Mental health-related hospitalisations of adolescents and their contact with child protection services to age 11 years, South Australia: a whole-of-population descriptive study

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The known: Adolescent mental health is an important area of public health, and children who have contact with child protection services are subsequently at greater risk of mental health challenges.

The new: Among adolescents aged 12–17 years born in South Australia during 1991–1999, 44.9% of those hospitalised with mental health-related diagnoses had histories of contact with the child protection system.

The implications: Early support, particularly for children under 12 years of age with histories of substantiated maltreatment or in out-of-home care, could reduce the number of mental health-related hospitalisations of adolescents, and avert the longer term negative consequences of child maltreatment.

Abstract

Objectives: To investigate the number of mental health-related hospitalisations of adolescents (12–17 years) in South Australia by level of contact with the child protection system (0–11 years).

Study design: Whole-of-population descriptive study; analysis of de-identified linked administrative data from the Better Evidence Better Outcomes Linked Data (BEBOLD) platform.

Setting, participants: Adolescents born in South Australia, 1991–1999; linked SA Department for Child Protection, Admitted Patient Care (SA Health), and South Australian Perinatal Statistics collection (SA Department for Health and Wellbeing) data.

Main outcome measures: Proportion of adolescents (12–17 years) hospitalised with mental health-related diagnoses; proportion of mental health-related hospitalisations of adolescents, by level of child protection contact (0–11 years) (no contact, notification but not screened in, screened-in notification but not investigated, investigation but not substantiated, substantiation, and out-of-home care).

Results: Of 175 115 adolescents born during 1991–1999, 5646 (3.2%) had been hospitalised with mental health conditions, and 27 203 (15.5%) had histories of contact with child protection services. The proportion of adolescents admitted to hospital with mental health-related diagnoses increased with the level of prior child protection contact, from 3366 of 147 912 adolescents with no contact (2.3%), to 398 of 6645 with notifications (6.0%), to 209 of 1191 who had been placed in out-of-home care (17.5%). Contact with child protection services was recorded for 2280 of 5646 adolescents admitted to hospital with mental health-related diagnoses (40.4%); 4477 of 10 633 mental health-related hospitalisations (44.9%) were of adolescents with histories of child protection services contact, including 1285 hospitalisations (12.1%) of adolescents for whom substantiated maltreatment (but not out-of-home care) was recorded, and 568 hospitalisations (5.3%) of adolescents who had been placed in out-of-home care.

Conclusion: About 45% of mental health-related hospitalisations of 12–17-year-old adolescents were of people who had had contact with child protection services by the age of 11 years, although only 15.5% of all adolescents had histories of child protection contact. The trauma associated with a history of child protection can have longer term sequelae, and this should be considered when adolescents are hospitalised with mental health conditions.

The mental health of adolescents is a major public health interest. In Australia, suicide is the leading cause of death among people aged 15–24 years.[1] In the 2013–14 Australian Child and Adolescent Survey of Mental Health and Wellbeing, parents reported that 14.4% of their 12–17-year-old children had experienced mental health disorders (anxiety disorders, major depressive disorder, attention deficit/hyperactive disorder, conduct disorder) during the preceding twelve months.[2]

The scale of the problem places a large demand on mental health services for young people, and these services are not adequately supported in Australia.[3,4] Primary care meets the mental health needs of only a minority of young people, and the complex needs of many require more comprehensive, multidisciplinary approaches.[5] As a result, adolescents may present to hospitals with mental health challenges when other services are not available.[3] Between 2012–13 and 2021–22, the overnight mental health-related hospitalisation rate rose from 47 to 55 per 10 000 people aged 12–17 years.[6] This rise could be related to insufficient care and social support, or reflect the increasing prevalence of mental health conditions among adolescents.

Child maltreatment has been described as "the most important preventable risk factor for psychiatric disorders", given American reports of population attributable fractions for a range of psychopathology types that range from 30% (anxiety) to 67% (parenteral drug use).[7] Child maltreatment and contact with child protection services are common in Australia. In 2020–21, 531 900 notifications of alleged maltreatment were recorded;[8] in South Australia, 25% of children born during 1999–2005 were subjects of child protection notifications by the age of ten years,[9] as were 13.8% of New South Wales children who started school in 2009 or 2012 by the age of five years.[10] In the 2021 Australian Child Maltreatment Study survey, the prevalence of mental disorders among people aged 16–24 years who had not experienced maltreatment was 21.6%, but 36.2% for those who had experienced a single type of maltreatment and 54.8% for respondents who had experienced multiple types of maltreatment.[11]

Associations between contact with child protection systems and mental health-related hospitalisation have also been reported.

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In South Australia, mental health disorders were among the top three reasons for hospital admissions of 13–17-year-old adolescents who had experienced out-of-home care, but not for those without contact with the child protection system.[12] In New South Wales, children who were the subjects of notifications to child protection services by the age of six years were more than twice as likely to be diagnosed with a mental health disorder during middle childhood (6–14 years) than children without any child protection system contact.[13] In Western Australia, 20% of children who had experienced substantiated maltreatment subsequently received mental health diagnoses, compared with 3.6% of children with no child protection system contact.[14]

We analysed linked whole-of-population data to investigate the burden of mental health-related hospitalisations of adolescents (12–17 years) in South Australia by level of contact with the child protection system (0–11 years). Our analysis examined the population burden both from the perspective of adolescents (unit of analysis is the individual person) and from the perspective of the hospital system (unit of analysis is the hospitalisation). Both perspectives are relevant to understanding the burden of mental health hospitalisations among adolescents with histories of child protection contact.

Methods

We undertook a whole-of-population descriptive study. The Better Evidence Better Outcomes Linked Data (BEBOLD) platform contains de-identified whole-population linked administrative data for all South Australian children born in 1991 or later.[15] Data were probabilistically linked by an independent agency on the basis of demographic characteristics (full name, date of birth, sex, address). Data linkage systems in Australia typically report false linkage rates of 0.4–0.8%.[16] We analysed data in BEBOLD from the SA Department for Child Protection, Admitted Patient Care (SA Health), and the South Australian Perinatal Statistics collection (Preventive Health SA). We report our study according to the Reporting of studies Conducted using Observational Routinely-collected health Data (RECORD) guidelines.[17]

Study population

We examined the nine birth cohorts born in South Australia during 1 January 1991 – 31 December 1999. They were examined from ages 0–11 years (1991–2010) for child protection contact, and from ages 12–17 years (2003–2016) for mental health-related hospitalisations.

Mental health-related hospitalisations

Mental health-related hospitalisations were defined by International Statistical Classification of Diseases, tenth revision, Australian modification (ICD-10-AM) codes for primary or additional diagnoses, as well as all external cause codes for self-harm (Supporting Information, table 1). The codes included those used for this purpose by the Australian Institute of Health and Welfare, as well as codes used to identify mental health-related hospitalisations in other Australian studies.[13,14,18,19]

Child protection system contact

Children were classified according to their highest level of contact with the child protection system while aged 0–11 years: no contact, notification but not screened in, screened-in notification but not investigated, investigation but not substantiated, substantiation, and out-of-home care (including care and protection orders) (Box 1).

1 Definitions of child protection contact levels*

Level	Definition
Notification	A report to the Child Protection Agency concerning suspected child abuse or neglect.
Screened in	A term used to indicate whether the notification is of sufficient concern to warrant intervention by the Child Protection Agency. Those that meet the threshold are screened in; those that do not are screened out.
Investigation	A determination of whether an incident of child abuse or neglect has occurred, and the circumstances of its occurrence.
Substantiation	A professional judgement as to whether abuse or neglect has occurred.
Out-of-home care	System of caring for a child who is removed from their family of origin; includes (but is not limited to) family-based care, emergency care, and residential care.

* Source: Glossary of reference 20. ◆

Socio-demographic variables

In supplementary analyses, we report the distribution of adolescents hospitalised with mental health conditions by sex and postcode-level socio-economic position (Index of Relative Socio-Economic Advantage and Disadvantage, IRSAD),[21] each as recorded at the time of the first mental health-related hospitalisation and stratified by highest level of child protection system contact. IRSAD values from the 2001, 2006, 2011, and 2016 censuses were applied to hospitalisations from two years before the census year to two years after the census year (five-year brackets).

Data analysis

We first calculated the proportion of all adolescents (ages 12–17 years) hospitalised with mental health-related diagnoses, both overall and with specific mental health diagnoses, by highest level of child protection system contact while aged 0–11 years. We determined the source of referral or transfer for each mental health-related hospitalisation, as well as the number of repeat mental health-related hospitalisations, by level of child protection contact. For the analysis of mental health-related hospitalisation burden from the perspective of the hospital system, we included only adolescents hospitalised at least once. Second, we calculated the proportion of adolescents hospitalised with mental health-related diagnoses who had contact with child protection services, overall and by highest level of child protection contact. Third, we calculated the proportion of mental health-related hospitalisations of people who had had contact with child protection services, overall and by highest level of child protection contact. Finally, we calculated the age-specific proportions of adolescents hospitalised (any cause) and of hospitalisations (any cause) that were mental health-related, by highest level of child protection contact. All analyses were conducted in STATA/SE 15.

Ethics approval

Ethics approval was granted by the SA Department of Health Human Research Ethics Committee (2022/HRE00137), and the

University of Adelaide HREC (H-185-2011). Approval to report the analyses of these data was also provided by the custodians of each data source.

Results

Adolescents admitted to hospital with mental health-related diagnoses, by level of contact with child protection services

Of 175 115 adolescents (12–17 years) born during 1991–1999, 5646 (3.2%) had been hospitalised with mental health-related diagnoses, and 27 203 (15.5%) had histories of contact with child protection services while aged 0–11 years. The proportion of adolescents admitted to hospital with mental health-related diagnoses increased with level of prior child protection system contact, from 3366 of 147 912 adolescents with no contact (2.3%), to 398 of 6645 with notifications (6.0%) and 209 of 1191 who had been placed in out-of-home care (17.5%) (Box 2). Similar patterns were evident for each mental health diagnosis category (Supporting Information, table 2).

Second or further mental health-related hospitalisations were recorded for 1827 of the 5646 adolescents hospitalised at least once with mental health-related diagnoses (32.4%); there were 10 633 mental health-related hospitalisations in total. The proportion of adolescents hospitalised more than once increased with the level of child protection contact, from 960 of 3366 adolescents with no contact (28.5%), to 139 of 398 with notifications (34.8%), and 103 of 209 who had been placed in out-of-home care (49.3%) (Box 3).

Mental health-related hospitalisations of adolescents, by level of contact with child protection services

Adolescents who had any contact with child protection services while aged 0–11 years comprised 15.5% of all 12–17-year-old people (Box 2), but 40.4% of adolescents admitted to hospital with mental health-related diagnoses (2280 of 5646). Of 10 633 mental health-related hospitalisations, 4777 (44.9%) were of adolescents with histories of child protection system contact; 1285 hospitalisations (12.1%) were of adolescents for whom maltreatment had been substantiated without leading to out-of-home care, and 568 (5.3%) were of adolescents who had been placed in out-of-home care (Box 4). Adolescents had been transferred from casualty or emergency departments for 7965 of 10 633 mental health-related hospitalisations (74.9%) (Supporting Information, table 3).

2 Mental health-related hospitalisations of adolescents (aged 12–17 years) born in South Australia during 1991–1999, by highest level of contact with child protection services while aged 0–11 years

Highest level of child protection contact (0–11 years)	Adolescents	No mental health-related hospitalisation		At least one mental health-related hospitalisation	
		Number	Proportion (95% CI)	Number	Proportion (95% CI)
All adolescents	175 115	169 469	96.8% (96.7–96.9%)	5646	3.2% (3.1–3.3%)
No contact	147 912 [84.5%]	144 546	97.7% (97.6–97.8%)	3366	2.3% (2.2–2.4%)
Notification	6645 [3.8%]	6247	94.0% (93.4–94.6%)	398	6.0% (5.4–6.6%)
Screened-in notification	7699 [4.4%]	7096	92.2%(91.5–92.7%)	603	7.8% (7.3–8.5%)
Investigation	6330 [3.6%]	5800	91.6% (90.9–92.3%)	530	8.4% (7.7–9.1%)
Substantiation	5338 [3.0%]	4798	89.9% (89.0–90.7%)	540	10.1% (9.3–11.0%)
Out-of-home care	1191 [0.7%]	982	82.5% (80.2–84.5%)	209	17.5% (15.5–19.8%)

CI = confidence interval. ◆

3 Repeat mental health-related hospitalisations of adolescents (aged 12–17 years) admitted to hospital at least once with a mental health condition, by highest level of contact with child protection services while aged 0–11 years

Highest level of child protection system contact	Number of adolescents	Number of repeat mental health-related hospitalisations				
		None	One	Two	Three	Four or more
Adolescents with at least one mental health-related hospitalisation	5646	3819 (67.6%)	984 (17.4%)	349 (6.2%)	174 (3.1%)	320 (5.7%)
No contact	3366	2406 (71.5%)	531 (15.8%)	177 (5.3%)	91 (2.7%)	161 (4.8%)
Notification	398	259 (65.1%)	71 (17.8%)	28 (7.0%)	10 (2.5%)	30 (7.5%)
Screened-in notification	603	389 (64.5%)	124 (20.6%)	36 (6.0%)	18 (3.0%)	36 (6.0%)
Investigation	530	340 (64.2%)	98 (18.5%)	44 (8.3%)	17 (3.2%)	31 (5.8%)
Substantiation	540	319 (59.1%)	114 (21.1%)	42 (7.8%)	27 (5.0%)	38 (7.0%)
Out-of-home care	209	106 (50.7%)	46 (22.0%)	22 (10.5%)	11 (5.3%)	24 (11.5%)

4 Numbers of adolescents (aged 12–17 years) admitted to hospital at least once with a mental health condition and of mental health-related hospitalisations of adolescents, by highest level of contact with child protection services while aged 0–11 years

Highest level of child protection system contact	Adolescents with at least one mental health-related hospitalisation	Mental health-related hospitalisations
Total number	5646	10 633
No contact	3366 (59.6%)	5856 (55.1%)
Any child protection contact	2280 (40.4%)	4777 (44.9%)
Notification	398 (7.0%)	776 (7.3%)
Screened-in notification	603 (10.7%)	1132 (10.6%)
Investigation	530 (9.4%)	1016 (9.6%)
Substantiation	540 (9.6%)	1285 (12.1%)
Out-of-home care	209 (3.7%)	568 (5.3%)

Mental-related hospitalisations as proportion of all hospitalisations, by age and level of contact with child protection services

Of 37 825 adolescents hospitalised for any cause, 5646 (14.9%) had been hospitalised with mental health-related diagnoses. The proportion increased with the level of child protection contact, from 3366 of 28 629 adolescents with no contact (11.8%) to 209 of 534 who had been placed in out-of-home care (39.1%). Differences by contact level declined with age, and were most marked at age 12 years (no contact: 104 of 4857, 2.1%; out-of-home care: 19 of 97, 20%) than 17 years (no contact: 1303 of 8309, 15.7%; out-of-home care: 68 of 186, 36.6%) (Box 5). Similar differences by age and level of child protection contact were evident for the number of hospitalisations (Box 6).

Sex and socio-economic position: supplementary analyses

The proportion of adolescents hospitalised with mental health-related diagnoses by sex did not vary markedly by level of child protection services contact (range for proportion of girls: 57.4–62.5%). The proportion of adolescents hospitalised with mental health-related diagnoses at each level of child protection contact increased with postcode-level socio-economic disadvantage (Supporting Information, table 6).

Discussion

Among adolescents (12–17 years) born in South Australia during 1991–1999, 44.9% of mental health-related hospitalisations were of people who had experienced contact with the child protection system while aged 0–11 years. Confirmed maltreatment during childhood (allegation substantiated or led to out-of-home care) was recorded for 17.4% of mental health-related hospitalisations, but for only 3.7% of all adolescents. Among those admitted to hospital with mental health-related diagnoses, 40.4% had experienced contact with child protection services by the age of 11 years.

We found that at least one mental health-related hospital admission was recorded for 3.2% of adolescents. This finding is similar to that of the Second Australian Child and Adolescent Survey of Mental Health and Wellbeing (2013–14), which found that 3.3% of 12–17-year-old adolescents had mental disorders that severely affected their social and educational functioning.[2] Further, our finding that mental health-related hospitalisations were recorded for 17.5% of adolescents who had experienced out-of-home care by the age of 11 years is consistent with those of earlier Australian studies.[13,14] For example, 19.7% of New South Wales children removed to out-of-home care by the age of six years received mental health condition diagnoses between the ages of 6 and 14 years.[13] The proportion of mental health-related hospitalisations was larger for adolescents who had experienced out-of-home care (39.5%) as for those without histories of child protection contact (10.7%). The difference was especially pronounced for younger adolescents: the proportion of mental health-related hospitalisations was more than nine times as large for 12-year-old adolescents who had experienced out-of-home care as for those who had never had contact with child protection services (17.6% *v* 1.9%).

In 2020–21, SA Health and the Department for Child Protection re-affirmed that health services for children in out-of-home care, including mental health services, were a priority.[22] However,

5 Proportions of adolescents (aged 12–17 years) admitted to hospital at least once (any cause) who had been hospitalised with a mental health condition, by age and highest level of contact with child protection services while aged 0–11 years

Highest level of child protection system contact	Adolescents with mental health-related hospitalisations/adolescents with hospitalisations (any cause)*						
	12 years	13 years	14 years	15 years	16 years	17 years	12–17 years
All adolescents	226/6448 (3.5%)	444/6837 (6.5%)	931/7952 (11.7%)	1473/9176 (16.1%)	1842/10 343 (17.8%)	2130/11 529 (18.5%)	5646/37 825 (14.9%)
No contact	104/4857 (2.1%)	210/5064 (4.1%)	515/5900 (8.7%)	845/6747 (12.5%)	1052/7442 (14.1%)	1303/8309 (15.7%)	3366/28 629 (11.8%)
Notification	12/317 (3.8%)	32/390 (8.2%)	57/411 (13.9%)	108/530 (20.4%)	145/608 (23.8%)	144/662 (21.8%)	398/2044 (19.5%)
Screened-in notification	29/437 (6.6%)	49/468 (10.5%)	110/559 (19.7%)	165/665 (24.8%)	200/782 (25.6%)	222/891 (24.9%)	603/2522 (23.9%)
Investigation	29/398 (7.3%)	63/392 (16.1%)	98/467 (21.0%)	151/574 (26.3%)	164/678 (24.2%)	192/761 (25.2%)	530/2130 (24.9%)
Substantiation	33/342 (9.6%)	67/411 (16.3%)	104/477 (21.8%)	146/517 (28.2%)	189/649 (29.1%)	201/720 (27.9%)	540/1966 (27.5%)
Out-of-home care	19/97 (20%)	23/112 (20.5%)	47/138 (34.1%)	58/143 (40.6%)	92/184 (50.0%)	68/186 (36.6%)	209/534 (39.1%)

* Individual people can be included more than once because of hospitalisations at different ages. Ratios by child protection system contact level are included in table 4 in the Supporting Information. ◆

6 Proportions of hospitalisations of adolescents (aged 12–17 years) admitted to hospital at least once (any cause) that were mental health-related, by age and highest level of contact with child protection services while aged 0–11 years*

Highest level of child protection system contact	Mental health-related hospitalisations/all-cause hospitalisations (proportion)						
	12 years	13 years	14 years	15 years	16 years	17 years	12–17 years
All adolescents	288/8882 (3.2%)	628/9477 (6.6%)	1387/11 417 (12.1%)	2220/13 191 (16.8%)	2780/15 533 (17.9%)	3330/17 545 (19.0%)	10 633/76 045 (14.0%)
No contact	128/6607 (1.9%)	301/6943 (4.3%)	721/8310 (8.7%)	1235/9490 (13.0%)	1565/11 045 (14.2%)	1906/12 346 (15.4%)	5856/54 741 (10.7%)
Notification	15/418 (3.6%)	39/527 (7.4%)	78/585 (13.3%)	156/748 (20.9%)	219/926 (23.7%)	269/1063 (25.3%)	776/4267 (18.2%)
Screened-in notification	33/638 (5.2%)	74/690 (10.7%)	173/826 (20.9%)	223/958 (23.3%)	276/1146 (24.1%)	353/1424 (24.8%)	1132/5682 (19.9%)
Investigation	42/600 (7.0%)	87/583 (14.9%)	132/765 (17.3%)	204/921 (22.2%)	237/1046 (22.7%)	314/1205 (26.1%)	1016/5120 (19.8%)
Substantiation	47/488 (9.6%)	93/564 (16.5%)	193/710 (27.2%)	265/788 (33.6%)	327/1053 (31.1%)	360/1195 (30.1%)	1285/4798 (26.8%)
Out-of-home care	23/131 (17.6%)	34/170 (20.0%)	90/221 (40.7%)	137/286 (47.9%)	156/317 (49.2%)	128/312 (41.0%)	568/1437 (39.5%)

* Individual people can be included more than once because of hospitalisations at different ages. Ratios by child protection system contact level are included in table 5 in the Supporting Information. ◆

the children who most need mental health support often do not receive it because the available services do not have the capacity to meet their complex needs.[23] The Royal Australasian College of Physicians position statement on the *Health care of children in care and protection services* (2023) highlighted the need for specialist multidisciplinary services that provide trauma-informed and integrated mental health care for all children and adolescents who come into contact with the child protection system.[24]

While our findings indicate that children placed in out-of-home care, in particular, need mental health support, 39.6% of mental health-related hospitalisations were of adolescents who experienced child protection contact but not out-of-home care. Even adolescents for whom the highest level of contact was notification were more than twice as likely to be hospitalised with a mental health-related diagnosis (6.0% *v* 2.3%) and more likely to be admitted more than once with a mental health-related diagnosis (34.8% *v* 28.6%) than those who had no contact with child protection services. Mental health support services should consider the acute mental health needs of all children who interact with child protection services, not only those placed in out-of-home care.[23]

Beyond the health system, the capacity to respond holistically to broader social determinants of mental health, such as poverty, must be considered.[25,26] From a public health perspective, a focus on prevention means considering how early support can be provided, particularly for families with ongoing functioning and safety concerns. Early support — particularly for children in out-of-home care, for whom mental health-related hospitalisations during early adolescence were more frequent than for those who had lower levels of contact with protection services — could proactively reduce the later need for mental health-related hospitalisations of adolescents, and avert the longer term negative consequences of child maltreatment.

Limitations

We analysed data for admissions to public hospitals of people born in South Australia. As children in out-of-home care are unlikely to be covered by private health insurance, most are likely to rely on public health services.[21] Hospital data coding errors are possible, but quality control procedures in South Australian hospitals are designed to minimise the error rate.[27] As the number of children in contact with Australian child protection services has risen in recent years,[8] the proportion of adolescents hospitalised with mental health-related diagnoses who have had contact with child protection services may now differ from that during the period covered by our analysis. Further, we underestimated the total population burden of mental health conditions as we examined only mental health-related hospitalisations. However, given the similar magnitude of child protection contact in jurisdictions with different legislation and practices,[10] and the similar burdens of mental health-related hospitalisations,[6] our findings should be generalisable across Australia.

Conclusion

Our report that almost 45% of mental health-related inpatient hospitalisations of adolescents were of people who have had contact with child protection services reflects the experience of clinicians in hospitals across Australia. More than 40% of adolescents hospitalised with mental health-related diagnoses were known to the child protection system. As contact with child protection preceded the mental health-related hospitalisations, our findings point to an opportunity for preventing mental health challenges in adolescents and minimising the need for mental health-related hospitalisations.

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Supporting Information

Additional Supporting Information is included with the online version of this article.