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Challenges in Using Medicaid Claims to Ascertain Child Maltreatment

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Abstract

Medicaid data contain International Classification of Diseases, Clinical Modification (ICD-9-CM) codes indicating maltreatment, yet there is a little information on how valid these codes are for the purposes of identifying maltreatment from health, as opposed to child welfare, data. This study assessed the validity of Medicaid codes in identifying maltreatment. Participants ($n = 2,136$) in the first National Survey of Child and Adolescent Well-Being were linked to their Medicaid claims obtained from 36 states. Caseworker determinations of maltreatment were compared with eight sets of ICD-9-CM codes. Of the 1,921 children identified by caseworkers as being maltreated, 15.2% had any relevant ICD-9-CM code in any of their Medicaid files across 4 years of observation. Maltreated boys and those of African American race had lower odds of displaying a maltreatment code. Using only Medicaid claims to identify maltreated children creates validity problems. Medicaid data linkage with other types of administrative data is required to better identify maltreated children.

Keywords

medicaid; maltreatment; validity; ascertainment

Introduction

For the past several decades, the collection of data about the numbers of children and youth subject to maltreatment nation-wide has been a policy priority. At a national level, for

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Authors' Note

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example, administrative data from states are aggregated into annual reports (Children's Bureau, 2012), and sentinel study designs such as the National Incidence Study capture children who do not present to child welfare agencies (Sedlak & Broadhurst, 1996). Finding ways to reliably identify child maltreatment from administrative *health* data (as opposed to administrative child welfare data) may be a useful corollary to these efforts but have, as yet, proven elusive.

One potential approach to identify maltreatment at a population level is to use codes contained within Medicaid claims, which are used to indicate maltreatment, to ascertain child abuse and neglect among health-seeking populations. Intuitively, this is very appealing. Virtually, all children in foster care possess categorical entitlements to Medicaid, and those that are maintained in home also have high Medicaid coverage through some combination of income eligibility and state Medicaid codes (English & Freundlich, 1997; Libby et al., 2007). Because there are relatively few non low-income children coming into contact with child welfare agencies, children who are not categorically eligible usually qualify for Medicaid through income eligibility regulations. Consequently, virtually all children who might come into contact with the child welfare system are either on or are eligible for Medicaid coverage (Raghavan & Leibowitz, 2007). Maltreated children are also very high users of health and mental health services (Gilbert et al., 2009), and impose considerable costs upon health insurers (Florence, Brown, Fang, & Thompson, 2013; Raghavan et al., 2012). This high level of need and use means that eligibility and coverage actually translate into paid claims, and many maltreated children generate Medicaid claims. Consequently, Medicaid claims might be a viable source of information on maltreatment status, especially for those children who come into contact with health services agencies, but not necessarily with child welfare agencies.

In keeping with this “maltreatment surveillance” use of Medicaid claims, there are several ways to potentially identify a cohort of maltreated children. Claims data contain various Ninth International Statistical Classification of Diseases and Related Health Problems, International Classification of Diseases, Clinical Modification (ICD-9-CM) codes (International Classification of Diseases, 2004). Medicaid codes relevant to maltreatment fall into three major groupings. First, some of these codes are diagnostic and are meant for the clinician or coder to indicate a clinical presentation or disease for which payment can be made for a particular service. “Child maltreatment syndrome” [995.5] or the “effects of hunger or thirst” [994.2 and 994.3] are examples of such diagnostic codes. A second category of codes is the E codes, meant to indicate external causes of injury or violence. Because maltreatment is transactional, E codes can be used to indicate, for example, “child abuse by a perpetrator” [E967] or “accident due to abandonment or neglect” [E904.0]. Finally, Medicaid claims also contain a grouping of supplemental codes that describe clinical presentations that do not involve a specific disease or an injury. These V codes include “evaluation for suspected abuse and neglect” [V71.81] and “counseling for victim of child abuse” [V61.21]. Collectively, these diagnostic, accident/injury, and supplemental codes can provide information on Medicaid-covered children presenting to health services agencies if they are used appropriately and captured within Medicaid claims.

Examples of such use of Medicaid claims to identify a maltreated cohort includes a study using all three groups of codes contained in Medicaid claims in a mid-Atlantic state to identify patterns of psychotropic medication use (Burcu, Zito, Safer, & Ibe, 2014). The authors used three diagnostic codes, three V codes, and four E codes to identify a cohort of children in Medicaid claims who had presumably been maltreated. This approach is different from other studies that use the foster care eligibility category to identify a cohort of youth in foster care, such as those by dosReis and colleagues, (2011). In these types of studies, the goal is not to generalize to maltreated children, just to those in foster care. A final set of studies have attempted to identify subgroupings of maltreatment, such as physical abuse using ICD-9-CM codes triangulated with a child abuse pediatrician's diagnosis (Hooft, Ronda, Schaeffer, Asnes, & Leventhal, 2013). Such an approach enhances the validity of the ICD-9-CM code using clinical judgment, as obtained from chart review or the clinical encounter. These and other approaches to enhancing the validity of ICD-9-CM codes are reviewed by Scott, Tonmyr, Fraser, Walker, and McKenzie, (2009).

The validity of an approach that solely uses Medicaid claims to identify maltreatment without any external validator is questionable; ICD codes likely underestimate the extent of maltreatment when used as a sole identifier of maltreatment. The reasons for why maltreatment does not get reported in claims has been addressed in prior literature; these include clinicians not indicating maltreatment in medical charts, other systemic problems with documentation in the chart, and coders not coding for maltreatment due to documentation-related or other reasons (Scott et al., 2009). Many forms of maltreatment may not generate a medical claim (Heger, Ticson, Velasquez, & Bernier, 2002), and so only those children with the greatest physical sequelae associated with maltreatment—such as a child presenting to an emergency department with a head injury that appears to be intentional rather than accidental—may receive such a code. Children with histories of neglect may not receive such a code if their physical or emotional sequelae do not rise above a severity threshold for health conditions. There are also formidable barriers to medical professionals reporting child abuse, including concerns about the gravity of the diagnoses, concerns with legal involvement, loss of client revenue, and uncertainty regarding the extent to which maltreatment accounts for the clinical presentation (Flaherty & Sege, 2005). Consequently, Medicaid's ICD-9-CM codes may “underascertain” maltreated children when maltreatment may not always be reflected in a claim file.

The magnitude of such validity problems is currently unknown because data that definitively identify maltreated children, such as data containing determinations by trained caseworkers using valid instruments to ascertain maltreatment, have not been linked at the child level to Medicaid claims containing ICD-9-CM codes for maltreatment. Such a data linkage would permit comparison of ascertainment rates between these two sets of data and would provide information on the magnitude of underascertainment occurring within Medicaid claims. Absent such data linkage, scholars attempting to validate maltreatment rates at a population level are forced to undertake other types of administrative data linkage such as hospital discharge data linked to death certificate information (Olsen & Durkin, 1996), hospital discharge data and administrative data from child protection services (Schnitzer, Slusher, & Van Tuinen, 2004), injury surveillance data (Winn, Agran, & Anderson, 1995), or

qualitative research on small samples (Rovi & Johnson, 2003). None of these are relevant for the purposes of identifying child maltreatment from Medicaid claims.

In this study, we examine the validity of Medicaid claims as indicators of maltreatment by quantifying the number of children identified by trained caseworkers as having been maltreated and comparing them to ICD-9-CM codes contained within Medicaid claims. We linked data from children interviewed in the first National Survey of Child and Adolescent Well-Being (NSCAW I), which contain child welfare worker assessment of maltreatment based upon a validated instrument. We also obtained Medicaid claims of NSCAW participants obtained from 36 states, and linked them to NSCAW using the child's social security number. Such a deterministic linkage, therefore, enables us to compare with great precision rates of agreement between caseworker assessment (our gold standard) and the maltreatment codes contained in Medicaid claims. In an attempt to identify characteristics of children who may be at most risk of underascertainment, we examined rates of non-ascertainment among children of varying demographic characteristics, insurance coverage, and placement status. Because prior health service use may bring the child into contact with health care providers and thereby increase the probability of a maltreatment code in the child's Medicaid record, we examined covariates of prior ambulatory, inpatient, and emergency department use. Our overall goal was to develop a profile of children who were at most risk of underascertainment, and better inform the identification of child maltreatment using health administrative data.

Method

Data Sources and Creation of Analytic Data Set

The NSCAW I is the first nationally representative, longitudinal study of children and adolescents coming into contact with child protection agencies. This sample contains data on 5,501 youth investigated by Child Protective Services for possible abuse and neglect and 727 youth in long-term foster care placement in 97 counties throughout the United States. NSCAW's baseline wave sampled children presenting to child protective services agencies within a 15-month period beginning in October 1999, with three follow-up waves of data collection extending over 3 years. Data within NSCAW are obtained from children, their child welfare workers, their caregivers, and their teachers. This study used data obtained from the child's caregivers and caseworkers. Details on NSCAW's design and fielding have been published elsewhere (Dowd et al., 2006; NSCAW Research Group, 2002). We also obtained Medicaid claims files Medicaid Analytic Extract or MAX (Research Data Assistance Center, n.d.) for years 2000 through 2003, corresponding to the time frame of NSCAW administration. We obtained data on all 36 states that were part of the NSCAW sampling frame. Both NSCAW and MAX data contain social security numbers (SSNs) of participants and beneficiaries, which we procured for this study.

We used SSNs to link our final analytic sample of 2136 NSCAW youth to their Medicaid Person Summary (PS) file that contains enrollment and other demographic information. Then, these enrollment files were linked to the child's Other Services (OT) and Inpatient Hospital (IP) files, which contain various clinical identifiers of maltreatment status (described subsequently). There are several reasons why not all youth surveyed in NSCAW

were linked to their claims files. First, only 3,279 youth or their caregivers provided SSNs, which was the key identifier for purposes of deterministic linkage. This study does not use probabilistic matches to increase the sample of linked and matched NSCAW youth because the principal priority is to eliminate confusion regarding the identity of the youth, even at the risk of not achieving matches for all possible children. Second, not all of the youth or caregivers of youth permitted linkage of their data to external records. Restricted to those that gave permission and provided SSN, the feasible maximum was $n = 2,803$. Of these, 2,371 (85% of the maximum) of NSCAW youth were successfully linked to Medicaid claims. Finally, the analytic sample size dropped from 2,371 to 2,136 because youth identified in Medicaid's personal summary files had to have generated at least one claim in the outpatient, inpatient, or prescription drug files. Mere observation of the youth without any service use excluded the child from the study because there is no opportunity for a clinician to provide a maltreatment diagnosis for a child who does not present to a health care provider. Children who were not enrolled in select Medicaid plan types—fee-for-service (FFS), primary care case management (PCCM), or “other” managed care plans with nonmental health care carve-out—for at least 10 months in a calendar year were also deleted, since we observe only enrollment, not claims or services, for children in Medicaid managed care. Linked and nonlinked children within NSCAW did not display statistically significant differences on demographic, placement, or health service utilization variables. These analyses were approved by the Washington University Human Research Protection Office and the Institutional Review Board of Research Triangle Institute (RTI International).

Ascertainment of Maltreatment

We treated investigating caseworker assessment of maltreatment contained in the NSCAW data as the gold standard for ascertainment of maltreatment. NSCAW's design involved every child being investigated by the local Child Protective Services agency at entry into the NSCAW study; trained investigating caseworkers used a modified Maltreatment Classification System (MMCS; J. T. Manly, Cicchetti, & Barnett, 1994) to determine presence or absence of abuse or neglect. The original Maltreatment Classification System is a multidimensional system designed to better operationalize child maltreatment nosology by specifying the subtypes, severity, and timing of maltreatment, its perpetrators, and its consequences upon children in terms of separations and placements (Manly, 2005). In order to further enhance its usability, the original system was further modified by adding specificity to some severity codes, adding categories for more specific subtypes, and changing some chronicity codes (Herrenkohl, 2005). This is perhaps the best current instrument to measure child maltreatment, displaying high concurrent validity with the measures used in the National Incidence Study-2 (Runyan et al., 2005). Many of the uniform data definitions proposed by the Centers for Disease Control and Prevention in an attempt to improve the surveillance of maltreatment are also based on the MMCS (Leeb, Paulozzi, Melanson, Simon, & Arias, 2008). NSCAW's study developers used this instrument to capture operational definitions of maltreatment. In this study, categories of physical abuse, sexual abuse, neglect, and abandonment were dichotomized such that a child could have more than one type of abuse coded.

We compared this caseworker assessment to eight different sets of Medicaid codes that could potentially be used to identify maltreatment using Medicaid claims. These included (1) presence of the ICD-9-CM diagnostic code for maltreatment (995.5); (2) presence of the diagnostic code for the effects of hunger or thirst (994.2 or 994.3); (3) presence of a V code suggestive of maltreatment (15.4, 61.21, or 71.81); (4) presence of an E code suggestive of maltreatment (960.1, 967, or 904.0); (5) presence of an E code for criminal neglect (968.4); (6) presence of an E code for assault (961-966, 968); (7) presence of an E code for no food or water (904.1, 904.2); and (8) presence of a V code for alleged rape or seduction (71.5). We also created a cumulative variable from the previously mentioned eight categories; this identified children receiving any diagnostic, V, or E code in their claims files. We pooled all 4 years of our claims data in order to determine if any of these codes appeared in any claim within this 4-year window of observation. As with NSCAW caseworker-derived maltreatment variable, clinicians and coders could use multiple ICD-9-CM codes for a given child.

Covariates

All covariates were obtained from the NSCAW I survey and were based on information provided by the child's primary caregiver. Child-level covariates included age in years (recoded into five age categories as shown in Table 3), gender (male/female), and race/ethnicity (White, African American, Hispanic, and other), all as contained in the NSCAW data set. In order to control for contact with health services, we used binary indicator variables to represent hospital, ambulatory, or emergency department visits. We also used indicators representing "fair" or "poor" health, with "excellent," "very good," or "good" as a referent; these questions have been validated in prior studies (Adams, Hendershot, & Marano, 1999). Each child's placement status was grouped into two mutually exclusive categories of in-home (i.e., living with their permanent primary caregiver, usually their birthparent), or out-of-home (in family foster care—either with a relative or nonrelative—or in congregate care, such as a group home or residential treatment center). Information on whether the child lived in an urban or rural area was used as a control for the availability of health care resources in the child's community. We also included dummy variables for insurance type (FFS, PCCM, or other types) from the Medicaid enrollment files. All covariates were measured at entry of the child into the NSCAW study.

Analyses

We first conducted descriptive analyses to gauge agreement in prevalence rates between caseworker assessment of maltreatment, and information on any maltreatment contained within Medicaid claims, as operationalized earlier. We then estimated a logistic regression model to identify children at greatest risk of nonascertainment of maltreatment using Medicaid claims. We developed a binary outcome variable indicating children with at least one caseworker report of maltreatment in NSCAW, but with none of the ICD-9-CM codes suggestive of maltreatment—that is, these are the nonascertained children. We regressed this outcome variable on the covariates described previously. We also included state dummies to control for unobserved state-level variables that might affect ascertainment for all children within a given state, and to adjust differences in managed care rates across states. In keeping with the use of unweighted data for all linked analyses using NSCAW (Florence et al., 2013;

Raghavan et al., 2012), no weights were used. All analyses were conducted in Stata version 13.1 (Hamilton & Stata Corporation, 2013).

Results

Table 1 compares caseworker ascertainment of maltreatment from NSCAW's investigative caseworkers with maltreatment indicators from ICD-9-CM codes. Of the every 7 children identified by caseworkers as being maltreated, only 1 child had any ICD-9-CM diagnostic, V, or E code in any of their Medicaid files across 4 years of observation. Rates of such underascertainment of maltreatment within Medicaid files varied depending upon the type of maltreatment suffered by children in the sample. A quarter of all children identified by their caseworkers as having been sexually abused had an ICD-9-CM code, while only a sixth of children with other types of maltreatment had a similar code.

Table 2 breaks down the "any ICD-9-CM code" column in Table 1 into its constituent diagnostic, V, and E codes, in an attempt to identify the specific codes that are most commonly encountered in Medicaid claims. As seen in this table, the single most common ICD code encountered in the sample was the diagnostic code for maltreatment (995.5), which was observed in over half of all children with any ICD maltreatment code in their claims. V codes were the next commonly observed codes and were collectively the most common codes observed in our sample. Few children received an E code. It is important to note that children received more than one type of code, and so percentages grouped across individual codes may not sum to a hundred. A tenth of children in our sample did not meet criteria for child maltreatment as assessed by their caseworkers. A majority of these children did not have any ICD code suggestive of maltreatment, and thereby displayed concordance between caseworkers and clinicians in maltreatment ascertainment (i.e., they were the "true negatives"). However, 1 in 7 of these children had at least one ICD code (most commonly a V code) indicative of maltreatment in their Medicaid claims (i.e., they were the "false positives").

Characteristics of children identified as having been maltreated by their caseworkers, but not so identified using Medicaid claims, are shown in Table 3. These are the children who are underascertained if ICD-9-CM codes alone were used to determine maltreatment. Among children identified by caseworkers as having been maltreated, boys and those of African American race had about 40% lower odds of displaying a maltreatment ICD-9-CM code. Compared to children of ages 14 years or older, younger children, and those placed out of home, had higher the odds of displaying a maltreatment code. Children with a history of a hospital visit had nearly twice the odds of showing a maltreatment code, while those with an emergency department visit had 40% higher odds of showing a similar code. Insurance status, urbanicity, and health status were not associated with whether or not a Medicaid maltreatment code was seen in the record of a child determined to have been maltreated by the child's welfare worker.

We also conducted a regression analysis to examine characteristics of children who were overascertained or were "false positives"—those that had an ICD-9-CM code for maltreatment in their Medicaid files, but were not determined to be maltreated by their

caseworkers (not shown in tables). Children resident in rural communities had 3.9 times the odds of being overascertained (95% CI: [1.4, 10.5]; $p = .008$), while those living in out-of-home arrangements had over twice the odds of being overascertained (OR: 2.4; 95% CI: [1.01, 5.8]; $p = .045$). Sociodemographic characteristics, insurance arrangements, and service use were not associated with overascertainment.

Discussion

In this study, we examine, using a unique deterministic (i.e., social security number-based) linkage between national survey data and claims data, the extent to which Medicaid claims can validly identify a population of children with histories of maltreatment. There are three sets of principal findings in this study. First, Medicaid claims identify maltreatment in only 15% of all children identified by the child's investigating child welfare worker as having been maltreated. Second, in addition to such false-negatives, the use of Medicaid claims can produce a few false-positives—approximately 16% of children who were not identified as having been maltreated by their caseworkers received an ICD-9-CM maltreatment code in their Medicaid files. Finally, boys, older children, and those of African American race/ethnicity are at greater risk of nonascertainment.

Studies such as this need to justify, first, that the investigating caseworker assessment of maltreatment is indeed valid and can reasonably be construed as accurately identifying maltreatment. Finding ways to capture with high validity that a child has been maltreated is an ongoing definitional challenge using administrative and encounter data (Runyan et al., 2005). Designers of the NSCAW I study recognized this problem, developing project-specific questions for caseworkers, trying to minimize the time between caseworker interview and the caseworker's investigation of the child, providing caseworkers with contact information of study personnel in case of questions, building in quality control and data checks, all preceded by thorough training of all field personnel associated with the study (Biemer, Dowd, & Webb, 2010; Dowd et al., 2006). They also used a nosological system that is well established in the child welfare literature, as discussed earlier. Many of the uniform data definitions proposed by the Centers for Disease Control and Prevention in an attempt to improve the surveillance of maltreatment are also based on the NSCAW approach (Leeb et al., 2008), suggesting the methodological soundness of the rating instrument. While such an approach reduces systematic (i.e., nonrandom) variation, it does not fully overcome the challenge that the United States today has no national child welfare system, and no national data definitions of what sets of phenomena constitute child abuse and neglect (Barnett, Manly, & Cicchetti, 1993). Despite all the NSCAW-related training, to the extent to which NSCAW's investigating caseworkers, spread across 36 states in our study, were influenced by what maltreatment means within their state, there is the possibility that children in the sample identified as being maltreated may in fact vary in their histories and presentations.

The thrust of this study, however, is not so much on interstate variations in ascertainment of maltreatment but to identify whether Medicaid claims within a state—presumably working under the same data definition—can pick up such maltreatment. And here it seems clear that relying upon Medicaid claims to identify a cohort of maltreated children yields unacceptably

low rates of ascertained maltreatment. The closest study that approximates our design is a linkage analysis of injury surveillance data containing E codes and medical records that found a 25% rate of underascertainment of injuries among children (Winn et al., 1995). Our finding of 85% under-ascertainment reveals that the problem is significantly worse for maltreatment, and that investigators conducting studies using only ICD-9-CM codes to identify maltreatment (Burcu et al., 2014) should do so with extreme caution, if at all.

The reasons for why child maltreatment do not get reported in claims has been addressed in prior literature, and have been summarized in the introduction section of this article (Flaherty & Sege, 2005; Scott et al., 2009). But it may also be that the current coding schema used by Medicaid—which is designed to principally capture health conditions—is inadequate for the capture of conditions such as maltreatment. Assuming that the set of codes used in this study represents the best set of available codes for clinicians to report maltreatment, clinicians and coders may have few options to indicate maltreatment. On one hand, this may warrant greater education among child serving professionals in the importance and implications associated with coding maltreatment using existing billing codes. This could be achieved, for example, through assuring greater availability of subspecialty fellowship-trained clinicians, such as child abuse pediatricians, who can serve as a referral source for clinicians encountering children with possible maltreatment. These subspecialty-trained clinicians may be more comfortable with the use of V and E codes in addition to diagnostic codes whenever the use of such coding appears appropriate. Alternatively, providing financial incentives for completion of V and E codes may result in their higher utilization, albeit at the risk of overdiagnosing maltreatment.

On the other hand, this may warrant rethinking our current health nosology to better capture the clinical uncertainty and timing of abuse ascertainment relative to when a child is seen within the health system. One such way to rethink ICD-9-CM nosology was proposed by Scott and colleagues, who suggested that the “... inclusion of a ‘possible abuse’ ICD code to indicate that there was a suspicion or investigation of child abuse in the medical record may circumvent issues where a determination of abuse does not occur until after the child is discharged” (Scott et al., 2009). Such a “possible abuse” category may also allay the concerns of health professionals who may perceive definitively coding child maltreatment as outside their scope of practice. Such “quasi-maltreatment” codes will enhance uncertainty on part of Medicaid scholars when it comes to ascertainment of maltreatment in the child, but these concerns can be dealt with using a sensitivity analyses, where results are presented both with and without the use of such “possible abuse” codes. In the interim, though, it is important to recognize that Medicaid codes are for the capture of health conditions, and clinicians and coders seem to be focused primarily on health status. Using the ICD-9-CM codes within Medicaid to capture maltreatment is fraught with risk.

Our study, however, suggests that the converse exists as well—there are a small group of “false positive” children whose caseworkers are not identifying maltreatment while claims data do so. The reason why this happens is unclear, but may be due to the child displaying subthreshold levels of harm or risk (Fallon, Trocme, & MacLaurin, 2011) that may require a more nuanced understanding of maltreatment that caseworkers may possess, and/or differences in caseworker decision making, given unsubstantiated maltreatment (Drake &

Jonson-Reid, 2000). Clinicians in these instances, presumably not following the operational definitions of maltreatment enshrined in the MMCS and deployed by NSCAW caseworkers, are probably coding children with any histories suggestive of abuse or neglect. From a practice perspective, this may not be entirely a bad thing, especially given the seriousness of child abuse and neglect as a public health challenge, and the small numbers of false-positive children. If clinicians have a high index of suspicion for maltreatment during their clinical encounters, and make referrals to child protective services for services or consultation, maltreatment can then be ruled out by more experienced child welfare investigators without undue prejudice to the child or his/her family. In this study, caseworker definitions are privileged over clinician reports of maltreatment, and we treat all such “overascertainment” as an error committed by the clinician or coder. But it should be recognized that this approach may not always be the most valid approach to take. Future scholarship should explore these “overascertained” children to identify the validity of their maltreatment status, and the specific factors that place the children at higher risk of ascertainment within Medicaid claims.

Our study has limitations other than the definitional issues described previously. First, managed care penetration limits information obtained from Medicaid claims. While we do use a control variable for managed care enrollment in our multivariable analyses, our bivariate results are best conceptualized as being limited to FFS claims. Second, our pooling of data across 4 years of observation means that rates of nonascertainment in a calendar year’s worth of claims are likely to be even greater. Our reported rates of nonascertainment therefore are lower than should be expected, and the nonascertainment problem in reality may be worse than what we have described. Finally, we adopt a population perspective in this article, based on the fact that scholars are attempting to identify maltreated children from Medicaid claims. Hence, our findings should not be used to critique clinical studies—such as those assessing the validity of ICD codes among children hospitalized due to abuse (Hooft et al., 2013). Despite these limitations, this study has important implications for Medicaid scholarship conducted on abused and neglected children. Relying exclusively on Medicaid claims to establish a cohort of maltreated children is highly problematic. Instead, triangulation of data from child welfare or other administrative data sets is necessary in order to capture a cohort of maltreated children at a population level.

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Table 1

Agreement Between Caseworker Assessment of Maltreatment and Clinician-Reported ICD-9-CM Maltreatment Codes (SSN-Matched Sample).

Caseworker assessment from NSCAW	Number of linked children	Any ICD-9 diagnostic, V or E code	Child did not receive ICD-9 coding for maltreatment
Any history of maltreatment	1,921 (100%)	292 (15.2%)	1,629 (84.8%)
Physical abuse	586 (100%)	94 (16.0%)	492 (84.0%)
Sexual abuse	297 (100%)	73 (24.6%)	224 (75.4%)
Neglect	1,322 (100%)	186 (14.1%)	1,136 (85.9%)
Abandonment	141 (100%)	21 (14.9%)	120 (85.1%)
Child did not receive caseworker assessment of maltreatment in NSCAW	215 (100%)	34 (15.8%)	181 (84.2%)

Note. NSCAW = National Survey of Child and Adolescent Well-being. Total $N = 2,136$. Percentages in parentheses reflect the number of cell observations divided by the number of children in the NSCAW-MAX SSN linkage (row total).

Table 2
Specific ICD-9-CM Codes Observed Among NSCAW Children (SSN-Matched Sample).

Caseworker assessment from NSCAW	Number of linked children	Any ICD-9 diagnostic, V, or E code	Children receiving diagnostic code for effects of hunger or thirst (994.2 or 994.3)	Children receiving one of the following V codes: 15.4, 61.21, or 71.81 ^a	Children receiving one of the following E codes: 960.1, 967 or 904.0 ^b	Children receiving the E code for criminal neglect (968.4)	Children receiving an E code for assault (E961-E966, E968)	Children receiving the E code for no food/no water (E904.1, E904.2)	Children receiving the V code for alleged rape/ seduction (V71.5)
Any history of maltreatment	1,921 (100%)	292 (15.2%)	0 (0.0%)	130 (6.8%)	4 (0.2%)	0 (0.0%)	6 (0.3%)	0 (0.0%)	38 (2.0%)
Physical abuse	586 (100%)	94 (16.0%)	0 (0.0%)	32 (5.5%)	2 (0.3%)	0 (0.0%)	2 (0.3%)	0 (0.0%)	13 (2.2%)
Sexual abuse	297 (100%)	73 (24.6%)	0 (0.0%)	31 (10.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	18 (6.1%)
Neglect	1,322 (100%)	186 (14.1%)	0 (0.0%)	88 (6.7%)	3 (0.2%)	0 (0.0%)	3 (0.2%)	0 (0.0%)	23 (1.7%)
Abandonment	141 (100%)	21 (14.9%)	0 (0.0%)	8 (5.7%)	0 (0.0%)	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)
Child did not receive caseworker assessment of maltreatment in NSCAW	215 (100%)	34 (15.8%)	0 (0.0%)	22 (10.2%)	0 (0.0%)	0 (0.0%)	1 (0.5%)	0 (0.0%)	3 (1.4%)

Note. NSCAW = National Survey of Child and Adolescent Well-being. Total $N = 2,136$. Percentages in parentheses reflect the number of cell observations divided by the number of children in the NSCAW-MAX SSN linkage (row total).

^a V15.4 = personal history of psychological trauma presenting hazards to health. V61.21 = counseling for victim of child abuse. V71.81 = observation and evaluation for suspected abuse and neglect.

^b E960.1 = rape. E967.9 = perpetrator of child and adult abuse, by unspecified person. E904.0 = accident due to abandonment or neglect of infants and helpless persons.

Table 3

Characteristics of Children With Caseworker-Reported Maltreatment.

	Odd ratios (standard errors) for any ICD-9-CM code for maltreatment
Male	0.7 (0.1) **
Age	
0–2	(Omitted)
3–5	2.1 (0.5) **
6–11	2.1 (0.4) *
12–13	1.7 (0.5)
14 or older	1.6 (0.5)
Race/ethnicity	
White	(Omitted)
African American, non-Hispanic	0.6 (0.1) *
Hispanic	0.6 (0.2)
Other/unknown	1.5 (0.4)
Missing race	8.5 (11.2)
Insurance type	
PCCM	(Omitted)
FFS only	1.0 (0.3)
Mix of FFS and PCCM	0.8 (0.3)
Other and multiple insurance types	0.8 (0.4)
Ineligible for Medicaid	0.5 (0.2)
Out-of-home care vs. in-home care	2.0 (0.3) ***
Fair or poor health vs. excellent or good health	1.1 (0.3)
Missing health indicator	0.2 (0.3)
Rural vs. urban	0.8 (0.2)
Any hospital visit	1.9 (0.4) **
Any ambulatory visit	1.4 (0.2)
Any emergency department visit	1.4 (0.3) *

Note. PCCM = primary care case management; FFS = fee for service. Total $N = 1,921$. Model included state dummies (not shown) to control for state Medicaid differences. All insurance categories in the model include full behavioral health coverage.

* Significant at $<.05$,

** Significant at $<.01$,

*** Significant at $<.001$.