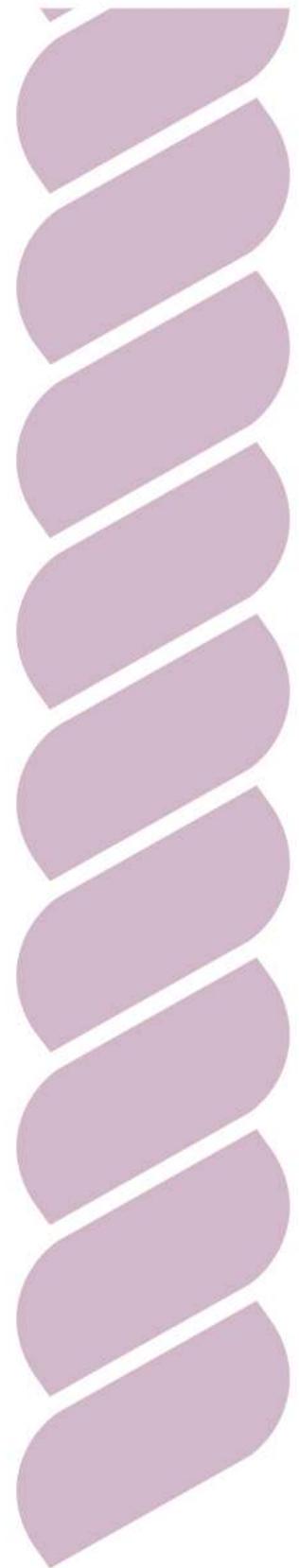


Variation in DHB seclusion rates

Mental health services



**Te Pou o te
Whakaaro Nui**

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Preface

Seclusion and restraint are traumatising experiences for people receiving services and staff delivering services. Reducing and working to eliminate seclusion and restraint is highlighted as a priority action in *Rising to the Challenge: The Mental Health and Addiction Service Development Plan 2012-2017* (Ministry of Health, 2012).

New Zealand has made good progress towards reducing seclusion and restraint. Since 2009, DHBs have reduced the proportion of people being secluded in inpatient mental health services by half.

Since 2008, Te Pou, with support from the Ministry of Health, has developed a range of evidence based tools and resources that support inpatient services in reducing restrictive practices.

Te Pou wants to ensure that DHBs and NGOs are able to use data and information to inform service development, planning and improvement work that ultimately improves outcomes for people.

This research report *Variation in DHB Seclusion Rates: Mental health services* examines the variation in rates of seclusion between individual DHB mental health inpatient services that continues to be of concern. The research **indicates that the variation between DHB's seclusion use is due to** differences in organisational culture and practice and not due to differences in populations.

Though it can be complex and challenging to implement, the research supports that applying a multi-level strategic and systemic approach, such as *Six Core Strategies*®, is critical towards achieving the sustainable reduction and eventual elimination of seclusion in mental health and addiction services.

Reducing restrictive practices is something every person working in mental health and addiction services has a role in. We hope you find the information in this report useful in this work.

Robyn Shearer

Chief Executive, Te Pou o te Whakaaro Nui

Executive summary

Seclusion is a practice that negatively impacts on the individual freedom and recovery of people in New Zealand. This report examines the variation in rates of seclusion between district health board (DHB) mental health inpatient services, and the extent to which this variation may be explained by differences in the sociodemographic and clinical characteristics of people accessing services. The study used cross-sectional data derived from the national Programme for the Integration of Mental Health Data (PRIMHD) data set for 2015. This data set provided information on the rates of seclusion for 19 DHBs with a mental health inpatient unit (forensic services were excluded). The sample included 10,727 inpatient admissions in 2015, reflecting 7,015 individual people aged between 18 to 64 years.

The overall rate of seclusion was 7.7% of admissions across New Zealand mental health inpatient services (DHBs range 2.2% to 23.3%). DHBs were classified into four groups based on their rates of seclusion. High secluding DHBs had rates of seclusion almost 11 times higher than the low secluding DHBs, unadjusted OR=10.9, 95% CI [7.7, 15.5], $p<.001$. The DHB groups were significantly associated with the **age, ethnicity (Māori/non-Māori), total Health of the Nation Outcome Score (HoNOS) scores, number of bed nights and Mental Health Act (MH Act) legal status (compulsory treatment/not compulsory treatment)** of people accessing services. However, when these sociodemographic and clinical characteristics were taken into account, the odds of seclusion remained virtually unchanged. After adjusting for the sociodemographic and clinical characteristics of people accessing services, the highest secluding DHBs had rates of seclusion that were over 11 times higher than the lowest secluding DHBs, adjusted OR=11.1, 95% CI [7.5, 16.4], $p<.001$.

These findings indicate the variation in rates of seclusion between DHBs cannot be explained by differences in the sociodemographic and clinical characteristics of people accessing services. Instead, it is more likely that variation between DHB rates of seclusion is due to differences in clinical practice. Progress towards further reducing seclusion and minimising variation between DHBs will require a multi-level strategic approach that includes building the capability of the workforce, leadership and organisational development, ensuring sufficient access to resources to implement seclusion reduction initiatives, and ongoing monitoring and evaluation.

Recommendations based on the findings of this report are outlined below.

1. Continued implementation of the *Six Core Strategies*[®] framework, and identifying what has been working well to reduce seclusion and areas for improvement in collaboration with stakeholders, clinicians, people accessing mental health services and their families and **whānau**.
2. Supporting strong local leadership, including service user leadership at all levels of service delivery.
3. Continued promotion and use of tools, resources, training, and support available for seclusion reduction, including sensory modulation and Safe Practice Effective Communication.
4. A continued focus on **improving outcomes for Māori, strengthening Māori leadership, and developing culturally effective responses**.

Introduction

This report examines the variation in rates of seclusion between district health board (DHB) mental health inpatient services, and the extent to which this variation may be explained by differences in sociodemographic and clinical characteristics of people accessing these services. Seclusion is a practice that negatively impacts on the individual freedom and recovery of people in New Zealand. For this reason, the objectives of this research support the long-term national strategy towards least restrictive practices in mental health services, and the eventual elimination of the use of seclusion. Seclusion has been defined in the *New Zealand Health and Disability Services Standards* as “where a consumer is placed alone in a room or area, at any time and for any duration, from which they cannot freely exit” (Standards New Zealand, 2008a, p. 30). Only people under the Mental Health (Compulsory Assessment and Treatment) Act 1992 can be legally secluded. Despite the ongoing efforts to reduce seclusion, it is still being utilised as an intervention of last resort and should only be used after all other de-escalation methods have been unsuccessful in reducing distress and managing safety (Ministry of Health, 2010b).

The use of least restrictive practices is necessary because seclusion is a major source of distress for most people involved (Happell & Harrow, 2010; T. L. Taylor et al., 2009). The need to reduce seclusion is increasingly prioritised by mental health services and the governments that fund them. This has been supported by the expansion of seclusion reduction research across several countries, including Australia, Canada, Finland, Netherlands, UK and the US (Goulet, Larue, & Dumais, 2017; Mellow, Tickle, & Rennoldson, 2017; T. L. Taylor et al., 2009). While the current national strategy in New Zealand is reduction in the use of seclusion, there is a strong move within the sector to completely eliminate the use of seclusion in mental health services (Ministry of Health, 2012b).

Impact of seclusion on people accessing services

Seclusion is an important topic in the literature with authors expressing concerns about individual rights and the potential harm on the physical and psychological wellbeing of people who experience seclusion (Fisher, 1994; T. L. Taylor et al., 2009). While a small number of people with lived experiences have reported that seclusion was helpful in their recovery, the overwhelming majority have expressed that seclusion was a profoundly negative experience, and was commonly seen as a form of punishment (Mellow et al., 2017). Seclusion can be traumatising for people, and also re-traumatising for people who have experienced interpersonal violence and victimisation previously (Bonner, Lowe, Rawcliffe, & Wellman, 2002; Brophy, Roper, Hamilton, Tellez, & McSherry, 2016). The integration of trauma-informed care approaches in mental health services has encouraged least restrictive practices and further understanding from staff regarding how coercive practices are experienced by people with pre-existing trauma histories (Muskett, 2014).

Impact of seclusion on the workforce

Nurses, as a key professional group delivering mental health inpatient services, are often involved in seclusion events. Consequently, this has led to a complex relationship between their attitudes towards the use of seclusion, emotional exhaustion, and job satisfaction (Happell & Koehn, 2011). While the use of seclusion can often lead to negative feelings amongst staff members, some clinicians and nurses have expressed opinions that seclusion is an intervention that promotes their sense of personal safety in the workplace (El-Badri & Mellsop, 2008; Happell & Harrow, 2010). Mental health nurses have also

reported that workplace culture can affect their willingness to discuss negative opinions regarding seclusion, and so, workplace culture is perceived by nurses to play an important role in reducing the use of seclusion (Happell & Harrow, 2010).

Seclusion reduction policies in New Zealand

To address the concerns around the use of seclusion, the Ministry of Health and Standards New Zealand introduced a government policy for seclusion reduction in 2009 (Standards New Zealand, 2008b). This policy was later incorporated into *Rising to the Challenge: The Mental Health and Addiction Service Development Plan 2012–2017* (Ministry of Health, 2012b), in which the reduction of seclusion is a priority action. The goal of this priority action is to improve mental health services for people, especially Māori people accessing services (Ministry of Health, 2012b). As part of the movement towards least restrictive practices, mental health services began to implement the use of *Six Core Strategies for Reducing Seclusion and Restraint Use*[®] (National Association of State Mental Health Program Directors, 2008). This is an evidence-based framework used to guide service-level planning and development.



Figure 1. *Six Core Strategies for Reducing Seclusion and Restraint Use*[®]. Adapted from: National Association of State Mental Health Program Directors (2008).

In accordance with *Rising to the Challenge*, seclusion was later introduced as a key performance indicator (KPI) for mental health services in 2014/2015 to monitor progress in seclusion reduction. This benchmarking indicator of seclusion comprises of three inter-related facets with the following baseline rates recorded in 2014/2015 (Northern Regional Alliance, 2016):

- total number of people secluded - 16 per 100,000 population
- number of seclusion events - 38 per 100,000 population
- total hours of seclusion - 966 per 100,000 population.

Seclusion has proven to be a difficult intervention to change across New Zealand mental health services. While the proportion of people accessing mental health services that have been secluded has nearly halved since 2009, in recent years seclusion rates have steadied (see Figure 2). This suggests a need to review and refine seclusion reduction initiatives (Ministry of Health, 2016).

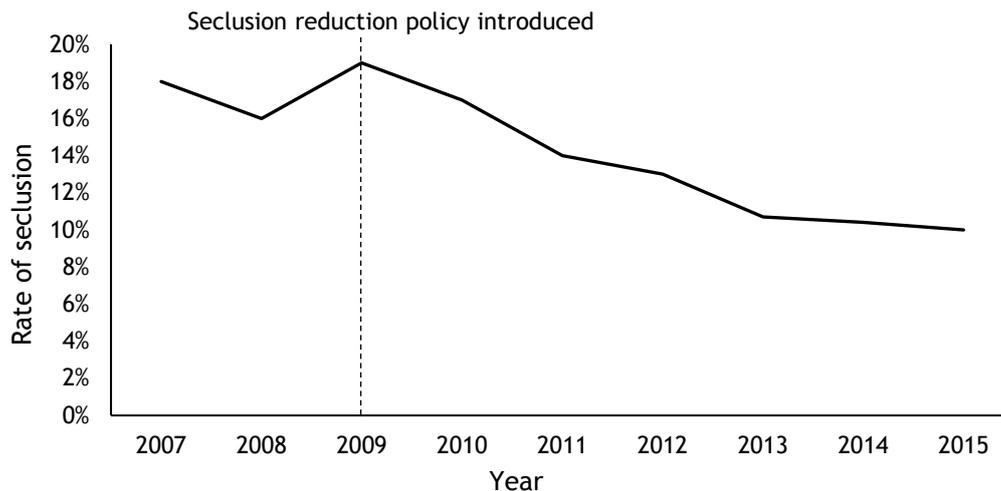


Figure 2. National rate of seclusion (the proportion of people accessing mental health services that have been secluded). Adapted from: the *Office of the Director of Mental Health Annual Report 2007–2015* (Ministry of Health, 2008, 2009, 2010a, 2011, 2012a, 2013b, 2014, 2015, 2016).

Risk factors associated with seclusion

Rising to the Challenge highlighted how Māori people experience higher rates of seclusion compared to other ethnic groups (Ministry of Health, 2012b). While the total number of people secluded in New Zealand has declined over the past six years, Māori comprise a large proportion (44% in 2015) of the people who experience seclusion in inpatient services (Ministry of Health, 2016). The *Office of the Director of Mental Health Annual Report 2015* suggested that Māori people were nearly five times more likely to be secluded than non-Māori people who accessed mental health services in 2015 (Ministry of Health, 2016). Thus, the movement towards least restrictive practices has further prioritised the need for understanding and **reducing the seclusion of Māori people** (McLeod, King, Stanley, Lacey, & Cunningham, 2017; Te Pou o te Whakaaro Nui, 2013a).

In addition to ethnicity, the *Office of the Director of Mental Health Annual Report 2015* showed younger people and males are more likely to be secluded than other groups in New Zealand's mental health services (Ministry of Health, 2016). Local research from New Zealand and Australia have also shown that age, gender, and ethnicity are associated with an increased risk of seclusion (El-Badri & Mellso, 2002; Happell & Koehn, 2010). Clinical factors associated with a higher risk of seclusion also include a previous history of aggressive behaviours; difficulties with social and behavioural symptoms; previous hospitalisations; and a longer length of hospitalisation (Happell & Koehn, 2010; K. Taylor et al., 2012).

This body of research on seclusion risk factors has raised awareness that the early assessment of risk factors and development of prevention plans can be useful in reducing seclusion (Georgieva, Vesselinov, & Mulder, 2012). However, concerns have been raised that a focus on risk factors may also lead to the assumption that differences in seclusion rates are due to the profiles of people accessing services. Therefore, the emphasis on risk factors has also prompted a need to examine whether these factors can explain differences in the use of seclusion.

Objectives

Against the background above, this report examines three key issues relating to rates of seclusion in DHB mental health inpatient services using data from the 2015 Programme for the Integration of Mental Health Data (PRIMHD) data set.

To address current issues around the use of seclusion, the goals of the study are outlined below.

1. To estimate the overall rate of seclusion for mental health inpatient services.
2. To examine the variation in rates of seclusion between DHB mental health inpatient services.
3. To examine the extent to which this variation can be explained by the sociodemographic and clinical characteristics of people accessing DHB mental health inpatient services.

Methods

Data collected

The study used cross-sectional data derived from the national PRIMHD data set to collate information on the rates of seclusion for DHB mental health inpatient services in 2015. The PRIMHD data set includes electronically recorded data collected since 2008. The data has been routinely collected in clinical practice by mental health clinicians and administrators within mental health services. The PRIMHD data set contains information on admission cases to DHB mental health inpatient services,¹ bed nights, legal status, health and social functioning, and the sociodemographic characteristics of people accessing services. Information collected is based on a range of standardised questions and measures. All DHB mental health services are mandated to collect this data which is monitored and stored in PRIMHD by the Ministry of Health.²

Participants

The study sample included people admitted into DHB mental health inpatient units in 2015 who had completed treatment by 30th June 2016. This sample was extracted from PRIMHD alongside data on seclusion, sociodemographic and clinical characteristics. Nineteen DHBs in New Zealand have a mental health inpatient unit, out of a total of 20 DHBs. The PRIMHD data set provided a sample of 10,727 admissions to mental health inpatient units over this time, reflecting 7,015 individual people aged between 18 to 64 years. Other types of inpatient services, such as child and adolescent, alcohol and drug, forensics, maternal mental health, and eating disorder services were excluded from this study. People with co-existing problems were also excluded from this study.

¹ The PRIMHD data set uses the term 'referrals', whereas in this report we use the term 'admissions' to define a person's stay in an inpatient unit

² The PRIMHD data was extracted on 8th July 2016. Permission to use the PRIMHD data was granted to Te Pou o te Whakaaro Nui (Te Pou) by the Ministry of Health. Analyses were based on de-identified data, therefore ethical approval was not required.

Measures

The following measures were extracted from the 2015 PRIMHD data set.

Rates of seclusion

The number of admission cases with seclusion for each DHB was used to examine rates of seclusion. These were calculated by dividing the number of admissions with seclusion over the total number of admissions. Rates of seclusion were calculated for the overall sample, for each of the 19 DHBs, and for each DHB group.

Sociodemographic characteristics

The sociodemographic characteristics of people examined included gender (male/female), ethnicity (Māori/non-Māori), and age (years).

Clinical characteristics

The clinical characteristics of people examined included health and social functioning, bed nights, and Mental Health Act (MH Act) legal status.

The Health of the Nation Outcome Score (HoNOS) tool was used to assess the health and social functioning of people who accessed mental health services (Wing et al., 1998). HoNOS is a clinician rated outcome measurement tool that is administered during admission, discharge, and every 90 days of treatment to measure outcomes following treatment. HoNOS contains 12 items about symptoms, behaviour, impairment, and social functioning. Each item is rated on a 5 point scale ranging from 0 (no problem) to 4 (severe to very severe problem). Total scores range from 0 to 48, and are based on the sum of the 12 items. Higher scores represent a greater severity of symptoms. The psychometric properties of HoNOS have been reviewed and findings indicate the measure has good validity and adequate reliability, internal consistency, and sensitivity to change (Pirkis et al., 2005; Te Pou o te Whakaaro Nui, 2012). In this report, total HoNOS scores were calculated based on those at the time of **each person's** admission into an inpatient unit.

Bed nights refer to people occupying a bed at midnight who were receiving treatment in a mental health inpatient unit (Ministry of Health, 2013a). The total number of bed nights over the length of a **person's** stay in an inpatient unit were calculated.

The MH Act refers to the legislation which enables the treatment and assessment of people, potentially against their will and the safeguards and monitoring processes to ensure it is not abused (Mental Health (Compulsory Assessment and Treatment) Act 1992). Inpatient compulsory treatment orders are covered under Section 30 of the MH Act. The MH Act legal status was used to determine whether or not a person was under compulsory treatment at any time during admission in an inpatient unit.

Analysis

The following statistical analyses were conducted to examine the relationship between DHBs, rates of seclusion, and the sociodemographic and clinical characteristics of people who accessed services.

Descriptive analysis

In the first stage of the analysis, the overall rate of seclusion and the variation of seclusion rates across all 19 DHBs were examined. Confidence intervals (CI) for population proportions were calculated for 95% confidence level using a z-value of 1.96.

The DHBs were then grouped depending on their seclusion rates to enable a tabular analysis of the variation in DHB seclusion rates and to maintain the anonymity of individual DHBs. A four-level classification was developed to rank DHB seclusion rates from low (Group 1) to high (Group 4) seclusion activity, and this was able to effectively capture the extent of variation between the DHBs.

Bivariate analysis

In the second stage of the analysis, bivariate analyses were conducted to examine the associations between DHB rates of seclusion as expressed in groups (see above) and:

- a) sociodemographic characteristics: gender (male/female), ethnicity (Māori/non-Māori) and age (years)
- b) clinical characteristics: total HoNOS scores, number of bed nights, and MH Act legal status (compulsory treatment/not compulsory treatment).

For dichotomous measures (gender, ethnicity, MH Act legal status), chi square tests were conducted. For continuous measures (age, total HoNOS scores, bed nights), one way analysis of variance (ANOVA) were conducted. In all analyses, tests of the linearity of association were conducted between DHB seclusion rates and the sociodemographic and clinical characteristics of people who accessed services.

Multivariate analysis

To determine the extent to which variation in rates of seclusion between DHBs could be explained by the differences in sociodemographic and clinical characteristics of people who accessed services, a multivariate logistic regression model was fitted to the data. This model was:

$$\text{Logit}(Y) = B_0 + B_1X + B_2Z_1 + \dots + B_{n+1}Z_n + U$$

In this model, Y was a dichotomous variable (seclusion/not seclusion), X was the four level measure of DHB seclusion rates, and Z₁ to Z_n were the sociodemographic and clinical covariates. From this model it was possible to obtain estimates of the covariate adjusted association between X and Y, and adjusted odds ratios (ORs) for the various levels of the DHB group measure (obtained by exponentiating the parameter B₁). An OR greater than one suggests that DHBs within the group are more likely to use seclusion compared to DHBs within the lowest secluding group.

All analyses were conducted using IBM® SPSS Statistics® version 22.

Results

The overall rate of seclusion

There was a total of 828 admissions with seclusion, out of 10,727 inpatient admissions in 2015. This reflects an overall seclusion rate of 7.7% across New Zealand mental health inpatient services.

Variation in rates of seclusion between DHBs

The rates of seclusion for each of the 19 DHBs show wide variation ranging from a low of 2.2% to a high of 23.3% (see Figure 3). The median seclusion rate across the DHBs was 7.8% (the mean was 9.0%).

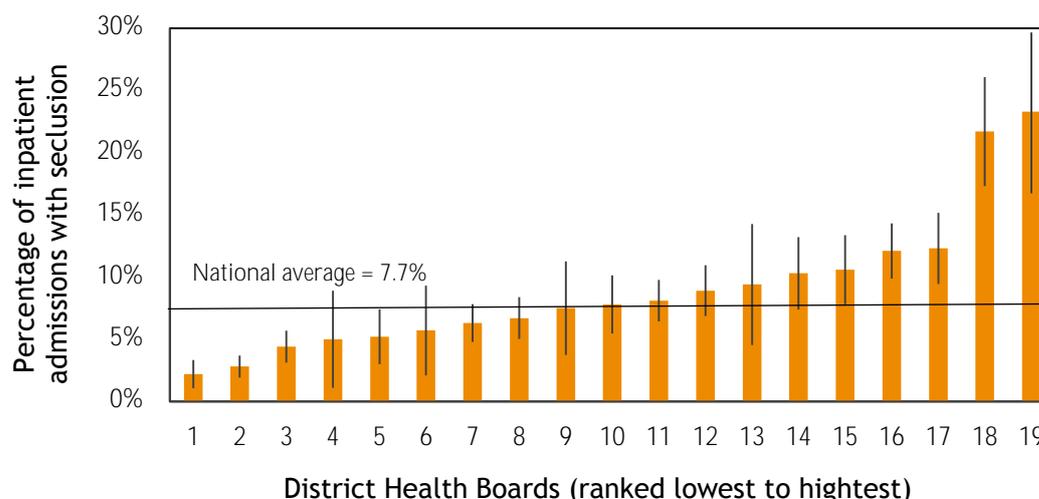


Figure 3. The percentage of inpatient clinical admissions with seclusion across 19 DHBs in 2015 with seclusion rates ranked from the lowest to the highest and 95% CI (N = 10,727).

As explained in the methods section, the 19 DHBs were subsequently classified into four groups based on their rates of seclusion. Chi square analysis showed that the associations between seclusion rates and DHB groups were significant and unlikely to be due to chance ($p < .001$). Most notably, this method of classification showed that Group 4 (22.2%) had an odds of seclusion which was almost 11 times higher than the rates of seclusion for Group 1 (2.6%), unadjusted OR=10.9, 95% CI [7.7,15.5], $p < .001$.

Table 1. The DHB Rates of Seclusion by Group (Ranked Lowest to Highest).

	DHB groups*				χ^2 (p)
	Group 1 (lowest) (n = 1,955)	Group 2 (n = 5,916)	Group 3 (n = 2,352)	Group 4 (highest) (n = 504)	
Seclusion rate (mean)	2.6%	6.7%	11.4%	22.2%	<.001
95% CI	[1.9, 3.3]	[6.1, 7.3]	[10.1, 12.7]	[18.6, 25.8]	

Note. *DHB groups are based on the rates of seclusion of each DHB.

These results raised an important issue about the reasons for the wide variation between DHB rates of seclusion. To address this issue, further analyses were undertaken to examine the relationships between DHB groups and the sociodemographic and clinical characteristics of people who accessed mental health inpatient services.

Sociodemographic characteristics

The associations between the four DHB groups and the sociodemographic characteristics of people who accessed services showed that the proportion of males did not differ across the DHB groups, see Table 2. In contrast, the proportion of Māori people was significantly different between the DHB groups, $\chi^2(3) = 213.8, p < .001$. This difference followed a linear association where higher secluding DHB groups had an increasingly higher proportion of Māori people accessing their services ($p < .001$). The mean age of people who accessed services also differed by DHB group, $F(3, 10723) = 5.0, p = .002$, and followed a linear association. However, the differences in mean age were small but statistically significant due to the use of a large sample, and so this finding needs to be interpreted with caution.

Table 2. Associations between DHB Groups and the Sociodemographic Characteristics of People Accessing Mental Health Inpatient Services.

Measure	DHB groups*				$\chi^2 (p)$
	Group 1 (lowest) (n = 1,955)	Group 2 (n = 5,916)	Group 3 (n = 2,352)	Group 4 (highest) (n = 504)	
Male (%)	53.1	51.2	52.0	50.6	.451 ^a
Māori (%)	17.5	35.1	31.7	33.1	<.001 ^a
Mean age (years)	36.5	37.7	37.7	37.9	.002 ^b

Note. *DHB groups are based on the rates of seclusion of each DHB. ^aChi square tests were used to assess the significance of between group differences for dichotomous measures. ^bOne way ANOVA tests were used to assess the significance of between group differences for continuous measures.

Clinical characteristics

The associations between the four DHB groups and the clinical characteristics showed that the total HoNOS scores, number of bed nights, and MH Act compulsory treatment status of people who accessed services were significantly different between DHB groups, see Table 3. However, these differences did not follow a linear association. The results showed that Group 4 had the highest total HoNOS scores on average, $F(3, 7547) = 9.8, p < .001$, but also had the lowest proportion of people under compulsory treatment status, $\chi^2(3) = 29.8, p < .001$. Whereas, Group 1 (lowest seclusion rates) had the highest proportion of people under compulsory treatment and number of bed nights, $F(3, 10723) = 41.6, p < .001$.

Table 3. Associations between DHB Groups and the Clinical Characteristics of People Accessing Mental Health Inpatient Services.

Measure	DHB groups*				χ^2 (p)
	Group 1 (lowest) ($n = 1,955$)	Group 2 ($n = 5,916$)	Group 3 ($n = 2,352$)	Group 4 (highest) ($n = 504$)	
Total HoNOS score [^]	14.2	14.7	14.1	15.8	<.001 ^b
Bed nights	20.7	14.6	19.5	17.8	<.001 ^b
Compulsory treatment (%)	17.9	14.1	17.4	11.7	<.001 ^a

Note. *DHB groups are based on the rates of seclusion of each DHB. [^]The analysis of total HoNOS scores had a sample of $n=7,551$ (out of 10,727) due to missing data in PRIMHD. ^a Chi square tests were used to assess the significance of between group differences for dichotomous measures. ^b One-way ANOVA tests were used to assess the significance of between group differences for continuous measures.

Adjustment for covariates

As described above, a logistic regression model was fitted to adjust for the covariates to examine if variation in rates of seclusion could be explained by the characteristics of people who accessed services. The main finding from the logistic regression model showed that after the adjustment for covariates the association between DHB status and odds of seclusion remained highly significant ($p < .001$) and virtually unchanged, see Table 4. Before adjustment, the highest secluding DHBs had odds of seclusion that were almost 11 times higher than those of the lowest secluding DHBs, whereas after the adjustment this ratio had increased slightly, adjusted OR=11.1, 95% CI [7.5,16.4], $p < .001$. The implication of this finding is that the variation in rates of seclusion between DHBs cannot be explained by the differences in the sociodemographic and clinical characteristics of people who accessed services.

Table 4. Unadjusted and Adjusted Associations (Odd Ratios) for the DHB Groups.

Association	DHB groups*				p
	Group 1 (lowest)	Group 2	Group 3	Group 4 (highest)	
Unadjusted OR	1.0	2.8	4.9	10.9	<.001
[95% CI]	-	[2.0, 3.7]	[3.6, 6.6]	[7.7, 15.5]	
Adjusted OR ¹	1.0	2.7	3.8	11.1	<.001
[95% CI]	-	[1.9, 3.7]	[2.7, 5.4]	[7.5, 16.4]	

Note. An OR greater than one suggests that DHBs within the group are more likely to use seclusion compared to DHBs in Group 1. *DHB groups are based on the rates of seclusion of each DHB. ¹Significant covariates were ethnicity, age, bed nights, MH Act status, and total HoNOS score ($p < .001$). Admission cases with missing data for these covariates could not be included in the adjusted OR analysis ($n=7,551$ out of 10,727 inpatient admissions).

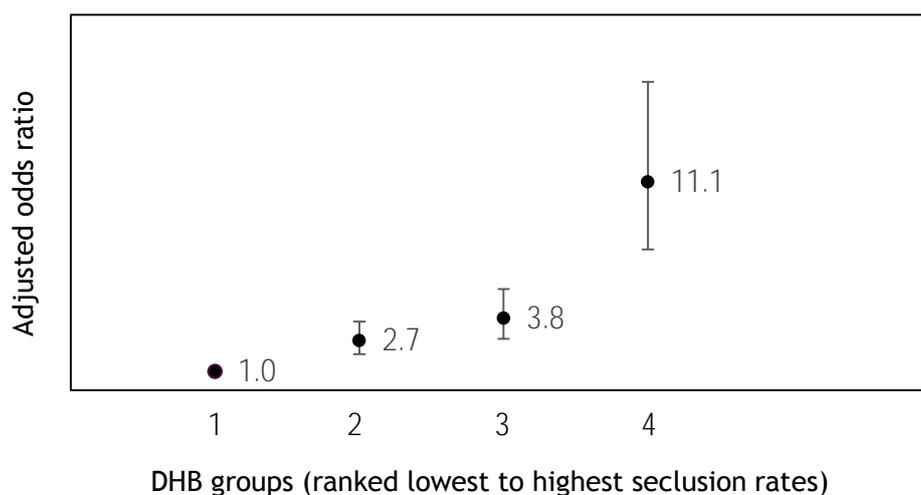


Figure 4. Adjusted association (odds ratios) for the use of seclusion in each DHB group ($N = 7,551$).

Note. An OR greater than one suggests that DHBs within the group are more likely to use seclusion compared to DHBs in Group 1. Adjustment of covariates included ethnicity, age, bed nights, MH Act status, and total HoNOS score. The error bars represent 95% CI.

Supplementary analyses

The results in the preceding sub-sections were subject to a number of limitations, including missing data, sample selection, and the classification of DHB seclusion rates. Missing data occurred because some items were not recorded into PRIMHD and, in particular, there was substantial missing data in the HoNOS scores. The sample used in the analysis included all admissions with the result that individuals who had multiple admissions were included in the analysis on two or more occasions. The analysis used one method for classifying DHB seclusion rates and it could be suggested that different conclusions would be reached by using different classifications.

To address these issues a series of further analyses were conducted to determine whether the issues above had any effect on the study findings. The analyses included: i) addressing missing data on HoNOS scores by setting missing values to the mean of the distribution, ii) restricting the analyses to first admission data; and iii) considering alternative classifications of DHB seclusion rates.

All of these supplementary analyses led to two general conclusions. First, there was substantial and statistically significant differences between DHBs in rates of seclusion ($p < .001$). Second, these differences could not be explained by the sociodemographic and clinical characteristics of people accessing services.

Discussion

This report examined the variation in rates of seclusion between DHB mental health inpatient services in 2015 using PRIMHD data. To the extent that seclusion is a practice that negatively impacts on the individual freedom and recovery of people accessing services, some consideration needs to be given to the origins of the variation in rates of seclusion.

Rate of seclusion in New Zealand

The findings of this report suggest the rate of seclusion across New Zealand mental health inpatient services in 2015 was nearly 8% of admissions (out of 10,727 inpatient admissions). A slightly higher rate was reported by the *Office of the Director of Mental Health Annual Report 2015* in which 10% of people (out of 7,545 people) were estimated to be secluded.³ The present rate of seclusion as indicated by the two reports (around 8-10%) has been the outcome of steady reduction since 2009, when 19% of people who accessed mental health inpatient services had experienced seclusion (Ministry of Health, 2010a). This suggests that seclusion reduction strategies over the past six years have led to some positive changes in mental health inpatient services, but improvements can still be made.

Variation between DHBs in rates of seclusion

The PRIMHD data showed significantly large variation between the 19 DHBs in rates of seclusion ranging from 2.2% to 23.3%. DHBs were classified into four groups based on their rates of seclusion. Analysis of the groups showed that the highest secluding DHBs had odds of seclusion that were almost 11 times higher than the lowest secluding DHBs. These associations were highly significant and unlikely to be due to chance. Similarly, a recent study found large variations in rates of seclusion between Australian states and territories, as well as individual services (Allan et al., 2017). Thus, variation in rates of seclusion is not an issue that is limited to the New Zealand context.

Identifying the origins of variation in rates of seclusion

Hypothetically, variation in rates of seclusion between DHBs may be attributable to: i) differences in the sociodemographic and clinical characteristics of people accessing services, because some DHBs may have a greater fraction of people accessing services with a higher risk of seclusion, and/or ii) differences between DHBs in clinical practice. It is important to note that these two explanations are not mutually exclusive and both may contribute to the variation in rates of seclusion.

To examine the origins of the variation, the use of PRIMHD data provided insight into the associations between DHB rates of seclusion and the sociodemographic and clinical characteristics of people accessing mental health inpatient services. The findings showed that DHB groups (based on rates of seclusion) were significantly associated with the age, ethnicity (**Māori/non-Māori**), total HoNOS scores, number of bed nights, and MH Act legal status (compulsory treatment/not compulsory treatment) of people accessing services. However, adjusting for these characteristics had no appreciable impact on the variation in rates of seclusion between DHBs. When the sociodemographic and clinical characteristics of people were taken into account, the highest secluding DHBs had odds of seclusion over 11 times higher than the lowest secluding DHBs. Therefore, the

³ The slightly different rates likely reflect the different methods used to calculate seclusion rates. Admissions were used in the current study, while the latter examined the number of people secluded.

findings of this report do not support the assumption that differences in seclusion rates are attributable to the sociodemographic and clinical characteristics of people accessing mental health inpatient services.

Strategies for reducing the use of seclusion

As mentioned previously, changes in seclusion reduction strategies have led to some positive outcomes over the past six years. However, there is a need to discuss the reasons why there is wide variation between DHBs in rates of seclusion (Ministry of Health, 2016). The findings of this study suggest the variation between DHBs is more likely to be attributable to differences in clinical practice around the use of seclusion.

In light of these findings, it is recommended that implementation of the *Six Core Strategies*[®] be reviewed to identify what has been working well to reduce seclusion rates in some DHBs, as well as areas in need of improvement to inform future planning of seclusion reduction initiatives across DHBs. This will require collaboration between stakeholders, clinicians, people accessing mental health services and their families **and whānau**. The *Six Core Strategies*[®] evidence-based framework highlights the key seclusion reduction strategies (Huckshorn, 2006; National Association of State Mental Health Program Directors, 2008; Te Pou o te Whakaaro Nui, 2013b). These strategies include leadership, use of data to inform practice, workforce development (e.g., ensuring the capability of all staff through Safe Practice Effective Communication (SPEC) training programme), reduction tools (e.g., sensory modulation and trauma informed care), debriefing techniques, and the inclusion and leadership of service users and their families at all levels of service delivery.

Within the *Six Core Strategies*[®] framework, leadership (including service user leadership) has been identified as one of the key factors in reducing the use of seclusion. A review of the literature indicates strong local leadership has a bigger impact on reducing the use of seclusion than policy changes and systems-level directives (Scanlan, 2010). While seclusion reduction policies and systems-level directives are necessary and effective, strong local leadership is essential to engage frontline staff and address required changes in service delivery (Scanlan, 2010). In particular, leadership can have a major influence on the attitudes, values, and commitment of frontline staff (Curie, 2005). This is important for leaders to consider because organisational and treatment culture is perceived as a key challenge in seclusion reduction (Happell & Harrow, 2010; Keski-Valkama et al., 2007). Furthermore, leadership from people accessing services and their families is an important strategy in seclusion reduction as it can empower service user perspectives and promote collaborative problem-solving to reduce seclusion (Scanlan, 2010).

In addition to these strategies, the New Zealand adaptation of *Six Core Strategies*[®] emphasised the **importance of cultural leadership to reduce seclusion for Māori people** (Te Pou o te Whakaaro Nui, 2013b). Given the unacceptably high rates of Māori people experiencing seclusion, a key focus on culturally effective responses **in partnership with Māori tāngata whai ora and whānau is required**. Cultural adaptations of the *Six Core Strategies*[®] framework, informed by local research, recommended a range of prevention strategies to reduce **the rates of seclusion for Māori people** (McLeod et al., 2013; Te Pou o te Whakaaro Nui, 2013a; Wharewera-Mika et al., 2016). These recommendations included service user leadership, increasing the capacity of **the Māori workforce** to better match the needs of people accessing services, and use of culturally-appropriate assessments and service delivery (Te Pou o te Whakaaro Nui, 2013a). Furthermore, local research has emphasised the need to increase the

responsiveness of community mental health services to Māori people as it is critical in preventing the need for inpatient admission and seclusion (McLeod et al., 2017; Wheeler, Robinson, & Robinson, 2005).

Outside of the *Six Core Strategies*[®] framework, the *Office of the Director of Mental Health Annual Report 2015* suggested that variation between DHBs may also be due to geographic variation and/or the use of sedating psychotropic medication (Ministry of Health, 2016). Thus far, the wider literature has commonly found that regional variation in rates of seclusion is linked to the location and size of inpatient units (Allan et al., 2017; Husum, Bjørngaard, Finset, & Ruud, 2010; Janssen et al., 2013). For example, an Australian study found rates of seclusion were higher in services that were situated in geographically remote locations and this was suggested to reflect differences in the availability of mental health services and resources (Allan et al., 2017). To address organisational factors that may be difficult to measure and adjust (such as ward ambience, unit size, and location), the *Office of the Director of Mental Health Annual Report 2015* recommended the monitoring of an individual DHB's performance over time (Ministry of Health, 2016). Monitoring and evaluation processes are important for reviewing the progress of seclusion reduction over time, and can be supported by using data collected through PRIMHD and the KPI project.

Limitations

When interpreting the study's findings a number of limitations need to be taken into account. It is important to note that the data used in this study does not represent all seclusion activity as it was based on data captured electronically through PRIMHD. In addition, this report focused on seclusion in adult mental health inpatient services, and excluded people accessing inpatient services from child and adolescent, alcohol and drug, maternal mental health, eating disorders services, and forensics. People with co-existing problems were also excluded from this study. As a result, rates of seclusion may have been underestimated in the current report. The exclusion of forensic services was based on the rationale that they have different models of care and longer lengths of admission for people who are in the justice system. Nonetheless, it is important to consider the rates of seclusion in forensic services, and so it will be worthwhile to examine the data in a subsequent report.

Conclusion and recommendations

While there have been some positive changes in seclusion reduction over the past six years, the findings of this report clearly show that there are differences in the use of seclusion across DHBs. The variation in rates of seclusion between DHBs cannot be attributed to the sociodemographic and clinical characteristics of people accessing services; instead, the variation is more likely to arise from differences in clinical practice around the use of seclusion. In turn, this raises issues about the processes needed to improve the current system. The findings of this report suggest that progress towards further reducing seclusion and minimising variation between DHBs will require a multi-level strategic approach that includes building the capability of the workforce, leadership and organisational development, ensuring sufficient access to best practice resources to implement seclusion reduction initiatives, and ongoing monitoring and evaluation.

Recommendations based on the findings of this report are outlined below.

1. Continued implementation of the *Six Core Strategies*[®] framework, and identifying what has been working well to reduce seclusion and areas for improvement in collaboration with

stakeholders, clinicians, people accessing mental health services and their families and **whānau**.

2. Supporting strong local leadership, including service user leadership at all levels of service delivery.
3. Continued promotion and use of tools, resources, training, and support available for seclusion reduction, including sensory modulation and Safe Practice Effective Communication.
4. A continued **focus on improving outcomes for Māori, strengthening Māori leadership, and** developing culturally effective responses.

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