Mental disorders in children known to child protection services during early childhood

Melissa J. Green[1,2], Gabrielle Hindmarsh[1], Maina Kariuki[1], Kristin R. Laurens[1,3], Amanda L Neil[4], Ilan Katz[5], Marilyn Chilvers[6], Felicity Harris[1], Vaughan J Carr[1,2]

The known: Adversity during childhood is associated with mental illness in adulthood, but less is known about childhood-onset mental disorders in children known to child protection services during early childhood.

The new: Analysis of linked population-level administrative data indicated that the adjusted odds of being diagnosed with a mental disorder during middle childhood was almost three times as high for children known to protection services during early childhood as for children without reports; for those placed in out-of-home care, the odds were more than five times as high.

The implications: Children who are maltreated or at risk of being maltreated during early childhood require specific mental health support and care.

Abstract

Objectives: To examine associations between being the subject of child protection reports in early childhood and diagnoses of mental disorders during middle childhood, by level of service response.

Design, setting, participants: Retrospective analysis of linked New South Wales administrative data, 2001–2016, for a population cohort of children (mean age in 2016, 13.2 years; SD, 0.37 years) enrolled in the longitudinal NSW Child Development Study (NSW-CDS), wave 2 linkage.

Main outcome measures: Associations between being the subject of a child protection report (any, and by level of child protection response) during early childhood (birth to 6 years of age) and diagnoses of mental disorders during middle childhood (6–14 years).

Results: 13 796 of 74 462 children in the NSW-CDS (18.5%) had been the subjects of reports to child protection services during early childhood: 1148 children had been placed in out-of-home care at least once, and 1680 had been the subjects of substantiated risk-of-significant-harm reports but were not placed in care, while 9161 had non-substantiated reports, and 1807 had reports of facts that did not reach the threshold for significant harm. After adjusting for sex, socio-economic disadvantage, perinatal complications, and parental mental illness, early childhood contact with protection services was associated with increased frequency of being diagnosed with a mental disorder during middle childhood (adjusted odds ratio [aOR], 2.72; 95% CI, 2.51–2.95). The frequency was highest for children who had been placed in out-of-home care (aOR, 5.25; 95% CI, 4.46–6.18).

Conclusion: Childhood-onset mental disorders are more frequently diagnosed in children who come to the attention of child protection services during early childhood, particularly in children placed in out-of-home care.

Children who experience adversity in early life are at high risk of a range of mental disorders during adulthood.[1–3] In particular, children known to child protection services are at increased risk of mental health difficulties (including anxiety, depression, aggression, and stress),[4–8] and these problems may be more pronounced in children who are placed in out-of-home care than in those who remain with their birth families.[6,9] The authors of two recent systematic reviews concluded that children placed in out-of-home-care consistently used mental health services more frequently than maltreated children cared for in the home, but found little evidence for differences between these groups of children in carer- or teacher-rated psychopathology during middle childhood and adolescence.[10,11]

Whole-of-population, registry-based studies have generally estimated the risk of diagnoses of adult-onset mental disorders in people maltreated during early and middle childhood, including those placed in care.[12,13] We have undertaken the first population-based investigation of the prevalence of childhood-onset mental disorders according to early contact with child protection services. Specifically, we examined associations between contact with child protection services during early childhood (from birth to 6 years of age) and diagnoses during middle childhood (6–14 years) of mental disorders treated in inpatient and ambulatory (outpatient) health services in the most populous Australian state, New South Wales. We also examined these associations according to the highest level of protection service response.

Methods

Study setting and record linkage

We analysed linked data from the NSW Child Development Study (NSW-CDS), wave 2.[14] The NSW-CDS is a longitudinal, population cohort study that links intergenerational, administrative records from several agencies with cross-sectional survey data for a total of 91 635 children, most of whom commenced primary school in NSW in 2009, and almost all of whom were aged 12–14 years in 2016.[15] The sources of the linked records for the analyses reported in this article were the NSW Registry of Birth, Deaths and Marriages (birth registrations, 2000–2006); the NSW Perinatal (2003–2005), Emergency Department (2005–2016), Admitted Patient (2001–2016), and Mental Health Ambulatory Data Collections (2001–2015) (all maintained by the NSW Ministry of Health); and the NSW Department of Family and Community Services Child Protection Case Management System – Key Information Directory System (2000–2009). Data linkage was conducted by the NSW Centre for Health Record Linkage (CHeReL; www.cherel.org.au) according to national privacy protocols, with an estimated false positive linkage rate of less than 0.5%.[14]

Exposure: child protection service contact and level of child protection response during early childhood (by 6 years of age)

For our analysis, children with records of contact with child protection services (ie, the child was a subject of at least one report

[1] University of New South Wales, Sydney, NSW. [2] Neuroscience Research Australia, Sydney, NSW. [3] Queensland University of Technology, Brisbane, QLD. [4] Menzies Institute for Medical Research, University of Tasmania, Hobart, TAS. [5] Social Policy Research Centre, University of New South Wales, Sydney, NSW. [6] NSW Department of Family and Community Services, Sydney, NSW. melissa.green@unsw.edu.au • doi: 10.5694/mja2.50392 • See Editorial (Kisely).

during 2003–2009) were classified according to the highest level of child protection response:

- children placed in out-of-home-care: this was deemed the highest service response, as it may reflect more severe maltreatment of the child or the inability of a family to continue caring for their child;
- children with a substantiated risk-of-significant-harm report: instances of actual or risk of significant harm verified by child protection case workers but not resulting in removal of the child from their family. A child is deemed to be at risk of significant harm if the circumstances causing concern for their safety, welfare or wellbeing are sufficiently serious to warrant a response by a statutory authority, with or without the consent of their family.
- children with an unsubstantiated risk-of-significant-harm report: including reports that initially met the threshold for risk of significant harm but no actual or risk of harm was determined during follow-up by case workers, or the report was not further investigated because of resource constraints; and
- children with reports that did not reach the threshold for risk of significant harm.

1 International Classification of Disease, 10th revision (ICD-10) codes for mental health conditions included in our analysis*

Diagnostic group and specific diagnoses	ICD-10 codes
Anxiety, stress and emotional disorders	
Phobias and anxiety	F40, F40.0, F40.0PC, F40.00, F40.01, F40.1, F40.10, F40.2, F40.210, F40.248, F40.8, F40.9, F41, F41.0, F41.0P, F41.0PC, F41.1, F41.2, F41.2P, F41.2PC, F41.3, F41.8, F41.9
Stress reactions	F43, F43.0, F43.1, F43.12, F43.2, F43.20, F43.21, F43.22, F43.23, F43.24, F43.25, F43.29, F43.8, F43.9
Childhood-onset emotional disorders	F93, F93.0, F93.1, F93.2, F93.3, F93.8, F93.9
Hyperkinetic and conduct disorders	
Hyperkinetic disorders	F90, F90.0, F90.1, F90.8, F90.9
Conduct disorders	F91, F91.0, F91.1, F91.2, F91.3, F91.8, F91.9
Developmental disorders	
Developmental disorders	F80, F80.0, F80.1, F80.2, F80.3, F80.45, F80.8, F80.9, F81, F81.0, F81.1, F81.2, F81.3, F81.8, F81.9, F82, F83
Autism spectrum disorders	F84, F84.0, F84.1, F84.2, F84.3, F84.4, F84.5, F84.8, F84.9
Unspecified developmental disorders	F88, F89
Other non-diagnostic codes	
Self-harm	R45.81, X84
Unspecified mental health disorder	F99, F99.1

* Mental disorder diagnoses were derived from records of the NSW Ministry of Health Emergency Department (2005–2016), Admitted Patient (2001–2016) and Mental Health Ambulatory (2001–2015) record collections. ◆

Outcome: diagnosis of mental disorder during middle childhood (6–14 years of age)

Childhood-onset mental disorders were defined by International Classification of Disease, revision 10 (ICD-10), Australian modification codes for specific disorders and self-harm (Box 1) recorded as primary or secondary diagnoses in the Mental Health Ambulatory Data Collection (public community-based or outpatient services), the Emergency Department Data Collection (with ICD-10 codes converted from Systematized Nomenclature of Medicine – Clinical Terms [SNOMED-CT] when possible), or the Admitted Patient Data Collection (both public and private hospital admissions), as available for 2010–2016.

A second series of analyses examined the likelihood of diagnoses in specific categories of mental disorder, again based on ICD-10 codes: phobias and anxiety, stress reactions, childhood-onset emotional disorders, hyperkinetic disorders, conduct disorders, developmental disorders (including autism spectrum and unspecified developmental disorders), and self-harm. Each of the mental disorder categories was dichotomised as a binary dependent variable in our analyses. A child could have codes in more than one category if separate records recorded different diagnoses.

Covariates

Sex, perinatal complications,[16] socio-economic status, and exposure to mental illness in a parent[17] were included as covariates in adjusted models. The child's sex was determined from the most frequently reported sex in all sources; when equal numbers of records recorded male and female sex (0.6% of the cohort), sex as recorded in the birth registration was used. Socio-economic disadvantage at birth was based on residential postcodes in the Perinatal Data Collection, and defined by the lowest quintile on the Index for Relative Socio-economic Disadvantage (IRSD), a function of the average income and employment levels associated with the residential postcode[18] according to 2011 Australian data (the closest available dataset to the time of the child's birth).[19] Perinatal complications included any of the following conditions recorded in the Perinatal Data Collection files of either the mother or the child: maternal diabetes mellitus, hypertension, pre-eclampsia, gestational diabetes. Parental mental illness included any psychiatric disorder recorded as primary or secondary diagnoses (ICD-10 F-codes) in NSW Ministry of Health records for 2001–2016.

Data analysis

Data were analysed in SAS 9.4 (SAS Institute) and Stata 13 (StataCorp). A series of unadjusted and adjusted logistic regression models assessed associations between:

- any child protection report during early childhood and diagnoses of childhood mental disorders (overall and by category) during middle childhood; and
- the highest level of child protection service response during early childhood and diagnoses of mental disorders (overall and by category) during middle childhood.

These analyses yielded odds ratios (ORs) with 95% confidence intervals (CIs) as measures of effect size; ORs of 1.00–1.49 were interpreted as small, 1.50–2.49 as moderate, and 2.50 or more as large effects.[20] To investigate whether higher levels of child protection response were associated with greater frequency of mental disorder diagnoses, we assessed linear trends in odds ratios after each of the logistic regression analyses.[21]

To protect the anonymity of children, table cells including data for fewer than 15 individuals are not reported. For analyses of the effect of child protection response level on diagnoses in specific mental disorder categories, this precluded including children with reports that did not meet thresholds for risk of significant harm, reducing the number of included participants for these analyses.

Ethics approval

The NSW-CDS received ethics approval from the NSW Population and Health Services Research Ethics Committee (reference, HREC/15/CIPHS/21).

Results

Participants

We analysed data for 74 462 children in the NSW-CDS (81.3% of the cohort of 91 635; excluded: 16 451 for whom linked maternal records were not available, 722 without perinatal data). The mean age of the eligible children was 13.2 years (standard deviation [SD], 0.37 years), and 38 522 were boys (51.7%). For 60 666 children (81.5%) there was no child protection report during early childhood (to 6 years of age). A total of 13 796 children (18.5%) were recorded as being the subject of at least one child protection report or being placed in out-of-home care during early childhood:

- 1148 children (8.3% of children with child protection service contact) who had been placed in out-of-home care;
- 1680 children (12.2%) with substantiated risk-of-significant-harm reports;
- 9161 children (66.4%) with unsubstantiated risk-of-significant-harm reports; and
- 1807 children (13.1%) with reports that did not reach the threshold for risk of significant harm.

Mental disorder diagnoses during middle childhood were recorded for 3092 children (4.15%), including 2171 (70.2% of children with recorded diagnoses) who had at least one diagnosis of an unspecified mental disorder (F99) (Box 2). A total of 1359 children had recorded diagnoses in two or more categories (two categories, 1060 children; three or more categories, 299 children).

2 Child protection service contact, childhood mental health disorder diagnoses, and covariates

Characteristic	Number of children
Total number of children	74 462
Contact with child protection service	
Any report	13 796 (18.5%)
No report	60 666 (81.5%)
Level of child protection contact during early childhood	
Out-of-home-care	1148 (1.54%)
Substantiated risk-of-significant-harm report	1680 (2.26%)
Unsubstantiated risk-of-significant-harm report	9161 (12.3%)
Report did not meet threshold for risk of significant harm	1807 (2.43%)
Childhood mental disorder diagnoses during middle childhood	
Any mental disorder	3092 (4.15%)
Phobias and anxiety	524 (0.70%)
Childhood-onset emotional disorders	165 (0.22%)
Stress reactions	179 (0.24%)
Hyperkinetic disorders	207 (0.28%)
Conduct disorders	264 (0.35%)
Developmental disorders*	425 (0.57%)
Self-harm	93 (0.12%)
Unspecified mental health disorder	2171 (2.92%)
Covariates	
Sex (boys)	38 522 (51.7%)
Socio-economic disadvantage†	14 386 (19.3%)
Perinatal complications	8113 (10.9%)
Any parental mental illness	18 127 (24.3%)

* Includes autism spectrum and developmental disability disorders unspecified. † Index of Relative Socio-economic Disadvantage: lowest quintile. ◆

Child protection contact and diagnoses of mental health disorders

The prevalence of diagnoses in each category of mental disorder was higher for children who had had contact with child protection services than for those who had not (Box 3). The odds of being diagnosed with any mental disorder were significantly higher for children with any child protection contact (*v* no contact: OR, 3.69; 95% CI, 3.42–3.97; adjusted OR [aOR], 2.72; 95% CI, 2.51–2.95). The effect sizes for associations between child protection contact and specific categories of mental disorder in the adjusted models were moderate (phobias and anxiety, developmental disorders) or large (all other categories) (Box 4).

Parental mental disorder was the covariate with the greatest effect size for any mental disorder (OR, 3.10; 95% CI, 2.89–3.34; aOR, 2.16; 95% CI, 1.99–2.34) and for most types of childhood mental disorder; the exceptions were hyperkinetic and developmental disorders, for which being a boy was the most influential covariate in adjusted models. In adjusted models, socio-economic disadvantage was associated with a small increase in the likelihood of being diagnosed with a developmental disorder, and small reductions for any mental disorder, and phobias and anxiety; perinatal complications were associated with small increases in the odds of being diagnosed with developmental disorders or self-harm (Box 4).

Level of child protection service response and diagnoses of mental health disorders

The prevalence of diagnoses in each category of mental disorder was highest for those who had been placed in out-of-home care (Box 3). The odds of being diagnosed with a mental disorder increased with the level of child protection response, and were greatest for children who had been placed in out-of-home care (*v* no child protection service contact: OR, 8.31 [95% CI, 7.13–9.68]; aOR, 5.25 [95% CI, 4.46–6.18]; for trend across response categories, $P < 0.001$). Similarly, the odds of being diagnosed with a mental disorder in any specific category increased with response level, and were highest for children who had been placed in out-of-home care for each disorder

3 Mental disorder diagnoses in 74 462 children during middle childhood, by early childhood child protection service contact and child protection response level

	Child protection contact		Child protection response level (highest)			
Childhood mental disorder	No report	Any report	Sub-threshold report	Unsubstantiated report	Substantiated report	Out-of-home care
Total number of children	60 666	13 796	1807	9161	1680	1148
Any mental disorder	1739 (2.87%)	1353 (9.81%)	82 (4.5%)	814 (8.89%)	231 (13.8%)	226 (19.7%)
Phobias and anxiety	358 (0.59%)	166 (1.20%)	NR	107 (1.17%)	26 (1.6%)	24 (2.1%)
Emotional disorders	86 (0.14%)	79 (0.57%)	NR	46 (0.50%)	NR	19 (1.7%)
Stress reactions	71 (0.12%)	108 (0.78%)	NR	53 (0.58%)	21 (1.2%)	30 (2.6%)
Hyperkinetic disorders	93 (0.15%)	114 (0.83%)	NR	61 (0.67%)	17 (1.0%)	29 (2.5%)
Conduct disorders	111 (0.18%)	153 (1.11%)	NR	87 (0.95%)	21 (1.2%)	42 (3.7%)
Developmental disorders*	247 (0.41%)	178 (1.29%)	NR	116 (1.27%)	24 (1.4%)	32 (2.8%)
Self-harm	38 (0.06%)	55 (0.40%)	NR	29 (0.32%)	NR	NR

NR = not reported (fewer than 15 children). * Includes autism spectrum and developmental disability disorders unspecified. ◆

category examined, in both the unadjusted and adjusted analyses (for trends across response categories, each: $P < 0.001$) (Box 5).

Discussion

We found that the odds of being diagnosed with a mental disorder during middle childhood were more than twice as high for children in the NSW-CDS cohort who had been the subjects of reports to child protection services in early childhood as for children unknown to child protection services. Most striking was that the odds of being diagnosed with any type of mental disorder were five times as high for children who had been placed in out-of-home care as for children not known to child protection services; the odds of developing stress-related, conduct, and hyperkinetic disorders (including

4 Child protection service contact during early childhood and diagnoses of mental health disorders during middle childhood: multivariable analysis

Outcome	Any child protection report	Sex (boy)	Socio-economic disadvantage*	Any perinatal complications	Any parental mental disorder
Unadjusted models: odds ratios (95% confidence intervals)					
Any mental disorder	3.69 (3.42–3.97)	1.48 (1.37–1.59)	1.02 (0.93–1.12)	1.07 (0.96–1.20)	3.10 (2.89–3.34)
Phobias and anxiety	2.05 (1.71–2.47)	0.98 (0.83–1.17)	0.79 (0.62–0.99)	1.20 (0.93–1.55)	2.18 (1.83–2.59)
Emotional disorders	4.06 (2.99–5.51)	1.21 (0.89–1.64)	0.85 (0.57–1.28)	1.00 (0.61–1.64)	3.16 (2.33–4.28)
Stress reactions	6.73 (4.99–9.09)	1.27 (0.94–1.70)	1.62 (1.17–2.25)	1.15 (0.73–1.7)	6.69 (4.88–9.17)
Hyperkinetic disorders	5.43 (4.12–7.14)	3.02 (2.19–4.16)	1.30 (0.94–1.79)	0.92 (0.59–1.45)	3.21 (2.45–4.22)
Conduct disorders	6.12 (4.79–7.82)	2.31 (1.77–3.02)	1.31 (0.99–1.74)	0.97 (0.66–1.44)	4.59 (3.59–5.87)
Developmental disorders†	3.20 (2.64–3.88)	2.69 (2.16–3.34)	1.52 (1.22–1.88)	1.54 (1.18–2.00)	2.55 (2.11–3.09)
Self-harm	6.39 (4.22–9.66)	1.00 (0.66–1.50)	1.30 (0.80–2.09)	1.70 (0.99–2.92)	4.51 (2.98–6.82)
Adjusted models:‡ adjusted odds ratios (95% confidence intervals)					
Any mental disorder	2.72 (2.51–2.95)	1.48 (1.37–1.59)	0.85 (0.78–0.94)	1.10 (0.98–1.23)	2.16 (1.99–2.34)
Phobias and anxiety	1.63 (1.33–2.00)	0.98 (0.82–1.16)	0.71 (0.56–0.90)	1.22 (0.94–1.58)	1.86 (1.54–2.25)
Emotional disorders	3.07 (2.18–4.31)	1.19 (0.87–1.62)	0.71 (0.47–1.06)	1.03 (0.63–1.69)	2.07 (1.48–2.91)
Stress reactions	3.72 (2.68–5.18)	1.25 (0.93–1.68)	1.25 (0.90–1.74)	1.20 (0.77–1.87)	3.93 (2.79–5.55)
Hyperkinetic disorders	4.17 (3.07–5.66)	2.98 (2.16–4.10)	1.05 (0.76–1.45)	0.95 (0.60–1.49)	1.81 (1.34–2.45)
Conduct disorders	4.02 (3.07–5.28)	2.29 (1.75–2.99)	1.03 (0.78–1.38)	1.01 (0.68–1.50)	2.64 (2.01–3.46)
Developmental disorders†	2.43 (1.96–3.01)	2.67 (2.14–3.31)	1.31 (1.05–1.63)	1.56 (1.20–2.03)	1.80 (1.46–2.23)
Self-harm	4.35 (2.75–6.89)	0.98 (0.65–1.47)	1.01 (0.62–1.63)	1.77 (1.03–3.04)	2.52 (1.59–3.98)

* Index of Relative Socio-economic Disadvantage: lowest quintile *v* other four quintiles. † Includes autism spectrum and unspecified developmental disorders. ‡ Each factor-specific odds ratio is adjusted for all other factors in table. ◆

5 Child protection service response level and diagnoses of mental health disorders: (adjusted) odds ratios (v no contact with services) with 95% confidence intervals

	Child protection response level (highest)							
	Unadjusted models				Adjusted models*			
Mental disorder†	Sub-threshold report	Non-substantiated report	Substantiated report	Out-of-home care	Sub-threshold report	Non-substantiated report	Substantiated report	Out-of-home care
Any mental disorder	1.61 (1.28–2.02)	3.31 (3.03–3.60)	5.40 (4.67–6.26)	8.31 (7.13–9.68)	1.39 (1.10–1.74)	2.56 (2.33–2.81)	3.80 (3.25–4.43)	5.25 (4.46–6.18)
Phobias and anxiety	NC	1.99 (1.60–2.47)	2.65 (1.77–3.95)	3.60 (2.37–5.46)	NC	1.63 (1.29–2.05)	1.98 (1.30–3.00)	2.50 (1.61–3.88)
Emotional disorders	NC	3.55 (2.48–5.09)	4.22 (2.19–8.13)	11.8 (7.19–19.6)	NC	2.86 (1.94–4.22)	3.09 (1.55–6.15)	8.01 (4.58–14.0)
Stress reactions	NC	4.97 (3.47–7.09)	10.8 (6.62–17.6)	22.9 (14.9–35.2)	NC	3.02 (2.05–4.43)	5.53 (3.28–9.32)	10.0 (6.23–16.2)
Hyperkinetic disorders	NC	4.37 (3.16–6.05)	6.66 (3.96–11.2)	16.9 (11.1–25.7)	NC	3.67 (2.59–5.21)	5.36 (3.08–9.31)	12.3 (7.60–19.9)
Conduct disorders	NC	5.23 (3.95–6.93)	6.91 (4.32–11.0)	20.7 (14.4–29.7)	NC	3.78 (2.79–5.13)	4.47 (2.73–7.34)	11.8 (7.84–17.7)
Developmental disorders‡	NC	3.14 (2.51–3.92)	3.54 (2.32–5.41)	7.01 (4.83–10.2)	NC	2.51 (1.98–3.19)	2.71 (1.75–4.21)	4.80 (3.21–7.20)

NC = not calculated because of low cell numbers in underlying data. * Adjusted for the covariates sex, socio-economic disadvantage, perinatal complications and parental mental disorder. Statistical summary for these covariates is included in the Supporting Information. † Any mental disorder: $N = 74\,462$; specific categories: $N = 72\,665$ (see Methods). Trend for "any mental disorder" and for each category of mental disorder in each model: $P < 0.001$. ‡ Includes autism spectrum and unspecified developmental disorders. ◆

attention deficit/hyperactivity disorder) were at least ten times as high for children placed in care, even after accounting for sex, socio-economic disadvantage, perinatal complications, and parental mental illness.

The odds of being diagnosed with any or specific types of mental disorder were also greater for children with substantiated or unsubstantiated reports of risk of significant harm than for children who had not been the subject of child protection reports. Both substantiated and unsubstantiated reports meet thresholds for risk of significant harm that justify further investigation, but many reports remain unsubstantiated because resource limitations preclude further investigation. The proportion of reports reaching the threshold for investigation that are investigated is increasing in NSW following substantial service reforms, rising to an estimated 21% in 2010–11 and 28% in 2012–13.[22]

In adjusted models, boys were more than twice as likely as girls to be diagnosed with hyperkinetic, conduct, and developmental disorders, findings consistent with national epidemiological evidence.[23] Children with a parent with a mental disorder were twice as likely to be diagnosed with a mental disorder; perinatal complications and socio-economic disadvantage were associated with small but significant increases in the frequency of developmental disorders.

Our findings must be considered in the context of the increased health surveillance of children in out-of-home care in NSW as the result of policy directives enacted in 2010, which may have increased the likelihood of diagnosis through greater overall exposure of children to health services. This includes the out-of-home care Health Pathway policy, a joint initiative of the NSW Ministries of Health and Family and Community Services open to children aged 0–17 years entering statutory out-of-home care since 2010.[24] However, our finding that mental disorder diagnoses were more frequent among children who had experienced out-of-home care is consistent with population-based reports from Sweden and Finland of increased levels of adult-onset mental disorders among people who had contact with child protection services during childhood, particularly those who had been placed in care.[12,13] Policy changes alone therefore probably do not explain our findings.

It is important to clarify that our findings should not be interpreted as suggesting that being the subject of a report to child protection services leads to mental health problems in children. Rather, we interpret our findings as reflecting the consequences of maltreatment that causes contact with child protection services, recognising that leaving a mistreated child with their family may risk further harm despite the intervention by child protection services, but that out-of-home care may not always provide optimal protection.

Indeed, the increased prevalence of mental disorder diagnoses associated with increasing level of child protection response suggests that the severity of trauma experienced during early childhood may be important, as may be the child's psychological response to being placed in care. This is consistent with smaller studies that have reported that trajectories of mental health and illness among children placed in care may depend upon the developmental period in which children were placed in care,[6] as well as carer characteristics and the child's interpersonal skills that influence healthy psychological development.[25]

Limitations

We did not examine individual trajectories of contact with the child protection system with respect to the precise developmental periods in which substantiated risk-of-significant-harm reports were made, nor the possibility of children in out-of-home care returning to their biological parents during later childhood. These pathways would be better explored with a study design

focused on children known to the child protection system. Another limitation was our use of hospital admission and outpatient mental health services data to determine when childhood mental disorders had been diagnosed; these data may underestimate the prevalence of less severe mental health problems, as they do not include data from private practitioners and primary care services. Nor did we consider the emergence of mental disorders during early childhood, which could be reasons for child protection reports or care placements. Finally, the lower prevalence of some categories of mental disorder in children living with greater socio-economic disadvantage may reflect deficiencies in area-based measures of socio-economic status, or operational confounding (that is, inadvertent measurement of another protective factor).

Conclusion

In our study, almost one in five children had been the subjects of reports to child protection services during early childhood, and 2828 (3.8%) had been maltreated (as evidenced by being placed in out-of-home care or a substantiated risk-of-significant-harm report). A further 12% of children may also have been at risk of serious harm, but the risk was not substantiated, either because of resource limitations or because follow-up investigation by case workers did not substantiate the initial reports. There are consequently a large number of children who should be regarded as being at increased risk of developing mental disorders during middle childhood, as well as other adverse outcomes not discussed here, including interactions with the legal system, especially children with conduct disorders. Our findings highlight the need for strategies for detecting children at increased risk of being harmed in order to provide support to families much earlier, so that maltreatment and its damaging mental and social consequences can be averted.

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Supporting Information

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