The use of seclusion for Māori in adult inpatient mental health services in New Zealand

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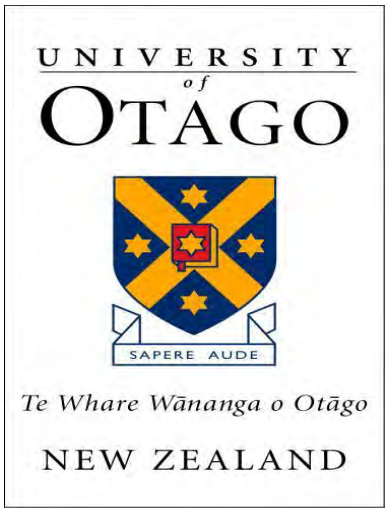

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Citation: McLeod, M., King, P., Stanley, J., Lacey, C., Cunningham, R., and Simmonds, S. (2013). *The use of seclusion for Māori in adult inpatient mental health services in New Zealand.* Auckland. Te Pou.

Published in September 2013 by Te Pou o Te Whakaaro Nui
The National Centre of Mental Health Research, Information and Workforce Development.
PO Box 108-244, Symonds Street, Auckland, New Zealand.

ISBN 978-1-877537-81-3

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Acknowledgements

The project team would like to acknowledge the Expert Advisory Group for this project who contributed throughout the study and were given the opportunity to provide feedback on the final report:

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- **Malcolm Robson** is the Kaiwhakahaere for the Transcultural Mental Health Services at Capital and Coast DHB.
- **Melanie Sargent** is a Senior Māori Policy Analyst for the Māori Population Health Group, Ministry of Health.

We would also like to thank those who participated in the West Coast and Northland DHB case studies.

The project was externally reviewed by Dr Rees Tapsell and Dr Marie Crowe. We are thankful for their comments.

This report was commissioned and funded by Te Pou, The National Centre of Mental Health Research, Information and Workforce Development, on behalf of the Ministry of Health. Opinions expressed in this report are those of the authors only and do not necessarily reflect those of Te Pou o Te Whakaaro Nui/The National Centre of Mental Health Research, Information and Workforce Development, or of the peer reviewers.

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Executive Summary

In New Zealand there have been recent moves towards limiting the use of restraint and seclusion, along with encouragement for the consideration and the use of preferred alternative interventions, in the mental health inpatient setting (Mental Health Commission, 2004; O'Hagan, Divis and Long, 2008; Te Pou, 2008; Ministry of Health, 2010b). While data on the use of seclusion is limited, available information suggests that there are ethnic differences in the use of seclusion in New Zealand, with Māori more likely to be secluded than non-Māori (El-Badri and Mellsop, 2002; Mental Health Commission, 2004; Ministry of Health, 2010a).

The overall aim of the research reported here was to expand the research base by investigating disparities in the use of seclusion in adult mental health inpatient units in New Zealand using kaupapa Māori quantitative methods (Simmonds, Robson, Cram and Purdie, 2008). The report is presented in two parts, reflecting the key objectives of the study.

Part One - Development of monitoring approach

Part one of this report outlines the development of an approach to monitoring Māori seclusion use in mental health inpatient units in New Zealand, with data from the Programme for the Integration of Mental Health Data (PRIMHD) database. Key stages in the development of the approach included an advisors hui, literature review, two District Health Board (DHB) case studies and a review of the PRIMHD dataset.

The advisors hui included a range of key stakeholders including Māori health researchers, policy advisors, consumer advisors, and mental health service staff. During this hui, a list of key factors likely to be contributing to differential use of seclusion for Māori was developed, and the factors prioritised according to their perceived importance. A review of the literature was undertaken to identify existing methods of monitoring and reporting seclusion use, and factors potentially contributing to seclusion use. In addition, brief case studies of two nominated DHBs were completed to gain an understanding of the impact of local context on seclusion use, and influences on seclusion use that are not currently captured in PRIMHD. An extract of the PRIMHD database was then examined, in consultation with the Ministry of Health, to identify which fields in the database were available for analysis, and which fields were not currently available but important factors for Māori (e.g. acuity of illness, and community mental health service access).

Finally, Part One presents the proposed approach to monitoring the use of seclusion that was used in Part Two of the report to analyse data from nine DHBs in New Zealand.

Findings

Monitoring the use of seclusion was identified in the literature and by the project advisors as important in contributing to the aim of seclusion reduction in New Zealand. A range of factors that may drive differences in seclusion use between population subgroups were also identified. These factors were broad-ranging and included those relating to the individual (e.g. age, diagnosis, legal status, disease acuity), the provider (e.g. staff characteristics and experience, ward environment, staff: service user ratios), and the wider health system (e.g. availability of community care). The case studies of West Coast and Northland DHBs' adult inpatient mental health services identified the importance of understanding the local context in interpreting results on the use of seclusion. Factors such as staff ratios, the layout and level of occupancy of the unit and organisational policies were seen to have an important influence on seclusion use at the local level.

The proposed monitoring approach applied in a consistent way and repeated over time could assist policymakers and service providers to: map trends in seclusion use and disparities over time; identify target populations for intervention; ensure that interventions are appropriately reaching target populations; and ensure that unintended harmful consequences do not result from any attempts efforts reduce seclusion use.

Recommendations for PRIMHD database

The monitoring of seclusion use for Māori and non-Māori-non-Pacific (nMnP) using the PRIMHD database is currently limited by the completeness and consistency of reporting within and between DHBs. Given the time and resources required to establish and maintain reporting into PRIMHD (for both DHBs and the Ministry of Health), we recommend a stepwise approach with an initial focus on critical data fields, and a longer-term view to extension of the database to include a wider range of factors. We understand that:

- the Ministry of Health and DHBs should work together to improve the standardisation and completeness of reporting into PRIMHD (including demographic data, time of admission/discharge, and start/end of seclusion events, diagnosis and legal status)
- the Ministry of Health and DHBs should work together to prioritise the collection of high quality 'critical' data (demographic data including ethnicity, admission and event data, diagnosis and legal status) by DHBs, with eventual extension to include community mental health service provision and HoNOS scores (as an indicator of disease severity)
- the Ministry of Health in consultation with DHBs, Māori mental health service providers and mental health consumers, should consider the value of additional variables to PRIMHD such as the reasons for seclusion, substitute activities and measures of staff and patient safety.

Recommendations for monitoring outcomes of seclusion reduction

The most commonly cited reason in the literature for the use of seclusion is for staff and service user safety. Therefore, in all DHBs, but particularly in those with seclusion reduction initiaves we recommend monitoring measures of staff and patient safety, including:

- events of assaults on staff or other service-users within the psychiatric inpatient unit,
- suicide attempts in psychiatric inpatient care, and
- episodes of service-users absconding from the psychiatric inpatient unit.

In addition, where seclusion reduction initaitives are in place, it is important to monitor the use of subsititute activities including:

- the use of restraint (pharmacological or physical)
- Police use of Section 122B Use of Force of the Mental Health (Compulsory Assessment and Treatment) Act 1992
- the use of preferred alternative interventions (e.g. sensory rooms).

Part Two - DHB pilot results

The second part of this report presents key findings from piloting of the approach outlined in part one, on nine DHBs that were determined to have complete reporting of seclusion events between 1 July 2008 and 31 June 2010.

Findings

The pilot results identified ethnic disparities between Māori and non-Māori-non-Pacific (nMnP) in the use of seclusion, with Māori having four times the population-based rate of seclusion events compared to nMnP. Differences in age and legal status on admission for Māori compared to nMnP were important contributors to the disparity between Māori and nMnP in seclusion use. However, after taking a number of variables (age, gender and NZDep06, referral pathway, legal status and

diagnosis on admission) into account Māori rates of seclusion remained 21 per cent greater than for nMnP admissions. A number of high-risk groups for seclusion were identified, including young Māori males, older Māori females, and Māori with psychiatric diagnoses of schizophrenia, bipolar disorders, substance-related disorders and depressive disorders. There were large differences between DHBs in the rates of seclusion use, although for the majority of DHBs, Māori had higher rates of seclusion events than nMnP.

Recommendations for further investigation and intervention

The groups identified in the pilot study as being at highest risk of seclusion include: young Māori males, older Māori females, and Māori with psychiatric diagnoses of schizophrenia, bipolar disorders, substance-related disorders and depressive disorders. In order to contribute to the goal of seclusion reduction in New Zealand, we recommend:

- investigation of high-risk groups for seclusion (both in terms of absolute numbers and rates of seclusion) using both quantitative and qualitative methods.

Given the large differences in the rates of seclusion use between DHBs, we also recommend:

- investigation of the drivers of DHB differences in seclusion use
- development and implementation of seclusion reduction initiatives in DHBs with the greatest disparities in seclusion use between Māori and nMnP, and the highest overall seclusion use.

Finally, in order to reduce the use of seclusion for Māori, support of culturally appropriate community mental health services is required in order to prevent the need for inpatient admission, or to reduce the acuity of illness where admission is required.

Introduction

Seclusion is a particular type of restraint. In a seclusion episode, the service user is placed by themselves in an area or room from which they cannot freely exit (Standards New Zealand, 2008). The use of seclusion in New Zealand is sanctioned by the Mental Health (Compulsory Assessment and Treatment) Act 1992, and best practice in seclusion use in mental health inpatient units is outlined in the Ministry of Health report 'Seclusion under the Mental Health (Compulsory Assessment and Treatment) Act 1992' (Ministry of Health, 2010b).

The use of seclusion is commonly justified as a way of keeping service users and staff safe on the ward (Soloff, Gutheil, and Wexter, 1985; El-Badri and Mellsop, 2008). However, evidence for the value of seclusion as an intervention is lacking (Salias and Fenton, 2000). Moreover, there is a body of evidence suggesting that seclusion can be psychologically damaging for those who experience it (Mental Health Commission, 2004).

Internationally, there has been a movement over the past decade to reduce the use of seclusion and restraint (Steinert, et al., 2010). In New Zealand there have also been recent moves towards limiting the use of restraint and seclusion (Mental Health Commission, 2004; O'Hagan, Divis and Long, 2008; Te Pou, 2008; Ministry of Health, 2010b), and encouragement to consider the use of preferred alternative interventions in the mental health inpatient setting (Ministry of Health, (2010b). A literature review of best practice in the minimisation of seclusion and restraint identified a range of interventions such as: national leadership, advocacy, organisational leadership/oversight, organisational culture change, workforce development, service user development and participation, practical prevention methods, debriefing, information, funding, and timeframes, as important contributors towards the reduction of seclusion and restraint in adult and child psychiatric inpatient settings (O'Hagan, Divis, and Long, 2008).

In order to identify any change in practice or outcomes resulting from seclusion reduction initiatives, it is important to collect information around the use of seclusion. However, there is a lack of good quality information on the rates of seclusion and restraint use in any country, including New Zealand. In 2008, a review of international seclusion rates found significant variation in frequency of seclusion between different countries, ranging from no seclusion events in Iceland where seclusion and restraint have been abolished, to 115.8 seclusion events per 100,000 resident population per year in the Netherlands (Steinert, et al., 2010). In New Zealand, there are documented ethnic differences in the use of seclusion in New Zealand, with Māori more likely to be secluded than non-Māori (El-Badri and Mellsop, 2002; Mental Health Commission, 2004; Ministry of Health, 2010a). The use of seclusion for Māori in New Zealand hospitals is relatively high when compared with published international rates (Steinert, et al., 2010) with a rate of 280 seclusion events per 100,000 resident population in 2009 (Ministry of Health, 2010a). This compared to a rate of 90 seclusion events per 100,000 resident population per year for those of Other ethnicities (excluding prioritised Māori and Pacific) (Ministry of Health, 2010a)

Project Aims and Design

This project seeks to expand the limited research on disparities in seclusion and restraint between Māori and non-Māori, non-Pacific (nMnP) peoples in New Zealand. The objectives of this report are to:

1. Develop an approach for monitoring disparities (by DHB) in seclusion, using data from the New Zealand Ministry of Health (MoH), Programme for the Integration of Mental Health Data (PRIMHD) dataset.

2. Pilot this approach on the data from a number of DHBs with data in PRIMHD.

3. Determine if ethnic disparities in seclusion exist between Māori and nMnP in general adult psychiatric inpatient units of New Zealand.

4. Identify factors associated with seclusion, comparing the distribution of these factors for Māori and nMnP general adult psychiatric inpatient admissions.

An expert advisory group was established and consulted throughout the project, with involvement in the design of the study and the analysis and interpretation of findings. The members of the advisory group were chosen to give breadth of clinical, research and Māori cultural expertise.

A number of activities were undertaken to develop the approach to monitoring seclusion use (Objective 1). The literature review and advisors hui were carried out to assist the quantitative analyses by providing a picture of the factors currently understood to influence the use of seclusion for Māori inpatients. Also, two DHB case studies were undertaken with a range of staff working in two DHB mental health services in order to provide context for the use of seclusion within these DHBs and to identify factors potentially influencing use of seclusion amongst Māori that may not have been captured by PRIMHD. Finally, a review of the PRIMHD data assisted in identifying which data fields were available for analysis now, and those which will be available in the future. Following this, an analysis of data from nine DHBs using the PRIMHD database was undertaken (Objectives 2, 3, 4).

Report structure

Part One presents the key stages undertaken to develop an approach to investigating seclusion use for Māori, the proposed (and finalised) monitoring approach, and a summary of key issues and recommendations for monitoring seclusion use. Part Two of the report presents the findings from piloting the approach outlined in Part One on nine New Zealand DHBs, and resulting recommendations.

Part One – An approach to monitoring disparities in seclusion use

Stages in development

This section outlines the development of an approach to monitoring Māori seclusion use, with data from the Programme for the Integration of Mental Health Data (PRIMHD) database. Key stages in the development of the approach included an advisors hui, literature review, two DHB case studies and a review of the PRIMHD dataset. Finally, we present the proposed (and subsequently finalised) approach to monitoring the use of seclusion that was used in part two of the report to analyse data from nine DHBs in New Zealand.

Advisors Hui

The advisors hui included a range of key stakeholders including Māori health researchers, policy advisors, consumer advisors, and a range of mental health service staff. During this hui, a list of key factors likely to be contributing to differential use of seclusion for Māori were identified and prioritised according to their perceived importance (by each individual). The responses were then collated by the research team, and reviewed by the advisors (Appendix 1).

Literature review

In order to provide context to the data analysis and to the broader discussion of the use of seclusion, a literature review was undertaken primarily to identify evidence on factors associated with use of seclusion in the mental health inpatient setting in New Zealand for Māori, and internationally for factors associated with differences in seclusion use by ethnicity or race. In addition, a summary of the literature on factors influencing seclusion use more generally is presented in Table 1.

The literature review involved a search of databases[1] (including Medline, Psych INFO, Google Scholar), as well as relevant websites to identify both published and grey literature. Bibliographies were reviewed and other literature such as unpublished work, reports, and lecture materials were identified through key informants.

A total of twenty-three studies were identified as reporting an association of seclusion use with race or ethnicity. In the majority of these papers, examination of seclusion by ethnicity/race was not the primary purpose of the research but rather, ethnicity was one of a number of factors examined.

In New Zealand, two studies (El-Badri and Mellsop, 2002; Kumar, et al., 2008) and two reports (MHC, 2004; Ministry of Health, 2010a2) reported on the use of seclusion in general adult psychiatric inpatient care by ethnic group. Three of these documents identified a higher use of seclusion for Māori service users as compared to non-Māori service users (although only two included seclusion figures).

The *Office of the Director of Mental Health: Annual Report 2009* released by the Ministry of Health (MoH) revealed that, "Māori were statistically more likely to be secluded than Pacific peoples and those from other ethnic groups"(2010a, p.20). This report presented results by prioritised ethnic groups of Māori, Pacific[3] and Other (inclusive of NZ European). Of the 1075 general adult psychiatric service users (ages 20-64 years) experiencing seclusion over 2009, 25.1 per cent (n=275) were

[1] Key search terms were used in different combinations to search the literature: Mental, Health, Seclu*, Restraint, Factor*, Forensic, Risk, Intervention, Initiative, Strateg*, Predict*, Legislati*, Polic*, Ethnic*, Rac*, Indigenous, Māori, Minorit*, Disparit*, Reduc*, Minimi*, Elimin*.

[2] Only the most recent annual report by the The Office of the Director of Mental Health was included.

[3] The report used prioritised ethnicity for the analysis therefore it is likely that numbers of Pacific peoples will have been under-counted.

identified as Māori compared to 3.1 per cent (n=33) identified as Pacific and 71.8 per cent (n=772) identified as being from other ethnic groups. Māori were reported as experiencing seclusion at a rate of 280 seclusion events per 100,000 resident population per year compared to those of other ethnicities, whose rate was 90 seclusion events per 100,000 resident population per year (Ministry of Health, 2010a).

The MHC (2004) report, *Seclusion in New Zealand Mental Health Services* stated that, "Māori tend to be more secluded than others" (MHC, 2004, p.7). However seclusion figures for Māori were not presented within this report.

The first of the two studies undertaken in New Zealand looked at frequency of seclusion use, and a range of factors associated with its use, including ethnicity (El-Badri and Mellsop, 2002). The study, based at Waikato Hospital, found that over a nine-month period, 84 of 539 service users were secluded. Based on the ethnicity recorded on hospital admission, 20 per cent of Māori, 11 per cent of NZ European and 22% of 'Other' service users over the study period were secluded. These results were statistically significant ($p = 0.008$) (El-Badri and Mellsop, 2002). The authors commented that the increased risk for Māori may "reflect more severe disturbances or psychopathology or…that non-European service users may be selectively perceived as more dangerous" (El-Badri and Mellsop, 2002, p.402). However, the various factors identified as influencing seclusion use (e.g. diagnosis and age) were examined independently of ethnicity in this study.

The second New Zealand study examined restrictive care practices (including seclusion) for adult psychiatric inpatients admitted to Rotorua Hospital between January 2000 and December 2001, with the primary purpose of examining differences for Māori versus non-Māori in restrictive care practices. Among the 300 service users included in the study, 31 per cent of Māori (n=38) compared to 19 per cent of non-Māori (n=33) experienced at least one seclusion event. In this study Māori were found to have a greater likelihood of being prescribed antipsychotic medications, and at higher doses than non-Māori service users, and were less likely to be referred to community psychotherapy services. There were no significant differences found between Māori and non-Māori in the use of seclusion (OR 1.62, 95 per centCI 0.86–3.01, $p = 0.1$), length of stay, and, compulsory status on admission after controlling for age, sex, diagnosis, and time (days) between onset of illness episode and admission (Kumar, et al., 2008). However, the authors noted that the study was underpowered to detect smaller than expected differences between Māori and non-Māori (Kumar, et al., 2008).

Internationally, ethnic and racial disparities in seclusion use have been reported. A recent study conducted in Australia examined differences between secluded (n=271) and non-secluded (n=2973) general adult and forensic inpatients for six months over a twelve-month period across eleven mental health services. They found that indigenous peoples overall were not significantly more likely than non-indigenous peoples to be secluded ($p = 0.066$), but there was a significantly higher use of seclusion for indigenous inpatients in the 25–34 year age group ($p = 0.016$) (Happell and Koehn, 2010).

Many of the overseas studies demonstrating ethnic or racial differences in seclusion use have come from the United States, where increased rates of seclusion have been found in black service users compared to white service users (Flaherty and Meagher, 1980; Soloff and Turner, 1981; Carpenter, Hannon, McCleery and Wanderling, 1988; Forquer, Earle, Way and Banks, 1996; Smith et al., 2005).

Spector (2001) conducted a literature review of studies based in the United Kingdom and United States examining seclusion use and other forms of coercion, and found that mental health workers routinely overestimated the potential for violence of non-white male psychiatric service users compared to white service users and that similar 'difficult' behaviour was tolerated more for white service users. The author concluded that racial stereotyping has an influence over mental health workers' perceptions of the dangerousness of psychiatric service users (Spector, 2001).

In the United Kingdom, a study examining ethnic disparities in psychiatric management between black (n=202, 74 per cent Afro-Caribbean and 24 per cent African) and white (n=186) service users following involvement in a violent incident,

found that black service users were more likely to be secluded.[4] However, the relationship between ethnic background and seclusion was confounded by age, gender and section type on admission (legal status). The higher use of seclusion for black service users following violent incidents was no longer significant after adjusting for all other variables (including age, gender, diagnosis, legal status, antecedent[5] and incident-specific variables) (Gudjonsson, Rabe-Hesketh and Szmulker, 2004).

Bennewith et al (2010) interviewed involuntary psychiatric inpatients at admission and four weeks following admission (n=778), and reviewed hospital records of coercion from 22 hospitals managed by eight mental health trusts located across England. Of the 778 service users recruited, 545 (70.5 per cent) agreed to a follow-up interview at four weeks. Black service users were found to have the highest self-report of coercion at admission (45.4 per cent, n=130) and hospital records of a coercive measure during admission (39.2 per cent, n=102), whilst white service users were found to have the lowest proportions of all ethnic groups in these two categories (31.9 per cent, n=520 and 19.6 per cent, n=392). However, the differences between black and white service users were no longer significant following adjustment for age, gender, diagnosis and mental health trust. On the basis of the above findings, the authors stated that psychiatric inpatients from areas with a high proportion of ethnic minority groups have a higher likelihood of experiencing seclusion independent of whether they themselves belong to an ethnic minority group (Bennewith, et al., 2010).

Several authors have also reported that no significant differences in seclusion use occur by ethnicity or race (Binder, 1979; Fisher, 1994; Oldham, Russakoff and Prusnofsky, 1983; Plutchik, et al., 1978; Ramchandani, Akhtar and Helfrich, 1981; Tardiff, 1981).

The following table presents a summary of factors identified in the literature as potentially associated with seclusion use in general adult psychiatric inpatient care more generally.

Table 1. *Summary of Literature on Factors and their Association with Seclusion*

Factors	Key Findings	References
Age	The average age of those secluded has been reported as being significantly younger than those not secluded.	(Mattson, et al., 1978; Plutchik, et al., 1978; Schwab, et al. 1979; Oldham, et al. 1983; Thompson, 1986; Fisher, 1994; Swett, 1994; Mason, 1995; Harte, 2003)
	A minority of studies reported no association between age and seclusion.	(Soloff, et al., 1981; El-Badri, et al., 2002; Frueh, et al. 2005)
Gender	Males have been reported as being more likely to be secluded than females.	(Garrison, 1984; Thompson, 1986; Carpenter, et al., 1988; Miller, et al., 1989; El-Badri, et al., 2002; Bowers, et al., 2007)
	Females more likely to be secluded than males.	(Way, et al., 1990)
	Other studies have found no association	(Plutchik, et al., 1978; Binder, 1979; Soloff, et al., 1981; Tardiff, 1981; Oldham, et al.,

[4] The remaining 34 inpatients were of an ethnicity other than those already listed, or had missing ethnic background information in their patient records.
[5] Antecedent variables included: agitation, specific interaction with patients/staff, staff refusal of patient request, refusal to take medication and patient attempting to abscond.

Factors	Key Findings	References
	between gender and seclusion.	1983; Hammill, et al., 1989; Ibikunle, et al. 2000; Frueh, et al., 2005)
Legal Status	Patients secluded have been reported as more likely to have involuntary status on admission than those not secluded.	(Soloff, et al., 1981; Oldham, et al., 1983; Thompson, 1986; Harte, 2003)
Diagnosis	Patients most likely to be secluded have been found to have one of the following diagnoses: schizophrenia, psychosis, bipolar affective disorder or borderline personality disorder.	(Plutchik, et al., 1978; Binder, 1979; Oldham, et al., 1983; Thompson, 1986; Betemps, et al., 1993; Swett, 1994; Harte, 2003)
Severity of Illness	Secluded patients have been reported to spend longer durations in hospital than non-secluded patients. One study reported that two scores (irritability and total assets) on the Nurses Observation Scale for Inpatient Evaluation; an indicator of acuity was a significant predictor for seclusion. One study reported significantly higher HoNOS scores for those secluded.	(Le Gris, et al., 1999; Ibikunle, et al., 2000; Harte, 2003) (Swett, 1994) (Happell, et al., 2010)
Medications	Secluded patients have been reported to be on more medications than non-secluded patients. Other studies have reported the role of second generation anti-psychotics in the reduction of seclusion.	(Ibikunle, et al., 2000) (Chengappa, et al., 2000; Chengappa, et al., 2002; Smith, et al., 2005)
Staffing Level	Lower staffing levels have been found to be associated with increased seclusion.	(Mattson, et al., 1978; Morrison, et al., 1995; Donat, 2002; MHC, 2004; O'Malley, et al., 2007)
Timing of Shift	Increased use of seclusion has been found to occur at shift times when staff were most pre-occupied with ward work.	(Mattson, et al., 1978; Garrison, 1984; Morrison, 1990; Vittengl, 2002; Schreiner, et al., 2004; Smith, et al., 2005; O'Malley, et al., 2007)
Level of Training	Less experienced staff have been found to be associated with increased use of seclusion.	(Mattson, et al., 1978; Morrison, et al., 1987; Crichton, 1997; Castle, et al., 1998; MHC, 2004)
Staff Gender	Two studies reported a greater male to female staff ratio was associated with increased use of seclusion. The opposite has also been reported. One study found that a small percentage of either male or female staff was associated with increased seclusion.	(Kirkpatrick, 1989; De Cangas, 1993) (O'Malley, et al., 2007) (Morrison, et al., 1995)

Factors	Key Findings	References
Staff Attitudes	Several authors have reported staff attitudes as having a strong influence over use of seclusion. A review of UK and US studies identified that racial stereotyping has an influence over mental health workers' perceptions of the dangerousness of service-users.	(Gerlock, et al., 1983; Gair, 1984; Fisher, 1994; Lendemeijer, et al., 1997; MHC, 2004; Livingstone, 2007) (Spector, 2001)
Physical	Unit overcapacity has been found to be one of the strongest predictors for increased use of seclusion. Poor ward design has also been found to be significantly predictive of stress in health settings.	(Palmstierna, et al., 1991; Brooks, et al., 1994; MHC, 2004) (Verderber, et al., 1987)
Ward Culture	Ward culture has been reported as an important factor influencing staff reaction to patient behaviour and therefore seclusion.	(Fisher, 1994; Walsh, et al., 1995; Crichton, 1997)
Forensic Setting	One study of a forensic setting in Australia reported that 44 per cent of forensic patients experienced seclusion. Several authors argue that due to occurrence of greater rates of violence in the forensic unit, a higher rate of seclusion may be expected.	(Stuart, et al., 2009). (Larkin, et al., 1988; Coldwell, et al., 1989; Heilbrun, et al., 1995)
Rural Setting	Two studies in New York found city units had higher seclusion use, and significantly higher seclusion and restraint of black inpatients. Rural and urban hospitals have both been reported as having higher rates of seclusion.	(Carpenter, et al., 1988; Forquer, et al., 1996) (Crenshaw WB et al., 1995; Harte, 2003)
Time since Admission	Seclusion occurs predominantly within the first 24 hours to the first half of a patient's admission to the psychiatric unit.	(Binder, 1979; Soloff, et al., 1981; Hammill, et al., 1989; Harte, 2002; Ibikunle, et al., 2000)
Day of week	One study reported that seclusion occurred most often on Mondays and least often on Saturdays and Sundays.	(Garrison , 1984)
Season	Higher rates of seclusion in winter and spring.	(Gerlock, et al., 1983; Harte, 2002)

In summary, there are a wide range of factors that may be of relevance for an investigation of disparities between population groups in New Zealand. The factors with stronger evidence tend to be those that are more easily measured and associated with the individual patient (e.g. age, gender, legal status on admission, time since admission and diagnosis), or relate to the inpatient unit (e.g. staffing levels, unit overcapacity and timing in relation to ward shifts). However, there are a number of additional factors for which there is less evidence or no identified studies, which may be important factors to investigate for Māori, such as staff characteristics (e.g. staff experience, ethnicity/race, gender, age), severity of illness and availability of community mental health services.

Higher rates of seclusion have been reported for indigenous and ethnic minority groups both in New Zealand and internationally. In New Zealand, one study estimated ethnic differences in seclusion use for Māori compared to non-Māori having adjusted for other factors (age, sex, diagnosis, time (days) between onset of illness and admission and readmission rates), and found no remaining significant differences (but the study was noted to be underpowered) (Kumar, et al., 2008). International studies have also attempted to adjust their analyses for a range of factors thought to be potential contributors to ethnic disparities in seclusion use including age, gender, diagnosis (Gudjonsson, et al., 2004), mental health trust (Bennewith, et al., 2010) and legal status on admission (Gudjonsson, et al., 2004), resulting in no significant differences following adjustment.

DHB Case Study Profiles

Case study profiles of two DHB psychiatric inpatient units (included in the subsequent pilot study) were undertaken. The purpose of the case study profiles was to identify local factors potentially influencing use of seclusion amongst Māori that may or may not have been captured by PRIMHD and to identify approaches the DHBs have to the collection, recording and use of seclusion data.

Semi-structured interviews were undertaken with a range of staff in the two DHBs. Four people from Northland DHB were interviewed by telephone, and seven face-to-face interviews were undertaken with staff from West Coast DHB. A range of staff were interviewed across the two DHBs including psychiatrists, community and inpatient service managers, consumer advisors and cultural consumer advisors, and ward staff. Interviews lasted 20 to 60 minutes and consisted of questions relating directly to service structure and procedures as well as open questions asking the interviewee's opinions of the factors which contribute to the level of seclusion use at the DHB, particularly for Māori.

Case Study 1 – Northland DHB

Northland DHB is funder, planner and a key provider of health and disability services for the population of Te Tai Tokerau (Northland), covering the area from Topuni (north of Wellsford) in the south to North Cape, and serving a population of about 148,500. Northland has a resident population with a high proportion of Māori (29 per cent vs. 14 per cent in New Zealand in 2006), widely dispersed rural communities and a disproportionately high level of socio-economic deprivation (35 per cent in NZDep deciles 9 and 10 in 2006).

Important context in considering the patterns of seclusion in Northland DHB

Staff identified a number of important contextual factors relating to the way mental health service are provided in Northland that need to be taken into account when considering the numbers and rates of seclusion events in the inpatient unit.

The ward environment was considered an important factor in the use of seclusion in Northland. The current inpatient unit consists of two older-style locked wards with open plan communal areas and a lack of access to pleasant outdoor spaces. The ward is often crowded and there are very limited private or quiet areas. However, there is a new inpatient unit currently under construction that will have 26 beds, including two seclusion beds and three or four beds in an intensive area, which aim to reduce the requirement for seclusion.

The service user mix on the inpatient ward in Northland DHB was also seen as having an influence over the use of seclusion. Currently, service users aged 18-64 years are cared for alongside elderly service users on both wards. This means that the frail elderly are cared for alongside young people with acute psychosis. On the new wards, elderly service users will be in a dedicated area and it will be possible to isolate individuals who are upset without secluding them.

A national analysis of seclusion events (without appropriate local input) risks being focused on events occurring inside of the inpatient unit, without having data on community service capacity, availability and appropriateness. In Northland, staff commented that people are often very unwell at admission, partly because of the difficulty of following up in the community in such a geographically dispersed area. Some staff suggested that there is limited continuity between community and inpatient supports.

The number and mix of staff on the ward was seen to have an important influence on the use of seclusion in Northland. The perception from staff was that this is a busy ward, with many very unwell clients. The staff-service user ratio for the day shift is usually around nine nursing staff for 26-28 service users (1:3). Māori service users are overrepresented on the ward, with over half of the clients on the ward at any one time being Māori. The majority of the medical and nursing staff are non-Māori, although there is a cultural worker and a number of support workers, the majority of whom are Māori. There was some comment that staff tend to be much older than service users, and although this may mean that they have a greater level of experience, there was a suggestion that this may impact on their ability to relate to and understand service users' needs, and in turn lead to a greater use of seclusion.

The organisational approach towards reduction of seclusion was identified as important in reducing seclusion rates. It is hoped that the seclusion monitoring and seclusion reduction initiatives underway, together with the move to the new ward, will significantly reduce the use of seclusion in Northland in the future.

Case Study 2 – West Coast DHB

West Coast DHB is funder, planner and a key provider of health and disability services for the population of Te Tai Poutini (West Coast region), covering an area that spans 538km from Karamea to Haast including the towns of Westport, Greymouth and Hokitika and, serving a population of 31,326. West Coast region is characterised by a resident population that has a relatively lower proportion of Māori (9 per cent vs. 15 per cent New Zealand population), widely dispersed rural communities, an aging total population (14 per cent of residents aged over 65 years), and a disproportionately high level of socio-economic deprivation with almost 50 per cent of the population living in NZDep 8, 9 and 10 areas.

Important context in considering the patterns of seclusion in West Coast DHB

There are a number of important contextual factors specific to West Coast DHB that influence the way psychiatric services are provided and need to be considered when examining proportions and rates of seclusion events for the DHB.

The population demographics of the West Coast region were seen to have an important influence on the numbers of seclusion events. The population group identified by staff to be most at risk of seclusion, young Māori male, were seen to be under-represented on the West Coast. Staff felt that the clients on the ward in the West Coast were older and with more chronic mental health issues than in other regions.

The staff to service user ratio on the ward was seen to be an important factor in reducing the need to place clients in seclusion. Often the ratio is 1:1, and therefore more intensive nursing care can be provided for service users. The Māori Mental Health Team was also identified as important and was seen by nursing staff to be successful in providing for Māori clients' cultural needs.

Staff leadership was also seen as being very important regarding the facilitation of culture change moving towards a reduction of seclusion, which for the Mental Health Unit had occurred over the last seven years. Staff experience was also considered to be an important factor, nursing staff turnover is very high on the psychiatric ward leading to recruitment of casual staff to fill shifts. This was considered to potentially influence seclusion use due to less experienced staff managing unwell service users on the ward.

Ward design was felt to be important regarding seclusion use on the West Coast. The ward is quiet, and given the relatively low number of service users admitted at any time, provides a number of places where service users can be on their own. This includes indoor open spaces such as a recreational area, exercise area, and dining room as well as a large outdoor space with a vegetable garden.

Organisational culture was identified as being very important regarding seclusion use specifically with regard to an organisational approach towards reduction of seclusion. This has included the development of the seclusion monitoring process within the last 5 years, increase in staff leadership and increased collegiality of doctors and nurses. A move towards a Kaupapa Māori model has been underway since 2008, which is seen to integrate more successfully Māori service users' clinical management with their cultural needs.

The provision of adequate community services was seen to be a major factor towards influencing seclusion. The TACT/CMHS services comprise very experienced clinical staff and continuity of care from service user admission to follow-up post-discharge is maintained. Early intervention within the community means that service users tend to be relatively well when they present to the ward.

The mental health services work closely with police. It was suggested in the West Coast region that accurate monitoring of seclusion events would additionally require consideration of police 'Use of Force' *(Mental Health Compulsory Assessment and Treatment Act: Section 122B*) as an alternative to seclusion for rural communities.

Summary of DHB case studies

The DHB case studies undertaken during this project demonstrated marked differences in the way inpatient mental health units run, and the importance of organisational factors in the use of seclusion. Therefore, in conjunction with monitoring through a national collection, the local context of seclusion use must be taken into account, both in the interpretation of their own results, as well as in the development of seclusion reduction interventions relevant to their local context and populations.

Strong consumer input was also identified as critical to the success of seclusion reduction interventions. It is important to regularly engage with consumers to ensure that changes in the way individuals are managed within the inpatient setting result in improved experiences for mental health consumers.

PRIMHD data review

The PRIMHD database held by the Ministry of Health provides an opportunity to obtain data on seclusion use and, through the information it provides, to investigate seclusion use amongst Māori.

The structure of the PRIMHD dataset in its current form provides a reasonable starting point as a means of monitoring seclusion use for Māori in New Zealand.

In the process of an initial review of PRIMHD data, we identified a number of challenges with using PRIMHD data. There was considerable variation by DHBs in the way data was reported to the PRIMHD dataset, which impacted on the ease and the time and expertise required to prepare the data for analysis. These variations included coding of bed-night activities (whether one activity record per night, or a single record covering the entire admission period), accounting of leave periods (as above), and recording of seclusion events (some DHBs started a new record if a seclusion event lasted overnight, with a new record starting at midnight). The variations in the way data was collected and submitted to PRIMHD required the creation of additional variables to improve the consistency of the data fields to allow meaningful analysis (as outlined in the methods of Part Two of this report). Improved consistency of data submission by DHBs would greatly reduce the workload required to prepare and analyse the data in future monitoring.

The PRIMHD database contains a large number of fields, which had been identified by the advisors and in the literature review as important to include in a review of seclusion use (e.g. demographic data, admission and event data, diagnosis and legal status). However, although disease acuity was identified as important to analyse as a potential driver of disparities between Māori and non-Māori in seclusion use, there were significant issues with the completeness and consistency of reporting of HoNOS scores to the PRIMHD dataset that meant we were unable to include this factor in our analysis.

Outline of an approach to monitoring seclusion

The following is an outline of an approach that may be used by individual DHBs, or at a national level, to monitor seclusion, with a focus on the use of seclusion for Māori. This outline has been developed based on the advisors hui, literature review and data available in the PRIMHD database in its current form. However, at a local or regional level, and certainly as PRIMHD matures, we would encourage extensions of the outlined approach to include other important considerations such as the influence of community visits and disease severity (HoNOS scores) on the use of seclusion which are not currently feasible given existing data availability and completeness.

PART 1 – A general description of admissions and seclusion events for the total (or DHB specific) population.
Why? - This will allow the identification of groups with higher use of seclusion, or greater length of seclusion events, to allow for further investigation.

Example analyses that may be performed for an individual DHB, or stratified by DHB

- Who is being admitted to the unit?
    - Admissions by ethnicity (total response) age, gender, New Zealand deprivation (NZDep)[6]
- How long are inpatient admissions?
    - Median length of inpatient admissions by ethnicity age, gender and NZDep
- Who is being secluded?
    - Number and proportion of seclusion events by gender, age, ethnicity, diagnosis
    - Rate of seclusion events per month of inpatient unit time (age standardised if comparing groups that have different age structures)
    - Rate of seclusion events per DHB resident population per year
- How long are seclusion events?
    - Median length of inpatient admissions by ethnicity age, gender and NZDep

[6] The New Zealand Deprivation Index (NZDep) is an area based measure that combines nine census variables that reflect aspects of material and social deprivation

PART 2 – Further investigation of identified issues e.g. Comparison of Māori and non-Māori non-Pacific use of seclusion

Why? Based upon the finding to step 1 above, further investigation can be undertaken to define the issue for identified groups. In this case, Māori have been found to have a high proportion of admissions that include at least one seclusion event, so this group has been compared to the mutually exclusive and relatively best off group of non-Māori non-Pacific admissions for further analysis.

Example analyses that may be performed for an individual DHB, or stratified by DHB

- Length of seclusion events for Māori and non-Māori, non-Pacific
- Frequency of seclusion use for Māori and non-Māori, non-Pacific
    - Number of seclusion events per year (Māori and non-Māori, non-Pacific)
    - Rate of seclusion events per month of inpatient unit time (Māori and non-Māori, non-Pacific)
    - Rate of seclusion events per DHB resident population per year (Māori and non-Māori, non-Pacific)
- Proportions and rates of seclusion events for Māori and non-Māori, non-Pacific

PART 3 - Examination of factors that may contribute to differential use of seclusion by ethnicity

Why? Where differences in the use of seclusion are found, there are likely to be a number of contributing factors. For example, differences in diagnosis on admission may drive differences in the use of seclusion. Further investigation of these factors will allow interventions to be appropriately targeted.

Note: For a list of factors that may be important to consider please refer to appendix 1

Example quantitative analyses that may be performed for an individual DHB, or stratified by DHB

- Distribution of age, gender, diagnosis, referral pathway, acuity of illness for Māori and non-Māori, non-Pacific service-users experiencing seclusion
- Rates of (inpatient and/or resident population) seclusion events for Māori and non-Māori, non-Pacific, adjusted for any differences in the gender, age, and diagnostic profiles between these two groups of inpatients.

Poisson regression modelling to examine the factors that generate ethnic disparities in seclusion rates for Māori.

PART 4 – Ongoing monitoring and intervention

Why? Ongoing monitoring of the use of seclusion will allow individual DHBs to measure changes in practise over time. Where issues have been identified for particular groups, further work can be undertaken to develop and implement strategies specific to this group.

Tool finalisation and recommendations

The monitoring of use of seclusion is a key strategy toward the successful reduction of seclusion practice. Existing monitoring provides us with limited information on the use of seclusion by ethnicity, and does not allow an assessment of the drivers of differential seclusion use for Māori compared to nMnP. Effective monitoring of the use of seclusion in inpatient psychiatric care is imperative to: guide best practice in the seclusion reduction; identify target populations for intervention; ensure that interventions are appropriately reaching target populations; and ensure that unintended harmful consequences do not result from efforts to reduce seclusion use. An advantage of using a national dataset for monitoring, such as PRIMHD, is consistency over time, allowing trends in practice to be observed where monitoring is repeated at regular intervals.

A number of stages were required to identify the wide range of potentially important factors driving higher use of seclusion for Māori, including: an advisors hui, a literature review, and two DHB case studies. However, only a limited set of the identified factors are currently available in the PRIMHD dataset, although the quality and range of factors collected in this database is planned to increase over time.

We identified considerable variation by DHBs in the way data was reported to the PRIMHD dataset, in particular between DHBs. These variations impacted on the ease of use and the time and expertise required to prepare the data for analysis. Improved consistency of data submission by DHBs into PRIMHD would greatly reduce to worklaoad required to prepare and analyse this data.

However, given the wide scope of data collected in PRIMHD, and the potential burden placed on DHBs in collecting and reporting this data, there may be the need to initially prioritise the high quality collection of 'critical' data by DHBs, with systematic extension of data collection over time. For seclusion monitoring, critical variables would initially include demographic data, time of admission/discharge, and start/end of seclusion events, diagnosis and legal status, with eventual extension to include community mental health service provision and HoNOS scores (as an indicator of disease severity).

In order to ensure that moves towards seclusion reduction do not result in unintended consequences, it will be important to monitor a range of additional variables that are either substitute activities for seclusion, or potential positive and negative outcomes. Substitute activities include those occurring within the inpatient unit, such as the use of restraint (pharmacological or physical), as well as activities outside of the unit, such as Police use of Section 122B *Use of Force* of the Mental Health (Compulsory Assessment and Treatment) Act 1992.

The most common justification for seclusion use in the literature is to manage perceived or assessed risk in order to keep the service user and those around them (including staff) safe. Reasons for seclusion use are not currently collected in the PRIMHD database, although they may be collected to varying levels of detail within individuals DHBs. In order to develop alternative strategies to manage 'risk', there needs to be a clear understanding of what drives the use of seclusion on the ward, and if the reasons vary across service user groups. In addition, where seclusion reduction strategies are implemented they should be done so with concurrent monitoring of of incidents such as threatened or actual violence towards staff and other service users.

There is also the need to develop monitoring systems to ensure that staff and patient safety are not compromised by attempts to reduce seclusion. Many of these events will be currently recorded as 'incidents', within the DHB, such as: assaults on staff or other service-users; suicide attempts; and, service-users absconding from the psychiatric inpatient unit.

Although nationally consistent monitoring of seclusion use by ethnicity is a good starting point, there are a number of complementary activites that are also important to ensure that efforts to reduce the use of seclusion are resulting in improved practice within inpatient services.

The DHB case studies undertaken during this project demonstrated the importance of local context in the interpretation of their own results, as well as in the development of seclusion reduction interventions. In addition, consumer perspectives are critical to ensure that changes in the way individuals are managed within the inpatient setting result in improved experiences for mental health consumers.

The outlined approach to monitoring the use of seclusion for Māori presented in this report was successfully piloted on data captured in PRIMHD, for nine DHBs. The results of the pilot (presented in part two of this report) were reviewed by the project advisors. Limited refinement of the approach was required, mainly with the addition of acuity of disease as an important factor to analyse.

Recommendations for PRIMHD database

The monitoring of seclusion use for Māori (and nMnP) using the PRIMHD database is currently limited by the completeness and consistency of reporting within and between DHBs. We recommend a stepwise approach with an initial focus on critical data fields, and a longer-term view to extension of the database to include a wider range of factors. We recommend that:

- the Ministry of Health and DHBs should work together to improve the standardisation and completeness of reporting into PRIMHD (including demographic data, time of admission/discharge, and start/end of seclusion events, diagnosis and legal status).
- the Ministry of Health and DHBs should work together to prioritise the collection of high quality 'critical' data (demographic data including ethnicity, admission and event data, diagnosis and legal status) by DHBs, with eventual extension to include community mental health service provision and HoNOS scores (as an indicator of disease severity)
- the Ministry of Health in consultation with DHBs, Māori mental health service providers and mental health consumers, should consider the value of additional variables to PRIMHD to allow such as the reasons for seclusion, substitute activities and measures of staff and service user safety.

Recommendations for monitoring outcomes of seclusion reduction

The most commonly cited reason in the literature for the use of seclusion is for staff and service user safety. Therefore, in all DHBs, but particularly in those with seclusion reduction initiaves we recommend monitoring measures of staff and service user safety, including:

- events of assaults on staff or other service-users within the psychiatric inpatient unit,
- suicide attempts in psychiatric inpatient care, and
- episodes of service-users absconding from the psychiatric inpatient unit.

In addition, where seclusion reduction initiatives are in place, it is important to monitor the use of subsititute activities including:

- the use of restraint (pharmacological or physical), and
- Police use of Section 122B Use of Force of the Mental Health (Compulsory Assessment and Treatment) Act 1992
- The use of preferred alternative interventions (e.g. sensory rooms).

Part Two – DHB Pilot

Section outline

This section begins with a summary of the key findings following the piloting of the monitoring approach presented in Part one of this report, on data from nine DHBs for the period 1 July 2008 to 30 June 2010. More detailed methods and results sections, and a discussion and recommendations coming from the pilot findings follow this.

Summary of key findings of DHB pilot

Over the two-year study period between 1 July 2008 and 30 June 2010, there were 944 Māori admissions (for 1245 individuals) and 5,295 non-Māori non-Pacific (nMnP) admissions (for 3454 individuals) to the nine DHBs. Māori in the sample were younger than the nMnP population, with the greatest difference being in the 18–24 year age group (22.8 per cent vs. 13.2 per cent), and overrepresented in the highest quintiles of socioeconomic deprivation (relatively more deprived) compared to nMnP admissions, with almost 50 per cent of Māori in the highest deprivation quintile 5 (49.3 per cent of all Māori admissions vs. 22.2 per cent for nMnP).

The majority of seclusion events lasted between 0–24 hours in duration (Māori 75.5 per cent vs. nMnP 74.4 per cent) with the most common seclusion duration being between 0–8 hours for both groups.

There were disparities between Māori and non-Māori-non-Pacific (nMnP) in the use of seclusion. The population age-standardised rate (ASR) of seclusion events for Māori overall was four times that of nMnP, at 27.6 seclusion events per 10,000 resident population/year for Māori compared to 6.9 for nMnP.

In terms of absolute numbers, young Māori males were the most likely group to be seen in seclusion. However, Māori females aged 55–64 years were found to have the highest rate of seclusion of all the age groups admitted to the ward (although contributing small numbers of overall admissions). Māori with psychiatric diagnoses of schizophrenia, bipolar disorders, substance-related disorders and depressive disorders had higher rates of seclusion than nMnP with the same diagnoses.

There were large differences in the use of seclusion by DHBs. The population-based ASRs of seclusion events ranged from 55.8 seclusion events per 10,000 resident population per year for Māori in Northland to 1.7 seclusion events per year for nMnP in Counties Manukau. However, for the majority of DHBs, Māori were more likely to be secluded than nMnP.

In the modelled results, adjusting for differences in age and legal status on admission for Māori compared to nMnP were important contributors to the disparity between Māori and nMnP in seclusion use. However, after taking a number of variables (age, gender and NZDep06, referral pathway, legal status and diagnosis on admission) into account, Māori rates of seclusion remained 21 per cent greater than for nMnP admissions

Methods for analysis of PRIMHD data

This section details the methods that were used in the analysis of PRIMHD data from the nine selected DHBs, as part of the piloting of the approach to monitoring seclusion events outlined in the previous section. This study has been guided by kaupapa Māori research principles, particularly as they apply to quantitative research (Simmonds, Robson, Cram and Purdie, 2008).

The Seclusion Project Advisory Group

An advisory group was established to contribute towards the study design and scope, and to assist in the interpretation of the study findings. The members of the advisory group had experience in areas of Māori health research, mental health research and in the provision of and use of mental health services, both general and kaupapa Māori.

Study sample

Anonymised (encrypted Master NHI) data on all inpatient bed-night and seclusion events reported to the New Zealand Ministry of Health as captured in the PRIMHD dataset was obtained for a total of nine (DHBs), for the two-year study period of 1 July 2008 – 30 June 2010. These nine DHBs were included because they were deemed by the Ministry of Health to have complete seclusion event reporting over the two year study period. The nine DHBs included in the study were:

- Northland
- Waitemata
- Counties Manukau
- Taranaki
- Whanganui
- Nelson Marlborough
- West Coast
- South Canterbury
- Southland.

Sample selection criteria

Data analysis was restricted to inpatient admissions measured as bed-nights spent in inpatient psychiatric units. Admissions of individuals aged over 18 years were included in the study with inpatient activity recorded between 1 July 2008 and 30 June 2010.[7]

To examine seclusion use for general adult psychiatric inpatients, admissions to the following units were excluded from the analyses:

- admissions to forensic units
- admissions to psychogeriatric units
- admissions to intellectual disability units.

[7] Data relating to admissions ongoing past the study end date of 30th June 2010 are therefore incomplete.

Ethics approval

Ethical approval was received from the Multi-region Ethics Committee of the New Zealand Health and Disabilities Ethics Committees (MEC/10/060/EXP).

Classification of key variables

Inpatient admission episode

An admission episode was defined as a continuous period of psychiatric inpatient admission from hospital bed-night activity within the DHB. An admission episode ended when an individual had no bed-night activity recorded for 24 hours. If an individual was re-admitted within a 24-hour period of their previous admission episode, or if the individual was transferred to another unit within the same DHB within a 24-hour period, it was considered an extension of the original admission. The total amount of time spent as an inpatient per admission was calculated by summing the duration of all bed-night activity for that admission.[8]

Seclusion events

Seclusion event data were similarly processed to allow calculation of number and duration of seclusion events. Multiple seclusion activity records were combined using a rule whereby a seclusion event began on entry to seclusion and ended when the person had been out of seclusion for greater than two continuous hours.[9] The duration of a seclusion event was calculated as the total time spent in seclusion excluding breaks that occurred within the seclusion activity.

Ethnicity

Ethnicity was based upon NHI ethnicity data recorded in three ethnicity fields of the activity codes table in the PRIMHD data extract. Each service user could have up to three different NZHIS ethnicity codes recorded.

Total response ethnicity was used for the calculation of Māori, Pacific, NZ European, and Asian admission and seclusion descriptive analyses presented in Part One of the results. For all remaining analyses in this report, individuals were classified as Māori if Māori was recorded within any of the ethnicity fields in the activity codes table for that admission. Individuals were classified into two mutually exclusive groups of Māori and non-Māori non-Pacific.[10]

Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori comparator group as initial univariate analysis by total response ethnicity indicated that Pacific peoples had similar proportions of seclusion to Māori. Therefore, inclusion of Pacific Island in the comparator group could potentially obscure ethnic disparities for Māori.

Gender

Gender was taken from the gender description recorded in the PRIMHD data extract.

Age

Age at admission was calculated from date of birth recorded in the PRIMHD data extract and date of admission. For the descriptive analysis, each group was stratified by the following age groups (in years): 18–24, 25–34, 35–44, 45–54, 55–64 and 65 years and over.

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[8] Therefore, an individual 'on–leave' from the psychiatric inpatient unit did not break an admission episode. However, leave periods were not included in the calculation of admission duration.

[9] From February 2010, the definition of a seclusion event from the *Seclusion under the Mental Health (Compulsory Assessment and Treatment) Act 1992* (2010) guidelines, applied a one-hour rather than, two-hour time frame (Ministry of Health, 2010b). As the guidelines were incrementally implemented from February 2010 onwards, (nearing the end of the two-year study period), a consistent rule of two-hours was applied to the definition of seclusion events in this study.

[10] The non-Māori non-Pacific group excludes all remaining Pacific Island not initially included in the prioritised Māori group. 1.5 per cent of admission records had missing ethnicity data; these records were excluded from analysis.

Socioeconomic deprivation

NZDep06 was used as a measure of socioeconomic deprivation. NZDep06 is a census based small area measure of material deprivation that combines nine variables from census information reflective of eight dimensions of material and social deprivation.[11] The domicile code recorded in the PRIMHD data extract for each admission was mapped to NZDep06 quintiles using the *NZDep2006 Index of Deprivation* indicator (Salmond C, et al., 2007).

Primary diagnosis on admission

For the descriptive analyses, all primary diagnoses (and secondary diagnoses of substance abuse) for an admission were taken from PRIMHD. Diagnoses were supplied as ICD-10 version 6 codes, so were mapped to the corresponding codes from the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision* (DSM-IV-TR). These were further ordered into eight diagnostic categories according to: findings of the literature review regarding psychiatric diagnoses associated with seclusion use; frequency of each psychiatric diagnosis in the dataset; and recommendations from key project advisors.

As an individual's diagnosis data is not required to be submitted to PRIMHD until three months following admission or discharge (whichever comes first),[12] a three-month 'diagnosis window' following an individual's admission episode was applied. Diagnosis data was linked to admission data using the referral ID code for the admission. Diagnostic categories in this study were:

- Schizophrenia (includes Schizophreniform Disorder and Schizoaffective Disorder)
- Bipolar disorders
- Personality disorders
- Depressive disorder
- Other psychosis
- Substance related disorders
- Miscellaneous [13]
- No axis I/II

As the study definition of an admission is different from the definitions used in PRIMHD and can include several administratively independent admissions, it is possible for a service user to have more than one "primary diagnosis" associated with an admission (if these differed across the chain of referrals). For admissions and referrals with more than one primary diagnosis, primary diagnoses were prioritised in the order of the list above. Substance abuse (where not the prioritised primary diagnosis) has been counted as a secondary diagnosis for adjustment in the multivariate analyses.

Legal status on admission

Admissions were classified as voluntary or involuntary based on the presence of an open legal status code at the time of admission in the PRIMHD data extract. The involuntary category included admissions with legal status codes from Sections 11, 13, 14(4), 29, 30 and 31 of the Mental Health (Compulsory Assessment and Treatment) Act 1992. Involuntary admissions were further divided into a) section 11-14 and b) sections 29-31. The 'voluntary' category comprised of

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[11] These eight dimensions reflect lack of income, employment, qualifications, transport, owned home, living space, communication and support.
[12] Personal Communication on 5th May 2011 with Jane Perrott, Senior Information Analyst at New Zealand Ministry of Health (Perrott J, 2011).
[13] Miscellaneous category includes coding for: Adjustment Disorders; Anxiety Disorders Dissociative Disorders; Eating Disorders; Impulse-Control Disorders Not Elsewhere Classified; Sexual and Gender Identity Disorders; Sleep Disorders; Somatoform Disorders; Delirium, Dementia, and Amnestic and Other Cognitive Disorders; Disorders usually first diagnosed in Infancy, Childhood or Adolescence; Factitious Disorders; Mental Disorders due to a General Medical Condition Not Elsewhere Classified, and Other Conditions That May Be a Focus of Clinical Attention.

everyone else (all remaining codes or, those individuals with no legal status codes recorded), as voluntary legal status is no longer explicitly recorded in the dataset.

Referral pathway to psychiatric inpatient admission

The referral pathway on admission was taken from the "referral from" code recorded in the PRIMHD data extract. A total of eighteen "referral from" codes were categorised into the following sub-groups: Mental Health[14]; Hospital (non-Psychiatric)[15]; General Practitioner; Justice/Police; Self; and Other[16] for initial descriptive analyses. However, given the limited numbers of admissions through the General Practitioner, Justice/Police, and Self-referral pathways (and the potential to break anonymity of individuals), these were added to the other category for the calculation of rates and the multivariate analyses.

Data analysis

Univariate analyses

All calculations of descriptive statistics, 95% confidence intervals and p-values for proportions of admissions with at least one seclusion event, duration of seclusion events, rates of admission, and rates of seclusion events, were performed using Stata 10. Age-standardisation was performed using Microsoft Excel 2007, employing the methods and formulae of Rothman, Greenland, and Lash (2008). Any p-value less than 0.05 was considered statistically significant.

Calculations of experience of seclusion events were at the level of each admission (proportion of admissions where there were any seclusion events). Therefore, a person with multiple seclusion events in a single admission was only counted once in the numerator for these percentages.

Population rates of admission/seclusion events

Population-based rates of admissions and seclusion events were calculated using the number of admissions or seclusion events within the DHB expressed relative to the 2001 Census populations for the nine DHBs within the study.[17] Population rates are thus presented as number of admission or seclusion events per 10,000 resident population per year. These calculations were performed using Stata 10. All population-based rates are directly age-standardised to the 2001 Census Māori Population (Robson, Purdie, Cram and Simmonds, 2007).

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[14] Mental health referral pathway includes: Alcohol and drug; Child adolescent and family mental health services; Adult community mental health services; Kaupapa Māori; Psychiatric outpatients; Psychiatric inpatient; Private practitioner; and, Mental health residential.
[15] Hospital (non-psych) pathway includes: Accident and emergency; Paediatrics; and, Hospital referral (non-psych).
[16] Other referral pathway includes: Other; Social Welfare; and, Unknown.
[17] An alternative and perhaps preferable approach which is only possible with a more complete PRIMHD dataset would be to use the domicile code of individuals to calculate the number of events for the DHB resident population, which would additionally pick up on transfers of the resident population across regions.

Rates of seclusion events per cumulative month of psychiatric inpatient admission

Rates of seclusion events were calculated per admission. Rates of seclusion events present a summary of seclusion activity that can account for multiple seclusion events for a single admission. The numerator in these rate calculations is the number of seclusion events observed for a particular group of service users; the denominator is cumulative person time – the summed total of admission durations for all people in that group. Rates are presented as the number of events per month of cumulative inpatient admission. Rates and confidence intervals were calculated using Stata 10.

Age standardisation

Rates have been age-standardised to the 2001 Census Māori population using direct standardisation.[18]

Multivariate analysis

Regression modelling was used to investigate the simultaneous contribution of multiple factors associated with seclusion rates. Seclusion rates were modelled according to ethnicity (Māori /non- Māori, non-Pacific), gender, and age group as personal characteristics; NZDep2006 as a measure of socioeconomic deprivation; and legal status on admission, referral pathway, and principal diagnosis as admission-level characteristics. The model is presented in several stages: crude associations according to ethnicity; associations according to ethnicity adjusting for gender and age; adjusting for these components plus socioeconomic deprivation; and adjusting clinical information sequentially for legal status, referral pathway, principal diagnosis, and secondary diagnosis of alcohol or substance abuse. This list of factors was chosen prior to modelling the data.

Modelling was performed in Stata 11.2 using a negative binomial regression distribution, which is fundamentally similar to a Poisson regression approach for count data.[19] Results are reported as rate ratios and 95% confidence intervals for the fully adjusted model and then a sequential presentation showing how disparities in seclusion rates between Māori and non-Māori non-Pacific change when adjusting for each additional model element. Note that the fully adjusted model presented in the results is limited to individuals who had diagnostic data coded in PRIMHD.

[18] Age standardisation allows the comparison of population groups with differing age structures, such as the younger Māori population as compared with the non-Māori population.

[19] Negative binomial regression (nbreg command in Stata) allows for overdispersion of data (greater variability in the number of events seen than would be expected under a Poisson distribution) which was observed in this data (mostly due to a large number of admissions where there were no seclusion events.

DHB results of piloted approach to monitoring seclusion

PART 1 - Brief overview of all admissions and seclusion events to the nine DHBs (total response ethnicity)

During the two-year period 1 July 2008 to the 30 June 2010, there were 7,702 admissions to the adult general psychiatric inpatient units within the nine study DHBs.

Who is being admitted?

Using total response ethnicity (where an individual is counted in each ethnic group they identify with), from these admissions there were 1,944 (25.2 per cent) admissions where Māori was recorded as an ethnic group, 542 (7.0 per cent) admissions for individuals recorded as Pacific, 5,449 (70.7 per cent) identified as NZ European and, 355 (4.6 per cent) identified as Asian/Other (Table 2). (Note that due to the use of total ethnicity, row percentages can sum to more than 100 per cent and ethnic groups should not be directly compared with each other.)

The median age for all admissions (18 years and above) was 39.4 years. There was variation in the median age of admissions by ethnic group (total response), with a median age of 33.3 years for Pacific admissions, 34.9 years for Māori, 41.0 years for NZ European and, 37.6 years for Asian/Other.

Overall, there was a greater proportion of male admissions 52.5 per cent (95%CI 51.4–53.6) than female admissions 47.5 per cent (95%CI 46.4–48.6) (Table 2).

What is the median length of admissions?

The median duration of psychiatric inpatient admissions was 10.9 days (95%CI 10.6–11.2) for all admissions to the nine DHBs. The median duration of psychiatric inpatient admissions varied significantly by ethnicity. For Māori this was 13.1 days (95%CI 12.3–13.9), for Pacific 19.6 days (95%CI 17.9–21.3), for NZ European 9.2 days (95%CI 8.8–9.5), and for Asian/Other 13.9 days (95%CI 12.2–15.6).

Who is being secluded?

The overall proportion of psychiatric inpatient admissions with a seclusion event(s) was 10.9 per cent (95%CI 10.3–11.7). This varied significantly by ethnicity. For those identifying as Māori, 15.2 per cent (95%CI 13.7–16.9) of admissions had at least one seclusion event, compared to 12.5 per cent (95%CI 9.9–15.6) of Pacific admissions, 10.1 per cent (95%CI 7.2–13.8) of NZ European admissions and 10.3 per cent (95%CI 7.3–13.9) of Asian/Other admissions (Table 2).

How long are seclusion events?

The median duration of seclusion events for all admissions to the nine DHBs was 12.0 hours (95%CI 11.2–12.8) with an inter-quartile range of 4.5–23.8 hours. The median duration of seclusion varied across ethnic groups but was broadly similar (Table 2).

Rate of seclusion events for inpatient admissions (total response ethnicity)

The rate of seclusion events per cumulative month of psychiatric inpatient admission for NZ European admissions was 0.29 (95%CI 0.27–0.31) which means that for every 100 psychiatric inpatient admission events of one month duration where NZ European was recorded as an ethnicity, there would be 29 seclusion events. The age-standardised rate (ASR) varied significantly by ethnicity. Māori had the highest ASR of seclusion events at 0.37 (95%CI 0.34–0.40). For Pacific the ASR of seclusion events per cumulative month of psychiatric inpatient admission was 0.23 (95%CI 0.19–0.27), and for Asian/Other 0.31 (95%CI 0.25–0.38) (Figure 1).

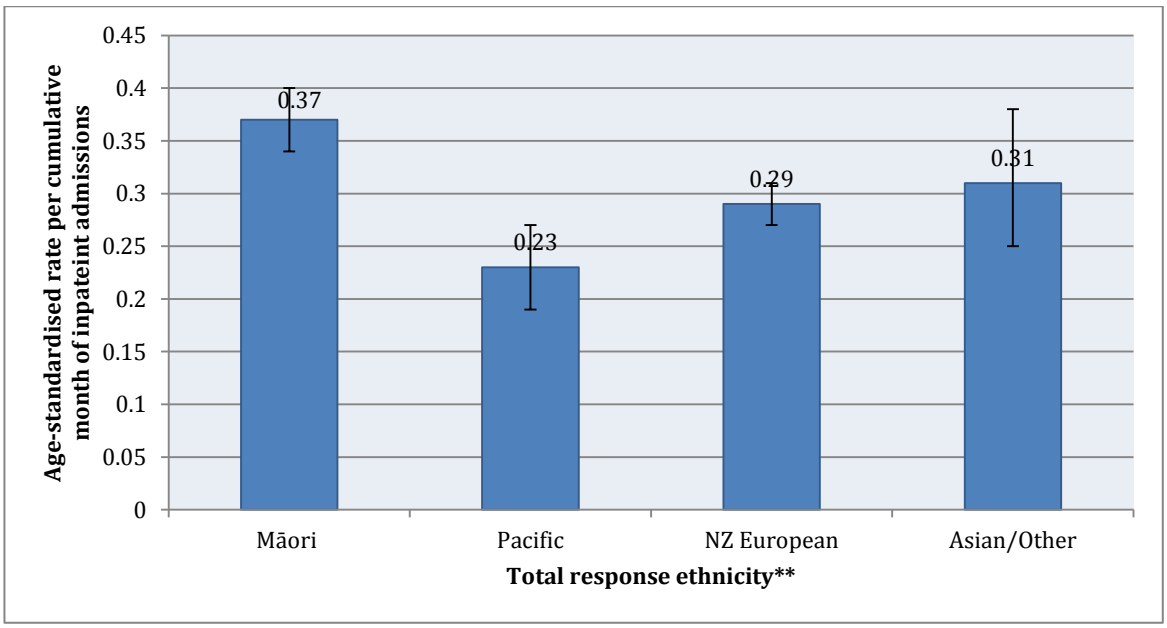

Figure 1. Age-standardised* rates (95% CI) of seclusion events per cumulative month of inpatient admission by ethnicity for nine study DHBs for the dates 1 July 2008 – 30 June 2010.

*Rates are age standardised to the 2001 Census Māori population.

**Total response ethnicity means that people who reported more than one ethnic group are counted once in each ethnic group reported, and the total number of responses for all ethnic groups can be greater than the total number of people who stated their ethnicities. Ethnic group results should not be compared directly with each other.

Table 2. *Percentage of admission and seclusion events, median duration of events and mean age by total response ethnicity* in the nine study DHBs for the dates 1 July 2008 – 30 June 2010*

	Total (N=7702)		Māori (N=1944)		Pacific Island (N=542)		NZ European (N=5499)		Asian/Other (N=355)	
		95% CI (interquart range)		95% CI (interquart range)		95% CI (interquart range)		95% CI (interquart range)		95% CI (interquart range)
% of total admissions	-	-	25.2%	24.3–26.2	7.0%	6.5–7.6	70.7%	69.7–71.8	4.6%	4.1–5.1
Female	47.5%	46.4–48.6	23.3%	21.9–24.7	6.3%	5.5–7.0	74.1%	72.7–75.6	5.0%	4.3–5.7
Male	52.5%	51.4–53.6	27.0%	25.6–28.4	7.7%	6.9–8.6	67.7%	66.2–69.1	4.3%	3.6–4.9
Median age in years	39.4y	(39.0–39.7)	34.9y	(34.2–35.6)	33.3y	(32.1–34.5)	41.0y	(40.6–41.5)	37.6y	(35.9–39.3)
% of admissions with seclusion events	10.9%	10.3–11.7	15.2%	13.7–16.9	12.5%	9.9–15.6	10.1%	7.2–13.8	10.3%	7.3–13.9
Female	9.1%	8.2–10.1	13.3%	11.1–15.8	11.3%	7.5–16.1	7.8%	6.8–8.9	9.8%	5.9–15.1
Male	12.6%	11.6–13.6	16.7%	14.6–19.1	13.5%	9.9–17.8	11.0%	9.9–12.3	10.5%	6.3–16.0
Median age in years	35.9y	(34.9–36.9)	33.5y	(31.9–35.1)	31.0y	(27.8–34.2)	37.6y	(36.0–39.7)	29.4.7y	(24.4–34.3)
Median duration of seclusion events in hours	12.0 hrs	(4.5–23.8)	12.5 hrs	(4.7–23.6)	9.4hrs	(2.5–16.0)	12.0hrs	(5.1–24.6)	10.2 hrs	(3.5–20.0)

*Total response ethnicity means that people who reported more than one ethnic group are counted once in each ethnic group reported, and the total number of responses for all ethnic groups can be greater than the total number of people who stated their ethnicities. Ethnic group results should not be compared directly with each other.

PART 2 - Comparison of Māori and non-Māori non-Pacific use of seclusion

Number and proportion of seclusion events for Māori and nMnP

Over the two-year study period between 1 July 2008 and 30 June 2010, there were 1,944 Māori admissions (for 1,245 individuals) and 5,295 non-Māori non-Pacific (nMnP) admissions (for 3,454 individuals) to the nine DHBs. The majority of admissions for Māori (80 per cent) and nMnP (88 per cent) involved no seclusion events. Where seclusion did occur during an admission, it was most commonly a single event (Table 3).

Table 3 *Number and proportion of seclusion events per admission for Māori* and non-Māori non-Pacific in nine study DHBs for the dates 1 July 2008 - 30 June 2010*

	Māori (n = 1245)		nMnP (n = 5295)	
Number of seclusion events	n	%	n	%
0	996	80.0	3,054	88.4
1	144	11.6	245	7.1
2	47	3.8	80	2.3
3	20	1.6	24	0.7
4+	38	3.1	51	1.5

* Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group.

Of all Māori admissions, 15.2 per cent included at least one seclusion episode, compared to 9.2 per cent of nMnP admissions. There were differences in the proportion of admissions including seclusion events between Māori and nMnP females (13.3 per cent vs. 7.6 per cent) and between Māori and nMnP males (16.7 per cent vs. 10.7 per cent) (Figure 2).

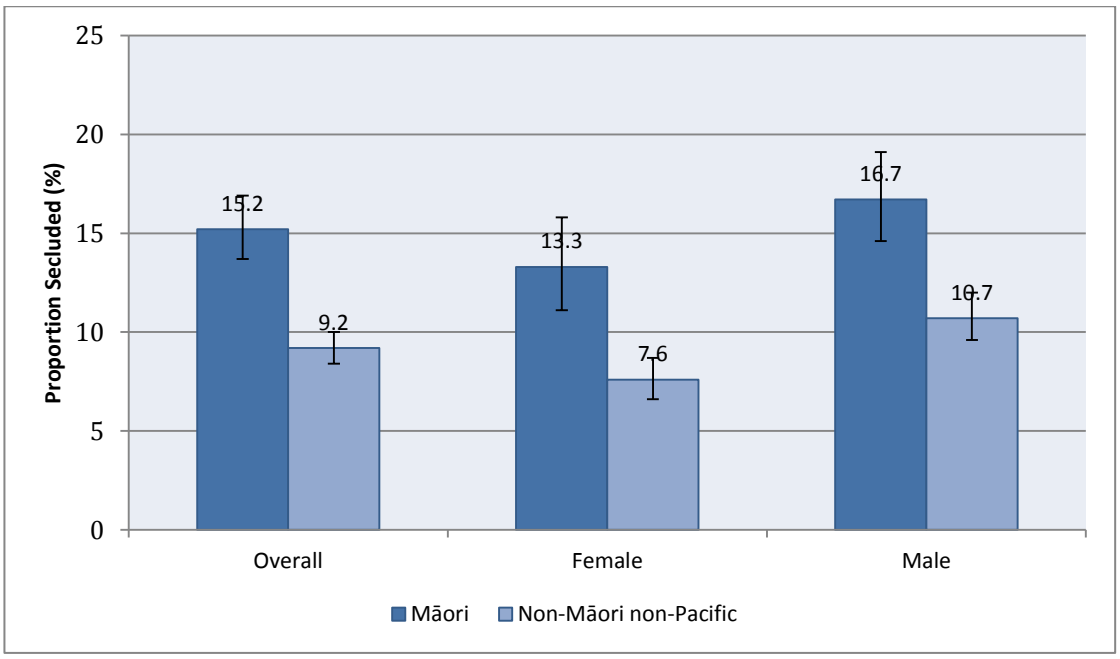

Figure 2. Proportion of Māori* and non-Māori non-Pacific inpatient admissions with at least one seclusion event (95% CI) overall and by gender, in the nine study DHBs for the dates 1 July 2008 – 30 June 2010

*Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group.

There were large differences in the number of inpatient admissions in our nine study DHBs, which largely reflect the size of the DHB populations (Figure 3). In terms of the total number of admissions Waitemata[20] will strongly influence the results for nMnP. There were also large differences between the DHBs in the number/percentage of mental health inpatient admissions that experienced at least one seclusion event, although in most DHBs higher proportions of Māori admission experienced seclusion than nMnP admissions (Figure 4).

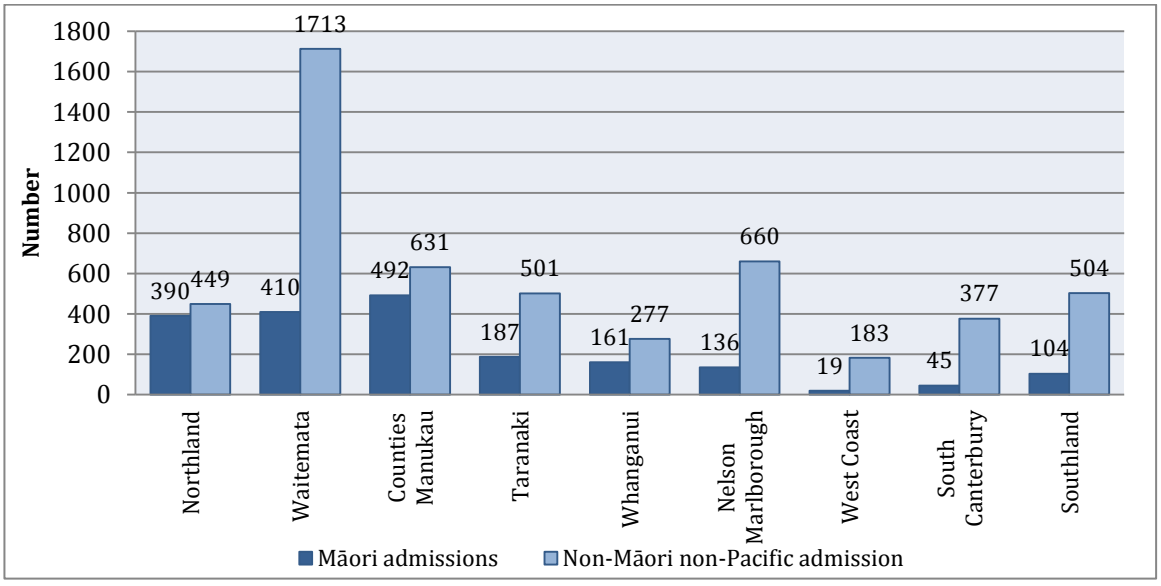

Figure 3. Number of Māori * and non-Māori non-Pacific inpatient admissions by DHB for the dates 1 July 2008 – 30 June 2010.

* Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group.

[20] Waitemata includes 752 nMnP and 85 Māori admissions with bed-night activity in the residential drug and alcohol treatment service.

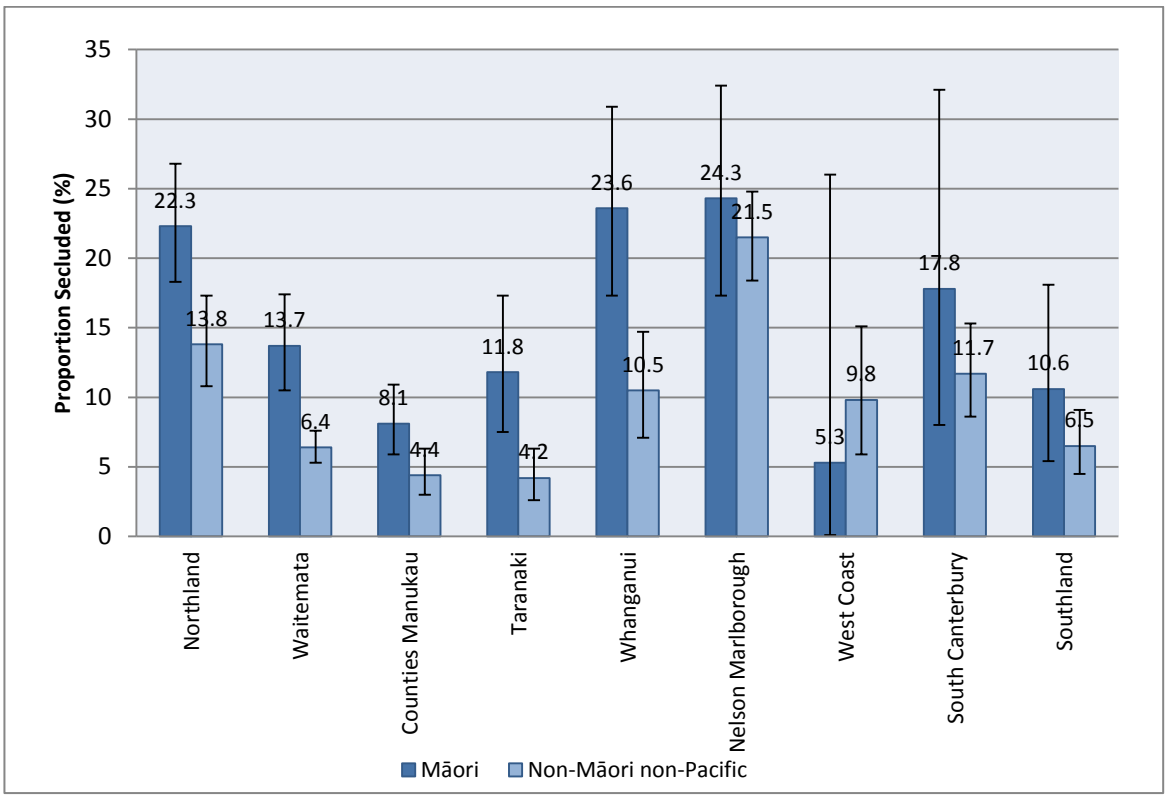

Figure 4. Proportion of Māori* and non-Māori non-Pacific inpatient admissions by DHB for the dates 1 July 2008 – 30 June 2010.

* Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group.

Duration of seclusion events

Among those secluded, the patterns of duration of seclusion events were similar for Māori and nMnP admissions. The majority of seclusion events lasted between 0–24 hours in duration (Māori 75.5 per cent vs. nMnP 74.4 per cent) with the most common seclusion duration being between 0-8 hours for both groups (Figures 5a and b).[21]

[21] Of the 580 seclusion events for Māori, three seclusion events (0.5%) lasted longer than 144 hours. Of the the 900 seclusion events for nMnP, twenty-one seclusion events (2.3%) lasted longer than 144 hours. The figures have been restricted to 0 - 144 hours.

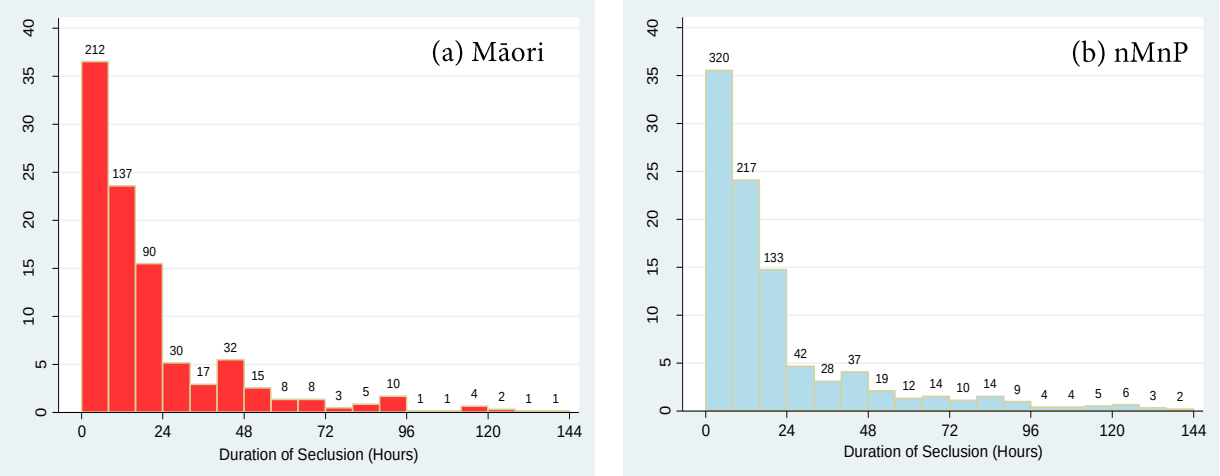

Figure 5.Duration of seclusion events in hours for a) Māori* b) nMnP general adult psychiatric admissions from the nine study DHBs for the dates 1 July 2008 – 30 June 2010.

* Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group.

For all nine DHBs the median duration of seclusion was higher for Māori than non-Māori non-Pacific (although not significant). The median duration of seclusion events for Māori ranged from 30.3 hours in Nelson Marlborough to 6.3 hours in Counties Manukau (Table 4).

Table 4.*Length of seclusion events for Māori* and non-Māori non-Pacific inpatient admissions with at least one seclusion event (95% CI) by DHB for the dates 1 July 2008 – 30 June 2010*

	Māori			non-Māori non-Pacific		
	n events	Duration of seclusion (hours)		n events	Duration of seclusion (hours)	
		Median	Interquartile range		Median	Interquartile range
Northland	232	10.9	4.4–18.3	125	10.0	5.7–19.0
Waitemata	99	12.0	5.5–19.7	265	10.8	3.5–18.0
Counties Manukau	71	6.3	1.9–12.9	50	3.7	2.2–7.8
Taranaki	45	11.0	5.2–24.2	44	6.2	3.3–10.2
Whanganui	60	26.0	16.1–67.2	40	24.0	14.1–56.6
Nelson Marlborough	46	30.3	15.0–53.3	247	21.0	9.8–51.7
West Coast	1	17.3	-	33	13.8	7.9–25.2
South Canterbury	10	16.0	9.8–32.3	60	12.0	5.7–23.5
Southland	16	22.4	14.6–43.4	36	15.7	9.6–50.6

* Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group.

Rates of seclusion events

Population age-standardised rates of seclusion events for Māori were significantly higher than nMnP overall and by gender. The population ASR of seclusion events for Māori overall was four times that of nMnP (Table 5), at 27.6 seclusion events per 10,000 resident population/year for Māori compared to 6.9 for nMnP (Figure 6). The ASR of seclusion events for Māori males was 32.7 seclusion events per 10,000 resident population/year compared to 8.8 for nMnP (age-standardised rate ratio 3.7, 95%CI 3.2–4.3) (Figure 6 and Table 5). For Māori females, the ASR of seclusion events was 4.5 times that of nMnP females at 23.0 seclusion events per 10,000 resident population/year compared to 5.0 for nMnP (Figure 6 and Table 5).

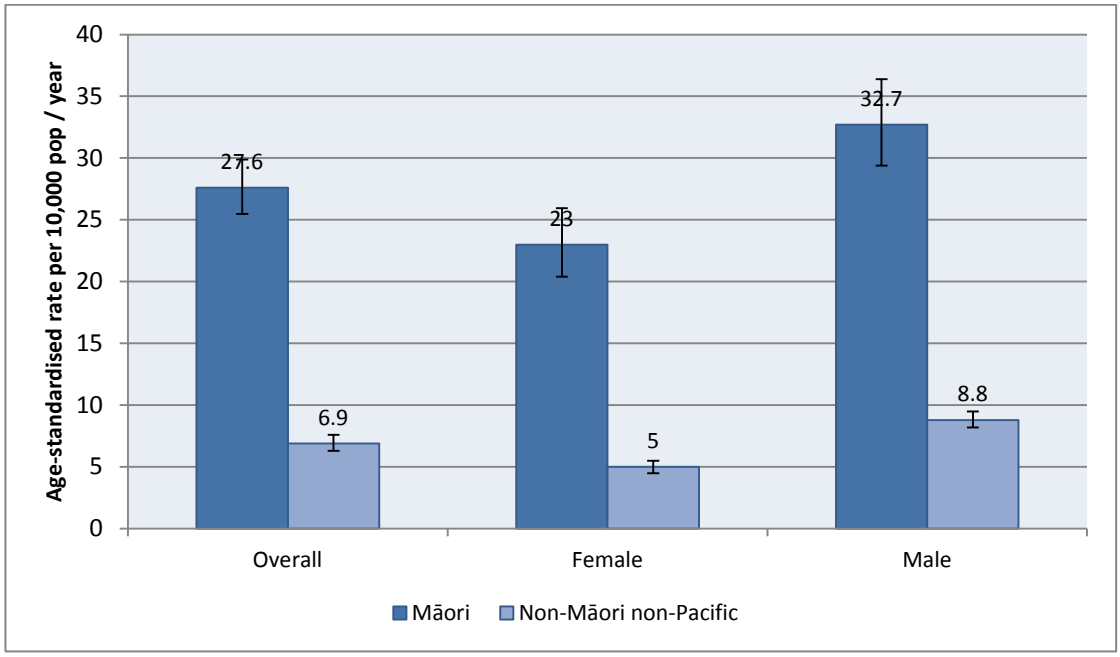

Figure 6.Age-standardised* rates of seclusion events per 10,000 resident population** per year for Māori*** and non-Māori non-Pacific (95% CI) overall and by gender, for the nine study DHBs for the dates 1 July 2008-30 June 2010.

*Age adjusted to the 2001 census Māori population

**Rates here are expressed relative to the combined 2001 census population for the nine studied DHBs

*** Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group.

Table 5. *Age standardised* rate ratios for Māori***: non-Māori non-Pacific rates of admission and seclusion events per 10,000 resident population** per year for the nine study DHBs for the dates 1 July 2008 – 30 June 2010*

	Māori/ nMnP rate ratio* for admissions		Māori/ nMnP rate ratio* for seclusion	
	Rate ratio	95% CI	Rate ratio	95% CI
Total	2.51	2.37–2.64	4.02	3.60–4.47
Male	2.85	2.65–3.07	3.73	3.24–4.31
Female	2.17	2.00–2.35	4.56	3.86–5.38

*Age adjusted to the 2001 census Māori population
**Rates are expressed relative to the combined 2001 census populations for the nine studied DHBs
*** Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group.

There were large differences in population-based ASRs of seclusion events by DHB ranging from 55.8 seclusion events per 10,000 resident population per year for Māori in Northland to 1.7 seclusion events per year for nMnP in Counties Manukau (Figure 7).

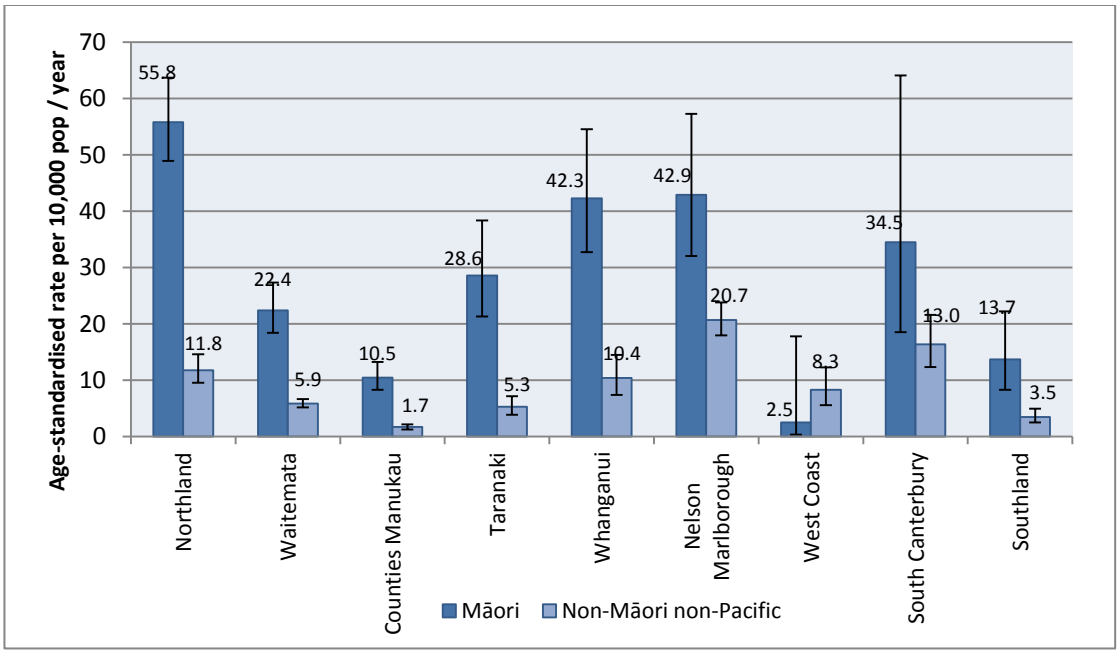

Figure 7. Age-standardised* rate of seclusion events per 10,000 resident population** per year for Māori*** and non-Māori non-Pacific (95% CI) by DHB for the dates 1 July 2008 – 30 June 2010.

*Age adjusted to the 2001 census Māori population
**Rates here are expressed relative to the 2001 census resident populations of each DHB
***Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group

The age standardised rate ratio for Māori: nMnP seclusion events by DHB varied from 0.30 in the West Coast up to 6.35 for Counties Manukau (Table 6). For most DHBs the Māori: nMnP rate ratio for admissions was greater than one, indicating that for most DHBs Māori are more likely to be admitted to an inpatient unit than nMnP. However, given that the Māori: nMnP rate ratios for seclusions for most of the larger DHBs are between 2–3 times the rate ratio of admissions, it can be seen that differences in the rate of seclusion cannot be explained solely by differences in admissions.

Table 6. *Age standardised rate ratios for Māori: nMnP rates of admission and seclusion events per 10,000 resident population* per year by DHB for Māori*** and non-Māori between 1 July 2008 - 30 June 2010*

	Māori: nMnP DHB population rate ratio** for admissions		Māori: nMnP DHB population rate ratio** for seclusions	
	Rate ratio	95% CI	Rate ratio	95% CI
Northland	2.12	1.82–2.47	4.72	3.68–6.01
Waitemata	2.80	2.51–3.13	3.81	3.02–4.83
Counties Manukau	3.93	3.48–4.44	6.35	4.39–9.18
Taranaki	2.13	1.78–2.54	5.41	3.53–8.28
Whanganui	2.17	1.76–2.68	4.07	2.67–6.21
Nelson Marlborough	2.37	1.96–2.87	2.07	1.50–2.86
West Coast	1.16	0.69–1.94	0.30	0.04–2.23
South Canterbury	2.31	1.67–3.18	2.10	1.07–4.16
Southland	1.86	1.49–2.31	3.86	2.12–7.04

*Age adjusted to the 2001 census Māori population
**Rates here are expressed relative to the 2001 census resident populations of each DHB
***Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group

PART 3 - Examination of factors that may contribute to differential rates of seclusion by ethnicity

The following section considers the role of differential distributions of a selection of demographic characteristics (age, gender and NZDep) as well as admission factors (diagnosis, referral pathway and legal status on admission) in the higher rates of seclusion use for Māori as compared to non-Māori non-Pacific.

Demographic characteristics

Over the two-year study period between 1 July 2008 and 30 June 2010, there were 1,944 Māori admissions (for 1,245 individuals) and 5,295 non-Māori non-Pacific (nMnP) admissions (for 3,454 individuals) to the nine DHBs. There were slightly more male than female admissions among Māori, with 56 per cent of all admissions being for males (95%CI 53.8–58.2). There was no significant difference in the proportion of males and females for the nMnP admissions (Table 7).

The age structure of the Māori inpatient population was younger than the nMnP population, with the greatest difference being in the 18–24 year age group (22.8 per cent vs. 13.2 per cent). The largest proportion of Māori was in the 25–34 year age group (27.6 per cent) and for nMnP the largest proportion was in the 35–44 year age group (25.3 per cent) (Table 7).

Māori admissions were overrepresented in the highest quintiles of socioeconomic deprivation (relatively more deprived) compared to nMnP admissions, with almost 50 per cent of Māori in the highest deprivation quintile 5 (49.3 per cent of all Māori admissions vs. 22.2 per cent for nMnP). Māori were underrepresented in the lowest quintiles of socioeconomic deprivation (relatively less deprived) compared to nMnP (3.9 per cent vs. 12.7 per cent) (Table 7).

Table 7. *Demographic characteristics of admissions to adult inpatient units, for Māori and non-Māori non-Pacific admissions from the nine study DHBs for the dates 1 July 2008 - 30 June 2010*

	Māori				Non-Māori-non Pacific			
	No. individuals	No. admissions	% Total adm	95% CI	No. individuals	No. admissions	% Total adm	95% CI
Overall	1245	1944	25.2	24.3–26.2	3,454	5295	68.8	67.7–69.8
Gender								
Female	551	856	44.0	41.8–46.2	1,639	2612	49.3	48.0–50.7
Male	694	1088	56.0	53.8–58.2	1,815	2683	50.7	49.3–52.0
Age (Years)								
18-24y	292	443	22.8	20.9–24.7	469	697	13.2	12.3–14.1
25-34y	332	537	27.6	25.6–29.6	706	1100	20.7	19.7–21.9
35-44y	325	477	24.5	22.6–26.5	891	1341	25.3	24.2–26.5
45-54y	190	275	14.2	12.6–15.7	810	1293	24.42	23.3–25.6
55-64y	85	177	9.1	7.8–10.4	377	579	11.0	10.1–11.8
65y & over	21	35	1.8	1.2–2.4	201	285	5.4	4.8–6.0
NZDep 06 Quintile								
Quintile 1	39	76	3.9	3.1–4.8	472	668	12.7	11.7–13.5
Quintile 2	84	143	7.4	6.2–8.5	540	780	14.8	13.8–15.7
Quintile 3	182	280	14.5	12.8–16.0	715	1104	21.0	19.8–21.9
Quintile 4	322	482	24.91	22.9–26.7	967	1540	29.28	27.9–30.3
Quintile 5	614	954	49.30	46.9–51.3	730	1168	22.21	20.9–23.2

*Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group

The ASR of seclusion events per month of psychiatric inpatient admission for Māori overall was significantly higher at 0.37 compared to the rate of 0.31 for nMnP. The ASR of seclusion events per month of psychiatric inpatient admission was significantly higher for Māori female admissions at 0.17 compared to nMnP females at 0.12. The ASR of seclusion events per month of psychiatric inpatient admission for Māori and nMnP males was similar, at 0.2 and 0.19 respectively (Table 8).

For Māori the age-specific rate of seclusion events per month of psychiatric inpatient admission was highest for those aged 55–64 years at 0.57 (95%CI 0.44–0.71).[22] This was significantly higher than the age-specific rate for nMnP admissions of the same age (ASRR 2.6, 95%CI 1.9–3.7). However, there was no gradient apparent for Māori in rates of seclusion by age group. In comparison, the nMnP group showed a gradient by age with decreasing rates of seclusion events with increasing age, from a rate of 0.45 for those aged 18–24 years to a rate of 0.12 for those aged 65 years and over (Table 8).

Māori had higher rates of seclusion per month of psychiatric inpatient admission compared to nMnP for all deprivation quintiles. Māori of quintile 1 (relatively least deprived) had a rate of 0.42 (95%CI 0.25-0.67) that was not only 2.1 times the rate for nMnP of quintile 1 but was also higher than the rates of seclusion for nMnP of all other quintiles (Table 8).

Table 8. *Rates and rate ratios of seclusion events (per cumulative month of inpatient admission) by demographic characteristics at the point of admission, for Māori and non-Māori non-Pacific from the nine study DHBs for the dates 1 July 2008 - 30 June 2010*

	Māori			Non-Māori non Pacific			Māori: nMnP rate ratio	
	Seclusion events	Rate per month	95%CI	Seclusion Events	Rate per month	95%CI	RR	95%CI
Overall*	582	0.37	0.34–0.41	901	0.31	0.29–0.33	**1.20**	**1.07–1.33**
Gender*								
Female	263	0.17	0.15–0.19	359	0.12	0.11–0.13	**1.43**	**1.21–1.69**
Male	319	0.20	0.18–0.23	542	0.19	0.18–0.21	1.05	0.91–1.21
Age								
18-24y	177	0.40	0.35–0.47	194	0.45	0.39–0.52	0.9	0.7–1.1
25-34y	154	0.35	0.29–0.41	216	0.30	0.26–0.34	1.2	0.9–1.4
35-44y	132	0.35	0.29–0.42	211	0.26	0.22–0.29	**1.4**	**1.1–1.7**
45-54y	49	0.27	0.20–0.36	168	0.23	0.20–0.27	1.2	0.8–1.6
55-64y	70	0.57	0.44–0.71	90	0.21	0.17–0.26	**2.6**	**1.9–3.7**
65y & over	0	-	-	22	0.12	0.07–0.18	0.0	0.0–0.9
NZDep 06 Quintile								
Quintile 1	18	0.42	0.25–0.67	70	0.20	0.15–0.25	2.1	1.2–3.6
Quintile 2	54	0.46	0.34–0.60	128	0.28	0.23–0.33	1.6	1.2–2.3
Quintile 3	78	0.33	0.26–0.41	190	0.28	0.24–0.32	1.2	0.9–1.5
Quintile 4	181	0.44	0.37–0.50	363	0.37	0.33–0.41	1.2	1.0–1.4
Quintile 5	251	0.32	0.28–0.36	137	0.17	0.14–0.20	1.9	1.5–2.3

*Age adjusted to the 2001 census Māori population

**Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group.

[22] Breakdown of this particular age group by gender demonstrates that Māori females of the age group 55–64 years have a rate of seclusion per month of psychiatric inpatient admission of 0.40, compared to Māori males of the same age group reporting a rate of 0.17.

Admission factors

There are significant differences in primary diagnosis on admission for Māori compared to nMnP. Of those admissions where a primary diagnosis could be linked, the most common coded primary diagnosis was no axis I/II disorder. Schizophrenia was a more common diagnosis for Māori inpatient admissions than for nMnP admissions (29.1 per cent vs. 16.9 per cent, $p < 0.0001$), while personality disorders and other depressive disorders were significantly more common amongst nMnP admissions (Table 9).

There are differences in the referral pathway on admission for Māori compared to nMnP. For both Māori and nMnP, most admissions are through a mental health pathway (50.4 per cent for Māori admissions and 47.4 per cent for nMnP). Māori are significantly more likely than nMnP to be referred to the inpatient unit via hospital non-psychiatric referral, or via Justice or Police (Table 9).

Māori were more likely to be admitted under sections 11–14 or 29–31 of the Mental Health Act, than to be voluntarily admitted (43.0 per cent voluntary vs. 57.1 per cent involuntary). Admissions for nMnP were more likely to be voluntary than involuntary (59.9 per cent vs. 40.1 per cent, respectively.) Māori admissions to the nine study DHBs were significantly more likely to be under the Mental Health Act than nMnP admissions (Table 9).

Table 9. *Primary diagnoses on admission to adult inpatient units of nine DHBs, for Māori and non-Māori non-Pacific admissions from the nine study DHBs for the dates 1 July 2008 - 30 June 2010*

	Māori			Non-Māori non-Pacific			P value*
	Number	% of admissions	95%CI	Number	% of admissions	95%CI	
Primary diagnosis on admission							
Schizophrenia	458	29.1	26.9–31.4	756	16.9	15.8–18.0	**<0.0001**
Bipolar disorder	204	13.0	11.3–14.6	515	11.5	10.6–12.4	0.120
Personality disorder	22	1.4	0.8–2.0	131	2.9	2.4–3.4	**0.001**
Other depressive	115	7.3	6.0–8.6	555	12.4	11.4–13.4	**<0.0001**
Other psychosis	77	4.9	3.8–6.0	189	4.2	3.6–4.8	0.260
Alcohol/substance	72	4.6	3.5–5.6	264	5.9	5.2–6.6	0.050
Miscellaneous	102	6.5	5.3–7.7	421	9.4	8.5–10.3	**<0.0001**
No condition on Axis I/II	522	33.2	30.9–35.5	1646	36.8	35.4–38.2	**0.011**
Referral pathway							
Mental health	980	50.4	48.2–52.6	2511	47.4	46.1–48.8	0.107
Hospital (non-psych)	462	23.8	21.9–25.7	933	17.6	16.6–18.6	**<0.001**
GP	9	0.5	0.2–0.8	16	0.3	0.2–0.5	0.270
Justice/police	25	1.3	0.8–1.8	27	0.5	0.3–0.7	**0.022**
Self	28	1.4	0.9–2.0	69	1.3	1.0–1.6	0.563
Other	440	22.6	20.8–24.5	1739	32.8	31.6–34.1	**<0.001**
Legal status on admission							
Voluntary	836	43.0	40.7–45.1	3172	59.9	58.6–61.2	**<0.0001**
Involuntary	1110	57.1	54.9–59.3	2123	40.1	38.8–41.4	**<0.0001**
Section 11-14	745	38.3	36.1–40.4	1530	28.9	27.7–30.1	**<0.0001**
Section 29-31	365	18.8	17.1–20.6	593	11.2	10.3–12.0	**<0.0001**

*Pearson chi-square statistic to compare Māori and nMnP

**Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group

For both Māori and nMnP, the highest rates of seclusion occurred where the primary admission diagnosis was bipolar disorder (rate of 0.79 per month of inpatient admission for Māori and 0.53 for nMnP). The pattern of higher rates of seclusion for Māori than nMnP admissions persisted across most primary diagnosis groupings. Māori with a primary admission diagnosis of schizophrenia had 1.4 times the rate of seclusion compared to nMnP, for bipolar disorder Māori had a rate 1.5 times higher, for other depressive disorders 3.2 times the rate, and for primary diagnoses of substance abuse 3.0 times the rate of seclusion for nMnP with the same disorder (Table 10).

Māori and nMnP admitted through mental health referrals had similar rates of seclusion events. Māori admitted through non-psychiatric hospital admissions had 2.4 times the seclusion rate of nMnP admissions through the same pathway (Table 10).

Both Māori and nMnP had higher rates of seclusion if admitted to the ward involuntarily. Māori had higher rates of seclusion events compared to nMnP whether they were admitted voluntarily (0.17 vs. 0.13) or involuntarily (0.44 vs. 0.37) (Table 10).

Table 10. *Rates and rate ratios of seclusion events (per cumulative month of inpatient admission) for admission factors at the point of admission, for Māori and non-Māori non-Pacific from the nine study DHBs for the dates 1 July 2008 - 30 June 2010*

	Māori			Non-Māori non-Pacific			Māori: nMnP rate ratio	
	Seclusion events	Rate per month	95%CI	Seclusion events	Rate per month	95%CI	RR	95% CI
Primary diagnosis on admission								
Schizophrenia	203	0.38	0.33–0.43	214	0.27	0.23–0.31	**1.41**	**1.16–1.72**
Bipolar Disorder	123	0.79	0.66–0.94	198	0.53	0.46–0.61	**1.50**	**1.19–1.89**
Personality Disorder	5	0.75	0.24–1.74	12	0.23	0.12–0.41	3.19	0.88–9.72
Other Depressive	12	0.23	0.12–0.40	17	0.07	0.04–0.11	**3.21**	**1.40–7.13**
Other Psychosis	22	0.45	0.28–0.67	49	0.40	0.29–0.53	1.12	0.65–1.89
Alcohol/substance	16	0.68	0.39–1.11	18	0.23	0.14–0.36	**2.98**	**1.42–6.20**
Miscellaneous	16	0.28	0.16–0.46	53	0.28	0.21–0.36	1.01	0.54–1.79
No axis I/II condition	110	0.25	0.20–0.30	249	0.24	0.21–0.27	1.04	0.83–1.31
Referral pathway								
Mental health	223	0.27	0.24–0.31	459	0.29	0.26–0.32	0.94	0.80–1.11
Hospital (non-psych)	241	0.73	0.64–0.82	163	0.30	0.26–0.35	**2.39**	**1.95–2.93**
Other	116	0.26	0.22–0.31	278	0.23	0.21–0.26	1.11	0.89–1.39
Legal status on admission								
Voluntary	83	0.17	0.14–0.22	174	0.13	0.11–0.15	**1.36**	**1.03–1.77**
Involuntary	497	0.44	0.40–0.48	726	0.37	0.34–0.40	**1.20**	**1.06–1.34**
Section 11-14	323	0.51	0.45–0.57	484	0.36	0.31–0.42	**1.24**	**1.07–1.42**
Section 29-31	174	0.41	0.37–0.45	242	0.31	0.27–0.35	1.16	0.95–1.41

*Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group

Multivariate analyses

In Table 11, stepwise adjustment has been made for demographic variables (age, gender and NZDep06) and admission factors (referral pathway, legal status and diagnosis on admission) for those admissions with a diagnosis coded, and separately for all admissions (without adjustment for diagnosis) (Table 11). This shows how adjusting for each of the variables impacts on the inequalities in seclusion use for Māori compared to nMnP.

For the restricted analysis, including only those admissions with a coded diagnosis, adjusting for all of the above variables, resulted in a reduction of the size of the disparity in seclusion rates between Māori and nMnP admissions, from an estimated additional 37 per cent risk for Māori compared to nMnP, (RR of 1.37 for the crude association) down to 21 per cent additional risk for Māori (RR = 1.21 fully adjusted for all model elements).

The only exception to this was adjustment for referral pathway, which did not change the point estimate of the rate ratio, and therefore did not explain the difference in seclusion rates between Māori and nMnP (Table 11). Adjusting for referral pathway prior to legal status had no impact on the change in Māori: nMnP rate ratios.

The adjustments for age group and gender, legal status on admission and secondary diagnoses of alcohol/substance abuse, all resulted in reductions to the estimated difference in seclusion rates for Māori compared to nMnP, that is, they partially explain some of the increased rate of seclusion among Māori relative to nMnP admission.

Adjusting for NZDep2006 quintile increased the point estimate of the rate ratio from RR = 1.25 (adjusted for age and gender) to RR = 1.30 (additionally adjusted for NZDep2006) (Table 11). This may be explained by the fact that Māori admissions were overrepresented in NZDep quintile 5 (relatively most deprived), and seclusion rates in this group were lower than rates in the least deprived reference group of quintile 1 (adjusting for the other demographic and admission factors) (Table 12).

Likewise, adjusting for principal diagnosis increased the estimate of ethnic disparity in seclusion (Table 11). The primary diagnoses that had the highest rates of seclusion compared to the reference diagnosis (no axis I/II diagnosis) were either similarly common for Māori and nMnP (bipolar disorder) or represented only small numbers of admissions (primary diagnosis of substance abuse or miscellaneous diagnoses) (Table 9). Schizophrenia was the most common diagnosis for both Māori and nMnP; however, seclusion rates were not significantly higher than the reference group of diagnoses after adjusting for other demographic and admission factors (Table 12).

Table 11. *Modelled seclusion event rate ratios for Māori compared to non-Māori non-Pacific, sequentially adjusted for demographic and admission factors, for the nine study DHBs for the dates 1 July 2008 – 30 June 2010*

	Admissions with diagnosis		All admissions	
Model	Rate ratio (Māori: nMnP)	95% CI	Rate ratio (Māori: nMnP)	95% CI
Crude estimate	1.37	1.18–1.59	1.32	1.15–1.53
Adjusted for age group, gender	1.25	1.07–1.46	1.19	1.03–1.38
+adj for NZDep2006	1.30	1.1–1.53	1.26	1.08–1.46
+adj for legal status on admission	1.22	1.04–1.44	1.21	1.04–1.4
+adj for referral pathway*	1.22	1.04–1.43	1.21	1.04–1.4
+adj for principal diagnosis	1.25	1.06–1.46	-	-
+adj for alcohol/substance abuse as secondary diagnosis	1.21	1.03–1.42	-	-

*Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group

Table 12 also shows the disparities in seclusion use between Māori and nMnP after adjusting for all of the other factors (RR = 1.21). It also shows the independent effects of the other population and admission variables on seclusion use, for example involuntary admissions under sections 11–14 of the Mental Health (Compulsory Assessment and Treatment) Act 1992, are four times more likely to be secluded compared to voluntary admissions after taking into account all the other variables in the model.

Table 12. *Modelled rate ratios (and 95%CI) of seclusion events during inpatient admission for population characteristics and admission factors (adjusted for all other variables) for the nine study DHBs for the dates 1 July 2008 - 30 June 2010*

Factor	Rate ratio	95% CI
Ethnicity		
Māori	1.21	1.03–1.42
Non-Māori, non-Pacific	1	[Reference]
Gender		
Male	1.09	0.93–1.27
Female	1	[Reference]
Age group (years)		
18–24	1	[Reference]
25–34	0.92	0.74–1.14
35–44	0.85	0.69–1.06
45–54	0.7	0.54–0.90
55–64	0.73	0.55–0.98
65+	0.31	0.18 –0.54
NZDep06 quintile		
1 (least deprived)	1	[Reference]
2	1.19	0.85–1.69
3	1.1	0.79–1.54
4	1.29	0.94–1.76
5 (most deprived)	0.87	0.62–1.20
Legal Status on Admission		
Voluntary	1	[Reference]
Section 11-14	4.13	3.33–5.11
Section 29-31	2.54	1.98–3.25
Referral pathway		
Mental health	1	[Reference]
Hospital (non-psychiatric)	1.2	1 .0–1.44
Other	0.71	0.58–0.86
Primary diagnosis on admission		
Schizophrenia	1.06	0.84–1.34
Bipolar Disorder	2.43	1.89–3.10
Personality Disorder	1.96	1.08–3.55
Other Depressive	0.83	0.53–1.3
Other Psychosis	1.7	1.21–2.39
Alcohol/substance abuse	2.65	1.76–3.99
Miscellaneous	1.52	1.06–2.19
No axis I/II condition	1	[Reference]
Secondary diagnosis alcohol/substance abuse		
Present	1.51	1.25–1.82
Absent	1	[Reference]

*Māori includes all individuals with Māori recorded on any of the ethnicity fields (prioritised Māori). Pacific peoples (not included in the prioritised Māori group) were excluded from the non-Māori non-Pacific comparator group

Discussion

In this pilot study, ethnic disparities between Māori and non-Māori-non-Pacific were found in the use of seclusion. Māori had 4.0 times higher age-standardised population rates of seclusion events rates than nMnP at 27.1 seclusion events per 10,000 resident population/year. Such findings are consistent with the limited data available identifying ethnic disparities in the use of seclusion between Māori and non-Māori in New Zealand. (El-Badri and Mellsop, 2002; Ministry of Health, 2010)

Of concern is that the crude population rate for Māori of 258 seclusion events per 100,000 resident population/year is the highest population-based rate of seclusion events reported internationally. The most recent review of international epidemiological data on population rates of seclusion events in different countries by Steinert et al (2010) reported marked variation from a rate of zero seclusion events per 100,000 resident population/year in Iceland to a rate of 115.8 seclusion events per 100,000 total population/year in the Netherlands. In comparison, the crude population rate of seclusion events for nMnP at 59 per 100,000 resident population per year sits well at the lower end of the reported international range. [23]

Factors that were important contributors to the disparity in seclusion rates between Māori and nMnP are age and legal status on admission. However, even after adjusting for a range of demographic variables (age, gender and NZDep06) and admission factors (referral pathway, legal status and diagnosis on admission), Māori rates of seclusion remained 21 per cent greater than for nMnP admissions. This suggests that there are additional factors that contribute to the differences in seclusion rates between Māori and nMnP above and beyond the demographic and admission factors we were able to adjust for based on the PRIMHD dataset.

An important factor, which we were unable to directly adjust for, is the relative level of acuity of illness between Māori and nMnP. In an Australian study HoNOS behavioural and impairment subscales were found to be significantly associated with the use of seclusion for those aged 25-34 and 25-54 years respectively (Happell and Koehn, 2010). In the DHB pilot study, only proxy measures of acuity were available, such as the length of admission, primary diagnosis and referral pathway. As the PRIMHD database matures, more direct measures of acuity, such as HoNOS scores, will be available and important to analyse in relation to Māori seclusion rates.

There was large variation by DHB in the proportion of admissions including at least one seclusion event, the population rates of seclusion events, and the median duration of seclusion events, suggesting that there are differences in how DHBs are using seclusion. Variation in the frequency of seclusion events by DHB has previously been identified both wthin New Zealand (Ministry of Health, 2010a) and the US (Carpenter, et al., 1988; Forquer et al., 1996). In addition to differences in population structure, and the characteristics of the admitted population, there are likely to be differences between DHBs at an organisational level such as staffing factors (e.g. staff: service user ratios, staff experience, staff gender), ward factors (capacity and physical layout) and organisational policy that may contribute to the variation in seclusion use between DHBs. However, despite variation by DHB in the way seclusion is used, Māori were consistently found to have higher proportions of seclusion and significantly higher rates of seclusion events at a population level compared to nMnP, for all of the study DHBs (with the exception of West Coast).[24]

The findings of this study demonstrate that in terms of absolute numbers, young Māori males are the most likely group to be seen in seclusion and are an important group to target seclusion reduction interventions to. In addition, Māori females

[23] The crude rate of seclusion events per 100,000 resident population per year is reported here as 59 for nMnP for comparability with the international rates reported by Steinert et al (2010).
[24] Results for West Coast DHB are likely to have been influenced by the relatively low numbers of Māori (n=19) and nMnP (n=183) admissions contributing to the sample for the two-year study period.

between the ages of 55–64 years, although contributing small numbers of overall admissions, were found to have the highest rate of seclusion of all the age groups admitted to the ward and this finding may require further exploration and tailored interventions.

There are significant differences in primary diagnosis on admission for Māori compared to nMnP, with Māori relatively more likely to be admitted with diagnoses of schizophrenia, and relatively less likely to be admitted with primary diagnoses of personality disorders and other depressive disorders. Of note, within a number of diagnostic categories, Māori had significantly higher rates of seclusion events than nMnP with primary diagnoses of schizophrenia (1.4 times the rate of seclusion for nMnP); bipolar disorder (RR = 1.5); depressive disorders (RR = 3.2); and substance abuse (RR = 3.0). The different risk of seclusion events could be due to a number of factors. Māori within these categories may have more severe disease on admission, they may be more likely to be admitted to DHBs with higher seclusion use, or ethnicity itself may have an influence on inpatient treatment.

For both Māori and nMnP, most admissions are through a mental health pathway (50.4 per cent for Māori admissions and 47.4 per cent for nMnP), and there was no significant difference in the rate of seclusion for Māori and nMnP admitted through this pathway. Māori admitted through non-psychiatric hospital admissions had 2.4 times the rate of nMnP admissions through the same pathway. Again, there are a number of possible reasons for this difference in rate, one of which is greater severity of disease for Māori on admission through the hospital, perhaps resulting from differential access to primary care or community mental health services. In order to reduce the use of seclusion for Māori within the inpatient mental health setting, effort should be placed on attempting to prevent the need for inpatient admission, as well as reducing the acuity of disease where admission is required. This may be achieved through the provision of accessible and high quality community mental health services for Māori.

There are several potential reasons why Māori may have a higher risk of experiencing seclusion than non-Māori, only some of which have been explored in this report. Part of the difference in seclusion rates between Māori nMnP has been demonstrated to result from the differential distribution of age and legal status on admission. In addition, some of the remaining disparity not accounted for in our model may result from other factors such as differences in disease severity, staff and organisational factors, and features of the ward environment.

Limitations of the DHB findings

There are a number of limitations to the pilot study findings. This study included a group of nine DHBs who were deemed to have reasonable quality seclusion data reported to the PRIMHD dataset. Although the outlined approach to monitoring seclusion use would be possible for any New Zealand DHB, the results presented in this report are only representative of the nine DHBs for which data was included.

The variables available for the quantitative analyses were limited by inclusion and completeness in the PRIMHD database. Although HoNOS scores were identified by the project advisors as being important to consider, we were unable to include these due to significant concerns about the data completeness. However, with ongoing improvements to the PRIMHD collection, these are likely be available for analysis in the future.

There were also limitations that resulted from the way we chose to categorise variables. For example, the principal diagnosis on admission was our main method of analysing and adjusting for diagnosis on admission. For the multivariate analyses, additional adjustment was made for secondary diagnoses of alcohol and substance abuse, and this had some impact on reducing the measured disparity in seclusion use between Māori and nMnP. This suggests that dual diagnoses may have an important role in disparities in seclusion use between Māori and nMnP, and further development of methods to capture dual diagnoses is required.

The population rates calculated in this report used admission and seclusion events within the DHB as the numerator, and DHB resident population from the 2001 census for the denominator. Ideally, with a complete PRIMHD dataset, individuals' domicile codes can be used to identify their region of residence for the calculation of rates of seclusion events for the resident population, regardless of the location of their inpatient events. The population rates for Māori in this report are potentially underestimated due to likely undercounting of Māori amongst seclusion events, based on the NHI ethnicity for seclusion events, relative to census population denominators.

Conclusion

In this study, Māori were found to have a higher rate of seclusion use than nMnP. Part of the difference in seclusion rates between Māori and nMnP has been demonstrated to result from the differential distribution of age and legal status on admission. Some of the remaining disparity not accounted for in our model may result from other factors we were not able to adjust for such as differences in disease severity, staff and organisational factors, and features of the ward environment.

Recommendations

In order to contribute to the goal of seclusion reduction in New Zealand, we recommend further investigation of high-risk groups for seclusion (both in terms of absolute numbers and rates of seclusion) using both quantitative and qualitative methods, including:

- young Māori males,
- older Māori females, and
- Māori with psychiatric diagnoses of schizophrenia, bipolar disorders, substance-related disorders and depressive disorders.

Given the large differences in the rates of seclusion use between DHBs we recommend:

- targeting the development and implementation of seclusion reduction initiatives to DHBs with the greatest disparities in seclusion use between Māori and nMnP, and the highest overall seclusion use.
- further investigation of the drivers of DHB differences in seclusion use.

Finally, in order to reduce the use seclusion for Māori, we recommend the support of culturally appropriate community mental health services in order to prevent the need for inpatient admission, or to reduce the acuity of illness where admission is required.

Appendix 1 – Summary of literature on reasons for seclusion use

Within the literature, there are a number of reasons identified for using seclusion in mental health settings. An understanding of these reasons and how they may vary by population groups is important when developing interventions. Of note for this report, there was no literature that examined whether the reasons for seclusion differed according to patient ethnicity/race. Reasons for placing an individual in seclusion are presented in two categories (based upon a modified version of the approach outlined in the MHC 2004 report), seclusion as risk management and seclusion as therapy.

Seclusion as risk management

The most frequent rationale given in the literature for use of seclusion is to maintain a safe ward environment by managing threatening or violent behaviour of inpatients. In a New Zealand study based in Waikato, the most common reason for seclusion use identified by both service users and staff was safety (of service users and staff) (El-Badri and Mellsop, 2008). In addition, although staff had negative feelings such as guilt and frustration about using seclusion, the majority of those interviewed admitted that they viewed seclusion as both warranted and beneficial, and they felt safer when it had been used (El-Badri and Mellsop, 2008).

The international literature was mixed on whether seclusion use was more often for the prevention or violence, or followed a violent incident. Several international studies found that events of violence to self or staff members were the most common reason for the use of seclusion (Soloff and Turner, 1981; Thompson, 1986; Hammill, McEnvoy, Koral, and Schneider, 1989; Kozub and Skidmore, 2001; Happell and Harrow, 2010). However, a review of 13 studies concluded that seclusion was more often used to contain behaviour that may lead to violence rather than to contain actual violent behaviour (Soloff, Gutheil, and Wexter, 1985).

Other studies present a contrasting picture, finding that use of seclusion and restraint actually led to violent incidents (Owen, Tarantello, Jones, and Tennent, 1998), and that restraint in preparation for seclusion led to a large proportion of assaults on staff occurring within a psychiatric unit (Lion, Snyder, and Merrill, 1981). There have been reports from a number of countries of physical injuries and fatalities of patients associated with use of seclusion (Busch and Shore, 2000; Citizens Commission on Human Rights, 2004; Livingstone, 2007; Prinsen and van Delden, 2009), and it is likely that there is significant underreporting of these incidents (Busch and Shore, 2000; Livingstone, 2007). However, it is difficult to know whether injuries and deaths occurring during times of seclusion were due to seclusion use, or the result of patient case mix and acuity (Busch and Shore, 2000; Prinsen and van Delden, 2009).

Seclusion as therapy

A less common reason for seclusion identified in the literature is seclusion as a therapeutic intervention. Two papers from the 1970s suggest that seclusion has a protective role for the vulnerable patient. Fitzgerald and Long (1973) note that seclusion can be a humane, practicable and therapeutic approach for managing extremely unwell patients. Gutheil (1978) suggests that the patient, safe from injuring self or others, feels protected and through social isolation, is removed from stimuli causing overwhelming sensory input.

Other therapeutic advantages that are identified in the literature include the use of seclusion to foster development of positive therapeutic relationships between patients and the clinical team (Fitzgerald and Long, 1973; Binder and McCoy, 1983; Crichton, 1997; Lendemeijer and Shortridge-Baggett, 1997). Some authors have maintained that seclusion of an uncontrolled patient may be of benefit to the other patients on the ward by promoting the therapeutic environment within the psychiatric unit (Kilgalen, 1977; Oldham, et al., 1983; Fisher, 1994; El-Badri and Mellsop, 2008).

However, these views contrast with those in a study of patients' recollections of personal seclusion experiences, where patients did not feel protected but sad and angry (Hammill, et al., 1989). A study based in New Zealand identified that more than half of patients and staff identified seclusion as negative and distressing for patients (El-Badri and Mellsop, 2008). Fear and anxiety were the most common feelings reported by secluded patients, the majority of whom felt that they were in seclusion as a form of punishment (El-Badri and Mellsop, 2008).

There is considerable literature on the negative psychological impacts of seclusion on the patient (Blanch and Parrish, 1990; Williams and Caleb, 1997; Castle and Mor, 1998; Mohr, Mahon, and Noone, 1998; Terpstra and Hunter, 2001; Mental Health Commission, 2004; Robins et al., 2005). Negative psychological effects have been reported to include: acute stress response (Williams and Caleb, 1997); exacerbation of agitation (Castle and Mor, 1998); distress (Robins, et al., 2005); and trauma (Mohr, Mahon, and Noone, 1998). Patients have discussed feelings of being punished (El-Badri and Mellsop, 2008), as well as feelings of helplessness, confusion, frustration, anger and fear (Binder and McCoy, 1983). The use of seclusion and restraint has also been identified as a key factor contributing toward development of post-traumatic stress disorder for patients with mental health disorders treated within the hospital setting (Cusack et al., 2003; Cusack, Fruel, and Brady, 2004; Robins et al., 2005)

Appendix 2 – List of factors identified by advisory group

Factors related to the use of seclusion in the general population (those with grey backgrounds were prioritised as the most important factor by the advisors)	
Individual factors	How this may impact on Māori
Diagnosis	Differential prevalence of psychosis, schizophrenia, bipolar by ethnicity Dual diagnosis Intoxication – final diagnosis may not reflect diagnosis at time of seclusion Nature of the presenting symptoms
History of past seclusion events	May lower the threshold for future seclusion events. Patterning of behaviours
Perceived risk – Risk of harm to self and others	Different levels of perceived threat with Māori service users, related to many other factors including diagnosis and provider factors.
Age, gender, ethnicity and iwi of individual	
Socioeconomic status	
Level of knowledge/ education of individual	Individual's resources to advocate Knowledge of their individual rights, and likelihood of complaints
Pathway of admission	Police versus family
Variation in the use of seclusion by time of day, day of week	e.g. Friday nights and holidays. Increase seclusion at handover times.
Severity of illness	? more severe illness in Māori presenting to hospital
Medication	Considering the route and types of medication. Some medications (e.g. antipsychotics) given prn or IM might require restraint to give, and then lead to seclusion. Could use chlorpromazine equivalence.
Length of time in inpatient unit	
Number of admissions to inpatient unit	
Legal status on admission	Māori more likely to be under Mental Health Act
Family support (advocacy for service user as well as their interactions with the provider)	
Who instigated seclusion (service user or staff)	Service user may request to be secluded to "get off madness of ward"

Advance directives	
Frequency of visits by the team at beginning of and during admission	e.g. psychotherapy for depression and suicide Review by psychiatrist
Time and day of admission	
Provider/Team/ Unit factors	
Culture of the unit/organisation (and leadership within organisation)	Gaps between actual and best practice
Characteristics of staff Ethnicity Age Gender Part time or full time	More female staff likely to resulting more male seclusions; more Māori staff members might mean less frequent seclusion for Māori
Experience/skill level of staff	Clinical knowledge, life skills Mix of staff- nurses, social workers, HCA, orderlies
Availability of support staff	How quickly the orderlies will arrive
Seclusion used as a form of punishment	
Number of staff (ratio of staff: service user)	Likely to vary by unit
Type of unit	More Māori in forensic units Different units likely to have different practices forensic; intellectual disability; older age Youth mental health (monitored closely by MSD and CYF); Standard wards Youth tend to 'test' seclusion, so may be overrepresented following transition to adult ward
Urban vs. regional units	More likely to have overseas trained doctors in regional units
Physical environment in the unit Room to move Level of noise in unit	Availability of seclusion rooms
Seclusion to manage behaviour	Particularly where services are placed under pressure
Mix of other service users in the unit Ethnicity Severity of illness	Ethnicity – if a lot of other service users are Māori, an individual Māori service user is less likely to stand out, and vice versa.
Turnover of staff	
Staff development	Training, supervision and debriefing Conferences – attending and presenting
Continuity of care	Nature and quality of handovers may impact o the length of seclusion
Access to alternatives (egg weighted blankets, aromatherapy,	Lack of culturally appropriate alternatives

Availability of kaumatua	But important to have a person with the "right skills" not just "old and brown". For some Māori their experience of being Māori has been negative (e.g. abuse)
The way seclusion policy applied within DHB/ individual unit	
Wider Health System / Policy	
Availability of comprehensive community mental health care	Prevention of inpatient admission through appropriate and effective care in the community that aims to improve quality of life egg addressing all aspects of Te Whare Tapa Wha.
Seclusion as a legally allowable practice	Differential impact of legislation on Māori
Primary care (quality and access)	
Justice system pathway	Differences in the way the justice system treats by ethnicity

Appendix 3 – Duration of seclusion events by demographic characteristics and admission factors

Table 13. *Duration of seclusion events by demographic characteristics and admission factors at the point of admission for Māori and non-Māori non-Pacific admissions to the nine study DHBs for the dates 1 July 2008 - 30 June 2010*

	Māori				Non-Māori non-Pacific			
	Seclusion Events	**Duration of Seclusion (Hours)**			**Seclusion Events**	**Duration of Seclusion (Hours)**		
		Median	Interquartile Range			Median	Interquartile Range	
Overall	580	12.5	4.7	23.6	900	12.1	5.0	24.1
Gender								
Female	261	10.0	3.5	18.4	359	10.4	3.3	23.0
Male	319	14.5	5.8	29.7	541	13.8	6.0	25.7
Age (Years)								
18-24y	175	13.0	5.8	25.5	193	14.3	3.5	23.5
25-34y	154	12.7	5.8	21.3	216	15.6	6.7	38.3
35-44y	132	12.2	4.1	21.5	211	9.7	3.3	17.8
45-54y	49	14.0	3.4	39.5	168	11.5	5.8	26.5
55-64y	70	8.7	3.2	23.3	90	11.3	7.1	20.5
65y & over	0	-	-	-	22	17.8	4.5	73.5
NZ Dep 06 Quintile								
Quintile 1	18	7.6	1.9	11.7	70	6.7	2.5	18.5
Quintile 2	54	12.9	4.5	34.3	128	11.4	5.0	24.6
Quintile 3	78	14.2	7.7	24.0	189	12.9	5.0	34.3
Quintile 4	181	13.3	5.5	24.6	363	12.3	6.0	23.7
Quintile 5	249	11.8	4.2	20.6	137	13.8	4.3	25.5
Referral Pathway on admission								
Mental health	223	15.0	5.0	38.5	459	14.6	5.5	37.3
Hospital (non-psych)	241	11.3	4.7	19.3	163	11.0	5.7	22.4
Other	116	12.2	5.3	21.1	278	11.0	3.5	18.7
Legal Status on admission								
Voluntary	83	11.3	3.5	18.2	174	14.3	5.9	36.3
Involuntary	497	12.7	5.0	24.0	726	11.9	4.4	23.5
Section 11-14	323	14.3	0.5	25.3	484	11.8	4.0	23.6
Section 29-31	174	10.9	3.8	21.4	242	12.3	5.1	23.3
Diagnosis on admission								
Schizophrenia	203	14.0	5.5	25.2	214	17.3	6.7	43.8
Bipolar Disorder	123	11.8	4.5	24.1	198	17.0	9.3	42.1
Personality Disorder	5	26.0	6.5	39.5	12	14.8	1.8	21.4
Other Depressive	12	13.6	6.9	23.6	17	12.0	2.7	35.5
Other Psychosis	22	15.9	6.6	42.3	49	12.0	6.3	21.2
Alcohol/substance	16	40.3	15.6	67.9	18	13.0	5.5	20.6
Miscellaneous	16	6.3	3.0	21.0	53	10.0	2.0	22.7
No axis I/II condition	110	11.7	5.0	17.9	249	9.9	3.3	17.0

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