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Returning to the emergency department: a retrospective analysis of mental health re-presentations among young people in New South Wales, Australia

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ABSTRACT

Objectives This study aimed to describe mental health emergency department (ED) presentations among young people aged 8–26 years in New South Wales, Australia, and to identify key characteristics associated with higher risk of ED mental health re-presentation.

Design, setting and participants Retrospective analysis of linked ED data records for mental health presentations between 1 January 2015 and 30 June 2018.

Main outcome measures The main outcome was the total number of mental health ED re-presentations within 1 year, following initial presentation. Count regression models were fitted to estimate factors associated with higher likelihood of re-presentations.

Results Forty thousand two hundred and ninety patients were included in the analyses, and 9713 (~25%) re-presented during the following year; 1831 (20%) presented at least three times. On average, patients re-presented 0.61 times per 365 person-days, with average time until first re-presentation of ~92 days but greatest risk of re-presentation within first 30–60 days. Young people with self-harm or suicidal diagnoses at initial presentation were more likely to re-present. Re-presentations were highest among young people <15 years (IRR 1.18 vs ≥20 years old), female (IRR=1.13 vs male), young people residing outside of major cities (IRR 1.08 vs major cities) and Aboriginal and Torres Strait Islander young people (IRR 1.27 vs non-Indigenous).

Conclusions ED mental health re-presentation is high among young people. We demonstrate factors associated with re-presentation that EDs could target for timely, high-quality care that is youth friendly and culturally safe, with appropriate referral pathways into community-based primary and mental healthcare services.

Strengths and limitations of this study

- ⇒ This is the first comprehensive analysis of emergency department (ED) mental health re-presentations using state-wide registry data in Australia. The findings have important clinical implications for ED care for young people with mental health presentations.
- ⇒ We examine mental health presentations among young people from 8 years of age in order to identify factors that will promote early intervention.
- ⇒ The accuracy of ED clinician's coding of mental health diagnoses is not assessed.
- ⇒ Data for suicide and self-harm were not captured where the mechanism was intentional poisoning.

INTRODUCTION

Young people experience the highest burden of disease associated with mental health conditions such as depression and anxiety.[1] In Australia, suicide is the leading cause of death among young people aged 15–24 years,[2] and almost 1 in 10 young people aged 12–15 years report ever having engaged in self-harm.[3] There are sex differences, with suicide and self-harm being the leading cause of disease burden for young men aged 15–24 years, while for young women it is anxiety.[4] This burden of disease is often carried through the lifetime with early experiences of mental health conditions being a strong predictor of mental health in adulthood.[5]

The emergency department (ED) is a critical, and often first-line, healthcare setting for young people with mental health concerns.[6] In Australia, in 2017–2018, young people aged 15–24 years had the highest rates of mental health presentations compared with other age groups.[7] In two of the most populated Australian states, New South Wales (NSW) and Victoria, these rates are increasing.[8 9] In NSW in 2010–2014, the rate of mental health presentations increased most rapidly for 10–14 year olds (13.8% per year).[8] Similarly, in Victoria, mental health presentations to the ED among people aged 0–19 years rose by 6.5% per year between 2008–2009 and 2014–2015.[10]

Mental health concerns are the most common reason for re-presentation to ED among young people.[11 12] Re-presentations are a significant burden on ED resources,

Table 1 Baseline characteristics of young people (N = 40 290) aged 8–26 years with mental health primary diagnosis from 1 January 2016 to 30 June 2018 in NSW public hospital EDs

	%	Definition*
Sociodemographic characteristics		
Sex		Sex of the patient based on the person's own self-report
Male	45.58	
Female	54.39	
Not stated	0.03	
Aboriginal and Torres Strait Islander		Whether the person is Aboriginal and/or Torres Strait Islander, based on the person's own self-report
No	87.34	
Yes	11.00	
Not stated	1.67	
Age at first presentation (years)		The age of the patient in years
20–26	44.24	
15–19	40.34	
8–15	15.42	
Rurality or remoteness		The patient's usual place of residence location according to the Australian Standard Geographical Classification System
Major cities	65.30	
Inner regional	24.12	
Outer regional or remote or very remote	6.29	
Not stated	4.30	
Socio-economic Indexes for Areas (SEIFA) quartile		An index developed by the Australian Bureau of Statistics ranking areas according to relative socioeconomic advantage where higher scores denote better advantage
Most disadvantage: First (816–940)	24.93	
Second (942–971)	23.92	
Third (972–1038)	23.41	
Least disadvantage: Fourth (1039–1155)	23.45	
Missing	4.30	
Characteristics of the initial ED presentation		
ED primary diagnosis		The condition established after assessment to be responsible for the person presenting to the ED; if the person is admitted as an inpatient, it is the equivalent of the admission diagnosis. These are classified using the ICD-10 subcodes.
Anxiety	23.19	
Depression	9.94	
General mental health problem	22.03	
Suicidal	16.85	
Self-harm	8.10	
Others	20.03	
Level of clinical facility		Clinical level according to NSW health designation reflecting increasing capacity and capability to provide specialist emergency care with higher numbers providing care for higher-risk patients and more complex clinical care
1 or 2	3.72	
3 or 4	36.14	
5 or 6	58.34	
Missing	1.80	
Triage category		Patient classification according to the urgency of their needs for medical and nursing care; based on the Australasian Triage Scale with category 1 indicating immediately life-threatening, category 2 indicating potentially life-threatening, category 3 indicating urgent, category 4 indicating semiurgent and category 5 indicating non-urgent presentations.
1 or 2	14.31	
3	51.81	
4 or 5	33.86	
Missing	0.02	

Continued

Table 1 Continued

	%	Definition*
Mode of arrival		Mode of transport by which the patient arrives
Arrived on own	57.41	
Ambulance	37.61	
Police	4.71	
Others	0.20	
Missing	0.07	
Source of referral		Source from which the patient was referred to the ED service
Others	15.37	
Self/family/friend	84.28	
Missing	0.35	
Admitted to hospital		The separation status of the patient from ED where he/she is admitted to a ward/inpatient, a critical care ward or an operating suite
No	76.74	
Yes	23.26	
Left at own risk		The separation status of the patient from ED where he/she left prior to treatment completion or did not wait until order for transfer to other facilities, whether admitted as inpatient or not
No	96.00	
Yes	4.00	
Completed treatment		The separation status of the patient from ED where he/she has completed treatment in the same facility
No	32.38	
Yes	67.62	
Transferred to another hospital		The separation status of the patient from ED where he/she is transferred to another hospital or other clinical service location, whether the patient has started treatment in the facility or not
No	92.55	
Yes	7.45	
Arrival time of day		Time at which the patient presents for the service
08:00–17:59	49.87	
18:00–23:59	33.66	
00:00–07:59	16.47	
Departure day of week		For an admitted patient, this refers to the day of week the patient is either (1) transferred to a ward or other unit or (2) leaves the ED for transfer to another unit; for a non-admitted patient, this refers to the day of week at which the assessment and initial treatment are completed and/or he/she physically leaves the department.
Friday–Sunday	40.23	
Monday–Thursday	59.14	
Missing	0.63	
First episode length of stay (min)		Duration of a patient's stay in the ED computed as the time difference between actual departure time/date and arrival time/date
<180 (3 hours)	41.18	
180–480 (3–8 hours)	43.91	
460+ (8+ hours)	14.89	
Missing	0.02	

*From Emergency Department Data Collection, NSW Ministry of Health data dictionary (https://www.cherel.org.au/media/23786/eddc-data-dictionary-for-cherel-website_jan2017.docx)
ED, emergency department; ICD-10, International Statistical Classification of Diseases and Related Health Problems, 10th Revision; NSW, New South Wales.

with the highest cost incurred from patients re-presenting within 6 months.[12] This is particularly important in the case of mental health presentations, which typically require greater and more specialised resources than other presentations, and may thus contribute to decreased efficiency and barriers to healthcare access for other patients.[13]

High presentation and re-presentation rates to the ED for mental health concerns suggest that young people's needs are not being met by community or primary healthcare services.[13] This is particularly important as young people who re-present with mental health concerns often have complex needs that require more resources and social support compared with other presentations.[12 14] For example, they are more likely to be involved in juvenile justice or have a disability.[12 14] While equipped to respond to acute mental health crises, the ED is limited in its ability to provide trauma-informed and/or multidisciplinary

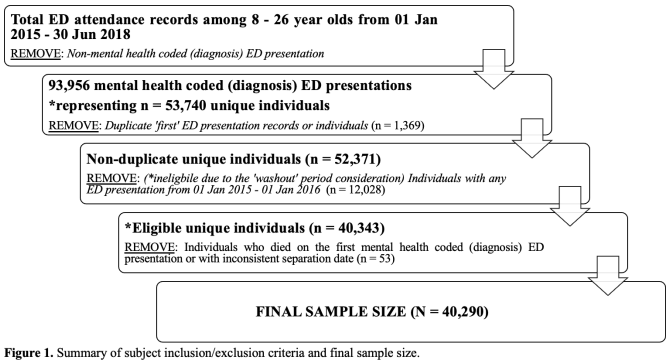

Figure 1. Summary of subject inclusion/exclusion criteria and final sample size.

Figure 1 Summary of inclusion/exclusion criteria and final sample size. ED, emergency department.

approaches that young people who are repeatedly re-presenting to the ED for mental health concerns need.[13 15–17] There are also time constraints and limited mental health trained staff in ED.[13 17]

There are few studies that explore the characteristics associated with ED mental health re-presentation in young people. A recent review found only 11 studies published in the past 36 years and no Australian studies were included.[12] This demonstrates the limited insights into this patient group, especially in the Australian context. In order to determine who is most at risk of mental health related re-presentation and to develop better care within the ED and/or referral pathways, it is imperative we have better insight into young people who re-present in Australia. To address this, we aimed to first describe ED service use and treatment for mental health presentations among young people aged 8–26 years in NSW and, second, to identify key characteristics (patient and ED) associated with higher risk of ED mental health re-presentation among young people in NSW.

METHODS

Design and data source

A retrospective analysis of ED data in all NSW public hospital EDs was undertaken. NSW is the most populous state in Australia, with a population of approximately 7.5 million people at the time of the study commencement in 2016. There were 115 designated EDs in NSW included in the study; data are described in detail elsewhere and include EDs captured in the NSW Emergency Department Data Collection (EDDC).[8 18–20] Briefly, the EDDC registry contains routinely collected administrative and clinical data for presentations to public hospital EDs in NSW. The NSW Centre for Health Record Linkage (www.cherel.org.au) performed probabilistic linkage of ED presentations, such that multiple presentations were linked together to obtain individual-level presentation information based on unique patient codes. After linking of the presentations, deidentified ED presentations for young people aged 8–26 years old at the time of the ED event between 1 January 2015 and 30 June 2018 were extracted.

Study population

Patients were included if they had a mental health primary diagnosis as recorded by ED clinicians and clerical personnel at the point of care. Mental health presentations were determined according to International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification, or equivalent Systematised Nomenclature of Medicine Clinical Terms codes (see online supplemental appendix 1 for diagnosis category descriptors). Records for the same individual made on the same day were tagged as duplicate records and removed from subsequent analyses. Unique patients were identified as those individuals with a first mental health presentation, where first presentation is defined as no presentation in the 12 months prior to the recorded ED event (ie, a washout period). To allow complete observation of the washout period, the included patients had no prior ED presentation(s) between 1 January 2015 and 1 January 2016.

Outcome and predictors

The main outcome of interest was the total number of mental health ED re-presentations within 1 year, following an initial mental health ED presentation. Potential predictors were identified from published literature.[8 11 14] These were analysed to determine correlations with future re-presentations that can be broadly classified as (1) patient sociodemographic characteristics and (2) characteristics of initial mental health presentation (eg, primary diagnosis classification based on main reason for presentation, triage category, hospital or ED facility clinical level (hospital facility type according to NSW Ministry of Health Role Delineations, https://www.health.nsw.gov.au/services/Pages/role-delineation-levels.aspx), mode of arrival, mode of separation, completion of treatment, length of stay (min), arrival time of day, departure day of week and source of referral). These data are recorded by ED clinicians and clerical personnel at the point of care. A brief description of these variables is provided in table 1.

Analysis

Descriptive summaries were presented for the study population overall and based on the number of mental health ED re-presentations within the next 365 days categorised as (1) 0 or never, (2) 1–2 times and (3) 3+ times. Mean and SD of total number of re-presentations were expressed as Poisson incidence rate per 365 person-days. The censored mean time until the first re-presentation was also computed within the 365-day follow-up period. Follow-up commenced from the first ED presentation from 1 January 2016 to 365 days following that first presentation or the end of study data availability (30 June 2018) if the first presentation was less than 365 days prior to this date. Censored mean is the mean time between the initial presentation and the first re-presentation. It was only calculated for those who re-presented to an ED during the 365-day observation period.

The number of ED re-presentations within 1 year was used in the regression analysis to assess the statistical significance of the relationship between each predictor to frequency of re-presentations. In particular, count-based log-link regression models were used where the (natural) logarithm of the number of readmissions was set to be the linear function of the predictors with an offset variable log of length of observation time. Due to excessive overdispersion (ie, the variance of the number of re-presentations within 365 days from first ED presentation is much larger than its mean due to the large number of zeros), negative binomial regression models were fitted. Both univariate and multivariate (including stepwise best subset) regression models were fitted and mean re-presentation rates per 365 person days were estimated, including corresponding 95% CIs. Incidence rate ratios (IRRs) and corresponding 95% CIs were used to assess statistical significance based on the null value of 1 (ie, statistical significance of the relationship between the predictor and frequency of readmissions, at 5% significance level, can be concluded if one is not within the CI).

Only <5% (n=1733) of the patients had missing data in some of the variables. While they were missing completely at random, the amount of missing information was found to be minimal and hence were excluded from further analysis. Patients who died during the first presentation were excluded from subsequent analyses. All statistical analyses were performed in Stata SE V.15.

Patient and public involvement

Patients and other members of the public were not involved in the design or conduct of this study. The research questions, study design and interpretation of the findings were informed by clinician researchers working in emergency, mental health and adolescent health. The results from this study will be disseminated through communication channels established in the Wellbeing Health & Youth Centre of Research Excellence in Adolescent Health Community of Practice, which includes young people, clinicians and researchers.

RESULTS

Mental health presentations

From 2 052 763 individual ED attendance records considered, 93 956 mental health ED presentations (4.58% of all records) were recorded among 53 740 unique individuals (5.94% of all individuals who ever attended ED) aged 8–26 at time of first presentation. After removal of duplicate records and allowing a 1 year washout period, 40 343 patients met our criteria for study inclusion. We further removed 53 individuals who either died on first presentation or had missing or inconsistent separation date, leaving 40 290 patients in the analysis (figure 1).

Over half (54%) of the patients were female; 87% were non-Indigenous; 15% were less than 15 years of age at time of first mental health ED presentation; and 6% resided in outer or remote regions (table 1).

At initial presentation, the three most common diagnoses were anxiety (23%), general mental health problem (22%) and suicidal ideation/behaviour (17%), and only 14% were triaged as either category 1 or 2 (potentially life-threatening). From these initial presentations, 68% completed treatment in the same facility; 23% were admitted to the hospital; 4% left at their own risk; 85% of patients stayed in the ED for less than 8 hours. Most patients either arrived on their own (57%) or via ambulance (38%), and 50% of arrivals occurred during normal working hours (08:00–17:59).

Mental health re-presentations

From the sample, 9713 of 40 290 (~25%) patients re-presented and received a mental health primary diagnosis during the following year; of these, 1831 patients presented at least three times. On average, patients were re-admitted 0.61 times per 365 person-days (table 2). During follow-up, the average time until the first mental health ED re-presentation was around 92 days, but the greatest risk of re-presentation was within the first 30–60 days from initial separation (figure 2).

Patients with either self-harm diagnosis during the initial presentation had the highest mean re-presentation incidence rate, while those diagnosed with either anxiety or depression had the lowest re-presentation rates (table 2).

In univariate regression analyses, re-presentations were associated with the following characteristics, which led to higher re-presentation incidence rates per 365 person-days: (1) according to sociodemographic characteristics, female (13% vs male), Aboriginal and Torres Strait Islander young people (27% vs non-Indigenous), aged <15 years (18% vs≥20 years) and residing in inner regional areas (8% vs major cities); and (2) according to characteristics of the initial ED presentation, triage categories 1–2 or 3 (16% and 22%, respectively, vs categories 4–5), admitted to hospital (33% vs not admitted), left at own risk (23% vs stayed), did not complete treatment (29% vs completed), arrived from 08:00 to 17: 59 (17% vs 18:00–23:59), departed on Monday–Thursday (11% vs Friday–Sunday), stayed for 3–8 or 8+ hours in the ED (17% and 45%, respectively, vs <3 hours) and arrived via ambulance (19% vs arrived on their own) (table 3).

Having an initial diagnosis of anxiety was used as the referent category as it is the most frequently reported mental health-related diagnosis at baseline. As such, an initial diagnosis of anxiety at first ED presentation was associated with less re-presentations compared with other mental health diagnoses. On the other hand, self-harm (85% vs anxiety) and suicidal diagnoses (62% vs anxiety) were associated with the highest risk of re-presentation(s). Multivariable (having all predictors considered at once in the model) and stepwise (a mix of both forward and backward selections beginning with the null model) regression analyses resulted in the same set of significantly associated characteristics and did not change the

Table 2 Descriptive characteristics of ED re-presentations with mental health primary diagnosis within 1 year from a patient's initial separation both overall and stratified by exposure variables considered (N=40 290)

	Mental health-related ED re-presentations (n)			Days until a first mental health-related ED re-presentation	
	Never	1–2 times	3+ times	Incidence rate*	
	n (%)†	n (%)†	n (%)†	Mean (95% CI)	Mean (censored)‡
Total	30 577 (76)	7882 (20)	1831 (5)	0.61 (0.59 to 0.63)	91.64§
Sociodemographic characteristics					
Sex					
Male	14 062 (46)	3510 (45)	793 (43)	0.56 (0.54 to 0.58)	88.86
Female	16 504 (54)	4370 (55)	1038 (57)	0.65 (0.63 to 0.67)	93.98
Aboriginal and Torres Strait Islander					
No	26 814 (88)	6814 (87)	1560 (85)	0.60 (0.58 to 0.62)	91.35
Yes	3191 (10)	984 (12)	255 (14)	0.76 (0.71 to 0.81)	93.39
Age at first presentation (years)					
20–26	13 828 (45)	3247 (41)	750 (41)	0.59 (0.57 to 0.61)	93.44
15–19	12 143 (40)	3386 (43)	725 (40)	0.59 (0.57 to 0.61)	96.70
8–15	4606 (15)	1249 (16)	356 (19)	0.71 (0.67 to 0.75)	85.93
Rurality or remoteness					
Major cities	20 018 (65)	5101 (65)	1189 (65)	0.60 (0.58 to 0.62)	91.04
Inner regional	7217 (24)	2020 (26)	481 (27)	0.66 (0.63 to 0.69)	93.75
Outer regional or remote or very remote	1914 (6)	516 (7)	103 (5)	0.61 (0.55 to 0.67)	95.89
SEIFA quartile					
Most disadvantage: First (816–940)	7596 (25)	1977 (25)	470 (26)	0.61 (0.58 to 0.64)	93.03
Second (942–971)	7266 (24)	1902 (24)	470 (26)	0.64 (0.61 to 0.67)	92.74
Third (972–1038)	7191 (23)	1836 (24)	404 (22)	0.60 (0.57 to 0.63)	93.26
Least disadvantage: Fourth (1039–1155)	7096 (23)	1922 (24)	429 (23)	0.61 (0.58 to 0.64)	89.18
Characteristics of the initial ED presentation					
ED primary diagnosis					
Anxiety	7635 (25)	1434 (18)	273 (15)	0.42 (0.39 to 0.45)	88.02
Depression	3041 (10)	805 (10)	159 (9)	0.54 (0.49 to 0.59)	84.77
General mental health problem	6576 (21)	1895 (24)	403 (22)	0.63 (0.60 to 0.66)	93.73
Suicidal	5038 (16)	1414 (18)	337 (18)	0.69 (0.65 to 0.73)	92.82
Self-harm	2356 (8)	694 (9)	214 (12)	0.79 (0.73 to 0.85)	96.15
Others	5984 (20)	1640 (21)	445 (24)	0.70 (0.66 to 0.74)	93.03
Mode of arrival					
Arrived on own	17 631 (58)	4555 (58)	944 (52)	0.56 (0.54 to 0.58)	88.36
Ambulance	11 466 (38)	2881 (37)	806 (44)	0.68 (0.65 to 0.71)	94.18
Police	1397 (4)	422 (5)	78 (4)	0.60 (0.53 to 0.67)	109.25
Others	62 (0)	17 (0)	3 (0)	0.59 (0.24 to 0.94)	104.74
Source of referral					
Others	4670 (15)	1237 (16)	284 (15)	0.63 (0.59 to 0.67)	95.61
Self/family/friend	25 812 (85)	6609 (84)	1537 (84)	0.60 (0.58 to 0.62)	91.14
Level of clinical facility					
1 or 2	1145 (4)	278 (3)	76 (4)	0.61 (0.53 to 0.69)	86.03
3 or 4	10 996 (36)	2904 (37)	660 (36)	0.60 (0.57 to 0.63)	91.89
5 or 6	17 868 (58)	4566 (58)	1072 (59)	0.62 (0.60 to 0.64)	92.12
Triage					

Continued

Table 2 Continued

	Mental health-related ED re-presentations (n)			Days until a first mental health-related ED re-presentation	
	Never	1–2 times	3+ times	Incidence rate*	
	n (%)†	n (%)†	n (%)†	Mean (95% CI)	Mean (censored)‡
1 or 2	4410 (14)	1095 (14)	261 (14)	0.62 (0.58 to 0.66)	97.10
3	15557 (51)	4287 (54)	1029 (56)	0.65 (0.63 to 0.67)	90.83
4 or 5	10604 (35)	2499 (32)	541 (30)	0.54 (0.51 to 0.57)	90.96
Admitted to the hospital					
No	23879 (78)	5812 (74)	1226 (67)	0.56 (0.54 to 0.58)	89.30
Yes	6698 (22)	2070 (26)	605 (33)	0.75 (0.71 to 0.79)	98.11
Left at own risk					
No	29447 (96)	7492 (95)	1740 (95)	0.60 (0.58 to 0.62)	92.54
Yes	1130 (4)	390 (5)	91 (5)	0.72 (0.63 to 0.81)	74.76
Completed treatment					
No	9434 (31)	2853 (36)	759 (41)	0.72 (0.69 to 0.75)	94.71
Yes	21143 (69)	5029 (64)	1072 (59)	0.56 (0.54 to 0.58)	90.02
Transferred to another hospital					
No	28382 (93)	7227 (92)	1681 (92)	0.60 (0.58 to 0.62)	91.32
Yes	2195 (7)	655 (8)	150 (8)	0.67 (0.61 to 0.73)	96.70
Arrival time of day					
08:00–17:59	15078 (49)	4058 (52)	957 (52)	0.62 (0.60 to 0.64)	90.62
18:00–23:59	10167 (33)	2761 (35)	632 (35)	0.65 (0.62 to 0.68)	91.22
00:00–07:59	5332 (18)	1063 (13)	242 (13)	0.51 (0.47 to 0.55)	97.40
Departure day of week					
Friday–Sunday	12461 (41)	3040 (39)	706 (38)	0.57 (0.55 to 0.59)	91.95
Monday–Thursday	17948 (59)	4771 (60)	1110 (61)	0.63 (0.61 to 0.65)	91.54
First episode length of stay (min)					
<180 (3 hours)	12911 (42)	3037 (39)	643 (35)	0.54 (0.52 to 0.56)	91.47
180–480 (3–8 hours)	13344 (44)	3521 (45)	827 (45)	0.62 (0.60 to 0.64)	90.50
460+ (8+ hours)	4317 (14)	1322 (17)	361 (20)	0.78 (0.73 to 0.83)	95.47

*Incidence rate is computed as per 365 person-days.
†Percentages (%) are relative to column totals, except for the otal row wherein they are relative to the total patient sample size (n=40 290).
‡Censored mean is appropriate to account for the censoring at 365 days, the length of the follow-up period. Note that this mean is only computed for those *patients who ever re-presented within 365 days* since initially presenting to an ED with a mental health-related primary diagnosis.
§Only overall time to first event can be computed a 95% CI due to sample size issues. In this case, 95% CI is 89.77 to 93.72.
ED, emergency department.

observations and interpretations made with the univariate regression analyses (table 3).

DISCUSSION

This is the first Australian study to analyse mental health ED re-presentations among young people. We found that one in four young people will re-present with a mental health concern within 1 year. Moreover, the first 30–60 days following an initial ED visit is the greatest period of risk for re-presentation. Our study also provides important insights into the characteristics of young people who are most likely to re-present for emergency mental healthcare. First, young people with self-harm or suicidal ideation/behaviour at initial presentation were more likely to re-present than those with other mental health diagnoses. Furthermore, there were increased re-presentations among young women and those aged less than 15 years as well as population groups that typically experience inequitable access to healthcare, such as Aboriginal and Torres Strait Islander young people and those residing outside major cities. Finally, our study points to the critical importance of the initial ED experience and outcomes as a predictor of re-presentation, with young people more likely to re-present who did not complete treatment, left on their own accord, had a long ED stay or were admitted. By appreciating the characteristics

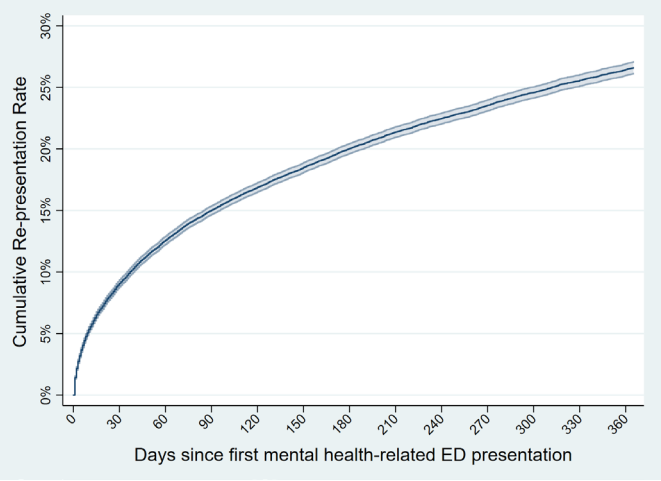

Figure 2 Cumulative re-presentation rate from first mental health-related ED presentation. ED, emergency department.

associated with young people who re-present to the ED for mental healthcare, these findings will inform more targeted mental healthcare.

Our analysis identified several important associations with re-presentations. We found patients with self-harm or suicidal diagnoses were more likely to re-present than those with other mental health diagnoses, which is consistent with other Australian[8 9] and international[21 22] studies that have demonstrated rising rates of young people presenting to the ED with self-harm or suicidal ideation/behaviour. For young people with suicide/self-harm presentations, the ED is often the first, and possibly only, contact with health services for mental healthcare.[8 13] A recent review found that most young people who engage in self-harm do not seek help from professional services, and almost half do not seek help at all.[23] Thus, these findings add to the literature to emphasise the vital role EDs play in responding to self-harm.

In Australia, as in most countries, mental health conditions are more consistently the leading cause of total (fatal and non-fatal) burden of disease for young women than they are for men.[4 24] This includes anxiety, depression and suicide/self-harm.[4] In our study, female patients were more likely than male patients to re-present, as were younger patients (<15 years). This is somewhat consistent with two recent studies that found women were more likely to present to the ED with mental health concerns.[8 10] A recent review also found similar results, but in most included studies, the influence of biological sex was non-significant and older youth had higher re-presentation rates.[12]

Presentations of Aboriginal and Torres Strait Islander young people were substantially over-represented compared with the NSW population (5.6% in 2016 of young people aged 10–24 years) and had higher re-presentation rates than non-Indigenous patients. Likewise, those residing outside of major cities experienced higher rates of re-presentations. This is consistent with literature that found rural location,[25] Aboriginal and Torres Strait Islander status[11] and low socioeconomic status[11 14] were strong predictive factors of re-presentation to the ED and likely also reflects higher rates of self-harm and suicide in these populations.[26] Taken together with the present findings, this points to challenges with equitable access to timely and culturally safe community-based mental healthcare for Aboriginal and Torres Strait Islander young people and young people in rural areas.

This study also emphasises that the initial ED experience and outcomes are important determinants for re-presentation. There is a disconnect between traditional ED environments and mental healthcare needs of young people. This is largely due to lengthy wait times or lack of knowledge about appropriate referral pathways, and limited availability of mental health specialists in ED[13 27] and is compounded as young people who re-present are more likely to require social support[13] and ongoing coordinated care.[14] However, new models of mental healthcare in ED that are specifically for young people and address these intersecting needs have seen rapid uptake in EDs in Australia and elsewhere.[28] While this is promising, robust evaluation is needed to determine whether these interventions lead to better clinical outcomes for young people, including fewer re-presentations as well as timely and appropriate care and referral to specialised services.

Strengths and limitations

This is the first Australian study to examine mental health ED re-presentations among young people. We have captured presentations from 8 years of age, which is important as mental health concerns, particularly self-harm, are presenting from preadolescence.[29 30] The results are generalisable to other states and territories in Australia and countries with similar demographics, as the data were gathered from all public hospitals EDs in NSW in the EDDC registry. The larger EDs participate in the EDDC meaning a substantial proportion of the NSW population is covered; however, this varies over time and does not capture the full population of NSW with lower participation from hospitals in rural and remote regions. Our focus was on mental health presentations and re-presentations; however, this study does not capture young people who may have an initial or subsequent presentation with other diagnoses or secondary diagnoses that may have been relevant to young people's mental health. There may be error in the recording of the data at the point of care, plus there is no assessment of the accuracy of coding of mental health diagnoses by ED clinicians and personnel, and likely some overlap, particularly for suicidal and self-harm diagnoses. Intentional poisoning was not included; however, future studies focused specifically on self-harm and suicide may consider including intentional poisoning as a diagnosis. As with other studies that rely on self-reporting of Indigenous status, the data in this study likely under-report the association.[31 32]

Table 3 Estimated incidence rate ratios (IRR) (including 95% confidence intervals (CI)) by exposure variable categories on the number of ED re-presentations with mental health primary diagnosis within 1 year from a patient's initial separation from negative binomial regression models (N=40 290)

	Univariate		Multivariable		Stepwise*	
	IRR	95% CI†	IRR	95% CI†	IRR	95% CI†
Sociodemographic characteristics						
Sex						
Male	1.00		1.00		1.00	
Female	1.13	(1.07 to 1.20)	1.13	(1.07 to 1.20)	1.14	(1.08 to 1.22)
Aboriginal and Torres Strait Islander						
No	1.00		1.00		1.00	
Yes	1.27	(1.16 to 1.39)	1.23	(1.13 to 1.35)	1.21	(1.10 to 1.33)
Age at first presentation (years)						
20–26	1.00		1.00		1.00	
15–19	1.00	(0.94 to 1.07)	0.96	(0.90 to 1.02)	0.96	(0.90 to 1.02)
8–15	1.18	(1.08 to 1.29)	1.09	(1.00 to 1.19)	1.10	(1.00 to 1.20)
Rurality or remoteness						
Major cities	1.00		1.00		1.00	
Inner regional	1.08	(1.01 to 1.16)	1.15	(1.07 to 1.24)	1.16	(1.08 to 1.25)
Outer regional or remote or very remote	0.99	(0.86 to 1.15)	1.04	(0.90 to 1.20)	1.03	(0.88 to 1.20)
SEIFA quartile						
Most disadvantage: first (816–940)	1.00		1.00		1.00	
Second (942–971)	1.03	(0.95 to 1.12)	1.06	(0.98 to 1.15)	1.05	(0.97 to 1.14)
Third (972–1038)	0.97	(0.89 to 1.06)	1.02	(0.93 to 1.12)	1.01	(0.92 to 1.10)
Least disadvantage: fourth (1039–1155)	1.01	(0.94 to 1.10)	1.11	(1.02 to 1.21)	1.11	(1.01 to 1.21)
Characteristics of the initial ED presentation						
ED primary diagnosis						
Anxiety	1.00		1.00		1.00	
Depression	1.27	(1.15 to 1.40)	1.16	(1.05 to 1.28)	1.18	(1.06 to 1.30)
General mental health problem	1.49	(1.37 to 1.62)	1.38	(1.27 to 1.51)	1.36	(1.24 to 1.49)
Suicidal	1.62	(1.47 to 1.79)	1.40	(1.26 to 1.55)	1.39	(1.25 to 1.55)
Self-harm	1.85	(1.65 to 2.08)	1.64	(1.46 to 1.85)	1.67	(1.48 to 1.89)
Others	1.65	(1.51 to 1.81)	1.49	(1.35 to 1.64)	1.48	(1.34 to 1.64)
Mode of arrival						
Arrived on own	1.00		1.00		1.00	
Ambulance	1.19	(1.11 to 1.27)	1.11	(1.04 to 1.18)	1.13	(1.06 to 1.21)
Police	1.04	(0.93 to 1.18)	0.97	(0.86 to 1.10)	0.97	(0.85 to 1.10)
Others	0.98	(0.61 to 1.58)	0.90	(0.56 to 1.45)	1.02	(0.63 to 1.65)
Source of referral						
Others	1.00		1.00			
Self/family/friend	0.96	(0.88 to 1.04)	1.01	(0.93 to 1.10)		
Level of clinical facility						
1 or 2	1.00		1.00			
3 or 4	1.00	(0.84 to 1.20)	0.96	(0.81 to 1.13)		
5 or 6	1.02	(0.86 to 1.22)	0.96	(0.81 to 1.14)		
Triage						
4 or 5	1.00		1.00		1.00	
3	1.22	(1.16 to 1.29)	1.10	(1.00 to 1.20)	1.10	(1.03 to 1.18)
1 or 2	1.16	(1.07 to 1.25)	0.99	(0.90 to 1.09)	1.00	(0.90 to 1.10)
Admitted to the hospital						
No	1.00		1.00		1.00	

Continued

Table 3 Continued

	Univariate		Multivariable		Stepwise*	
	IRR	95% CI†	IRR	95% CI†	IRR	95% CI†
Yes	1.33	(1.25 to 1.42)	1.42	(1.15 to 1.76)	1.21	(1.12 to 1.30)
Left at own risk						
No	1.00		1.00		1.00	
Yes	1.23	(1.09 to 1.40)	1.56	(1.24 to 1.95)	1.31	(1.14 to 1.51)
Completed treatment						
Yes	1.00		1.00			
No	1.29	(1.21 to 1.37)	1.21	(0.97 to 1.50)		
Transferred to another hospital						
No	1.00		1.00			
Yes	1.09	(0.97 to 1.22)	1.20	(0.98 to 1.46)		
Arrival time of day						
08:00–17:59	1.00		1.00		1.00	
00:00–07:59	0.83	(0.76 to 0.91)	0.81	(0.74 to 0.88)	0.80	(0.73 to 0.89)
18:00–23:59	1.06	(0.99 to 1.13)	1.03	(0.96 to 1.10)	1.03	(0.97 to 1.10)
Departure day of week						
Friday–Sunday	1.00		1.00		1.00	
Monday–Thursday	1.11	(1.04 to 1.18)	1.08	(1.02 to 1.15)	1.08	(1.02 to 1.15)
First episode length of stay (min)						
<180 (3 hours)	1.00		1.00		1.00	
180–480 (3–8 hours)	1.17	(1.10 to 1.25)	1.09	(1.02 to 1.17)	1.10	(1.03 to 1.18)
460+ (8+ hours)	1.45	(1.34 to 1.58)	1.25	(1.14 to 1.37)	1.26	(1.14 to 1.38)

*Stepwise regression results include only covariates which were found to be significant at α=5%.
†CI is also used to assess the significance of the IRR coefficient, where if 1 is not inside the estimated CI, then it is concluded to be significantly associated with either significantly lower (if limits are <1) or higher (if limits are >1) re-presentation rate at α=5%.
ED, emergency department; IRR, incidence rate ratio.

CONCLUSIONS

One in four young people re-present to NSW EDs with mental health presentations, and this is most prevalent among young people with initial presentations of self-harm or suicidal ideation/behaviour. Young people less than 15 years, young women, Aboriginal and Torres Strait Islander young people and young people residing outside major cities are most at risk of re-presentation; thus, it is essential that EDs, as well as community mental and primary healthcare services, are aware of those young people at highest risk of re-presentation and work together to strengthen navigation pathways out of ED to provide follow-up mental healthcare that is more appropriate than recurrent visits to ED. It is important to also acknowledge that those young people at risk of re-presentation are those already at higher risk of health provision inequity and stigma. All health service providers, including those in ED, need to be aware of and actively promote gender and culturally sensitive care.

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