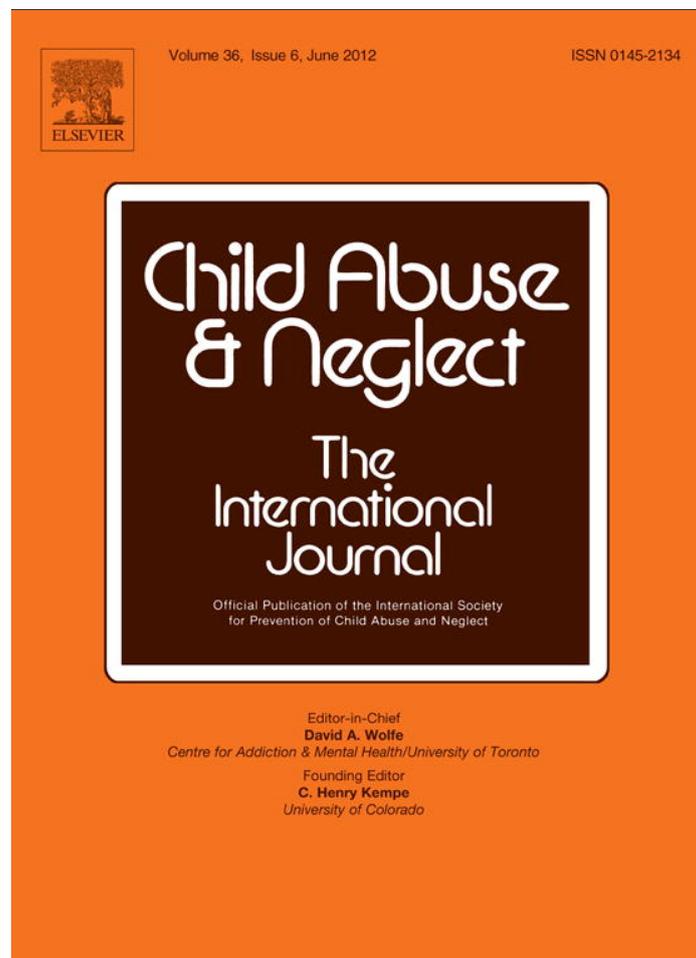


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## Child Abuse &amp; Neglect



## Child maltreatment and onset of emergency department presentations for suicide-related behaviors<sup>☆</sup>

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### ABSTRACT

**Objectives:** To determine whether the rates of a first presentation to the emergency department (ED) for suicide-related behavior (SRB) are higher among children/youth permanently removed from their parental home because of substantiated maltreatment than their peers. To describe the health care settings accessed by these children/youth before a first SRB presentation to help design preventive interventions.

**Methods:** A population-based (retrospective) cohort of 12–17-year-olds in Ontario, Canada was established. Children/youth removed from their parental home because of the above noted maltreatment ( $n = 4683$ ) and their population-based peers ( $n = 1,034,546$ ) were individually linked to administrative health care records over time to ascertain health service use and subsequent ED presentations for SRB during follow-up. Person-time incidence rates were calculated and Cox regression models used to estimate adjusted hazard ratios (HR) and corresponding 95% confidence intervals (CI).

**Results:** After controlling for demographic characteristics and prior health service use, maltreated children/youth were about five times more likely to have a first ED presentation for SRB compared to their peers, in both boys (HR: 5.13, 95% CI: 3.94, 6.68) and girls (HR: 5.36, 95% CI: 4.40, 6.54).

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**Conclusions:** Children/youth permanently removed from their parental home because of substantiated child maltreatment are at an increased risk of a first presentation to the ED for SRB. The prevention of child maltreatment and its recurrence and the promotion of resilience after maltreatment has occurred are important avenues to study toward preventing ED SRB presentations in children/youth. Provider and system level linkages between care sectors may prevent the need for such presentations by providing ongoing environmental support.

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## Introduction

It is noteworthy that the study of resilience first began with maltreated children and refers to “the ability to maintain or regain mental health, despite experiencing adversity” (Herrman et al., 2011, p. 259). Promoting resilience through ongoing environmental support (Afifi & MacMillan, 2011), including the use of professional services (Wekerle, Waechter, & Chung, 2012), is an important avenue to study towards improving the lives of maltreated children/youth. In this paper, we examine children/youth with histories of maltreatment and emergency department (ED) presentations for suicide-related behavior (SRB) to shed light on how health care and child welfare sectors could work together towards preventing the need for such ED SRB presentations.

SRB are defined as fatal or non-fatal self-inflicted injuries or self-poisonings with suicidal, undetermined or no suicidal intent (Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007b; Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007a). Both survey and health services data show that non-fatal SRB peak dramatically in youth (Centers for Disease Control and Prevention, 2002; Hawton & Harriss, 2008; Martin et al., 2010), with youth seeking treatment, a more suicidal subset (Ystgaard et al., 2009). Children/youth who present to the emergency department (ED) for SRB provoke concern for several reasons: more than half have a mental illness documented (Olfson, Gameroff, Marcus, Greenberg, & Shaffer, 2005; Vajda & Steinbeck, 2000), and at least 2/3 are suicidal (Hawton & Harriss, 2007; Hjelmeland, 1996; Vajani, Anest, Crosby, Alexander, & Millet, 2007). About one quarter of these children/youth will have a repeat ED presentation for SRB within the following year (Hulten et al., 2001; Stewart, Manion, Davidson, & Cloutier, 2001; Vajda & Steinbeck, 2000); their mortality risk is 3–4 times higher than expected (with suicide risk 10–20 times higher than expected) (Hawton & Harriss, 2007; Reith, Whyte, Carter, & McPherson, 2003). Their hospital care is costly to society, comprising nearly 1% of adolescent emergency department presentations (Bethell & Rhodes, 2008). About half who present to the ED with SRB are admitted (Bethell & Rhodes, 2009; Olfson et al., 2005). Yet, to date, findings from randomized controlled trials aimed at preventing SRB in youth have been inconclusive (Newton et al., 2010; Robinson, Hetrick, & Martin, 2011).

Insights about those with a first ED SRB presentation can help identify factors that if acted on, would prevent such presentations. Some have documented an association between child welfare involvement and an inpatient admission for SRB (Christoffersen, Poulsen, & Nielsen, 2003; Katz et al., 2011; Vinnerljung, Hjern, & Lindblad, 2006). However, those admitted to hospital represent more severe SRB, leaving open important questions on those presenting to the ED for the first time and repeatedly—groups that may be amenable to preventive interventions. Further, while prior mental health problems have been controlled through service use measures (Christoffersen et al., 2003; Katz et al., 2011) information about the settings accessed can help design preventive interventions.

### *Child maltreatment and ED presentations for SRB*

Little is known about the risk of ED SRB presentations in maltreated children and their prior health service use. A Canadian study of 224 children/youth with a first suicidal (ideation, plan or attempt) ED presentation found 14.4% were Crown wards (described below) and that Crown wards were about twice as likely to return to the ED for mental health reasons (including suicide attempts) within 6 months (Stewart et al., 2001).

We studied the population of children/youth aged 12–17 years in the province of Ontario, Canada, to determine who was at an increased risk for a first ED presentation for SRB. We hypothesized that, regardless of the duration of their out-of-home-placement (Katz et al., 2011; Vinnerljung et al., 2006), boys and girls removed from their parental home permanently because of substantiated maltreatment would be at a greater risk for presenting to the ED for SRB than their population-based peers; and that this effect would persist after controlling for prior mental health service use (proxy for mental health problems) (Christoffersen et al., 2003; Katz et al., 2011), and their place of residence (those living in smaller, poorer communities may use the ED as their regular source of ambulatory medical care) (Guttmann, Shipman, Lam, Goodman, & Stukel, 2010; Ryan, Riley, Kang, & Starfield, 2001).

## Methods

### *Study design and setting*

This is a population-based (retrospective) cohort study of children and youth at risk for a first ED presentation for SRB in the Province of Ontario, Canada between 1 January 2004 and 31 December 2008. This study was approved by the Research

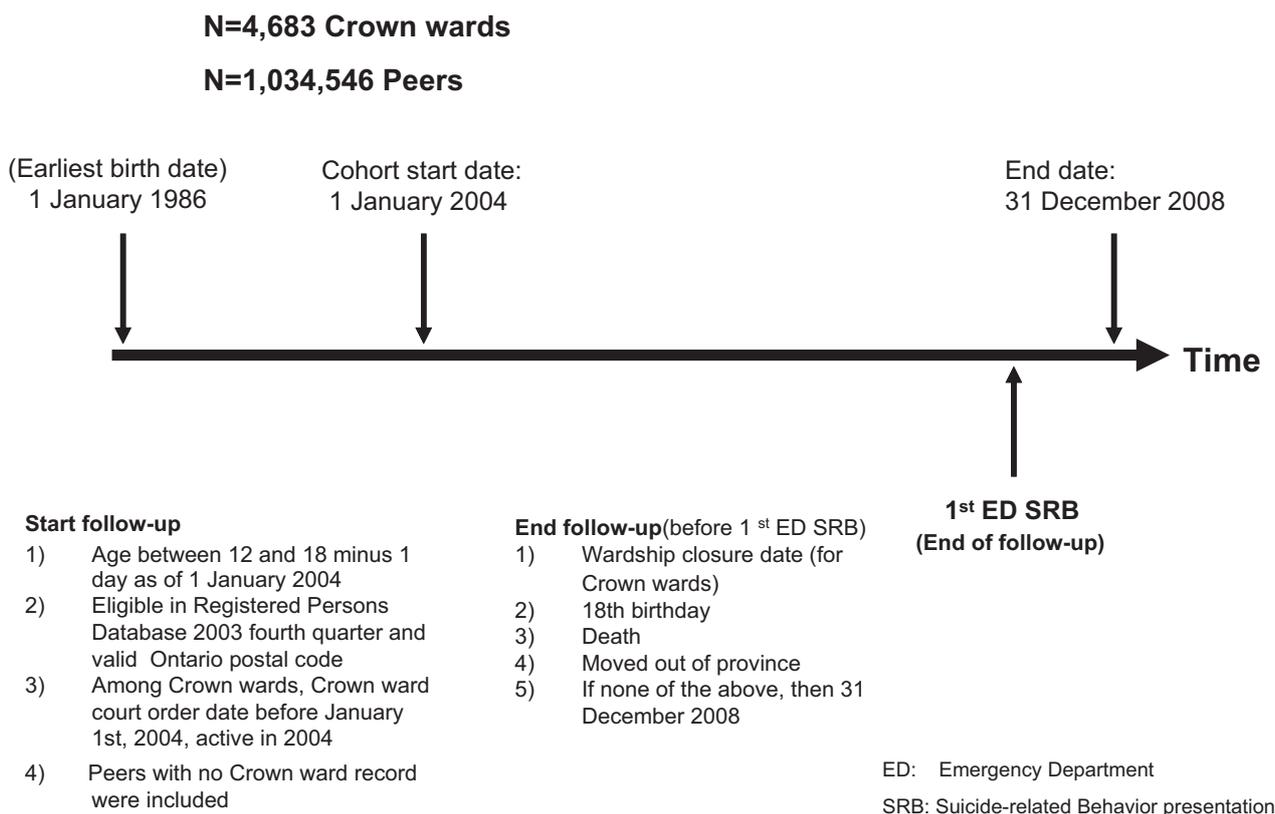


Fig. 1. Cohort design.

Ethic Boards of St. Michael's Hospital and Sunnybrook Health Sciences Centre, and data access granted under the umbrella of a data sharing agreement between the Ontario Ministry of Children and Youth Services and the Institute for Clinical Evaluative Sciences (ICES).

*Study population*

The cohort was created from the Ontario Registered Persons Data Base (RPDB) housed at ICES. Coverage of children and youth in the RPDB is near 98% owing to universal medical coverage (Iron et al., 2008). Our sample of maltreated children/youth, Crown wards (described below) were identified in a separate provincial data base (from June 1990 to 31 December 2008). Ninety-five percent were individually linked to their unique identifier in the RPDB through probabilistic matching (using date of birth, full name, and sex). Probabilistic linkage methods tend to outperform exact matching methods by accounting for absent, incomplete or inaccurate linking variables (Black et al., 1996; Jaro, 1995). Among those in the RPDB, aged 12–17 years (inclusive) as of 1 January 2004 (baseline) with a valid and active Ontario health card and postal code, 2 sub-cohorts were identified: Crown wards and their peers (Fig. 1). Crown wards were included if their Crown ward order dates occurred before 1 January 2004 (n = 4683) and their wardship remained active (i.e., not closed) in 2004. Peers with no Crown ward record (as per data coverage) were included (n = 1,034,546). Using the identifier in the RPDB, cohort members were individually linked to their health service records over time and tracked to the end of their follow-up (defined in Fig. 1). Mean and median lengths of follow-up in Crown wards were: 2.5 and 2.9 and in peers were: 2.4 and 3.1 years, respectively.

*Measures*

*Exposure: Crown ward status.* Crown wards are children and youth who have had their maltreatment legally-substantiated (defined in the Child and Youth Family Services Act). Temporary removal from the parental home (up to 12 months) was not/no longer an option (Child and Family Services Act, 1990; The Ontario Ministry of Children and Youth Services, 2011). They have been made permanent wards of the Crown through a court proceeding and been placed in the care of a Children's Aid Society (CAS) with full guardianship responsibilities (Ontario Association of Children's Aid Societies, 2011). Children and youth can become a Crown ward any time between birth up to age 16 and remain a Crown ward until age 18 unless the wardship is closed (e.g., due to legal adoption). (In this sample, less than 5% were under the age of 5 when they became Crown wards). The CAS works to find permanent homes for these children and youth.

*Outcome: First ED presentation for SRB.* An ED presentation for SRB was defined from National Ambulatory Care Reporting System (NACRS) (Canadian Institute for Health Information, 2008), data as a record listing a code for self-inflicted injury

**Table 1**  
Sample characteristics at baseline (1 January 2004).

	Crown wards (N = 4683)	Peers (N = 1,034,546)
<b>Age (years)<sup>a</sup></b>		
12	555 (11.9%)	176,487 (17.1%)
13	599 (12.8%)	178,679 (17.3%)
14	709 (15.1%)	174,781 (16.9%)
15	853 (18.2%)	168,942 (16.3%)
16	1029 (22.0%)	167,830 (16.2%)
17	938 (20.0%)	167,827 (16.2%)
<b>Sex<sup>a</sup></b>		
Female	2112 (45.1%)	503,915 (48.7%)
Male	2571 (54.9%)	530,631 (51.3%)
<b>Community size<sup>a</sup></b>	(n = 577 missing)	
1,250,000+	996 (24.3%)	425,808 (41.2%)
500,000–1,249,999	440 (10.7%)	129,066 (12.5%)
100,000–499,999	1273 (31.0%)	253,849 (24.5%)
10,000–99,999	485 (11.8%)	89,553 (8.7%)
<10,000	912 (22.2%)	136,270 (13.2%)
<b>Neighborhood income quintile<sup>a</sup></b>	(n = 592 missing)	(n = 3191 missing)
5 (highest)	708 (17.3%)	211,734 (20.5%)
4	679 (16.6%)	201,681 (19.6%)
3	725 (17.7%)	198,403 (19.2%)
2	1006 (24.6%)	202,236 (19.5%)
1	973 (23.8%)	217,301 (21.1%)
<b>Prior SRB<sup>a</sup></b>		
	261 (5.6%)	3584 (0.4%)
<b>Wardship duration</b>		
≤24 months	1758 (37.5%)	Not applicable
>24 months	2925 (62.5%)	Not applicable

<sup>a</sup> Difference between Crown wards and peers  $p < 0.0001$ .

or poisoning as per the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Canada (ICD-10-CA): X60–84. Deaths on arrival or during the ED stay were identified but not excluded (to clarify prevention opportunities after the first ED SRB presentation).

**Prior SRB.** Any individuals presenting to the ED for SRB before 1 January 2004 were identified through NACRS (2 years before baseline) and/or an inpatient admission (10 years before baseline) through the Discharge Abstract Database (DAD) (Juurink et al., 2006), with records listing ICD-9-CM: E950–9 (before April 1, 2002) or ICD-10-CA: X60–84 thereafter. These individuals were described separately, and then excluded from analysis as they were no longer at risk for a first ED presentation for SRB.

**Wardship duration (Crown wards only).** Categorized as >24 months (yes or no) to describe the time from the Crown ward court order date to baseline. Legal adoptions tend to occur within 24 months of the Crown ward court order date.

**Age and sex (at baseline).** Obtained from the RPDB. Hospital presentations for SRB are known to peak in youth, with higher rates in girls (Colman et al., 2004; Corcoran, Keeley, O'Sullivan, & Perry, 2004; Hawton & Harriss, 2008; Olfson et al., 2005).

**Community size and neighborhood income quintile.** Defined using postal code information from the RPDB (last quarter of 2003) and the Statistics Canada Postal Conversion File (Wilkins, 2009). Using this information, each cohort member's residence was assigned to its dissemination area (a small relatively stable geographic unit and the smallest standard unit for which census data are produced) (Statistics Canada, 2011), and described accordingly. There were 784 (16.7%) Crown wards with incorrect postal codes which identified their CAS agency rather than their residence. For 207 of these individuals, the CAS agency postal codes were used to indicate residency because these individuals had contact(s) with hospitals in 2003–2004 in the same municipality as their CAS agency. Residency for the remaining 577 individuals was assigned a missing value (Table 1). Neighborhood income had some additional individuals with missing values as their postal code information was insufficient to assign them to an income quintile. In the multivariable analyses (see below) missing values were analyzed as a separate category.

**Mental health service use prior to baseline (excluding SRB):** was ascertained using linked data for the 2 years before baseline and hierarchical, mutually exclusive categories defined as:

- Outpatient mental health only if one or more Ontario Health Insurance Plan (OHIP) records identified the physician was a psychiatrist and/or listed a mental health diagnosis or procedure; (Rhodes et al., 2006; Steele, Glazier, Lin, & Evans, 2004), or
- ED and/or inpatient mental health (potentially with outpatient mental health contacts). ED mental health: if one or more NACRS records identified the most responsible diagnosis was an ICD-9-CM or ICD-10-CA mental disorder. Inpatient

**Table 2**

Incidence rates per 100,000 person-years (with 95% confidence intervals) of first emergency department presentation for suicide-related behaviors, by sex and Crown ward status.

	Boys	Girls	Overall
Crown wards	977.8 (753.1–1248.7)	2398.3 (1980.1–2878.8)	1578.5 (1356.1–1827.2)
Peers	113.4 (108.2–118.8)	308.2 (299.3–317.3)	208.2 (203.1–213.4)

mental health admission(s); using DAD, where the most responsible diagnosis was an ICD-9-CM or ICD-10-CA mental disorder or a psychiatrist was identified the most responsible physician;

- o None

*Other ED presentations prior to baseline* (excluding SRB and mental health): was ascertained using linked NACRS data for the two years before baseline, including only records that did not meet criteria for a SRB or mental health presentation, and categorized (yes or no) accordingly.

*Mental health service use subsequent to baseline.* (See definition of mental health service use above.) Individuals with a period of  $\geq 150$  days without a mental health contact (either from baseline or between any two contacts after baseline) but before their first ED presentation for SRB were identified as having a “gap” in contact. We selected a period of 150 days to capture those with shorter and longer periods without contact. It should be noted that such a gap depends on the timing of the first ED presentation for SRB. Thus, those with no mental health contact(s) and no ED presentation for SRB but with follow-ups  $\geq 150$  days would be identified as having a gap. Children/youth with their first ED presentation for SRB (or end of follow-up) before 150 days would have no gap.

### Statistical analyses

Frequencies and proportions were used to describe the sample. Differences between Crown wards and peers were tested with Chi-square statistics (excluding missing values). Incidence rates of the first ED presentation for SRB were calculated using person time denominators (per 100,000 person years) with 95% confidence intervals (CIs), stratified by sex and Crown ward status. Cox regression was then applied to calculate hazard ratios (HR) and 95% CIs for a first ED presentation for SRB, stratified by sex. First, we determined the unadjusted HRs, comparing Crown wards and their peers. Next, among Crown wards, we examined whether wardship duration was associated with a first ED SRB presentation. Before proceeding to multivariable modeling, we compared mental health service use and other ED presentations prior to baseline among Crown wards and peers with sex-specific risk ratios (RR) with 95% CIs. Finally, multivariable Cox regression models were fit, in sequence, examining the change in magnitude of the Crown ward (vs. peer) HR after adjustments for health services used prior to baseline, subsequent mental health service use and demographic variables. Deviance statistics were used to select the final model.

## Results

### Characteristics of study subjects

**Table 1** provides baseline characteristics of the cohort. Compared to peers, Crown wards were more likely to be older and male and to live in less populated geographic areas and lower income neighborhoods. Further, they were more likely to have had prior SRB than their peers. After excluding those with prior SRB, the number of first ED SRB presentations during follow-up was 179 in Crown wards and 6326 in peers. None of these presentations were fatal in Crown wards; however, 19 (0.3%) were in peers.

### The rates and risk of a first ED presentation for SRB

**Table 2** shows the incidence rates and corresponding 95% CIs of a first ED presentation for SRB. The 95% CIs do not overlap between Crown wards and peers overall, or in boys or in girls. Further, the non-overlapping 95% CIs between boys and girls in Crown wards and in peers illustrates how rates are higher in girls, particularly Crown ward girls.

The unadjusted HR of a first ED presentation for SRB (using Cox regression) was about eight times higher in Crown wards than their peers, in both boys [HR: 8.80 (95% CI: 6.84–11.26)] and girls [HR: 8.10 (95% CI: 6.74–9.75)]. Among Crown wards, wardship duration was not associated with risk, either in boys [HR: 0.78 (95% CI: 0.47–1.28)] or girls [HR: 1.05 (95% CI: 0.72–1.53)].

### Mental health service use and other ED presentations prior to baseline

**Table 3** shows that in the 2 years prior to baseline, the most frequent type of mental health service used was outpatient alone for both Crown wards and peers. Crown wards were more likely than peers to have had prior mental health service

**Table 3**

Prior mental health service use and emergency department (ED) presentation(s) among those at risk for a first ED presentation for suicide-related behavior (SRB) in Crown wards compared to their peers.

Health service use prior to baseline (2 years)	Crown wards		Peers		Crown ward vs. peers			
	Girls <i>n</i> = 1930	Boys <i>n</i> = 2492	Girls <i>n</i> = 501,178	Boys <i>n</i> = 529,784	Girls		Boys	
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	RR	95% CI	RR	95% CI
Mental health services								
- Outpatient only	464 (24.0%)	715 (28.7%)	36,427 (7.3%)	42,279 (8.0%)	3.31	(3.05;3.58)	3.60	(3.38;3.83)
- ED or Inpatient	49 (2.5%)	66 (2.7%)	2413 (0.5%)	1893 (0.3%)	5.27	(3.99;6.97)	7.41	(5.82;9.44)
- Any	513 (26.6%)	781 (31.4%)	38,840 (7.7%)	44,172 (8.3%)	3.43	(3.18;3.70)	3.76	(3.54;3.99)
Other ED presentations	283 (14.7%)	305 (12.2%)	114,376 (22.8%)	144,479 (27.3%)	0.64	(0.58;0.72)	0.45	(0.40;0.50)

CI: Confidence Interval; RR: Risk Ratio.

**Table 4**

The unadjusted and adjusted risks of a first emergency department (ED) presentation for suicide-related behavior (SRB) in Crown wards compared to their peers.

Crown wards vs. peers	Boys		Girls	
	Hazard Ratio (95% CI)		Hazard Ratio (95% CI)	
Unadjusted association	8.80 (6.84; 11.26)		8.10 (6.74; 9.75)	
Adjusted associations			<b>Deviance</b>	
<b>Model 1</b>	6.61 (5.12;8.53)		Model 1	
Prior mental health use (2 years before baseline)			320.6; 2df*	
<b>Model 2</b>	6.66 (5.16;8.59)		Model 2 vs. 1	
Model 1 + Prior other ED presentation(s) (2 years before baseline)			4.0; 1df*	
<b>Model 3</b>	5.60 (4.32;7.25)		Model 3 vs. 2	
Model 2 + Subsequent mental health use (after baseline but before first ED SRB or end of follow-up)			103.0; 1df*	
<b>Model 4 (Final)</b>	5.13 (3.94;6.68)		Model 4 vs. 3	
Model 3 + age + community size + neighborhood income quintile			635.9, 9df*	

\* Statistically significant difference *p* < 0.05; df: degrees of freedom.

use, both overall and for each category of mental health service use. (The RRs were all greater than 1 and the 95% CIs did not include 1.) Yet, Crown wards were less likely than their peers to have prior other ED presentations.

*Adjusted risks of the first ED presentation for SRB*

Table 4 shows the risk estimates comparing Crown wards to their peers and fit statistics for multivariable models: each line demonstrates the subsequent model was a better fit than its predecessor. In both boys and girls, mental health service use (prior and subsequent) had the largest explanatory effects on the HR comparing Crown wards and peers. The adjusted model 3 attenuated the crude estimates by about one-third in boys and girls. In comparison to peers, the HR remained (about 5 times) higher in Crown wards than peers. This was true in boys where the HR was 5.13 (95% CI: 3.94–6.68) and girls, where the HR was 5.36 (95% CI: 4.40–6.54).

**Discussion**

This study is novel as it examines child maltreatment and the risk of a first ED presentation for SRB in boys and in girls. Thus, the findings are relevant for designing interventions for both sexes to (a) prevent such events from ever occurring and (b) prevent repeat (possibly fatal) events among the majority who survive their first such presentation. As hypothesized Crown wards were (about five times) more likely to have a first ED SRB presentation than peers, in boys and in girls, after controlling for demographic characteristics and mental health service use and ED presentation(s). Characteristics associated with being a Crown ward (i.e., substantiated child maltreatment necessitating permanent removal from the parental home), likely increased their risk of SRB. Accordingly, key prevention implications for health and child welfare sectors are reviewed. Before discussing these implications, we identify study limitations and compare our findings with others.

### Limitations

While studying ED presentations for SRB captures at least double the population admitted to inpatient care for SRB, most children and youth do not present for treatment of their SRB (Centers for Disease Control & Prevention, 2010; Madge et al., 2008; Martin, Bergen, Richardson, Roeger, & Allison, 2004). As such, we cannot generalize these findings to those who do not present to the ED.

Like others (Christoffersen et al., 2003; Katz et al., 2011; Vinnerljung et al., 2006), this study makes use of pre-existing population-based administrative data. Such databases are attractive for their sheer size and ability to capture children/youth in relation to their service use trajectories and outcomes. However, these data are constrained by their content in several ways as they were not designed for research purposes. First, health outcomes are limited by the ICD coding system which does not (yet) identify suicidal intent (in ideation or behaviors) but rather self-inflicted poisonings or injuries and those with undetermined intent. Because some of the latter may indeed be self-inflicted, we examined SRB rates using a broader definition (Bethell & Rhodes, 2009). As the difference in rates between Crown wards and peers remained much the same, for parsimony, we report results for self-inflicted poisonings or injuries.

Second, such databases do not always contain information on socio-demographic factors, such as ethnicity. Thus, it is not known whether some ethnicities are over represented in the child welfare population and in hospital presentations for SRB. While we were able to link to postal code data, we were unable to determine community size and income information for some Crown wards as their postal codes reflected their CAS agency. As these individuals may differ systematically from other subjects, for adjustment purposes, we retained these individuals in a separate missing category.

Third, population-based data on child welfare involved children/youth is not always comprehensive and may vary over time. For example, the province-wide database capturing all Crown wards in this study lacks information on the nature of maltreatment, its age of onset and family background. This database is unique, though, as it extends back to June 1990. Still some peers (born between 1986 and May 1990), may have been Crown wards (before June 1990). This number is likely small given few Crown wards became Crown wards under age five. Yet, the inclusion of these peers may have attenuated the HRs for Crown wards compared to peers in boys and girls.

Fourth, “proxy” measures of mental health problems are treatment-based. As such, it is not possible to describe and compare levels of unmet need in child welfare populations with their peers. Without further information it is difficult to disaggregate factors influencing selection into treatment (e.g., severity, supports) from treatment response. As such, associations between mental health service use and SRB outcomes should not be considered indicators of treatment effectiveness.

Fifth, population-based information on services used over time, while free from possible recall error, is often limited to insured medical services. Thus, for example, counseling, paid for privately is not included; nor is counseling provided/paid through other mechanisms, such as school personnel. Overall, working with these data holdings provides the opportunity to directly influence policy makers and researchers to revise current data collection and linkage methods and in understanding when more thorough, targeted studies are required.

### Comparison to other studies

Among Crown wards, wardship duration was not associated with a first ED presentation for SRB. Two cohort studies similarly found that that nature and duration of the out-of-home placements did not alter the risk of a hospital admission for SRB (Katz et al., 2011; Vinnerljung et al., 2006). Together, these findings focus attention on the role of exposures (e.g., acquired or inherited) prior to out-of-home placement.

Child maltreatment would have been quite serious in our sample of Crown wards because it resulted in permanent removal from the parental home (i.e., temporary or voluntary options were not/no longer viable). This likely explains why the magnitude of the HR for Crown wards was greater than that observed for child welfare involved children and youth in previous cohort studies examining hospital admissions for SRB (adjusted RR ~ 2.0) (Christoffersen et al., 2003; Katz et al., 2011; Vinnerljung et al., 2006), but closer in magnitude to the association observed for those with a history of hospital discharge for violence, abuse or neglect (adjusted RR ~ 4.0) (Christoffersen et al., 2003). Notable, in our study and others (Christoffersen et al., 2003; Katz et al., 2011), adjusting for prior mental health problems may have produced overly conservative estimates of risk if these problems were a consequence of child maltreatment, leading to SRB hospital presentations (Rothman & Greenland, 1998).

### Implications

First and foremost, child welfare and health care interventions that successfully prevent serious child maltreatment and its recurrence are likely to have a significant impact on the risk for SRB leading to ED presentations. Effective interventions and evidence gaps in preventing child maltreatment have been comprehensively reviewed (MacMillan et al., 2009).

Among children/youth first presenting to the ED for SRB, health and child welfare sectors can work together at provider and hospital/regional levels towards preventing future presentations or suicides. At the provider level, clinicians would be

wise to consider child maltreatment (current or past) and child welfare involvement as part of an overall mental health assessment (Baren, Mace, & Hendry, 2008; National Institute for Clinical Excellence, 2004). In particular, without a thorough assessment, it may not be safe to discharge a child/youth home.

Among children and youth who present to the ED for SRB with known, active child welfare involvement, it would seem clinically essential to contact the child welfare worker/agency – if maltreatment has recurred this is legally required – (Child and Family Services Act, 1990; The Ontario Ministry of Children and Youth Services, 2011), and other (mental) health care providers involved. For example, in Ontario, most of the child welfare population, including Crown wards, has legal access to their biological parents. Thus, there is some chance that maltreatment has recurred. Also, given that outpatient physicians (often family physicians) are responsible for most ambulatory care, including mental health care, it would seem prudent to include them in discharge planning. As children and youth presenting to the ED with SRB often have mental illness, arranging for a skilled mental health assessment along with information about accessing appropriate treatments could be very beneficial. Children with histories of maltreatment may have (symptoms of) post traumatic stress disorder misdiagnosed (Cohen and The Workgroup on Quality Issues, 2010). Further, any prescribed psychotropic medications need close monitoring (American Academy of Pediatrics, 2002).

Within hospitals, mental health interventions that begin in the ED with follow-through to other settings hold promise in preventing pediatric SRB (Newton et al., 2010). Hospitals that treat children and youth with SRB may need to review current practices with respect to child protection. In particular, not all hospitals have the same access to (predefined) specialized mental health resources (Baraff, Janowicz, & Asarnow, 2006; Doan & Fein, 2011) or child protection teams or units (Loo, Bala, Clarke, & Hornick, 1999). Better resourced regions may need to work more closely with those less so, to develop competencies, ongoing interagency collaborations and/or innovative treatment models.

## Conclusions

This study highlights not only child maltreatment as a risk factor for SRB presenting to the ED, but also the intersection of the ED, mental health services and child welfare as providing an opportunity to intervene. Further research on the prevention of child maltreatment and its recurrence and the promotion of resilience after maltreatment has occurred is needed to clarify how linkages between care sectors may prevent the need for such presentations. The need for strong linkages between sectors of care, at provider and organizational levels, is well-recognized (American Academy of Pediatrics, 2002; Hébert & MacDonald, 2009; Hjern & Vinnerljung, 2002; Kazak et al., 2011; Kolko, Herscell, Costello, & Kolko, 2009; Lyons & Rogers, 2004; Raghaven, Inkelas, Franke, & Halfon, 2007; Romanelli et al., 2009). Some research suggests such linkages improve the match between need and specialty mental health service use (Hurlburt et al., 2004), and outcomes (Bai, Wells, & Hillemeier, 2009). Planning in advance for crises may succeed given more direct, appropriate resources are available (Doan & Fein, 2011; McKenna, 2011).

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