>	<b>\$64,690,493</b>	<b>267,166</b>	<b>\$242</b>

Source: HealthConsult MHCS 'Costed Activity' data set 2015; \* Includes only costed service contacts, community services costed only at the episode level are excluded.

Table 5.1 shows that, excluding the residential setting, the MHCS data set includes \$400.4m in mental health service costs. The 12,330 costed admitted episode account for \$335.7m, at an average cost per episode of \$27,230. The 267,166 costed community service contacts account for \$64.7m, at an average cost per service contact of \$242. Across the jurisdictions, Table 5.1 shows that the average cost per episode in Qld of \$46,560 is noticeably higher than the other jurisdictions, with the next highest being WA at \$24,778. In the community setting, WA has the highest average cost per service contact at \$470, followed by Qld at \$357. Private sector average costs are systematically lower than the public sector, however the costs base is different so direct comparison is not valid.

## 5.2 ANALYSIS OF COSTS IN THE ADMITTED SETTING

Table 5.2 presents the profile of costs per episode in the MHCS data set in the admitted setting by the selected study site characteristics.

**Table 5.2: Distributions of cost per episode – Admitted setting**

Jurisdiction	Number of Episodes*	Distribution of cost per episode					
		25 <sup>th</sup> percentile	Median	75 <sup>th</sup> percentile	Inter-quartile range	Average	Coefficient of Variation
NSW	5,006	\$1,404	\$3,668	\$17,483	\$16,079	\$22,271	2.51
Qld	3,063	\$6,705	\$18,545	\$53,297	\$46,591	\$46,560	1.71
WA	2,081	\$5,354	\$13,260	\$28,916	\$23,562	\$24,778	1.44
SA	612	\$7,341	\$15,547	\$30,135	\$22,794	\$23,607	1.09
<b>All public</b>	<b>10,762</b>	<b>\$2,355</b>	<b>\$9,908</b>	<b>\$29,605</b>	<b>\$27,249</b>	<b>\$29,745</b>	<b>2.03</b>
Private	1,568	\$4,554	\$8,839	\$13,087	\$8,532	\$9,972	0.75
<b>All Admitted</b>	<b>12,330</b>	<b>\$2,644</b>	<b>\$9,619</b>	<b>\$25,262</b>	<b>\$22,619</b>	<b>\$27,230</b>	<b>2.09</b>
<b>Target Population</b>							
Child, Adolescent and Youth	359	\$3,589	\$12,549	\$34,182	\$30,594	\$39,363	2.89
General	11,452	\$2,497	\$9,055	\$22,527	\$20,030	\$22,793	1.92
Older Persons	279	\$12,666	\$35,823	\$80,991	\$68,325	\$51,099	0.97
Forensic	240	\$129,266	\$157,422	\$208,208	\$78,942	\$193,065	0.80
<b>Service Location</b>							
Metropolitan	10,841	\$2,270	\$9,061	\$23,548	\$21,278	\$25,623	2.01
Non-metropolitan	1,489	\$6,119	\$15,024	\$39,454	\$33,335	\$38,931	2.20

Source: HealthConsult MHCS 'Costed Activity' data set 2015.

Table 5.2 shows that the public sector median cost per episode varied in a wide range from \$3,668 for NSW study sites through to \$18,545 for Qld sites, a spread of just over five to one. The average cost per episode varied in a smaller range from \$22,271 in NSW through to \$46,560 in Qld, a spread of just over two to one. The average costs per episode are much higher than the median costs due to the presence of high cost outliers in the data. In fact, some episodes had costs in excess of \$1m due to long LOS (refer to Appendix C), as illustrated by the higher average and median costs per episode for forensic services, where LOS is greater. Two common measures of spread are shown in each row, the inter-quartile range (IQR) and the coefficient of variation (CV, standard deviation divided by the mean). Except for private sector study sites (CV<1.0), both measures indicate a significant spread in the data, which is not

surprising, as there is no casemix adjustment. The purpose of the project is to provide a data set to underpin the development of a casemix classification system.

More insight into the variation in the admitted setting cost data can be gained by looking at the cost per bed day, which takes out the effect of the differences in LOS, particularly the impact of the high proportion of same day episodes included in the NSW data. Table 5.3 presents the profile of costs per bed day in the admitted setting by the selected study site characteristics.

**Table 5.3: Distributions of cost per bed day – Admitted setting**

Jurisdiction	Number of bed days	Cost per bed day (\$)					
		25 <sup>th</sup> percentile	Median	75 <sup>th</sup> percentile	Inter-quartile range	Average*	Coefficient of Variation
NSW	111,578	\$946	\$1,297	\$1,472	\$526	\$1,571	3.21
Qld	73,512	\$1,381	\$2,259	\$4,845	\$3,463	\$4,917	2.27
WA	34,624	\$1,322	\$1,704	\$1,917	\$595	\$1,643	0.68
SA	13,759	\$745	\$1,076	\$1,397	\$652	\$1,206	0.70
<b>All public</b>	<b>233,473</b>	<b>\$1,019</b>	<b>\$1,424</b>	<b>\$2,092</b>	<b>\$1,072</b>	<b>\$2,513</b>	<b>2.81</b>
Private	30,880	\$511	\$543	\$574	\$63	\$531	0.20
<b>All sites</b>	<b>264,353</b>	<b>\$773</b>	<b>\$1,361</b>	<b>\$1,940</b>	<b>\$1,166</b>	<b>\$2,263</b>	<b>2.93</b>
<b>Target population</b>							
Child, Adolescent and Youth	7,202	\$483	\$2,048	\$5,030	\$4,546	\$4,303	2.00
General	207,094	\$779	\$1,370	\$1,915	\$1,136	\$2,233	2.99
Older Persons	13,911	\$609	\$1,089	\$1,912	\$1,303	\$1,496	1.25
Forensic	36,146	\$807	\$953	\$1,587	\$780	\$1,483	0.98
<b>Service location</b>							
Metropolitan	245,653	\$700	\$1,305	\$1,789	\$1,089	\$1,917	3.32
Non-metropolitan	18,700	\$1,408	\$2,237	\$5,321	\$3,913	\$4,801	1.63

Source: HealthConsult MHCS 'Costed Activity' data set 2015; \* Average cost per bed day is calculated at the episode level.

Review of Table 5.3 shows that the median cost per bed-day, excluding the private sector sites, varied from \$1,076 in SA study sites through to \$2,259 for Qld sites, a spread of 2.1 to one (as expected, much narrower than cost per episode). Also excluding private sector sites, average cost per bed day varied from \$1,206 in SA to \$4,917 in Qld, a spread of just over four to one. As with cost per episode, the average costs per bed day are much higher than the median costs due to some high cost outliers in the data. The data also suggest that Child, Adolescent and Youth services have much higher than average costs per bed day (\$4,303 compared to \$2,513 across all public study sites). When considering service location, the data show that metropolitan sites (\$1,917) had a much lower average cost per admitted bed day compared to non-metropolitan sites (\$4,801). Some of this variation is most likely due to higher input costs incurred by Regional and Remote mental health services.

### 5.3 ANALYSIS OF COSTS IN THE COMMUNITY SETTING

Table 5.4 presents the profile of costs per episode in the MHCS data set in the community setting by the selected study site characteristics.

**Table 5.4: Distribution of cost per episode – Community setting**

Jurisdiction	Number of episodes	Cost per community episode (\$)*					
		25 <sup>th</sup> percentile	Median	75 <sup>th</sup> percentile	Inter-quartile range	Average	Coefficient of Variation
NSW	31,121	\$43	\$88	\$252	\$210	\$572	3.71
Qld	7,942	\$1,196	\$3,161	\$7,690	\$6,494	\$7,451	2.24
WA	3,727	\$337	\$889	\$1,635	\$1,298	\$2,202	3.68
SA	1,758	\$410	\$1,070	\$2,408	\$1,997	\$2,377	2.15
<b>All public</b>	<b>44,548</b>	<b>\$61</b>	<b>\$176</b>	<b>\$1,158</b>	<b>\$1,097</b>	<b>\$2,006</b>	<b>4.05</b>
Private	1,278	\$291	\$782	\$1,933	\$1,641	\$1,549	1.60
<b>All sites</b>	<b>45,826</b>	<b>\$61</b>	<b>\$181</b>	<b>\$1,194</b>	<b>\$1,133</b>	<b>\$1,993</b>	<b>4.02</b>
<b>Target population</b>							
Child, Adolescent and Youth	3,841	\$649	\$1,577	\$3,748	\$3,099	\$3,752	2.50
General	40,435	\$53	\$138	\$875	\$821	\$1,746	4.32
Older Persons	1,228	\$155	\$517	\$1,745	\$1,590	\$3,560	3.71
Forensic	322	\$337	\$1,039	\$4,365	\$4,027	\$6,020	2.48
<b>Service location</b>							
Metropolitan	35,426	\$47	\$99	\$402	\$356	\$1,076	4.54
Non-metropolitan	10,400	\$674	\$1,686	\$4,815	\$4,141	\$5,119	2.69

Source: HealthConsult MHCS 'Costed Activity' data set 2015; \* Includes episodes where only an episode level cost was available, as well as episodes costed at the service contact level.

Table 5.4 shows that the public sector median cost per episode varied from \$88 for NSW study sites to \$3,161 for Qld sites, a spread of nearly 36 to one. Further analysis of the data suggests some issue with the way in which episodes are defined in NSW, as there are a considerable number of single service contact episodes. The average cost per episode varied in a smaller range from \$572 in NSW through to \$7,451 in Qld, a spread of just over 13 to one. As with admitted episodes, it is clear that there are some very high cost community setting episodes in the data that make average cost per episode much higher than the median cost. Both the IQR and CV indicate a significant spread in the data, typically higher than for the admitted episodes data. This finding might be expected given the significant variation in the length of episodes. Once again, the private sector data show less variation than the public sector data.

More insight into the variation in the community setting cost data can be gained by looking at the cost per service contact, which takes out the effect of the different episode lengths. Table 5.5 presents the profile of costs per service contact in the community setting by the selected study site characteristics.

Table 5.5: Distribution of cost per service contact – Community setting

Jurisdiction	Number of service contacts	Cost per service contact (\$)*					
		25 <sup>th</sup> percentile	Median	75 <sup>th</sup> percentile	Inter-quartile range	Average	Coefficient of Variation
NSW	103,702	\$51	\$83	\$168	\$117	\$147	1.31
Qld	100,284	\$43	\$106	\$289	\$246	\$357	5.90
WA	15,375	\$94	\$225	\$674	\$580	\$470	3.50
SA	31,320	\$27	\$53	\$121	\$94	\$138	5.87
<b>All public</b>	<b>250,681</b>	<b>\$43</b>	<b>\$91</b>	<b>\$224</b>	<b>\$181</b>	<b>\$250</b>	<b>5.74</b>
Private	16,485	\$43	\$72	\$170	\$127	\$128	1.57
<b>All community sites</b>	<b>267,166</b>	<b>\$43</b>	<b>\$91</b>	<b>\$213</b>	<b>\$170</b>	<b>\$242</b>	<b>5.74</b>
<b>Target population</b>							
Child, Adolescent and Youth	39,941	\$50	\$109	\$304	\$254	\$283	6.54
General	217,854	\$41	\$86	\$200	\$159	\$228	5.58
Older Persons	8,115	\$52	\$103	\$259	\$207	\$411	4.18
Forensic	1,256	\$71	\$132	\$240	\$169	\$286	4.00
<b>Service location</b>							
Metropolitan	213,075	\$40	\$90	\$199	\$159	\$211	4.98
Non-metropolitan	54,091	\$51	\$103	\$309	\$258	\$363	6.25

Source: HealthConsult MHCS 'Costed Activity' data set 2015; \* Includes only costed service contacts, community services costed only at the episode level are excluded.

Table 5.5 shows that the median cost per service contact, excluding the private sector sites, varied from \$53 in SA study sites through to \$225 for WA sites, a spread of 4.2 to one (much narrower than the 36 to one for cost per episode). Also excluding private sector sites, average cost per service contact varied from \$138 in SA to \$470 in WA, a spread of 3.4 to one. As with cost per episode, the average costs per service contact are much higher than the median costs, and there is considerable spread within jurisdictions, especially outside of NSW. The data also suggest that Older Person services have much higher than average costs per service contact of \$411 compared to \$250 across all public study sites. As with admitted services, metropolitan sites (\$211) had a much lower average cost per service contact compared to non-metropolitan sites (\$363).

#### 5.4 ANALYSIS OF COSTS BY PHASE OF CARE

As discussed in the activity analysis, phase of care was the most important of the three new data elements introduced for the MHCS. This section examines how costs vary by phase of care in the admitted and community settings.

5.4.1 Costs per phase of care – admitted setting

Table 5.6 presents the number of phases and the average cost for each phase of care type in the admitted setting by selected study site characteristics.

Table 5.6: Average cost per phase by phase of care type – Admitted setting

Study site characteristic	Acute		Functional Gain		Intensive Extended		Consolidating Gain		Initial Assessment		All Phases	
	Phase	Average cost	Phase	Average cost	Phase	Average cost	Phase	Average cost	Phase	Average cost	Phase	Average cost
NSW	4,515	\$13,505	212	\$104,277	625	\$32,914	102	\$67,764	10	\$14,680	5,464	\$20,262
Qld	1,874	\$25,077	1,293	\$14,339	524	\$16,941	376	\$17,819	228	\$17,287	4,295	\$19,803
WA	1,739	\$18,708	389	\$9,320	370	\$12,856	575	\$5,712	173	\$4,150	3,282	\$13,845
SA	624	\$20,244	123	\$9,315	31	\$10,725	35	\$5,296	17	\$3,036	831	\$17,267
<b>All public</b>	<b>8,752</b>	<b>\$17,497</b>	<b>2,017</b>	<b>\$22,518</b>	<b>1,550</b>	<b>\$22,282</b>	<b>1,088</b>	<b>\$15,700</b>	<b>428</b>	<b>\$11,350</b>	<b>13,872</b>	<b>\$18,422</b>
Private	1,521	\$9,917	-	-	-	-	-	-	-	-	1,521	\$9,917
<b>All Admitted</b>	<b>10,273</b>	<b>\$16,375</b>	<b>2,017</b>	<b>\$22,518</b>	<b>1,550</b>	<b>\$22,282</b>	<b>1,088</b>	<b>\$15,700</b>	<b>428</b>	<b>\$11,350</b>	<b>15,393</b>	<b>\$17,582</b>
<b>Target population</b>												
Child Adolescent and Youth	268	\$26,513	31	\$20,359	126	\$7,784	36	\$51,665	46	\$12,107	507	\$21,961
General	9,529	\$15,183	1,580	\$15,288	1,181	\$16,918	835	\$12,456	364	\$11,331	13,526	\$15,072
Older persons	274	\$26,455	41	\$8,591	60	\$42,951	43	\$26,490	5	\$4,330	423	\$26,806
Forensic	202	\$45,460	365	\$55,563	183	\$60,108	174	\$21,161	13	\$11,906	937	\$47,278
<b>Service location</b>												
Metropolitan	9,018	\$15,247	1,747	\$22,724	1,369	\$24,251	989	\$15,496	196	\$11,373	13,320	\$17,114
Non-metropolitan	1,255	\$24,478	270	\$21,186	181	\$7,392	99	\$17,739	232	\$11,331	2,073	\$20,591

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Note that the total number of phases in this analysis is different to Chapter 4, as phases that had costs at the episode level but not at phase level were included, and phases that has costs at phase level but not episode level were excluded in the Chapter 4 analysis; but, for this analysis study sites must have reported a cost at the phase level.

Table 5.6 shows that, for public sector sites, the national average cost per phase ranges from \$11,350 for the ‘initial assessment’ phase (note only a small number of admitted episodes were classified as ‘initial assessment’) through to \$22,518 for the ‘functional gain’ phase (a spread of just under two to one). However, the national data are influenced by a very high reported costs for the 212 consumers in the ‘functional gain’ phase in NSW (average cost \$104,227). Across the States, ‘initial assessment’ is the lowest cost phase in WA and SA (again note small volume) with ‘acute’ clearly being the highest cost phase. For Qld, the ‘functional gain’ phase has the lowest cost with ‘acute’ again being the highest cost phase.

Table 5.7 presents the number of bed-days and the average cost per bed-day for each phase of care in the admitted setting by selected study site characteristics. Costs per bed day has been chosen in order to examine any difference in costs that may be due to different intensity of service (measured in terms of resource consumption) in each phase. Part of the variation in costs per episode could be attributed to the LOS differences that are associated with the service models typically applied to consumers in the different phases of care.

Table 5.7: Average cost per bed day by phase of care type – Admitted setting

Study site characteristic	Acute		Functional Gain		Intensive Extended		Consolidating Gain		Initial Assessment		All Phases	
	Bed-days	Average cost	Bed-days	Average cost	Bed-days	Average cost	Bed-days	Average cost	Bed-days	Average cost	Bed-days	Average cost
NSW	52,572	\$1,158	19,501	\$1,132	22,685	\$906	7,108	\$972	101	\$1,453	101,967	\$1,085
Qld	18,305	\$2,567	12,622	\$1,469	6,087	\$1,458	5,378	\$1,246	802	\$4,915	43,194	\$1,969
WA	21,199	\$1,529	2,450	\$1,471	3,087	\$1,540	2,542	\$1,292	405	\$1,773	29,920	\$1,514
SA	10,251	\$1,232	920	\$1,245	302	\$1,101	190	\$976	60	\$860	11,724	\$1,224
<b>All public</b>	<b>102,327</b>	<b>\$1,495</b>	<b>35,493</b>	<b>\$1,278</b>	<b>32,161</b>	<b>\$1,073</b>	<b>15,218</b>	<b>\$1,122</b>	<b>1,368</b>	<b>\$3,551</b>	<b>186,805</b>	<b>\$1,367</b>
Private	30,768	\$490	-	-	-	-	-	-	-	-	30,768	\$490
<b>All Admitted</b>	<b>133,095</b>	<b>\$1,262</b>	<b>35,493</b>	<b>\$1,278</b>	<b>32,161</b>	<b>\$1,073</b>	<b>15,218</b>	<b>\$1,122</b>	<b>1,368</b>	<b>\$3,551</b>	<b>217,573</b>	<b>\$1,243</b>
<b>Target population</b>												
Child Adolescent and Youth	2,801	\$2,537	78	\$8,091	1,311	\$748	1,828	\$1,017	88	\$6,329	6,106	\$1,824
General	119,848	\$1,206	20,018	\$1,204	16,639	\$1,200	9,148	\$1,137	1,161	\$3,553	167,052	\$1,219
Older persons	5,921	\$1,224	224	\$1,572	2,868	\$899	1,204	\$946	14	\$1,546	10,231	\$1,108
Forensic	4,525	\$2,029	15,173	\$1,337	11,343	\$970	3,038	\$1,212	105	\$1,474	34,184	\$1,296
<b>Service location</b>												
Metropolitan	121,810	\$1,127	34,025	\$1,166	31,701	\$1,047	13,924	\$1,101	778	\$2,865	202,239	\$1,126
Non-metropolitan	11,285	\$2,722	1,468	\$3,891	460	\$2,905	1,294	\$1,357	590	\$4,455	15,334	\$2,783

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Note that the total number of phases in this analysis is different to Chapter 4, as phases that had costs at the episode level but not at phase level were included, and phases that has costs at phase level but not episode level were excluded in the Chapter 4 analysis; but, for this analysis study sites must have reported a cost at the phase level. Also note that the overall cost per bed-day is different to that presented in Table 5.3, as that analysis was of the distribution of cost/bed-day, whereas this analysis calculates costs on the basis of total cost/total bed-days (i.e. overall average versus average of the averages).

Table 5.7 shows that, for public sector sites, the national average cost per bed day for the phase of care types ranges from \$1,073 for the ‘intensive extended’ through to \$3,551 for the ‘initial assessment’ (a spread of 3.3 to one). The national rank order of average cost per bed day for the phase types is not replicated for all jurisdictions, but there is a degree of consistency. The ‘consolidating gain’ phase has the lowest cost per bed day in all jurisdictions except SA, and the ‘initial assessment’ phase has the highest cost per bed day in all jurisdictions except SA. Given the newness of the phase of care data element, this descriptive analysis suggests that it has considerable potential to explain cost variation. There appears to be some work to do on improving the consistency in interpretation of the data element, but it appears to be revealing differences in the intensity of services (as measured by cost of resources consumed) provided to consumers in each phase in the admitted setting. The detailed statistical analysis will be done as part of the classification development work.

#### 5.4.2 Costs per phase of care – community setting

Table 5.8 presents the number of service contacts and the average cost per service contact for each phase of care in the community setting by selected study site characteristics. Examining cost per service contact allows a consideration of any difference in costs that may be due to different intensity of service (measured in terms of resource consumption) in each phase. As discussed earlier (see Section 5.3) part of the variation in cost per episode in the community setting can be attributed to the fact that there is a considerable difference in the number of service contacts per episode.

Table 5.8: Average cost per service contact by phase of care type – Community setting

Study site characteristic	Acute		Functional Gain		Intensive Extended		Consolidating Gain		Initial Assessment		All Phases	
	Contacts	Average cost	Contacts	Average cost	Contacts	Average cost	Contacts	Average cost	Contacts	Average cost	Contacts	Average cost
NSW	35,196	\$171	17,562	\$87	11,975	\$154	17,655	\$67	2,149	\$180	103,702	\$147
Qld	6,029	\$811	18,167	\$352	3,301	\$629	11,157	\$397	4,129	\$654	100,284	\$357
WA	1,748	\$453	2,980	\$321	1,286	\$322	2,391	\$503	3,363	\$374	15,375	\$470
SA	2,648	\$302	7,222	\$136	1,832	\$194	4,086	\$184	912	\$242	31,320	\$138
All public	45,621	\$274	45,931	\$215	18,394	\$255	35,289	\$214	10,553	\$433	250,681	\$250
Private	3,013	\$112	11,544	\$125	149	\$151	1,426	\$173	93	\$155	16,485	\$128
All Admitted	48,634	\$264	57,475	\$197	18,543	\$254	36,715	\$213	10,646	\$430	267,166	\$242
<b>Target population</b>												
Child Adolescent and Youth	4,268	\$274	9,441	\$193	5,007	\$398	3,031	\$170	4,211	\$345	39,941	\$283
General	42,485	\$260	47,426	\$192	11,147	\$221	31,930	\$197	6,064	\$487	217,854	\$228
Older persons	1,868	\$308	513	\$612	2,362	\$106	1,468	\$630	360	\$459	8,115	\$411
Forensic	13	\$4,811	95	\$372	27	\$212	286	\$236	11	\$854	1,256	\$286
<b>Service location</b>												
Metropolitan	41,431	\$210	43,651	\$160	16,688	\$197	22,409	\$242	4,542	\$392	213,075	\$211
Non-metropolitan	7,203	\$574	13,824	\$313	1,855	\$770	14,306	\$167	6,104	\$459	54,091	\$363

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Note that this includes only costed service contacts, community services costed only at the episode level are excluded.

Table 5.8 shows that, for public sector sites, the national average cost per service contact by phase of care type ranges from \$214 for the ‘consolidating gain’ through to \$433 for the ‘initial assessment’ (a spread of just over two to one to one). The national rank order of average cost per service contact for the phase types is not replicated for all jurisdictions. The ‘consolidating gain’ phase only has the lowest cost per service contact in NSW, whereas the ‘functional gain’ phase has the lowest cost per service contact in all other jurisdictions. The ‘initial assessment’ phase has the highest cost per service contact in NSW; in Qld and SA the ‘acute’ phase has the highest cost per service contact, and the ‘consolidating phase’ has the highest cost per service contact in WA. So, the pattern in the community setting is not as consistent as for the admitted setting, but this may be related to the newness of the phase of care data element, and the difficulty, as reported by study sites, in interpreting the concept consistently. The more rigorous statistical analysis being done as part of the classification development work may produce stronger evidence of phase of care explaining variation in cost per service contact.

## 5.5 ANALYSIS OF COSTS BY FIRST RECENT EPISODE OF CARE

The other new data element for which the cost analysis is presented is first recent episode of mental health care. Table 5.9 compares the distribution of cost per phase, split by phase type and whether or not the consumer had a first recent episode or not in the admitted setting.



**Table 5.9: Average cost per phase of care and first recent episode of mental health care – Admitted setting**

Number of phases and distribution of cost per phase	Acute		Functional Gain		Intensive Extended		Consolidating Gain		Initial Assessment		All Phases	
	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode
Number of phases	7,135	2,008	1,821	195	1,256	291	881	207	317	106	11,412	2,807
25 <sup>th</sup> percentile	\$1,477	\$4,888	\$3,221	\$2,474	\$2,682	\$2,166	\$944	\$1,851	\$1,555	\$2,932	\$1,626	\$4,138
Median	\$7,362	\$11,321	\$9,396	\$10,161	\$7,375	\$5,798	\$3,657	\$16,717	\$2,946	\$6,901	\$7,082	\$10,723
75 <sup>th</sup> percentile	\$19,893	\$23,155	\$19,164	\$19,719	\$21,901	\$12,095	\$11,397	\$30,110	\$8,895	\$20,519	\$19,143	\$22,755
Average	\$16,858	\$18,316	\$22,424	\$23,475	\$24,089	\$14,649	\$12,660	\$28,640	\$8,929	\$17,395	\$17,996	\$19,021
Coefficient of Variation	2.2	1.2	2.4	2.1	1.8	2.0	2.0	1.7	2.0	1.9	2.2	1.5

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Note that this excludes phases that were costed but the first recent episode data element was not reported.

Table 5.9 suggests that across all phases, consumers with no first recent episode had a higher average cost per phase (\$19,021 versus \$17,996) and also a higher median cost per phase (\$10,723 versus \$7,082). For the individual phases, consumers with no first recent episode have higher average and median costs for every phase type except ‘intensive extended’. Of some note is the much higher average and median cost for consumers with no first recent episode for the ‘initial assessment’ phase (\$20,519 versus \$8,895 and \$6,901 versus \$2,946). Another interesting observation is that the spread of costs within a phase, as measured by the CV, is always less for consumers with no first recent episode than for consumer with a first recent episode, except for the ‘intensive extended’ phase. All these data lend some support to the proposition that mental health consumers with no first recent episode require more resources.

Turning to the community setting, Table 5.10 compares the distribution of cost per service contact split by phase type and whether or not the consumer had a prior first recent episode or not.

**Table 5.10: Average cost per service contact by phase of care and first recent episode of mental health care – Community setting**

Number of service contacts and distribution of cost per service contact	Acute		Functional Gain		Intensive Extended		Consolidating Gain		Initial Assessment		All Phases	
	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode	Yes, had a prior first recent episode	No prior first recent episode
Number of service contacts	28,942	19,675	41,803	15,670	10,286	8,256	18,538	18,176	3,963	6,678	169,892	97,240
25 <sup>th</sup> percentile	\$79	\$60	\$37	\$43	\$34	\$47	\$28	\$51	\$89	\$60	\$39	\$51
Median	\$132	\$120	\$83	\$62	\$91	\$121	\$98	\$51	\$225	\$142	\$92	\$86
75 <sup>th</sup> percentile	\$252	\$212	\$199	\$168	\$230	\$252	\$233	\$120	\$557	\$337	\$215	\$212
Average	\$284	\$235	\$204	\$176	\$256	\$252	\$260	\$164	\$572	\$346	\$252	\$226
Coefficient of Variation	5.2	5.4	3.1	3.0	8.7	4.6	5.3	6.2	3.0	3.9	5.9	5.4

Source: HealthConsult MHCS ‘Costed Activity’ data set 2015. Note that this includes only costed service contacts but excludes 34 service contacts that were costed, but the first recent episode was not reported.

Table 5.10 suggests that across all phases, consumers with no first recent episode had a lower average cost per service contact (\$226 versus \$252), and also a lower median cost per service contact (\$86 versus \$92). For the individual phases, consumers with no first recent episode have lower average cost per service

contact for every phase type. The median costs per service contact is also lower for each individual phase type, except for ‘intensive extended’. Even for the ‘initial assessment’ phase, cost per service contact is always lower for every measure presented. Looking at the CVs for each individual phase type shows that there is considerable spread in the data, with no real pattern that suggests whether or not the distribution of costs is tighter for consumers with a first recent episode. These data correspond with the qualitative feedback provided from study sites that first recent episode may not be a cost driver in the community setting. In making this observation, it should be noted that this analysis does not attempt to determine whether first recent episode impacts on the frequency of service contacts within a phase, and hence the bundled cost at the phase level. Such analysis may be part of the classification development work.

### 5.6 COST VARIATION IN MHCS DATA SET

The analysis presented in this Chapter shows that there is cost variation in the MHCS data set between and within jurisdictions. However it is important to recognise that variation in cost data was not unique to the MHCS and the measured variation should not concern stakeholders about whether the data in the MHCS data set is suitable for use in the classification development. To illustrate this point, the cost variation in the Round 17 NHCDC (2012/13) data for MDC 19 (taken as a surrogate for episodes that are likely to meet the definition of the mental health care type) and the MHCS data are compared. The NHCDC is considered to be a valid reference set, as it is used in numerous IHPA activities including the determination of the National Efficient Price and the ongoing development of the AR-DRG classification system, was compared to the cost variation in the MHCS data set.

The comparative analysis of the MHCS data set and the NHCDC data set for the states involved in the MHCS showed that the cost variation at both the episode level and bed day level is consistent (see Appendix B). At the cost per episode analysis level, both well accepted data dispersion measures the Interquartile Ratio (IQR) and the Coefficient of Variation (CV) show very similar levels of spread when the full MHCS and NHCDC data sets are compared. This result is obtained, even though the NHCDC data set is much larger than the MHCS and is quite mature, being in its 17<sup>th</sup> year of operation. When the NHCDC data set is matched, in terms of the number of episodes to the MHCS data set, the three random samples taken show there is more cost variation in the NHCDC data. In fact two of the three random samples of NHCDC data produce larger measures of dispersion (both the IQR and the CV) than MHCS.

At the cost per bed day level, both the IQR and CV are lower in the NHCDC data set. However when three random samples of the NHCDC data set are generated, matched to the number of episodes in the MHCS data set, the IQR and CV are higher than the MHCS data set in one of three random samples. When the cost per bed day is trimmed to exclude per bed day costs above \$16,000 in both data sets, there is little or no impact on the IQR but a large reduction in the CV in both data sets (i.e. both NHCDC and MHCS CVs are  $\leq 1$ ).

This analysis demonstrates that measured variation in costs does not necessarily equal measured error. The cost variation seen in the final MHCS data set is likely to be due to many factors including differences in consumer characteristics, service models, locations of services as well as applied costing practices. It is important to recognise that the principal purpose of the classification system is to explain as much as possible of the variation in measured cost using consumer characteristics data. If there was no variation in the measured costs, then there would be no need for a classification system.

## Key features of the approaches used by jurisdiction

This Chapter summarises the views of the study sites and representatives from State Health Authorities, by participating jurisdiction, in regards to the new data elements collected in the MHCS, and provides an overview of the costing process used by each jurisdiction.

### 6.1 NEW SOUTH WALES

Admitted and community settings were included in the NSW data. This section presents a summary of the processes adopted for the collection of the activity and cost data within NSW study sites.

#### 6.1.1 Views about phase of care

In general, phase of care was a concept that NSW sites struggled with, particularly in the admitted setting. Clinicians expressed confusion in relation to what was required to be captured, and the frequency with which this data element was to be reviewed, updated and recorded. This difficulty resulted in the majority of NSW study sites only recording one phase of care per admitted episode. Some sites reported that phase of care was determined by relevant clinicians on the wards, and other sites reported that a clinician or study site coordinator reviewed the medical records and associated clinical notes and made a judgement as to whether there had been any changes in the phases of care during the admitted episode. For ambulatory consumers, phase of care was collected for each service contact.

In discussions on what the concept of phase of care was about, one site thought that phase of care only changed with the relocation of a consumer to another ward or unit. This misunderstanding resulted in poor or no phase of care data being collected after the admission, due to the lack of a trigger to review phase of care at the recommended fortnightly intervals. One site had instances where more than one phase of care was recorded for a consumer on the same day, which was due to different clinicians seeing the consumer and each interpreting the consumers' phase of care differently. Another site reported that they found it difficult to determine phase of care prospectively. They also expressed uncertainty around distinguishing between 'intensive extended' and 'consolidating gain' phases of care.

Most participants felt that additional training on phase of care was required so that the distinction between each phase could have been better reflected in the data collection process. However, many of them recognised there was not adequate lead time for this training to occur. One site reported that they do not believe phase of care influences resource consumption, especially in relation to ambulatory consumers, but rather more impacts on the frequency with which consumers are receiving a service.

#### 6.1.2 Views about MHIC codes

In the admitted setting, MHIC codes were collected and assigned to consumers on a daily basis, or after an intervention with the consumer. NSW sites felt that the list of MHIC codes provided was not broad enough to incorporate all services and interventions that are provided to consumers, which led to an increased use of 'other' categories and the development of additional site-specific MHIC codes. NSW also commented that the lack of adequate site preparation time and lack of clarity surrounding the definitions of the MHIC codes resulted in difficulties and inconsistencies in collecting MHIC codes. Some sites noted that in the initial weeks of the study not all MHIC codes were collected, as this was a

new data element and there was insufficient lead time to implement the collection process properly. For one site, the collection of MHIC codes was based on an audit of the consumers' medical records.

The general feeling was the use of MHIC codes was subjective. The language within the existing list of MHIC codes had different meanings to different members of staff, which in turn led to varying interpretations and applications. Staff involved in providing extensive multidisciplinary assessments did not find it easy to fully capture the interventions provided with the available MHIC codes. The process of collecting MHIC codes was found to be very labour intensive. One site reported that there was a lack of medical engagement in the collection of MHIC codes, which provided the additional challenge of education of medical staff to use a new set of definitions. For these reasons NSW sites felt there was a lack of consistency in the use and application of MHIC codes.

A more positive view expressed at one site was that having the ability to capture high cost activities at a consumer level such as specialising and tribunal preparation was a positive outcome. Another site thought that some MHIC codes would be a driver of cost, however, the existing codes provided were not sufficiently comprehensive. Some of the missing categories within the MHIC codes that were noted included routine nursing care; discharge planning; and supervision of medication.

### ***6.1.3 Views about first recent episode***

In the admitted setting, first recent episode was assigned through the use of the hospital administration system to identify if the consumer had received treatment at the facility within the previous five years. In so doing, sites acknowledged the importance of completing an intensive assessment of a consumer when he/she presented to a facility for the first time and recognised the service provided to a new consumer would cost more. However, it was felt that the five year timeframe that was applied to this study was too long a period to measure the impact of first recent episode, especially as an illness can evolve over time. NSW sites felt that reassessment of a consumer is common even when moving between service settings, for example, when transferring from admitted to ambulatory care.

### ***6.1.4 Overview of the NSW costing process***

For admitted episodes, where possible, time was used to allocate costs. Where high cost interventions were recorded and captured such as specialising, seclusion, etc., they were costed separately. Where required, RVUs were developed and used in the allocation of costs to a consumer level. Some sites used the MHIC code collection process to develop RVUs and apply them within the costing process. For ambulatory consumers, all costs were largely allocated based on time. This process relied on a separate cost centre for each of the ambulatory services, where not possible, estimates were used.

There were delays at some sites from when the study commenced to when all data elements were fully collected, which impacted on the costing process. One site expressed difficulty in costing the emergency department portion of the consumer cost. It was noted that only interventions that were captured could be costed, for example, if specialising hours for a consumer were not recorded, they could not be included in the cost. One site noted that they had not completed costing for ambulatory consumers previously, and hence did not have a baseline for comparison. Sites noted that factors such as the multidisciplinary nature of service delivery increased the cost of some service contacts. Location of service delivery also influenced cost, for example, where clinicians are required to fly in and fly out, additional costs were attributable to these consumers. Varying staff profiles within different regions also had an impact on cost.

## 6.2 QUEENSLAND

Admitted and community settings were included in the Qld data. This section presents a summary of the processes adopted in the collection of the activity and costing data within Qld. The approach used by Qld was that all relevant activity data elements required for the MHCS were recorded within the state-wide mental health clinical information system. In the admitted setting, episode information was collected through hospital administration systems and supplemented with the mental health specific elements from the mental health system where available.

### 6.2.1 *Views about phase of care*

An early decision was made by Qld Health and sites to capture phase of care against a provision of service (POS) recorded in the clinical information system. For most sites this was done at each POS, however one site chose to assign phase of care at regular case review meetings. The latter was a more streamlined approach and was seen as more practical for longer term utilisation. The issues around phase of care were exacerbated by the approach and frequency of capturing phase of care. Capturing phase of care at each POS was found to be excessive and business rules were developed to condense the number of phases of care extracted and reported for each consumer within an episode of care.

Many Qld sites had difficulty with the Phase of care concept. Some sites reported confusion between the appropriate use of 'functional gain' and 'consolidating gain' phases of care, and other sites between 'functional gain' and 'intensive extended'. Most sites felt that more pre-study training would have potentially reduced the clinical subjectivity in assigning phase of care. The applicability of phase of care to child and youth services was also questioned, as consumers receiving treatment within these services are usually always acute. Qld stakeholders felt that many factors influence cost, not just phase of care.

### 6.2.2 *Views about MHIC codes*

A subset of the MHIC codes were used to record mental health interventions at each POS. Sites reported that, as the initial training in the use of MHIC codes was limited due to the short lead up time, there were delays in staff fully embracing and capturing MHIC codes. Generally clinicians tended to gravitate towards the use of a limited set of MHIC codes. It was commonly thought that the list of MHIC codes needs to be broadened to incorporate all services and activities provided within mental health. It was also thought that pilot testing of the new mental health classification system should also include a review of the intervention codes.

### 6.2.3 *Views about first recent episode*

First recent episode information was gathered as part of the extract, coordinated by the Mental Health Alcohol and Other Drugs Branch, from historical clinical records in the state-wide clinical information system. Participating sites had varying opinions on whether first recent episode would influence cost.

### 6.2.4 *Overview of the Qld costing process*

In Qld, mental health activity is captured in a state-wide clinical information system, which provides a comprehensive clinical record about the treatment and care provided to consumers of public mental health services. Qld took the opportunity during the MHCS to develop a feeder system from the mental health system into the costing system, which included the development of:

- a data transfer and manipulation tool;
- new intermediate consumer product types utilising minute(s) based products; and
- encounter matching rules and reference tables.

The Australian Hospital Patient Costing Standards (AHPCS) were adhered to in developing the costing interface and NHCDC data specification were also used as reference data. This work required additional resources and effort by Hospital and Health Services (HHS) and the Department of Health.

Each HHS was responsible for managing their cost databases, with the final compilation, matching of activity data and submission of data to the Consortium being managed by the Department of Health.

A number of key areas were identified that caused significant issues in costing:

- Not all data elements required for the MHCS are mandated for collection (either through NMDS or other regulatory frameworks), which meant not all sites collected all requested activity data. This issue led to variation as for some admitted episodes only admitted products were captured, whilst others included both admitted products and mental health products.
- Overlapping and concurrent phases of care and service that were not easily mapped to actual costs.
- Inclusion of in-reach services (such as provision of care by community based mental health teams to consumers admitted to hospital), so some costs were incurred by a team or unit in a different service to where the consumer was, including costs incurred by teams outside of the MHCS.
- Only selected teams within a site participated in the MHCS. However within a study site all team activity was costed. For example, if a consumer was treated by one team included in the MHCS and another team that was not included, costs were included for both teams.
- The inclusion of tertiary services (that is services that routinely provide care to consumers from multiple locations) created similar issues around what could be costed within the constraints of the study scope.

Qld Health advised that it continues to review and develop the new information feeder system and processes to improve the quality of mental health activity and costing data. Qld felt additional time was needed in the MHCS to review and refine the results. Implementation of a new feeder system on top of a new DRS meant that analysis and refinement was not completed to a satisfactory level.

### 6.3 WESTERN AUSTRALIA

Admitted, residential and community settings were included in the WA data. This section presents a summary of the processes adopted in the collection of the activity and cost data within WA.

#### 6.3.1 Views about phase of care

Phase of care was generally determined by the relevant nursing staff, or the most senior person on each shift. However the approach used by WA sites in the allocation of phases of care varied. There was a general consensus that more time should have been allowed for training on the phase of care data element prior to the commencement of the study. Participants also felt that there was a need for more clarity surrounding the definitions of phase of care.

- **Admitted:** The processes for assigning phase of care by WA admitted sites included:
  - all phases of care 1 to 5 were used, with the caveat that ‘initial assessment’ could only be applied to consumers pending admission;
  - some sites set up business rules where either an ‘initial assessment’ or ‘acute’ phase was assigned automatically on admission;
  - one site applied business rules for phase of care at discharge: for Community Treatment Order consumers ‘intensive extended’ was used and for all other consumers ‘consolidating gain’ was assigned;
  - at most sites the study site coordinator in consultation with the appropriate clinician reviewed phase of care every 14 days;
  - one site applied business rules for phase of care at transfer: if the consumer was transferred to HITH care or to another authorised facility, the phase of care remained as ‘acute’; and
  - one site established business rules to finalise phase of care data, which included, only assessments made by nursing staff were retained for admitted episodes – where there was a

conflict for phase of care on a particular day, the most acute phase of care assessed was retained.

- **Ambulatory:** The processes for assigning a phase of care included:
  - an assessment was made for each service contact recorded in Return F; and
  - individual clinicians made the assessment for each service contact using the definitions provided.
- **Residential:** The processes for assigning a phase of care included:
  - individual clinicians made an assessment of phase of care during each intervention. A site specific business rule was then applied to the final phase of care data, which included, only assessments made by nursing staff were retained. Where there was a conflict of the assigned phase of care on any particular day, the most acute phase of care assessed was retained.

While there was some general support for the phase of care data element, there were concerns raised about the consistency in its application and the potential opportunities for gaming if adopted as a funding mechanism. It was also felt that the phase of care was not necessarily a driver of cost, but rather cost was driven by the amount of time that is spent with the consumer. Phase of care was seen as a potential variable to report against, similar to care type, but not as a basis for funding or costing.

### **6.3.2 Views about MHIC codes**

The collection of MHIC codes was primarily done using a manual paper based system, however, an electronic option was provided and used by some disciplines. Each team member recorded the appropriate MHIC code and the discipline of the staff member. At two of the sites the times were recorded against each MHIC code to support the costing process. Some sites had issues with psychiatrists and other medical doctors not collecting MHIC codes. This problem was overcome by using relevant information recorded from team meetings, medical records, progress notes and medication interventions.

Views on the use of MHIC codes varied. Some sites were generally supportive of the use of MHIC codes but found the process to record the information very time consuming and intrusive. Some sites indicated that they were concerned that the current MHIC code list used during the MHCS was not comprehensive nor mutually exclusive. It was thought that MHIC codes could potentially be used within the costing process, however, what would be needed was a large sample size to provide agreed average MHIC code weightings nation-wide. Additionally, there would need to be the assumption that all mental health professionals know and understand each MHIC code, and the codes are applied consistently.

### **6.3.3 Views about first recent episode**

First recent episode was identified as a derived variable by merging all of the in-scope admitted and community activity using unique consumer identifiers. An algorithm was created to determine if the consumer had prior contact/admission within each study site. There were mixed opinions in relation to first recent episode, however, on balance it was considered unlikely that this data element could be used as a cost driver, due to the definition and methodology to collect the information not being robust enough to ascertain if in fact it was a consumer's first recent episode. Additionally, one site reported that it was hard to determine the impact of first recent episode, especially in the admitted setting as a re-presentation was often dependant on the community and social supports available to the consumer.

### **6.3.4 Overview of the WA costing process**

Costing was completed by each of the WA sites (i.e. not by the WA Department of Health). Bed hours were used as the basis for all staff timing. This information was supplemented in some sites by

clinicians collecting times against MHIC codes. For costs such as pharmacy and imaging, RVUs were used. Ambulatory consumers cost were based on actual time and costs incurred.

For phase of care, the approach that was adopted was to cost each day and then roll the cost per day up into the relevant phases of care within the consumer episode. Where there was a change in the phase of care, it was deemed that the previous phase ended at midnight the day before and the new phase commenced on the day that it was recorded. This process was adopted to overcome the issue that the existing costing system was built to cost a consumer episode rather than a phase of care.

WA sites felt that a longer lead time before the data collection process commenced would have allowed better preparation. Due to the timing, investigation on how to gather some of the data to support the costing process had to be performed during the study period, which resulted in partial or no data at all being collected. The outcome was that no new data were able to be used to support the costing process, as it was either too late or the data were not useful due to incompleteness or lack of robustness.

WA also highlighted that location based costs and volume efficiency are issues in the delivery of mental health services in country WA.

## 6.4 SOUTH AUSTRALIA

Admitted, residential and community settings were included in the SA data. This section presents a summary of the processes adopted in the collection of the activity and cost data within SA.

### 6.4.1 Views about phase of care

The phase of care for a consumer was often discussed as part of team meetings. The approach to allocation of phases of care for participating SA sites included:

- **Admitted:** phases of care 1 to 4 were collected within the admitted setting. Phase of care 5 ‘initial assessment’ was not intended to be used although some data were captured and reported. Phase of care was recorded in the existing electronic data collection system and mapped to the consumer. The data element was collected in all applicable assessment and intervention service contacts regardless of the day of the episode. Initially, this practice resulted in phase being captured and reported multiple times per day. Upon review of process and data quality, the process was changed to align to more formalised regular assessment/review processes. The phases of care that were reported included:
  - initial phase of care on admission; and
  - after weekly ‘ward round’ review.

The two week or 14 day guideline for review of phase of care was not ignored, rather a phase change was recorded/reported whenever a change was noted upon regular formalised assessment/review. Therefore every recorded change in phase of care was included in the submitted data. Data matching was required, based on shared identifiers, to ensure the episodes aligned with the admitted patient NMDS equivalent records. This extra process was required as SA does not have a unique state-wide client identifier across hospitals or mental health information systems.

- **Ambulatory:** phases of care 1 to 5 were collected within the community setting. Collection of phase of care was mandatory in community based support services for face-to-face assessments and reviews, and related interventions (e.g. case conference, medical support and review, transfer of care/discharge, emergency, comprehensive and risk assessment, discipline specific assessment, support, therapy or counselling interventions). The phases of care that were reported included:
  - for each service contact recorded in Return F; and



- phase of care was included for those services where it was determined collection of this data element was mandatory.

By the end of the study it became evident to SA stakeholders that a more restricted/targeted approach to identifying and recording a phase that continues over multiple days rather than contact-by-contact may yield more meaningful community phase of care data. SA stakeholders felt this would be less prone to variation in interpretation of phase of care based on factors such as individual worker discipline. SA stakeholders felt that it did not make sense for a clinician to document phase contact-by-contact, when many such contacts are client-not-participating in CMHC NMDS terms.

- **Residential:** phases of care 1 to 5 were collected within the residential setting. Initially phase of care was collected in all assessment and intervention service contacts regardless of the day of the episode. Three months into the study, once data became available and fed back to site coordinators, it became evident that a more targeted approach would be appropriate. After this time the phases of care that were reported included:
  - initial phase of care on admission; and
  - after weekly 'ward round' review.

The two week or 14 day guideline for review of phase of care was not ignored, rather a phase change was recorded/reported whenever a change was noted upon regular formalised assessment/review. Therefore every recorded change in phase of care was included in the submitted data.

SA felt that the quality of the phase of care data may have been impacted by inconsistent application of the definitions by the staff recording this data element. It was thought that staff with strong clinical understanding were best placed to make the judgement in relation to phase of care. There was a general feeling that the phase of care should be able to give a broad prediction of the volume of interventions required to be provided. Phase of care was not perceived to be a cost driver. Specifically, in the community setting, SA thought it would be difficult to ascertain if one phase of care was more costly than another given the significant variations in timeframes that may apply to each. For example 'consolidating gain' may require lower frequency of contact over a long period of time compared to 'acute' which may require higher frequency of contact over a shorter period of time.

### **6.4.2 Views about MHIC codes**

Within the admitted setting MHIC codes were recorded in the existing electronic data collection system and mapped to the consumer. For community based services a MHIC code was collected with each service contact. Some sites developed tick lists and 'cheat' sheets that could be used to assist clinicians in collection of MHIC codes. MHIC codes were thought to be data that should be a cost driver, although sites were uncertain if the data collected supported this theory. Some issues about MHIC codes raised by SA sites included:

- the MHIC code list needs to be expanded, it currently mainly relates to psychological interventions and not to other interventions and activities;
- MHIC codes were largely biased toward admitted care and not representative of the full spectrum of mental health interventions currently provided;
- the most expensive labour resources (e.g. medical clinicians) are the least likely to report interventions with consumers;
- quality of the MHIC data collected was too varied and the study sites too narrow to provide a fully comprehensive view of mental health interventions;
- while the applicability of MHIC codes in all sites was acknowledged, it was felt that the volume and time of interventions must be important in order to quantify MHIC codes as a cost driver;

- in principle MHIC codes should be a cost driver, or at least a predictor of cost; the assumption was made that interventions are not provided unless clinically appropriate and each MHIC has its own inherent cost when tied to volume and duration of the intervention; and
- not all interventions provided during the study were captured and reported (e.g. specialising) – collection of MHIC codes is subjective by nature.

There was a perception in SA that the number of MHIC codes collected would correlate with the volume of work being completed and may be linked to resourcing requirements.

### **6.4.3 Views about first recent episode**

Capturing first recent episode across all service settings in SA was undertaken by extracting data from existing systems rather than as a MHCS specific data capture. Despite SA's lack of unique state-wide patient identifier within and between hospital and mental health client information systems, this could be achieved within the MHCS because all of the nominated study sites (and their parent organisations) shared the same mental health client information system (CBIS); the 'NOCC Episode' counting unit is aligned with the definition of organisation adopted by the first recent episode items. In the admitted setting additional matching was required based on shared identifiers to ensure these episodes aligned with the hospital admitted patient NMDS equivalent records. Under a different definition of first recent episode (e.g. as a state or region-wide concept) SA's systems would not have supported this reporting method as some regions use more than one (unlinked) information system.

There were differing opinions in SA in regards to the impact of first recent episode on mental health care costs. For some sites, first recent episode was not considered to be a cost driver of mental health services, while other sites perceived that a new episode could potentially be more expensive due to a longer admission and assessment process. For the MHCS, SA thought the issue is about whether defining first recent episode at organisation level is meaningful in terms of identifying cost drivers.

### **6.4.4 Overview of the SA costing process**

A centralised approach to costing of consumers participating in the MHCS was adopted for the SA sites. Fractional bed-days for both medical and nursing staff were used across all three settings. For pharmacy costs, an RVU was developed based on actual costs. Theatre costs were based on time and type of staff. ECT costs were based on actual time, the number and type of staff involved in delivering the service.

For phase of care, the approach adopted was to cost each day and then roll the cost per day up into the relevant phases of care within the episode. Where there was a change in the phase of care, it was deemed that the previous phase ended at midnight the day before and the new phase started on the day that it was recorded. This process was used to work around the fact that the existing costing system was built to cost at the episode level rather than at a phase of care level.

The study relied on data from a number of sources, and it was assumed that the data would be consistent across these systems. This was not the case, as currently the systems are run and managed independently (e.g. phase of care might start or end outside the admission and separation period). Additionally, it was difficult to link records across data sets, as SA does not have a unique consumer identifier across all sites.

## **6.5 PRIVATE SITES**

There were four participating private hospital sites, with each site having both admitted and ambulatory/community settings. This section presents a summary of the processes adopted in the collection of the activity and cost data at the private hospital sites.

### **6.5.1 Views about phase of care**

The phase of care assigned to all admitted consumers within the private setting was defaulted to ‘acute’ on admission. The phase of care concept was not able to be tested in the private sites due to concerns about private health insurance payments. For ambulatory consumers phase of care was captured and recorded for each contact with the consumer. Some sites relied on the professional judgement of the treating clinician to assess and assign the phase of care, while at other sites business rules were applied based on the program that the consumer was attending. The private sites felt that phase of care was not a cost driver but identified the level and intensity of the program in which the consumer was enrolled. Most felt that the cost for community consumers was largely driven by the duration of the intervention and whether it was a group or individual session.

### **6.5.2 Views about MHIC codes**

The method and assignment of MHIC codes varied by site. Variability was noted with the number of MHIC code interventions recorded, fluctuating from only services considered to be over and above ‘normal’ standard of care being documented to every intervention with the consumer being captured and reported. The general feeling was that the interpretation and use of MHIC codes was subjective, and hence the data element was not a good predictor of cost.

The collection of MHIC codes was a paper based process with some sites using medical record audits to identify and record relevant interventions. The methodology adopted at each site was influenced by the short lead time to prepare for data collection, with sites indicating that, if they had more lead time, they would have used different tools and mechanisms. There was a general feeling that the level of labour intensity to collect and report the data for the MHCS was prohibitive relative to the quality and volume of data collected. For future studies, all private sites felt that more lead time for preparation was required, to allow investigation into technological tools to assist in the capturing and reporting of data.

### **6.5.3 Views about first recent episode**

The first recent episode data element was collected by extracting data already in study site’s systems. The majority of consumers that participated within the MHCS had previous contact with the site. Most private sites did not initially think first recent episode would be a driver of cost. Although, they noted that the assessment process for consumers without a first recent episode may be longer and more labour intensive than for a consumer with a recorded history with the facility, which could potentially be reflected in the cost. All other elements of treatment were perceived to be consistent across both consumer populations.

### **6.5.4 Overview of the private sector costing process**

The costing process for all private hospitals was completed by a third party contractor. None of the participating private hospitals had previously completed NHCDC or patient level costing. This situation provided challenges in extracting data in a format that was supportive and integrated with the costing process, especially for financial data where the general ledger structure and aggregation of data did not align with patient level costing requirements.

Generally the basis for allocation of costs was the time the consumer spent on the ward or unit. Where ECT costs were captured and identifiable these were used, or a one-off study was conducted to determine the cost of an ECT intervention. For ambulatory consumers the cost was largely reflective of the duration of the intervention, type of staff providing the treatment, and if it was a group of individual session. Seasonal adjustments were made to the data, especially in relation to the December holiday period. Phase of care for admitted consumers was equal to the episode cost, as only one phase of care was recorded per episode. For ambulatory consumers the phase of care was costed for each service contact that was recorded for the consumer, which in turn was aggregated to determine the ambulatory episode cost.

As noted above, this was the first time that patient level costing has been undertaken at these facilities, which provided additional challenges to completing the costing process due to lack of costing infrastructure. This problem was exacerbated by the late appointment of the costing contractor, which reduced the amount of time that sites had available to collect data that could potentially assist and support the costing process. Additionally, for all but one site, pharmacy services were managed by an external third party, which made obtaining data in a format that was able to be matched at a consumer level not possible. Also, medical costs were not included in the private cost data.

## Lessons learnt

This Chapter summarises the lessons learned from undertaking the MHCS. It is based on analysis of the qualitative data gathered through contact with the study sites and state health authority representatives; from discussions within the Consortium members, as well as with IHPA staff; and analysis of minutes of MHWG and MHSCCS meetings. It is hoped that the learnings presented in this Chapter can be applied to any future national costing studies, and more broadly across other ABF projects that are primarily for the purposes of costing and classification system development.

### 7.1 SUFFICIENT TIME FOR STUDY SITE SET UP

It was not possible to implement the project plan, which provided for a period of two to three months between recruitment of a study site and the start of data collection primarily due to the substantial delay in receiving nominations for study sites. IHPA invited study site nominations in mid-March 2014. Most site nominations were received by 2<sup>nd</sup> May 2014 (i.e. 43 sites) with the feasibility survey process rolled out by FMTs from the 5<sup>th</sup> May 2014. A short list of 25 sites was provided to the MHWG on the 4<sup>th</sup> June 2014 meeting, and to the MHCSSC meeting on the 18<sup>th</sup> June 2014 for approval, just a few weeks prior to the scheduled start of data collection on 1<sup>st</sup> July, 2014.

The late finalisation of the study sites meant that the process of IHPA contracting the sites was delayed, which in turn held up study sites from recruiting and/or appointing study site coordinators. The absence of study site coordinators restricted the intended pilot of the data collection process and infrastructure. Four pilot sites (three public and one private) were scheduled to commence data collection in the week of 26<sup>th</sup> May 2014. In the event, as the study site coordinators had not been recruited, the FMT's had limited ability to pilot the developed infrastructure. Also, the absence of study site coordinators delayed the onsite training delivered by FMTs, which meant study sites had little or no preparation time prior to the 'go live' date for the prospective data collection.

All study sites reported to FMTs during the close-out visits that the lack of adequate lead time to prepare for the study impacted on the site's ability to develop site-specific documentation, participate in training conducted by FMTs, provide subsequent training to staff (especially in relation to new data elements) and to establish and quality assure all study processes. The originally planned two to three month lead time, prior to starting live data collection, would have been appreciated by all involved. Most sites felt that this additional time would have allowed for system modifications, which would have assisted and enhanced the data collection process.

### 7.2 PROSPECTIVE DATA COLLECTION PERIOD

The initial intention of the study was to conduct a six month prospective data collection. Due to the delays in recruitment of study sites, only one site was able to commence data collection on the 1<sup>st</sup> July 2014. In the end, there were 11 sites that started data collection in July, nine in August, four in September and two in October. The staggered start was a result of either late sign up of study sites, or sites needing more time prior to starting the live data collection process.

All sites expressed relief at the end of the data collection period, as the required level of labour intensity was much more than they anticipated. Most sites felt that a three month data collection period would be more achievable for such studies going forward, assuming adequate preparation and training time is also provided. Some sites felt that the data required by the MHCS required significant change in clinical

practice (e.g. implementing the phase of care concept), which could not have been fully achieved within the nominated six month timeframe, especially without adequate preparation and training time.

It is the Consortium's view that the resultant data were not greatly impacted by the staggered start, but rather by the slow or patchy start to achieving complete data capture of all specified mandatory fields, particularly the new data elements. This problem resulted in a proportion of the data received not being included in the 'costed activity' data set. For example, the collection of the new data elements often began two to four weeks after the 'go live' data collection reported by sites. As a result, a number of episodes had no associated phases of care recorded, which meant these episodes were not costed to the phase, and hence not included in the 'costed activity' data set.

Another important issue was the timing of the study period. Many sites expressed concern about the planned July to December period, as it included a major holiday season (i.e. Christmas/December). It was felt that this timing created two problems, first the number of consumers seen in the December period was not representative of the normal activity levels, which in turn had the potential to distort the costing (i.e. atypically high cost attributed to atypically low activity). Second, arrangements for closing off the data collection and transferring the data to the Consortium had to be made in the December/January holiday period, when many staff were on scheduled leave. In the event, no site was able to provide their final data submission to the Consortium in January as originally scheduled.

### 7.3 NEW DATA ELEMENT/CONCEPTS

The MHCS involved the use of three new data elements: phase of care, mental health intervention and first recent episode of mental health care. The reason for inclusion of these new data elements was to test the proposition that they are cost drivers in mental health care, which was put forward in the UQ report. Definitions and data domains for each of the new data elements were developed as part of the MHCS. The process for refining and testing the developed definitions and data domains of each of the new data elements was restricted due to the timeframe in which the study needed to be undertaken.

The data development process involved consultation with a small group of clinicians and the provision of a discussion paper to the MHCSSC and MHWG to gather input, but the amount of work done was restricted by the available time. Also, the inability to roll out the pilot as intended meant there was limited opportunity to test the new data elements at study sites and/or with on-site mental health clinicians. In practice, the restricted timeframe meant that education/training in the new data elements was being undertaken at the same time as the sites going live with their prospective data collection.

Most sites reported continued confusion about the concept of phase of care, especially as this was a new concept within clinical practice and clearer definitions, training and preparation were required to ensure the operational success of this data element. Regardless of the advice and/or additional training provided, there appears to be variability in the interpretation, and hence reporting, of phase of care in the MHCS data set. Some sites felt that there was greater consistency in interpretation of the new data elements (particularly phase of care) in the second half of the project. Most sites also reported that the AIHW list of MHIC codes were not comprehensive and did not represent all activities and interventions that were being provided within their mental health service. This situation resulted in a significant proportion of interventions being allocated to 'other' or additional and undefined site-specific MHIC codes being captured and submitted by sites. The collection of first recent episode of mental health care was less of an issue for most sites, as they extracted the date of discharge from a prior episode from existing systems.

Overall, it is the Consortium's view that the limited implementation time for the new data elements and the truncated on-site training time has resulted in some quality issues in the MHCS data set, particularly with the phase of mental health care and the MHIC codes. Nonetheless, it is considered that the vast amount of data generated can be used to further refine all three new data element concepts to improve their suitability and use going forward. Further, the Consortium believes that the inclusion of new data

elements in the costing study was not the problem, as the MHCS provided an excellent basis for testing and refining the ideas on cost drivers put forward in the UQ report. However, if any future costing studies are also to be used to test new data elements or concepts it is vital that adequate time is allocated to data development work and to training and education of study participants.

### 7.4 APPOINTMENT OF STUDY SITE COORDINATORS

Each site recruited a study site coordinator with funding support provided by IHPA. That person was the key point of contact for the allocated FMT, except in NSW where there was one key point of contact for both FMTs and NSW study site coordinators, which was a state level study coordinator based at the MoH. All arrangements relating to a sites participation in the MHCS were made through the study site coordinator, except in NSW, where it was via the state level study coordinator.

The MHCS experience shows that, like any short position offered on a term contract, the study site coordinator positions were hard to fill, especially in the short time frame available. However, FMTs found that majority of the study site coordinators were enthusiastic about the challenge of coordinating the MHCS for their site. These positions were instrumental in being a conduit between study site staff and the FMTs. As intended, the study site coordinators also became the onsite trainers, as it was not possible for FMTs to be continuously onsite.

The Consortium received a lot of positive feedback on the 'level of effectiveness, knowledge of relevant subject matter and enthusiasm that was demonstrated by the study site coordinator'. Any successes achieved by the MHCS are certainly partly attributable to the personnel that occupied these roles. Unfortunately, some sites were unable to maintain the same site coordinator for the length of the study. Changing the occupant of the position at these sites created problems, as retraining was required and momentum was lost in the transition period.

The Consortium is of the view that the study site coordinator role is a crucial feature of the study design for any projects similar to the MHCS, particularly where prospective data collection is required. For any such future studies, it is the Consortium's view that the success of this role relies on:

- appointment at least four weeks prior to live data collection commencement;
- the position being full time, at least for the first four – six weeks of the project ((or at least until data collection and submission processes are well established);
- the position being occupied (at least on a part-time basis) until the data quality assurance process is complete; and
- the person in the position being known to the service so that there is a limited learning curve effect.

### 7.5 USE OF FMTs TO SUPPORT SITES

The Consortium provided support to study sites via the two person FMTs. An FMT was allocated to each site for the duration of the study, with the support work commencing with the feasibility assessment questionnaire and concluding with the study close-out visits. All sites were personally visited by FMTs at least twice (i.e. these were the private hospital sites which collected data for the shortest period of time) through the study period with some sites being visited up to five times. Comments made by study sites in regards to the FMTs included:

- some sites were not aware of the level and type of support that FMTs would provide until after the data collection commenced;
- several sites acknowledged the excellent support and level of responsiveness that was provided by the FMTs;
- several sites indicated the ease with which they were able to approach FMTs at any time to ask questions;
- sites noted that problems identified with the DRS were well handled by the FMTs;

- several sites reported that FMTs demonstrated good working knowledge of costing requirements;
- most sites noted the high level of availability that was demonstrated by FMTs;
- jurisdictions that used regular teleconferences/meetings with FMTs found this mechanism to be useful for dealing with issues, receiving updates, etc.;
- one site flagged disappointment at the failure of the FMT to provide mid-study feedback that had been promised, which they acknowledged was a result of delays in the study progress; and
- most sites felt that additional benefit would have been achieved by FMTs spending more time physically onsite, particularly with the study site coordinators and costing staff.

In reviewing these comments, and reflecting on the experience, it is the Consortium's views that the FMT model for site support was extremely successful. Undoubtedly, there is scope for refinement for future studies (particularly in the number and timing of site visits), but the idea that study sites should have support continuously available through a single point contact should be preserved.

### 7.6 DEVELOPMENT OF THE MENTAL HEALTH COSTING STUDY WEBSITE

A MHCS-specific website was developed to act as a communication vehicle for the study. The website had publicly accessible sections (general study information) and secure access sections to which access was limited to study participants. There were 90 registrants to the MHCS website which included:

- 14 Consortium members;
- six IHPA staff;
- 58 study sites staff;
- 11 state/territory health authority staff; and
- one stakeholder group.

HealthConsult ensured that the website was regularly updated throughout the study, a process which was noted by most users of the website. Most sites reported that the MHCS website was a useful tool that supported the study process. Most sites considered the website to be comprehensive and supportive to them and the whole study. The main reasons study sites used the MHCS website included:

- to download updated versions of the DRS and the other study documentation;
- to ensure all participants were up to date with the changes that occurred throughout the study period;
- to access the DQA database;
- to access the FAQ section, which was noted by a number of sites as being a useful resource; and
- to access the discussion forum, which was rarely used as sites reported that there was easy access to FMTs to ask questions and/or the FAQ section often contained the answers to their questions.

Again, in reviewing these comments, and reflecting on the experience, it is the Consortium's view that the use of a widely available study website with general and restricted access content is an important communication tool for any future studies similar to the MHCS.

### 7.7 DATA EXTRACTION AND SUBMISSION PROCESS

The MHCS was designed to have four data submission points throughout the six month prospective data collection period. The four data submission points were:

- **Data submission point 1:** To be provided within one month of study commencement and include data on study site characteristics (i.e. Data Return A);
- **Data submission point 2:** To be provided by 30<sup>th</sup> September 2014 and include the first two months of activity data (i.e. Data Returns B, D, E and F);



- **Data submission point 3:** To be provided by 30<sup>th</sup> November 2014 and include the first four months of activity data (i.e. Data Returns B, D, E and F) and interim costing data (i.e. Data Returns C, G and H); and
- **Study submission point 4:** To be provided in January 2015 and include all six months of activity data (i.e. Data Returns B, D, E and F) and final costing data (i.e. Data Returns C, G and H).

The delay in, and staggered, start resulted in delays in the MHCS data being submitted in accordance with this schedule. In addition, study sites, and the Consortium, had to comply with IHPA Third Party Usage of Data Policy and data transfer protocols<sup>4</sup>. The implementation of this Policy was new to all those involved, and did result in some initial delays in the data submission process. Besides the initial delays, once all involved became familiar with the process the impact on the data submission process was minimal. However, application of the Policy did impact on the ability to carry out the data quality assurance process, as discussed in section 7.8.

The biggest impact on the data submission process was the difficulty that study sites had with the data extraction process. Although most sites (except private hospital sites) already collected the majority of data elements specified in the DRS (except for the new data elements), it was extracting the data to comply with the DRS that presented challenges. The most difficult aspect was linking all the data elements required for the MHCS from multiple sources within the organisation and providing that data in the specified format for the study. Most sites did not anticipate the extent to which this process would result in delays and so had not allocated adequate resourcing and time to deal with these issues.

The first submission of data was received by the Consortium from two WA sites in late October. The first activity data submission was expected from all sites by 30<sup>th</sup> September 2014. No interim costing data was ever received from study sites. The delays in receiving, and in some cases the absence of, interim data significantly impacted the Consortiums ability to quality assure the data and provide timely feedback that could enable the sites to enact on the advice and make any of the necessary changes.

### 7.8 QUALITY ASSURANCE PROCESS

The Consortium developed a Data Quality Assurance Framework (or DQAF) to support the MHCS. The DQAF described the processes to be used by FMTs and study sites to assure the quality of the generated data. The DQAF was modelled around the submission of data at the four submission points. Unfortunately with no activity data being submitted until late in October (and only from two sites) and no interim costing data being submitted, implementation of the DQAF as intended was not possible.

Recognising the delay in data submissions, as a supplementary strategy, the Consortium developed the Data Quality Assurer (DQA), which was a Microsoft Access Database provided to allow sites to run an onsite check of their Data Returns to identify any DRS compliance issues, which they could correct prior to submission to the Consortium. For those sites and/or jurisdictions able to use DQA (i.e. not all had a Microsoft Access Database skills or access to the software product) some reported that it was a ‘powerful and useful tool, although it needed some tweaking’.

Once the data were received by the Consortium, site error reports in a summary level format (e.g. by Data Return by data element, not by consumer) were provided to sites by their FMTs. The usefulness of these summary level error reports was questioned by some sites and the Consortium. However due to the IHPA Third Usage of Data Policy, only summary level data could be emailed (i.e. as any information containing de-identified consumer IDs was not transmittable by email). There were two

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<sup>4</sup> This Policy sets out the rules for how third parties should manage and secure IHPA Protected Data. IHPA places extreme importance on the security and management of this information because of the inherent sensitivity of the data and legal and other obligations IHPA has to protect this information.

processes available to the Consortium and sites to share consumer level data (which was the level the errors were at):

- For Qld, NSW or SA sites, they could upload data to IHPA's Electronic Data Warehouse (EDW) – IHPA would then save it on a USB or hard drive encrypted device and courier it to HealthConsult.
- For the remaining study sites and Consortium members data needed to be loaded onto an IHPA encrypted USB device and couriered via a safe handling courier.

These processes were not only time consuming but acted as barriers to data exchange for sites and/or Consortium members. As an alternative, FMTs had long conversations with study sites about which of their de-identified consumer numbers were generating the issues raised in the error reports. Sites found it difficult to find the errors identified in the summary level error reports which meant sites would fix some but not all the issues identified in the error reports.

In addition, the lateness with which the costing processes commenced at sites impacted on the level of support that could be provided by FMTs and hence the quality of the submitted costing data. In addition, the lack of an interim costing submission significantly impacted the FMTs ability to review the output and provide sites with opportunities to improve processes before the completion of the study period. The result was that, notwithstanding the significant investment of resources, not all issues with the costing data could be corrected prior to finalising the data set.

Some sites felt it would have been better for the Consortium to have undertaken the costing process but also recognised that an aim of the study was to build site capacity in this area. The lack of preparation time meant that some of the data that sites were collecting to improve their costing was later rendered not usable. Sites found this situation frustrating and a waste of time to staff involved. Although most did report that the resultant data meet their expectations. For the private sites a costing subcontractor was appointed to do the costing on their behalf, however again the lateness of this appointment impacted on their ability to provide supporting data that could have potentially enhanced the costing data produced.

From the Consortiums viewpoint, there was not enough time after the last data submission from sites to complete the necessary processing and cleansing to finalise the data for submission to IHPA. Some of the issues identified in the costing process (e.g. missing the costing of some phases of care) could not be corrected as sites either had no capacity or will to re-run the costing process. Some sites were unable to cost to the phase of care, so where possible, the Consortium undertook this work on their behalf.

### **7.9 ENGAGEMENT OF STAFF AT STUDY SITES**

From the first round of FMTs site visits, it was recognised that there were personnel at all sites that were excited to be involved in the MHCS and thought 'it was a once in a life time experience'. There was without doubt an initial buzz at study sites that their work would influence the development of the AMHCC. The level of initial engagement and enthusiasm was noted at most sites by FMTs. Even at the close-out visits most study site staff reflected on the enormity of the task they had all been involved in – some even said they would do it all again!

Some sites reported that the involvement of many staff and teams within their facility enabled discussion about the broader picture of mental health services and was an educational tool in terms of learning more about ABF and the types of services they actually deliver and how it compares to other sites around Australia. Specific comments made by study site staff included:

- the MHCS enabled some of the known anomalies within our organisation to be substantiated by the study results;

- being involved has brought about cultural change, with a service commitment to focus on outcome measures;
- it felt important to participate in a national study and contribute to increasing knowledge and insight into the cost of mental health services;
- the study made us experience a level of collegiately and team work within our organisations;
- many of our clinicians wanted to be part of this study;
- our staff gained validation by participating in the study;
- being involved provided knowledge and educational opportunities;
- we developed data collection techniques and methodologies as a result;
- provided us with the opportunity to learn more about costing methodology in general, and to better understand current methods/status regarding approaches and scope of costing systems; and
- enabled us to use the data to have discussions on models of care and other aspects of service delivery.

A number of sites reported that the level of engagement of staff participating in the MHCS was not as good as they would have liked and the amount of work and labour intensity that was required to participate in the MHCS overwhelmed some staff. Engagement of staff at study sites was also impacted by changeover of staff during the MHCS period.

## Conclusion

The principal purpose of the MHCS was to generate a comprehensive data set to underpin development of the AMHCC. This goal has been achieved, with a much larger data set on mental health costs than has ever been available in Australia, provided to IHPA to support classification development work. The data set represents the culmination of a very significant amount of work by staff at study sites, state/territory health authorities, IHPA, the Consortium and a wider group of mental health stakeholders via the project governance committees. The analysis in this report has only ‘scratched the surface’ of the data set. It is the Consortium’s view that much more value can be extracted from the MHCS data set by subsequent analyses for classification development and related ABF purposes.

Another important objective expressed by the Consortium was to use the MHCS to build capability in mental health services in activity based costing and related ABF work. Staff at study sites participating in the MHCS have advanced their knowledge of ABF, although many of them reported that the study was more complex and challenging than they had envisaged. Thus, the MHCS has started the process of building capacity in ABF related work in the mental health sector. But there is clearly more to be done. It is expected that the processes of developing the AMHCC, including the pilot data collection being run by IHPA, and the more general ABF education and training work being done by Mental Health Australia, will further build on what has been achieved by the MHCS.

Appendix A provides information on the participating sites.

### A.1 CHILD SITES DEFINED BY SETTING AND TARGET POPULATION

Table A.1 presents the child sites within the MHCS by consumer setting, target population and specialised mental health unit.

**Table A.1: Overview of child study sites that participated in the MHCS**

Jurisdiction	#	Name of Study Site	Settings				Target Populations		
			Admitted	Residential	Community	CA&Y	F	G	O
NSW	<b>The Children's Hospital at Westmead</b>								
	1	CHW Mental Health Inpatient Location	✓			✓			
	2	CHW Psychological Medicine Service	✓			✓			
	3	CHW Emergency Department	✓		✓	✓			
	4	SCHN Eating Disorder Care Ward	✓		✓	✓			
	<b>Concord Centre for Mental Health</b>								
	1	Concord Hospital Broughton Rehab Inpatient Service	✓					✓	
	2	Concord Hospital ECT Department	✓					✓	
	3	Concord Hospital Kirkbride Acute Inpatient Service	✓					✓	
	4	Concord Hospital Manning Acute Inpatient Service	✓					✓	
	5	Concord Hospital Manning East Acute Inpatient Service	✓					✓	
	6	Concord Hospital McKay East Intensive Care Inpatient Service	✓					✓	
	7	Concord Hospital McKay West Acute Inpatient Service	✓					✓	
	8	Concord Hospital Norton Acute Inpatient Service	✓					✓	
	9	Concord Hospital Mental Health Admission Service	✓					✓	
	10	Concord Hospital Walker NonAcute C&A Inpatient Service	✓			✓			
	11	Concord Mental Health Day Program	✓					✓	
	12	Concord Specialist Mental Health Services for Older People (SMHSOP)			✓				✓
	13	Concord Hospital Jara Older Persons Acute Inpatient Service	✓					✓	
	14	Concord Consultation Liaison			✓			✓	
	<b>Croydon Community MH Service</b>								
	1	Croydon Acute Care Service			✓			✓	
	2	Croydon Boarding House Team			✓			✓	
	3	Croydon Core Adult Mental Health Team			✓			✓	
	4	Croydon Early Intervention Team			✓			✓	
	5	Croydon/Canterbury Assertive Outreach Team			✓			✓	
	6	Croydon/Canterbury Clozapine Clinic			✓			✓	
	<b>Hornsby Ku-Ring-Gai Hospital</b>								
	1	Hornsby Ku-Ring-Gai Hospital - Acute Mental Health Inpatient Service	✓					✓	
	2	Hornsby Ku-Ring-Gai Hospital - Child & Adolescent Inpatient Service	✓			✓			
	3	Hornsby Ku-Ring-Gai The Psychiatric Emergency Care Centre (PECC)	✓					✓	
	4	Hornsby Ku-Ring-Gai Hospital Mental Health Intensive Care Service	✓					✓	

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Jurisdiction	#	Name of Study Site	Settings				Target Populations		
			Admitted	Residential	Community	CA&Y	F	G	O
	5	Hornsby Ku-Ring-Gai Hospital Mental Health Consultation & Liaison Team			✓			✓	
	6	Hornsby Ku-Ring-Gai Assertive Outreach and Residential Services (AORS) team			✓			✓	
	7	Hornsby Ku-Ring-Gai Child & Adolescent Team			✓	✓			
	8	Hornsby Ku-Ring-Gai Acute Care Team			✓			✓	
	9	Hornsby Ku-Ring-Gai Early Psychosis Intervention Service (EPIS)			✓			✓	
	10	Hornsby Ku-Ring-Gai Hospital Clozapine Clinic			✓			✓	
	11	Hornsby Aged Care			✓				✓
	12	Wahroonga Rehabilitation Service			✓			✓	
<b>The Forensic Hospital, Malabar</b>									
	1	Forensic Hospital: Austinmer Mixed Adolescent Inpatient Unit	✓				✓		
	2	Forensic Hospital: Austinmer Women Acute Inpatient Unit	✓				✓		
	3	Forensic Hospital: Bronte Male Acute Inpatient Unit	✓				✓		
	4	Forensic Hospital: Clovelly Male Extended Care Inpatient Unit	✓				✓		
	5	Forensic Hospital: Dee Why Long Stay Inpatient Unit	✓				✓		
	6	Forensic Hospital: Elouera Mixed Rehabilitation Inpatient Unit	✓				✓		
<b>Macquarie Hospital</b>									
	1	Macquarie Acute Mental Health Inpatient Service	✓					✓	
	2	Macquarie Bridgeview Extended Care Service	✓					✓	
	3	Macquarie Cottages Rehabilitation Service	✓					✓	
	4	Macquarie Figtree Rehabilitation Service	✓					✓	
	5	Macquarie Henley Rehabilitation Service	✓					✓	
	6	Macquarie Hamilton Extended Care Service	✓					✓	
	7	Macquarie Manning Extended Care Service	✓					✓	
	8	Macquarie Lavender Extended Care Older Service	✓						✓
	9	Macquarie Tarban Extended Care Service	✓					✓	
<b>Royal North Shore Hospital</b>									
	1	Royal North Shore Hospital - CJ Cummins Unit -Acute Mental Health Inpatient Service	✓					✓	
	2	Royal North Shore Hospital The Psychiatric Emergency Care Centre (PECC)	✓					✓	
	3	Royal North Shore Hospital Consultation/Liaison			✓			✓	
	4	Royal North Shore Psychosis In Young People (PIYP)			✓	✓			
	5	Royal North Shore Community Acute Services			✓			✓	
	6	Royal North Shore Assertive Outreach Team			✓			✓	
	7	Royal North Shore Child and Adolescent Psychiatry			✓	✓			
	8	Royal North Shore Hospital - Emergency Dept. Mental Health CNC			✓			✓	
<b>Wagga Wagga Base Hospital and Murrumbidgee Community Mental Health</b>									
	1	Wagga Wagga MH Service - Adult Acute	✓					✓	
	2	Young Community Mental health - Adult			✓			✓	
	3	Young Community Mental health services - Aged			✓				✓
	4	Young Community Mental Health services - Child & adolescent			✓	✓			
	5	Wagga Wagga MH Service - Adult Acute - HDU	✓					✓	
	6	Wagga Wagga MH Service - Adult subacute	✓					✓	
	7	Wagga Wagga Base Hospital Yathong T BASIS inpatient Service	✓						✓
	8	Wagga Mental Health Emergency Care Service Unit			✓			✓	
	9	Dementia Behaviour Assessment & Management			✓				✓
	10	Wagga Community MH Service - Adult			✓			✓	
	11	Wagga Community MH Service - Aged			✓				✓

## HealthConsult Consortium

Jurisdiction	#	Name of Study Site	Settings				Target Populations		
			Admitted	Residential	Community	CA&Y	F	G	O
	12	Wagga Community MH Service - Child & Adolescent Mental Health Service			✓	✓			
	13	Griffith Community Mental Health Service - Adult			✓			✓	
	14	Griffith Community Mental Health Service - Aged			✓				✓
	15	Griffith/Leeton Community Mental Health Service - Child & Adolescent Mental Health Service			✓	✓			
	16	Tumut Community Mental health services - Aged			✓				✓
	17	Tumut Community Mental health - Adult			✓			✓	
	18	Tumut Community Mental Health services - Child & adolescent			✓	✓			
	19	Temora Community Mental health services - Aged			✓				✓
	20	Temora Community Mental Health - Adult			✓			✓	
	21	Temora Community Mental Health services - Child & adolescent			✓	✓			
	22	Deniliquin Community Mental Health Service - Adult			✓			✓	
	23	Deniliquin Community Mental Health Service - Aged			✓				✓
	24	Deniliquin Community Mental Health Service - Child & Adolescent Mental Health Service			✓	✓			
<b>Central Queensland HHS (Central Queensland MH &amp; AOD Division)</b>									
	1	Rockhampton Adult Community MH Service	*		✓			✓	
	2	Rockhampton Child and Youth MH Service	*		✓	✓			
	3	Gladstone Community MH Service, General Adult	*		✓			✓	
	4	Gladstone Community MH Service, Child and Youth	*		✓	✓			
<b>Gold Coast HHS (Mental Health &amp; Integrated Care Directorate)</b>									
	1	Gold Coast Hospital, Adult Acute Mental Health Unit	✓		*			✓	
	2	Robina Hospital, Young Persons Acute Mental Health Unit	✓		*	✓			
	3	Robina Hospital, Child and Youth Acute Mental Health Unit			*	✓			
	4	Robina Hospital, Adult Acute Mental Health Unit	✓		*			✓	
	5	Robina Hospital, Older Persons Extended Treatment and Rehabilitation	✓		*				✓
	6	Robina Hospital, Adult Extended Treatment and Rehabilitation	✓		*			✓	
	7	Palm Beach Adult Community MH Service	*		✓			✓	
	8	Ashmore Adult Community MH Service	*		✓			✓	
	9	Southport Child and Youth Community MH Service	*		✓	✓			
	10	Burleigh Child and Youth Community MH Service			✓	✓			
	11	Gold Coast University Hospital, Adult Acute Mental Health Unit	✓		*			✓	
	12	Gold Coast University Hospital, Adult Extended Treatment and Rehabilitation	✓		*			✓	
	13	Robina Community MH Service, Child and Youth	*		✓	✓			
	14	Robina Community MH Service, Young Persons	*		✓	✓			
<b>Metro North HHS (Metro North MH)</b>									
	1	Caboolture Hospital, Community Care Unit	*		✓			✓	
	2	Royal Brisbane and Women's Hospital, Adult Acute Unit	✓		*			✓	
	3	Inner North Brisbane Community MH Service, Northern Team	*		✓			✓	
	4	The Prince Charles Hospital, Secure MH Rehabilitation Unit	✓		*			✓	
<b>Townsville Health and Hospital Service (MH Service Group)</b>									
	1	Townsville Child and Youth Community MH Service	*		✓	✓			
	2	Townsville Hospital, Adolescent Acute Inpatient Unit	✓		*	✓			
	3	Townsville Hospital, Adolescent Day Services	✓		*			✓	
<b>West Moreton HHS</b>									
	1	Ipswich Hospital, Older Persons Acute Mental Health Unit	✓		*				✓

## HealthConsult Consortium

Jurisdiction	#	Name of Study Site	Settings				Target Populations		
			Admitted	Residential	Community	CA&Y	F	G	O
	2	Ipswich Hospital, Adult Acute Mental Health Unit	✓		*			✓	
	3	The Park – Centre for Mental Health, Forensic Inpatient Services	✓		*		✓		
	4	The Park – Centre for Mental Health, Secure MH Rehabilitation Unit	✓		*			✓	
	5	Ipswich Child and Youth Community MH Service	*		✓	✓			
	6	Goodna Community MH Service	*		✓			✓	
	7	Ipswich Community MH Service, General Adult	*		✓			✓	
	8	Ipswich Community MH Service, Older Persons			✓				✓
	9	Ipswich Community MH Service, Forensic			✓		✓		
	WA	<b>Albany Regional Hospital</b>							
1		Albany Regional Hospital Adult Mental Health Inpatient Unit	✓					✓	
2		Albany Mental health Service CAMHS Ambulatory			✓	✓			
3		Albany Mental Health Service General Ambulatory			✓			✓	
4		Albany Mental Health Service Older Persons Ambulatory			✓				✓
<b>Broome Regional Hospital</b>									
1		Broome Hospital Adult Inpatient Unit	✓					✓	
2		Kimberley Mental Health and Drug Service CAMHS Ambulatory			✓	✓			
3		Kimberley Mental Health and Drug Service General Ambulatory			✓			✓	
<b>Fremantle Hospital</b>									
1		Fremantle Hospital Adult Mental Health Inpatient Unit	✓					✓	
2		Fremantle Hospital Older Persons Mental Health Inpatient Unit	✓						✓
3		Hampton Road Service Adult Residential		✓				✓	
4		Fremantle Mental Health Service General Ambulatory			✓			✓	
5		Fremantle Mental Health Service Older Persons Ambulatory			✓				✓
<b>Graylands Selby-Lemnos and Special Care Health Service</b>									
1		Graylands	✓					✓	
<b>Sir Charles Gairdner Hospital</b>									
1	Sir Charles Gairdner Hospital	✓					✓		
SA	<b>Eastern Community Mental Health Centre</b>								
	1	EMH Eastern Glynburn			✓			✓	
	2	EMH Eastern Hallett			✓			✓	
	<b>Glenside Hospital</b>								
	1	Eastern PICU	✓					✓	
	2	Glenside Rural & Remote	✓					✓	
	3	Helen Mayo House	✓					✓	
	<b>Lyell McEwin Hospital</b>								
	1	Lyell McEwin Hospital (General Adult)	✓					✓	
	2	Lyell McEwin Hospital (Older Persons)	✓					✓	
<b>Noarlunga Mental Health</b>									
1	Southern Intermediate Care Centre		✓				✓		
2	The Trevor Parry Centre		✓				✓		
Private	<b>St John of God Richmond Hospital (NSW)</b>								
	1	SJoG Richmond Clinic	✓		✓			✓	
	<b>Toowong Private Hospital (Qld)</b>								
1	Toowong Private Hospital	✓		✓			✓		



## HealthConsult Consortium

Jurisdiction	#	Name of Study Site	Settings				Target Populations		
			Admitted	Residential	Community	CA&Y	F	G	O
		<b>St John of God Pinelodge Clinic (Vic)</b>							
	1	SJoG Pinelodge Hospital	✓		✓			✓	
		<b>Perth Clinic (WA)</b>							
	1	Perth Clinic	✓		✓			✓	

Source: Data Return A Mental Health Costing Study 2014/2015. CA&Y = child, adolescent and youth; G = General; O = Older Persons; F = Forensic

Please note that the information is based on the activity data submitted, for Gold Coast no data has been included in the costed activity data set due to this site being unable to submit costing data. Note: The data submitted to the MHCS from Qld incorporated all activity of participating sites across admitted and community services, including in-reach and out-reach service contacts (that is community staff providing additional treatment to an admitted consumer). Therefore most sites contributed to the activity and costs of both admitted and community services. However, to best describe and compare the services, the setting with ✓ relates to the primary setting within which treatment is provided and the \* reflects costed activity data which occurred in other settings by the same team.

**A.2 METROPOLITAN AND NON METROPOLITAN SITES**

Table A.2 presents sites participating in the MHCS, classified as a metropolitan or a non-metropolitan site.

**Table A.2: List of Metropolitan and Non-Metropolitan Sites**

Jurisdiction	Name of Study Site	Metropolitan Sites	Non-Metropolitan Sites
NSW	Hornsby Ku-Ring-Gai Hospital	✓	
	Royal North Shore Hospital	✓	
	Macquarie Hospital	✓	
	Concord Centre for Mental Health	✓	
	Croydon Community MH Service	✓	
	Wagga Wagga Base Hospital and Murrumbidgee Community Mental Health		✓
	The Children’s Hospital at Westmead	✓	
	The Forensic Hospital, Malabar	✓	
Qld	Gold Coast HHS	✓	
	Central Queensland HHS		✓
	Townsville HHS		✓
	West Moreton HHS	✓	
	Metro North HHS	✓	
WA	Broome Regional Hospital		✓
	Albany Regional Hospital		✓
	Graylands Selby-Lemnos and Special Care Health Service	✓	
	Fremantle Hospital	✓	
	Sir Charles Gairdner Hospital	✓	
SA	Glenside Hospital	✓	
	Noarlunga Mental Health	✓	
	Eastern Community Mental Health Centre	✓	
	Lyell McEwin Hospital	✓	
Private	Perth Clinic (WA)	✓	
	Toowong Private Hospital (Qld)	✓	
	St John of God Pinelodge Clinic (Vic)	✓	
	St John of God Richmond Hospital (NSW)	✓	

## Appendix B: Comparison of cost variation in MHCS data set to NHCDC data

### PURPOSE

This analysis was undertaken to address stakeholder concerns about the amount of variation in the MHCS data set. In order to address these concerns we have analysed the National Hospital Cost Data collection (NHCDC), the longest running cost data collection in Australia. The NHCDC involves each hospital and/or state/territory health authority undertaking the costing process for their hospitals. It is the basis of numerous IHPA activities including the determination of the National Efficient Price and the ongoing development of the AR-DRG classification system. The research question is whether the variation in costs measured in the NHCDC is any different to that observed in the MHCS data set.

### METHODOLOGY

The basis for the NHCDC data set, used in this analysis, is all Major Diagnostic Category (MDC) 19 records from Round 17 NHCDC (2012/13) acute data set from the four MHCS participating states (i.e. NSW, Qld, WA and SA). Random matched samples (i.e. in terms of the total number of episodes) from within the NHCDC data set were generated for direct comparison to the MHCS data set. The samples from the NHCDC data sets were generated using a stratified sampling technique. First, subject to a minimum volume criterion, the same number of sites in each state that participated in the MHCS were selected at random. Then the same number of episodes as provided to that MHCS from each state was randomly selected from those sites.

### RESULTS AND DISCUSSION

The analysis presented focuses on the admitted data only as there is no comparative data set within the NHCDC for the community MHCS data. The analysis is presented at the cost per episode level and cost per bed day level.

#### *Comparison at the cost per episode level*

Table B.1 presents the data held in the MHCS data set compared to the NHCDC (Round 17) data set for the states who participated in the MHCS. Analysis of the data shows that the number of episodes in the NHCDC data set is about eight times as big as the MHCS data set, and the national average and median cost is just under half. The Qld data were noticeably higher, in terms of the median and average cost per episode, compared to the NHCDC data set.

Two measures of data dispersion have been included – the interquartile ratio (IQR) and coefficient of variation (CV). The IQR is a non-parametric measure of dispersion, being equal to the difference between the upper and lower quartiles (i.e.  $IQR = Q_3 - Q_1$  or in other words, the IQR is the 1<sup>st</sup> quartile subtracted from the 3<sup>rd</sup> quartile) divided by the median. The CV, a parametric measure of the dispersion of data points in a data series around the mean, is calculated by dividing the standard deviation by the mean. Distributions with IQR or CV less than 1 are generally considered to have low variability, whereas distributions with IQR or CV higher than 1 are considered to have high variability.

**Table B.1: Cost distribution for cost per episode – comparison of MHCS data to NHCDC data**

State	MHCS data					NHCDC data				
	Number of Episodes	Median	Average	Interquartile ratio	Coefficient of Variation	Number of Episodes	Median	Average	Interquartile ratio	Coefficient of Variation
NSW	5,006	\$3,668	\$22,271	4.38	2.51	34,207	\$6,113	\$15,142	2.66	1.82
Qld	3,063	\$18,545	\$46,560	2.51	1.71	26,693	\$3,494	\$10,324	2.87	2.19
WA	2,081	\$13,260	\$24,778	1.78	1.44	11,861	\$4,818	\$11,238	2.40	1.70
SA	612	\$15,547	\$23,607	1.47	1.09	10,821	\$4,575	\$11,345	2.58	1.70
<b>All public</b>	<b>10,762</b>	<b>\$9,908</b>	<b>\$29,745</b>	<b>2.75</b>	<b>2.03</b>	<b>83,582</b>	<b>\$4,677</b>	<b>\$12,558</b>	<b>2.77</b>	<b>1.92</b>

Source: HealthConsult MHCS data set 2015 and NHCDC Round 17 (2012/13).

Analysis of both the IQR and CV in both the MHCS data set and IQR data set are all greater than 1. The IQR is very similar in both the MHCS data set (2.75) and NHCDC data set (2.77). However the CV suggests there is more variation in the MHCS data set (2.03) compared to the NHCDC data set (1.92). Due to the considerably larger size of the NHCDC data set this is not a surprising finding. To eliminate the number of observations as a factor influencing the measure of variation in cost, we extracted three random samples with the same number of episodes at the state level from the NHCDC data set and calculated the same variables as presented in Table B.1.

Table B.2 shows the cost distribution of cost per episode of three matched NHCDC samples. In comparison to the MHCS data set (refer to Table B.1), the median and average cost per episode is noticeably lower in the matched NHCDC data set. But, both the dispersion measures (IQR and CV) are higher in the matched NHCDC data set in all but one of the random NHCDC sample (i.e. CV is 2.02 in sample 2 is almost identical to the CV in MHCS of 2.03). These data indicate that the variation in the cost per episode of the MHCS data set is generally lower than that in the matched NHCDC data set.

**Table B.2: Cost distribution for cost per episode – sampled NHCDC data with same number of episodes as MHCS**

State	Number of Episodes	Matched NHCDC – Sample 1				Matched NHCDC – Sample 2				Matched NHCDC – Sample 3			
		Median	Average	Interquartile ratio	Coefficient of Variation	Median	Average	Interquartile ratio	Coefficient of Variation	Median	Average	Interquartile ratio	Coefficient of Variation
NSW	5,006	\$2,210	\$10,399	4.29	2.43	\$2,568	\$11,266	3.98	2.32	\$956	\$9,572	8.21	2.72
Qld	3,063	\$4,752	\$13,660	2.89	2.62	\$5,247	\$12,716	2.36	1.84	\$3,539	\$9,007	1.40	1.92
WA	2,081	\$5,040	\$11,568	2.56	1.60	\$3,851	\$10,567	3.02	1.73	\$4,937	\$10,698	2.42	1.66
SA	612	\$5,474	\$11,904	2.42	1.80	\$11,185	\$20,010	2.16	1.51	\$3,611	\$7,872	2.08	1.46
<b>All public</b>	<b>10,762</b>	<b>\$3,675</b>	<b>\$11,639</b>	<b>3.25</b>	<b>2.36</b>	<b>\$3,836</b>	<b>\$12,041</b>	<b>3.24</b>	<b>2.02</b>	<b>\$3,314</b>	<b>\$9,532</b>	<b>2.64</b>	<b>2.27</b>

Source: NHCDC Round 17 (2012/13).

*Comparison at the cost per bed day level*

Table B.3 compares the cost per bed day by state in the MHCS data set to the NHCDC data set. Again the NHCDC data set is bigger in terms of the number of bed days and the MHCS costs are higher in terms of both the median and average cost per bed day. At the state level, again Qld has a noticeably higher average and median cost per bed day in the MHCS data set compared to the NHCDC data set. The IQR is similar across both data sets but the CV is higher in the MHCS data set (2.81) compared to the NHCDC data set (1.71) but both are over 1.

**Table B.3: Cost distribution for cost per bed day – comparison of MHCS data to NHCDC data**

State	MHCS Data					NHCDC data				
	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation
NSW	111,578	\$1,297	\$1,571	0.41	3.21	466,662	\$1,144	\$1,313	0.60	0.64
Qld	73,512	\$2,259	\$4,917	1.53	2.27	220,643	\$1,148	\$1,285	0.62	0.68
WA	34,624	\$1,704	\$1,643	0.35	0.68	103,544	\$1,460	\$1,813	0.89	3.32
SA	13,759	\$1,076	\$1,206	0.60	0.70	102,403	\$1,227	\$1,617	0.77	0.71
<b>All public</b>	<b>233,473</b>	<b>\$1,424</b>	<b>\$2,513</b>	<b>0.75</b>	<b>2.81</b>	<b>893,252</b>	<b>\$1,188</b>	<b>\$1,414</b>	<b>0.67</b>	<b>1.71</b>

Source: HealthConsult MHCS data set 2015 and NHCDC Round 17 (2012/13).

Again to take out the influence of the number of observations on cost variation, Table B.4 presents the cost per bed day analysis of three matched NHCDC samples (at the level of total number of episodes per state). In two of the three samples the IQR is lower than the MHCS (and the whole NHCDC data set), however in one of the random samples (see sample 3) both the IQR and CV are larger than that in the MHCS data set (refer to Table B.3).

**Table B.4: Cost distribution for cost per bed day – sampling comparison of NHCDC data**

State	Matched NHCDC – Sample 1					Matched NHCDC – Sample 2					Matched NHCDC – Sample 3				
	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation
NSW	57,373	\$916	\$1,115	0.49	0.60	62,170	\$916	\$1,103	0.45	0.52	47,625	\$903	\$1,060	0.60	0.75
Qld	29,867	\$1,463	\$1,630	0.66	0.61	30,187	\$1,210	\$1,422	0.66	0.54	27,215	\$905	\$1,115	0.36	0.62
WA	20,852	\$1,284	\$1,360	0.64	0.63	18,554	\$1,229	\$1,451	0.84	0.73	14,390	\$1,579	\$2,071	0.70	4.17
SA	7,587	\$1,182	\$1,489	0.76	0.61	8,889	\$1,104	\$1,456	0.71	0.87	4,186	\$1,308	\$1,903	1.31	0.77
<b>All public</b>	<b>115,679</b>	<b>\$1,073</b>	<b>\$1,330</b>	<b>0.73</b>	<b>0.64</b>	<b>119,800</b>	<b>\$1,060</b>	<b>\$1,281</b>	<b>0.58</b>	<b>0.64</b>	<b>93,416</b>	<b>\$941</b>	<b>\$1,319</b>	<b>0.78</b>	<b>2.95</b>

Source: NHCDC Round 17 (2012/13).

*Comparison at the cost per bed day (trimmed to include only <\$16,000 per bed day)*

The MHCS data set, like other cost data sets, contains outliers. This analysis repeats that presented in Table B.3 and B.4 but the data set excludes any per bed day cost greater than \$16,000 in either data set. Table B.5 compares the trimmed MHCS data set to the trimmed NHCDC data set. Trimming the MHCS data set made a small difference to the IQR (i.e. reduced from 0.75 to 0.72) but a large difference to the CV (i.e. reduced from 2.81 to 1.00, refer to Table B.3). The CVs impacted the most by the trimming was in NSW and Qld which had the highest number of cost per bed day cases greater than \$16,000. A similar effect was seen with the trimmed NHCDC data set, except there was no change in IQR, but a reduction in CV from 1.71 to 0.69.

**Table B.5: Cost distribution for cost per bed day – comparison of trimmed MHCS data to trimmed NHCDC data**

State	Trimmed MHCS Data					Trimmed NHCDC data				
	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation
NSW	111,552	1,297	1,406	0.40	0.72	466,658	1,144	1,312	0.60	0.63
Qld	73,106	2,147	3,280	1.38	0.92	220,642	1,148	1,283	0.62	0.66
WA	34,621	1,703	1,622	0.35	0.53	103,524	1,459	1,724	0.89	0.75
SA	13,759	1,076	1,206	0.60	0.70	102,400	1,227	1,615	0.77	0.70
<b>All public</b>	<b>233,038</b>	<b>1,417</b>	<b>1,951</b>	<b>0.72</b>	<b>1.00</b>	<b>893,224</b>	<b>1,188</b>	<b>1,400</b>	<b>0.67</b>	<b>0.69</b>

Source: HealthConsult MHCS data set 2015 and NHCDC Round 17 (2012/13).

We then extracted three random samples from the trimmed NHCDC data set which matched the MHCS trimmed data set in terms of the number of episodes per state. Table B.6 presents the results of the three matched trimmed NHCDC data sets. All three random samples of the trimmed NHCDC data set produced very similar IQR and CV at the ‘all public’ level compared to the whole trimmed NHCDC data set (refer to Table B.5). Although the CV at the state level in some of the samples was higher than that in the MHCS sample. For example, in WA the CV in the MHCS trimmed data set was 0.53 but in the three random NHCDC samples was higher (ranged from 0.73 to 0.94). In NSW and Qld, the CV in all three of the trimmed matched NHCDC random samples was lower than that in the MHCS data set.

**Table B.6: Cost distribution for cost per bed day – sampling comparison of trimmed NHCDC data**

State	Matched NHCDC – Sample 1 Trimmed					Matched NHCDC – Sample 2 Trimmed					Matched NHCDC – Sample 3 Trimmed				
	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation	Number of Bed days	Median	Average	Interquartile ratio	Coefficient of Variation
NSW	59,746	903	1,033	0.31	0.65	60,094	890	971	0.25	0.50	60,663	902	1,019	0.29	0.66
Qld	20,665	1,049	1,145	0.57	0.53	16,434	955	1,151	0.63	0.52	22,625	1,201	1,142	0.88	0.73
WA	23,603	1,525	1,751	1.05	0.73	20,449	1,230	1,481	0.81	0.94	24,655	1,164	1,399	0.98	0.83
SA	8,338	1,029	1,082	0.31	0.54	5,591	1,289	1,549	0.61	0.63	8,691	1,101	1,470	0.78	0.59
<b>All public</b>	<b>112,352</b>	<b>946</b>	<b>1,208</b>	<b>0.65</b>	<b>0.71</b>	<b>102,568</b>	<b>915.9</b>	<b>1,154</b>	<b>0.64</b>	<b>0.72</b>	<b>116,634</b>	<b>928.6</b>	<b>1,153</b>	<b>0.76</b>	<b>0.75</b>

Source: NHCDC Round 17 (2012/13).

## **CONCLUSION**

The comparative analysis of the MHCS data set and the NHCDC data set for the states involved in the MHCS shows that the level of cost variation at both the episode level and bed day level is consistent in these two data sets.

At the cost per episode analysis level, both data dispersion measures show very similar levels of spread when the full data sets are compared, noting that the NHCDC data set is much larger than the MHCS and is quite mature, being in its 17<sup>th</sup> year of operation. When the NHCDC data set is matched, in terms of the number of episodes to the MHCS data set, the three random samples taken show there is more cost variation in the NHCDC data. Two of the three random samples produce larger measures of dispersion (both the IQR and the CV).

At the cost per bed day level, both the IQR and CV are lower in the NHCDC data set. However when three random samples of the NHCDC data set are generated, matched to the number of episodes in the MHCS data set, the IQR and CV are higher than the MHCS in one of three random samples. When the cost per bed day is trimmed to exclude per bed day costs above \$16,000 in both data sets, there is little or no impact on the IQR but a large reduction in the CV in both data sets.

The variation seen in the MHCS data set is often due to the Qld sites cost data, and analysis of the NHCDC data set suggests that the Qld cost data were unusually high. However this elevated level does not create a problem in terms of the development of the AMHCC, as it is the relativities in the cost that are more important than absolute costs for classification development work. Systematically higher absolute costs in one state/territory can be taken account of by the AMHCC developers when formulating the classifications models.

This analysis demonstrates quite clearly that measured variation in costs does not necessarily equal measured error. The cost variation seen in the final MHCS data set is likely to be due to many factors including differences in client characteristics, service models, locations of services as well as applied costing practices. It is important to recognise that the principal purpose of the classification system is to explain as much as possible of the variation in measured cost using client characteristics data. If there was no variation in the measured costs, then there would be no need for a classification system.

## Appendix C: ALOS analysis of MHCS data

Appendix C shows analysis of ALOS was undertaken at the episode level by setting. The ALOS was calculated using three methods:

- ALOS (overall) – includes the admission and separation data in the data set irrespective of the study period;
- ALOS (completed) – includes only episodes completed by 31<sup>st</sup> December 2014; and
- ALOS (study period) – assumes an admission date equivalent to the start of data collection or post the start of data collection and a separation date of 31<sup>st</sup> December 2014 unless separation occurred within the study period.

### C.1 ANALYSIS OF ALOS IN ADMITTED EPISODES

Table C.1 presents the ALOS by jurisdiction for same-day and overnight separations in the admitted setting.

**Table C.1: ALOS – Same day and overnight separations – Admitted setting**

Jurisdiction	Same day				Overnight							
	Frequency		ALOS		Frequency		ALOS (overall)		ALOS (completed)		ALOS (study period)	
	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity
NSW	1,912	1,871	1.0	1.0	3,429	3,135	117.5	123.8	32.1	30.9	33.2	34.1
Qld	16	8	1.0	1.0	5,391	3,055	56.1	81.7	24.2	28.5	20.0	23.9
WA	204	52	1.0	1.0	2,224	2,029	19.7	20.4	16.5	16.9	16.2	16.9
SA	6	-	1.0	-	783	612	22.6	24.7	22.6	24.7	20.7	22.5
<b>All public</b>	<b>2,138</b>	<b>1,931</b>	<b>1.0</b>	<b>1.0</b>	<b>11,827</b>	<b>8,831</b>	<b>64.8</b>	<b>78.6</b>	<b>24.7</b>	<b>26.2</b>	<b>23.1</b>	<b>25.8</b>
Privates	10	9	1.0	1.0	1,559	1,559	19.9	19.9	20.2	20.2	19.8	19.8
<b>All admitted sites</b>	<b>2,148</b>	<b>1,940</b>	<b>1.0</b>	<b>1.0</b>	<b>13,386</b>	<b>10,390</b>	<b>59.6</b>	<b>69.8</b>	<b>24.1</b>	<b>25.3</b>	<b>22.8</b>	<b>24.9</b>

Source: HealthConsult MHCS 'Costed Activity' Data set 2015.



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Table C.2 presents the ALOS by jurisdiction by target population.

**Table C.2: ALOS – Same day and overnight separations – Admitted by target population**

Target Population	Same day				Overnight							
	Frequency		ALOS		Frequency		ALOS (overall)		ALOS (completed)		ALOS (study period)	
	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity
Child, Adolescent and Youth	5	2	1.0	1.0	557	357	20.9	24.0	18.5	20.8	16.7	18.8
General	2,123	1,935	1.0	1.0	12,136	9,517	40.7	45.2	22.1	22.6	19.9	21.3
Older person	20	3	1.0	1.0	446	276	120.2	178.7	41.9	53.4	37.9	48.9
Forensic	-	-	-	-	247	240	964.2	990.4	422.9	436.4	146.7	150.3
<b>All admitted sites</b>	<b>2,148</b>	<b>1,940</b>	<b>1.0</b>	<b>1.0</b>	<b>13,386</b>	<b>10,390</b>	<b>59.6</b>	<b>69.8</b>	<b>24.1</b>	<b>25.3</b>	<b>22.8</b>	<b>24.9</b>

Source: HealthConsult MHCS 'Costed Activity' Data set 2015.

Table C.3 presents the ALOS by jurisdiction by service location in the admitted setting.

**Table C.3: ALOS – Same day and overnight separations – Admitted by location of service**

Service location	Same day				Overnight-admitted							
	Frequency		ALOS		Frequency		ALOS (overall)		ALOS (completed)		ALOS (study period)	
	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity
Metropolitan	2,033	1,912	1.0	1.0	11,772	8,929	64.9	78.8	25.2	27.3	23.9	26.9
Non- Metropolitan	115	28	1.0	1.0	1,614	1,461	21.1	15.2	17.2	13.9	14.4	12.7
<b>All admitted sites</b>	<b>2,148</b>	<b>1,940</b>	<b>1.0</b>	<b>1.0</b>	<b>13,386</b>	<b>10,390</b>	<b>59.6</b>	<b>69.8</b>	<b>24.1</b>	<b>25.3</b>	<b>22.8</b>	<b>24.9</b>

Source: HealthConsult MHCS 'Costed Activity' Data set 2015.

**C.2 ANALYSIS OF ALOS IN COMMUNITY EPISODES**

Table C.4 presents the ALOS by jurisdiction for community episodes.

**Table C.4: Profile of ALOS of episodes– Community**

Jurisdiction	Same day				Overnight					
	Frequency		ALOS		Frequency		ALOS (overall)		ALOS(study period)	
	Activity	Costed activity	Activity	Costed activity	Activity	Activity	Activity	Costed activity	Activity	Costed activity
NSW	27,081	26,002	1.0	1.0	6,101	5,040	477.3	526.5	108.8	110.7
Qld	937	183	1.0	1.0	18,435	7,759	173.9	272.8	54.6	71.7
WA	34	4	1.0	1.0	10,065	3,677	381.5	380.7	120.7	128.5
SA	31	25	1.0	1.0	1,821	1,733	519.0	539.9	96.8	100.3
<b>All public</b>	<b>28,083</b>	<b>26,214</b>	<b>1.0</b>	<b>1.0</b>	<b>36,422</b>	<b>18,209</b>	<b>299.4</b>	<b>390.2</b>	<b>84.0</b>	<b>96.7</b>
Privates	59	57	1.0	1.0	1,392	1,221	152.7	150.2	79.1	79.2
<b>All community sites</b>	<b>28,142</b>	<b>26,271</b>	<b>1.0</b>	<b>1.0</b>	<b>37,814</b>	<b>19,430</b>	<b>294.0</b>	<b>375.2</b>	<b>83.8</b>	<b>95.6</b>

Source: HealthConsult MHCS ‘Costed Activity’ Data set 2015.

Table C.5 presents the ALOS by jurisdiction by target population.

**Table C.5: ALOS – Same day and overnight separations – Community by target population**

Target Population	Same day				Overnight					
	Frequency		ALOS		Frequency		ALOS (overall)		ALOS (study period)	
	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity
Child, Adolescent and Youth	170	60	1.0	1.0	5,250	3,690	218.6	241.9	90.9	99.1
General	27,397	25,774	1.0	1.0	29,571	14,640	315.6	416.6	82.3	94.2
Older person	547	434	1.0	1.0	1,498	781	239.1	259.0	97.6	104.3
Forensic	27	3	1.0	1.0	1,495	319	186.8	300.0	75.5	96.3
<b>All community sites</b>	<b>28,142</b>	<b>26,271</b>	<b>1.0</b>	<b>1.0</b>	<b>37,814</b>	<b>19,430</b>	<b>294.0</b>	<b>375.2</b>	<b>83.8</b>	<b>95.6</b>

Source: HealthConsult MHCS ‘Costed Activity’ Data set 2015.

Table C.6 presents the ALOS by jurisdiction by service location for community episodes.

**Table C.6: ALOS – Same day and overnight separations – Community by service location**

Service location	Same day				Overnight					
	Frequency		ALOS		Frequency		ALOS (overall)		ALOS (study period)	
	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity	Activity	Costed activity
Metropolitan	27,941	26,162	1.0	1.0	28,408	12,913	322.3	447.1	84.4	101.0
Non- Metropolitan	200	109	1.0	1.0	9,406	6,517	208.4	232.6	82.3	84.8
<b>All community sites</b>	<b>28,142</b>	<b>26,271</b>	<b>1.0</b>	<b>1.0</b>	<b>37,814</b>	<b>19,430</b>	<b>294.0</b>	<b>375.2</b>	<b>83.8</b>	<b>95.6</b>

Source: HealthConsult MHCS 'Costed Activity' Data set 2015.

### C.3 ANALYSIS OF ALOS IN RESIDENTIAL EPISODES

Table C.7 presents the ALOS by jurisdiction for same-day and overnight separations in the residential setting.

**Table C.7: ALOS – Same day and overnight separations – Residential**

State	Same day				Overnight					
	Frequency		ALOS		Frequency		ALOS (overall)		ALOS (study period)	
	Activity	Costed activity	Activity	Costed activity	Activity	Activity	Activity	Costed activity	Activity	Costed activity
WA	-	-	-	-	97	27	15.7	17.0	15.7	17.0
SA	7	-	1.0	-	253	176	30.9	25.1	21.6	19.6
<b>All public</b>	<b>7</b>	<b>-</b>	<b>1.0</b>	<b>-</b>	<b>350</b>	<b>203</b>	<b>26.7</b>	<b>24.0</b>	<b>20.0</b>	<b>19.2</b>

Source: HealthConsult MHCS 'Costed Activity' Data set 2015.