

# A Review of Findings from the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS)

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## ABSTRACT

**Objective:** This article critically assesses and reviews analyses derived from three cycles of the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS) published between 2001 and October 2011.

**Methods:** Articles were retrieved from the Public Health Agency of Canada's data request records, which tracked database access and ensuing publications. The included articles were reviewed and appraised independently by the authors.

**Synthesis:** Overall, 37 peer-reviewed articles using CIS data were included in the review. These articles revealed an increased likelihood of substantiation or placement if investigations 1) uncovered the presence of emotional or physical harm in a child, 2) involved older children, 3) identified the presence of risk indicators in caregivers, or 4) documented unstable or unsafe housing. A similar proportion of articles used a descriptive or multivariate approach to analyze CIS data, and strengths and limitations were identified.

**Conclusion:** Researchers have analyzed and interpreted the CIS extensively, although several issues are understudied – such as neglect and emotional maltreatment – especially using multivariate approaches. We hope this review will contribute to helping address gaps in the CIS literature.

**Key words:** Canadian Incidence Study of Reported Child Abuse and Neglect (CIS); child maltreatment surveillance; child abuse; domestic violence; epidemiology; sex offences

La traduction du résumé se trouve à la fin de l'article.

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Child maltreatment is recognized as a major public health concern by the World Health Organization (WHO).<sup>1</sup> Maltreatment can be an act of either omission or commission by a caregiver or his/her substitute,<sup>2</sup> and can take many forms, including physical, emotional or sexual abuse, neglect, or exposure to domestic violence. Developmental and behavioural problems, as well as poor physical and mental health, are associated with child maltreatment (e.g., refs. 3-6).

According to WHO,<sup>1</sup> collecting sound epidemiological data on child maltreatment and its context is a necessary first step in addressing this preventable issue, and ultimately reducing its public health burden. In Canada, until recently, there was little data on child maltreatment and its associated social determinants.<sup>7</sup> For years, before a child maltreatment surveillance system was established, Canadian decision-makers, advocates and researchers had to rely on information collected from abroad to inform their actions. One problem with this approach was the inadequacy of such data to take into account the uniqueness of the Canadian context.

In 1998, the Public Health Agency of Canada (PHAC) (at the time, part of Health Canada) initiated the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS) as a surveillance tool. The CIS collects data in all Canadian provinces and territories on children 15 years and under who have been reported to child welfare agencies due to alleged maltreatment. Information is collected on the characteristics of the maltreatment, the child, the child's caregivers, and the household in which they live.

Given the lack of systematic reporting of CIS data use in the peer-reviewed literature, the timing is appropriate to review the evidence

derived from CIS data collected over the last decade. This review therefore attempts to:

- determine which categories of maltreatment the CIS data have served to study;
- identify main findings and remaining gaps in the CIS literature and present a summary of associations between maltreatment-related variables; and
- assess the quality of evidence of the CIS literature.

## Description of the CIS

PHAC launched the CIS in 1998 and subsequently collected data in 2003 and 2008. The CIS serves to estimate the occurrence of reported child abuse and neglect and to examine associated health determinants. Data are gathered on investigations of neglect, exposure to domestic violence, emotional maltreatment, physical and sexual abuse. Children and families investigated by child welfare services and short-term investigation outcomes are also documented. The CIS is primarily designed to provide information at the national level. Provinces and territories can collect additional data to obtain provincial/territorial estimates.<sup>8</sup>

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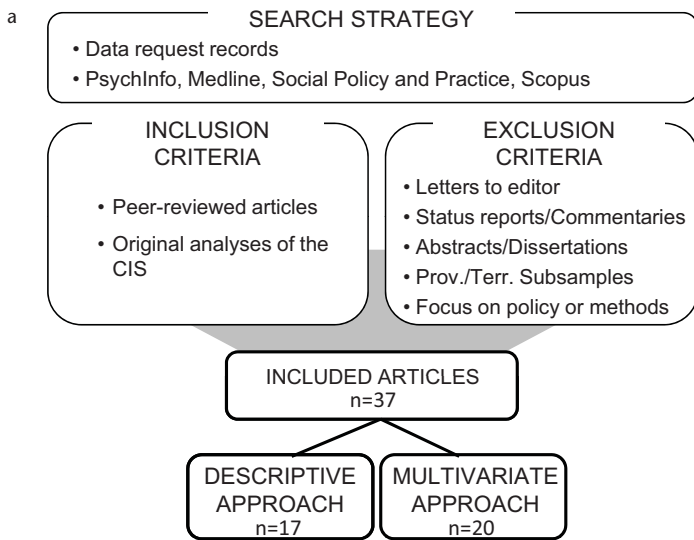
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**Conflict of Interest:** None to declare.

**Figure 1.** a) Search strategy for articles focussing on descriptive and multivariate analyses of the CIS, and b) Critical appraisal questions (adapted from Newman et al., 2005)



**b**

**Topic**

1. What is the research question?
2. Are the aims of the research clear? (Well-defined age group, outcomes considered, etc.)

**Methods**

3. Are clear definitions used for variables?
4. Are eligibility and exclusion criteria clearly stated?
5. Is the sampling strategy used for the study clear/appropriate?
6. Are the right analyses used to answer the research question?
7. Is the number of participants sufficient?

**Findings/Conclusions**

8. Is it clear how the data were analyzed?
9. Are the results clearly presented?
10. Do researchers take into account/discuss potential confounding factors in the analysis? (e.g., regression or covariate analysis used, adjusting for likely confounding factors)
11. Are the conclusions drawn supported by the study results?
12. Is this study relevant for practice/policy?

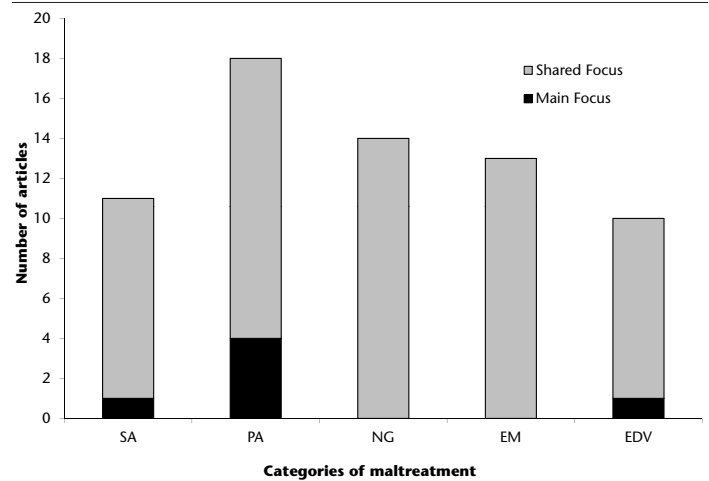
Across participating agencies, welfare workers are directly involved in collecting information by filling in surveys specifically designed for the CIS.\* The survey is completed at the conclusion of the investigation, typically six to eight weeks following initial report to the agency. Agencies are selected from the total number of welfare organizations identified across Canada by taking into account factors such as size, province/territory, and First Nations status. Data are collected over a three-month period in the fall. To ensure consistency, a set of definitions are provided to welfare workers, and subsequent analyses of CIS data must be understood within the context of these definitions.†

CIS data are made available to investigators after review of proposals. This contributes to obtaining a wide range of analyses, in addition to the initial surveillance report published by PHAC. Applicants are asked to notify PHAC of CIS-related publications.

\* The CIS is based on a close partnership between provincial and territorial governments, Aboriginal (First Nation, Inuit and Métis) organizations, non-governmental organizations, and researchers. A multidisciplinary and multisectorial steering committee, with experts from the field, is created for each cycle. They provide advice on agency recruitment, data collection and analysis, and implications for policy and practice.

† Definitions of terms can be found in the Glossary of the CIS-2008: Major Findings report.<sup>8</sup>

**Figure 2.** Number of articles using a multivariate approach with different categories of maltreatment used as either a main or shared focus



SA: Sexual Abuse; PA: Physical Abuse; NG: Neglect; EM: Emotional Maltreatment; EDV: Exposure to Domestic Violence

## METHODS

Articles reviewed for this manuscript were retrieved from PHAC's data request records and through a search of databases using the term "Canadian Incidence Study of Reported Child Abuse and Neglect". Inclusion and exclusion criteria are reported in Figure 1a.

Included articles were reviewed independently by CO and LT to identify topics and key findings and to critically appraise the methods. A third reviewer (AMU) participated in the critical appraisal of articles for which LT was an author, and assisted in resolving disagreement. Articles were assessed using a set of questions adapted from the Evidence-Based Social Services Critical Thinking Tool<sup>9</sup> (Figure 1b).

Figure 2 describes utilization of CIS maltreatment categories. Table 1 documents main findings and the strengths and limitations of the reviewed articles. Table 2 summarizes the presence (or absence) of significant associations ( $p < 0.05$ ), and the direction of the odds ratio, between dependent (e.g., placement, substantiation of the maltreatment investigation) and independent variables identified in logistic regression models.

For Table 2, in the absence of a reference category, variables should be considered as dichotomous and as reflecting the presence of the attribute. When multiple models were reported in an article, only results from the final model were included. For purposes of concision, not all investigated associations could be reported and the readership should refer to the original source for details. Given that the levels of variables were collapsed differently across articles, Table 2 only captures high-level relationships. For instance, the variable *age* was broken down into inconsistent age categories across studies, so this issue was resolved by using a *young* versus *old* dichotomy in Table 2.

## RESULTS

Thirty-seven articles published between 2001 and October 2011, which either used descriptive or multivariate approaches, met our inclusion criteria. Data from the 1998, 2003 and 2008 CIS data sets were used. Articles were published in peer-reviewed journals from a wide variety of disciplines, including health, social work, psychology, and law.

**Table 1.** Characteristics of Articles Presenting Original Analyses Based on the CIS

Ref. & CIS-Year	Topics (Describes/Examines...)	Methods	Key Findings – As Expressed by the Author(s)	Strengths and Limitations
<b>Sexual Abuse (SA)</b>				
(10) CIS-1998	male- and female-perpetrated SA (victim, perpetrator, type of abuse, family structure and worker information).	n=345 unweighted Chi-square	Girls were more likely to be victimized for both male- and female-perpetrated sexual violence and females tended to abuse younger children. The majority of children came from families with lower SES although 20% came from middle-class homes. Referrals to child welfare more likely to be made by non-professionals.	+ research aims clear - poorly defined variables except SA - high level of missing data for income - small sample size - confounders not assessed
(11) CIS-2003	how parental separation affects the making of child SA allegations.	n=11,562 unweighted Frequencies	About 5% of SA allegations were considered to be intentionally false, with intentionally false allegations actually higher for neglect, at 7%. Intentionally false allegations were made in about 4% of all cases. During ongoing custody or access dispute, the false allegations were higher: 14%.	+ research aims clear + only national data that include false allegations - poorly defined variables - confounding not assessed
(12) CIS-1998	whether SA is more harmful to children if it co-occurs with other categories of maltreatment.	n=5,143 weighted Chi-square Logistic reg. Interaction eff.	No independent effect of SA co-occurring on emotional harm. Co-occurring SA appears to have a stronger effect on emotional harm among 12-15-year-olds and girls.	+ research aims clear + potential confounders assessed - small sample size
<b>Neglect (NG)</b>				
(13) CIS-2003	SES characteristics and personal problems of mothers and fathers in NG families.	n=1,266 Chi-square Post-hoc adjusted residuals	Fathers seem to have fewer personal problems than mothers.	+ random child selected from each family + discusses participation and completion rate + research aims clear + clearly defined variables - confounders not assessed
<b>Emotional Maltreatment (EM)</b>				
(14) CIS-1998 & 2003	the prevalence and characteristics of reports of EM, as well as changes in these reports between 1998 and 2003.	n=7,609/76,218 n=9,931/180,240 weighted/ unweighted t-test Chi-square	Reports of EM often reveal situations of chronic victimization that have been the subject of previous reports and are associated with greater emotional impact. Reported EM increased almost threefold between 1998 and 2003.	+ research aims clear - confounders not assessed
(15) CIS-1998, 2003 & 2008	whether Canadian child welfare services respond to EM with the same level of perseverance as with other categories of maltreatment.	n=5,360 11,562 14,040 t-test	EM substantiated at a lower rate than other categories of maltreatment, a higher proportion of EM were referred for specialized services, kept open for ongoing child welfare services, led to an out-of-home placement and child welfare court application.	+ research aims clear - results in Figure 1 misleading - confounders not assessed - questionable statistical source
<b>Corporal Punishment/Physical Abuse (PA)</b>				
(16) CIS-1998	the potential impact of a repeal of the CCC that permits child physical punishment and child welfare's response to these reports.	n=3,786 Chi-square ANOVA	The findings suggest that the Canadian child welfare system is already in a position to respond to changes in the CCC. The effectiveness of its response would likely be increased by the repeal of the defence.	+ research aims clear + clearly defined variables - confounders not assessed - unclear statistical approach (ANOVA) - advocacy undertones
(17) CIS-2003	the Supreme Court of Canada criteria to distinguish reasonable from abusive force against children by testing them against substantiated cases of PA.	n1=1,286 n2=1,279 + 1,173 weighted Logistic reg.	The majority of substantiated PA actually met each of the Court's reasonable force criteria.	+ research aims clear + confounders assessed + clearly defined variables - results poorly presented, unclear if Table 3 is adjusted or unadjusted
(18) CIS-2003	the characteristics of PA and whether the abuse occurs alone or co-occurs.	n= 658 unweighted Chi square Logistic reg.	Single and co-occurring PA are distinct types of maltreatment.	+ research aims clear + confounders assessed - poorly defined variables (maltreatment, substantiation) - unclear how suspected and unsubstantiated variables are coded
(19) CIS-1998	whether child, perpetrator or socio-economic characteristics predict injury in inappropriate punishment.	n=8,164 weighted Logistic reg.	Injurious and non-injurious PA cannot be distinguished on the basis of the personal characteristics or circumstances of the child or perpetrator.	+ research aims clear + clearly defined variables + confounders assessed - questionable validity of index - no CI presented
(20) CIS-1998	the influence of family poverty on professional's decision-making to substantiate and/or intervene in cases of physical punishment.	n=5,704 weighted Phi Chi-square Logistic reg.	Professional decision-making in reported cases of physical punishment was not explained by poverty.	+ research aims clear + confounders assessed - unclear reference category e.g., education and family size) - no CI presented
<b>Exposure to Domestic Violence (EDV)</b>				
(21) CIS-2003	the child welfare system's response to child maltreatment investigations substantiated for EDV.	n=5,560 weighted and unweighted Chi-square Logistic reg.	Maltreatment involving children who have experienced EDV is substantiated more often than other categories of maltreatment but children are placed less often if it occurs in isolation.	+ research aims clear + addresses missing data + confounders assessed - poorly defined variables

...continues

**Table 1.** Characteristics of Articles Presenting Original Analyses Based on the CIS... continued

Ref. & CIS-Year	Topics (Describes/Examines...)	Methods	Key Findings – As Expressed by the Author(s)	Strengths and Limitations
(22) CIS-2003	the report profiles of Caucasian, Aboriginal compared to other visible minorities.	n=9,554 Chi-square Post-hoc adjusted residual analysis	<b>Aboriginal Peoples</b> Aboriginals, Blacks and Latinos are over-represented among the cases selected for investigations. Possibility of a racial bias in the identification, reporting, and substantiation of maltreatment.	+ research aims clear + describes process for excluded or incomplete cases - poorly defined variables (e.g., alcohol abuse) - confounders not assessed - small convenience sample for First Nations agencies
(23) CIS-1998	the experiences of Aboriginal children and their families, comparing them to White and visible minority children investigated by Canadian child welfare authorities.	n=5,128 ANOVA	Findings suggest the development of neglect intervention programs that include poverty reduction and substance misuse components.	+ research aims clear + addresses missing data - confounders not assessed - results presented on children 0-15 although not all variables apply (e.g., special education) - small convenience sample for First Nations agencies
(24) CIS-1998	the experiences of Aboriginal children and families who come into contact with the child welfare system.	n=3,159 Chi-square	NG is the most common category of maltreatment in these communities – related to poverty, inadequate housing, and substance abuse.	+ research aims clear - poorly defined variables - confounders not assessed - small convenience sample for First Nations agencies - advocacy undertones
(25) CIS-1998	clinical and organizational characteristics on the decisions to place a child in out-of-home care.	n=1,304 unweighted Bivariate analyses Mixed model Logistic reg.	The lack of appropriate resources at the agency or community level may explain over-representation of Aboriginal children being placed.	+ research aims clear + confounders assessed at two levels - poorly defined variables - small convenience sample for First Nations agencies - speculative interpretation of results
(26) CIS-1998	Socio-economic, child, parent, and/or maltreatment characteristics as reasons for over-representation of Aboriginal children in CIS.	n=2,898 unweighted Chi-square Logistic reg.	Higher rates of placement and substantiation among Aboriginals were related to NG and substance abuse.	+ research aims clear + exclusion criteria clearly stated + confounders assessed +/- mostly clearly defined variables, except for dependent variables - no rationale provided for combining confirmed and suspected - small convenience sample for First Nations agencies
<b>Child's Developmental Disorders</b>				
(27) CIS-1998	the relationship between the presence or absence of physical harm in children with developmental disabilities and types of parental composition.	n=666 Chi-square	Children with developmental delays who live with non-related male parent figures or male single parents are not at special risk for physical harm. Having one female parent may represent a reduced risk for physical harm compared to having two parents.	- limitations of data or analysis not stated - confounders not assessed - no information of the CIS methods provided
(28) CIS-1998	the experience of children with and without developmental delays with regard to the pattern of reported and substantiated maltreatment and the alleged perpetrator.	n=666 Chi-square	Compared to non-delayed children, those with developmental delays experienced more maltreatment, particularly NG, over longer periods of time, and are more likely to have multiple perpetrators. Caregivers of children with developmental delays show more risk factors than their counterparts, and may be more in need of prevention and support services.	+ mentions unvalidated questionnaire - confounders not assessed - poorly defined variables
(29) CIS-1998	the children reported for maltreatment who were identified with behavioural, social, mental, and emotional problems and disabilities.	n=7,672 Chi-square	Behavioural problems and developmental disabilities were the most often reported for all ages. A developmental framework should guide the assessment, prevention, intervention and decisions for reporting child maltreatment.	- confounders not assessed - poorly defined variables - results inappropriately presented at times (e.g., irregular school attendance for young children)
(30) CIS-1998	the types and proportions of identified clinical findings among children with and without disabilities.	n=7,672 Chi-square	Among children with and without disability, behavioural problems were the most commonly reported. Overall, children with disabilities were found to have the same types of clinical findings as children without disabilities, but at greater frequencies.	- confounders not assessed - poorly defined variables - results inappropriately presented at times (e.g., irregular school attendance for young children)
<b>Key CIS Findings</b>				
(31) CIS-1998	key findings of the CIS	n=7,672 Chi-square using weighted data	Among all investigations, 45% were substantiated and 22% suspected. Primary investigation reasons were PA (31%), SA (11%), NG (40%), and EM (19%).	+ several limitations mentioned - confounders not assessed - poorly defined variables

...continues

**Table 1.** Characteristics of Articles Presenting Original Analyses Based on the CIS... continued

Ref. & CIS-Year	Topics (Describes/Examines...)	Methods	Key Findings – As Expressed by the Author(s)	Strengths and Limitations
(32) CIS-1998	the characteristics of intentionally false reports of maltreatment during parental separation.	n=7,672 Chi-square	Only 4% of all cases are considered to be intentionally fabricated. In cases of custody dispute, it is higher (12%). NG was reported most often and custodial parents fabricated the least maltreatment.	- confounders not assessed - poorly defined variables
<b>False Allegations of Maltreatment (see also ref. 16)</b>				
(33) CIS-2008	the profile of young parents who are the subject of maltreatment-related investigation and identifies which factors determine service provision at the conclusion of the investigation.	n=3,285 unweighted Chi-square Logistic reg.	Young parents are struggling with several issues including poverty, housing, mental health, violence and children who exhibit functioning concerns. Ongoing services are more often provided to young parents in investigations where there are concerns around drug/solvent use, cognitive impairment, mental or physical health issues and few social supports.	+ research aims clear +/- clearly defined variables except for maltreatment categories + addresses missing data + one child selected from each family + confounders assessed - uses weights for subpopulation analyses
(34) CIS-2003	decision making and service referral in child maltreatment investigations involving children of parents with cognitive impairments.	n=1,170 weighted Logistic reg.	Perceived parent non-cooperation was the most potent predictor of court application.	+ research aims clear + confounders assessed + assesses missing data - no rationale for adding child functioning issues - poorly defined variables except for caregiver cognitive impairment - sample size was insufficient to permit a robust test of the full model
(35) CIS-2003	the prevalence and outcomes for mothers with mental health issues and their children in child maltreatment investigations.	n=2,272 rescaled sample weights Chi-square Logistic reg.	Outcomes for mothers with mental health issues and their children are different from those without mental health issues: increased likelihood of substantiation, placement, cases being kept open, and court applications.	+ research aims clear + confounders assessed + comprehensive analysis of missing data - mean provided for categorial variables
(36) CIS-2003	the prevalence of parental cognitive impairment in the relationship between parental cognitive impairment and maltreatment investigation outcomes including substantiation, case disposition and court application.	n=11,562 Logistic reg.	Parental cognitive impairment was noted in 10.1% of child maltreatment investigations, and in 27.3% of child welfare court applications. NG was the most common concern. With child and case characteristics held constant, parental cognitive impairment predicted investigation outcomes. The relationship between parental cognitive impairment and investigation outcomes was partly mediated by perceived parent non-cooperation, mental health issues and low social support.	+ research aims clear + confounders assessed + comprehensive analysis of missing data - questionable source for using rescaled weights - CI not provided
(37) CIS-1998	the effect of caregiver vulnerabilities alone and co-occurring on substantiation of PA, SA and NG (controlling for other variables).	n=missing unclear if weighted or unweighted Logistic reg. Interaction eff.	Caregiver vulnerabilities should be considered in tandem with partner relationships and targeted for child maltreatment prevention.	+ research aims clear + confounders and interaction terms assessed - questionable validity of index - CI not provided - did not report n.s. results - not clear why EM was excluded
(38) CIS-1998	reported maltreatment and household-related stressors, child and caregiver functioning concerns in single mothers of children with/without developmental delay.	n=226 Chi-square	NG was the most frequently reported form of maltreatment among single mothers. Specifically, single mothers of children with developmental delay had children with more problems, had fewer resources, and had more problems themselves. Need for increased support for single mothers of children with developmental delay.	- the limitations of the data or the analysis not stated - confounders not assessed - no information of the CIS methods provided - poorly defined variables
<b>Adolescent Functioning Issues</b>				
(39) CIS-2003	the determinants of substance abuse in children and adolescents aged 10-15 years.	n=2,767 unweighted F-statistic Rao-Scott corr. Logistic reg.	14% of all investigated children were abusing substances and 16% among those whose investigation of maltreatment had been substantiated. Severity of maltreatment and behavioural factors are associated with substance abuse.	+ research aims clear + confounders assessed + clearly defined variables + random selection of one child - weighted data for subpopulation
(40) CIS-2003	five categories of child maltreatment and other risk correlates to establish association with noted anxiety and/or depression.	n=4,381 unweighted Mixed model Logistic reg.	The strongest associations were found with child substance abuse, substantiated EM, primary caregiver's mental health problem and substantiated SA.	+ research aims clear +/- clearly defined variables except for combining confirmed and suspected child functioning + confounders assessed at two levels - limited description of hierarchical model

...continues

**Table 1.** Characteristics of Articles Presenting Original Analyses Based on the CIS... continued

Ref. & CIS-Year	Topics (Describes/Examines...)	Methods	Key Findings – As Expressed by the Author(s)	Strengths and Limitations
<b>Placement</b>				
(41) CIS-2003	factors associated with decisions in favour of out-of-home placement following maltreatment investigations involving infants.	n=763 unweighted Chi-square Multivariate logistic reg.	Child's toxicology at birth, abandonment, physical harm, number of previous family openings and caregivers' risk indicators (substance abuse, mental health issues and/or few social supports) are associated with an increased likelihood of placement.	+ research aims clear + confounders assessed + clearly defined variables - statistics: few cases for some subcategories
<b>Maltreatment and Risk Substantiation</b>				
(42) CIS-2003	whether suspected maltreatment differs from substantiated and unsubstantiated maltreatment.	n=10,010 unweighted Chi-square Multinomial Logistic reg.	Clinical characteristics informed substantiation decision (e.g., severity of harm, caregiver risk factors). Suspected maltreatment is a separate category that differs from both substantiated and unsubstantiated cases.	+ research aims clear - poorly defined variables (e.g., maltreatment category)
(43) CIS-2008	differences in the profile of children and families in risk-only investigations and child maltreatment investigations.	n=11,925 unweighted Chi-square Logistic reg.	Families investigated for <i>alleged maltreatment</i> , compared to those investigated for future risk, were more likely to live in an overcrowded home with the presence of household hazard, and to run out of money for basic necessities. Younger children were more likely to be the subject of a <i>risk investigation</i> .	+ research aims clear + clearly defined variables + confounders assessed - did not select only one child from each family
(44) CIS-2003	the determinants of maltreatment substantiation in a sample of infants.	n=793 unweighted Chi-square Logistic reg.	EDV, which is mostly reported by police, and the presence of physical harm are associated with substantiated maltreatment, as well as caregiver's vulnerabilities such as substance abuse, few social supports and positive toxicology at the child's birth.	+ research aims clear + confounders assessed + clearly defined variables + addresses missing data - statistics: few cases for some subcategories
<b>Reporting Source</b>				
(45) CIS-1998 & 2003	the types of maltreatment level of harm and child functioning issues (controlling for family status, age and sex of the child) reported by health care and non-health care professionals.	n=3,143 n=7,749 weighted Chi-square Logistic reg.	Health care professionals play an important role in identifying children in need of protection considering harm and other child functioning issues. However, under-reporting remains an issue.	+ research aims clear + confounders assessed +/- clearly defined variables, except age groups
<b>Physical Harm</b>				
(46) CIS-1998	the nature and severity of the physical harm associated with reports of child maltreatment.	n=3,780 Cross tabulations	The presence of physical harm was lower than expected. Current mandatory reporting, abuse investigations, and risk assessments procedures may need to be tempered for cases in which physical harm is absent.	+ research aims clear + clearly defined variables + investigation process described well - confounders not assessed - no significance testing

CCC: Criminal Code of Canada; CIS: Canadian Incidence Study of Reported Child Abuse and Neglect; USA: United States of America; reg: regression; eff: effect; : Multivariate; CI: Confidence Interval; n.s.: non-significant; SES: socio-economic status

Table 1 lists 37 articles for which topics, sample sizes, methods, key findings, and strengths and limitations are reported. Of those, 17 articles used a descriptive/chi-square approach and 20 articles used a multivariate (logistic regression) approach to analyze CIS data. These descriptive articles addressed a variety of topics (see Table 1). Overall, articles were often exploratory in nature and many relied on general questions (e.g., ref. 10) rather than clearly defined hypotheses. Although these descriptive articles are an important step in establishing a Canadian knowledge base of child maltreatment, the quality of evidence they provide is rather weak compared to articles using a multivariate approach. Common weaknesses included the use of poorly defined variables, an unclear statistical approach, an advocacy undertone that tainted some interpretation, and in some cases small samples.

In general, the methods used in the multivariate articles were of good quality because they relied on clearly defined research questions with operationalized hypotheses. Results were efficiently presented and mostly supported by sound statistical approaches. The evidence provided by these articles should therefore be regarded as the highest quality of evidence derived from the CIS data. Nevertheless, inconsistencies with regard to the definition of variables and to statistics were identified.

Variables were at times poorly defined or poorly reported. Investigation of the caregiver's ethno-racial status, which was at times used as a proxy for the child's ethnoracial status, was not consis-

tently treated across studies. For instance, various groupings were used: 1) Aboriginal peoples and other; 2) Caucasians, Aboriginal peoples and other visible minorities; and 3) Caucasian, Aboriginal, Black, Asian and others.<sup>22,25,26</sup> Also, a rationale for age categories was often missing, resulting in studies relying on four age categories (0-3, 4-7, 8-11, and 12-15 years),<sup>12</sup> three (0-5, 6-11, and 12-15 years),<sup>18</sup> two (<6 or ≥6 years),<sup>25</sup> or treating age as a continuous variable (0-15 years),<sup>5,45</sup> without explaining the reasons for choosing a given approach. Finally, the use of indexes varied greatly between studies. Most indexes attempted to pool different variables to account for measures of poverty, caregiver characteristics or child functioning. In some cases, variables were summed to produce an index score (e.g., refs. 18,42), without clear details on the procedure. In addition, few studies commented on the empirical validity of indexes.

Another limitation regarded statistics. Some studies included analyses based on weighted data whereas some relied on the use of unweighted data. Although the use of weighted data may allow conclusions to be generalized to the Canadian population (i.e., not only to the sample), the use of unweighted data prevents the introduction of potential bias from items such as seasonal variation, regionalization and annualization adjustments. The unweighted approach should be prioritized when analyzing the CIS data. Also, although most studies reported p-values, which only compare the estimates, authors often failed to include confidence intervals,

**Table 2.** Summary of Associations From the CIS Data

References		42	26	20	34	36	37	44	35	17	43	21	25	26	20	35	41	34	34	12	45	40	39	18	19	33				
Table # in original source		4	4*	4	2*	3*	1*	4	4*	4*	3*	4*	5*	6*	5	4*	4*	3*	4*	4	7	3	5*	3	3*	4*				
Dependent Variables	Independent Variables	Substantiation (all)	Substantiation	Substantiation	Substantiation	Substantiation	Substantiated SA	Substantiated PA	Substantiated NG	Substantiation for infants	Substantiation - mothers	Substantiated PA	Substantiated maltreatment	Substantiated risk	Placement	Placement	Placement	Placement	Placement (removal)	Infant placement	Substantiation, case kept open	Unsubstantiation, case kept open	Emotional harm	Healthcare report	Anxiety/depression - Adol.	Substance abuse	Co-occurring (vs. PA)	Physical harm	Ongoing service provision	
		Categories of maltreatment	SA	↓	-			↓									ref	-					↓		ref	-	↑	-		
	PA	ref	ref							↓	↓					ref			↑				↓		-	↑	-			
	NG									↓	↓								↑				↓		-	↑	-			
	EDV									↑										↑				↑	↑	↑	-			
	EM																			↑				↑	↑	↑	-			
	Co-occurrence																			↑				↑	↑	↑	-			
Maltreatment	Substantiation	X	X	X	X	X	X	X	X	X	X	X	X	X	↑						X	X	↑							
	Duration (repeated/longer abuse)														↑								↑						↑	
	Prior opening/substantiation	↑	-			↑									↑								↑						↑	
	Physical harm	↑													↑									↑			↑		↑	
	Emotional harm	↑																						↑			↑		↑	
	Placement															X	X	X	X	X	X									
	Referral source																													
	Non-professional	ref																												
	Health care professional																													
	School professional																													
	Police	↑																												
	Child	Age (older)	-	↑																										
		Gender (female)																												
		Ethnoracial status (proxy)																												
		White	ref	ref																										
Aboriginal		-	-																											
Other minority		↑																												
Functioning concerns																														
At least one																														
Behaviour concerns		↑																												
Cognitive concerns																														
Emotional concerns																														
Physical health concerns																														
Substance abuse																														
Caregiver	Education (high school and less)																													
	Source of income																													
	Social assistance/not empl.																													
	Full-time employment		ref																											
	Socio-economic disadvantage																													
	Cooperative	↓																												
	Presence of risk indicator(s)	↑																												
	Mental health issues																													
	Alcohol/drug abuse																													
	Few social supports	↑	↑																											
	Criminal activity	↑																												
	Cognitive impairment																													
	History of maltreatment	↑																												
	Antisocial behaviour																													
	Physical health																													
Intimate partner violence																														
Household	Unstable housing																													
	Large family size																													
	Public housing																													
	Unsafe house	↑	↑	↑																										
	Family structure																													
	Two-parent biological	ref	ref																											
	Two-parent blended	↓	-																											
Single parent	↓	-																												

Legend: ↑: Increased odds ratio; ↓: Decreased odds ratio; —: absences of effect (p>0.05); ref: reference variable; Relationship not investigated; Grouped variables; Control variables; x: Not applicable; PA: Physical abuse; SA: Sexual abuse; Adol.: Adolescents; NG: Neglect; EDV: Exposure to domestic violence; EM: Emotional maltreatment.

which provide the size of any true effect by putting upper and lower bounds.<sup>47</sup> Finally, issues pertaining to missing data were seldom mentioned.

Figure 2 shows that physical abuse was the most commonly studied category of maltreatment, having been included in 17 out of 20 articles using a multivariate approach. Physical abuse on its own

was the focus of 4 articles.<sup>17-20</sup> Sexual abuse<sup>12</sup> and exposure to domestic violence<sup>21</sup> were the main focus once each. Neglect and emotional maltreatment were only analyzed in conjunction with other categories of maltreatment.

Table 2 summarizes associations between a variety of independent variables and dependent variables from 29 logistic regression

models stemming from 20 multivariate articles. Four general conclusions emerge: 1) investigations for which emotional or physical harm was observed were more likely to be substantiated or to result in placement; 2) the likelihood of a maltreatment investigation being substantiated generally increased with the age of the victim; 3) the presence of risk indicators in caregivers was almost systematically associated with an increased likelihood of substantiation or placement; 4) unstable or unsafe housing was associated with increased likelihood of substantiation or placement.

## **DISCUSSION**

This review summarized findings from CIS analyses published in peer-reviewed literature. To the best of our knowledge, this is the first article to present such a comprehensive summary derived from this child maltreatment surveillance tool.

Across all articles, physical abuse was the most studied category of maltreatment, whereas exposure to domestic violence attracted the least attention. For neglect and exposure to domestic violence, analyses have almost consistently been conducted in conjunction with other maltreatment categories. This is somewhat surprising given that they are the most common categories of maltreatment,<sup>8</sup> and the large sample facilitates in-depth analyses. However, this parallels the child maltreatment literature, according to which neglect is the least-studied category of maltreatment.<sup>48</sup> Exposure to domestic violence was at times introduced as a risk factor for other categories of child maltreatment. This is probably related to variations in Canadian legislation regarding whether exposure to domestic violence is seen as child maltreatment.<sup>49</sup>

Our review revealed that studies relied on a descriptive or multivariate approach in approximately equal proportions. Several descriptive articles represented initial attempts to explore topics lacking evidence, thus preventing reliance on statistical approaches that necessitated *a priori* hypotheses. However, the introduction of controlled variables in the analysis would have contributed to improved understanding of associations (e.g., ref. 15). As more evidence is collected in the future, providing support for clear, directional hypotheses, it is hoped that the number of articles using multivariate approaches will increase. According to a recent review of the broader child maltreatment literature, this trend has already started, and there are a growing number of articles that use longitudinal designs with multivariate analytic strategies.<sup>50</sup>

General conclusions derived from Table 2 are consistent with the child maltreatment literature. Not surprisingly, investigations involving observed emotional or physical harm were more likely to be substantiated or to result in placement.<sup>51</sup> Among other factors, the increased likelihood of substantiation for investigations involving older children may be attributable to the fact that older children can understand and report abuse. However, infants remain the most vulnerable population to maltreatment in North America.<sup>44,52,53</sup> This highlights the importance of dividing age categories based on a sound developmental rationale. The presence of caregivers' mental health issues, alcohol or drug abuse, lack of social supports, history of maltreatment and being a victim of domestic violence have been documented with the most consistency in our study as well as others.<sup>54,55</sup> Unstable or unsafe housing was associated with increased likelihood of substantiation or placement. The latter two findings highlight an association between child maltreatment and the socio-economic determinants of health, and sup-

port the need for an intersectoral public health approach in tackling child maltreatment.

## **Limitations and strengths of the review**

The current review differs from most traditional reviews in that it does not attempt to answer a specific research question by reviewing data collected from different sources, but it instead tracks different research questions that were addressed using one data source. Consequently, the use of the critical appraisal framework was used with flexibility. The current review focussed solely on peer-reviewed articles and disregarded the gray literature, which represents a fair proportion of CIS-derived dissemination products. While factsheets, book chapters and similar publications can be useful sources, they are rarely independently reviewed. In addition, some of the excluded materials, such as dissertations, have been transformed to peer-reviewed publications. Also, our review is probably not free of publication bias (the tendency to publish mostly significant results), but it documented that journals published researchers' non-significant findings (e.g., refs. 12,19). Another potential limitation, which is attributable to the CIS body of literature as a whole, is that key authors tend to specialize on specific topics and populations, such as Aboriginal peoples, adolescents, caregivers' mental health problems, corporal punishment, emotional maltreatment, and infants. The evidence stemming from the CIS would be strengthened in terms of both theoretical and methodological considerations if a more diverse group of researchers were implicated in data analyses. Overall, this review fills an important gap since practitioners, researchers and policy-makers have requested consolidated information from the CIS.<sup>56,57</sup>

## **Limitations and strengths of the CIS**

Findings from this review should be considered within the limitations of the CIS. The CIS: 1) collects information on children reported to child welfare agencies; 2) portrays perceptions by child protection workers and these are not independently verified; 3) includes mostly dichotomised variables; 4) captures non-independent observations (i.e., siblings, child protection workers and agencies that provide information on multiple children); 5) works under the assumption that the three-months data collection period in the fall is representative of the year; 6) has used evolving definitions across cycles; and 7) uses a cross-sectional design.

The CIS also has many strengths: 1) all Canadian jurisdictions participated in the CIS; 2) the number of Aboriginal agencies participating has increased with each cycle;<sup>58</sup> 3) the data are policy-relevant (e.g., refs. 56,59); 4) the CIS has had extensive media coverage;<sup>60</sup> 5) there were few missing data;<sup>61</sup> 6) most data have excellent test-retest reliability;<sup>62</sup> and 7) little recall bias due to the recent investigation of the maltreatment.

## **CONCLUSIONS**

The CIS generates data pertaining to child maltreatment that are analyzed and interpreted by researchers and experts in the field. The CIS has been utilized extensively, although several issues remain unexplored. In the future, it is hoped that CIS analyses will continue to inform child welfare policy development and practice, particularly by filling gaps with regards to categories of maltreatment that are understudied (e.g., exposure to domestic violence) or consistently studied in conjunction with other categories of maltreatment (e.g., neglect and emotional maltreatment).



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## RÉSUMÉ

**Objectif :** Cet article fait l'examen et l'évaluation critique d'analyses découlant de trois cycles de l'Étude canadienne sur l'incidence des signalements de cas de violence et de négligence envers les enfants (ECI) publiés entre 2001 et octobre 2011.

**Méthode :** Les articles ont été obtenus à partir des dossiers de demande de données de l'Agence de la santé publique du Canada, qui font le suivi des accès à la base de données et des publications qui s'ensuivent. Les

articles inclus ont été examinés et évalués indépendamment par les auteurs.

**Synthèse :** Globalement, nous avons examiné 37 articles évalués par des pairs utilisant les données de l'ECI. Ces articles révèlent une probabilité accrue de corroboration ou d'hébergement si l'enquête 1) découvre la présence de dommages émotionnels ou physiques chez un enfant, 2) porte sur des enfants plus vieux, 3) révèle la présence d'indicateurs de risque chez les pourvoyeurs de soins ou 4) fait état de conditions de logement instables ou dangereuses. Une proportion semblable d'articles utilise une approche descriptive ou multivariée pour analyser les données de l'ECI, et nous en cernons les forces et les limites.

**Conclusion :** Les chercheurs inclus dans notre examen analysent et interprètent abondamment les données de l'ECI, mais plusieurs enjeux sont sous-étudiés, notamment la négligence et la maltraitance affective – surtout lorsqu'on fait appel à des approches multivariées. Nous espérons que notre examen contribuera à combler les lacunes dans la littérature portant sur l'ECI.

**Mots clés :** Étude canadienne sur l'incidence des signalements de cas de violence et de négligence envers les enfants (ECI); surveillance de la maltraitance des enfants; maltraitance des enfants; violence familiale; épidémiologie; infractions sexuelles



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