The use of cross-jurisdictional population data to investigate health indicators of child maltreatment

Melissa O'Donnell, Natasha Nassar, Helen M Leonard, Richard P Mathews, Yvonne G Patterson and Fiona J Stanley

ABSTRACT

Objectives: To determine the extent to which children with a hospital admission related to assault or maltreatment or to a notified sexually transmitted infection (STI) have contact with the Western Australian Department for Child Protection (DCP), and to investigate injuries and conditions often associated with child maltreatment and subsequent contact with the DCP.

Design, participants and setting: Retrospective cohort study using de-identified, record-linked child protection and hospital morbidity data to identify all children aged 0–17 years in Western Australia between 1 January 1990 and 31 December 2005, and a subcohort of children born in WA between these dates, admissions of these children to public and private hospitals in WA, and their contact with the Western Australian DCP.

Main outcome measures: Annual trends in notifications and substantiations of child maltreatment; proportion of children with assault-related and maltreatment-related hospital admissions resulting in notifications, substantiations, or out-of-home care.

Results: Most children admitted for maltreatment-related reasons (90%) had contact with the DCP, with 81% of these children being notified, 68% having maltreatment substantiated, and 50% entering out-of-home care. Specific injuries and conditions were associated with children who had greater contact with the DCP, including retinal haemorrhage, rib fractures, multiple injuries, STIs at under 14 years of age, and malnourishment.

Conclusions: The health system effectively identifies and notifies real cases of maltreatment, and a high proportion of these are substantiated. Health data play an important role in improving maltreatment surveillance, providing opportunities to make valid comparisons over time and between jurisdictions, as well as to monitor conditions and injuries associated with child maltreatment.

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There are concerns about increasing rates of child maltreatment in Australia, with a 50% increase in notifications from the financial years 2002–03 to 2006–07, and a 45% increase in substantiated notifications.[1] To prevent child maltreatment, it is important that we provide support for at-risk families, or at least identify children who are being maltreated early in the abuse cycle, to reduce harm.[2] Hospitals play an important role in identifying and treating suspected non-accidental injuries and reporting them to child protection agencies.

To date, no studies in Australia have investigated whether children presenting to hospitals with suspected maltreatment are being notified to child protection agencies, and the outcome of such notifications. However, a recent study did find that children subject to abuse substantiated by child protection agencies had a higher prior rate of emergency department use.[3] Our aim in this study was to determine the extent to which children with hospital admissions related to assault or maltreatment or a notified sexually transmitted infection (STI) have subsequent contact with child protection agencies. We also investigated specific injuries often associated with child maltreatment.

METHODS

There were two parts to this study. The first was a retrospective cohort study of all children aged 0–17 years in Western Australia who had contact with the Department for Child Protection (DCP) from 1 January 1990 to 31 December 2005. This cohort was used to investigate trends in the involvement of child protection agencies and in child characteristics. In the second part of the study, we used a cohort of all children born in WA between 1 January 1990 and 31 December 2005 to investigate hospital admissions related to assault or maltreatment, and child protection outcomes.

Both parts of the study used linked de-identified data. Data obtained from Western Australian health data collections included those from the Midwives Notifications System, birth registrations, the Hospital Morbidity Data Collection, and the Notifiable and Infectious Disease Database for the period 1990 to 2005, inclusive. Midwives Notifications and birth registration data were used to identify child characteristics. Hospital morbidity data contain information on all hospital admissions (public and private) with diagnostic information for each admission coded using the International Classification of Diseases (ICD). All ICD codes were recoded to comply with the 10th revision of the ICD (ICD-10). The Notifiable and Infectious Diseases Database contains information on notifiable STIs in children.

We obtained child protection data that included notifications, substantiations and out-of-home care for 1990 to 2005, inclusive. Notifications consist of reports made to the DCP about concerns of maltreatment or risk of harm. A substantiation is made when there is reasonable cause to believe the child has been or is at risk of harm.[4] In 1995, the DCP introduced a new policy, with child protection referrals being assigned as child concern reports if there was no indication of maltreatment, but concern was expressed over a child's welfare.[5] From 1 January 1990 to 31 December 2005, WA did not have mandatory reporting, but interagency protocols existed between the DCP and the Department of Health.[6] For this study, we used the first child concern report, substantiation and notification for any individual child to identify trends.

In 2004, an STI protocol was established between the DCP and the Communicable Disease Control Directorate (CDC) to report any notified STI for children under the age of 14 years.

Data sets were linked by the Western Australian Department of Health Data Linkage Branch by matching identifiers common to the sets of records (eg, name, address, etc).[7] Only a unique project identifier and the individual's clinical information was provided; identifying information was removed.

Child health indicators

Children were considered to have had a hospital admission related to maltreatment if they had any of the following ICD-10 diagnostic codes recorded: T74, Y07.1–Y07.3, Y07.8, Y07.9. An assault-related admission was defined by ICD-10 codes: X85–Y09. As most maltreatment admissions also had a code of assault, maltreatment cases were only counted once and removed from assault cases. The distinction between these admissions is explained in detail in our previous work,[8] and, based on this, common injuries and conditions associated with child maltreatment were assessed.[8] Data on STIs only include children aged 2–13 years, born in WA between 1 January 1990 and 31 December 2005 and notified to the CDC.

Socioeconomic disadvantage was determined by the Index of Relative Social Disadvantage from the Australian Bureau of Statistics (ABS) using the birth registration and Midwives Notifications data.[9] We assigned six levels of disadvantage to collection districts, ranging from 1 (least disadvantaged) to 6 (most disadvantaged).

Ethics approval

Ethics approval for this study was granted by the University of Western Australia Human Research Ethics Committee, the Confidentiality of Health Information Committee and the Western Australian Aboriginal Health Information and Ethics Committee.

Data analyses

Overall trends were calculated by the number of first child concern reports, notifications and substantiations for any individual child. Annual prevalence rates were calculated based on estimates of the child population using the Rates Calculator, version 9.1.5.[10] Linked hospital and child protection data determined the proportion of children with an assault-related or maltreatment-related hospital admission, or a notified STI, with whom child protection agencies had become involved. Temporal relationships between admissions and notifications were examined. Specific injuries and conditions associated with child maltreatment were also assessed for their occurrence in children who had contact with the DCP. SAS, version 9.1 (SAS Institute Inc, Cary, NC, USA) was used for the analyses.

RESULTS

Child protection agency involvement

Between 1 January 1990 and 31 December 2005, there were 50 692 notifications with 19 207 of these substantiated. In the early years, there was a sharp increase in the rate of first notifications from 51 per 10 000 children in 1990 to 75 per 10 000 in 1994; this was followed by a decline in 1995 corresponding with the introduction of child concern reports (Box 1). The rate of child concern reports shows an initial increase in child concern reports, peaking in 1997, before falling over the next 5 years, and there was a small but steady increase in the rate of notifications. The substantiation rate followed a similar trend to that of notifications, increasing from 19 to 27 per 10 000 children between 1990 and 1994, and falling to 17 per 10 000 children in 1995; from then onward, the rate remained relatively stable.

Rates of first notifications were highest for children aged 0–4 years (58 per 10 000 children), and gradually declined with increasing age. Notifications to the DCP were more prevalent among Aboriginal children compared with non-Aboriginal children (116 v 33 per 10 000 children), and among girls compared with boys (45 v 35 per 10 000 children).

Hospital admissions for child maltreatment and assault

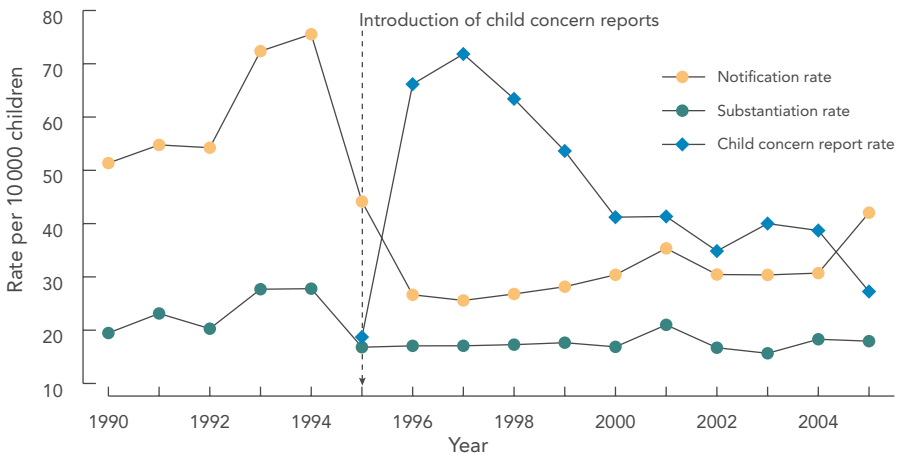
Overall, 4% of children who had been notified to the DCP and 6.4% of those with a substantiated notification had a maltreatment-related hospital admission. A total of 604 children had at least one maltreatment-related admission, while 304 children had at least one assault-related admission (Box 2). Most children with maltreatment-related admissions were aged under 5 years and had been born into communities with higher levels of social disadvantage. Of the children who had an STI notification, over two-thirds were female, and half were born in areas of greater social disadvantage.

Most children with maltreatment-related admissions had contact with the DCP (90%), with 81% having at least one notification (Box 3). Over two-thirds of children had a substantiated notification, while half entered out-of-home care. Of the children who had an assault-related admission, 64% had contact with the DCP, more than half had a notification, 43% had a substantiation and 26% entered out-of-home care.

A total of 98 children aged under 14 years had an STI notification, with almost two-thirds having contact with the DCP (Box 3). Sixty per cent had been notified to the DCP, with over a third having a substantiated notification and 15% entering out-of-home care. When only the 35 cases from 2004 onwards were considered (after the establishment of an interagency protocol), 86% of children had been notified to the DCP, with 54% of those notifications being substantiated.

Of the 490 children admitted to hospital for maltreatment and who had been notified to the DCP (Box 3), 73% were reported directly after admission, usually within the first 4 days. In half of the 73% of cases that

1 Rates of child concern reports, child protection notifications and substantiations, 1 January 1990 to 31 December 2005*



* Only the first notification, substantiation and child concern report was used for any individual child. ◆

2 Characteristics of children born in Western Australia between 1 January 1990 and 31 December 2005 relating to hospital admissions for maltreatment and assault, and to notifications of sexually transmitted infections in the same period

Characteristic	No. of children	No. of children with maltreatment-related admissions	No. of children with assault-related admissions	No. of children aged 2–13 years with notified sexually transmitted infections
Total children	397 346	604	304	98
Age groups				
0–5 years	na	562 (93.1%)	146 (48.0%)	38 (38.8%)*
6–11 years	na	37 (6.1%)	78 (25.7%)	20 (20.4%)
12–15 years	na	5 (0.8%)	80 (26.3%)	40 (40.8%)†
Sex†				
Female	193 330 (48.7%)	270 (44.7%)	127 (41.8%)	70 (71.4%)
Male	204 013 (51.3%)	334 (55.3%)	177 (58.2%)	28 (28.6%)
Aboriginality				
Non-Aboriginal	375 003 (94.4%)	392 (64.9%)	214 (70.4%)	44 (44.9%)
Aboriginal	22 343 (5.6%)	212 (35.1%)	90 (29.6%)	54 (55.1%)
SEIFA§				
1 (lowest disadvantage)	31 001 (7.8%)	4 (0.7%)	8 (2.6%)	0 (0.0%)
2	52 222 (13.1%)	27 (4.5%)	11 (3.6%)	5 (5.1%)
3	89 284 (22.5%)	50 (8.3%)	35 (11.5%)	2 (2.0%)
4	94 467 (23.8%)	116 (19.2%)	60 (19.7%)	13 (13.3%)
5	59 005 (14.8%)	135 (22.4%)	54 (17.8%)	8 (8.2%)
6 (highest disadvantage)	36 658 (9.2%)	173 (28.6%)	81 (26.6%)	27 (27.6%)

na = not applicable. SEIFA = socio-economic index for area.
* Children aged 0–1 and 14–15 years were not included. † Three children had missing data for sex. § SEIFA had missing data, so percentages will not add up to 100. ◆

3 Child protection data from the period 1 January 1990 to 31 December 2005 for children born in Western Australia in the same period

	Maltreatment-related admission	Assault-related admission	Sexually transmitted infection notification
Total	604	304	98
Child concern report	262 (43.4%)	110 (36.2%)	24 (24.5%)
Child protection notification	490 (81.1%)	173 (56.9%)	59 (60.2%)
Substantiated notification	413 (68.4%)	130 (42.8%)	39 (39.8%)
Entered out-of-home care	305 (50.5%)	80 (26.3%)	15 (15.3%)
Any involvement of child protection authorities	542 (89.7%)	194 (63.8%)	63 (64.3%)

were reported after admission, this was the first notification for the children concerned, with hospital health care workers making 42% of the 490 notifications. Of the 413 cases that were substantiated, 68% were first substantiated notifications for the children concerned.

A high proportion of children admitted with a specific injury or condition had contact with the DCP. Particularly common were retinal haemorrhage (67%), rib fractures (69%), multiple injuries (31%), and malnourishment (38%). Among children aged under 6 years, 83% of those admitted for rib fractures had a notification, and 60% entered out-of-home care.

DISCUSSION

This is the first population-based study confirming that most children suspected during a hospital admission of having been maltreated were notified to child protection agencies, with most of these cases being substantiated. Our results indicate that, of children who have contact with child protection agencies, only a small proportion are hospitalised for recognised or suspected maltreatment. However, among those who are, the probability of maltreatment being substantiated is high. Children diagnosed with retinal haemorrhage, rib fractures, multiple injuries, STIs under the age of 14, and malnourishment were identified as having greater contact with child protection agencies.

The strength of this study is that we used linked population-level data to facilitate the tracking of child protection outcomes, avoiding the bias introduced by relying on participation and recall by individuals. Researching such a sensitive issue is a challenge, but using de-identified data protects the privacy of research subjects. The study has limitations, as under-ascertainment may arise from the use of the diagnostic codes reported on the morbidity dataset to identify children with maltreatment-related and assault-related hospital admissions.[11] Further, child maltreatment is only identified by notification to the DCP, and there may be children who have been maltreated but not reported. Also, it is highly likely that notification rates will be lower in WA than in other Australian states,

as WA did not have mandatory reporting during the study period.

Despite these limitations, our research provides some confidence that a large proportion of cases that are suspected in the hospital as involving maltreatment are notified and substantiated by child protection agencies. In addition, after the introduction of the STI interagency protocol, over half of the children notified to the DCP had a finding of abuse or risk of harm, and this supports the continuation of this protocol.

This study shows that the hospital system is identifying and reporting real cases of maltreatment, confirmed by the high proportion of substantiations. The widespread collection of morbidity data in many countries, with universal classification codes, creates opportunities to broaden child maltreatment surveillance and make valid comparisons over time and between jurisdictions.[12] While cases that reach hospital are the tip of the iceberg, monitoring admissions for maltreatment is an important public health initiative.

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COMPETING INTERESTS

None identified.

AUTHOR DETAILS

Melissa O'Donnell, GradDipEd, MPsych, PhD, Research Officer[1]
Natasha Nassar, BEc, MPH, PhD, Research Fellow[2,1]
Helen M Leonard, MB ChB, MPH, Senior Research Fellow[1]
Richard P Mathews, BPsych, MA, Manager, Performance Reporting and Evaluation[3]
Yvonne G Patterson, BSc, MPsych, MBA, Assistant Executive Director, Resource Allocation[4]
Fiona J Stanley, MB BS, MSc, MD, Director[1]

1 Telethon Institute for Child Health Research, Centre for Child Health Research, University of Western Australia, Perth, WA.
2 Kolling Institute of Medical Research, University of Sydney, Sydney, NSW.
3 Disability Services Commission, Government of Western Australia, Perth, WA.
4 Department for Child Protection, Government of Western Australia, Perth, WA.

Correspondence: melissao@ichr.uwa.edu.au

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