Mental health–related callouts to the ambulance service in Aotearoa New Zealand: a descriptive analysis

Gabrielle Harding, Sarah Fortune, Rodrigo Ramalho, Andrew Swain, Aroha Brett, Bridget Dicker

ABSTRACT

AIMS: This study aimed to determine the association between demographic and clinical characteristics of mental health–related callouts to the ambulance services in Aotearoa New Zealand, focussing on differences among Māori, Pacific peoples and non-Māori non-Pacific peoples (NMNPP).

METHODS: A retrospective cross-sectional study analysed routinely collected data from electronic patient report forms between 1 July 2022 and 30 June 2023. Mental health–related callouts were identified using clinician-coded impressions from the Aotearoa New Zealand Paramedic Care Collection.

RESULTS: Of 26,847 callouts, a higher proportion involved individuals under the age of 24 among Māori (31.9%) and Pacific people (29.3%) compared to NMNPP (19.1%) ($p<0.001$). Callout proportion was higher in the most deprived areas, particularly among Māori (47.7%) and Pacific peoples (49.9%) versus NMNPP (24.5%) ($p<0.001$). Of total individual callouts, 15.8% presented more than once, with a higher proportion among Māori.

CONCLUSIONS: This study demonstrates an association between ethnicity, deprivation and mental health–related ambulance callouts, with Māori and Pacific populations in deprived areas experiencing proportionately higher callouts. Findings highlight the need for culturally responsive interventions and equitable access to care. Ambulance data can inform policy and monitor mental health trends.

Mental health conditions are common in Aotearoa New Zealand, affecting individuals across all communities. Globally, one in eight individuals is affected by a mental health condition, most commonly depression and anxiety.[1] The most recent Aotearoa New Zealand based prevalence study, conducted in 2006, suggested that 38.5% of the population met the criteria for one or more mental health condition.[2] In the 2023/2024 New Zealand Health Survey, 19.1% of adults reported moderate levels of psychological distress and 13% experienced high or very high levels of psychological distress.[3] In addition to the widespread prevalence of mental health conditions, there are disparities in both access and quality of mental health services available to Māori and Pacific peoples in Aotearoa New Zealand.[4] For mental health conditions, Māori have higher rates of being undiagnosed, admission to hospital and poorer outcomes.[5] Pacific peoples also have higher rates of mental health conditions but lower rates of mental health service access compared to other ethnicities.[6]

Recent health sector reforms in Aotearoa New Zealand highlight the need to strengthen mental health services. The 2018 Government Inquiry into Mental Health and Addiction, He Ara Oranga, called for a paradigm shift: from crisis response, described as the "*ambulance at the bottom of the cliff*", toward early intervention, community-based care and an equity focus.[7] The establishment of Te Aka Whai Ora – Māori Health Authority ensured Māori leadership in health service design and delivery in response to Te Pae Tata, the Interim New Zealand Health Plan.[8] However, the recent disbanding of Te Aka Whai Ora – Māori Health Authority raises concern over the Crown's commitment to Te Tiriti o Waitangi/the Treaty of Waitangi obligations and equitable health outcomes.[9]

Ambulance clinicians may be the first point of contact for individuals experiencing a mental health–related problem. Frontline ambulance services around Aotearoa New Zealand operate under the same *Clinical Procedures and Guidelines* authored by the National Ambulance Sector Clinical Working Group. Ambulance officers have a range of medications in their scope of practice and the ability to refer to general practitioners, urgent care centres or transport to emergency departments.[10] There have been increasing numbers of mental health calls to emergency services.[11,12] To reduce pressure on police and ambulance

services, telehealth mental health services have been expanded. At the same time, police have signalled their intention to reduce involvement in mental health–related callouts.[13,14]

Although international studies have explored mental health–related ambulance callouts, there is currently no Aotearoa New Zealand–based literature on this topic, highlighting a gap in understanding local, demographic, clinical and service use patterns.

The relatively limited international literature suggests that mental health–related ambulance callouts are common and often involve younger patients, females, frequent presentations and limited pre-hospital intervention.[15–19] These findings demonstrate the complexity associated with mental health presentations, reinforcing the need for locally relevant data.

This study aimed to address the gap by determining the association between demographic and clinical presentations of mental health–related callouts to the ambulance service among Māori, Pacific peoples and non-Māori non-Pacific peoples (NMNPP).

Methods

Study design

The study was a retrospective, observational, cross-sectional design using routinely collected data from electronic patient report forms (ePRFs) from 1 July 2022 to 30 June 2023. Mental health–related callouts were identified through clinical impression codes documented by the attending ambulance clinicians in the ePRF. When an individual dials 111, calls are triaged using the Medical Priority Dispatch System (MPDS) and a response level is assigned, ranging from non-urgent to a lights-and-sirens response.[20] This study does not include inter-hospital transfers, or mental health–related calls triaged to telehealth services. Emergency ambulance services are primarily provided by Hato Hone St John (covering 90% of the population) and Wellington Free Ambulance (serving 10% in the Wellington region).[20] These services cater to approximately 5.2 million people and incorporate rural and urban locations.[21]

Eligibility criteria

Observations were included if the attending ambulance clinician selected one of six mental health–related terms as either the primary or secondary clinical impression, as recorded in the ePRFs (Table 1). Cases were excluded if no ambulance attended the scene or if the clinical impression did not include any of the six specified mental health terms. However, if a patient presented with a mental health condition alongside a non-included clinical impression (e.g., alcohol intoxication) the case was still included. Notably, our selection of six mental health–related conditions did not encompass the terms listed as "Not included" in Table 1.

Data sources

The main data source for this study was the Aotearoa New Zealand Paramedic Care Collection (ANZPaCC). Both ambulance services routinely use electronic ePRFs to collect clinical and demographic data during patient attendance and are required to meet HISO 10052:2015 Ambulance Care Summary Standards.[22] Clinical terms are standardised using SNOMED Clinical Terms (SNOMED CT), which the attending ambulance clinician selects. The ANZPaCC dataset is managed by both Wellington Free Ambulance and Hato Hone St John, ensuring data privacy and integrity through de-identification processes.[22,23]

Table 1: Inclusion and exclusion criteria for mental health–related clinical impressions.

Inclusion	Clinical impressions
Included	Mental health problem, intentional poisoning, suicidal, self-harm, hanging, anxiety
Not included	Abnormal behaviour, accidental poisoning by drug (ACC), acute confusion, acute drug intoxication, agitated state, agitation of unknown cause, alcohol abuse, alcohol intoxication, altered level of consciousness (ALOC), confusion, delirium, dementia, drug withdrawal, hallucinations, laceration, poisoning of unknown intent, presentation for social reasons

Measures

Ethnicity was the independent variable, categorised into three groups: Māori, Pacific peoples and NMNPP. These classifications follow single ethnicity prioritisation as outlined in the minimum standards of ethnicity data by Ministry of Health – Manatū Hauora in HISO 10001:2017.[24] The level of socio-economic deprivation was measured using the meshblocks within the New Zealand Deprivation Index 2018 (NZDep18).[25] Status codes assigned by ambulance clinicians are as follows: zero (deceased), one (immediate threat to life), two (serious threat to life), three (potential threat to life) and four (no threat to life). The number of mental health–related callouts was tracked using a unique encrypted identifier (encrypted National Health Index, NHI). This allowed us to determine the number of repeat callouts to the ambulance services over the year-long period.

Data analysis

All descriptive statistics were analysed using IBM SPSS Statistics, version 29.0.2.0. We retained all the available data, but for variables with missing data we used pairwise deletion. This means that any data points with missing values were excluded from the specific analyses involving those variables, resulting in smaller denominators for those calculations.

Ethics

Māori oversight was provided through consultation with Hato Hone St John's Māori Responsiveness Team, in line with Te Tiriti o Waitangi and the principle of rangatiratanga. This ensured that Māori had meaningful input and authority over the relevance and direction of the study.

This study was approved by the Northern B Health and Disability Ethics Committee. Reference: Aotearoa New Zealand, Paramedic Care Collection (ANZPaCC), 2022 FULL 13415.

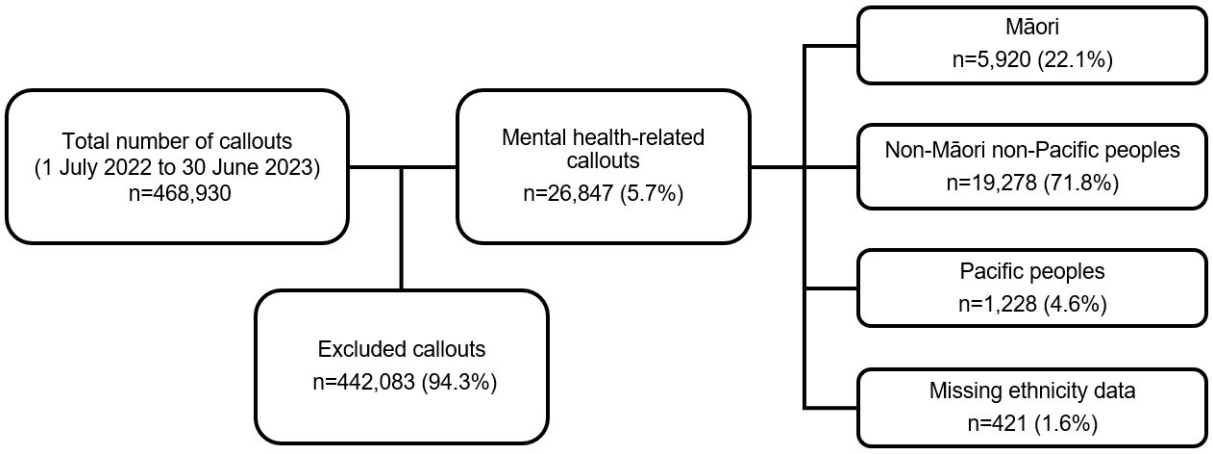
Results

In the period from 1 July 2022 to 30 June 2023 there were a total of 468,930 callouts, of which 26,847 callouts met inclusion criteria (Figure 1). Missing data constituted less than 4% for all variables (Appendix Table 1). The total number of mental health–related callouts were 5,920 (22.1%) for Māori, 1,228 (4.6%) for Pacific peoples and 19,278 (71.8%) for NMNPP.

Demographic characteristics

Among all individuals presenting with a mental health–related callout, 22.4% were 24 years and under, 30.9% were aged 25 to 44, 24.4% were 45 to 64 years and 22.2% were 65 years or older (Table 2). There was a significant difference in the proportion of mental health callouts among younger Māori and Pacific peoples, with 31.9% and 29.3% respectively being under the age of 24, compared to 19.1% among NMNPP (p<0.001). Similarly, there was a significantly higher proportion of mental health callouts in the 25–44 age group that were for Māori (39.7%) and Pacific peoples

Figure 1: Distribution of mental health–related callouts by ethnicity in the dataset.



(37.6%) compared to NMNPP (28.8%) (p<0.001).

In terms of sex differences, 64.3% of all mental health callouts were among females and 35.7% among males, with no significant differences across the three ethnicity groups (p=0.092). Specifically, the proportions of mental health callouts among females were 63.3% for Māori, 62.9% for Pacific peoples and 64.7% for NMNPP.

Nearly one-third (30.8%) of mental health callouts occurred in the most deprived quintiles (9 and 10), with the highest proportions among Māori (47.7%) and Pacific peoples (49.9%), compared to 24.5% among NMNPP. There was a trend of higher mental health callouts in areas of greater deprivation for Māori and Pacific peoples, with lower proportions in less deprived areas. The association between NZDep18-quintile and ethnicity was statistically significant (p<0.001) (Table 2).

Table 2: Demographics of mental health–related callouts.

		Total mental health–related callouts (N=X)		**Māori**		**Pacific peoples**		**Non-Māori/ non-Pacific peoples**		**Pearson Chi-squared p-values***
Total	Missing ethnicity N=421(1.6%)	N	%	N	%	N	%	N	%	
		26847	100%	5920	22.1%	1228	4.6%	19278	71.8%	
Age	≤ 24	5821	22.4%	1836	31.9%	352	29.3%	3633	19.1%	<0.001
	25–44	8020	30.9%	2284	39.7%	452	37.6%	5284	27.8%	
	45–64	6334	24.4%	1176	20.4%	283	23.5%	4875	25.7%	
	≥65	5762	22.2%	459	8%	115	9.6%	5188	27.3%	
Sex	Female	16926	64.3%	3733	63.3%	772	62.9%	12421	64.7%	0.092
	Male	9410	35.7%	2165	36.7%	456	37.1%	6789	35.3%	
Location type	Home	20703	78.3%	4456	75.3%	984	80.1%	15263	79.2%	<0.001
	Healthcare facility	1244	4.7%	222	3.8%	40	3.3%	982	5.1%	
	Other	4479	16.9%	1242	21%	204	16.6%	3033	15.7%	
Rurality	Urban	21125	81%	4607	78.7%	1142	93.8%	15376	80.9%	<0.001
	Rural	4960	19%	1244	21.3%	75	6.2%	3641	19.2%	
NZDep18 quintile	1 and 2	2894	11.2%	297	5.2%	73	6%	2524	13.4%	<0.001
	3 and 4	3865	15%	512	8.9%	106	8.8%	3247	17.2%	
	5 and 6	4872	18.8%	829	14.5%	146	12.1%	3897	20.6%	
	7 and 8	6241	24.2%	1354	23.6%	281	23.2%	4606	24.4%	
	9 and 10	7960	30.8%	2734	47.7%	604	49.9%	4622	24.5%	

*p<0.05 is significant; $\chi 2$ test for nominal values. Denominator variations are due to <4% variable-specific missing data.

Clinical characteristics

Final clinical status analysis revealed similar statistics across the three ethnicity groups for both status zero and status one mental health–related callouts. Specifically, the proportions for status zero were 1.1% among Māori, 0.9% among NMNPP and 0.7% among Pacific peoples. For status one, the proportions were 1.8% among Māori, 1.5% among NMNPP and 1.4% among Pacific peoples. However, there was a slight difference in the proportions for status two; Pacific peoples had a lower proportion at 5.8% compared to 7.8% for both Māori and NMNPP. For status three and four, Pacific peoples had a slightly higher proportion at 92.1%, while Māori had 89.3% and NMNPP had 89.9% (p=0.045).

Analysis showed a statistically significant association between transport status and ethnicity (p<0.001). Of the total cases, 67.2% were transported by the ambulance services and 32.8% were not. Māori had a higher proportion of transportation by ambulance at 69.9%, compared with NMNPP (66.5%) and Pacific peoples (63.9%) (p<0.001).

For repeat calls, 19,801 cases were valid, with a statistically significant association between repeat calls and ethnicity (p<0.036). In the year-long dataset, 84.2% of mental health–related callouts were non-repeating. Of the total patients, 9.8% presented twice, 2.8% presented three times and 3.2% presented four or more times. Pacific peoples had a lower proportion of patients presenting four or more times (2%) compared to Māori (3%) and NMNPP (3.3%). Pacific peoples also had fewer patients presenting three times (1.6%) compared to Māori (2.7%) and NMNPP (2.9%). Māori had a higher proportion of patients presenting twice (10.2%) compared to NMNPP (9.7%) and Pacific peoples (9.1%).

Discussion

This study explored the associations between demographic and clinical presentations and mental health–related callouts to emergency ambulance services among Māori, Pacific peoples and NMNPP in Aotearoa New Zealand. The total number of mental health–related callouts during the study period was 26,847. Key findings indicate disproportionately high rates of mental health–related callouts among younger Māori and Pacific peoples compared to younger NMNPP. Female patients accounted for over half of callouts across all ethnicities. The data also highlighted concerning trends, such as higher proportions of callouts in areas of lower socio-economic deprivation for Māori and Pacific peoples. Additionally, the study revealed that most callouts were of low acuity, with a notable proportion of repeat callouts, suggesting unmet need for mental health care.

In regards to sex differences, females constituted 64.3% of the callouts, consistent with findings from Australian ambulance literature.[15,17,18] This contrasts the higher suicide rates among males in Aotearoa New Zealand.[26] Data from the 2023/2024 New Zealand Health Survey show that very high psychological distress was more prevalent among females than males, with Māori females disproportionately affected.[3] Despite being more likely to consult a healthcare professional in the last 12 months, females aged over 15 years reported a higher unmet need for mental health services than men.[3] Ataera-Minster et al. identified a higher prevalence of diagnosed mental disorders and psychological distress among Pacific women compared to Pacific men.[27] This contrasts Te Rau Hinengaro's earlier findings, which found no significant difference.[2,27] The authors suggest the discrepancy may reflect sex differences in self-reporting, service presentation and unconscious gender bias in clinical assessment.[27] Visibility in this study does not equate to adequate mental health care for women, nor does lower proportions of male callouts imply lower need. These patterns may reflect differences in help seeking, gendered perceptions of distress, or potential biases in clinical decision making by ambulance clinicians. While these factors are not measured in this study, they warrant further investigation.

Regarding age, the study identified that younger Māori and Pacific peoples had higher proportions of mental health–related ambulance callouts, aligning with the broader context of mental health statistics and socio-economic deprivation in Aotearoa New Zealand.[28] Over a third of young adults in Aotearoa New Zealand face socio-economic deprivation, which is linked to increased depression, anxiety and self-harm.[28,29] These factors, combined with barriers to accessing services, contribute to the higher proportion of callouts among younger individuals.[28] Recent data from the 2023/2024 New Zealand Health Survey shows the unmet need for professional mental health or substance use support has increased, has disproportionately affected Māori and Pacific peoples and is highest among those 25–34 years.[3]

Socio-economic deprivation significantly impacts mental health callouts, with higher

Table 3: Clinical characteristics of mental health–related callouts.

		Total mental health–related callouts (N=X)		Māori		Pacific peoples		Non-Māori/non-Pacific peoples		Pearson Chi-squared p-values*
Total		N	%	N	%	N	%	N	%	
Missing ethnicity N=421(1.6%)		26,847	100%	5,920	22.1%	1,228	4.6%	19,278	71.8%	
Final clinical status	0	241	0.9%	66	1.1%	9	0.7%	166	0.9%	0.045
	1	409	1.5%	104	1.8%	17	1.4%	288	1.5%	
	2	2,034	7.7%	461	7.8%	71	5.8%	1,502	7.8%	
	3 and 4	23,739	89.8%	5,288	89.3%	1,131	92.1%	17,320	89.9%	
Patient transported	Not transported by ambulance	8,677	32.8%	1,784	30.1%	443	36.1%	6,450	33.5%	<0.001
	Transported by ambulance	17,746	67.2%	4,135	69.9%	785	63.9%	12,826	66.5%	
Repeat presentations**	1	16,681	84.2%	3,780	84.2%	862	87.2%	12,039	84.0%	0.036
	2	1,942	9.8%	456	10.2%	90	9.1%	1,396	9.7%	
	3	553	2.8%	120	2.7%	16	1.6%	417	2.9%	
	≥4	625	3.2%	133	3.0%	20	2.0%	472	3.3%	
Repeat presentations**	>1	3,120	15.8%	709	15.9%	126	12.7%	2,285	15.9%	

*p<0.05 is significant; $\chi 2$ test for nominal values. Denominator variations are due to <4% variable-specific missing data.
**This variable is based on the total number of patients (n=19801) not the total number of incidents (n=26847).

callouts in more deprived areas. This trend was more pronounced among Māori and Pacific peoples, who had the largest portion of callouts in high deprivation areas. This may reflect population trends, as a greater proportion of Māori and Pacific peoples live in areas of higher socio-economic deprivation. These findings are consistent with studies from Australian regions showing higher ambulance callouts in more deprived areas.[15,18]

Final clinical status and transportation status provide insight into the management of mental health–related callouts. The predominance of lower acuity cases (89.8%) and the high rate of cases not transported to healthcare facilities (32.8%) suggest that many mental health callouts may be managed outside emergency settings. Duncan et al. (2019) reported a lower rate of patients left at home by the ambulance (11.8%), but transportation statistics may vary by local protocols and pathways.[19]

The high proportion of repeat callouts (15.9%) indicates a need for more comprehensive care pathways and support services. This finding is consistent with those of Australia and Scotland.[15,19] Limited demographic data on repeat presenters in Aotearoa New Zealand highlight the need for a better understanding of this group's needs. Continued reliance on emergency services suggests inadequate access to or insufficient community-based support. Additionally, Māori individuals often face negative experiences, stigmatisation, fear and distrust which may contribute to delays in help-seeking of mental health care.[4]

Limitations

As a cross-sectional observational design, this study identifies associations but cannot establish causation between demographic and clinical variables and mental health–related callouts. Although missing data were minimal (<4% per variable), their absence could introduce bias. Reliance on clinician coded impressions may oversimplify complex mental health presentations and reflect subjective interpretation. The use of single ethnicity prioritisation, where Māori is prioritised first, followed by Pacific peoples, may undercount Pacific peoples, particularly those who identify as both Māori and Pacific. Since Māori is prioritised above Pacific in the hierarchy, individuals with both identities are counted only as Māori. Future studies could utilise total ethnicity rather than prioritised ethnicity to address this limitation, however this would require careful analysis due to multiple sampling of individual patients.

Recommendations for practice, policy and research

The findings of this study have a number of practical implications. Ensuring appropriate emergency systems, services and support for Māori and Pacific peoples should be a priority for future mental health policies. Addressing socio-economic determinants of mental health such as financial strain, unemployment and inadequate access to healthcare services can improve mental health outcomes.[30] Addressing these issues requires comprehensive policy changes and a targeted approach to mitigate stressors such as racism, socio-economic inequities, stigmatisation and systemic barriers to healthcare. In addition, addressing upstream factors such as access to economic resources may prevent overburdening community mental health services, emergency departments and ambulance services.

These findings must be considered within the context of mental health policy reforms in Aotearoa New Zealand. He Ara Oranga called for a fundamental shift in the mental health system, reinforced by Te Pae Tata, leading to the briefly established Te Aka Whai Ora – Māori Health Authority. The disbanding of Te Aka Whai Ora – Māori Health Authority raises concerns about the sustainability of equity focussed mental health systems and Te Tiriti obligations.[7–9] The reliance on ambulance services for low acuity and repeat mental health–related callouts indicates the need for strengthening community-based and culturally safe services which have yet to be realised in practice.[4] Strengthening community mental health support, educating ambulance staff and establishing clear referral pathways to comprehensive mental health care may help reduce reliance on emergency services and improve continuity of care.

Broadly, this study demonstrated that utilising ambulance data to monitor mental health service trends offers valuable insights into help-seeking behaviours and real-time trends.[23] Australia's successful integration of ambulance data for monitoring mental health and substance use provides a useful example that could inform local approaches.[17,32]

Conclusion

In conclusion, this study has identified significant disparities in mental health–related callouts to Aotearoa New Zealand ambulance services across different ethnicities. The high rates of

callouts, particularly among younger Māori and Pacific peoples, highlight an unmet health need. These findings suggest areas of concern regarding access to timely and appropriate mental health care, particularly in communities experiencing socio-economic deprivation. As an observational cross-sectional study, it identified associations but did not establish causation between clinical and demographic variables and mental health callouts. Nonetheless, the descriptive data provide a valuable foundation for further investigation into service use, unmet need and equity in mental health care. The study has emphasised the value of ambulance data; future studies could explore the use of these data to monitor mental health trends. These findings may help identify policy priorities, including improving access pathways from ambulance services to community-based mental health care and addressing the broader socio-economic determinants that shape mental health.

COMPETING INTERESTS
Bridget Dicker is an employee of Hato Hone St John, and this work was undertaken in "time only" as part of her employment.
Gabrielle Harding is an employee of Hato Hone St John, and this research was conducted as part of her studies at The University of Auckland.
The remaining authors have no other conflicts of interest to declare.

ACKNOWLEDGEMENTS
The authors would like to thank Wellington Free Ambulance and the Hato Hone St John Clinical Evaluation, Research and Insights team for their contributions to the data for this analysis.

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URL
https://nzmj.org.nz/journal/vol-139-no-1630/mental-health-related-callouts-to-the-ambulance-service-in-aotearoa-new-zealand-a-descriptive-analysis

CITATION
Harding G, Fortune S, Ramalho R, et al. Mental health–related callouts to the ambulance service in Aotearoa New Zealand: a descriptive analysis. N Z Med J. 2026 Feb 27;139(1630):50-62. doi: 10.26635/6965.7145.

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Appendix

Appendix Table 1: Summary of missing data by variable.

Variables:	Cases valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Age group and ethnicity	25,937	96.6%	910	3.4%	26,847	100.0%
Clinical impression and ethnicity	26,426	98.4%	421	1.6%	26,847	100.0%
Clinical status at scene and ethnicity	26,425	98.4%	422	1.6%	26,847	100.0%
Clinical status final and ethnicity	26,423	98.4%	424	1.6%	26,847	100.0%
ePRF* sex and ethnicity	26,336	98.1%	511	1.9%	26,847	100.0%
GCH and ethnicity**	26,085	97.2%	762	2.8%	26,847	100.0%
Location type and ethnicity	26,426	98.4%	421	1.6%	26,847	100.0%
NZDep18 quintile and ethnicity	25,832	96.2%	1,015	3.8%	26,847	100.0%
Repeat visit and ethnicity	19,801	97.9%	421	2.1%	20,222	100.0%
Transported by ambulance and ethnicity	26,423	98.4%	424	1.6%	26,847	100.0%

*ePRFs=electronic patient report forms.
**GCH=Geographical Classification for Health.

Appendix Table 2: Inclusion criteria for mental health related clinical impressions.

Inclusion	Clinical impressions	SNOMED code
Included	Mental health problem	413307004
	Intentional poisoning	410061008
	Suicidal	267073005
	Self-harm	248062006
	Hanging	219329006
	Anxiety	48694002
Not included	Abnormal behaviour	25786006
	Accidental poisoning by drug (ACC)	59369008
	Acute confusion	130987000
	Acute drug intoxication	231466009
	Agitated state	24199005
	Agitation of unknown cause	24199005
Not included	Alcohol abuse	15167005
	Alcohol intoxication	25702006
	Altered level of consciousness (ALOC)	3006004
	Confusion	40917007
	Delirium	2776000
	Dementia	52448006
	Drug withdrawal	363101005
	Hallucinations	7011001
	Laceration	312608009
	Poisoning of unknown intent	269736006
	Presentation for social reasons	313331005