

Ethnic disparities in the use of seclusion for adult psychiatric inpatients in New Zealand

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ABSTRACT

AIM: This study aims to investigate disparities in seclusion between Māori and non-Māori non-Pacific (nMnP) adults in mental health inpatient units in New Zealand.

METHOD: This study uses data on 7,239 inpatient psychiatric admissions and 782 seclusion events for nine district health boards (servicing 39% of the New Zealand population) for the period 1 July 2008 to 30 June 2010, from a New Zealand Ministry of Health dataset (PRIMHD). We calculate the age-standardised rates of seclusion per monthly inpatient admissions. Regression modelling of seclusion event rate ratios for Māori compared to nMnP adjusted for age, gender, socioeconomic deprivation (NZDep2006), legal status, referral pathway and diagnosis.

RESULTS: Māori psychiatric inpatients are 39% more likely to experience a seclusion episode than nMnP adults in New Zealand. Important contributors to the disparity in seclusion rates between Māori and nMnP were age and legal status on admission. Adjustment for a range of demographic and admission variables accounted for part of the measured disparity between Māori and nMnP (RR 1.33, fully adjusted).

CONCLUSIONS: To reduce seclusion use for Māori, community mental health services responsive to Māori needs are required to prevent the need for inpatient admission, and reduce the acuity of illness where admission is required.

In a seclusion episode, the service user is placed by themselves in an area or room from which they cannot freely exit.¹ The use of seclusion is commonly justified as a way of keeping patients and staff safe on the ward.^{2,3} However, evidence for the value of seclusion as an intervention is lacking.^{4,5} Across the world there has been a movement over the past decade to reduce the use of seclusion and restraint.⁶ Internationally, ethnic and racial disparities in seclusion use have been reported.⁷⁻¹³

The indigenous Māori population (approximately 15% of the total population) have a higher prevalence of mental health problems than the non-Māori population (largely consisting of New Zealand European).¹⁴ In 2011, Māori were found to contribute a higher proportion of specialist mental health service contacts (two-thirds

higher than non-Māori New Zealanders) and a higher proportion of inpatient admissions (one quarter of mental health inpatients are Māori).¹⁵ However, in terms of contact with any health services (eg, community, primary care, specialist services) Māori are considered to be under accessing health services for mental health problems according to need.¹⁴ In New Zealand there have been reported ethnic differences in the use of seclusion, with the indigenous Māori population more likely to be secluded than non-Māori, although previous studies were insufficiently powered to allow adjustment for other factors associated with seclusion (eg, age, gender, diagnosis, severity, etc).^{5,16,17} In this study we aim to expand the limited research base by investigating factors associated with ethnic disparities in the use of seclusion for adults in mental health inpatient units in New Zealand.

Methods

Advisory group

An advisory group was established to contribute towards the identification of variables that might contribute to ethnic disparities, advise on aspects of 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 specifically designed for Māori.

Study sample

This study uses the Programme for the Integration of Mental Health Data (PRIMHD) dataset, a national mental health and addiction services-integrated data collection system, managed and held by the New Zealand Ministry of Health (MoH). The PRIMHD dataset provides information on inpatient psychiatric admissions, including data on seclusion use in district health boards (DHB).

Anonymised data on all inpatient bed-night and seclusion events reported to the NZ MoH PRIMHD dataset was obtained for nine (of 21) DHBs, who were deemed by the MoH to have complete seclusion event reporting over the two-year study period. The nine included DHBs provide services to 38.5% of the New Zealand resident population (based on the 2006 New Zealand Census). The timeframe was the two-year period of 1 July 2008 to 30 June 2010.

The nine included DHBs varied considerably in size and in ethnic population proportions (based on 2006 New Zealand Census data), with four DHBs having more than 15% of their population recorded as Māori (other five DHBs ranged from 5.9 to 10.6% Māori), and two DHBs with relatively high Pacific populations at more than 5% (other seven DHBs: 0.6 to 1.5% Pacific). The nine DHBs combined had an average of 14% of their population identifying as Māori.

Admissions of individuals aged over 18 years were included in the study. To examine seclusion use for general adult psychiatric inpatients, admissions to forensic units, psychogeriatric units and intellectual disability units were excluded.

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

Key variables

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 (excluding periods of leave recorded in the PRIMHD dataset). This definition was used to focus the analysis on actual time spent in the mental health inpatient unit from the patient's point of view.

Seclusion events

For the analyses, seclusion events included the total time spent in seclusion, excluding any breaks that occurred during the seclusion activity. 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 more than two continuous hours.¹

Ethnicity

Individuals were classified into two mutually exclusive groups of Māori and non-Māori non-Pacific (nMnP). Individuals were classified as Māori if Māori was recorded within any of the ethnicity fields in the activity codes table for that admission (a prioritised ethnicity approach).¹⁸ Pacific peoples (7.0% of total admission events) not included in the prioritised Māori group were excluded from the non-Māori (largely New Zealand European) comparator group, as Pacific peoples had similar proportions of seclusion to Māori and could obscure comparisons with majority New Zealand European ethnicity.

Gender and age

Gender was taken from the gender description recorded in the PRIMHD data extract. Service users were categorised into age groups based on age at the time of admission as (in years): 18–24, 25–34, 35–44, 45–54, 55–64 and 65 years and over.

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 (income, employment, qualifications, transport, owned home, living space, communication and support).¹⁹ The domicile code recorded (indicating geographical area of residence) for each admission was mapped to NZDep06 quintiles.

Primary diagnosis on admission

Primary diagnoses on admission (coded within three months of admission) were ordered into eight diagnostic categories. Diagnostic categories in this study were: Schizophrenia (includes Schizophreniform and Schizoaffective disorders); Other psychosis; Bipolar disorders; Depressive disorders; Personality disorders; Substance-related disorders; No axis I/II diagnosis (this is a recording of no diagnosis) and Miscellaneous (all remaining diagnoses).

For admissions and referrals with more than one primary diagnosis, primary diagnoses were prioritised in the order of the list above, and substance abuse (where not the prioritised primary diagnosis) has been counted as a secondary diagnosis for adjustment in the multivariable analyses.

Legal status on admission

Admissions were classified as involuntary if the Mental Health (Compulsory Assessment and Treatment) Act 1992²⁰ was used during the admission with the remaining admissions classified as voluntary.

Referral pathway

Referral pathways on admission were categorised into the following sub-groups: Mental Health; Hospital (non-Psychiatric); General Practitioner; Justice/Police; Self; and Other. As the last four categories were relatively sparse, these were combined into a single category for the calculation of rates and in the multivariable analyses.

Univariate analyses

All calculations of descriptive statistics, 95% confidence intervals and p-values

were performed using Stata 11.2. An alpha of 0.05 was used for considering statistical significance.

Rates of admission/seclusion events

Rates of seclusion events per cumulative month of psychiatric inpatient admission are presented as the number of events per month of cumulative inpatient admission. The numerator in these rate calculations is the number of seclusion events observed for a particular group of patients; the exposure-time denominator is cumulative person time—the summed total of admission durations for all people in that group (excluding leave periods).

Age-standardisation to the 2001 census population of Māori²¹ was performed for calculation of univariate rates of seclusion (reported for Māori and nMnP; along with rate ratios). Age-standardised rates for Māori and nMnP service users are also presented stratified across several demographic and clinical factors.

Multivariable analysis

Regression modelling was performed in Stata 11.2, using a random effects model Poisson regression (xtmepoisson procedure). Random effects were included according to DHB of service user, and included a random intercept term and a random coefficient for the principal comparison (Māori compared to nMnP). These random effects allow for the consideration of heterogeneity across the DHB areas studied for (a) baseline rate of seclusion; and (b) impact of ethnicity on rates of seclusion.

Seclusion rates were modelled according to ethnicity (Māori/nMnP), gender and age group as personal characteristics; NZDep2006 as a measure of socioeconomic deprivation; and legal status on admission, referral pathway, principal diagnosis and secondary diagnosis for alcohol/substance abuse as admission-level characteristics. The fully adjusted model is limited to individuals admitted in the study period who had diagnostic data coded in PRIMHD. To check that our 'diagnosis only' model (Supplementary Table 1) was not biased, we also ran the same model all admissions (regardless of whether a diagnosis had been recorded), and the results were very similar.

Table 1: 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.

Seclusion events per admission	Māori (n=1,944 admissions)		non-Māori non-Pacific (n=5,295 admissions)	
	Frequency	% of admissions	Frequency	% of admissions
No seclusion events	1,648	84.8	4,809	90.8
One	192	9.9	342	6.5
Two	49	2.5	76	1.4
Three	22	1.1	26	0.5
Four or more	33	1.7	42	0.8

*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.

Results

Over the two-year study period between 1 July 2008 and 30 June 2010, there were 1,944 Māori admissions (for 1,245 unique individuals) and 5,295 nMnP admissions (for 3,454 unique individuals) to the nine study DHBs. Where seclusion events occurred during an admission, it was most commonly as a single event (Table 1).

Of all general adult psychiatric inpatient admissions for Māori, 15.2% included at least one seclusion event compared to 9.2% for nMnP admissions ($p < 0.001$). Māori male and female admissions to the inpatient unit were significantly more likely to be secluded than nMnP of the same gender. Of Māori male admissions, 16.7% were secluded compared with 10.7% of nMnP ($p < 0.001$). Of Māori female admissions, 13.3% were secluded compared with 7.6% of nMnP ($p < 0.001$).

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% vs. nMnP 74.4%), with the most common seclusion duration being between 0–8 hours for both groups.

Māori admissions to adult inpatient mental health services were younger and

relatively more deprived than nMnP admissions (not presented). This pattern was also reflected in the secluded Māori population, which was younger (56.9% being aged 34 years or under compared to 45.5% of nMnP) and overrepresented in the highest quintiles (quintiles 4 and 5, relatively more deprived) of socioeconomic deprivation compared to secluded nMnP (Table 2).

The age-standardised rate 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 age-standardised rate of seclusion events per month of psychiatric inpatient admission was significantly higher for Māori female admissions compared to nMnP female admissions, but similar for Māori and nMnP among male admissions.

There was no gradient apparent for Māori in age-specific rates of seclusion. In comparison, the nMnP group showed a gradient by age with decreasing rates of seclusion events with increasing age (Table 2). Māori had higher rates of seclusion per month of psychiatric inpatient admission compared to nMnP for all deprivation quintiles.

Māori had higher rates of seclusion than nMnP admissions across most primary diagnosis groupings (Table 2).

Table 2: Rates and rate ratios of seclusion events per cumulative month of inpatient admission by demographics and admission factors for Māori and non-Māori non-Pacific.

	Māori		Non-Māori non-Pacific		Māori: nMnP rate ratio
	Events	Rate per month (95%CI)	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					
18–24	177	0.40 (0.35–0.47)	194	0.45 (0.39–0.52)	0.89 (0.72–1.10)
25–34	154	0.35 (0.29–0.41)	216	0.30 (0.26–0.34)	1.16 (0.94–1.44)
35–44	132	0.35 (0.29–0.42)	211	0.26 (0.22–0.29)	1.37 (1.09–1.71)
45–54	49	0.27 (0.20–0.36)	168	0.23 (0.20–0.27)	1.19 (0.85–1.64)
55–64	70	0.57 (0.44–0.71)	90	0.21 (0.17–0.26)	2.65 (1.91–3.66)
65 & over	0	-	22	0.12 (0.07–0.18)	-
NZ Dep 2006 Quintile**					
Quintile 1	18	0.42 (0.25–0.67)	70	0.20 (0.15–0.25)	2.12 (1.19–3.61)
Quintile 2	54	0.46 (0.34–0.60)	128	0.28 (0.23–0.33)	1.64 (1.18–2.28)
Quintile 3	78	0.33 (0.26–0.41)	190	0.28 (0.24–0.32)	1.18 (0.89–1.54)
Quintile 4	181	0.44 (0.37–0.50)	363	0.37 (0.33–0.41)	1.19 (0.99–1.42)
Quintile 5	251	0.32 (0.28–0.36)	137	0.17 (0.14–0.20)	1.88 (1.53–2.34)
Primary diagnosis					
Schizophrenia	203	0.38 (0.33–0.43)	214	0.27 (0.23–0.31)	1.41 (1.16–1.72)
Other psychosis	22	0.45 (0.28–0.67)	49	0.40 (0.29–0.53)	1.12 (0.65–1.89)
Bipolar disorder	123	0.79 (0.66–0.94)	198	0.53 (0.46–0.61)	1.50 (1.19–1.89)
Other depressive	12	0.23 (0.12–0.40)	17	0.07 (0.04–0.11)	3.21 (1.40–7.13)
Personality disorder	5	0.75 (0.24–1.74)	12	0.23 (0.12–0.41)	3.19 (0.88–9.72)
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)

*Age standardised to the 2001 census Māori population.

**Quintile 1 is least deprived and Quintile 5 is the most deprived.

Table 3: Modelled seclusion event rate ratios for Māori* compared to non-Māori non-Pacific, sequentially adjusted for demographic and admission factors. Results for patients with recorded diagnostic information (n=6,049).

Model including	Adjusted rate ratio (Māori: nMnP)	95% CI
Crude estimate	1.39	1.05–1.83
Adjusted for age group, gender	1.27	0.95–1.70
+adj for NZDep2006	1.31	0.96–1.80
+adj for legal status on admission	1.32	0.98–1.77
+adj for referral pathway	1.32	0.98–1.77
+adj for principal diagnosis	1.34	0.98–1.84
+adj for alcohol/substance abuse as secondary diagnosis	1.33	0.97–1.81

*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.

Multivariable analyses

Table 3 presents the modelled rate ratios comparing seclusion between Māori with nMnP using sequentially adjusted models to consider the impact of demographic variables (age, gender and NZDep06) and admission factors (referral pathway, legal status and diagnosis on admission) for those admissions with a diagnosis coded (n=6,049). The crude estimate was a 39% higher seclusion rate for Māori compared to nMnP; following adjustment for all of the above sociodemographic and clinical characteristics, this reduced slightly to a 33% higher rate for Māori (RR 1.33, fully adjusted model). As a sensitivity analysis, we also ran the full model for all admissions (n=7,239) and found very similar results to the diagnosis-only model.

In addition to the ethnicity variable, several other factors in the fully-adjusted model (Supplementary Table 1) were significantly associated with the seclusion rate. Service users who were admitted involuntarily under the Mental Health (Compulsory Assessment and Treatment) Act 1992 had higher rates of seclusion than voluntary service users.

Service users referred from non-psychiatric hospital settings had higher seclusion rates than service users referred from mental health services (RR 1.42, 95% CI 1.02–1.97); while service users referred from other settings (including self-referral, general practitioner, police/justice settings) had a lower rate of seclusion than patients referred from mental health settings (RR 0.75, 95% CI 0.57–0.99).

Seclusion rates also differed by primary diagnosis: compared to service users with a diagnosis of schizophrenia as per DSM-IV criteria, seclusion rates were higher among service users with diagnoses for bipolar disorder (RR 2.25, 95% CI 1.92–2.64), personality disorder (RR 1.83, 95% CI 1.10–3.02), other psychosis (RR 1.47, 95% CI 1.12–2.93) and a primary diagnosis of alcohol or substance abuse (RR 1.75, 95% CI 1.22–2.51). Seclusion rates were lower for service users with an 'other depressive diagnosis' (ie, not bipolar disorder; RR=0.64, 95% CI=0.43–0.94).

Discussion

In this study, ethnic disparities between Māori and nMnP were found in the use of seclusion. Māori admitted as inpatients to the psychiatric unit had a 39% higher rate of seclusion. 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.^{16,17}

There is a limited evidence base (internationally and in New Zealand) in terms of what drives differences in seclusion use for indigenous and ethnic minority populations. One previous New Zealand study estimated ethnic differences in seclusion use for Māori compared to non-Māori having adjusted for 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).²² 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, legal status on admission¹¹ and mental

health trust,²³ resulting in no significant differences following adjustment.

In this study, factors that were important contributors to the disparity in seclusion rates between Māori and nMnP were age and legal status on admission. The impact of age on seclusion rates is at least in part the result of Māori having a younger population age structure than nMnP population, as well as the higher rate of seclusion use in younger age groups. 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 33% 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. For example, Māori may have more severe disease on admission, they may be more likely to be admitted to DHBs with higher seclusion use in general or ethnicity itself may have an influence on inpatient treatment. International evidence has suggested that ethnic or racial stereotyping of psychiatric inpatients by healthcare workers may influence management with regard to the use of coercive measures such as seclusion.²⁴

One 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, Health of the Nation Outcomes (HoNOS) behavioural subscale (for those aged 25–34 years) and impairment subscales (for those aged 25–54 years) were found to be significantly associated with the use of seclusion.¹² However, we included or adjusted for proxy measures of acuity, such as the length of admission, primary diagnosis and referral pathway measures.

For both Māori and nMnP, most admissions are through a mental health pathway (50.4% for Māori admissions and 47.4% for nMnP). However, Māori who are admitted through non-psychiatric hospital admissions had 1.4 times the rate of seclusion events as nMnP admissions through the same pathway. This may be the result of differential access to primary care or community mental health services for Māori¹⁴ resulting in more severe illness on presentation.²⁵ 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.

Limitations of the DHB findings

There are a number of limitations to the study findings. This study included a group of nine DHBs (out of a total twenty-one DHBs in New Zealand) who were deemed to have reasonable quality seclusion data reported to the PRIMHD dataset that would be usable for the planned analyses. It is important to note that the DHBs included were not a random sample from all New Zealand DHBs: however, the majority of DHBs included in the study demonstrated a higher rate of seclusion use (unadjusted) for Māori compared to nMnP (not presented).

The variables available for the quantitative analyses were limited by inclusion and completeness in the PRIMHD database. For example, we were unable to include direct measures of acuity of illness on admission (such as HoNOS) despite this being identified in the literature as important to consider.¹²

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. However, 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.

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, differential access to and quality of community care for Māori, staff and organisational factors and features of the ward environment. Future research is required to investigate the role of service-provider level factors in the differential use of seclusion by ethnicity.

In order to reduce the use of seclusion for Māori, high quality community mental health services responsive to Māori needs are required to prevent the need for inpatient admission and to reduce the acuity of illness where admission occurs.

Supplementary Table 1: 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.

		Admissions with diagnosis (n=6,049)	
		Rate ratio	95% CI
Ethnicity	Māori	1.33	0.97–1.81
	Non-Māori non-Pacific	1	[Reference]
Gender	Male	1.07	0.95–1.20
	Female	1	[Reference]
Age group (years)	18–24	1	[Reference]
	25–34	0.81	0.69–0.95
	35–44	0.76	0.64–0.90
	45–54	0.66	0.55–0.80
	55–64	0.65	0.53–0.81
	65+	0.21	0.13–0.34
NZDep06 quintile	1 (least deprived)	1	[Reference]
	2	1.12	0.85–1.48
	3	1.17	0.89–1.53
	4	1.33	1.03–1.71
	5 (most deprived)	0.89	0.68–1.16
Legal Status	Voluntary	1	[Reference]
	<i>Section 11–14</i>	3.80	3.23–4.49
	<i>Section 29–31</i>	2.88	2.40–3.45
Referral pathway	Mental health	1	[Reference]
	Hospital (non-psychiatric)	1.42	1.02–1.97
	Other	0.75	0.57–0.99
Primary diagnosis	Schizophrenia	1	[Reference]
	Bipolar disorder	2.25	1.92–2.64
	Personality disorder	1.83	1.10–3.02
	Other depressive	0.64	0.43–0.94
	Other psychosis	1.47	1.12–1.93
	Alcohol/substance abuse	1.75	1.22–2.51
	Miscellaneous	1.32	1.00–1.74
	No axis I/II condition	2.41	1.87–3.10
Secondary diagnosis substance abuse	Present	1.16	1.00–1.35
	Absent	1	[Reference]

Competing interests:

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