

# Child Maltreatment Outpatient Visits to Kentucky Non-Federal Acute Care Hospitals, 2008-2010

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## INTRODUCTION

Child maltreatment is an issue of vital importance both nationally and in the Commonwealth of Kentucky (American Medical Association, 1992; Commonwealth of Kentucky, 2011). Victims of child maltreatment frequently experience injuries that require medical treatment. For example, Gothard, Runyan, and Hadler (1985) suggest that as many as 10% of the children under age 6 treated in emergency departments have experienced some type of non-accidental injury. A review of individuals treated in Kentucky's health care facilities can help to assess the burden of child maltreatment injuries within the state and can provide a basis for undertaking and assessing injury prevention efforts.

## BACKGROUND

Child Maltreatment has been characterized by the World Health Organization (WHO) as "all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child's health, survival, development, or dignity in the context of a relationship of responsibility, trust, or power" (2002). Child maltreatment serves as a significant cause of intentional injury for children of all ages, and has been estimated to account for approximately 10% of all emergency department visits for those under age 18 throughout the United States (Chang, Knight, Ziegfield, Haider, Warfield, and Paidas, 2004). Within the state of Kentucky, child maltreatment is the second leading mechanism of death for children under age one (Commonwealth of Kentucky, 2011), and both national and international evidence suggest that child maltreatment creates "long lasting changes to brain architecture, psychological functioning, mental health, health risk behaviors, social functioning, life expectancy, and health care costs" (Mikton and Butchart, 2009 p. 353). Although there is widespread recognition of the importance of this issue, it is nearly impossible to effectively count the number of children who experience maltreatment for a given area or time frame. Incidence and prevalence statistics are estimates that rely upon data from a variety of often disparate sources. These can include child protection databases, morbidity and mortality statistics, and case reports from law enforcement and the judicial system. Hospital treatment data for inpatient and emergency department admissions also provides vital information on the burden of child maltreatment (Scott, Tonmyr, Fraser, Walker, and McKenzie, 2009). Despite this diverse array of data sources, none alone provides a comprehensive assessment of the issue. The quantification of the scope of child maltreatment is vital to prevention and other efforts on behalf of abuse victims.

## METHODS

In order to better understand the nature and extent of the issue of child maltreatment within the Commonwealth of Kentucky, an analysis of electronic statewide outpatient (OP) data, including emergency department visit data, was conducted for the period 2008-2010. Prior to receipt of the data sets, all personal identifiers were removed by the maintaining agency to ensure patient confidentiality.

OP data includes demographic information; payer status, service type(s), as well as the discharge diagnosis coded using the International Classification of Diseases, Clinical Modification, 9<sup>th</sup> Revision (ICD-9-CM) for visits to 199 healthcare facilities located within the Commonwealth of Kentucky. The ICD system describes an injury using diagnosis codes and E-codes. An injury diagnosis code is a single code that describes the nature of the injury (e.g., fracture, open wound, etc.) and the body region (head, arm, skull, etc.). Patients could be assigned up to 25 diagnosis code fields per case upon discharge as well as up to three codes each which identify the nature and mechanism of injury (E codes and V codes). The first diagnosis code is called the principal diagnosis code. The principal diagnosis for an OP visitor is defined as the condition established after study to be chiefly responsible for occasioning the visitor to seek out emergency care. Other conditions that coexist at the time of treatment, or that affect the received treatment, are also coded in the remaining 24 diagnosis code fields in the OP dataset and are called secondary diagnoses. Injury-related diagnoses should be supplemented (when circumstances of the injury are known) with additional codes called E-codes. The E-codes are separated into three groups: external-cause-of-injury E-codes, place-of-injury E-codes, and activity E-codes. The external-cause-of-injury E-code is a single code that describes the nature/mechanism of injury (e.g., fall, motor-vehicle collision, firearm, etc.) and the intent of injury (e.g., unintentional, assault, self-inflicted, or undetermined). Up to three E codes can be entered for each visit.

The resulting OP dataset, which was analyzed for the period of 2008-2010, generated 7,033 visits which met the following two inclusion criteria: 1) reported residence within the Commonwealth of Kentucky at the time of treatment; 2) care received for patients 18 years of age or less within an Emergency Department or as an admission for observation/care or outpatient treatment for surgery or other treatment. After initial selection, these visits were placed into one of three mutually exclusive categories. The first category included any visits in which a patient received at least one discharge diagnosis code for Child

Maltreatment Syndrome (995.5) or its associated ICD 9 diagnoses (995.50-995.59); 652 visits met this criterion. The second categorization included 473 visits in which at least one E-code that specified a perpetrator of the injury/illness had been provided (E967 generally or E967.0-E967.9).

The remaining OP visits were selected based upon a methodology proposed by P.G. Schnitzer, P.L. Slusher, R.L. Kruse, and M.M. Tarleton in the 2011 publication "Identification of ICD Codes Suggestive of Child Maltreatment" in *Child Abuse and Neglect*. Schnitzer et. al., (2011) used data from the state of Missouri, to identify a "comprehensive list of ICD codes that represent illnesses and injuries suspicious for child maltreatment (physical abuse, sexual abuse, neglect)" as well as specific inclusion and exclusion criteria such as age limits and co-occurring diagnosis codes (2011, p. 5). By replicating the same inclusion and exclusion criteria within the 2008-2010 OP data, the third category of 5,908 visits were generated as being "suggestive of child maltreatment" (Schnitzer et al, 2011). The large number of visits identified in the present study suggests that the prevalence of child maltreatment injuries/illnesses may be significantly more widespread within the Commonwealth of Kentucky than a simple analysis using only child maltreatment codes would demonstrate. If these findings are indicative of the actual number of child maltreatment related visits within the healthcare setting, this surveillance provides a more accurate representation of the actual burden of child maltreatment injuries within the Commonwealth of Kentucky. As such it may serve as a starting point for future prevention efforts.

Table 1. Child Maltreatment Visits to Outpatient Facilities by Inclusion Criteria Codes, 2008-2010\*.

<i>Type of Child Maltreatment Suggested</i>	<i>Selected ICD 9 Codes</i>	<i>Age Restrictions</i>
Codes Suggestive of Sexual Maltreatment	054.1- Genital Herpes	<10 yrs.
	098- Gonococcal Infection	<10 yrs.
	614.9- Pelvic Inflammatory Disease- Unspecified	<10 yrs.
	922.4- Contusion of Genitalia	<10 yrs.
	V71.5- Observation After Alleged Rape	<10 yrs.
	V71.81- Observation After Abuse/Neglect	<10yrs.
Codes Suggestive of Physical Maltreatment	362.81- Retinal Hemorrhage	<3 yrs.
	807.0 and 807.1- Rib Fracture	<5 yrs.
	811- Scapula Fracture	<5 yrs.
	852.2- Traumatic Subdural Hemorrhage	<5yrs.
	853.0- Other/Unspecified Intracranial Hemorrhage	<5 yrs.
	863.1- Stomach Injury	<10 yrs.
	E965, E966, and E 968.2- Assault	<4 yrs.
	E968.9- Assault, Not Otherwise Specified	<4 yrs.
Codes Suggestive of Physical Maltreatment or Neglect	E 988- Undetermined Intent, Other Means	<10 yrs.
	800- Skull Vent Fracture	<5 yrs.
	805- Vertebral Fracture	<5 yrs.
	852.0- Traumatic Subarachnoid Hemorrhage	<5 yrs.
	862- Intrathoracic Injury NEC	<5 yrs.
	863.2 and 863.3- Small Intestine Injury	<5 yrs.
	865- Spleen Injury	<5 yrs.
Codes Suggestive of Neglect	952- Spinal Cord Injury	<3 yrs.
	262- Severe Malnutrition	<10 yrs.
	692.7- Solar Radiation Dermatitis	<2 yrs.
	808- Pelvic Fracture	<5 yrs.
	860- Traumatic Pneumothorax	<5 yrs.
	861- Heart or Lung Injury	<5 yrs.
	863.8- GI Injury NEC	<5 yrs.
	864- Liver Injury	<5 yrs.
	866- Kidney Injury	<5 yrs.
	941- Burn of Head	<5 yrs.
	942- Burn of Trunk	<5 yrs.
	945- Burn of Leg	<5 yrs.
	946- Burn of Multiple Sites	<5 yrs.
960-979- Poisoning by Drugs/Medicinals	<5 yrs.	
994.1- Drowning Non-Fatal Submersion	<4 yrs.	

\*Schnitzer, P. G., Slusher, P. L., Kruse, R.L., & Tarleton, M.M. (2011). Identification of ICD codes suggestive of child maltreatment, *Child Abuse and Neglect*, 35, 3-17.

**Table 2. Type of Treatment Received for Kentucky Child Maltreatment-related Outpatient Visits, 2008-2010.**

<i>Type of Treatment Received</i>	<i>Number and Percentage of Visits</i>
Emergency Department Care	5,715 (81%)
Observation/Care	545 (8%)
Outpatient Surgery	673 (10%)
Outpatient Observation	95 (1%)

\* 5 visits did not receive a code for the type of treatment received.

**Table 3. Kentucky Child Maltreatment-Related Outpatient Visits by Race, 2008-2010\*\*.**

<i>Patient Race</i>	<i>Visits by ICD-9 Diagnosis Code of Child Maltreatment Syndrome or Associated Diagnoses</i>	<i>Visits That Received at Least One Perpetrator E-Code</i>	<i>Visits that Meet Criteria as Suggestive of Child Maltreatment</i>
White	521 (80%)	378 (80%)	4,821 (82%)
African-American	104 (16%)	63 (13%)	603 (10%)
Other	25 (4%)	32 (7%)	455 (8%)
Asian	<5 (<1%)	0	25 (<1%)
American Indian/Alaska Native	0	0	7 (<1%)
TOTAL	652	473	5,908*

\*4 patients were categorized as more than one race

\*\* Percentages may not equal 100% because of rounding

**Table 4. Kentucky Child Maltreatment-Related Outpatient Visits by Ethnicity, 2008-2010.**

<i>Patient Ethnicity</i>	<i>Visits by ICD-9 Diagnosis Code of Child Maltreatment Syndrome or Associated Diagnoses</i>	<i>Visits That Received at Least One Perpetrator E-Code</i>	<i>Visits that Meet Criteria as Suggestive of Child Maltreatment</i>
Hispanic	12 (2%)	5 (1%)	124 (2%)
Non-Hispanic	640 (98%)	468 (99%)	5,783 (98%)
TOTAL	652	473	5,908*

\*Total includes 1 visit for which ethnicity data was not provided

\*\* Percentages may not equal 100% because of rounding

**Table 5. Kentucky Child Maltreatment-Related Outpatient Visits by Discharge Year, 2008-2010.**

<i>Discharge Year</i>	<i>Visits by ICD-9 Diagnosis Code of Child Maltreatment Syndrome or Associated Diagnoses</i>	<i>Visits That Received at Least One Perpetrator E-Code</i>	<i>Visits that Meet Criteria as Suggestive of Child Maltreatment</i>	<i>ANNUAL TOTAL</i>
2008	191 (9%)	134 (6%)	1,847 (85%)	2,172
2009	206 (9%)	174 (7%)	1,972 (84%)	2,352
2010	255 (10%)	165 (7%)	2,089 (83%)	2,509

**Table 6. Child Maltreatment-Related Outpatient Visits by ICD 9 Code Assignment, 2008-2010.**

<i>ICD 9 Code</i>	<i>Number and Percentage of Visits</i>
995.50- Child Abuse Unspecified	30 (5%)
995.51- Child Emotional/Psychological Abuse	5 (<1%)
995.52- Child Neglect, Nutritional	47 (7%)
995.53- Child Sexual Abuse	328 (50%)
995.54- Child Physical Abuse	198 (30%)
995.55- Shaken Baby Syndrome	30 (5%)
995.59- Other Child Abuse and Neglect	50 (8%)

\*36 visits received more than one maltreatment diagnosis code.

**Table 7. Suspected Child Maltreatment Kentucky Outpatient Visits by Number and Type, 2008-2010.**

<i>Suspected Child Maltreatment Diagnoses Number and Type</i>	<i>Frequency and Percentage</i>
One Diagnosis Indicative of Child Sexual Maltreatment	993 (17%)
Two Diagnoses Indicative of Child Sexual Maltreatment	6 (<1%)
One Diagnosis Indicative of Child Physical Maltreatment	154 (3%)
Two Diagnoses Indicative of Child Physical Maltreatment	<5 (<1%)
One Diagnosis Indicative of Child Physical Maltreatment/Neglect	363 (6%)
Two Diagnoses Indicative of Child Physical Maltreatment/Neglect	<5 (<1%)
One Diagnosis Indicative of Child Neglect	4,234 (72%)
Two Diagnoses Indicative of Child Neglect	198 (3%)
Three Diagnoses Indicative of Child Neglect	14 (<1%)
TOTAL VISITS	5,908

\* Percentages may not equal 100% because of rounding

\*\* 56 Visits were coded within more than one category of suspected child maltreatment.



**Table 8. Kentucky Child Maltreatment-Related Outpatient Visits by Discharge Status, 2008-2010**

<i>Discharge Status</i>	<i>Visits by ICD-9 Diagnosis Code of Child Maltreatment Syndrome or Associated Diagnoses</i>	<i>Visits That Received at Least One Perpetrator E-Code</i>	<i>Visits that Meet Criteria as Suggestive of Child Maltreatment</i>
Routine Discharge	623 (96%)	451 (95%)	5,294 (90%)
Left Against Medical Advice	0	<5 (<1%)	30 (<1%)
Discharged to Another Healthcare Facility of Any Type	10 (2%)	10 (2%)	113 (2%)
Deceased	0	0	10 (<1%)
Admitted for Inpatient Care	19 (3%)	10 (2%)	452 (8%)
Hospice or Other Long-Term Care	0	0	5 (<1%)
TOTAL	652	473	5,908

\*percentages may not equal 100% because of rounding

**Table 9. Kentucky Child Maltreatment-Related Outpatient Visits by Perpetrator Status, 2008-2010**

<i>Perpetrator</i>	<i>Visits by ICD-9 Diagnosis Code of Child Maltreatment Syndrome or Associated Diagnoses</i>	<i>Visits with at Least One Perpetrator E-Code</i>
Father, Stepfather, or Boyfriend- E967.0	97 (15%)	181 (38%)
Mother, Stepmother, or Girlfriend- E967.2	37 (6%)	67 (14%)
Spouse or Partner- E967.3	0	8 (2%)
Child- E967.4	12 (2%)	10 (2%)
Sibling- E967.5	11 (2%)	15 (3%)
Grandparent- E967.6	15 (2%)	12 (3%)
Other Relative- E967.7	27 (4%)	20 (4%)
Non-Related Caregiver- E967.8	5 (<1%)	12 (3%)
Unspecified-E967.9	30 (5%)	59 (12%)
Perpetrator of Child/Adult Abuse- E967	<5 (<1%)	0
None Listed	333 (51%)	0
Multiple Codes	21 (3%)	27 (6%)
TOTAL	652	473

\* Percentages may not equal 100% because of rounding

\*\* Hospital staff may enter up to three perpetrator codes per visit

Table 10. Kentucky Child Maltreatment-Related Outpatient Visits by Perpetrator Status and Discharge Year, 2008-2010.

<i>Perpetrator</i>	<i>Year</i>		
	<i>2008</i>	<i>2009</i>	<i>2010</i>
Father, Stepfather, or Boyfriend- E967.0	93 (4%)	100 (4%)	85 (3%)
Mother, Stepmother, or Girlfriend- E967.2	23 (1%)	36 (2%)	45 (2%)
Spouse or Partner- E967.3	<5 (<1%)	<5 (<1%)	<5 (<1%)
Child- E967.4	<5 (<1%)	6 (<1%)	13 (<1%)
Sibling- E967.5	9 (<1%)	8 (<1%)	9 (<1%)
Grandparent- E967.6	10 (<1%)	10 (<1%)	7 (<1%)
Other Relative- E967.7	18 (<1%)	20 (<1%)	9 (<1%)
Non-Related Caregiver- E967.8	<5 (<1%)	10 (<1%)	<5 (<1%)
Unspecified-E967.9	29 (1%)	30 (1%)	30 (1%)
Perpetrator of Child/Adult Abuse- E967	0	<5 (<1%)	<5 (<1%)
None Listed	1,947 (90%)	2,065 (88%)	2,229 (89%)
Multiple Codes	10 (<1%)	15 (<1%)	23 (<1%)
TOTAL	2,172	2,352	2,509

\* Percentages may not equal 100% because of rounding

\*\* Hospital staff may enter up to three perpetrator codes per visit

## Summary and Conclusions

Understanding the extent and nature of child maltreatment through surveillance is a vital first step towards prevention efforts, although characterizing the magnitude of the issue is at best a challenging endeavor. Outpatient data provides a useful mechanism for quantifying at least a portion of those cases severe enough to require medical treatment. Through the retrospective data analysis documented here, it is evident that child abuse and neglect may be much more widespread than a simple analysis of OP presentations coded for Child Maltreatment Syndrome and the associated diagnoses (995.50-995.59) would suggest. By utilizing the methods proposed by Schnitzer et al. (2011) on Kentucky's Emergency Department data, an additional 6,381 cases were identified, making those 652 visits specifically coded as maltreatment only 10% of the total number of visits which were suggestive of child maltreatment during this 36 month period. Examining OP data serves as a valuable starting point for prevention efforts since the need for emergency medical care suggests a level of severity, thus, these children may be the most in need of intervention. If used as a single measure, OP data alone is likely to underestimate the actual burden of child maltreatment victims within the Commonwealth of Kentucky. Additional data sources are needed for comprehensive surveillance, including child protective services records, law enforcement records, and others.

This analysis provides an overall picture of children treated as outpatients for child maltreatment related conditions. This type of information may arm policymakers with enough data to formulate organizational and legislative policies and may spur providers to implement procedural changes within healthcare settings to better identify potential maltreatment cases and increase intervention opportunities. For example, only 473 of over 5,900 visits, or approximately 8%, of those that had diagnosis codes which were suggestive of child maltreatment had a documented perpetrator code within the medical record. Although it may be possible that individuals simply refused to provide this information, it may be equally likely that, at least in a portion of cases, providers simply neglected to ask or record this information in the medical record. The present study results suggest that maltreatment and/or neglect may have been a factor in 10 fatalities that were not coded as Child Maltreatment. For example, several children under age 4 drowned while in the bathtub. This is typically viewed as neglect by child protection workers and is commonly coded as such by medical personnel. In the remaining cases, diagnosis codes identified severe physical injuries including multiple contusions, bony fractures, and significant head trauma, but no perpetrator was listed. This is an area for medical professional training opportunities to collect this data for diagnoses which are likely to be related to Child Maltreatment. In situations where those individuals

accompanying the patients choose not to answer, this can be noted as well. In Kentucky, medical professionals are mandatory reporters, and prevention efforts and protective services can be introduced within those settings where maltreatment occurs or is suggested. These data results provide baseline measurements for: 1) child maltreatment prevention efforts to assess intervention effectiveness; 2) further comprehensive data analyses; and 3) data to linkages with other data sources including child protection services records, and child fatality review panel records, among others. Similarly, medical record abstraction of those visits which were suggestive of maltreatment may help us to refine the Schnitzer, et. al., (2011) model for use within the particular milieu of Kentucky's healthcare settings, and will provide a mechanism to assess the effectiveness of the model for identifying cases of child maltreatment.

With these study results as a baseline for the identification and surveillance of child maltreatment, we can further understand the nature and extent of this issue and help protect those children most in need.

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