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Trends in child and adolescent discharges at a New Zealand psychiatric inpatient unit between 1998 and 2007

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Abstract

Aim This paper describes demographic and diagnostic data for young people discharged from a regional child and adolescent psychiatric inpatient unit in New Zealand (NZ) over a 10-year period (January 1998–December 2007).

Method Data was obtained from an electronic database, including the number of discharges, demographic characteristics (age, ethnicity, gender) and clinical data (primary diagnosis at discharge, length of stay).

Results Results showed a significant increase in number of discharges over time but no significant change in length of stay. Significant linear trends of increasing proportions of psychotic disorders and decreasing proportions of affective, bipolar affective, personality traits, suicidal/self-harm, and externalising behaviour disorders were observed. Results also found a significant decrease in the proportion of discharges of young people of European descent and a significant increase in proportion of discharges of those of Māori descent.

Conclusions This study provides evidence of changing patterns in demographic and diagnostic variables in a NZ child and adolescent inpatient population over a 10-year period. The findings have important implications for future service delivery in child and adolescent psychiatric inpatient settings.

Research on child and adolescent inpatient mental health populations can provide useful information on changes in service utilisation, psychiatric diagnoses, and demographic variables, and can have implications for service planning with regard to young people's psychiatric inpatient care.

There has been little research in New Zealand (NZ) on trends, demographic and illness variables in child and adolescent inpatient populations. A Christchurch study gathered admission data over an 18-month period in an adolescent inpatient unit in the South Island.[1] In a sample of 72 subjects the most common diagnosis was mood disorder (54%) followed by anxiety or adjustment disorder (25%) and major psychosis (21%).[1] Unfortunately, no demographic information (gender, ethnicity) was reported in this study.

In terms of ethnic differences, the available evidence from the few NZ studies of inpatient populations suggests an over-representation of admissions for young Māori. A 25-year longitudinal study of adolescents looked at, among other things, ethnic identification and mental health problems.[2] The authors described increased rates of psychiatric disorder amongst Māori youth (age 18–25 years)—depression, anxiety and substance dependence were all over-represented in the 18–21 year age group, in comparison to non-Māori.[2]

A study on a cohort of Māori and non-Māori patients (aged between 15 and 45) admitted to inpatient services in Otago between 1990 and 1992 found Māori were over represented among first admissions.[3] Māori were also found to be a more disadvantaged group with respect to financial support, education and other health problems.[3] These findings are consistent with adult studies which have found that patterns of diagnosis, trends over time and use of psychiatric services in adult patients also vary between different ethnic groups in NZ, and data suggest that rates of admission to hospital are higher for Māori than non-Māori.[4]

A retrospective file review of more than 900 adult patients from three Auckland acute inpatient psychiatric units reported that, based on the community population, Māori admissions were double the expected rate and Asian admissions were lower than expected.[5] Compared to European admissions, Māori, Pacific, and Asian admissions were all more likely to have a diagnosis of a psychotic disorder.[5]

Given the lack of NZ studies on child and adolescent psychiatric inpatient populations, the current retrospective analysis tried to address this gap by depicting trends in sociodemographic and diagnostic characteristics in a NZ child and adolescent inpatient unit over a period of 10 years between 1998 and 2007. It was also hoped that this information could then be used to inform future service planning.

Method

The study setting was an acute child and adolescent psychiatric inpatient unit with 23 beds, based in a public health service in the North Island. The unit includes a small eight bedded locked section, with minimal outdoor access and no capacity for family/whānau to stay. The rest of the unit is 'open', and more spacious, with access to a garden and activity areas. Admissions cover the age range 0–18 years, but the vast majority are for adolescents aged 13–18 years.

The geographic area served is large and encompasses both rural and urban regions. The population served is approximately 2 million, with an ethnically diverse mix including most of the Pacific Island population in NZ and a growing number of people of South East Asian descent. The model of practice used is bio-psycho-social with a strong focus on family/whānau participation and continuity of care with the referring service.

Ethical approval was obtained from the Northern Y Regional Ethics Committee and the relevant health service. All consecutive discharges between 1st January 1998 to 31st December 2007 were identified on an electronic database. Repeat discharges were examined and any temporary discharges (patients readmitted within 14 days) were re-coded as one continuous inpatient admission and one discharge. The data obtained from the electronic database included the number of discharges, demographic characteristics (age, ethnicity, gender) and clinical data (primary diagnosis at discharge, length of stay).

For the purpose of the descriptive analyses, primary diagnoses at discharge were grouped into the following diagnostic groups: Psychotic Disorders (incl. psychosis, schizophrenia), Affective Disorders (incl. depression, dysthymia), Anxiety Disorders (incl. phobia, post traumatic stress disorder, obsessive compulsive disorder, adjustment disorder), Bipolar Affective Disorder, Developmental Disorders (incl. pervasive development disorder, attention deficit hyperactivity disorder, autistic spectrum disorder), Eating Disorders (incl. anorexia nervosa, eating disorders not otherwise specified), Externalising Behaviour Disorders (incl. disruptive behaviour disorder, oppositional defiant disorder, conduct disorder), Substance Abuse Disorders, Suicide/Self-harm, Personality Traits, Other and None.

Summary statistics (proportions, means/medians, and 95% confidence intervals) were calculated for the distributions of demographic and clinical data, both overall and on a yearly basis. Trends across time for changes in annual discharge numbers were investigated by regression analyses. Trends across time for changes in annual patient proportions (and therefore controlled for any entire sample change in numbers) were investigated by the chi-square based linear trend test in the Stats Direct Version 2.7.8.software (Stats Direct Ltd, UK).

Results

There were 1109 discharges in the 10-year review period. This constituted 899 individual people, with 150 of those individuals having more than one discharge from the unit. In terms of demographic variables, 50.6% (n=561) of the discharges involved a female patient and the mean age was 15.6 years (range 2.6–19.7 years).

Over half of all discharges (53.4%, n=588) involved young people who identified as European, with the remaining sample identifying as NZ Māori (29.1%, n=321), Pacific Islander (7.4%, n=82), Asian (7.1%, n=78), or Other (3.0%, n=33). Ethnicity was not recorded for seven discharges. Māori young people were over-represented in the discharges and Pacific Island young people under-represented compared to the ethnic proportions of the relevant age group of the catchment area of the unit (Table 1, p<0.0001).

Table 1. Ethnic proportions of relevant age group in catchment area (Census data) compared to unit population

Ethnicity	Census 1996–2006 %	Unit population % (95% CI)
European	54.8	53.4 (50.4 to 56.3)
NZ Māori	21.5	29.1 (26.5 to 31.9)
Pacific Islander	12.0	7.4 (6.0 to 9.1)
Asian	8.7	7.1 (5.7 to 8.7)
Other	3	3.0 (2.1 to 4.2)

The annual changes in the numbers and proportions of discharges from 1998 to 2007 are shown in Tables 2 and 3. Table 2 shows the number of discharges over 10 years increased, with 68% more discharges in 2007 compared to 1998, and a linear trend of eight additional discharges per year (p=0.007). No significant trend of change in gender proportions was observed reflecting similar rates of male and female patients over the 10-year period.

Changes over time were observed for ethnicity, with a significant decrease in the proportion of European patients (p=0.002) and a significant increase in the numbers and proportions of NZ Māori patients (p=0.0004 and p=0.0001). However, there was little change over time in discharges from young people of Pacific Island, Asian or Other ethnicity.

In terms of clinical variables, Table 3 shows that the majority of discharges received a primary diagnosis of either Psychosis (34%, n=382), Anxiety (16%, n=181) or Affective disorders (15%, n=167). More than 50% of the total number of both Māori (321) and Pacific Island (82) patients was discharged with a diagnosis of psychosis compared to significantly smaller proportions in the other ethnic groups (p=0.0001) (data not shown). Psychosis was the most common diagnosis for Māori and Pacific Island patients in this child and adolescent psychiatric inpatient setting.

Table 2. Number of discharges and demographic characteristics of the unit population between 1998 and 2007

Variables	1998–2007		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	P value
	n	%	n (%)										
Discharges	1109		79	82	78	75	129	127	157	115	134	133	0.007
Gender													
Female	561	50.6	40 (51)	40 (49)	35 (45)	39 (52)	63 (49)	61 (48)	75 (48)	71 (62)	71 (53)	66 (50)	0.001 0.33
Male	548	49.4	39	42	43	36	66	66	82	44	63	67	0.05
Ethnicity													
European	588	53.4	43 (56)	49 (60)	40 (51)	43 (57)	82 (64)	73 (57)	86 (55)	56 (49)	61 (46)	55 (43)	0.21 0.002
NZ Māori	321	29.1	14 (18)	23 (28)	15 (19)	18 (24)	29 (23)	39 (31)	49 (31)	40 (35)	50 (37)	44 (34)	0.0004 0.0001
Pacific Islander	82	7.4	5 (6)	1 (1)	12 (15)	11 (15)	11 (9)	7 (6)	8 (5)	7 (6)	8 (6)	12 (9)	0.27 0.68
Asian	78	7.1	8 (10)	8 (10)	9 (12)	2 (3)	6 (5)	7 (6)	7 (4)	7 (6)	11 (8)	13 (10)	0.19 0.71
Other	33	3.0	7 (9)	1 (1)	2 (3)	1 (1)	0 (0)	1 (1)	7 (4)	5 (4)	4 (3)	5 (4)	0.47 0.98

Table 3. Clinical Characteristics of the unit population between 1998 and 2007

Variables	1998–2007		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	P value
	n	%	n (%)										
Disorder													
Psychotic	382	34.4	21 (27)	17 (21)	19 (24)	24 (32)	43 (33)	50 (39)	58 (37)	38 (33)	58 (43)	54 (41)	0.001 <0.0001
Affective	167	15.1	16 (20)	16 (20)	15 (19)	12 (16)	23 (18)	19 (15)	12 (8)	12 (10)	19 (14)	23 (17)	0.43 0.05
Anxiety	181	16.3	9 (11)	18 (22)	9 (12)	9 (12)	19 (15)	17 (13)	24 (15)	28 (24)	20 (15)	28 (21)	0.005 0.09
Developmental	64	5.8	2 (3)	5 (6)	7 (9)	1 (1)	7 (5)	10 (8)	11 (7)	6 (5)	10 (7)	5 (4)	0.15 0.70
Bipolar Affective	122	11.0	11 (14)	11 (13)	11 (14)	11 (15)	16 (12)	13 (10)	19 (12)	9 (8)	11 (8)	10 (8)	0.97 0.02
Eating	63	5.7	4 (5)	4 (5)	3 (4)	8 (11)	6 (5)	5 (4)	10 (6)	12 10)	5 (4)	6 (5)	0.16 0.96
Other	60	5.4	1 (1)	4 (5)	3 (3)	1 (1)	1 (1)	5 (4)	6 (4)	5 (4)	3 (2)	0 (0)	0.66 0.62
Personality Trait	19	1.7	3 (4)	1 (1)	1 (2)	3 (4)	2 (2)	4 (3)	3 (2)	1 (1)	1 (1)	0 (0)	0.31 0.05
Alcohol & Other Drug	18	1.6	1 (1)	2 (2)	1 (1)	0 (0)	3 (2)	1 (1)	5 (3)	2 (2)	1 (1)	2 (0)	0.46 0.97
Suicide & Self Harm	6	0.5	3 (4)	1 (1)	1 (1)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0.03 0.001
Externalising Behaviour	50	4.5	8 (10)	2 (2)	3 (4)	6 (8)	9 (7)	2 (2)	8 (5)	2 (2)	6 (4)	4 (4)	0.80 0.06
"None"	9	0.8	0 (0)	1 (1)	6 (8)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	1 (1)	0.46 0.02

A linear trend of increasing proportions of discharges of Psychotic disorders ($p<0.0001$) was observed. Linear trends of decreasing proportions were observed for Affective disorders ($p=0.05$), Bipolar Affective disorders ($p=0.02$), Personality Trait disorders ($p=0.05$), Suicidal/Self Harm ($p=0.001$), Externalising Behaviour disorders ($p=0.06$) and a diagnosis of "None" ($p=0.02$). There were no significant linear trends in proportions of other diagnostic groups. In terms of actual numbers, there were linear trends of increasing numbers of discharges of Psychosis ($p=0.001$) and Anxiety ($p=0.005$) at rates of five and two additional discharges per year, respectively.

There was little gender difference in the changes over time across diagnoses (data not shown), with the exception of anxiety, which in females increased on average 1.4% annually as a proportion ($p=0.01$), whereas in males there was a trend of essentially no change ($p = 0.65$). Over 90% of discharges had a Length of Stay (LOS) of less than 90 days across all years and there was no significant change over time.

Discussion

This study describes the demographic and clinical characteristics of young people admitted to a NZ adolescent psychiatric inpatient unit (public health facility) over a 10-year period. The findings suggest that the unit's population has changed substantially over the last 10 years, with a marked increase in the number of discharges (which equates to number treated) over time. This increase may reflect the increase in population for the unit catchment area.

Other key findings were the significant linear trends of increasing proportions of psychotic disorders and decreasing proportions of affective, bipolar affective, personality traits, suicidal/self-harm, and externalising behaviour disorders. One explanation for these observed trends may be related to an increase in more severe presentations over time, combined with increased availability of community services in NZ for less severe presentations resulting in a decrease of some of the other diagnostic groups.

Community teams have grown in size and resourcing, and there has also been the introduction of approaches such as Cognitive Behaviour Therapy, Dialectical Behavioural Therapy and Intensive Clinical Support Services that have kept young people with mental health issues in the community for longer. Another explanation for the changes in diagnostic categories over time could be related to the reported proportional increase of young people of Māori descent in the current sample, for whom the most common diagnosis was in fact psychosis. However, due to the fact that this was a retrospective study, we can only hypothesise about the potential factors that may have contributed to these changing trends in illness variables. The results could also reflect changes in diagnostic practice, admission criteria, or actual changes in illness prevalence and further research is needed to clarify reasons for these observed findings.

Ethnic differences in the proportion of discharges included a decrease in discharges of young people of European descent compared to an increase in those of Māori descent. In tandem, there was an over-representation of young Māori being admitted to the unit compared to the catchment population. These findings are similar to results from both NZ adult[4,5] and adolescent[2] studies, yet the reasons for this over-representation are unclear.

Some authors have suggested that the elevated risk of mental disorder among young Māori may be explained by young Māori tending to come from socially disadvantaged backgrounds and having higher exposure to childhood adversity.[2,3] Another explanation for increased rates of psychiatric disorder among Māori youth may be related to substance abuse; however, substance use was not robustly recorded on the database used for this study. Young Māori males have been found to have an increased use of cannabis compared to non Māori,[6,7] and the development of cannabis dependence has been associated with increased rates of psychotic symptoms in young people in NZ.[8]

Substance misuse has been associated with earlier onset of psychosis, and cannabis appears to confer an increased likelihood of developing schizophrenia in biologically vulnerable individuals.[9] Swadi and Bobier reported that 64.5 % of an inpatient youth sample had co-morbid substance use, and that 80% of those with a psychotic illness had used substances.[1] While the scope of the current project did not allow collection of information on substance use, socioeconomic status and exposure to childhood adversity, we strongly recommend and support Kaupapa Research is carried out in this area.

The initial findings from this study suggest significant increases in the number of young people seen in the unit, significant trends in certain diagnostic categories, and significant ethnic differences in the proportion of discharges. These findings have important clinical and service implications. There is an imperative to provide culturally appropriate and acceptable services with adequate resources to engage and work with young people and their families. This could for example include providing whānau accommodation within the unit.

Given the changing nature of admissions to this inpatient unit, issues such as staffing ratios and areas of expertise may need to be reviewed to reflect the increasing complexity and severity of patients' presentations and needs. There are also important implications for the design and resourcing of the unit, given the increase in young people presenting with acute psychosis. This could include providing an intensive care area with a higher staff presence and increasing space in the inpatient unit for low stimulus areas.

The findings from this retrospective study are limited by the extent and accuracy of the original data sources. Diagnostic data originated from a number of different service based clinicians, which may be less reliable than data from structured diagnostic interviews completed by researchers. This study included only primary diagnoses, and as such did not capture the full range of clinical co-morbid diagnoses. Similarly, definitions and/or identification of ethnicity may have varied over time, potentially influencing the size or trend in ethnic groups. Prospective study design using structured interviews with clear definitions of ethnicity could reduce these limitations.

Another limitation is that this study's findings are based on a group of young people from a particular birth cohort residing in the northern half of the north island. The extent to which the results based on this group can be generalised to other parts of NZ needs to be determined. A final limitation is that it is as yet unclear whether the findings from this study reflect true changes in diagnostic or demographic trends or that the results reflect contextual changes such as diagnostic practice changes in

admission criteria, or access to mental health care. Further research needs to include systematic prospective studies using standardised instruments in order to more rigorously investigate trends in child and adolescent discharges in NZ inpatient units.

Despite the limitations, this study has demonstrated the unique demographic and diagnostic variables of a child and adolescent acute inpatient population, and provided the first information on changing patterns in these variables in a NZ setting. In an era of limited resources, such information is crucial for clinicians, managers and decision makers to assist with clinical and service planning in child and adolescent psychiatric inpatient settings.

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