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Methodological challenges in measuring child maltreatment☆

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ABSTRACT

Objective: This article reviewed the different surveillance systems used to monitor the extent of reported child maltreatment in North America.
Methods: Key measurement and definitional differences between the surveillance systems are detailed and their potential impact on the measurement of the rate of victimization. The infrastructure requirements, quality of information, timely access to data and the usefulness for child welfare policy are compared and contrasted and a summary table of the type of information by each system is presented.
Results: Two studies collect data regarding the extent and nature of child maltreatment using survey methodology reported to professionals: the United States National Incidence Study of Child Abuse and Neglect (NIS) and the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS), and the United States National Child Abuse and Neglect Data System (NCANDS) uses administrative data methods to collect annual case-level and state data.
Practice implications: The purpose of this comparison is to assist researchers and policy analysts with interpreting data from these studies as well as to help officials from other countries in developing surveillance systems that are appropriately adapted to their needs.

Introduction

How many children are maltreated in the population is a subject of debate in the literature. There is agreement only that the true extent of child maltreatment is unknown. The scope of this problem is estimated from self-report surveys or reports to child welfare services and/or police, but many incidents of abuse or neglect are never admitted or reported (Cicchetti & Carlson, 1989; MacMillan, Jamieson, & Walsh, 2003). Estimates indicate that between half to four fifths of all victims

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of maltreatment are not known to child protection services (Bolen & Scannapieco, 1999; Sedlak & Broadhurst, 1996). The tip-of-the-iceberg analogy easily comes to mind when one thinks of the scope of child maltreatment (Sedlak & Broadhurst, 1996; Trocmé et al., 2005).

The question of how to measure identified child maltreatment is one with which more and more jurisdictions are grappling. Although there are continued efforts in North America to create uniform approaches to the measurement of child maltreatment, there are enormous inconsistencies and variations in definitions used in child welfare legislation and by agency officials and researchers (Runyan et al., 2005). The purpose of this paper is to focus on the different approaches used to determine the extent of reported child maltreatment in the United States and Canada. These jurisdictions have comprehensive population surveys and administrative maltreatment data available through a number of sources including administrative data and sample surveys. This paper compares the three major child maltreatment surveillance methods being used in North America to assist researchers and policy analysts with interpreting these datasets as well as help officials from other countries in developing surveillance systems that are appropriately adapted to their needs. Before discussing the three North American child maltreatment surveillance systems, an overview of the key measurement issues associated with the measurement of reported child maltreatment is provided. Self-report surveys are not the subject of this paper as the focus will be on administrative data and sample surveys in order to assist with the interpretation of the various models. However, self-report survey data are the primary source for estimates of the prevalence of childhood maltreatment and have also been used to estimate the incidence of maltreatment (Finkelhor, Ormrod, Turner, & Hamby, 2005).

Key measurement issues

Understanding the definitional issues associated with measuring the phenomenon of child maltreatment is essential to understanding the difference in surveillance approaches. One of the difficulties in comparing child abuse and neglect reports is that statistics are rarely presented with enough detail to allow one to consider all the data collection issues and their potential impact on measurement. Maltreatment statistics can vary considerably in the forms of maltreatment being reported. The failure to document multiple forms of maltreatment can lead to underestimating some forms of maltreatment (English et al., 2005; MacMillan et al., 1997) even among reported children. Some measures include only cases where the child has been harmed, while others also consider children maltreated if they are at substantial risk of harm.

Research on rates of child maltreatment can focus on the annual incidence, which is the number of cases in a single year; or on childhood prevalence, which is the number of children maltreated during childhood. At what point a child is identified as maltreated is fundamental to understanding the limitations of data estimating the epidemiology of child maltreatment. Further, many children who are maltreated are not reported or not investigated, and many cases investigated by child welfare authorities are not substantiated (Sedlak & Broadhurst, 1996; Trocmé et al., 2005; USDHS, 2008).

How a child maltreatment event is measured is an important construct when comparing international rates of maltreatment. If provided in the aggregate, child welfare investigations can use either a child-based or family-based method of tracking cases. For child-based methods, each investigated child is counted as a separate investigation, while for family-based investigations the unit of analysis is the investigated family regardless of the number of children investigated. At the child welfare agency/office level, the number of children investigated for maltreatment may be hard to discern depending on the data collection and aggregation methods as children investigated several times in a year are often counted several times, each time as a separate investigation depending on the agency and jurisdiction. Finally, the characteristics of children and their circumstances who are investigated by child welfare authorities varies depending on the jurisdiction. Therefore, at minimum, comparisons across jurisdictions require that the data be disaggregated.

There are several methods by which child maltreatment surveillance data can be obtained, of which we will highlight two types: professional survey methodology, and administrative data extraction.

Surveys of professionals and agency records surveys

Surveys of professionals are surveys that are conducted with child protection workers regarding their investigations of alleged child maltreatment. Serial surveys are those that repeat the same questions at different points in time. In North America, two serial studies collect data regarding the extent and nature of child maltreatment using surveys of child protection workers. In Canada, two cycles of the Canadian Incidence Study of Reported Child Abuse and Neglect (CIS-1998, 2003) have been completed, and the results of the third CIS cycle will be released in the fall of 2010. Investigating workers complete the data collection instrument based upon their review of the case file. The Public Health Agency of Canada is committed to funding the CIS in 5-year cycles. In the United States, three National Incidence Study of Child Abuse and Neglect (NIS-1979, 1986, 1993) studies have been completed and the results of the fourth study will be released in 2009. Earlier cycles of the NIS used investigating workers to complete the data collection instrument. When the NIS began to include large agencies with significant caseloads, the NIS moved towards data extraction/abstraction from case file records. In an agency where caseloads and time allow, investigating workers still complete the data collection instrument. However, the NIS largely depends on both field staff to complete the data abstraction and NIS project staff to do the data extraction for agencies with electronic case files. Both the CIS and the NIS are examples of serial, cross-sectional surveys. A new sample of children reported to child welfare services is selected for each study. Conclusions about changes in rates and reported maltreatment are made based on a comparison of samples drawn from each study.

Administrative data extraction methodology

The National Child Abuse and Neglect Data System (NCANDS) is a continuous data collection activity with an annual acquisition cycle (U.S. Department of Health and Human Services, 2008). NCANDS is supported by the US Federal government to collect annual statistics on child maltreatment known to the State public child welfare agency. States submit data on investigations and assessments of allegations of child maltreatment based upon extracts from their administrative data systems. Almost all states provide data at the child level. The next section of the paper describes the specific methods employed for each of these data collection efforts.

Canadian Incidence Study of Reported Child Abuse and Neglect (CIS)

In Canada, most child abuse and neglect statistics are kept on a provincial or territorial basis. However, because of differences among provincial and territorial definitions of maltreatment, and in methods for counting cases, it is not possible to aggregate provincial and territorial statistics. The lack of comparability of provincial and territorial data has hindered the ability of governments and social service providers to improve policies and programs that address the needs of maltreated children. The 1998 Canadian Incidence Study of Reported Child Abuse and Neglect (CIS-1998; Trocmé et al., 2001) was the first study in Canada to estimate the incidence of child abuse and neglect reported to and investigated by the Canadian child welfare system. The Public Health Agency of Canada is committed to continuing a 5-year cycle of data collection.

A stratified cluster sampling design is used first to select a representative sample of child welfare offices and then to sample cases within these offices. In 2003, from a total of 400 child welfare offices in Canada, 63 were randomly selected: 55 sites provided detailed information about the investigations and an additional 8 child welfare offices in Québec provided information about the form and substantiation level of the investigated maltreatments. Québec child welfare offices were included on the basis of availability of data from a common information system that was implemented in the province just prior to data collection for the CIS-2003. The fields contained in this system were mapped onto the CIS-2003 questions. While this approach provided a basis for deriving selected national estimates that include Québec, there was not sufficient correspondence between the fields and the CIS-2003 questions to include the Québec sample in all tables.

Cases opened for investigation at the randomly selected sites between October 1 and December 31, 2003, were eligible for inclusion. In several Aboriginal jurisdictions and in Québec, data collection included cases opened in January 2004. This adjustment was made to accommodate late enrolment of some Aboriginal sites and to allow for a data adjustment period in Québec's new information system. Three months was considered to be the optimum period to maintain participation and compliance with study procedures. Consultation with service providers indicated that activity during the study period is typical of the whole year, although potential seasonal effects in the types of cases investigated were not examined. However, an examination of reported maltreatment in a 12-month time frame at a large Canadian child welfare agency revealed that the volume of cases fluctuated but the type of reported maltreatment reported monthly remained consistent throughout the year (Fallon, 2005).

The CIS collects information from child welfare workers about investigated children and their families as they came into contact with child welfare authorities. While investigating alleged maltreatment is the core mandate for most child welfare authorities, situations that are considered to involve children at risk of maltreatment are also opened for preventive services. One of the main tasks of the study research team is to reclassify and evaluate these cases that are opened to participating agencies in different ways, some counting children, some counting families, some cases opened for child behavior problems. For jurisdictions using family-based case counts, a final case selection stage is required to identify the specific children who had been investigated.

A significant challenge for the study is to overcome the variations in the definitions of maltreatment used in different jurisdictions. Investigating workers are trained by the study team to include investigations that using a single set of definitions corresponding to standard research classification schemes. For example, in jurisdictions that do not investigate allegations of educational neglect, workers are asked to include children in the CIS who were the subject of an educational neglect investigation. Conversely, if a child was investigated because of a behavioral concern and not maltreatment concern, workers are trained not to include that child in the study. Each investigation has a minimum of one and a maximum of three identified forms of maltreatment. Most child welfare authorities do not have a systematic mechanism for tracking new allegations on open cases and therefore new allegations on already open cases are not included.

Two sets of weights are applied to derive national annual incidence estimates. First, results are annualized to estimate the volume of cases investigated by each study site over the whole year. To account for the non-proportional sampling design, regional weights are then applied to reflect the size of each site relative to the child population in the region from which the site was sampled. CIS estimates cannot be unduplicated because annualization weights are based on unduplicated service statistics provided by the study sites. Therefore, estimates for the CIS refer to child maltreatment investigations.

An estimated 217,319 child maltreatment investigations were conducted in Canada in 2003 (excluding Québec). Forty-seven percent of these investigations were substantiated, involving an estimated 103,298 investigated children, for an incidence rate of 21.71 substantiated investigations per 1,000 children. In a further 13% of investigations there was insufficient evidence to substantiate maltreatment; however, maltreatment remained suspected by the investigating worker. Forty percent of investigations were unsubstantiated. This percentage of unsubstantiated cases is similar to or lower than the percentage of unsubstantiated cases reported in most jurisdictions and reflects laws that require the public and profes-

sionals to report all cases of suspected maltreatment. Most unsubstantiated cases are indeed reports made in good faith; only 5% of reports tracked by the CIS-2003 were considered to have been made with malicious intent (see Table 8-2 in the CIS-2003 Major Findings Report).

Nearly one-third (30%) of all substantiated investigations involved neglect as the primary category of maltreatment, an estimated 30,366 neglect investigations at a rate of 6.38 substantiated investigations per 1,000 children. Exposure to domestic violence was the second most frequently substantiated category of maltreatment (an estimated 29,370 substantiated investigations for a rate of 6.17 per 1,000 children), followed closely by physical abuse (an estimated 25,257 substantiated investigations, a rate of 5.31 per 1,000 children). Emotional maltreatment was the primary category of substantiated maltreatment in 15% of cases (an estimated 15,369 substantiated investigations, a rate of 3.23 per 1,000 children) while sexual abuse cases represented 3% of all substantiated investigations (an estimated 2,935 substantiated investigations, a rate of .62 per 1,000 children).

National Incidence Study (NIS)

There have been four cycles of the National Incidence Study (NIS) conducted in the United States: NIS-1 (1979–1980); NIS-2 (1986); NIS-3 (1993) and NIS-4 (2005–2006) (results for the NIS-4 were not available at the time this paper was written). The NIS includes children who were investigated by child welfare service agencies. The NIS employs the same methodology as the CIS, selecting a nationally representative sample of counties and a 3-month data collection period. The child protection agency in the sampled county is a key participant, providing basic demographic data on all the children who are reported and investigated during the 3-month study period. Unlike the CIS, the NIS also surveys a representative sample of community professionals serving children and families who are likely to come into contact with maltreated children such as police and sheriffs' departments, public schools, shelters (for domestic violence victims and for runaway and homeless youth), day care centers, hospitals, voluntary social service agencies, mental health agencies, public housing, and county juvenile probation and public health departments. Duplicate forms are unduplicated so that each child is included in the database only once. Finally, the data are weighted to represent the total number of children maltreated in the United States and annualized to transform the information from the 3-month data period into estimates reflecting a full year. Including children known to community professionals provides a more complete picture of the scope of child abuse and neglect.

Children identified to the study by non-child welfare sentinels and those who were investigated by a child welfare service professional are evaluated according to two sets of definitional standards: the Harm Standard and the Endangerment Standard. The Harm Standard was developed for the NIS-1, and has been used in all subsequent studies. It requires that an act or omission result in demonstrable harm in order to be classified as abuse or neglect. It is strongly objective in definition but sometimes excludes children whose maltreatment was substantiated as abuse or neglect by a child welfare professional. The Endangerment Standard allows children who were not yet harmed by maltreatment to be counted in the abused and neglected estimates if either a non-child welfare professional considered them to be endangered by maltreatment or if their maltreatment was substantiated by a child welfare professional.

Results from the first three NIS studies conducted in 1976, 1986, and 1993 consistently pointed to significant underdetection of cases of maltreatment known to professionals working with children. The 1993 study found that only one-third of cases countable under the study Endangerment Standard had been investigated by child protective services (CPS; Sedlak & Broadhurst, 1996). An estimated 2.8 million children experienced some form of maltreatment under the Endangerment standard during 1993 (41.9 children per 1,000 children), a 98% increase over 1986. Of the 2.8 million children identified under the Endangerment standard, 927,000 were investigated by CPS (13.8 per 1,000 children). Using the Endangerment Standard in 1993, 29.2 children per 1,000 (an estimated 1.9 million) were neglected; 9.1 children per 1,000 (an estimated 614,100) experienced physical abuse; 4.5 children per 1,000 (an estimated 300,200) were sexually abused; and 7.9 children per 1,000 (an estimated 532,200) suffered emotional abuse. An estimated 1,553,800 children experienced some form of maltreatment under the Harm Standard during 1993 (23.1 children per 1,000 children), which was a 67% increase from 1986 and a 149% increase from 1980. Using the Harm Standard, in 1993, 13.1 children per 1,000 (an estimated 879,000) were neglected; 5.7 children per 1,000 (an estimated 381,700) experienced physical abuse; 3.2 children per 1,000 (an estimated 217,700) were sexually abused; and 3.0 children per 1,000 (an estimated 204,500) suffered emotional abuse.

National Child Abuse and Neglect Data System (NCANDS)

In the United States, annual maltreatment statistics are reported by the National Child Abuse and Neglect Data System, which is a dataset resulting from the aggregation of state administrative child maltreatment data voluntarily provided by states. The dataset was created in response to requirements of the federal *Child Abuse and Prevention Treatment Act* (CAPTA) legislation in 1988. The stated purpose of NCANDS is to collect and analyze data on child abuse and neglect known to child protective services agencies (U.S. Department of Health and Human Services, 2008).

During the early years, states provided aggregated data on key indicators of child protective services but as of the 1993 data year states began to voluntarily submit case-level data (U.S. Department of Health and Human Services, 2008). As of 2000, the reported data comes from an aggregated data file, which results from the merging of three data sources: the Child File (i.e., case-level data), the Agency File, and the Summary Data Component (SDC). Each state maps data from its own child maltreatment information system to a standard NCANDS layout using supplied guidelines and with technical assistance from

the project staff. All investigations or assessments of alleged maltreatment that receive a disposition in the given year are included in the case-level data collection component. The case-level data is structured into a unit of analysis that contains a unique identifier for each child and report, referred to as a report-child pair, which, among other advantages, permits longitudinal analysis of repeat events (Fluke, Shusterman, Hollinshead, & Yuan, 2008). Data are evaluated and validated through both qualitative analysis of items for compatibility and a set of rules used to assess data consistency and evaluate data ranges for accuracy, missingness, and cross-submission reliability. Information collected includes report sources, demographics of the children and the perpetrators, maltreatment types, dispositions of the assessment or investigation, worker and supervisor IDs, risk factors, and services and placements that result from the investigation. In addition, an ID linkage is provided to case-level data on children who are included in data submissions to the federal Adoption and Foster Care Analysis and Reporting System (AFCARS). Data in the Agency File are aggregated and include information regarding children and family funding sources, screened-out referrals, the Child Protection Service workforce, and additional information on child victims and child fatalities (U.S. Department of Health and Human Services, 2008). The NCANDS findings are published annually in a report series titled *Child Maltreatment*. Beginning in 2003 the data were submitted for the U.S. federal fiscal year. The annual *Child Maltreatment* reports based on NCANDS represent the most comprehensive reporting on child protective services by the U.S. federal government. Fifty states, the District of Columbia, and the Commonwealth of Puerto Rico are eligible to contribute to NCANDS. For 2007, 48 jurisdictions provided case-level data, two jurisdictions did not report and two jurisdictions reported using the (U.S. Department of Health and Human Services, 2008).

In the United States, an estimated 3.5 million children were investigated or assessed by CPS agencies in 2007, of which an estimated 794,000 children were determined to have been abused or neglected based on a victim rate of 10.6 per 1,000 children (U.S. Department of Health and Human Services, 2009). Approximately sixty percent of investigations involved child neglect (436,944 children) or medical neglect (6,759 children). Neglect continues to be the dominant form of maltreatment investigated by CPS in the United States. Physical abuse was noted in 10.8% of cases and sexual abuse in 7.6% (U.S. Department of Health and Human Services, 2009). A relatively large proportion of cases (13.1%) were labeled in a new category, multiple maltreatments, defined as two or more types of maltreatment reported (only those states that reported multiple maltreatment types are included in this analysis).

Component comparisons

Table 1 presents a summary of the key components of the three North American surveillance systems. The purpose of this comparison is to assist researchers and policy analysts with interpreting data from these studies as well as to help officials from other countries in developing surveillance systems that are appropriately adapted to their needs. There are various infrastructure requirements for the CIS, NIS, and NCANDS. The three systems require considerable cooperation and participation on the part of their jurisdictions, agencies, and associated personnel. All three also require federal support in the form of mandates for data collection and financial support. A range of authorities involved with children including any kind of protection service

The sentinel methodology employed by the NIS is grounded in the ability to unduplicate all cases. The NIS receives a complete census of children that the sampled child protection agency investigates which is then used to unduplicate reports across the entire jurisdiction and all sentinel sectors. The NIS sentinel methodology could be adapted in regions that do not have a formal child protection system in order to derive estimates of child maltreatment known to the social service sector. In jurisdictions without a formal child protection system, the sentinel methodology would need to include a rigorous unduplication process and would be dependent on the quality of identifying information available about the investigation or case. Further, there are enormous costs associated with the design and data collection phases of the NIS. The study is a congressionally mandated, periodic effort of what is now the Children's Bureau (CB), a unit within the Administration on Children, Youth, and Families (ACYF), within the Administration for Children and Families (ACF) in the U.S. Department of Health and Human Services. It requires not only the efforts of the child protection agency sampled within a jurisdiction, but also the enlistment of schools, police, hospitals, and community agencies. All four iterations of the NIS have been conducted under contract to Westat, whose headquarters is in Rockville, Maryland.

The CIS does not require a well-developed information system as specific details about the child maltreatment investigation are gathered directly from investigating workers. This methodology would also be appropriate for jurisdictions with formal child protection systems but not accompanying information systems. The Public Health Agency of Canada (Government of Canada) provides the majority of the funding for the cyclical data collection with additional support from all provinces and territories in the form of in-kind contributions of agency workers and administrative time and, if desired, oversampling contributions. University-based researchers in collaboration with Government of Canada personnel generate the major findings of the study and conduct secondary analyses.

NCANDS relies upon State departments of child welfare to extract data to a common electronic record format and submit data on each child who has been the subject of an investigation or assessment of alleged maltreatment. Jurisdictions that do not have sufficient person power to develop extracts or who do not have automated information systems provide data through the Summary Data Component in aggregate. NCANDS is federally sponsored by the Children's Bureau in the Administration of Children, Youth and Families (ACYF) in the Administration for Children and Families (ACF) in the U.S. Department of Health and Human Services, and receives technical support from Walter R. McDonald & Associates, Inc., with assistance from the American Humane Association.

Table 1
North American child maltreatment data collection systems.

Descriptors	CIS-2003	NIS-3	NCANDS
Methodology	• Survey	• Survey, nationally representative sample	• Extracts from automated information systems
Coded by	• Investigating worker	• Submitted by CPS workers, child welfare sentinel and recoded by evaluative coders	• CPS workers
Level of measurement	• Investigations	• Child	• Investigations of reports • Child-report pair • Child
Number of forms of maltreatment	• Multiple forms, standardized	• Multiple forms, standardized	• Multiple forms; local definitions mapped to standard definitions
Type of maltreatment	• CIS: (5 main types) • Physical abuse (5 subtypes), sexual abuse (8 subtypes), emotional maltreatment (3 subtypes), neglect (8 subtypes), exposure to domestic violence	• Physical abuse, sexual abuse (3 forms), emotional abuse (4 forms), neglect (3 subtypes: physical neglect, emotional neglect, educational neglect), and other	• Neglect, physical abuse, medical neglect, sexual abuse, psychological maltreatment, and other
Child demographics	• Age, sex, Aboriginal status, living arrangements	• Age, sex, race, living arrangements	• Age, sex, race/ethnicity, living arrangements
Levels of substantiation/disposition	• 3 levels defined by study	• 2 standards: harm standard and endangerment standard, then cases substantiated/indicated	• Substantiated, indicated, alternative response-victim, alternative response non-victim, unsubstantiated; intentionally false; unknown, closed without a finding; determined by case worker
Severity of harm	• Type of injury, chronicity, need for treatment for emotional and physical harm	• Severity of injury	• Fatalities only
Report makers	• Multiple reporting sources allowed	• Multiple reporting sources allowed; variety of sentinels included	• Professional and non-professional reporters to public child welfare agencies
Child functioning/risk factors	• 22 functioning issues captured for all investigated children • Prior reports	• Detailed information for substantiated victims collected • Prior reports	• Disability, risk factors • prior reports
Parent/caregiver risk factors/characteristics	• Income, 9 parent factors; also household risks	• Income, family structure, family size, residence in a metropolitan vs. rural area	• Risk factors including caregiver disabilities and other risk factors
Perpetrators	• Caregiver or other relationship to child; for non-parent perpetrators know only age and relationship	• Relationship to child, including non-parents, age, sex, employment status	• Age, sex, relationship to child
Receipt of services	• Court, ongoing care, Out-of-home care, referrals made on family behalf, criminal court	• No[a]	• Foster care, ongoing services, in-home services, court action
Duplication	• Partially unduplicated, cannot unduplicate annualization	• Each child included only once	• Duplicates included
Agency data	• Size, location, annual caseload, screening practices etc.	• No[a]	• Available on state-by-state basis, number CPS workers, funding sources, preventive services; additional data on fatalities
Number of workers in study	• Yes, also age, education, job status, caseload levels, years experience	• No[a]	• Yes
Agency location	• Yes	• No[a]	• State and county identified

[a] Not examined in main NIS.

Quality of information

The CIS and NIS collect cross-sectional data that does not control for the passage of time. There is an unmeasured heterogeneity between samples because the children and families are selected from agencies that are different in each study cycle (Walkup & Yanos, 2005). Caution should be used when comparing changes in rates of reported maltreatment, as there may be important population differences or events that impact the each study cycle. However, the trend data obtained from these surveillance systems reveal important information about the epidemiology of reported child maltreatment without the enormous expense associated with longitudinal data collection.

The CIS and the NIS use standard maltreatment definitions which allow for very specific classifications of maltreatment (32 forms in the CIS-2008 and 60 forms in the NIS-4). NCANDS uses state data where there is considerable variability across state child protection service systems with respect to both what is included under the broad maltreatment typologies and their definitions. Both the NIS and the CIS demonstrate excellent reliability for whether an investigation was included in the sample or not (Sedlak & Broadhurst, 1996; Trocmé et al., 2005). However, data collected in the three North American surveillance systems are not independently verified.

The CIS collects the most detailed information about the investigated child including information about up to three forms of investigated maltreatment and 22 possible child-functioning concerns. The CIS, NIS, and NCANDS gather detailed information about the demographics of the caregivers and possible risk factors. Similarly, the CIS and the NIS collect information about injuries, although both studies do not make estimates about fatalities given their relatively small sample sizes. The CIS documents the type of injury and whether medical treatment was required; the NIS documents the severity of the injury. NCANDS collects information only on fatalities.

NCANDS allows for children to be identified across multiple investigation events both within and across submission years, although only within a state's data rather than across states, and allows for linkages to more detailed placement data available for placed children in the U.S. AFCARS data program. Despite the collection of such detailed information by the CIS and NCANDS, it is important to note that the decision as to whether or not a case meets CIS or NCANDS definitions of abuse is subjectively determined by investigating workers.

Timely access to data

The surveillance systems reviewed in this paper have become integral to providing important context for child protection service provision and monitoring rates of reported child abuse and neglect. The timeliness of the data is an important consideration as the demands on the data from stakeholders are vast. The CIS requires 2 years from the start of data collection before data are available. Funding of the NIS does not permit regular cycles of data collection. Availability of data for the first three cycles of the NIS study has varied: for the NIS-3, the report to Congress was publicized in 1996, 3 years after the data were collected (1993). Annual NCANDS data, which is published in a yearly report entitled *Child Maltreatment*, are available 18 months after the close of the data collection year.

Usefulness of data

Each of the three data collection efforts makes unique and important contributions in describing child maltreatment. The CIS provides an opportunity to examine trends in child maltreatment investigations and changes in child welfare services at a national level and to analyze them in more detail than is possible using current provincial and territorial administrative information systems. Comparisons between 1998 and 2003 data demonstrate the importance of public health datasets like the CIS, as findings from these studies have contributed to policy changes in several Canadian jurisdictions. For example, the findings from the CIS-2003 were used to inform the Children's Aid Society of Toronto's policy concerning children exposed to domestic violence. The CIS-2003 data was also used to inform the "Child Welfare Transformation" in Ontario when the child welfare sector moved to a differential response model. CIS data also supports provincial and territorial efforts to integrate their administrative systems to better learn from the diverse policies and programs that have been developed. Finally, the CIS datasets provide researchers across the country opportunities to examine in more detail the factors underlying changes in reported and substantiated maltreatment (Trocmé et al., 2005). The NIS has similar applicability within a U.S. context as the CIS does in Canada, but is also a somewhat richer dataset in that it includes children known to community professionals who may be experiencing maltreatment but have not come into contact with child welfare services. The large sample size included in the NCANDS dataset and its continuous census collection allows researchers to explore substantive issues, such as what leads to a recurrence of child abuse/neglect and factors that influence access to services, as well as providing data on trends. In addition, the annual report based on NCANDS data is a critical source of information for many activities of the federal government and is used to help assess the performance of several Children's Bureau programs (U.S. Department of Health and Human Services, 2008).

Discussion

> "Our concern with child abuse and neglect, and most research on the problems, derives from cases that have come to light through the existing social agencies. In focusing our attention only on those children readily accessible to study, we are working within a very narrow frame and within entirely too limited a population" (Newberger, 1977).

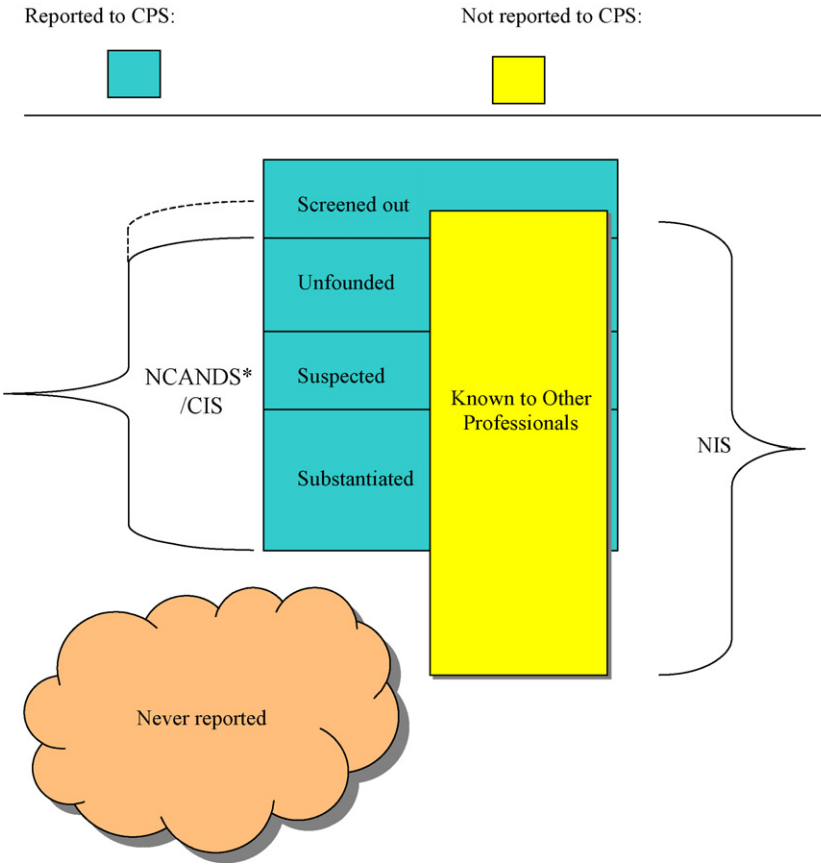

Fig. 1. Comparing North American child maltreatment data collection studies.

Although Newberger's quotation is 30 years old, it highlights the need to be clear about the limitations of any measurement approach taken to describe maltreated children—the surveillance measurement systems described in this article reflect only child maltreatment identified to the community. One of the challenges in measuring the extent of child abuse and neglect is that the constructs underpinning child maltreatment are constantly evolving. The roots of child welfare can be traced to the enactment of the English Poor Law of 1601 (McGowan & Meezan, 1983; Costin, 1985; Otto & Melton, 1990; Schene, 1998). This law acknowledged that the public had a responsibility to assist with the care of people who could not care for themselves (McGowan & Meezan, 1983; Schene, 1998). Any intervention regarding children was limited to the poorest families who were given assistance by the state (Otto & Melton, 1990). A landmark point for increasing societal awareness about child abuse and neglect was the XIV Congress of Forensic Medicine in 1929, during which, Parisot and Caussade presented a paper entitled *On Abusing the Child* (Parisot & Caussade, 1929). The discovery of child abuse through radiological identification of patterns of injuries in 1946, brought further societal attention to the issue of child abuse (Caffey, 1946). Following the report and publication of radiological evidence of child abuse, Kempe and Steele made their first presentation about battered child syndrome in Chicago in 1961 (as cited in Kempe, Silverman, Steele, Droegemuller, & Silver, 1962). The definition of maltreatment now includes sexual abuse (Tutty, 1993; Wurtele & Miller-Perrin, 1992), neglect (De Francis, 1956; Lapp, 1983; Martin & Walters, 1982), and emotional maltreatment (Brassard, Germain, & Hart, 1987; Thompson & Kaplan, 1993). Most recently, in some North American jurisdictions, the child welfare system has been investigating unprecedented reports of children being exposed to domestic violence (Trocmé et al., 2005).

Given the evolving nature of the identification, detection, and response to child maltreatment, no existing data collection system can represent all maltreated children. The commonalities and differences in the detection and classification capabilities of the three North American surveillance systems are illustrated in Fig. 1. The NIS is able to detect children not reported to a child protection service for abuse or neglect because it includes reports from sentinels. Both NCANDS and the CIS include a "suspected" level of verification, including children whose maltreatment has not been verified but remains a concern.

Although the rate of victimization is considerably higher in Canada than the United States, this difference reflects several important distinctions in the mandate and scope of the two countries. First, the rate of case substantiation is much higher in Canada compared to the United States. Only one quarter (24.9%) of reports were substantiated in the United States in 2005, with maltreatment remaining suspected ("indicated") in another 3% of cases (U.S. Department of Health and Human Services—Administration on Children, 2006), whereas 47% of investigations were substantiated in Canada in 2003, with

maltreatment remaining suspected in another 13% of cases (Trocmé et al., 2005). A second and related point is that the rate of substantiated physical abuse is two and half times higher in Canada, a difference most likely associated with differences in standards with respect to acceptability of the use of corporal punishment. Three quarters of substantiated physical abuse cases in Canada involved inappropriate use of physical punishment (Durrant, Trocmé, Fallon, Milne, & Black, 2009). Third, there has been a major expansion across Canada in cases of exposure to domestic violence and, to a lesser extent, in cases of emotional maltreatment. As a result, the rate of victimization attributed to exposure to domestic violence is nearly as high as the rate of neglect, and the rate of emotional maltreatment is nearly as high as the rate of physical abuse.

Conclusion

The purpose of a child maltreatment surveillance system is to provide data on a timely basis in order to inform all interested stakeholders about trends and risks impacting children and families. An effective identification system provides the ability to develop the tools to make strategic funding decisions and target interventions (Wolfe & Yuan, 2001). This paper reviewed three surveillance methods in order to provide sufficient detail to compare their data as well as to highlight the strengths and limitations of each approach for jurisdictions trying to develop a surveillance system best suited to their capabilities. The NIS and the CIS use serial cross-sectional surveys of professionals to estimate the number of children maltreated in the year. NCANDS extracts administrative data on a yearly basis from state information systems. Each approach provides insight into the extent and nature of child maltreatment, which is the foundation for prevention of child maltreatment.

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