EMERGING TRENDS FOR
MENTAL HEALTH IN-PATIENT CARE
IN THE
NORTHERN TERRITORY’S TOP END

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ABSTRACT

Objective:
This project identifies emerging trends in mental health in-patient care for people living in the Northern Territory’s Top End. There is a specific focus on trends for Aboriginal and Torres Strait Islander people given the high proportion living in this region.

Methodology:
The Admitted Patient Mental Health National Minimum Data Set (NMDS) for the Darwin Mental Health Services In-patient Unit from 1 July 2000 to 30 June 2010 was analysed using Stata 11 and other statistical web based programs. There were 6079 separations for the 10 years captured by this dataset. The results are discussed in context, using findings from the literature review.

Key Findings:
- **Key Finding 1:** The overall number of short stay separations from the Darwin Mental Health In-patient Unit is decreasing.
- **Key Finding 2:** The overall number of long stay separations from the Darwin Mental Health In-patient Unit is increasing.
- **Key Finding 3:** The average length of stay for Indigenous patients is increasing.
- **Key Finding 4:** The proportion of separations for female patients for both short and long stays is increasing.
- **Key Finding 5:** There are a higher proportion of female patients admitted for long stays.
- **Key Finding 6:** The proportion of separations (short and long stay) for Indigenous people is increasing.
- **Key Finding 7:** The proportion of short and long stay separations for those patients whose usual place of residence was in an NT Rural or NT Remote region is increasing.
- **Key Finding 8:** The average age on separation for Indigenous patients is lower than the average age for non-Indigenous patients.
- **Key Finding 9:** The proportion of separations for male patients is higher where there has been involuntary treatment during the in-patient stay.
Conclusions:
This project found that whilst overall separations for each year are decreasing, the number of separations continues to increase for Indigenous people living in remote areas of the Northern Territory’s Top End. This increased service utilisation may link with improved access to mental health care through primary and specialist services, and improved mental health literacy but may also be due to increased prevalence of mental illness. The challenge for the Darwin Mental Health In-patient Unit will be to continue to meet demand while maintaining the quality of in-patient mental health care and providing a culturally safe environment.
ACKNOWLEDGEMENTS

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# TABLE OF CONTENTS

ABSTRACT ........................................................................................................................................... i  
Objective:  ........................................................................................................................................ i  
Methodology: ..................................................................................................................................... i  
Key Findings: ..................................................................................................................................... i  
Conclusions: ...................................................................................................................................... ii  
ACKNOWLEDGEMENTS ................................................................................................................... iii  
TABLE OF CONTENTS ...................................................................................................................... iv  
Appendicies ....................................................................................................................................... vi  
LIST OF TABLES ............................................................................................................................... vii  
LIST OF FIGURES ............................................................................................................................. ix  
ABBREVIATIONS .............................................................................................................................. xi  
CHAPTER 1 - INTRODUCTION ....................................................................................................... 2  
The Location ...................................................................................................................................... 2  
Top End Mental Health Services ...................................................................................................... 2  
Mental health and mental illness ....................................................................................................... 3  
The context ......................................................................................................................................... 3  
Objective .......................................................................................................................................... 4  
Research Question ........................................................................................................................... 4  
Rationale for the study ..................................................................................................................... 5  
CHAPTER 2 - LITERATURE REVIEW ........................................................................................... 6  
Methodology ..................................................................................................................................... 6  
Results .............................................................................................................................................. 7  
Hospital Admissions ......................................................................................................................... 7  
Access to care ................................................................................................................................. 8  
Comorbidity ..................................................................................................................................... 10  
Quality Care ..................................................................................................................................... 10  
Conclusion ....................................................................................................................................... 15  
CHAPTER 3 - METHODS ............................................................................................................... 16  
Ethics ............................................................................................................................................... 16  
The Data Set .................................................................................................................................... 17  
Sample Size ..................................................................................................................................... 17  
Data Cleansing and Coding ............................................................................................................. 17  
Analytical methods .......................................................................................................................... 19  
Are the methods of the research appropriate? ............................................................................. 20
Appendices

Appendix A  Admitted Patient Mental Health National Minimum Data Set (NMDS)
Appendix B  Mental Health National Outcomes and Casemix Collection (MHNOCC)
Appendix C  Key Performance Indicators for Australian Public Mental Health Services
Appendix D  Letter of Support – Mental Health Director, NT Department of Health & Community Services
Appendix E  Letter of Support – Data Custodian, NT Department of Health & Community Services
Appendix F  Ethics Approval
Appendix G  Map – Health Districts, Department of Health & Families (Northern Territory)
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1:</td>
<td>The number of Separations for Darwin Mental Health In-Patient Unit</td>
<td>21</td>
</tr>
<tr>
<td>Table 2:</td>
<td>Darwin Mental Health In-patient Unit Separations for NT Top End residents</td>
<td>22</td>
</tr>
<tr>
<td>Table 3:</td>
<td>Darwin Mental Health In-Patient Unit Separations for NT Top End residents per 100,000 population</td>
<td>22</td>
</tr>
<tr>
<td>Table 4:</td>
<td>Darwin Mental Health In-Patient Unit Separations (excluding same day) for NT Top End residents per 100,000 population and relative risk ratios by Gender</td>
<td>27</td>
</tr>
<tr>
<td>Table 5:</td>
<td>Darwin Mental Health In-Patient Unit Separations (excluding same day) for NT Top End residents per 100,000 population and relative risk ratios by Indigenous Status</td>
<td>30</td>
</tr>
<tr>
<td>Table 6:</td>
<td>Darwin Mental Health In-Patient Unit separations (excluding same day) for NT Top End residents by Indigenous Status stratified by Region of Usual Residence</td>
<td>36</td>
</tr>
<tr>
<td>Table 7:</td>
<td>Darwin Mental Health In-Patient Unit Separations (excluding same day) for NT Top End residents by Region of Usual Residence stratified by Gender</td>
<td>36</td>
</tr>
<tr>
<td>Table 8:</td>
<td>Primary Diagnosis for Darwin Mental Health In-Patient Unit Separations (&lt; 36 Days) by Gender</td>
<td>37</td>
</tr>
<tr>
<td>Table 9:</td>
<td>Primary Diagnosis for Darwin Mental Health In-Patient Unit Separations (≥ 36 Days) by Gender</td>
<td>38</td>
</tr>
<tr>
<td>Table 10:</td>
<td>Primary Diagnosis for Darwin Mental Health In-Patient Unit Separations (&lt; 36 Days) by Indigenous Status</td>
<td>38</td>
</tr>
<tr>
<td>Table 11:</td>
<td>Primary Diagnosis for Darwin Mental Health In-Patient Unit Separations (≥ 36 Days) by Indigenous Status</td>
<td>39</td>
</tr>
<tr>
<td>Table 12:</td>
<td>Usual Accommodation Type for All Separations (excluding same day)</td>
<td>39</td>
</tr>
<tr>
<td>Table 13:</td>
<td>Admission Source for Darwin Mental Health In-Patient Unit Separations (&lt;36 Days)</td>
<td>41</td>
</tr>
<tr>
<td>Table 14:</td>
<td>Discharge Status for Darwin Mental Health In-Patient Unit Separations (&lt; 36 Days)</td>
<td>42</td>
</tr>
<tr>
<td>Table 15:</td>
<td>Discharge Status for Darwin Mental Health In-Patient Unit Separations (≥36 Days)</td>
<td>43</td>
</tr>
<tr>
<td>Table 16:</td>
<td>Darwin Mental Health In-Patient Unit Separations (excluding same day) where the patient was Discharged Against Medical Advice (DAMA)</td>
<td>43</td>
</tr>
</tbody>
</table>
Table 17: Number of psychiatric in-patient beds per 100,000 population reported in NT and Nationally

Table 18: Average Length of Stay for Admitted Patient Mental Health related Separations in Public Hospitals

Table 19: NT psychiatrists and psychiatrists-in-training FTE (per 100,000 population)
**LIST OF FIGURES**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Map: Northern Territory’s Top End Region</td>
<td>2</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Separations (&lt; 36 days) from Darwin Mental Health In-Patient Unit</td>
<td>23</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Average Length of Stay (days) for NT Top End residents at the Darwin Mental Health In-Patient Unit</td>
<td>23</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Average Length of Stay (excluding same day separations) for NT Top End Residents at Darwin Mental Health In-Patient Unit by Gender and Indigenous Status</td>
<td>24</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Separations (&lt;36 days) and Patients for Darwin Mental Health In-Patient Unit</td>
<td>25</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Separations (≥36 days) and Patients for Darwin Mental Health In-Patient Unit</td>
<td>26</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Separations (&lt;36 days) from Darwin Mental Health In-Patient Unit by Gender</td>
<td>26</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Long Stay (≥ 36 days) Separations from Darwin Mental Health In-Patient Unit by Gender as a proportion of Total Separation.</td>
<td>27</td>
</tr>
<tr>
<td>Figure 9</td>
<td>Separations (&lt;36 days) from Darwin Mental Health In-Patient Unit by Indigenous Status</td>
<td>28</td>
</tr>
<tr>
<td>Figure 10</td>
<td>Separations (≥ 36 days) from Darwin Mental Health In-Patient Unit by Indigenous Status as a proportion of Total Separations</td>
<td>29</td>
</tr>
<tr>
<td>Figure 11</td>
<td>Darwin Mental Health In-Patient Unit Separations (excluding same day) per 100,000 population by Indigenous Status</td>
<td>29</td>
</tr>
<tr>
<td>Figure 12</td>
<td>Darwin Mental Health In-Patient Unit Separations (≥36 days) per 100,000 population by Indigenous Status</td>
<td>31</td>
</tr>
<tr>
<td>Figure 13</td>
<td>Darwin Mental Health In-Patient Unit Separations (excluding same day) for NT Top End residents per 100,000 population stratified by Indigenous Status and Gender</td>
<td>31</td>
</tr>
<tr>
<td>Figure 14</td>
<td>Average Age of NT Top End Patients for Separations from the Darwin Mental Health In-Patient Unit separations</td>
<td>32</td>
</tr>
<tr>
<td>Figure 15</td>
<td>Average Age of NT Top End Patients for Separations from the Darwin Mental Health In-Patient Unit by Gender and Indigenous Status</td>
<td>33</td>
</tr>
<tr>
<td>Figure 16</td>
<td>NT Top End Resident Separations (&lt;36 days) from Darwin Mental Health In-Patient Unit by Region of Usual Residence</td>
<td>34</td>
</tr>
</tbody>
</table>
Figure 17: NT Top End Resident Separations (≥ 36 days) from Darwin Mental Health In-Patient Unit by Region of Usual Residence

Figure 18: Darwin Mental Health In-Patient Unit Separations (excluding same day) per 100,000 population by NT Top End Region of Usual Residence

Figure 19: Usual accommodation Type (excluding private residence and ‘other’ accommodation type) for all Darwin Mental Health In-Patient Unit Separations (excluding same day)

Figure 20: Darwin Mental Health In-Patient Unit Separations (excluding same day) for NT Top End residents who were categorised as Involuntarily during their treatment
# ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<td>AHMAC</td>
<td>Australian Health Ministers’ Advisory Council</td>
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<td>AHW</td>
<td>Aboriginal Health Worker</td>
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<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
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<td>AIMhi</td>
<td>Australian Integrated Mental Health Initiative</td>
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<td>ALOS</td>
<td>Average Length of Stay</td>
</tr>
<tr>
<td>AMHS</td>
<td>Area Mental Health Services</td>
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<td>AMHW</td>
<td>Aboriginal Mental Health Worker</td>
</tr>
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<td>ASGC-RA</td>
<td>Australian Standard Geographical Classification – Remoteness Area</td>
</tr>
<tr>
<td>CINAHL</td>
<td>Cumulative Index to Nursing and Allied Health Literature</td>
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<td>CTO</td>
<td>Community Treatment Order</td>
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<td>DAMA</td>
<td>Discharged Against Medical Advice</td>
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<tr>
<td>HoNOS</td>
<td>Health of the Nation Outcomes Scales</td>
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<td>HREC</td>
<td>Human Research Ethics Committee</td>
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<td>HREOC</td>
<td>Human Rights and Equal Opportunity Commission</td>
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<td>ICD-10</td>
<td>International Classification of Disease (No. 10)</td>
</tr>
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<td>LSP</td>
<td>Life Skills Profile</td>
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<td>MCP</td>
<td>Motivational Care Planning</td>
</tr>
<tr>
<td>MH-NOCC</td>
<td>Mental Health National Outcomes and Casemix Collection</td>
</tr>
<tr>
<td>MHIU</td>
<td>Mental Health In-patient Unit</td>
</tr>
<tr>
<td>NT</td>
<td>Northern Territory</td>
</tr>
<tr>
<td>NMDS</td>
<td>Admitted Patient National Mental Health Data Set</td>
</tr>
<tr>
<td>RA3</td>
<td>Remoteness Area 3: ABS Remoteness Area category – Outer Regional Australia</td>
</tr>
<tr>
<td>RA4</td>
<td>Remoteness Area 4: ABS Remoteness Area category – Remote Australia</td>
</tr>
<tr>
<td>RA5</td>
<td>Remoteness Area 5: ABS Remoteness Area category – Very Remote Australia</td>
</tr>
<tr>
<td>RDH</td>
<td>Royal Darwin Hospital</td>
</tr>
<tr>
<td>TEMHS</td>
<td>Top End Mental Health Service</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
</tbody>
</table>
CHAPTER 1 - INTRODUCTION

The Location

The Darwin Mental Health In-patient Unit is located on the Royal Darwin Hospital campus and provides specialist services, including psychiatric services, to a population of approximately 150,000 people from the Northern Territory’s Top End. In Darwin there are 20 acute beds, 10 secure beds and a 5 bed sub-acute residential facility (Northern Territory Government 2011). The NT covers approximately one sixth of the landmass of Australia, but constitutes only one percent of the population (Northern Territory Government 2005). The Northern Territory’s Top End Health Service Region includes Darwin Urban, Darwin Rural, Katherine and East Arnhem health service districts (Chondur and Guthridge 2006), more specifically, the urban centre of Darwin, Tiwi Islands, Croker Island, Wessel Islands and Groote Eylandt, regional centres and remote communities of West Arnhem, East Arnhem, and parts of the Roper Gulf and Victoria Daly areas. The Top End region ‘covers 36% (487,500 sq km) of the Northern Territory’s land area’ (Territory Natural Resource Management 2012).

Figure 1: Map - The Northern Territory’s Top End Region

Top End Mental Health Services

Top End Mental Health Services provide mental health services to the larger urban centres of Darwin and Katherine, and to more than 100 remote communities and small towns scattered across the Top End of the Northern Territory, which vary in population from about 50 to more than 2000 people. Primary care services to remote communities are delivered through community health
centres, staffed by nurses and Aboriginal Health Workers, and either a resident GP or a fly in fly out District Medical Officer. ‘Specialist mental health services are provided by regional Mental Health Services, which visit the larger communities 4-6 weekly. The visiting team may comprise a psychiatric nurse, an Aboriginal Mental Health Worker (AMHW), and a psychiatry registrar or psychiatrist. Twelve communities have local Aboriginal Mental Health Workers – most are employed through the Division of General Practice AMHW program. The Department of Health and Community Services employs four remote Aboriginal Mental Health Workers’ (Nagel 2004, p.2). Since 2004, a number of changes have taken place including expansion of primary care services and movement to community controlled services under ‘closing the gap’ policies. ‘Specialist outreach services (fly-in fly-out private psychiatrists) now complement the outreach of local services’ (Nagel in Meadows, Singh, & Grigg in press). In 2010-11, a Northern Territory-wide 24 hour Mental Health Triage and Response Service commenced in Darwin ‘providing the first point of contact, particularly after hours, for referrals and advice regarding people who reside in the Territory who require mental health services’. This service ‘will facilitate improved services to consumers and carers, a stronger level of support to General Practitioners and remote clinics and will provide an improved response in the Darwin area’ (NT Government 2011, p.61).

In addition to the NT resident population, approximately 1.8 million tourists visit the NT each year, some of whom may require mental health services’ (Northern Territory Government 2005, p.4).

**Mental health and mental illness**

The terms ‘mental health’ and ‘mental illness’ can be ambiguous. For this project ‘mental illness’ is a term describing a diverse range of behavioral and psychological conditions (Department of Health & Ageing 2005). This project uses ICD-10 diagnostic codes which are discussed in more detail later in this treatise. When talking about ‘mental health’ in this project, the World Health Organisation (WHO) definition for health as being ‘a state of complete physical, mental and social well-being and not merely the absence of disease’ (WHO 1946, p.2) applies.

**The context**

Mental Health Reform commenced in Australian in 1992 and since then a series of National Mental Health Plans, have been implemented. These plans are supported by national policy, strategy, standards and guidelines for implementation. Mental Health Reform introduced alternative methods of mental health care which through deinstitutionalising care has led to improvements in community-based mental health care. Involving patients and carers in individual care planning and treatment, improving accessibility, focusing on recovery, developing national
Key Performance Indicators (KPIs) and implementing annual reporting mechanisms are just a few of the initiatives introduced since 1992.

Mental health care responsibility moved to community care models with hospital-based mental health units providing specialist acute in-patient services. Recent moves toward providing quality mental health care have included national initiatives as well as localised solutions. The Darwin Mental Health In-patient Unit has worked in collaboration with Menzies School of Health Research on projects geared towards improving the in-patient experience for Aboriginal and Torres Strait Islander clients through a series of client file reviews. Menzies School of Health Research’s Australian Integrated Mental Health Initiative (AIMhi) project team commenced these file audits in 1995 and are currently reviewing files for a 2010-2012 file audit. The findings from this analysis of the hospital separations data will provide another source of valuable information to support this collaboration between researchers and health service planners.

Objective
This research project aims to inform service delivery and quality of in-patient care by identifying emerging trends in mental health in-patient care for people living in the Northern Territory’s Top End. There is a specific focus on trends for Aboriginal and Torres Strait Islander people given the high proportion living in this region. Trends will be identified through analysis of the Admitted Patient Mental Health National Minimum Data Set (NMDS) for the Darwin Mental Health In-patient Unit from 2000-01 to 2009-10.

The author acknowledges the diversity in history and culture for Aboriginal and Torres Strait Islander people who will be referred to collectively as Indigenous people in this treatise. This terminology does not intend to diminish the diversity of culture for Aboriginal and Torres Strait Islander people.

Research Question
What are the emerging trends for mental health in-patient care in the Northern Territory’s Top End?

- Are there any demographic trends?
- Are there any geographical trends? (urban vs rural vs very remote)
- Does the comparison show similarities which may be generalised across other populations?
- Can the findings inform clinical practice, service delivery and in-patient care?
Rationale for the study

The burden of mental illness

There is growing recognition of the extent to which mental health disorders contribute to overall ill-health and their economic implications. Although mental disorders account for only about 1% of deaths, they are responsible for an estimated 11% of disease burden worldwide. The World Health Organisation has projected that this will rise to 15% by the year 2020. Within Australia, the Australian Institute of Health and Welfare reported mental disorders to be the third leading cause of overall disease burden, accounting for 13% of total burden and 27% of total years lost due to disability. Mental disorders rank third after heart disease and cancer as the largest causes of illness-related burden in Australia (Department of Health & Ageing 2005).

This research study will review the Admitted Patient Mental Health National Minimum Data Set (NMDS) for the Darwin Mental Health In-patient Unit over a ten year period from 1 July 2000. The NMDS is a data collection for a series of national indicators that is collected annually. Analysis of this data set will give a broader picture of in-patient trends during the period. During this period external influences including national and state health policy, plans, standards and strategies; funding cuts and injections, Indigenous policy; legislation; social and community influences; mental health promotion, improved access; recovery and social inclusion movements; and Aboriginal Health Worker employment and training have shaped the growth of the mental health care system in the Northern Territory. Particular interest will be taken in trends specifically applicable for Indigenous in-patients who are a particularly vulnerable group and have particular mental health care needs. Trends identified through analysis of the NMDS will be contextualised through consideration of these external factors and the findings from the AIMhi NT project during this period.

It is anticipated that identifying emerging trends will contribute to the understanding of in-patient mental health care in the Northern Territory’s Top End and will inform future service delivery.
CHAPTER 2 - LITERATURE REVIEW

This literature review will present and critique publications relevant to the research question - *what are the emerging trends for mental health in-patient care in the Northern Territory’s Top End?* Cross-cultural aspects of Indigenous mental health care will be a focus of this review.

This review explores frequently discussed aspects of mental health care, including access to care; comorbidity; mental health policy; hospital admissions; quality care; and outcomes. Several research studies are examined in more detail to understand their research design, methodology, findings, and limitations. It concludes by reflecting on trends, future directions and challenges for mental health care in general and Indigenous mental health care more specifically.

**Methodology**

An online search of Pubmed, CINAHL and the Ebscohost database collection was conducted. The Ebscohost search included publications from Academic Search Premier, Communication and Mass Media complete, E-Journals, Health Source, Medline, PsychARTICLES, Psychology and Behavioural Sciences Collections and SocINDEX databases.

The results from using the search terms in Pubmed were ‘Indigenous Psychiatric In-patient Care’ (14 results – 2 relevant), ‘Aboriginal Mental Health In-patient’ (4 results – 2 relevant), ‘Aboriginal Mental Health Hospital Trends’ (5 results – 1 relevant), ‘Indigenous Mental Health Hospital Admissions’ (3 results – 0 relevant), ‘Aboriginal Mental Health Northern Territory’ (10 results – 3 relevant), ‘Northern Territory Mental Health Hospital Trends’ (0 results) and ‘Northern Territory hospital trends’ (25 results – 2 relevant).

Other terms searched across all databases included ‘Indigenous Mental Health Worker’ (21 results), ‘Hospital Indigenous Health’ (15 results), ‘Hospital Indigenous Mental Health’ (2 results) ‘Length of Stay Mental Health’ (66 results), ‘Mental Health Indigenous Trends’ (42 287 results), ‘Length of Stay Mental Health Indicators’ (126 135) and ‘Length of Stay Mental Health Australia’ (379 700). The last three searches were very general and any relevant articles found had already been identified through other searches.

An internet search identified historical and current Government publications, including data and websites with various relevant reports. Websites examined included, but were not limited to,
A separate search by author for Nagel, Hunter, Kowanko, Haswell-Elkins, Eley and Westerman identified other publications relevant to this study.

A targeted approach to find more recent articles included a search through Australasian Psychiatry, Rural and Remote Health and through the repositories Indigenous Australian Health InfoNet and the Closing the Gap Clearing House website.

Peer reviewed journal articles; Commonwealth, State and Territory reports, policies, standards and legislation; discussion papers; book chapters; editorials; previous collected data and statistics; Key Performance Indicators and occasional papers were included in the review.

The selected publications were reviewed for relevance to the current project, their ability to inform the research being undertaken, their reliability and validity (methodology used in research and credibility of the authors for the subject matter discussed). Those publications reviewed and deemed relevant were critically appraised and their arguments will be presented in this literature review.

**Results**

**Hospital Admissions**

*Trends in hospital admissions.*

The National Mental Health Report 2010 states that the largest share of national mental health spending (28%) is for hospital services. The 2010 report, the eleventh since 1993, monitors progress under the national mental health strategy using mandated data collections, including the Admitted Patient Mental Health National Minimum Data Set (NMDS) (Appendix A), and the Mental Health National Outcomes and Casemix Collection (MHN OCC) (Appendix B).

Nagel & Thompson found that in Darwin ‘overall rates of hospitalization increased progressively from 1993 to 2000 (Nagel and Thompson 2006, p.293). Haswell-Elkins et al. (2007a), Hunter (2002), Kowanko et al. (2007), Nagel (2003) and Nagel (2005) also discussed the differences in hospital admission/separation rates. In the study, a *Seven Year Review of Hospitalisation Patterns for the Cairns Base Hospital Mental Health Unit* they found that ‘there has been a significant increase in hospital occupancies every year and the rate of acceleration in bed usage has increased’ (Haswell-Elkins et al. 2007a, p.1) for all admissions from 1999/2000 – 2005/2006.
The National Mental Health Report 2010 report highlights difficulties in accessing psychiatric in-patient care and the 2007 National Survey of Mental Health and Wellbeing found that only 34.9% of people who had a mental disorder in the previous 12 months accessed services (Slade et al. 2009). The hospital data presented in this project should be interpreted remembering that many mentally ill people do not even access a mental health service.

**Hospital admissions for Indigenous people**

‘National hospital separation data indicates that diagnosed mental and behavioural disorders are 1.5 and 2.1 times more likely among Aboriginal people (males, females respectively) than their non-Indigenous peers’ (Kowanko et al. 2007, p.220). Considering the barriers in accessing services for Indigenous Australians the unmet need in mental health care may be vast. In the Northern Territory, they found that ‘there was a marked increase in the number of admissions between 1995 and 2001’ (Nagel and Thompson 2006, p.293) for Indigenous people.

**Access to care**

In-patient care has changed rapidly over recent decades in response to concurrent shifts in community values and health policy. The National Mental Health Strategy is the framework guiding mental health reform. Since 1992 there have been four National Mental Health Plans each building on the strengths of the previous plan. Common to them all is the need to provide services which meet the needs of regional, remote and Indigenous people.

**Trends in access to care**

The aim of the Doessel et al. (2006) study was to determine whether access to specialised psychiatric services had improved since 1992 using data available from 1968-1969 to 2002-2003. The study focused on access to mental health services based on their geographical location in Queensland, that is, whether they were living in a south east, coastal or inland Queensland region. The study was hindered by a change in ABS regional classifications in 1974 making it difficult to analyse regional data. They used statistical analysis, including concentration ratios, to analyse the data and test their hypothesis that regional access to services had improved. Using complex formula they presented many graphs of concentration ratios and plotted inequality coefficients all of which were difficult to follow. In their results they reiterated that the regular two-variable analysis was not possible then explained the limitations and assumptions associated with their analysis. They concluded that not only do the statistical results not support their hypothesis, the ‘empirical results indicate that the regional inequality has also risen since the early 1990s’ (Doessel et al. 2006, p.252). Although the formula, graphs and underlying reasoning were convincing, they...
state that ‘there is no empirical way to determine the validity of this argument’ (Doessel et al. 2006, p.252). While it seems likely, it is difficult for the reader to conclude with certainty whether the argument is valid. They do nevertheless raise interesting points about access to services saying that it can be difficult to see small changes in population level data. Rickwood (2004) also comments on Australia’s progress saying that change is slow and the barriers are considerable.

**Challenges for access to care**

Much of the population of the Northern Territory includes the population described in the Third National Mental Health Plan. ‘Certain groups in the community encounter specific access challenges due to cultural, linguistic and geographical barriers, and service gaps. These groups include Indigenous people, people from culturally and linguistically diverse backgrounds, people using forensic services, and people living in rural and remote areas’ (Australian Health Ministers 2003, p.19). The Indigenous people living in remote northern Australia not only fit the demographic profile mentioned here, for many, access to specialist mental health services is limited and often involves excessive travel (Hunter 2007; Nagel et al. 2009; Nagel et al. 2011; Northern Territory Government 2005; Parker 2003). Those requiring in-patient mental health care often need to travel long distances, usually by plane, to Darwin, which means leaving their community, their family and all that is familiar to go to a hospital for a length of time unknown to them, and to experience health care in a manner that is far from their usual way of life.

Many authors have identified barriers to accessing mental health services for Indigenous people. Barriers consistently identified in the literature are: limited access to specialist mental health services (Eley et al. 2007; Hunter 2002; Hunter 2007; Isaacs et al. 2010; Kowanko 2004; Nagel et al. 2009; Swan and Raphael 1995; Westerman 2004); failure of services to acknowledge and respect traditional methods (Westerman 2004); cultural competence of mental health workforce (Eley et al. 2007; Kreger and Hunter 2005; Nagel and Thompson 2006; Smith et al. 2011; Trauer 2010; Vicary and Westerman 2007; Walker and Sonn in Purdie, Dudgeon and Walker 2010; Westerman 2004); engagement issues (Eley et al. 2006; Eley et al. 2007; Smith 2011; Westerman 2004); mental health literacy (Isaacs et al. 2010; Nagel et al. 2009; Vicary and Westerman 2004); institutional racism (Henry, Houston and Mooney 2004; Isaacs et al. 2010; Kowanko et al. 2004); and shame and stigma (Isaacs et al. 2010; Nagel et al. 2009; Rickwood 2004). Some of these barriers will be discussed in more detail later in *Quality Care*.
Comorbidity

Comorbidity and service utilisation

The 2007 National Mental Health and Wellbeing Survey suggested that the rate of service use differs by the number and type of comorbidity (Burgess et al. 2009). This survey had limitations that included under-representation of remote and very remote populations; exclusion of prisons, hostels and the homeless where mental disorder may be more common (Whiteford and Groves 2009); reliance on self reporting; and a low response rate (Burgess et al. 2009; Slade et al. 2009; Whiteford and Groves 2009).

Even with these limitations, the findings were that those with comorbid substance use and mental health disorders are accessing services at low rates. This Survey found that ‘for comorbid anxiety and substance use it is 30% and for comorbid affective disorders and substance use it is 28%’ (Whiteford and Groves 2009, p.646). In the Northern Territory study, Nagel and Thompson (2006) collected information from client files and found that accurately identifying substance misuse information was a limitation for their study. The Far North Queensland study reported similar difficulties with their chart analyses (Haswell-Elkins et al 2007b). These different approaches, self-reported in a national survey and hospital client files, both suggest that comorbid substance use and mental illness impact service utilisation but could only speculate on the extent given the identified limitations.

Quality Care

Another important component of mental healthcare is the process of monitoring quality. The Commonwealth Government has identified a number of clinical indicators (Appendix C) for this purpose. Measures of quality of care include the length of time patients are hospitalised on each occasion (average length of stay), readmission rates and performance on mandated outcome measures. These routinely collected measures are discussed below.

Average length of stay as an indicator for quality care

The average length of stay is an indicator of the efficiency of hospitals (AIHW 2011b). The Australian Health Ministers’ Advisory Committee’s Mental Health Standing Committee (2008) describe the rationale behind this indicator explaining that average length of stay is the main driver of variation in in-patient costs and reflects differences in casemix and practice. In practice, this indicator is influenced by other factors, for example readmission rates, community support capacity, and is not considered as an indicator in isolation. Hyland et al. (2008) found that some studies suggest shorter lengths of stay as a predictor for readmission, while other studies have found an association with longer stays and readmission rates. They also reported that some studies
‘have found no relationship’ (Hyland 2008, p.14). These findings support the suggestion that average length of stay is influenced by other factors.

The national average length of stay for admitted patient mental health related separations (with and without specialised psychiatric care) was reported as 10.5 days in 2003-04 and 11.2 days in 2007-08 (AIHW 2011b). It is therefore difficult to give a precise optimal length of stay as this indicator should be considered in context, however, the rates from the Darwin Mental Health Unit can be considered in respect to other Australian mental health in-patient units.

In Far North Queensland, Haswell-Elkins and colleagues reported on hospitalisation patterns over a 6, 7 and 8 year period for the Cairns Base Hospital Mental Health Unit. They found that the 6 year review revealed ‘a concerning rise in length of stay’ specifically ‘among Indigenous male patients under 30 years’, and the 7 year review ‘revealed further major rises in length of stay’ across both Indigenous and non-Indigenous patients (Haswell-Elkins 2008, p.ii). In the final report they found that there was an increase in admissions for Indigenous patients from 1999-00 to 2006-07 (Haswell-Elkins 2008). The average length of stay increases could be attributed to several influences. There was a fourth report from a retrospective chart review of separations matched by age and primary diagnosis of schizophrenia-related (ICD-10 F20 and F29) disorders for those aged between 20-29 years. The length of stay results were separated into tertiles and reported by person and separation. This enabled the authors to examine the findings by a specific diagnosis to further explain the trend. They could not identify any single factor that increased length of stay saying the ‘observed differences between groups could have occurred by chance’ (Haswell-Elkins et al. 2007b, p.18). The authors identified potential future study factors associated with length of stay but they did not have conclusive findings.

In the Northern Territory, they found that average length of stay did not change substantially from 2000 to 2006. ‘The average length of stay for Indigenous clients was 8.0 days in 2001 and 8.7 days in 2004, and for non-Indigenous clients it was 9.3 and 9.9 days respectively’ (Nagel, Thompson and Spencer 2008, p.5). They suggest that shortened length of stay may be influenced by workload issues, demand for services, availability of community support services; and may impact other quality of care measures such as comprehensive assessments, care planning, AMHW involvement in care, and discharge planning (Nagel, Thompson & Spencer 2008, p.7). Increases in average length of stay may be influenced by the complexity of the case as well as the other influences mentioned previously including demand for services, capacity of the community to provide support services (Nagel, Thompson & Spencer 2008).
The WA Country Health Service (2011) report that the average length of stay during 2003-2008 was approximately 4 days for ‘people under the other psychiatry category’, just under 3 days for ‘diagnoses with a drug and alcohol issue’, 12 days for ‘major affective disorders’ and approximately 18 days, ‘longer in recent years with 21.5 days in 2007/08,’ for schizophrenia (WA Country Health Service 2011, p.12). This report suggests that diagnosis is one of the factors linked with Length of Stay.

The NT, WA and Queensland studies show the importance of considering length of stay rates in context. Length of stay may be influenced by patient, service and environmental factors that limit its use as an indicator of quality of care.

**Readmission rates**

‘The underlying theory is that due to the episodic and cyclic nature of mental illness some people will require multiple admissions over a lifetime’, and the period just after discharge is ‘identified as a time of greater risk’ (AHMAC-MHSC 2008). The AHMAC-MHSC (2008) stated that international literature identifies one month as being the appropriate time period to use as an indicator. The KPIs for Australian Public Mental Health Services (Appendix C) used a 28 day readmission rate as the national indicator. Readmission rates can be used with other information, for example length of stay, and influences the provision of quality care.

Plever et al. (2010) in a study of schizophrenia patients in Queensland reported a 20% readmission rate from a study sample with an average length of stay of 21 days. This study had a sample with a diagnosis of schizophrenia, however the rates may differ for other diagnoses and with the complexity of the illness. Nagel (2004) reported that the rate in 2002, in Darwin was 21% for all readmissions and 23% for Indigenous readmissions. This readmission rate may be influenced by factors such as length of stay, for example ‘shorter lengths of stay might allow less time for comprehensive assessment and discharge planning’ (Nagel, Thompson & Spencer 2008, p.7).

**Involuntary treatment and readmission rates**

Sometimes legislation that facilitates involuntary treatment, referred to as Community Treatment Orders (CTO), is enacted. Vaughan et al. (2000) conducted a retrospective study in NSW that investigated readmission rates for patients (n=123) on CTOs over a 4 year period and a matched comparison group. They found that patients on CTOs were admitted much sooner than their counterparts. They concluded that the limitations of the retrospective case study meant that they could not determine the influence of CTOs on readmission rates.
In Western Australia, Preston, Kisely and Xiao (2002) conducted an epidemiological study, using matched controls, which compared rates of in-patient admissions, bed days and outpatient contacts for those placed on a community treatment order. They concluded that CTOs ‘do not lead to reduced use of health services’ (Preston Kisely and Xiao 2002, p.1244) which is consistent with Nagel’s findings that ‘[t]here is no available evidence that use of involuntary treatment in the Indigenous community is associated with improved outcomes’ (Nagel 2003, p.175). Acknowledging the limitations of retrospective studies, and the recommendation from Vaughan et al. (2000) for a prospective study, there was no conclusive evidence about the impact of CTOs, and readmission rates, service utilisation and patient outcomes.

**Outcome measures**

There was provision in the second National Mental Health Plan for the collection of national de-identified consumer level outcomes (Burgess and Pirkis 2006). The dataset, known as MH-NOCC (Appendix B), includes data obtained from the standardised clinician-rated instruments Health of the Nation Outcomes Scales (HoNOS) and Life Skills Profile (LSP). The HoNOS is a 12-item scale that measures severity of mental illness. The LSP is a 16-item measure that assesses functional impairment. The HoNOS and LSP are validated tools that have been used with Indigenous people (Nagel et al. 2009; Trauer 2010) however discussion continues about their cross-cultural validity (Hunter 2002; Nagel and Thompson 2007; Nagel et al. 2009; Trauer 2010; Westerman 2004). While outcomes are not included in the NMDS, they should be considered along with previously mentioned indicators such as length or stay and readmission rates as important measures of quality of in-patient care.

**Cross cultural care**

‘Quality encapsulates appropriate care that leads to good results for consumers of mental health services’ (AHMAC NMHWG 2005, p.2). What quality in-patient mental health care looks like in a cross-cultural context is not clear. The literature (Eley et al. 2006; Ely et al. 2007; Nagel, Thompson & Spencer 2008; Nagel & Thompson 2006; Westerman 2004) suggests that it includes engagement and communication; a culturally competent workforce; social inclusion and recovery; and improved outcomes. Routinely collected data, such as the NMDS, does not enable detailed understanding of the quality of care. In the Northern Territory, the AIMhi researchers examined individual client files to gain a more in depth understanding of quality mental health care in practice.

The AIMhi NT study which involved a series of retrospective chart audits for the Darwin Mental Health In-patient Unit in 1995, 2001 and 2004 explored implementing quality care principles in an
in-patient setting. Nagel, Thompson and Spencer (2008) used criteria to collect quality of care data in their chart audit which included family and social history; employment; motivational care planning; whether an Aboriginal Mental Health Worker was involved and whether a case manager was identified on discharge. This study focused on whether relevant information had been entered on a patient’s file, for example, were at least ‘four lines of social history’ (Nagel, Thompson and Spencer 2008, p.6) recorded. They found in 1995 that even with this low minimum standard social history was recorded in 29% (1995), 83% (2001) and 35% (2004) of Indigenous client files. The decline was consistent for both Indigenous and non-Indigenous clients from 2001 to 2004 suggesting that there may have been systemic factors influencing the recording of this data. A chart audit has limitations as it only reports what was recorded not what may have actually happened, and that the data captured for the three months may not be representative across the entire year (Nagel, Thompson and Spencer 2008).

Westerman (2004) discussed the challenges of engagement for non-Indigenous clinicians and Indigenous clients. Westerman argued that the ‘use of cultural consultants should become standard practice throughout mental health services working with Indigenous people’ (Westerman 2004, p.3). An argument echoed by Wand, Corr and Eades (2009) in their discussion about consultation-liaison psychiatry services. Nagel and Thompson reported that ‘improvements in care’ in their study ‘coincide with the commencement of employment of Aboriginal Mental Health Workers in the inpatient unit’ (Nagel and Thompson 2006, p.291). Nagel, Thompson and Spencer (2008) reported low rates of documented involvement of AMHWs in their 2004 audit which contrasted reasonable rates in the 2001 audit (Wand, Corr & Eades 2010). The AIMhi study aims to improve outcomes for collaboration with AMHWs so while this decline would have been disappointing their study design will enable them to monitor trends over time compensating for fluctuations. Wand, Corr & Eades (2009) found that AHWs were consulted in 48% of assessments and that Aboriginality was only mentioned in 52% of Indigenous assessments (Wand, Corr and Eades 2010). Trends could be identified in consultation-liaison psychiatry if AHW involvement was monitored over a longer period. Sheldon (in Purdie, Dudgeon and Walker 2010) also identified the importance of consultation and collaboration with Aboriginal Mental Health Workers. The introduction of a National Registration System for Aboriginal Health Workers and recognition as health professionals will further support the inclusion of AMHWs in care and thus contribute to the improvement of the quality of care for Indigenous patients.
Conclusion

The literature shows the breadth and depth of research investigating quality mental health care in Australia in remote and regional areas and for Indigenous peoples. Trends identified throughout this review showed differences in the access and utilisation rates against various indicators. There were several studies that reported findings relevant to Indigenous in-patient care and most were based on retrospective data collection. This project will also identify trends from regularly reported data and it is anticipated that similar limitations to those reported in the literature will be experienced.

The literature suggests that future directions should include collaboration and partnerships with Indigenous people in the implementation of culturally safe in-patient mental health services. Continued challenges will include supporting the Indigenous workforce, improving the cultural competence of non-Indigenous mental health professionals, and promoting the inclusion of AHWs, carers and family in consultation, assessment and care planning to achieve better mental health outcomes for patients. Effort should now be focused on closing the gap between reporting the need for access to culturally appropriate mental health services and the collaborative implementation of such services.
CHAPTER 3 - METHODS

This chapter explains how the project was implemented. The research question and project objectives were presented in Chapter 1 and the literature review was discussed in the previous chapter setting the context and rationale for the project. This section discusses ethics, accessing the dataset, analysis tools and the methods of reporting the findings presented in the next chapter.

Ethics

An application was submitted to the Human Research Ethics Committee of Northern Territory Department of Health and Menzies School of Health Research to amend the study protocol for Cultural security and care planning in acute mental health settings (HREC-08/45) to include this treatise as an extension of the project. The request to change the study protocol included the aims, methodology, timelines and anticipated outcomes for the extension of the project. The NMDS is a de-identified dataset that is not re-identifiable so participant privacy would not be breached in this project. The retrospective, de-identified dataset also meant that it was not possible to obtain informed consent from participants. Participant Information Sheets and Consent Forms were not required for this project.

The NHMRC Guidelines for Human Research outline the requirements for studies that involve researching Indigenous peoples. These guidelines require the researchers to consider the research study in terms of reciprocity, respect, equality, responsibility, and survival and protection for Indigenous peoples. These considerations were taken into account and considered by the Indigenous subcommittee and the Human Research Ethics Committee of Northern Territory Department of Health and Menzies School of Health Research.

A letter of support was obtained from the Director Mental Health, NT Department of Health and Community Services (Appendix D) and the Data Custodian of the NT NMDS (Appendix E).

Approval for this project was granted by the Human Research Ethics Committee of Northern Territory Department of Health and Menzies School of Health Research (Appendix F).
The Data Set
This project will analyse the Admitted Patient Mental Health Care National Minimum Data Set (NMDS) from the Royal Darwin Hospital over a 10 year period from 1 July 2000. The NMDS – Mental Health Establishments Collection commenced in 2005-06 after a transition period from the previous data collection tool, the National Survey of Mental Health Services. The upgrade to a National Minimum Dataset allowed for electronic data collection processes and improved validation techniques and will ensure sustainability for long term data collection (Australian Government, 2010).

The NMDS format and annual reporting requirement meant that a 10-year sample could be requested from the Data Custodian of the Northern Territory’s NMDS. Once HREC approval had been granted a ‘Request Form’ was submitted as per the NT Government’s Data Access Protocol to the Data Custodian.

Sample Size
The sample size was not predetermined in terms of the number of participants or separations, however, the 10 year period was selected to give a reasonable period to identify trends. Participants selected for the study were in-patients in the Darwin Mental Health In-patient Unit who were discharged between 1/7/2000 and 30/6/2010. Inclusion in the study was clear with dates being used to define inclusion and then the year for stratification purposes.

The variables were coded according to the criteria which are defined for the NMDS to ensure consistent reporting nationally. The definitions are available through the Meteor website (www.meteor.aihw.gov.au).

Data Cleansing and Coding
Unknown data was treated as missing data and removed so that it didn’t influence the statistical analyses.

Region of Residence
The location of usual residence at the time the person was admitted was divided into five categories. The categories for Northern Territory residents were NT urban, NT rural and NT remote; and the other two categories were interstate and overseas. The Northern Territory categories were determined using the Australian Standard Geographical Classification – Remoteness Area (ASGC-RA) categories (ABS, 2006a) as a guide.
The RA categories were renamed for this project as follows:

RA3: Outer Regional Australia - NT Urban
RA4: Remote Australia - NT Rural
RA5: Very Remote Australia - NT Remote

Using the Department of Health and Ageing website – Doctor Connect, each location was identified by ABS RA category and coded NT urban, NT rural and NT remote.

The separations from people who usually reside interstate, overseas or where the location was unknown were removed from the dataset for analyses by region of residence.

A dataset of separations for those who usually reside in the Northern Territory’s Top End was created to enable per 100,000 population rates to be calculated. The data was categorised in the four Top End Health Districts to be consistent with the population data that was available for the study period. The Top End Health District’s are Darwin Urban, Darwin Rural, East Arnhem and Katherine. A map showing the regional boundaries (Appendix G) shows there are some differences in these categories and the ABS classifications, for example, the Health Districts categorise Maningrida as Darwin Rural whereas the ABS classifies it as Very Remote. This project will use the Northern Territory Health District categories for population comparisons such as rate per 100,000 population. Where population comparisons are not used the data is presented using the ABS categories described in this project as NT urban, NT rural and NT remote.

Age
The age for each separation was calculated from the dataset as the age of the patient on discharge. The age was then allocated to one of the following age groupings, based on the ABS age reporting categories – 18-19 years; 20-24 years; 25-29 years; 30-34 years; 35-39 years; 40-44 years; 45-49 years; 50-54 years; 55-59 years; 60-64 years; 65-69 years; 70-74 years; and over 75 years. Only adult data will be used for comparison given the disproportionate number of children in Indigenous populations and the low number of children admitted to in-patient mental health units. The age population data for 18-19 years old was calculated by assuming that firstly, the ABS population data for the 15-19 years category is distributed evenly over the age groups, and secondly that 2/5 (40%) of the population of this category were aged 18-19 years.
**Primary Diagnosis**

The primary diagnosis for all separations was collapsed into the following categories:

- Organic & physiological causes of mental disorders and behavioural syndromes (F00-F09; F50-F59; G90-99)
- Developmental Disorders (F70-98)
- Poisoning & Toxic Effects (T36-T65)
- Mental & behavioural disorders due to psychoactive substance use (F10-F19)
- Injuries (S00-S39)
- Schizophrenia, schizotypal & delusional disorder (F20-F29)
- Mood (affective) disorders (F30-F39)
- Neurotic, stress-related & somatoform disorders (F40-F48)
- Disorders of adult personality and behaviour (F60-F69)
- Disorders of psychological development (F80-F89)
- Behavioural & emotional disorders with onset usually occurring in childhood and adolescence (F90-F98)
- Inflammatory, non-inflammatory, obstetric, circulatory, neurological disorders (G40-O99)
- Examination, investigation, other circumstances (Z00-Z76)
- Other (T66-T88;R40-R46)

**Analytical methods**

Stata 11 was used to analyse the data and produce two way tables, tests of association between variables and to identify trends that could be observed graphically through trendlines. Web-based statistical programs (www.vassarstats.net and www.medcalc.org) were used to calculate and confirm manual calculation for rates, relative risk ratios, chi-square tests of association and Fisher Exact Probability Tests.

Data was graphed using Stata 11, Excel 2007 and were presented in graphically in bar graphs, line graphs, and tables.

Data was stratified and removed for analysis purposes as appropriate. For example the data for those who usually reside interstate or overseas was removed when analysing region of residence to create a sample of NT residents. The data for those residing outside of the Northern Territory’s Top End was removed to create a dataset of patients who usually reside in the NT Top End. This data was translated to per 100,000 population so that population level comparisons could be made.
Are the methods of the research appropriate?
The methods of data analysis are consistent with current research practice and are appropriate to seek information about trends over a 10 year period with hospital separations data. Guidance was received from a supervisor with experience in statistical analysis and reporting. For population based statistical calculations and comparisons advice was sought from an epidemiologist. Interpretation of the findings will enable the research questions to be considered and conclusions developed.

Reporting Discrepancies
The limitations of this retrospective project, including reporting discrepancies, are discussed in the limitations sections. It is possible that discrepancies in the reporting of Indigenous status may have been influenced by data collection methods and region of residence may have been influenced by those staying in Darwin just prior to admission who usually reside elsewhere; those living in residential facilities for reasons that may, or may not, be associated with their illness; and forensic patients. The incompatibility of the reporting systems may have also influenced the completeness of the dataset.

Validity of the findings
This project’s findings were compared to NT Health annual reports and National reports to ensure the findings were consistent with general discussion. For example the average length of stay rates are considered in relation to those reported in other studies (AIHW 2011b; Department of Health & Community Services 2007; Nagel, Thompson & Spencer 2008) and any irregularities were discussed with supervisors, NT Mental Health practitioners, the data custodian and compared with previously published material to ensure the data were valid and that irregularities were not a result of data collection processes, reporting methods or analysis errors. The integrity of the findings for this project was maintained through methodical recording of data cleansing, coding and analysis to enable review of analysis techniques and findings.
CHAPTER 4 - RESULTS

This chapter presents the findings from analysis of the *Admitted Patient Mental Health Care National Minimum Data Set (NMDS)* for the Darwin Mental Health In-patient Unit from 1/07/2000 to 30/06/2010. This chapter has been arranged to present the findings for separations, length of stay, demographic variables, region of usual residence, diagnosis and other interesting trends that emerged. The findings presented and described in this chapter will be discussed further in the next chapter.

Separations

The NMDS contained a total of 6079 separations for this 10 year period. The same day separations were removed from the main dataset creating a subset to be analysed separately. The remaining data was sorted into short stay and long stay separations. A short stay was determined to be an admission of less than 36 days and a long stay was any admission of 36 days or more which is consistent with the methodology of published material using admitted mental health patient data (AIHW 2000; AIHW 2005; Haswell-Elkins et al. 2008).

Table 1: The number of Separations for Darwin Mental Health In-patient Unit.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Separations</th>
<th>Short Stay (&lt;36 days)</th>
<th>Long Stay (≥ 36 days)</th>
<th>Same Day Separations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>87</td>
<td>79</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2001-02</td>
<td>82</td>
<td>72</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>2002-03</td>
<td>610</td>
<td>550</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>2003-04</td>
<td>713</td>
<td>648</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td>2004-05</td>
<td>866</td>
<td>792</td>
<td>36</td>
<td>38</td>
</tr>
<tr>
<td>2005-06</td>
<td>916</td>
<td>786</td>
<td>45</td>
<td>85</td>
</tr>
<tr>
<td>2006-07</td>
<td>719</td>
<td>638</td>
<td>43</td>
<td>38</td>
</tr>
<tr>
<td>2007-08</td>
<td>705</td>
<td>624</td>
<td>44</td>
<td>37</td>
</tr>
<tr>
<td>2008-09</td>
<td>713</td>
<td>572</td>
<td>51</td>
<td>90</td>
</tr>
<tr>
<td>2009-10</td>
<td>668</td>
<td>553</td>
<td>47</td>
<td>68</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>6079</strong></td>
<td><strong>5314</strong></td>
<td><strong>342</strong></td>
<td><strong>423</strong></td>
</tr>
</tbody>
</table>

There were a low number of separations for 2000-01 and 2001-02. The low number of separations was inconsistent with previously published statistics for this period (AIHW 2008; Nagel, Thompson & Spencer 2008; Nagel & Thompson 2006). There may have been data missing from these two years due to incompatible data systems (personal communication with the Data Custodian) so the data from 2000-01 and 2001-02 has been omitted from the dataset for analysis.
The separations for those patients who said that they usually reside in a place outside of the Northern Territory’s Top End were removed from the data set to calculate population statistics and to understand the findings in terms of those who usually reside in the NT Top End. This dataset contained 5680 separations for short stay, long stay and same day separations (Table 2).

### Table 2: Darwin Mental Health In-patient Unit Separations for NT Top End residents.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Separations</th>
<th>Short Stay (&lt;36 days)</th>
<th>Long Stay (≥ 36 days)</th>
<th>Same Day Separations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>576</td>
<td>521</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>2003-04</td>
<td>664</td>
<td>605</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>2004-05</td>
<td>809</td>
<td>742</td>
<td>30</td>
<td>37</td>
</tr>
<tr>
<td>2005-06</td>
<td>853</td>
<td>734</td>
<td>40</td>
<td>79</td>
</tr>
<tr>
<td>2006-07</td>
<td>666</td>
<td>589</td>
<td>41</td>
<td>36</td>
</tr>
<tr>
<td>2007-08</td>
<td>665</td>
<td>587</td>
<td>42</td>
<td>36</td>
</tr>
<tr>
<td>2008-09</td>
<td>667</td>
<td>531</td>
<td>49</td>
<td>87</td>
</tr>
<tr>
<td>2009-10</td>
<td>622</td>
<td>518</td>
<td>45</td>
<td>59</td>
</tr>
<tr>
<td>Total:</td>
<td>5680</td>
<td>4827</td>
<td>316</td>
<td>397</td>
</tr>
</tbody>
</table>

The separations where patients identified as usually residing in the Northern Territory’s Top End (n=5680) were calculated per 100,000 population for short stay, long stay and same day separations (Table 3). There is an increase in separations in all categories, with the highest being in 2004-05 for short stays; and 2008-09 for long stay and same day separations.

### Table 3: Darwin Mental Health In-Patient Unit separations for residents of the NT Top End per 100,000 population.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Separations</th>
<th>&lt; 36 days</th>
<th>≥ 36 days</th>
<th>Same day separations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>374.3</td>
<td>338.6</td>
<td>19.5</td>
<td>16.2</td>
</tr>
<tr>
<td>2003-04</td>
<td>426.3</td>
<td>388.4</td>
<td>19.9</td>
<td>18.0</td>
</tr>
<tr>
<td>2004-05</td>
<td>506.6</td>
<td>464.6</td>
<td>18.8</td>
<td>23.2</td>
</tr>
<tr>
<td>2005-06</td>
<td>521.0</td>
<td>448.4</td>
<td>24.4</td>
<td>48.3</td>
</tr>
<tr>
<td>2006-07</td>
<td>397.7</td>
<td>351.8</td>
<td>24.5</td>
<td>21.5</td>
</tr>
<tr>
<td>2007-08</td>
<td>386.4</td>
<td>341.0</td>
<td>24.4</td>
<td>20.9</td>
</tr>
<tr>
<td>2008-09</td>
<td>376.6</td>
<td>299.8</td>
<td>27.7</td>
<td>49.1</td>
</tr>
<tr>
<td>2009-10</td>
<td>345.3</td>
<td>287.6</td>
<td>25.0</td>
<td>32.8</td>
</tr>
</tbody>
</table>

Figure 2 shows the total number of short stay, long stay and same day separations for the Darwin Mental Health In-patient Unit from 2002-03 to 2009-10. There was an increase in the number of short stay separations from 2002-03 until 2004-05 and then from 2005-06 there was a decrease in
the number of short stay separations which is similar to what has been described for separations per 100,000 population (Table 3). The trend line shows an overall decrease in the number of short stay separations, and a slight increase in the number of long stay separations during this period.

Figure 2: All Separations from Darwin Mental Health In-patient Unit for those who usually reside in the NT Top End.

Average Length of Stay
The average length of stay for all separations (excluding same day) is just above the average length of stay for short stay separations. The influence of the few long stay separations each year on the overall average length of stay can be seen by presenting the short and long stay separations individually (Figure 3).

Figure 3: Average Length of Stay (days) for NT Top End Patients at the Darwin Mental Health In-patient Unit.

The average length of stay for NT residents (excluding same day separations) when calculated by gender and Indigenous status showed an increase across all categories (Figure 4). The increase in
length of stay for Indigenous separations was more significant with an increase of almost three and half days (3.6 days) from 10.5 days in 2002-03 to 14.1 days in 2009-10. The non-Indigenous average length of stay fluctuates within a range of approximately 2 days during the period (10.8 – 13.1 days). For gender, the rate fluctuates with the average length of stay ranging from 11.0 – 13.2 days for males and from 10.1 – 15.2 days for females during the study period.

Investigation into six separations during the period of greater than 180 days (6 months) showed that they were equally spread amongst the variables. That is, there were 3 male and 3 female; 3 Indigenous and 3 non-Indigenous. Further investigation found that there were two separations with a length of stay greater than 300 days. Both people were Indigenous and there was one male and one female. These separations were removed and the length of stay recalculated. The removal of these very long stay (>300 days) separations reduced the length of stay for Indigenous separations in 2006 and 2007 and for gender it reduced the length of stay for males in 2006 and for females in 2007. The impact of the very long stay patients on overall average length of stay statistics should not be underestimated as it impacted the average length of stay across all categories by approximately one day when recalculated.

Separations and the number of Individual Patients
The NMDS is a de-identified dataset so the number of individual patients admitted to the Darwin Mental Health In-patient Unit each year could not be determined. An attempt to gain some understanding of the number of individual patients contained in the NMDS was achieved by
matching birthdate, locality name, gender, usual accommodation, and Indigenous status which gave an indication of separations likely to be the same person within each given year. Figures 5 and 6 show the results of this analysis, however, caution must be used with these results given the method of calculating the number of individual patients.

![Graph showing separations and patients](image)

**Figure 5: Separations (<36 days) and Patients for Darwin Mental Health In-patient Unit.**

When the number of individual patients is considered, rather than separations, the increase during 2002-03 to 2005-06 is not as marked. The difference between the number of patients and separations may be explained through re-admission rates that were not captured through this dataset but have been reported in other studies. The data for long stay separations (n=342) were analysed independently. For this subgroup there were fewer matches, and there is a very small difference between separations and patients for each year (Figure 6). The trend lines show the number of separations and patients were both decreasing for short stays and increasing for long stays during the period.
Figure 6: Separations (≥36 days) and Patients for Darwin Mental Health In-patient Unit.

Gender Status

The data were stratified by year and then by gender status for further analysis. Figure 7 shows the differences between male and female short stay separations as a proportion of total separations for each year. There were consistently more male separations (50-64%) than female (36-42%) for every year covered in this study, however, the trend line suggests a slight increase in female separations during the study period.

Figure 7: Separations (<36 days) from Darwin Mental Health In-patient Unit by Gender.
There were more long stay separations for males than females for all years except 2008-09 (Figure 8). The separations for 2006-07 (51% male) and (49% female) are reflective of population level gender ratios that report the proportion of males in the NT population in 2006 was 52%. (ABS 2007). The trend line shows that separations increased for females and decreased for males during this period.

Figure 8: Long Stay (≥ 36 days) Separations from Darwin Mental Health In-patient Unit by Gender as a proportion of Total Separations.

There are more separations for males per 100,000 population for every year of the NMDS (Table 4). This is consistent with earlier findings that described the proportion of males and females in the dataset as a percentage of total separations.

Table 4: Darwin Mental Health In-Patient Unit Separations (excluding same day) for NT Top End residents per 100,000 population and relative risk ratios by Gender.

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
<th>Rate Ratio¹</th>
<th>Relative Risk</th>
<th>Confidence Interval (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>568.9</td>
<td>372.9</td>
<td>1.5</td>
<td>1.53***</td>
<td>1.284 – 1.813</td>
</tr>
<tr>
<td>2003-04</td>
<td>617.0</td>
<td>456.3</td>
<td>1.4</td>
<td>1.35**</td>
<td>1.154 – 1.584</td>
</tr>
<tr>
<td>2004-05</td>
<td>762.8</td>
<td>497.7</td>
<td>1.5</td>
<td>1.53***</td>
<td>1.325 – 1.772</td>
</tr>
<tr>
<td>2005-06</td>
<td>701.6</td>
<td>528.1</td>
<td>1.3</td>
<td>1.33***</td>
<td>1.151 – 1.533</td>
</tr>
<tr>
<td>2006-07</td>
<td>543.4</td>
<td>437.2</td>
<td>1.2</td>
<td>1.24**</td>
<td>1.062 – 1.456</td>
</tr>
<tr>
<td>2007-08</td>
<td>560.2</td>
<td>390.1</td>
<td>1.4</td>
<td>1.44***</td>
<td>1.224 – 1.685</td>
</tr>
<tr>
<td>2008-09</td>
<td>456.5</td>
<td>403.8</td>
<td>1.1</td>
<td>1.13</td>
<td>0.961 – 1.330</td>
</tr>
<tr>
<td>2009-10</td>
<td>458.7</td>
<td>354.8</td>
<td>1.3</td>
<td>1.29**</td>
<td>1.094 – 1.527</td>
</tr>
</tbody>
</table>

¹ Male:Female Rate using per 100,000 population rates
** P < 0.01
*** P < 0.0001

Leigh-ann Onnis | Emerging Trends for Mental Health In-patient Care in the Northern Territory’s Top End
Males were 1.1 – 1.5 times more likely than females to be discharged from the Darwin Mental Health In-patient Unit (Table 4). The relative risk ratio suggests that the risk of separation from Darwin Mental Health In-patient Unit was higher for males than females living in the Northern Territory Top End for each year of the study (Table 4).

**Indigenous Status**

The NMDS only contained 24 separations (less that 0.5% of the dataset) where Indigenous Status was unknown or not stated. These separations were excluded for analysis. The number of non-Indigenous separations is higher across all years (Figure 9). The ABS NT population data (ABS 2001; ABS 2007; ABS 2011a; ) shows that the proportion of Indigenous residents differs over the period, however, as a guide approximately 30% of the NT population (ABS, 2007) identifies as Indigenous which is lower than the proportion of separations for Indigenous people at the Darwin Mental Health In-patient Unit where it ranged between 37-45%. The trend line shows an increase in separations (< 36 days) for Indigenous patients and a decrease for non-Indigenous patients.

There was an increase in long stay separations for Indigenous patients and a decrease for non-Indigenous patients during this period (Figure 10). The difference between Indigenous and non-Indigenous separations narrowed from 2002-03 to 2008-09 where the proportions were almost equal. In 2009-10 there were more separations for Indigenous people than non-Indigenous.

---

**Figure 9: Separations (<36 days) from Darwin Mental Health In-patient Unit by Indigenous Status.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Indigenous</th>
<th>Non-Indigenous</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>37%</td>
<td>63%</td>
</tr>
<tr>
<td>2003-04</td>
<td>39%</td>
<td>61%</td>
</tr>
<tr>
<td>2004-05</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>2005-06</td>
<td>44%</td>
<td>56%</td>
</tr>
<tr>
<td>2006-07</td>
<td>44%</td>
<td>56%</td>
</tr>
<tr>
<td>2007-08</td>
<td>41%</td>
<td>59%</td>
</tr>
<tr>
<td>2008-09</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>2009-10</td>
<td>43%</td>
<td>57%</td>
</tr>
</tbody>
</table>

---

Leigh-ann Onnis | Emerging Trends for Mental Health In-patient Care in the Northern Territory’s Top End
Figure 10: Separations (≥ 36 days) from Darwin Mental Health In-patient Unit by Indigenous Status as a proportion of Total Separations.

The number of separations (excluding same day) per 100,000 population (Figure 11) show there are more separations for Indigenous people per 100,000 population than for non-Indigenous people. This suggests that the high number of separations for Indigenous people is more profound when presented in the context of population proportions.

Figure 11: Darwin Mental Health In-patient Unit Separations (excluding same day) per 100,000 population by Indigenous Status.
<table>
<thead>
<tr>
<th>Year</th>
<th>Indigenous</th>
<th>Non-Indigenous</th>
<th>Rate Ratio¹</th>
<th>Risk Ratio</th>
<th>Confidence Interval (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>777.74</td>
<td>381.9</td>
<td>2.0</td>
<td>2.04***</td>
<td>1.714 – 2.421</td>
</tr>
<tr>
<td>2003-04</td>
<td>933.88</td>
<td>424.8</td>
<td>2.2</td>
<td>2.20***</td>
<td>1.877 – 2.576</td>
</tr>
<tr>
<td>2004-05</td>
<td>1129.59</td>
<td>489.4</td>
<td>2.3</td>
<td>2.31***</td>
<td>2.000 – 2.664</td>
</tr>
<tr>
<td>2005-06</td>
<td>1209.86</td>
<td>446.5</td>
<td>2.7</td>
<td>2.71***</td>
<td>2.352 – 3.121</td>
</tr>
<tr>
<td>2006-07</td>
<td>966.94</td>
<td>355.2</td>
<td>2.7</td>
<td>2.72***</td>
<td>2.328 – 3.184</td>
</tr>
<tr>
<td>2007-08</td>
<td>864.49</td>
<td>367.9</td>
<td>2.3</td>
<td>2.35***</td>
<td>2.006 – 2.753</td>
</tr>
<tr>
<td>2008-09</td>
<td>859.34</td>
<td>307.4</td>
<td>2.8</td>
<td>2.80***</td>
<td>2.377 – 3.288</td>
</tr>
<tr>
<td>2009-10</td>
<td>774.47</td>
<td>294.7</td>
<td>2.6</td>
<td>2.62***</td>
<td>2.224 – 3.106</td>
</tr>
</tbody>
</table>

¹ Indigenous:Non-Indigenous rate using per 100,000 population rates.

*** p < 0.0001

Indigenous people were 2.0 – 2.8 times more likely than non-Indigenous people to be discharged from Darwin Mental Health In-patient Unit for every year in the study period (Table 5). The relative risk ratios suggest that the risk of separation was higher if you were an Indigenous person than if you were a non-Indigenous person living in the Northern Territory’s Top End during the period of this study.

Figure 12 shows that as a proportion of all long stay separations for each year, there was an increase in separations for Indigenous people. The data for long stay separations was then calculated using population statistics to get a clearer understanding. When calculated per 100,000 population, the increase in long stay separations for Indigenous people is even more apparent (Figure 12).
The separations were stratified by gender and Indigenous status for each year (Figure 13) and then calculated per 100,000 population. For Indigenous males, the proportion of separations is high but decreasing during the study period. For Indigenous females it decreases slightly during the study period.
For non-Indigenous males the proportion of separations per 100,000 population is decreasing and for non-Indigenous females the proportion is low and also decreasing during the study period. The number of separations per 100,000 population was a lot lower for non-Indigenous patients than Indigenous patients.

Age
For most years there were more separations for those aged 18-29 years. The average age range for short stay separations was 34-36 years and for long stay was 31-37 years (Figure 14). There were fewer separations for those aged over 50 years. The average age range for same day separations is 32 - 56 years, with the average age increasing from 2006-07 suggesting that the age of patients for same day separations is increasing. The average age of the same day patients is 20 years older than short stay patients and more than 20 years older than long stay patients.

![Figure 14: Average Age of NT Top End patients for Separations from the Darwin Mental Health In-patient Unit.](image)

When the average age of separations for NT residents is calculated by gender (Figure 15), females were older for all years except 2004-05. When the average was calculated for all separations during the study period the average for females was one year older (36 years) than males (35 years).
When the average age of separations for NT residents was calculated by Indigenous status (Figure 15), the difference is a lot clearer. The average age for Indigenous separations was a lot younger than for non-Indigenous separations across all years with the difference when calculated for the whole study period showing that Indigenous people were on average 8 years younger (31 years) than non-Indigenous people (39 years) on separation.

**Region of Residence**

The number of separations for each year by region of residence as a percentage of the total separations for each year (Figure 16) shows a decrease in NT urban separations, an increase in NT remote and NT rural separations.
Figure 16: NT Top End Resident Separations (<36 days) from Darwin Mental Health In-patient Unit by Region of Usual Residence.

Similarly for long stay separations (Figure 17) there is a decrease in NT urban separations and an increase in NT remote separations. The trend for NT rural separations is more consistent with the proportion for some years being similar to the proportion for short stay separations for those residing in NT rural regions and in 2007-08 it was the same (10%) for both short and long stay separations.

Figure 17: NT Top End Resident Separations (≥ 36 days) from Darwin Mental Health In-patient Unit by Region of Usual Residence.
The number of separations per 100,000 people by region of residence for those people who usually reside in the Northern Territory’s Top End (Figure 18) shows a similar trend for NT urban and NT rural separations to the findings presented in Figure 16 and 17 with a higher proportion of Darwin Urban and Darwin Rural separations earlier in the study period.

It is difficult to make direct comparisons with previous data presented as this figure uses the NT Health District classifications. It can, however, be seen that the proportion of separations from the East Arnhem and Katherine Health Districts increased during the study period and all of East Arnhem and much of the Katherine region would fall within the ABS very remote category. These findings suggest that the number of remote separations increased and urban separations decreased. The rate per 100,000 population comparison places the number of separations in context for the smaller number of people who live in remote regions.

![Figure 18: Darwin Mental Health In-patient Unit Separations (excluding same day) per 100,000 population by NT Top End Region of Usual Residence.](image)

Table 6 shows the separations (excluding same day) by Indigenous status stratified by usual region of residence for all patients for short and long stay separations. This suggests that there are more non-Indigenous people per 100,000 population in Darwin Urban and Darwin Rural areas hospitalised in the Darwin Mental Health In-Patient Unit and the opposite effect, that is, more Indigenous separations per 100,000 population in Katherine and East Arnhem Health Districts which represent the more remote areas.
Table 6: Darwin Mental Health In-Patient Unit Separations (excluding same day) for NT Top End residents by Indigenous Status stratified by Region of Usual Residence.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03 (n=545)</td>
<td>2234.1</td>
<td>334.3</td>
<td>266.9</td>
<td>1465.9</td>
<td>132.4</td>
<td>309.7</td>
<td>227.8</td>
<td>534.2</td>
</tr>
<tr>
<td>2003-04 (n=636)</td>
<td>2417.1</td>
<td>357.6</td>
<td>508.4</td>
<td>1815.4</td>
<td>261.5</td>
<td>479.7</td>
<td>253.8</td>
<td>495.2</td>
</tr>
<tr>
<td>2004-05 (n=769)</td>
<td>2992.1</td>
<td>429.3</td>
<td>554.8</td>
<td>1519.6</td>
<td>291.0</td>
<td>642.5</td>
<td>294.0</td>
<td>520.1</td>
</tr>
<tr>
<td>2005-06 (n=773)</td>
<td>2924.2</td>
<td>390.1</td>
<td>683.2</td>
<td>1055.0</td>
<td>351.8</td>
<td>521.4</td>
<td>483.4</td>
<td>883.4</td>
</tr>
<tr>
<td>2006-07 (n=630)</td>
<td>2523.1</td>
<td>290.4</td>
<td>490.3</td>
<td>1299.4</td>
<td>249.6</td>
<td>406.7</td>
<td>250.8</td>
<td>689.2</td>
</tr>
<tr>
<td>2007-08 (n=629)</td>
<td>2048.5</td>
<td>304.3</td>
<td>504.5</td>
<td>1577.7</td>
<td>273.6</td>
<td>423.5</td>
<td>344.8</td>
<td>455.5</td>
</tr>
<tr>
<td>2008-09 (n=580)</td>
<td>2016.8</td>
<td>251.7</td>
<td>539.2</td>
<td>890.8</td>
<td>220.6</td>
<td>422.9</td>
<td>333.8</td>
<td>631.8</td>
</tr>
<tr>
<td>2009-10 (n=553)</td>
<td>1940.4</td>
<td>248.8</td>
<td>429.4</td>
<td>846.6</td>
<td>202.3</td>
<td>494.4</td>
<td>246.1</td>
<td>311.0</td>
</tr>
</tbody>
</table>

The separations (excluding same day) for those patients who usually reside in the NT Top End were stratified by gender (Table 7). The data suggests that for the Darwin Urban and Darwin Rural Health Districts there are more female separations than male per 100,000 population. For East Arnhem and Katherine Health Districts the number of separations (excluding same day) per 100,000 population varies across each year of the study suggesting that there are other factors influencing these separations leading to the fluctuations seen during the study period.

Table 7: Darwin Mental Health In-Patient Unit Separations (excluding same day) for NT Top End residents by Region of Usual Residence stratified by Gender.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Darwin Urban Male</th>
<th>Darwin Urban Female</th>
<th>Darwin Rural Male</th>
<th>Darwin Rural Female</th>
<th>Katherine Male</th>
<th>Katherine Female</th>
<th>East Arnhem Male</th>
<th>East Arnhem Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03 (n=551)</td>
<td>583.1</td>
<td>409.2</td>
<td>1029.5</td>
<td>310.6</td>
<td>238.2</td>
<td>229.2</td>
<td>387.1</td>
<td>325.7</td>
</tr>
<tr>
<td>2003-04 (n=636)</td>
<td>627.4</td>
<td>445.2</td>
<td>1155.0</td>
<td>688.3</td>
<td>301.8</td>
<td>454.3</td>
<td>395.7</td>
<td>297.9</td>
</tr>
<tr>
<td>2004-05 (n=772)</td>
<td>793.8</td>
<td>513.1</td>
<td>1096.5</td>
<td>650.8</td>
<td>589.7</td>
<td>351.2</td>
<td>382.5</td>
<td>384.4</td>
</tr>
<tr>
<td>2005-06 (n=774)</td>
<td>691.9</td>
<td>538.2</td>
<td>1039.8</td>
<td>558.1</td>
<td>393.8</td>
<td>487.1</td>
<td>808.9</td>
<td>467.5</td>
</tr>
<tr>
<td>2006-07 (n=630)</td>
<td>537.9</td>
<td>439.0</td>
<td>894.0</td>
<td>619.0</td>
<td>369.7</td>
<td>290.9</td>
<td>431.2</td>
<td>419.9</td>
</tr>
<tr>
<td>2007-08 (n=629)</td>
<td>548.7</td>
<td>361.9</td>
<td>1057.5</td>
<td>657.9</td>
<td>359.6</td>
<td>342.9</td>
<td>386.4</td>
<td>391.6</td>
</tr>
<tr>
<td>2008-09 (n=580)</td>
<td>419.3</td>
<td>400.0</td>
<td>890.6</td>
<td>406.7</td>
<td>305.5</td>
<td>346.4</td>
<td>439.7</td>
<td>465.7</td>
</tr>
<tr>
<td>2009-10 (n=563)</td>
<td>459.9</td>
<td>353.6</td>
<td>679.7</td>
<td>451.8</td>
<td>340.5</td>
<td>368.3</td>
<td>320.6</td>
<td>220.4</td>
</tr>
</tbody>
</table>
Diagnosis

The NMDS only contained data about diagnosis from 2005. The dataset was incomplete for 2004-05 so data for 5 years, 2005-06 to 2009-10 (n=3170) were analysed.

The proportion of separations for each primary diagnosis category for each year were stratified by long and short stay and then by gender and Indigenous status for further analysis. A summary of the proportion of separations for each year for the most frequently reported primary diagnoses (proportion > 5%) is presented below.

The most common primary diagnoses (in ICD-10 category order) were:
- **F00-F09**: Organic & physiological causes of mental disorders and behavioural syndromes
- **F10-F19**: Mental & behavioural disorders due to psychoactive substance use
- **F20-F29**: Schizophrenia, schizotypal & delusional disorder
- **F30-F39**: Mood (affective) disorders
- **F40-F48**: Neurotic, stress-related & somatoform disorders

### Table 8: Primary Diagnosis for Darwin Mental Health In-Patient Unit Separations (< 36 Days) by Gender (%).

<table>
<thead>
<tr>
<th>Primary Diagnosis</th>
<th>2005-06 Male (n=469)</th>
<th>2006-07 Male (n=374)</th>
<th>2007-08 Male (n=389)</th>
<th>2008-09 Male (n=331)</th>
<th>2009-10 Male (n=325)</th>
<th>Female (n=523)</th>
<th>Female (n=263)</th>
<th>Female (n=235)</th>
<th>Female (n=241)</th>
<th>Female (n=226)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F00-F09</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>F10-F19</td>
<td>22</td>
<td>24</td>
<td>18</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>F20-F29</td>
<td>36</td>
<td>40</td>
<td>41</td>
<td>44</td>
<td>41</td>
<td>36</td>
<td>34</td>
<td>34</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>F30-F39</td>
<td>19</td>
<td>16</td>
<td>21</td>
<td>20</td>
<td>22</td>
<td>23</td>
<td>26</td>
<td>32</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>F40-F48</td>
<td>18</td>
<td>15</td>
<td>16</td>
<td>18</td>
<td>23</td>
<td>24</td>
<td>23</td>
<td>20</td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

For both short and long stay separations the highest proportion of separations were for F20-F29 (Schizophrenia, schizotypal and delusional disorder) for both males and females for every year of the NMDS (Table 8 and Table 9). Every year for both short and long stay separations there was a higher proportion of males with this primary diagnosis. For short stay separations the second most common diagnosis differed each year. For females, however, it was more commonly F30-F39 (mood (affective) disorders).

For both short and long stay separations, a higher proportion of males had a primary diagnosis of mental & behavioural disorders due to psychoactive substance use. The only exception is long stay separations for 2005-06 where females had a higher proportion (5%). For long stay separations,
mood (affective) disorders were the second most common primary diagnosis. There was a higher proportion of females with this primary diagnosis across all years.

Table 9: Primary Diagnosis for Darwin Mental Health In-Patient Unit Separations (≥ 36 Days) by Gender (%).

<table>
<thead>
<tr>
<th>Primary Diagnosis</th>
<th>2005-06</th>
<th>2006-07</th>
<th>2007-08</th>
<th>2008-09</th>
<th>2009-10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (n=24)</td>
<td>Female (n=21)</td>
<td>Male (n=22)</td>
<td>Female (n=21)</td>
<td>Male (n=27)</td>
</tr>
<tr>
<td>F00-F09</td>
<td>4 -</td>
<td>- 5 -</td>
<td>- 12 -</td>
<td>- 3 -</td>
<td>- -</td>
</tr>
<tr>
<td>F10-F19</td>
<td>- 5 -</td>
<td>- -</td>
<td>4 - 5 -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>F20-F29</td>
<td>83 57</td>
<td>82 76</td>
<td>73 59</td>
<td>82 66</td>
<td>85 70</td>
</tr>
<tr>
<td>F30-F39</td>
<td>13 33</td>
<td>18 19</td>
<td>23 29</td>
<td>9 31</td>
<td>15 30</td>
</tr>
<tr>
<td>F40-F48</td>
<td>- 5 -</td>
<td>- -</td>
<td>- -</td>
<td>5 -</td>
<td>- -</td>
</tr>
</tbody>
</table>

The most common primary diagnosis for both short and long stay separations when stratified by Indigenous status is also F20-F29 (schizophrenia, schizotypal & delusional disorders) with one exception (Table 10). In 2009-10, a higher proportion of non-Indigenous people were admitted for F30-F39 (mood (affective) disorders). For short stay separations the second most common primary diagnosis differed across the years. For long stay separations, the most common primary diagnosis was F30-F39 (mood (affective) disorders) with a higher proportion for non-Indigenous separations across all years.

For short stay separations (Table 10) a higher proportion of Indigenous people had a primary diagnosis of F10-F19 (Mental & behavioural disorders due to psychoactive substance use) and for long stay separations there were only Indigenous separations with this diagnosis (Table 11).

Table 10: Primary Diagnosis for Darwin Mental Health In-Patient Unit Separations (< 36 Days) by Indigenous Status (%).

<table>
<thead>
<tr>
<th>Primary Diagnosis</th>
<th>2005-06</th>
<th>2006-07</th>
<th>2007-08</th>
<th>2008-09</th>
<th>2009-10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I (n=340)</td>
<td>N1 (n=445)</td>
<td>I (n=372)</td>
<td>N1 (n=366)</td>
<td>I (n=339)</td>
</tr>
<tr>
<td>F00-F09</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>F10-F19</td>
<td>21 13</td>
<td>27 13</td>
<td>21 12</td>
<td>17 9</td>
<td>10 9</td>
</tr>
<tr>
<td>F20-F29</td>
<td>38 31</td>
<td>36 40</td>
<td>44 36</td>
<td>42 38</td>
<td>46 29</td>
</tr>
<tr>
<td>F30-F39</td>
<td>17 28</td>
<td>17 20</td>
<td>16 28</td>
<td>17 31</td>
<td>12 36</td>
</tr>
<tr>
<td>F40-F48</td>
<td>19 22</td>
<td>14 22</td>
<td>17 20</td>
<td>20 17</td>
<td>29 22</td>
</tr>
</tbody>
</table>
Table 11: Primary Diagnosis for Darwin Mental Health In-Patient Unit Separations (≥ 36 Days) by Indigenous Status (%).

<table>
<thead>
<tr>
<th>Primary Diagnosis</th>
<th>2005-06</th>
<th>2006-07</th>
<th>2007-08</th>
<th>2008-09</th>
<th>2009-10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I (n=14)</td>
<td>NI (n=31)</td>
<td>I (n=20)</td>
<td>NI (n=23)</td>
<td>I (n=25)</td>
</tr>
<tr>
<td>F00-F09</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>F10-F19</td>
<td>7 -</td>
<td>- -</td>
<td>4 -</td>
<td>4 -</td>
<td>- -</td>
</tr>
<tr>
<td>F20-F29</td>
<td>57 77</td>
<td>80 78</td>
<td>76 56</td>
<td>80 65</td>
<td>83 73</td>
</tr>
<tr>
<td>F30-F39</td>
<td>29 19</td>
<td>20 17</td>
<td>16 39</td>
<td>12 31</td>
<td>17 27</td>
</tr>
<tr>
<td>F40-F48</td>
<td>- 3</td>
<td>- -</td>
<td>4 6</td>
<td>- 4</td>
<td>- -</td>
</tr>
</tbody>
</table>

Other Trends

Usual Accommodation Type

Data were only available for four years 2006-07 to 2009-10 for usual accommodation type (Table 12). There were very few separations over the four year period for some of the fourteen categories and so the categories alcohol/drug treatment residence, domestic supported living, mental health community based residential, other accommodation, other shelter/refuge, other supported accommodation, psychiatric hospital, and residential age care were collapsed into ‘other’ and data for the unknown category were removed. The categories homeless persons’ shelter and public place (homeless) were combined under the heading homeless leaving 2642 separations to be analysed. For every year most separations were for people who lived in a private residence (70-78%). In the two most recent years the second most usual accommodation type was homeless (5%).

Table 12: Usual Accommodation Type for All Separations (excluding same day) (%).

<table>
<thead>
<tr>
<th>Year</th>
<th>Boarding House / Hostel</th>
<th>Homeless</th>
<th>Prison / Remand / Youth training</th>
<th>Private Residence</th>
<th>Other #</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006-07 (n=654)</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>78</td>
<td>5</td>
</tr>
<tr>
<td>2007-08 (n=661)</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>73</td>
<td>13</td>
</tr>
<tr>
<td>2008-09 (n=682)</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>70</td>
<td>18</td>
</tr>
<tr>
<td>2009-10 (n=645)</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>76</td>
<td>15</td>
</tr>
</tbody>
</table>

# Other includes alcohol/drug treatment centre, domestic supported living, community based residential support, other accommodation types, psychiatric hospital, residential aged care and unknown/unable to determine administration codes.

The data for private residence was removed and the data were analysed for all known usual accomodation types other than a private residence (Figure 19). For those that don’t usually live in
a private residence, the most identified alternative accommodation types for the 2006-07 to 2009-10 period were in a Boarding House/Hostel, Prison/Remand/Youth Training facility or Homeless.

Analysis of the same day separations (n=423) showed that there was one separation in 2007 and two separations in 2008 where the person reported their usual accommodation type as homeless. There were no same day separations with prison/remand or youth training reported as their usual accommodation type.

**Admission Source**

The proportion of separations for each year from various admission sources were analysed (Table 13). Two admission sources of interest are admissions from Accident & Emergency (now referred to as the Emergency Department) and in-patient transfers from other hospitals. The data show that admissions from the Emergency Department represented more than 50% of the admission sources in 2002-03 (52.91%). From 2004-05 there has been a decline through until 2009-10 where the Emergency Department was the admission source for 13.74% of Darwin Mental Health In-patient Unit separations.

The in-patient transfers from other hospitals fluctuated across the study period, remaining below 1%. The higher rates in 2004-05 (0.76%) and 2005-06 (0.84%) coincide with the period where the number of separations were high for the Darwin Mental Health In-patient Unit.
Table 13: Admission Source for Darwin Mental Health In-Patient Unit Separations (<36 days) (%).

<table>
<thead>
<tr>
<th>Year</th>
<th>Accident &amp; Emergency</th>
<th>In-patient Transfer</th>
<th>Other / Ward / Newborn / Renal</th>
<th>Outpatient Department</th>
<th>Outside Referral</th>
<th>Other #</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>52.91</td>
<td>0.18</td>
<td>43.09</td>
<td>1.27</td>
<td>0.36</td>
<td>2.18</td>
</tr>
<tr>
<td>2003-04</td>
<td>44.14</td>
<td>0.62</td>
<td>51.08</td>
<td>0.31</td>
<td>1.39</td>
<td>2.47</td>
</tr>
<tr>
<td>2004-05</td>
<td>51.39</td>
<td>0.76</td>
<td>43.43</td>
<td>-</td>
<td>-</td>
<td>4.42</td>
</tr>
<tr>
<td>2005-06</td>
<td>43.20</td>
<td>0.84</td>
<td>37.17</td>
<td>-</td>
<td>0.14</td>
<td>18.65</td>
</tr>
<tr>
<td>2006-07</td>
<td>39.60</td>
<td>0.28</td>
<td>34.94</td>
<td>10.33</td>
<td>0.14</td>
<td>14.71</td>
</tr>
<tr>
<td>2007-08</td>
<td>31.69</td>
<td>0.16</td>
<td>32.96</td>
<td>0.64</td>
<td>12.58</td>
<td>21.97</td>
</tr>
<tr>
<td>2008-09</td>
<td>17.66</td>
<td>0.17</td>
<td>17.83</td>
<td>-</td>
<td>19.93</td>
<td>44.41</td>
</tr>
<tr>
<td>2009-10</td>
<td>13.74</td>
<td>0.18</td>
<td>16.82</td>
<td>-</td>
<td>16.46</td>
<td>52.80</td>
</tr>
</tbody>
</table>

# Other is a statistical admission type for admitted patients (see discussion section for more information).

Involuntary Treatment

The data from the NMDS for Involuntary Treatment was only collected from 2005 with involuntary treatment only recorded from 2008-09. The *NT Mental Health and Related Services Act*, which superseded previous legislation, commenced in 2000 and involuntary admissions to the Darwin Mental Health In-patient Unit occurred prior to July 2008. For this reason, the early data which reported that there was no involuntary treatment from 2005-2008, seemed unreliable and only two years of separations for NT Top End residents (n=1143) were included in the dataset for analysis. In 2008-09, fewer than half (46%) of separations were involuntary. This increased in 2009-10 where three quarters (82%) of separations were reported as involuntary. When considered per 100,000 population the proportion of Indigenous patients receiving involuntary treatment was higher for both years (Figure 20). There was a higher rate of separation for males than females (per 100,000 population) each year and more resided in Darwin Rural areas.
Figure 20: Darwin Mental Health In-patient Unit Separations (excluding same day) for NT Top End residents who were categorised as *Involuntarily* during their treatment.

**Discharge Status**

Analysis of discharge status for short stay (Table 14) and long stay (Table 15) separations suggests most patients are discharged *home* with the remainder, in low proportions, to other destinations. A death occurred in the two most recent years (one for each year); discharged to a psychiatric hospital was only recorded from 2007-08; and the number of patients taking their own leave has declined considerably from 2004-05 (2.78%) with the lowest proportion in 2008-09 (0.52%).

**Table 14: Discharge Status for Darwin Mental Health In-Patient Unit Separations (< 36 Days) (%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Home</th>
<th>Take Own Leave</th>
<th>Psych. Hospital</th>
<th>Deceased</th>
<th>Transfer Other Hospital</th>
<th>Transfer Residential Aged Care</th>
<th>Transfer Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>93</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>0.2</td>
<td>0.2</td>
<td>4</td>
</tr>
<tr>
<td>2003-04</td>
<td>92</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>0.3</td>
<td>0.5</td>
<td>4</td>
</tr>
<tr>
<td>2004-05</td>
<td>94</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>0.3</td>
<td>0.1</td>
<td>2</td>
</tr>
<tr>
<td>2005-06</td>
<td>91</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.1</td>
<td>4</td>
</tr>
<tr>
<td>2006-07</td>
<td>92</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>0.3</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>2007-08</td>
<td>93</td>
<td>2</td>
<td>0.2</td>
<td>-</td>
<td>0.2</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>2008-09</td>
<td>94</td>
<td>0.5</td>
<td>0.4</td>
<td>0.2</td>
<td>0.4</td>
<td>0.2</td>
<td>4</td>
</tr>
<tr>
<td>2009-10</td>
<td>88</td>
<td>0.5</td>
<td>0.2</td>
<td>0.2</td>
<td>0.7</td>
<td>0.2</td>
<td>8</td>
</tr>
</tbody>
</table>
Table 15: Discharge Status for Darwin Mental Health In-Patient Unit Separations (≥36 Days) (%).

<table>
<thead>
<tr>
<th>Year</th>
<th>Home</th>
<th>Take Own Leave</th>
<th>Psychiatric Hospital</th>
<th>Transfer - Other Hospital</th>
<th>Transfer - Residential Aged Care</th>
<th>Transfer - Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03 (n=35)</td>
<td>80</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>2003-04 (n=33)</td>
<td>91</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>2004-05 (n=36)</td>
<td>83</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>2005-06 (n=45)</td>
<td>80</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2006-07 (n=43)</td>
<td>88</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>2007-08 (n=44)</td>
<td>93</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2008-09 (n=51)</td>
<td>86</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>2009-10 (n=47)</td>
<td>87</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>9</td>
</tr>
</tbody>
</table>

# Other Administrative codes have not been included in this table. They represent the remaining proportion for each year.

Further analysis was undertaken on the separations where the patient was reported to Take Own Leave which is now referred to as Discharged Against Medical Advice (Table 16). For these separations (n=99) a higher proportion were male, Indigenous and resided in NT urban areas. The data contained only three long stay separations. There were 10 separations that were matched by the process explained previously, and therefore, most likely the same patient. Assuming this to be the case, it is estimated that there were 89 patients who left the Darwin Mental Health In-patient Unit against medical advice during the 8 year period.

Table 16: Darwin Mental Health In-Patient Unit Separations (excluding same day) where the patient was Discharged Against Medical Advice (DAMA) (%).

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
<th>Indigenous</th>
<th>Non-Indigenous</th>
<th>Urban</th>
<th>Rural</th>
<th>Remote</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03 (n=13)</td>
<td>100</td>
<td>-</td>
<td>60</td>
<td>40</td>
<td>54</td>
<td>15</td>
<td>31</td>
</tr>
<tr>
<td>2003-04 (n=17)</td>
<td>88</td>
<td>12</td>
<td>65</td>
<td>35</td>
<td>71</td>
<td>-</td>
<td>29</td>
</tr>
<tr>
<td>2004-05 (n=22)</td>
<td>79</td>
<td>21</td>
<td>61</td>
<td>39</td>
<td>59</td>
<td>18</td>
<td>23</td>
</tr>
<tr>
<td>2005-06 (n=9)</td>
<td>40</td>
<td>60</td>
<td>70</td>
<td>30</td>
<td>67</td>
<td>-</td>
<td>33</td>
</tr>
<tr>
<td>2006-07 (n=13)</td>
<td>57</td>
<td>43</td>
<td>93</td>
<td>7</td>
<td>31</td>
<td>15</td>
<td>54</td>
</tr>
<tr>
<td>2007-08 (n=10)</td>
<td>55</td>
<td>45</td>
<td>64</td>
<td>36</td>
<td>50</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td>2008-09 (n=4)</td>
<td>25</td>
<td>75</td>
<td>75</td>
<td>25</td>
<td>75</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>2009-10 (n=2)</td>
<td>75</td>
<td>25</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>-</td>
<td>100</td>
</tr>
</tbody>
</table>

Since 2006-07, the proportion of separations for people residing in NT remote areas reported as discharged against medical advice (DAMA) has increased to 100%. The increase in separations for NT remote residents must be considered in context. For this same period the number of DAMA separations for each year has decreased to only two separations in each year for 2009-10. In other
words, 50% of 10 separations is more than 100% of 2 separations, so Table 16 should be considered in context given the low number of separations for the latter years.

There were six same day separations reported as discharged against medical advice, which accounts for just over 1% of all same day separations during the period. There was one each year for 2002-03, 2004-05, 2008-09 and 2009-10, with two being recorded in 2003-04. None of these separations were intended to be day patients. All of these patients usually resided in an NT urban area, 50% were non-Indigenous and 66% were male. Six separations is a very small number of patients to discharge against medical advice on the same day as admission and makes up only 0.09% of the total sample of separations (n=5910).

In summary, the findings in this section for separations for Darwin Mental Health In-patient Unit (2002-03 to 2009-10) suggest trends in the following areas:

- number of separations
- average length of stay
- demographic variables (gender, Indigenous status, age, region of residence)
- involuntary treatment
- admission source (Emergency Department, In-patient transfers)
- discharge status (Discharged Against Medical Advice, Homelessness)

These trends will be discussed further in the context of historical, environmental, operational, political and social influences in the next chapter.
CHAPTER 5 - DISCUSSION

This chapter discusses the key findings identified through analysis of the Admitted Patient Mental Health National Minimum Data Set (NMDS) and the emerging trends for mental health in-patient care in the Northern Territory’s Top End contextualised through the literature review and environmental, social and political influences. Limitations are considered and conclusions drawn leading to recommendations for future action.

Hospital separations and admissions

The AIHW defines a mental health separation as ‘an episode of care for an admitted patient, which can be a total hospital stay (from admission to discharge, transfer or death) or a portion of a hospital stay beginning or ending in a change of type of care’ (AIHW 2011a, p.1726). An admission, on the other hand, is the point of entry for a patient to a mental health unit. It is the beginning of their episode of care for in-patient treatment. Both admission and separation data are reported and analyses of both have been undertaken by government departments and researchers, amongst others, during the period. This project reports separation data, and will use information from other studies to interpret these findings. At times it is necessary to use findings from studies that analysed admissions rather than separations. It is acknowledged that admissions and separations will offer different findings, however, the admission trends are relevant and contribute to the overall understanding of the trends emerging in mental health in-patient care in the Northern Territory’s Top End.

Key Finding 1: The number of short stay separations is decreasing.

Analysis of the number of separations and separations per 100,000 population showed that separations from the Darwin Mental Health In-patient Unit continued to increase up until 2005-06. Separations then decreased over the subsequent years. In order to understand the reasons behind this trend, what may have contributed to the increase for the years prior to 2005-06, and why there has been a decrease since this time, it is necessary to investigate surrounding events.

On a national level, mental health reform was leading the way by reducing the number of psychiatric in-patient beds from 1993. The national mental health strategy prescribed the replacement of standalone psychiatric hospitals with an increase of psychiatric beds in general hospitals (Department of Health & Ageing 2004). This aimed to ‘both reduce the stigma associated with psychiatric care as well as stimulating improvements in service quality’ (Department of Health & Ageing 2004, p.23). For the Northern Territory, mental health reform differed from the states given its lack of standalone psychiatric hospitals and private mental health
in-patient beds (Meadows, Singh, and Grigg 2007; Northern Territory Government 2005). For the Northern Territory ‘much of the emphasis has been on community service development and expansion to complement the role of existing in-patient services’ (Department of Health & Ageing 2002, p.103).

As community based services expanded, the number of in-patient beds per 100,000 population was decreasing, both in the NT and nationally from 1993 – 2008 (Table 17). The decrease in beds may have contributed to the increase in separations and the higher readmission rates during this period (Nagel 2004).

Table 17: Number of psychiatric in-patient beds per 100,000 population reported in the Northern Territory and Nationally.

<table>
<thead>
<tr>
<th>All in-patient beds</th>
<th>NT</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1993</td>
<td>24.2</td>
<td>45.5</td>
</tr>
<tr>
<td>June 1998</td>
<td>15.4</td>
<td>33.7</td>
</tr>
<tr>
<td>June 2000</td>
<td>16.5</td>
<td>31.5</td>
</tr>
<tr>
<td>June 2003</td>
<td>16.1</td>
<td>30.7</td>
</tr>
<tr>
<td>June 2008</td>
<td>15.6</td>
<td>30.8</td>
</tr>
</tbody>
</table>

Source: Commonwealth Department of Health and Ageing, National Survey of Mental Health Services Database (Department of Health and Ageing, 2002; Department of Ageing, 2010)

The ‘rates of admission have increased progressively since 1993’ (Nagel 2004, p.2) for the Darwin Mental Health In-patient Unit. This is consistent with national data showing that from 1993-94 to 1999-00 there was an increase in mental health hospital separations (Department of Health & Ageing 2002). Both nationally and in the Northern Territory, hospital separations increased in the period prior to this study (1993-00) and in the first few years of this study. These results suggest combined influences stemming from national initiatives, such as National Mental Health Plans and associated mental health reform as well as more localised events. Nagel proposes that this ‘may be a result of case finding due to a recent increase in specialist services to remote communities’ (Nagel 2004, p.2). It is possible that an increase in suicides led to an increase in specialist mental health outreach services for Top End remote communities who uncovered an unmet need and led to resources that increased capacity on the ground (Nagel in Meadows Singh and Grigg 2007).

The increase in the number of overall separations includes an overall increase in separations for Indigenous people that is most likely due to a combination of factors such as population increases, a previously unmet need, improved awareness of mental illness in the community, hospitalisation becoming more acceptable (and culturally appropriate), or that appropriate community-based services were not available or not utilised (Nagel in Meadows & Singh 2001; Nagel and Thompson
The increase in the 1990s up to 2005 could also have been a result of improved outreach specialist services responding to the need for Indigenous people in remote communities. The result was an increase of separations in the catch up period and then a steadier rate, once consistent services were established.

Having reviewed the possible events linked with the increase in separations up to 2005-06, the decrease that followed requires examination in terms of relevant contextual information. The decrease in separations from 2005-06 may be the result of several factors. The improvement of mental health services and establishment of community based services means that there is more support in the community setting. The development of residential care and in-reach services for forensic patients may have also contributed to the decrease in separations. The NT Department of Health (2007) reported that ‘increased rural and remote services assisted in stabilising demand for in-patient services in the Top End, resulting in a decrease in separations and bed days in the in-patient unit in Darwin’ (Department of Health & Community Services 2007, p.80). In 2008, they reported that ‘there was an unanticipated decrease in separations’ and suggested that it ‘is thought likely to have been due to better bed management strategies and improved community based services. These include expanded rehabilitation and recovery services, [and] rural and remote visiting services’ (Department of Health & Families, 2008, p.93). One new service, Papaya, providing urban community based support opened in Darwin in 2008 and was described as ‘an eight bed sub-acute residential facility’ providing ‘24-hour support to mental health clients at risk of requiring hospital admission or following discharge from hospital’ (NT Department of Health & Families 2008, p.28). In summary, it likely that services caught up with the unmet need and that increased investment linked with improved access to services and community-based support was beginning to show dividends.

**Key Finding 2: The number of long stay separations is increasing.**

This project found that for long stay patients the increase in separations seen up until 2005-06 steadied in 2006-07, but the decrease in separations seen with short stay separations did not occur and the number of long stay separations continued to increase through to 2009-10. Many of the reasons for increases for short stay separations also apply for long stay separations. The continued increase in long stay separations may reflect severity of illness, increased mental illness related to increased substance use, difficulty in finding appropriate accommodation and community-based mental health support, and improved access to mental health services. ‘There may also be a tendency to label problem behaviour that which may have previously been accepted or otherwise managed in the Aboriginal community’ (Nagel in Meadows and Singh 2001, p.86). Longer stays may also represent improved quality of care through greater opportunity for in-patient treatment,
recovery training, and attention to relapse prevention strategies. This theory is supported by findings in a recent 3 year study showing decreased readmission rates and increased length to readmission in the years 2009-2012 (Nagel et al. unpublished)

It is not possible to determine why the number of long stay separations continues to increase when short stay separations have been decreasing since 2005-06 from the NMDS. Many of the factors discussed above could be contributors and it may also represent greater severity and complexity of illness, increased treatment resistance, and associated difficulty in finding placement or returning the person to their home, family or community. Further investigation is needed to determine the factors influencing this finding.

**Average Length of Stay**

**The average length of stay for NT Top End residents is comparable with national rates.**

The ‘average length of stay is the average number of patient days for admitted patient separations’ (AIHW 2010a, p.69). Nationally the average length of stay for admitted patient mental health related separations with and without specialised psychiatric care increased from 10.5 days in 2003-04 to 11.2 days in 2007-08 (AIHW 2011b). This project found that the average length of stay for all separations (excluding same day) for NT Top End residents varied during this period (Table 18), being just above the national average each year.

**Table 18: Average Length of Stay for Admitted Patient Mental Health related Separations in Public Hospitals.**

<table>
<thead>
<tr>
<th>All in-patient beds</th>
<th>NT Top End</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003-04</td>
<td>12.1</td>
<td>10.5</td>
</tr>
<tr>
<td>2004-05</td>
<td>11.3</td>
<td>10.8</td>
</tr>
<tr>
<td>2005-06</td>
<td>11.0</td>
<td>10.8</td>
</tr>
<tr>
<td>2006-07</td>
<td>13.0</td>
<td>11.1</td>
</tr>
<tr>
<td>2007-08</td>
<td>12.0</td>
<td>11.2</td>
</tr>
</tbody>
</table>

Source: Australian Hospital Statistics 2009-10, Cat no HSE 107 (AIHW, 2011b)

When only short stay separations for NT Top End were analysed the Average Length of Stay (ALOS) ranged from 9.1 to 9.8 days for all years except for 2005-06 where the ALOS was 8.3 days. The year, 2005-06, also had a high number of short stay separations when compared to other years in the study period. The lower average length of stay and the increased number of separations may be due to an increased demand for in-patient services for this year.
Key finding 3: The average length of stay for Indigenous patients is increasing.

The findings from this project suggest that the average length of stay for all separations (excluding same day) for Indigenous patients increased from 10.5 days in 2002-03 to 14.1 days in 2009-10. It was higher than the average length of stay for non-Indigenous patients from 2005-06 and continued to increase for the remainder of the study period. The average length of stay for Indigenous patients may have increased partly to enable thorough assessments and care planning and involvement of Aboriginal Mental Health Workers in treatment protocols. To implement quality in-patient care for Indigenous patients it may be necessary for their stay to be longer than for non-Indigenous patients. Recent three year audits do not necessarily support this explanation given evidence of limited psychosocial history, carer involvement and Aboriginal Mental Health Worker engagement in care which has persisted since the previous audit in 2004 (Nagel et al. unpublished). Other explanations for increased length of stay include increased complexity of their illness, comorbid diagnosis and challenges associated with discharge.

The ‘Department of Health and Community Services Top End in-patient data show that the average length of stay for Indigenous clients was 8.0 days in 2001 and 8.7 days in 2004, and for non-Indigenous clients it was 9.3 and 9.9 days respectively’ (Department of Health and Community Services Information Management in Nagel, Thompson & Spencer 2008, p.5). The rates reported in this project were different than those published in other reports. These differences may be due to discrepancies in data collection, inclusion criteria or analysis methodologies.

The average length of stay for separations from the Darwin Mental Health In-patient Unit was lower than those reported from a study of the Cairns Base Hospital mental health unit during the same period. The average length of stay for Indigenous patients in 2002-03 was 10.21 days and in 2006-07 was 27.15 days (Haswell-Elkins et al. 2008). The average length of stay for Far North Queensland patients was considerably higher than the average length of stay reported for Northern Territory patients in this project.

One of the National Information Priorities and strategies stemming from the Second National Mental Health Plan was the ‘development of performance indicators and benchmarks for Australian mental health services’ (Eagar, Burgess & Buckingham 2003, p.iii). The National Performance Indicators include Average Length of Stay (Appendix C). The rationale for this indicator is that ‘length of stay is the main driver in in-patient episode cost and reflects differences between mental health service organisations in practice, case mix or both. Inclusion of this indicator promotes a fuller understanding of an organisation’s episode costs’ (National Mental Health Performance Subcommittee, 2011, p.33). This is how the indicators were intended as
'none of these indicators is useful in isolation' (Eagar, Burgess & Buckingham 2003, p.45). ‘They will measure the extent to which the mental health system is achieving its policy objectives, including the efficient use of its resources and the extent to which it is contributing to the wellbeing of its target population’ (Eagar, Burgess & Buckingham 2003, p.45). It is beneficial to investigate other indicators such as 28 day readmission rates to gain further understanding of average length of stay. AIMhi NT has been doing this through chart audits and has found that they are decreasing (Nagel et al. unpublished).

The overall average length of stay may be influenced by internal factors such as bed management policies, suitable accommodation and community based support for discharge, unanticipated demand or increases in very long stays as described by the NT Department of Health. ‘There was an overall increase in the length of stay due to a number of relatively long-stay patients with complex needs requiring beds in the first half of the year’ (Department of Health & Community Services 2007, p.80).

*Readmission rates should be considered in conjunction with average length of stay*

These findings suggest that average length of stay changes should be considered along with other factors to determine impact and are not an independent indicator. This project did not collect data for readmission rates, however, their interconnection with separations and average length of stay means that the discussion would not be complete without considering their impact. ‘The Australian Council of Health Care Standards and the Royal Australian and New Zealand College of Psychiatrists recommend an emergency readmission rate of less than 10%’ (Nagel 2004, p.5).

Research undertaken by Nagel and colleagues for the Darwin Mental Health In-patient Unit provides information about readmission rates during this study period. ‘The emergency readmission rate within 28 days of discharge for NT was 21% in 2002 with NT Indigenous [rate] slightly higher (23%) than that of NT non-Indigenous (20%)’ (Nagel 2004, p.5). Nagel goes on to suggest that Darwin Mental Health In-patient Unit’s ‘readmission rate could be even higher due to data quality issues’ This high readmission rate in 2002, twice the recommended rate may contribute somewhat to the increasing separation numbers during this period. When the separations for this project were crudely matched to determine an estimate of the number of individual people who were discharged each year rather than the number of separations the numbers were lower and the difference each year less marked. This suggests that while the trend of increasing separations remains, the severity of the increase may be somewhat attributed to the high readmission rates. Additional investigation using a re-identifiable coded dataset would further inform this hypothesis.
Preliminary findings from a chart audit (three month capture of new admissions) conducted in 2011-12 by Nagel and colleagues report that 28 day readmission rates for the Darwin Mental Health In-patient Unit were 17.4% in 2009, 12% in 2010, and 10.1% in 2011 (Nagel et al. unpublished). These rates are lower than those reported for 2002 and suggest a decrease in 28 day readmissions in recent years.

The length to readmission (90 day readmissions) for 2009, 2010 and 2011 was 26.8, 73.8 and 64.2 days respectively (Nagel et al. unpublished). The decrease in the rate of 90 day readmissions from 2009 to 2011 for their sample, occurs during a period when the number of separations from the Darwin Mental Health In-patient Unit was steady even showing a slight decrease in 2008-09 and 2009-10. An understanding around what may have contributed to the improved readmission rates would include activities undertaken in the Mental Health In-patient Unit around relapse prevention and recovery (Nagel 2008), changes to case management in community and improved access to services.

Findings from a series of clinical file audits (1995, 2001 and 2004) revealed that 'significant improvements in in-patient care occurred between 1995 and 2001 but were not sustained in 2004. Recording of social history, and appointment of a case manager, were less likely to occur in 2004 compared with 2001, for both non-Indigenous and Indigenous clients. Busy in-patient units are at risk of focusing on acute care to the detriment of relapse prevention activities and culturally appropriate care’ (Nagel, Thompson, and Spencer 2008, p1). The lower number of separations from 2006-07 and the increase in awareness and support for care planning and relapse prevention techniques (Nagel, Thompson and Spencer 2008) may have contributed to the lower 90 day readmission rates seen in 2010 and 2011.

Length of Stay and Costs of In-patient care

The cost of in-patient care could also influence separation and readmission rates. Nationally, ‘mental illnesses are the single largest cause of disability in Australia, accounting for 24% of the burden on non-fatal disease’ (Department of Health & Ageing, 2010, p17). With mental health in-patients placing a burden on the hospital system it is expected that discharging patients and implementing residential or community support is not only beneficial for the patient but more cost effective. The ‘average unit costs in the [Northern] Territory’s psychiatric in-patient units were 63% above the national 1999-00 average’ (Department of Health & Ageing, 2002, p115) which places an even higher burden on the NT’s health system than the other states. The increasing cost of in-patient mental health care together with national mental health reforms improving the quality
of mental health care emphasise the importance of enhancing recovery based relapse prevention strategies during in-patient stays, and provision of alternative community-based care and community mental health support programs in the Northern Territory, especially for those living in remote communities.

**Demographic Trends**

**Key finding 4: The proportion of separations for female patients for both short and long stays is increasing.**

There were more separations for males than females for both short and long stays. Whilst this remained consistent it is interesting that the number of separations for females is increasing slightly for short stays and more rapidly for long stays with 2008-09 being the only year in the dataset where there were more female than male long stay separations. When all separations for NT residents were calculated per 100,000 NT population, males were between 1.1 and 1.5 times more likely to be discharged from the Darwin Mental Health In-patient Unit. The proportions from this dataset differ from other published statistics (Department of Health & Community Services 2007; NT Department of Health & Families 2008; AIHW 2009) for this period, however, the observations that there are more male separations are consistent with national and NT previously published statistics (Nagel in Meadows and Singh 2001). As mentioned previously this may be due to discrepancies in data collection, inclusion criteria or analysis methodologies.

There are a number of reasons for the increase in the proportion of female separations. There may be an increased need for mental health in-patient care as a result of increased alcohol and drug use, domestic violence, relationship problems, unemployment, depression in general and perinatal depression more specifically, (Nagel 2005), protective factors associated with living in remote Aboriginal communities where residents have close family relationships, family obligations and people are inclined to care for and support each other, (Hunter 2007; personal communication with Tricia Nagel) and improved mental health literacy and access to care through cultural awareness training for mental health professionals and mental health training for community health workers. (Nagel 2005; Nagel et al. 2011; Hunter 2007).

**Key finding 5: There are a higher proportion of females admitted for long stays.**

The higher proportion of female compared to male long stay separations suggests that when females are admitted they are staying for longer. Contributing factors for increases in the proportion of females being admitted were discussed in Key finding 4 and will not be revisited here. Other reasons for this increase may include increased severity of illness, increased substance misuse; longer duration of untreated illness; and difficulty in finding appropriate accommodation.
and care on discharge, particularly if there are relationship, family or domestic violence concerns. There may also be additional pressures of child rearing and extended family responsibilities associated with their mental illness. It is difficult to reach any conclusion about why there may be an increased number of female long stay separations without further investigation.

**Key Finding 6: The proportion of both long and short stay separations for Indigenous people is increasing.**

Approximately 30% of the NT population is Indigenous (ABS 2001; ABS 2011a; ABS 2007). Even though the proportion of the separations for Indigenous people in the NMDS fluctuated; they were higher than the comparable Indigenous population proportions for each year of the study. The number of separations for Indigenous people is increasing and in 2009-10 it remains disproportionately high.

This is consistent with other reports for the Northern Territory. Nagel reports that ‘Indigenous people are over represented in psychiatric in patient care’ (Nagel 2004, p.3) and the NT Government report that ‘Aboriginal people are significantly over-represented in the mental health in-patient population. This over-representation has increased since 2002-03 from 67% to an estimated 86% by the end of June 2005’ (Northern Territory Government 2005, p.10).

‘The proportion of Aboriginal in-patients decreased marginally compared to the previous year’ (NT Department of Health & Families 2008) which reflects the results found in this project where the proportion of separations for Indigenous people decreased from 2006-07 to 2007-08. The population proportion remains around 30% and does not decrease during this time suggesting that the decrease may be due to factors other than population decreases.

In Far North Queensland, Haswell-Elkins et al. found that there was an increase in admissions to the Cairns Base Hospital Mental Health Unit for the Indigenous population from 1999-00 to 2006-07 and that the ‘numbers of non-Indigenous admissions increased gradually, with no upward trend in the latter four years (Haswell-Elkins et al. 2008, p.13). Haswell-Elkins et al. (2008) found that in Far North Queensland, the proportion of Indigenous patients increased from 17.6% in 1999-00 to 25.5% in 2006-07. This project found that the proportion of separations for Indigenous patients ranged from 38-43% (fluctuating over the study period). The two proportions are not directly comparable given differences in Indigenous population proportions, however, they are consistent in their reporting of an increase in the Indigenous patients being admitted in to mental health units in northern Australia.
Reporting a high proportion of hospital separations for Indigenous people is only one aspect of understanding the prevalence of mental illness, population level information is also needed. Hospitalisation data and mortality due to serious mental illness were the main sources of information about the prevalence for mental health disorders for the Indigenous population (Department of Health & Ageing 2002) until population surveys were undertaken more recently.

There have been several population surveys that have collected further information about mental health, often referred to as social and emotional wellbeing, for Indigenous Australians. Population surveys undertaken during this study period describe the many factors that contribute to poor mental health for Indigenous Australians (ABS 2009; AIHW 2009; Chamberlain, and MacKenzie 2006). After taking into account the differences of the two populations, Indigenous Australians were twice as likely as non-Indigenous Australians to report high levels of psychological distress (AIHW 2009). ‘Between July 2005 and June 2007 Indigenous Australians were hospitalised for mental health-related conditions [nationally] at 1.8 times the rate of non-Indigenous Australians’ (AIHW 2009, p.53).

While we know the proportion of Indigenous separations is increasing, when stratified by gender and Indigenous status, the proportion of Indigenous male patients per 100,000 population remains considerably higher than Indigenous females and all non-Indigenous patients.

*The proportion of both short and long stay separations for non-Indigenous people is decreasing*

The proportion of short stay separations for non-Indigenous people is decreasing, although only slightly. For long stay separations the same trend appears, however, there was a more distinct decrease for non-Indigenous patients. This may be a result of decreased need, however the proportion change is most like a flow on effect from the increase in Indigenous separations discussed above.

In summary, with population proportions remaining steady and both short and long stay separations increasing for Indigenous people, these findings suggest that factors other than population increases are contributing to this trend. The implementation of population surveys as well as hospital and mortality data will contribute to further understanding about the prevalence of mental illness in Indigenous populations.
**Key Finding 7: The proportion of short and long stay separations for those patients whose usual place of residence is a NT Rural or NT Remote region is increasing.**

There was an increase in the proportion of short and long stay separations for those patients who usually resided in NT Rural regions and a larger increase in the proportion of short and long stay separations for those patients who resided in NT Remote regions. Much has been written about the vulnerability of Indigenous people living in remote Northern Territory and while this remains significant, some attention needs to also be given to the geographic location of residence as well as the Indigenous status of the patient when considering access to care.

The AIMhi Baseline Report states that ‘base line measures show that Aboriginal people, and non-indigenous people living in remote areas, are increasingly requiring hospital treatment and emergency evacuation for mental illness’ (Nagel 2004, p.8). This project found that when the separations for NT residents were considered by the region in which the patient usually resides there was a decrease in separations for the NT Urban population and an increase for the NT Rural and NT Remote populations for both short and long stays. The increase for the NT Remote population was more marked for the long stay patients, and has increased noticeably over the last three years of the study period. This suggests that the proportion of patients who stay in the in-patient unit for longer than 36 days is increasing for residents of NT Remote regions. This may be due to improved access to mental health services or the severity of the illness prior to in-patient admission as discussed previously. Access to care and quality of in-patient care contributes to these increases significantly and is discussed in more detail later in chapter.

**The proportion of short and long stay separations for those patients whose usual place of residence is a NT Urban region is decreasing.**

There was a decrease in the proportion of short and long stay separations for those patients who usually reside in NT Urban regions. The increase in separations from NT Rural and NT Remote residents may have reduced the number of separations from NT Urban which would have been high when there was limited access to care for those living outside of urban areas. There may also be improved access to primary health care services, intensive case management, same day mental health care treatment, specialist services and community based mental health services for urban residents than for the rural and remote residents reducing the need to access in-patient services.
Key Finding 8: The average age for Indigenous patients is lower than the average age for non-Indigenous patients.

The average age for Indigenous separations were lower (ranging from 6-9 years difference) across all years of the study. The average age for Indigenous patients ranged from 30-32 years and for non-Indigenous patients it ranged from 37-39 years.

When the average age is considered for all separations from the Darwin Mental Health In-patient Unit, more than half of the short stay separations for each year of this study were 34 years of age or younger and approximately one fifth were 24 years or younger. For patients that were residents of the NT Top End, the average age for short stays ranged from 34-36 years and long stays ranged from 31-38 years. With the population of the Northern Territory being the youngest population of all Australian states and territories the findings of an increased proportion of young people is as would be expected because people ‘under the age of 18 constitute 30% of the population, a greater percentage than anywhere else in the country’ (Northern Territory Government 2005, p.5).

For most years there were more separations for those aged 18-29 years.

Young people in the NT are at high risk of mental illness. Recent studies have reported that ‘young people suffer increasing rates of suicide, substance-use disorders and in the NT they have high rates of incarceration’ (Nagel in Meadows, Singh and Grigg 2007, p.127). The Indigenous population in the Northern Territory has a disproportionate number of young people and many of these young people live in remote areas. Indigenous youth can experience increased exposure to substance misuse, life stressors similar to the remote Indigenous adult population, geographical isolation, cultural difference and many of the challenges of social and economic disadvantage with limited appropriate external support (Nagel 2005). As a result, ‘young people are frequently admitted to psychiatric wards in the NT’ (Nagel in Meadows, Singh and Grigg 2007, p.127). For all short and long stay separations for NT Top End residents (n=5135), there were 170 separations (58% were Indigenous patients) for people who were under 18 years at the time of discharge. This is a small proportion of separations, approximately 0.03% of the dataset, and does not give cause for concern.

This project did not aim to study mental health care for young people and will not speculate in great detail about what this means other than raise it as an area for future investigation in the recommendations section.
More about Access to Care

The key findings about changes to the separation rates for Indigenous residents of the Northern Territory’s Top End and those living in rural and remote areas are influenced greatly by access to care. In order to appreciate the effect that access to care has on demand and appropriately meeting the needs this section presents the Northern Territory’s approach in the context of a national framework.

During the period of this study, there have been several national health surveys that have reported population statistics about the need for mental health care and barriers to access for many Australians. In 2001, the National Mental Health Survey stated that ‘approximately 1.8 million people (9.6% of the population) reported having a long-term mental or behavioural problem’ and that there are ‘less than 1% of adults with a mental illness hospitalised each year’ (ABS 1998 quoted in Commonwealth Department of Health & Ageing, 2002). In 2005, it was reported that ‘approximately 18% of the adult population [were] experiencing symptoms within a 12 month period’ which increased from 2001 to ‘about 2.4 million Australian adults’ (Department of Health & Ageing, 2005, p.14). By 2007 it was reported that ‘one in five (20% or 3.2 million) Australians had a 12-month mental disorder’ (ABS 2008). These population surveys emphasise the increase in reported prevalence of mental illness in Australia, an increase in awareness and that there is still a considerable amount of people for whom their illness remains untreated. ‘The survey data suggest that two thirds of adult Australians and three quarters of children and younger people with a mental disorder do not receive any form of treatment’ (Department of Health and Ageing 2005, p.15). ‘Only by undertaking population surveys is it possible to estimate the prevalence of mental disorders in the community’ (Whiteford, and Groves 2009, p.644) and to gain insight into their impact.

All indications are that mental illness is increasing and further surveys will confirm that mental illness remains highly prevalent and largely untreated in Australia. These increases at a population level make this project’s findings of an increase in separations appear reasonable. With increased awareness comes increased demand. ‘The 2007 National Survey of Mental Health and Wellbeing provided evidence of the impact of these changes, with the finding that the percentage of those with a mental illness who saw a mental health professional in 2007 was almost double those who did so in 1997’ (Australian Health Ministers 2009, p.20). The increases discussed earlier may very well be a response from a community who, until recently, were unable to access mental health care or didn’t do so due to the stigma associated with mental illness (AHMAC 2010).
The National Mental Health Plans have been clear about the need to ensure that ‘consumers and their families and carers should be able to access services appropriate to their needs, both within and beyond the specialist mental health sector’ (Australian Health Ministers 2003, p.19). There is a need to ensure that vulnerable groups have equal access to appropriate services. ‘Services should be responsive to those with mental health needs in all population groups and across the lifespan. Equitable access depends upon an appropriate level, mix and distribution of services. This poses challenges, especially given the demographic and geographical variations between jurisdictions’ (Australian Health Ministers 2003, p.19).

For the NT Top End population, it has been suggested that improved access to care led to increased mental health in-patient separations for both NT Rural and NT Remote residents. The data suggests that the unmet need may have been satisfied and that while separations are now remaining steady overall, the increase in separations for Indigenous remote patients is increasing. In 2005, Nagel thought that the trend for increasing hospital admissions ‘may have been stemmed though it is too early to tell’ and suggested that the ‘data are encouraging and may represent improved community capacity to treat mental illness and maintain treatment’ (Nagel 2005, p.24). The trends shown in this project suggest that while there may be increased capacity in remote communities there is still an increasing need for in-patient treatment.

‘Nationally, the supply of psychiatrists and psychiatrists-in-training, measured as FTE per 100,000 population, increased between 2003 – 2007 by an annual average of 1.4%’ (AIHW 2010b, p165). In the Northern Territory a ‘separate service for remote Indigenous people in the in-patient ward was established’ (AIHW 2011b). This is known as the Remote Team. The team includes three AMHWs to assist with the assessment and management of Indigenous patients. The service in the Top End has been changing in other ways, with the development and enhancement of the RANZCP psychiatry registrar training programme, and the establishment of the Remote Team Psychiatry Registrar position as an accredited Indigenous specialty-training placement. The remote team registrar, or a specialist outreach psychiatrist, visits major Top End communities once every 4 to 6 weeks’ (Nagel 2004, p.2). The Northern Territory had a psychiatrist and psychiatrist-in-training FTE per 100,000 population ratio similar, and at times higher, than the national rate (Table 19).
As well as specialist services, the employment of AMHWs has assisted many people to be able to access mental health care. ‘In 1995, there were no AMHWs employed by the Top End Mental Health Services’ (Nagel and Thompson 2006, p.294). ‘There has been increasing recognition that the most effective people to deal with the majority of Indigenous mental health issues in Australia are Indigenous health workers’ (Parker 2003, p.613).

The 2001 AIMhi chart audit showed that ‘an Aboriginal Mental Health Worker was engaged in care of 64% of Indigenous patients during their hospital stay in late 2001’ (Nagel and Thompson 2006, p.294; Nagel, Thompson & Spencer 2008, p.6). In 2004 this number had dropped, though not significantly, to 55%’ (Nagel Thompson & Spencer 2008, p.6). Whilst the decrease was disappointing, more than half of the Indigenous patients had an AMHW engaged in their treatment which is an improvement from the period prior to 1997 when staff at the in-patient unit would have been largely non-Indigenous.

### Emergency Admissions

**The number of patients admitted through the Emergency Department is decreasing.**

There was a decrease in separations arriving through the Emergency Department, however, changes in reporting and the addition of new statistical admission coding for patients already admitted to hospital may have influenced these results. The decrease may be attributed to an increase in mental health trained health professionals able to assess people in the community including the Tamarind Centre and Community Mental Health Services who provide assessment for hospital admission and referral (Mental Illness Fellowship Australia 2005).

Nagel (2004) reports that there were 118 evacuations in the Top End from January 2002 to October 2003 and of these, 98 were for individuals with mental illness. ‘The most frequent reasons for evacuation were ‘situational crisis’ and ‘substance related mental disorder’’. These numbers include ‘Indigenous and non-Indigenous people living in the rural and remote Top End’ (Nagel 2004, p.5).

Nagel proposes that ‘hospitalisations can be minimised when support and follow-up are available in the community’ (Nagel in Meadows and Singh 2001, p.87). ‘Outside of the metropolitan areas

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**Table 19: NT psychiatrists and psychiatrists-in-training FTE (per 100,000 population)**

<table>
<thead>
<tr>
<th>Year</th>
<th>NT</th>
<th>National</th>
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<tbody>
<tr>
<td>2003</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>2004</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>2005</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>2006</td>
<td>22</td>
<td>18</td>
</tr>
</tbody>
</table>

there is no public transport system’. For those living in communities outside of Darwin, access to in-patient services requires expensive air evacuation’ (Northern Territory Government 2005, p.5).

Developments in community mental health care that have facilitated assessments to be undertaken in the community are of benefit in many ways, minimising pressure on the patient, enabling assessment to take place where there is greater access to information (family, community, clinic staff) and reduces the costs of transportation and expenditure for hospitals if patients don’t need to be admitted for assessment (Nagel in Meadows and Singh 2001).

In summary, the decrease in admissions through the Emergency Department may be a result of improved community capacity to assess and manage cases, minimising the frequency of emergency evacuations and admissions.

**Mental Illness and Substance Use**

For many people experiencing mental illness there are often other comorbid health conditions. The National Health Survey: Mental Health (2001) found that those with mental and behavioural problems were more likely than those without such problems to be high risk drinkers. ‘Adults reporting mental or behavioural problems in 2004-05 were more likely than those without such problems to drink at a level at which is risky/high risk in the long term’ (ABS 2006b, p.5). Conversely, ‘those without mental and behavioural problems were more likely to be low risk drinkers (51.6% compared with 44.4%)’ (ABS 2006b, p.5). The NMDS contains data about the primary diagnosis (and secondary for some separations) for mental health patients in an in-patient unit. This data does not include any patient history or information about comorbid illness or factors that may have contributed to the admission. This project will not discuss diagnosis in detail as it is difficult to examine the findings contextually. It would, however, be negligent to not mention that substance use influences the mental health of people living in the Northern Territory’s Top End in both direct and indirect ways. ‘Rates of alcohol consumption are significantly higher in the Northern Territory than in the rest of Australia with 17% of the population drinking at risky or high risk rate[s]’ (Whetton et al. 2009, p.i). Recently, ‘[a]lcohol bans came into effect in the Northern Territory as part of the Australian Government’s Emergency response to child abuse in Aboriginal communities’ this meant that alcohol was ‘banned on Aboriginal land and community living areas, in all town camps and other areas’ (Brough 2007). Alcohol restrictions influence social and substance use behaviour, particularly in the Northern Territory where consumption is known to be high.
The Northern Territory Government has introduced two pieces of legislation that may influence substance use in the Northern Territory. The *Liquor Legislation Amendment Act 2007* introduced restrictions including ‘dry areas and increasing police powers to search and seize alcohol, as well as supporting the introduction of an identification system for the purchase of alcohol’ and the *NT Volatile Substance Abuse Prevention Act* was introduced in 2006, in response to community concerns about abuse of volatile substances such as petrol, paint and glue.

It is too soon to tell if they will influence comorbid substance use and mental illness, but evaluation of the effectiveness of this legislation will provide further understanding of the benefits of these interventions.

**Involuntary Treatment**

*Key Finding 9: The proportion of separations for male patients is higher where there has been involuntary treatment.*

The Mental Health and Related Services Act (2007, p.1) provides ‘for the care, treatment and protection of people with mental illness’. The Act (2007, p.2) establishes provisions for the review of the voluntary and involuntary admission and treatment of people in approved treatment facilities and ‘for the administration of involuntary treatment in the community’.

The NMDS definitions describe a positive response to this category as being satisfied if ‘the patient was involuntarily treated at any time during the episode of care’ (AIHW 2010; Nagel Thompson & Spencer 2008). There were only two years of data available for involuntary treatment in the NMDS for this project. The findings from this data suggest that those who received involuntary treatment were more likely to be non-Indigenous, male and residing in the NT urban region, however, caution is advised with these findings as they are based on only two years of data.

The proportion of male patients admitted is higher than for female patients for involuntary treatment. This is consistent with national data where ‘a relatively higher number of involuntary separations were for males’ (AIHW 2010, p75). The compliance challenges for health professionals in NT remote settings, including the difficulty in developing a voluntary contract (Nagel 2003) may go some way to explain why one quarter of the involuntary separations for each year were from NT remote regions.

The findings suggest an increased proportion of involuntary treatment for males, however there is not enough data to identify trends from this dataset.
Social Inclusion

The proportion of separations where the patient identified as being homeless is consistent with national rates.

This project found that 4-5% of all separations (excluding same day) for 2006-07 to 2009-10 were for patients who identified as being homeless. The proportion remained steady and is important when considering the relationship between mental health and homelessness and the need to promote social inclusion. The proportion is similar to that found in a recent study on psychosis in Australia where 5.2% of participants (people with a psychotic illness) reported being homeless and 12.8% said that they had been homeless at sometime in the past 12 months (Morgan et al. 2011).

Homelessness is an indicator in the social inclusion agenda. The ‘percentage of mental health consumers living in stable housing’ and ‘prevalence of mental illness among homeless populations’ (AHMAC 2010, p.19) are both indicators for the Fourth National Mental Health Plan. To progress its social inclusion agenda, the Australian Government established an Australian Social Inclusion Board to consult with the community and advise the Australian Government on ways it can implement the Agenda (HREOC 2009). ‘While mental health is related to social isolation, the causal link is hard to establish’ (ABS 2009, p.15).

‘The ABS uses the cultural definition of homelessness to enumerate the population’ (Chamberlain, and MacKenzie 2006). This means that homelessness is determined by what the majority of the community would expect to be adequate housing. In Australia, this generally means a safe and affordable structure with a roof, access to power, and sanitation. For many people living in the Northern Territory, inflated house prices, limited access to public housing, overcrowding, high unemployment in rural and remote areas and limited available resources could mean that many people who do not identify as homeless may indeed fit the ABS definition.

For a long time it was assumed that the homeless population was distributed across Australia in the same way as the general population. However, the 2001 Census found that the rate of homelessness was lower in the ‘southern states’ (New South Wales, Victoria, South Australia, Tasmania and the Australian Capital Territory), significantly higher in Queensland and Western Australia, and much higher in the Northern Territory (Chamberlain 1999; Chamberlain and MacKenzie 2003; Chamberlain and MacKenzie 2006). The ‘NT has the highest homeless rate in Australia’ (Northern Territory Government 2005, p.13) with the rate in 2001 and 2006 being 288 and 248 respectively per 10,000 of the population. This is significantly higher than the national rate for both 2001 and 2006 of 53 per 10,000 of the population. To understand just how high the rate is for NT, Qld had the second highest rate in 2001 at 70 per 10,000 population. In part this
reflects the high number of people in remote areas living in substandard, impoverished dwellings but even in urban areas, the number of homelessness is significantly higher that other jurisdictions’ (Northern Territory Government 2005). This project found that the proportion of people separating from the Darwin Mental Health In-patient Unit who were homeless was approximately 5%, with Darwin having the highest rate of homelessness in Australia and research suggesting that there is a link between mental illness and homelessness (ABS 2009), this is an area where increased demand for services may arise in the future.

The proportion of Indigenous patients discharged against medical advice is higher than the proportion for non-Indigenous patients.

The findings of this study are consistent with the findings from other studies. In 2004-06 (2 years), ‘The Northern Territory had the highest proportion of Indigenous persons hospitalised who discharged against medical advice’ (AIHW 2011a, p.1277). Of those separations where the patient left against medical advice, 21% were Indigenous patients. ‘Indigenous males were more likely than Indigenous females to discharge against medical advice’ (AIHW 2011a, p.1277) and those living in remote and rural regions were more likely than those living in urban regions to discharge against medical advice (AIHW 2011a). Remoteness of usual residence, remoteness of hospital and principal diagnosis are significant variables affecting the outcome of discharge from hospital against medical advice for Indigenous people (AIHW 2008).

In a group interview about the problems that exist for those living in rural areas who are transferred to an urban hospital for treatment Stamp and colleagues found that there was a reluctance to travel brought about by transportation and accommodation difficulties, financial constraints, separation from family and antisocial arrival times, cultural and language differences and lack of privacy (Stamp et al. 2006). Many of the reasons behind the reluctance of remote and rural patients to voluntarily transfer to an urban in-patient unit are similar to the reasons why these patients choose to discharge against medical advice (Franks, and Beckmann 2002; Stamp et al. 2006). To understand why NT remote and rural residents discharge against medical advice more frequently consideration should be given to the reasons listed above, as well as reasons associated with their illness and involuntary treatment status.

The proportion of male patients discharged against medical advice is higher than for female patients.

In a national hospital statistical study analyzing all separations, it was reported that ‘hospitalisation for mental and behavioural disorders was the most significant variable’ that ‘increased the likelihood of being discharged against medical advice’ (AIHW 2011a, p.1296). The findings of
this project suggest that there were a higher proportion of males who discharged against medical advice is consistent with the findings from other studies where Indigenous males were more likely than Indigenous females to be discharged (AIHW 2011a).

In summary, the proportion of patients who discharged against medical advice is low, but for those separations that are against medical advice a larger proportion are Indigenous and male.

Summary
This chapter has presented the key findings from this project. The discussion contains insight into the key changes that have impacted separations in general and the in-patient population more specifically and suggests why some of the findings may have been observed such as changes in quality of care; access to services and demand for culturally appropriate services. The observed changes were compared with national information, and findings from other published reports and journal articles to give further understanding about the context in which the changes were occurring and what the findings may mean for the Darwin Mental Health In-patient Unit in the future.

The findings presented in this chapter include:

Separations

Key Finding 1: The overall number of short stay separations from the Darwin Mental Health In-patient Unit is decreasing

Key Finding 2: The overall number of long stay separations from the Darwin Mental Health In-patient Unit is increasing.

Length of Stay

Key Finding 3: The average length of stay for Indigenous patients is increasing.

Demographic Trends – Gender Status

Key Finding 4: The proportion of separations for female patients for both short and long stays is increasing.

Key Finding 5: There are a higher proportion of female patients admitted for long stays.

Demographic Trends – Indigenous Status

Key Finding 6: The proportion of separations (short and long stay) for Indigenous people is increasing.
Demographic Trends – Region of Residence

**Key Finding 7:** The proportion of short and long stay separations for those patients whose usual place of residence was in a NT rural or NT remote region is increasing.

Demographic Trends - Age

**Key Finding 8:** The average for age for Indigenous patients is lower than the average age for non-Indigenous patients.

Involuntary Treatment

**Key Finding 9:** The proportion of separations for male patients is higher where there has been involuntary treatment during the in-patient stay.

Before making conclusions about the key findings and how they address the research question it is important to first consider the limitations of this project.

**Limitations**

The limitations identified for this project are discussed below. Many of these limitations were identified prior to receiving the dataset and were allowed for during data analysis. Where possible, steps have been taken to minimise their impact on the overall findings.

**Data Quality**

The NMDS was requested according to the process outlined in the NT Data Access Protocols. Unfortunately there were difficulties accessing the data and it took approximately three months to receive the NMDS. The Data Custodian advised that there were some incompatibilities with the data systems and that some of the older data was not available. The result was that an incomplete dataset was received with data missing for some years. There was sufficient data to undertake analysis but for some items, such as involuntary treatment, there was insufficient data to identify trends.

**Data Management Systems**

The Data Custodian advised that more than one data management system had been used during the ten year period of this study. There may have been inconsistencies with the data reporting during this time due to both human input/error and variable definitions. ‘Issues relating to data definitions are being addressed through ongoing development of a nation minimum data set for mental health services’ (Department of Health and Ageing 2002, p184). They caution against using earlier data, particularly where it contradicts previously published statistics and explain that ‘inconsistent reporting methods can result in the appearance of change where little or none exist’ (Department of
Health and Ageing 2002, p184). The data received for 2000-01 and 2001-02 was removed from the NMDS before analysis continued on this project to maintain the integrity of the dataset.

Retrospective data
The data is retrospective and de-identified. It is therefore, not possible, to confirm the data or to correct any errors in data collection. The accuracy of some variables such as Indigenous status and locality of usual residence is only as reliable as the data entered into the system. For example, if someone usually resides in a rural region but was staying with someone in Darwin because they were unwell, they may have a contact address in Darwin and that may be listed as their usual residence even though they usually reside elsewhere. Similarly someone living in Darwin may give the community they came from as their home even though they have been living in Darwin for some time.

Reporting of Indigenous Status
‘The incompleteness of Indigenous identification means the number of hospital separations recorded as Indigenous is an underestimate of hospitalisations involving Aboriginal & Torres Strait Islander peoples’ (AIHW 2008, p.175). The difficulties in knowing the accuracy of the reporting of Indigenous status has been discussed in many studies (AIHW 2008; Commonwealth Department of Health and Ageing 2002; Tew 2008; Zhao et al. 2004; Haswell-Elkins et al. 2008; Nagel 2003; ABS 2011b).

‘Identification of Indigenous Australians can occur on Death Registration Forms and Medical Certificates of Cause of Death. However, it is recognised that not all Indigenous deaths are captured through these processes, leading to under-identification’ (ABS 2011, p.30). ‘Records of hospital use cannot always provide an understanding of the prevalence of some diseases in the Indigenous population’ as ‘the extent of undercounting of Indigenous people in these data sources is not known’. (Department of Health and Ageing 2002, p.198) These discrepancies make it difficult to determine the accuracy of population level statistics and prevalence data taken from government databases, such as hospitals, housing and mortality records.

In the Northern Territory the accuracy of Indigenous status reporting is believed to be high with one study showing ‘a very high level of agreement (94%) between interviews and NT hospital data on Indigenous status’ (Condon, Williams, Pearce et al. in Zhao et al. 2004, p.502) and for under identification in the Indigenous population the error rate ‘has been reported as being lowest in NT’ (ABS in Zhao et al. 2004, p.502).
**De-identified data**

There were some limitations with a de-identified data set as it was not possible to calculate the number of individual patients each year accurately. This would have influenced the accuracy of the rate per 100,000 population calculations, the gender, Indigenous status and region of residence findings to some extent. The findings are reported by separations, however, in some ways knowing the number of individual patients would have reduced the effect of readmissions and improved the accuracy of the rate per 100,000 population.

The limitations have impacted on this project in some ways, for example, it was disappointing not to have a complete 10-year dataset. Other limitations were anticipated and did not influence the project. Most importantly the dataset was quite extensive and the limitations did not minimize the strength of the findings most of which are consistent with other published findings and all of which improve our knowledge in regard to the research questions. The next chapter will bring the work together drawing conclusions about the key findings and their relevance to the research questions.
CHAPTER 6 – CONCLUSION

The environmental, political, social and operational factors influencing mental health care in Australia in general, and hospital admissions more specifically, discussed in the project will continue to impact mental health care in the Northern Territory. Identification of trends, awareness of external influences and implementation of localised responses is the most effective way for the Darwin Mental Health In-patient Unit to manage future demand.

When considering the research question, ‘What are the emerging trends for mental health in-patient care in the Northern Territory’s Top End?’ and the objective of this project, trends have been identified as key findings across all the subcategories.

Trends

Separations

- The overall number of short stay separations (<36 days) is decreasing and the overall number of long stay separations (≥ 36 days) from the Darwin Mental Health In-patient Unit is increasing.

Demographic Trends

- The proportion of both short and long stay separations for non-Indigenous people is decreasing and the proportion of separations for Indigenous people is increasing.
- The proportion of separations for female patients for both short and long stays is increasing.
- The average length of stay for Indigenous patients is increasing.
- The proportion of separations for male patients is higher where there has been involuntary treatment.

Geographical Trends (region of residence)

- The proportion of short and long stay separations for those patients who usually reside in NT urban regions is decreasing. The proportion of short and long stay separations for those patients who usually reside in NT Rural or NT Remote regions is increasing.

‘Although getting reliable and accessible services in place will not be sufficient, it would be a good start’ (Hunter 2007). The findings from this project suggest that the Darwin’s Top End Mental Health Services have gone some way to meet the needs of the NT Top End residents during the
period immediately prior and during this study period. Overall trends for separations suggest that
the increase in separations may have been a response to an unmet need and improved access to
care and that the decrease in the number of separations from 2005-06 is the stabilising period
where demand and services align. As Hunter (2007) says access to services is a good starting point
and the increase in separations for Indigenous people living in the Northern Territory’s Top End
may be the next challenge for the Darwin Mental Health In-patient Unit. Indicators such as average
length of stay and readmission rates frame the picture of culturally appropriate treatment but do not
tell the whole story. The AIMhi NT research in this area will better inform the Darwin Mental
Health In-patient Unit about these trends.

**Generalising the findings across other populations**

Some of the findings may be generalised to Central Australian, Northern Western Australia (WA),
Far North Queensland (FNQ) and Queensland Gulf populations, however, there are differences that
would make it essential for caution to be taken before doing so.

**Rural and Remote regions**

The rural and remote regions of Central Australia, FNQ, the Queensland Gulf and northern WA
have similar geographies with mental health units located in regional hospitals located in regional
urban areas. They all have limited capacity and deliver mental health outreach services to rural
and remote populations with differing levels of frequency. These populations may have also
experienced increased demand for services with improved awareness and reduced stigma. They
may also experience similar cultural difficulties in the delivery of culturally appropriate services,
as well as cost, workforce and affordable housing difficulties.

**How the findings inform clinical practice, service delivery and in-patient care**

The experience of the Northern Territory’s Top End Mental Health service could inform service
provision, clinical practice and policy through experience and outcomes. There isn’t a universal
approach that will suit all remote communities, regional towns and rural settings but aspects of the
NT experience could provide valuable information for other northern Australian mental health
service providers working within a similar environment.

- **Mental Health Literacy** - Service provision could be improved if efforts to increase awareness
  and improve mental health literacy are implemented in conjunction with outreach visits to
  facilitate access in the community to mental health professionals.
• **Decreasing Stigma** - Increasing awareness of services and decreasing stigma through health promotion could improve the opportunity to provide community treatment and preventive services aimed at minimising the number of evacuations and the length of stay for mental health in-patient treatment.

• **Specialist Outreach Services** - The findings suggest that an increase in specialist outreach services improved access to mental health services and led to a rapid increase in demand.

• **Increased Demand** - Increased access and increased awareness may lead to an increase in demand for services and the findings from this project suggest that this is quite likely the case.

• **Small, widely dispersed, culturally diverse populations** – Some regions of Qld, WA and SA may also have characteristics similar to those in the NT that make it difficult to provide the full spectrum of mental health services. These regions would have similar challenges and difficulties and may benefit from the experiences of the NT Top End, particularly where there have been positive patient outcomes.

In summary, this project found that whilst overall separations for each year are decreasing, the number of separations continues to increase for Indigenous people living in remote areas of the Northern Territory’s Top End. Increased treatment capacity in the community, improved access to specialist mental health care and improved mental health literacy appear to have translated into service utilisation and have increased demand for services. The challenge for Darwin Mental Health In-patient Unit will be to continue to meet demand while maintaining the quality of in-patient mental health care and providing a culturally safe environment.
CHAPTER 7 – RECOMMENDATIONS

The findings from this project have been discussed and summarised addressing the research question. This analysis has raised several areas where further investigation would be beneficial. The following recommendations suggest areas where further investigation is needed or where there may be opportunities for improvements to mental health in-patient care.

- **Recommendation One**
  
  Community based mental health services - Improved community-based services including an increase in mental health expertise in community organisations enables assessments to be undertaken in the community reducing the number of patients entering through the Emergency Department.

  **Recommendation**: Investigation into the effectiveness of community-based services in minimising the pressure on the Darwin Mental Health In-patient Unit would enable resources to be redirected to where they are of the most value and provide the best outcomes for patients.

- **Recommendation Two**
  
  Separations and Individual patients - When the separations for this project were crudely matched to determine an estimate of the number of individual people who were discharged each year rather than the number of separations the numbers were lower and the difference each year less marked. This suggests that while the trend of increasing separations remains, the severity of the increase may be somewhat attributed to high readmission rates.

  **Recommendation**: Additional investigation using a re-identifiable coded dataset would further inform this hypothesis.

- **Recommendation Three**
  
  Increased Average Length of Stay for females - It is difficult to reach any conclusion about why there may be an increased number of female long stay separations without further investigation.

  **Recommendation**: Further investigation into the reasons for the increased average length of stay, for example, severity of illness, comprehensive assessments and care planning to explain this trend.
• **Recommendation Four**  
  **Youth Mental Health** - The national data suggests that mental illness in young people is increasing. Mental health promotion for youth and young adults and improved community mental health literacy is important for prevention along with community support for those experiencing mental illness.  
  **Recommendation**: Further investigation may be beneficial into access to mental health services for young people in the NT and the capacity of the mental health system to be able to meet increases in demand given the high proportion of young people living in the Northern Territory.

• **Recommendation Five**  
  **Social Inclusion & Homelessness** - This project found that the proportion of people separating from the Darwin Mental Health In-patient unit who were homeless was approximately 5%. With Darwin having the highest rate of homelessness in Australia and research suggesting that there is a link between mental illness and homelessness there may be an increased demand for services by people who identify as being homeless. This may impact the length of stay with patients remaining in the Darwin Mental Health In-patient Unit until suitable accommodation is available.  
  **Recommendation**: Further investigation may be beneficial to understand whether homelessness is impacting on in-patient care.
REFERENCES

ABS – see Australian Bureau of Statistics.

AHMAC – see Australian Health Ministers’ Advisory Council.


AIHW – see Australian Institute of Health & Welfare.


AHMAC-MHSC – see Australian Health Ministers’ Advisory Council, Mental Health Standing Committee.


Haswell-Elkins, M, Tulip, F, Saunders, V, & Wargent, R. 2007a, Seven year review of hospitalisation patterns to the mental health unit, , 1999/2000 to 2005/2006, Cairns Base Hospital, Second Report, North Queensland Health Equalities Promotion Unit, School of Medicine, University of Queensland, Cairns.

Haswell-Elkins, M, Saunders, V, Miller, G, Wargent, R, Brownlie, A, & Wheeler, T. 2007b, Chart Analysis of Clinical Pathways and Possible Length of Stay Indicators at the Mental Health Unit Cairns Base Hospital, Final Report, North Queensland Health Equalities Promotion Unit, School of Medicine, University of Queensland, Cairns.


HREOC – see Human Rights & Equal Opportunity Commission.


*Liquor Legislation Amendment Act 2007* (Northern Territory).


Meadows, G, Singh, B, & Grigg, M (eds). In press, *Mental Health in Australia*, 2nd Ed. (Revised), South Melbourne, Australia, Oxford University Press.

*Mental Health and Related Services Amendment Act 2007* (Northern Territory).


WHO – see World Health Organisation.


Websites

www.abs.gov.au
www.aihw.gov.au
www.aihw.gov.au/closingthegap
www.auseinet.com
www.doctorconnect.gov.au/internet/otd/publishing.nsf/content/re-intro
www.health.gov.au
www.healthinfonet.ecu.edu.au
www.health.nt.gov.au
www.medcalc.org/calc/relative_risk.php
www.meteor.aihw.gov.au
www.nt.gov.au
www.vassarstats.net
## Appendix A

### Admitted Patient Mental Health National Minimum Data Set (NMDS)

Table 2: Patient-level data elements agreed for collection in the National Minimum Data Set – Institutional Mental Health Care from 1 July 1997

<table>
<thead>
<tr>
<th><strong>IDENTIFIER</strong></th>
<th><strong>SERVICE AND ADMINISTRATIVE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment identifier</td>
<td>Pension status</td>
</tr>
<tr>
<td>Person Identifier</td>
<td>Type of episode of care</td>
</tr>
<tr>
<td><strong>SOCIODEMOGRAPHIC</strong></td>
<td>Admission date</td>
</tr>
<tr>
<td>Sex</td>
<td>First admission for psychiatric treatment</td>
</tr>
<tr>
<td>Date of birth</td>
<td>Discharge date</td>
</tr>
<tr>
<td>Country of birth</td>
<td>Total leave days</td>
</tr>
<tr>
<td>Indigenous status</td>
<td>Mode of separation</td>
</tr>
<tr>
<td>Marital status</td>
<td>Mental health legal status</td>
</tr>
<tr>
<td>Area of usual residence</td>
<td>Total psychiatric care days</td>
</tr>
<tr>
<td>Type of usual accommodation</td>
<td>Referral to further care</td>
</tr>
<tr>
<td>Employment status</td>
<td>Source of referral</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CLINICAL</strong></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Principal diagnosis</td>
<td>****</td>
</tr>
<tr>
<td>Additional diagnosis</td>
<td>****</td>
</tr>
<tr>
<td>Diagnostic Related Group</td>
<td>****</td>
</tr>
<tr>
<td>Major Diagnostic Category</td>
<td>****</td>
</tr>
<tr>
<td>Intended length of hospital stay</td>
<td>****</td>
</tr>
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</table>
Appendix B

Mental Health National Outcomes & Casemix Collection (MHN OCC)

Table 1: Standardised instruments included in the MHN OCC dataset

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Adults</th>
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<th>Children and adolescents</th>
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<tbody>
<tr>
<td>Clinician-rated</td>
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<td></td>
</tr>
<tr>
<td>Health of the Nation Outcome Scales (HoNOS)</td>
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<tr>
<td>Health of the Nation Outcome Scales for Children and Adolescents (HoNOSCA)</td>
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<tr>
<td>Health of the Nation Outcome Scales 55+ (HoNOS55+)</td>
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<td></td>
<td>✓</td>
</tr>
<tr>
<td>Life Skills Profile 18 (LSP-18)</td>
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</tr>
<tr>
<td>Resource Utilisation Groups – Activities of Daily Living Scale (RUG-ADL)</td>
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<td></td>
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</tr>
<tr>
<td>Children’s Global Assessment Scale (CGAS)</td>
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<td></td>
<td>✓</td>
</tr>
<tr>
<td>Consumer-rated</td>
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<td></td>
</tr>
<tr>
<td>Mental Health Inventory (MHI) or Behaviour and Symptom Identification Scale 32 (BASIS-32B) or Kepler-10 Plus (K-10+)</td>
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<tr>
<td>Consumer- and parent-rated</td>
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</tr>
<tr>
<td>Strengths and Difficulties Questionnaire (SDQ)</td>
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</table>

Source: Department of Health and Ageing (2003)²

Table 2: Additional measures included in the MHN OCC dataset

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<th>Measure</th>
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<th>Older persons</th>
<th>Children and adolescents</th>
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<tr>
<td>Clinician-rated</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Factors Influencing Health Status (FIHS)</td>
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<tr>
<td>Focus of Care</td>
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<tr>
<td>Mental Health Legal Status</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Principal and Additional Diagnoses</td>
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<td>✓</td>
<td>✓</td>
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</tbody>
</table>

Source: Department of Health and Ageing (2003)²

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### Key Performance Indicators for Australian Public Mental Health Services (Second Edition 2011)

<table>
<thead>
<tr>
<th>Mental Health Services Key Performance Indicators</th>
<th>Effective</th>
<th>Appropriate</th>
<th>Efficient</th>
<th>Responsive</th>
<th>Accessible</th>
<th>Sustainable</th>
<th>Capable</th>
<th>Safe</th>
<th>Continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHS PI 1: Change in consumers’ clinical outcomes</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MHS PI 2: 28 day readmission rate</td>
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<td>MHS PI 3: National Service Standards compliance</td>
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<td>MHS PI 4: Average length of acute inpatient stay</td>
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<td>MHS PI 7: Average cost per three month community care period</td>
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<td>MHS PI 9: New client index</td>
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<td>MHS PI 10: Comparative area resources</td>
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<td>MHS PI 11: Pre-admission community care</td>
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<td>MHS PI 14: Outcomes readiness</td>
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<td>MHS PI 15: Rate of seclusion</td>
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▲ = Primary domain
■ = Secondary domain
Associate Professor Tricia Nagel  
Head, Mental Health, Wellbeing and Chronic Diseases Division  
Menzies School of Health Research  
PO BOX 41096  
Casuarina NT 0811

27 September 2011

Dear Tricia

This letter is to confirm my support for the extension to the Cultural security and care planning in acute mental health setting project being undertaken by the Menzies School of Health Research.

The aims of the extension are to include analysis of the Admitted Patient Mental Health Care National Minimum Data Set (NMDSS) which will further inform your in-patient project by providing information about population level trends for the Northern Territory. I understand that the variation to the project arises from the inclusion of a Menzies School of Health Research MPH student, Leigh-ann Onnis, who is requesting to undertake this piece of related research, under your supervision.

A condition of my support for the research is that the Director of NT Mental Health is formally given a copy of the completed Masters Thesis as the analysis and conclusions therein may be valuable for the further development of Mental Health Services within the Northern Territory.

Yours sincerely

[Signature]

Bronwyn Hendry  
Director Mental Health  
Department of Health and Community Services
5/10/2011

Dr Michael Nixon
Chair, Human Research Ethics Committee
NT Dept of Health and Menzies School of Health Research

Re: Cultural Security and Care Planning in Acute Mental Health Setting project

Dear Dr Nixon

Leigh-ann Onnis is seeking additional ethics clearance for access to de-identified Mental Health NMDS data for the Cultural Security and Care Planning in Acute Mental Health Setting project

This letter is to confirm my support as data custodian for this request.

Regards

Gary Inglis
Acute Care Information Unit
08 89227796
10 October 2011.

Associate Professor Tricia Nagel,
Head of Healing and Resilience Division,
Menzies School of Health Research
PO Box 41096,
Casuarina NT 0811.

Dear Associate Professor Nagel,

Re: HREC-08/45: Cultural security and care planning study in patient mental health

Thank you for email communication on the 7 October 2011. The Human Research Ethics Committee of the Northern Territory Department of Health and Menzies School of Health Research thanks you for taking the time to respond to the issues of concern identified by the Committee at the meeting held on the 17 August 2011.

The Chair has reviewed and approved the following documents:

1. Letter of support from Data Custodian of Acute Care Information Unit, Department of Health, dated 5 October 2011.

2. Letter of support from Director of Mental Health, Department of Health and Community Services, dated 27 September 2011.

Full approval is now granted for the above research study to be recommenced. The Committee is satisfied that the research proposal meets the requirements of the NH&MRC National Statement on Ethical Conduct in Human Research, 2nd ed., 2007.

This approval will be ratified at the next meeting of the Human Research Ethics Committee to be held 19 October 2011. Please note that HREC approval applies only to research conducted after the date of this letter.

Approved Project timeline: 20/08/2008 – 31/03/2012. This approval is for a period of six (6) months. A final project report is required on or before 31/03/2012.

Please note the terms under which ethical approval is granted:

1. The safe and ethical conduct of this project is entirely the responsibility of the investigators and their institution(s).

2. Researchers should report immediately anything which might affect continuing ethical acceptance of the project, including:
   a) adverse effects of the project on subjects and the steps taken to deal with these,
   b) other unforeseen events,
   c) new information that may invalidate the ethical integrity of the study.
   d) Proposed Changes in the project

3. Approval for a further twelve months will be granted if the HREC is satisfied that the conduct of the project has been consistent with the original protocol.

The Human Research Ethics Committee of NT Department of Health and Menzies School of Health Research (HREC) is constituted and operates in accordance with the NH&MRC National Statement on Ethical Conduct in Human Research (2007).
4. Confidentiality of research participants should be maintained at all times as required by law.

5. The Patient Information Sheet and the Consent Form shall be printed on the relevant site letterhead with full contact details.

6. The Patient Information Sheet must provide a brief outline of the research activity including, risks and benefits, withdrawal options, contact details of the researchers and must also state that the Human Research Ethics Secretary can be contacted (telephone and email) for information concerning policies, rights of participants, concerns or complaints regarding the ethical conduct of the study.

7. The Committee must also be notified at the completion of the project.

If you have any queries or if I can be of further assistance, please do not hesitate to contact me on (08) 89228705.

Yours sincerely,

Dr Michael Nixon
Chair
Human Research Ethics Committee
of Northern Territory Department of Health
and Menzies School of Health Research