ANALYSIS OF ARCHIVED DATA ON CHILD ABUSE HOMICIDES COLLECTED BY THE OFFICE OF THE CHIEF MEDICAL EXAMINER FOR THE STATE OF OKLAHOMA

By

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Bachelor of Science in Forensic Science

Texas A&M University

College Station, Texas

2014

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
December, 2016

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ACKNOWLEDGEMENTS

I would like to thank my committee comprised of Dr. Robert Allen, Dr. Ron Thrasher, and Ms. Jane Pritchard for their unending support during the process of writing my thesis. Each one contributed in their own way to sculpt me into the scientist I am today. I would also like to thank the Tulsa Office of the Chief Medical Examiner staff. Without the hardworking individuals of this office, I would not have had the knowledge (or data for that matter) for which was needed to preform research on the topic of child abuse homicides.

I also want to thank my family for supporting me throughout my college career, I know sometimes I was stressed and sounded ungrateful, but they stuck with me and encouraged me to continue with this process. Without my family I would not have been able to be where I am now. I am truly lucky to have such a loving and supportive family.

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Date of Degree: DECEMBER 2016

Title of Study: ANALYSIS OF ARCHIVED DATA ON CHILD ABUSE HOMICIDES COLLECTED BY THE OFFICE OF THE CHIEF MEDICAL EXAMINER FOR THE STATE OF OKLAHOMA

Major Field: FORENSIC SCIENCES

Abstract: The goal of this study is to provide useful information for predicting, preventing, and investigating child abuse homicides by collecting and analyzing information about victims, perpetrators, and injuries. Studies have been conducted all over the world on the topic of child abuse homicides. While the population of these locations vary, one thing remains the same, young children, those under the age of 5, are to the highest risk for child abuse homicides.

This study examined information regarding child abuse homicides over the past 15 years for the state of Oklahoma in hopes of determining at-risk populations and to lay the ground work for future studies in child abuse homicide prevention. This study used the Office of the Oklahoma Chief Medical Examiner database to gather information about victims and perpetrators of child abuse homicides. Data including age, gender, race, types of injuries, and relationship towards the victim were collected. To determine the significance of this data, contingency tables were used to compare the findings of this study with the overall population demographics of the state of Oklahoma and the U.S.

The results of this study presented evidence that corroborated past research on the topic of child abuse homicides, such as, the most common injury sustained by victims was blunt force trauma, children under the age of 5 are most susceptible to child abuse homicides, and that black individuals are nearly twice as likely to be abused as any other race of individuals. This study also found that those who share a biological relationship with the victim are the most likely perpetrators of these homicides regardless of the perpetrators' gender.

The nature of this study is to provide information regarding child abuse homicides that can later be used to assist in education and the prevention of child abuse homicides.

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CHAPTER I

INTRODUCTION

Think of a car accident. Imagine the injuries of a crash, the broken bones, the brain contusions, the scrapes and bruises. Now imagine that another human being has inflicted those kinds of injuries onto another person, a person who is defenseless and relies on that person for all needs. That is the fate of a child who is abused. When the abuse becomes so violent, the result may be homicide. The goal of this study is to provide useful information for predicting, preventing, and investigating child abuse homicides[1] by collecting and analyzing information about victims, perpetrators, and injuries.

Studies on child abuse have been performed for years in countries such as India,[2] Egypt,[3,4] and Japan.[5] Each of these studies used multiple populations to calculate statistics and to make comparisons regarding the demographics of both living and deceased victims. Literature from DiMaio,[6,7] Toro et al,[8] and Molina et al.[9] focus on the two common types of injuries found on victims of child abuse and child abuse homicides, blunt force trauma and asphyxiation.

Few studies focus specifically on Oklahoma or the population that exists within this state. Via the Office of the Chief Medical Examiner's case database, the particulars of child abuse homicides can be reviewed and analyzed for trends and compare them with the U.S. population. Oklahoma is also somewhat unique in its population make up due to the large population of Native Americans living within its borders. Therefore, ethnic background was considered in this analysis.

For a global problem, like child abuse and child abuse homicides, there is no quick solution.[10,11] There are ways to reduce the harmful effects, but no way to stop the action completely. One way to limit child abuse and the associated homicides is through prevention programs that may be enhanced by knowing who both the victims and the perpetrators of child abuse are through demographic information available in a database harboring facts associated with each incident [12].

The purpose of this study is to draw from records of the Office of the Chief Medical Examiner of the State of Oklahoma and determine trends and make comparisons between Oklahoma and the U.S. population regarding the victims and perpetrators of child abuse homicides. This study examines the demographic composition of Oklahoma while analyzing historical child homicide data from the past fifteen years. Analysis of this kind will benefit the agencies that use this information to formulate education programs and set legal precedents.

CHAPTER II

REVIEW OF LITERATURE

Child Abuse

In child abuse research there are two main questions: First, who commits the abuse? Second, who is the recipient of the abuse?

Perpetrator demographics are collected for the purpose of identifying individuals and particular situations that precipitate child-directed violence. In identifying the perpetrator, a question always asked is "How were the perpetrator and the victim related?" Was it the mother 's boyfriend, the father's girlfriend, the mother, the father, or a stranger? These possible perpetrators can be broken up into two groups, biological abusers and non-biological abusers. Biological abusers are those who share kinship with the child. These abusers include mothers, fathers, grandparents, aunts and uncles. Biological abusers generally have more exposure to the child and are known by the child. Literature has shown that most perpetrators of child abuse fall into this category. Non-biological abusers are perpetrators who do not fit the definition of biological abusers.

Based on the classification of the abuser (biological or not), the homicide can be classified differently. If the homicide is committed by a parent or primary guardian of the child victim, the homicide can be classified as a filicide. Filicide is defined as killing of offspring by parents.[5,13] A filicide may also be subclassified as a neonaticide, meaning that the parents killed their child within a few days of the child being born.

In child abuse homicides, the likely suspects are the mother and the father.[14] Distant relatives (uncles, aunts, and cousins) are typically not likely suspects. Research by Debowska et al. has shown that mothers tend to kill a child when the child is younger and fathers are more likely to kill a child when the child is older.[1] This trend seems to be changing. Due to the dynamics of family life, some mothers are continuing to work while the father remains home with the child. Coinciding with this change in family dynamics is a decrease in the age at which fathers kill their children.[14] When fathers are implicated in the killing of a child, the reason often given is revenge.[15] The father is usually not angry at the child but at the mother. Fathers commit the homicide motivated by negative emotions like jealousy, anger, and impulsivity.

Women are the main perpetrators when it comes to killing younger children; this is also true for neonaticide.[13] When a mother is guilty of neonaticide, single mothers are found to be more likely to commit this type of homicide than married mothers.[12] The mental status of the mother is often examined during neonaticide investigations. The extent to which the mental status plays in the role of mothers who kill is still unknown. Future research will need to be completed to further understand what motivates a person to commit filicide.

The "boyfriend" of the child's mother is the likely suspect and perpetrator in non-biological killings.[16] Stepfathers are also at an increased risk of committing child homicides when compared with biological fathers.[14] Both parties (boyfriends and stepfathers) are more likely to kill the victim by blunt force trauma or bludgeoning.[10]

Examining the type of injury sustained by victims of child abuse homicides along with the demographics of the victims is important for those who must investigate the death, like medical examiners.[9] Many studies indicate how the victims of child abuse died and elaborate on the common findings of these victims. Two common causes of death in child abuse homicides are blunt force trauma and asphyxia.

Blunt force trauma is an injury that is produced by either a blunt object striking the body or the impact of the body against a blunt surface or object.[7] Blunt force trauma is one of the most common causes of death (46% of cases in one study) in child abuse cases.[4] For signs of child abuse, Coleman et.al. recommend looking for lacerations (cuts), abrasions (bruises), and fractures (broken bones).[17] These are just some of the injuries that can be present on an abused child. These injuries are generally localized to the head and chest regions of the body.[7]

Another common cause of death is asphyxia (as high as 21.8% in some studies).[11] Asphyxia is death caused by inadequate oxygenation of tissues. This can either be caused by suffocation, strangulation, or chemical asphyxia.[7] For the purposes of this study, the focus will be on suffocation and strangulation. There are four types of suffocation: environmental suffocation, smothering, choking, and mechanical asphyxia. Only two types of suffocation deaths will be considered here: smothering and mechanical asphyxia. Smothering occurs when an object is placed over the nose and mouth. This object could be a pillow or hand. Mechanical asphyxia is when the victim is unable to breath due to pressure being applied to the chest or neck which does not allow the victim to inhale. This is caused by a heavy weight (like a car or a collapsed building) pinning the victim, making inhaling impossible. Strangulation occurs when the blood vessels in the neck are closed off due to pressure. The blood vessels can be closed off by an assailant's hands or a rope around a victim's neck. Other types of asphyxia deaths include manual strangulation, where the victim is strangled by the perpetrator's hands.[18] In some studies, asphyxia is shown to be more common than blunt force trauma as the leading cause of death in child abuse homicides.[8] Asphyxia deaths are difficult to diagnose. One sign that someone suffered from asphyxia is the appearance of petechiae. Petechiae are red dots created when blood vessels rupture in the eyes, face, or neck. These are a result of added pressure from the body due to the traumatic event. But petechiae are not always present in smothering deaths.[6] The inconsistency of the appearance of petechiae leads to the potential for the death to be classified as accidental.

The discussion thus far has focused on the perpetrator and the type of injury. The demographics of the victim is also a point of interest. These demographics vary based on the time and location of the study. Take, for example, two Egyptian studies. El-Hak et al.[4] studied child abuse cases from 1996-2005 and found that the group with the greatest number of victims was ages 3-6. Alsaif et al.[19] studied child homicide cases from 2006-2010 and found that the majority of the victims were under the age of 1. The variability of ages in child abuse homicides indicates that younger children are more at risk of abuse.[20] These infant victims rely on the caretaker for everything. The pressure of caring for the child may cause caretaker stress and ultimately result in the events leading up to the death of the child.

While age varies in the different studies, the gender of child abuse homicide victims is not so varied. The gender of victims is generally close to a 50-50 ratio but can vary.[12] The larger the population, the closer to an even distribution of male: female child victims is achieved. This should reflect the actual population of the country of origin.

The predominant population at risk for child abuse varies by the region or country in which a study takes place. In this study, the U.S. population distribution was analyzed and compared to Oklahoma demographics. Okoye and Okoye analyzed child deaths based on the U.S. population groups of White, Hispanic, American Indian, African American, and Asian.[1] This distribution of child abuse homicides in the U.S. population by race is shown below:

- White 72.13%
- Hispanic 9.22%
- Black 7.14%
- American Indian 7.06%
- Other 4.45%

To summarize the literature, the age of child abuse victims varies greatly and depends upon when and where the study took place. For the U.S. population, the genders of the victims are evenly split. The majority of victims are white as is most of the U.S. population. The most

common type of injury is blunt force trauma. The likely perpetrators of child abuse homicides are known by the victim prior to the abuse.

Importance for the study

Child abuse takes many forms and it is an occurrence deserving of intense study to add to the existing knowledge about these crimes. Collecting information about child abuse homicides (such as who is the likely victim, who is the likely perpetrator, and what are the likely injuries) may provide topics for education and ultimately aid in prevention [12,19]. Data about child abuse homicides has been compiled in various meta-analyses; these analyses would not be possible without studies focusing on the demographics of perpetrators and victims.[20,21]

When looking at the prevalence of child abuse and maltreatment, analysis of possible relationships and correlations were studied using data from self-reported cases,.[12,15] These articles involved participants who had either been abused or witnessed abuse first hand. A review by Stoltenborgh et al. came to the conclusion that "child maltreatment is a widespread, global phenomenon affecting the lives of millions of children all over the world.[21]" Ji and Finkelhor, with their study focused in China, found that abuse and maltreatment was prevalent in mainland China. Ji and Finkelhor state that education programs would be needed to promote non-violent parenting.[20] Their demonstration that child abuse is not just a United States or a Western hemisphere problem, but a global problem, emphasizes that gathering information about this phenomenon is of the utmost importance.

The purpose of a study by Kajese et al. on child abuse homicides was "to provide critical information that can be used for future preventative measures." [12] Preventative measures will only come from research that conclusively identifies who are at risk as victims and as abusers. Developing these diagnostic tools and producing educational aids that target society in general and parents in particular will ultimately reduce the prevalence of child abuse.[22]

Research shows a problem in regards to child abuse on a global scale.[17,18,2] Some preventative measures introduced in various studies evaluate education programs focused on child sexual abuse. Mendelson and Letourneau suggest the targeting of parents of young children for preventive education. Mendelson and Letourneau conclude that the treatment of the victims and punishment of the perpetrators is not enough to handle a problem of this magnitude. They stress preventive measures.[23] Prevention will be ineffective if the subject of the education is not a member of an at-risk population, either as a victim or as one who may commit the abuse. Chen et al. adds information about the need for prevention in an article regarding child sexual abuse in China.[24] In the study, Chen et al. made it apparent that parents had varying degrees of knowledge about child abuse. Few parents in the study knew that males might be victims of sexual abuse or that females could be perpetrators of the abuse.[24] Dinehart and Kenny focused on the existing knowledge of early child care workers and the role that the workers fill in the process of reporting child abuse.[25] Moffitt et al. suggest prevention programs to address both male and female violence.[26] The Moffitt study looked at negative emotionality (NEM) and based all findings on NEM scores, a scoring system that is based on emotional evidence and negative emotions. By calculating the NEM of a couple or a person, Moffitt et al. state that the NEM score is indicative of the likelihood of a person becoming a victim or an abuser.[26]

Each of these studies focuses on selecting the audience for preventive education programs. Osofsky[10] states "informing science and raising awareness about both prevalence of children's exposure to domestic violence and co-occurrence of domestic violence and child maltreatment will not only contribute substantially to the literature, but also ultimately help the children and families who are impacted negatively by such exposure." While the subjects of this study were deceased, the goal was to aid in preventive measures to ensure that future victims can be spared. To answer questions such as the likely perpetrators and victims, and the more common forms of injury was the goal of this research. Information from studies such as this one can

provide useful information to death investigators, law enforcement agencies, and policy makers in predicting, preventing, and investigating child abuse deaths.[1]

CHAPTER III

METHODOLOGY

This study focuses on child abuse homicides. The information for this study was gathered from the Oklahoma Office of the Chief Medical Examiner's case database (OCME case database) and the U.S. census. Since study subjects are human decedents, the Institutional Review Board of Oklahoma State University Center for Health Sciences was alerted to the study. Because the information pertained to deceased individuals, the university IRB classified the research as not dealing with human subjects and prescribed no further review or action necessary. The de-identified demographic information from the U.S. census is approved by the IRB.

Data for this study was collected from two principal sources: an OCME database search and a 2014 U.S. census search. The OCME database was searched to fill in information regarding the decedents, whose case numbers are listed in a filtered spreadsheet. The U.S. census search was used to collect generalized demographic data of the total Oklahoma and U.S. populations.

The goal of this research was to elucidate trends about victims and perpetrators of child abuse homicides in Oklahoma with regards to race, gender, and age. The Methods section is divided into parts discussing data collection strategy, how data was gathered, and how data was analyzed.

Setup and Access

A medical examiner case is initiated when an investigator receives notification that a death has occurred. The OCME maintains a database that contains case information for all cases within its jurisdiction from both the Tulsa office and the Oklahoma City office. The information contained in this database includes decedent demographic information (race, sex, and age) along with case-specific information (place of death, hospital of death, narrative of scene investigation, and police records). To track all the information associated with the cases in this database, the OCME investigators assign each case a unique number.

To gain access to the OCME database, permission was given by the deputy chief medical examiner. A confidentiality agreement was signed with the OCME deputy chief medical examiner. The confidentiality agreement protects decedent information from misuse that could cause emotional distress to the decedent's remaining family. An employee of the OCME supervised while the information from the database was collected.

The OCME database electronically houses all the case information for the state of Oklahoma. The database cannot be efficiently searched without assistance from the deputy chief or assistant deputy chief, who can filter the OCME database using keywords such as *homicide*, *suicide*, or *accidental.* The keywords relate to the topic that is being investigated. For this research, the keyword *homicide* populates a list of over 3000 case numbers. The search was further refined by filtering for year the decedent died; for this research the years of 2000 to 2015 were chosen. Once the OCME database was searched and filtered with keywords for cases that occurred between these years, the assistant deputy chief provided an electronic copy of the spreadsheet.

The spreadsheet includes several headings that are populated by the search. The column headings were case number, date of death, pathologist, age, age modifier, immediate cause,

immediate secondary cause, immediate tertiary cause, and CODE. The case number is the number previously mentioned that is assigned to a decedent (and therefore the decedent's case); the date of death is the day, month, and year in which the decedent died; pathologist names the doctor who performed the autopsy. Fields also included are age of the decedent at time of death; an age modifier column that changes the date in the instance when a decedent is months or days old; the immediate, secondary, and tertiary immediate cause of death as listed by the pathologist; and CODE, a unique code that is given to a case for reference in the cause of death. These codes classify the death as asphyxia-related, gunshot-wound related, and child-abuse to name a few.

To avoid data loss and data conversion error, the following columns were added with headings: county, race, and type of injury. Columns for primary location of injury, secondary location of injury, genital trauma, perpetrator relation, and perpetrator's sex were added as well. These headings were added to the right of the headings generated from the OCME database filtered for homicides. These columns were filled in as data was collected.

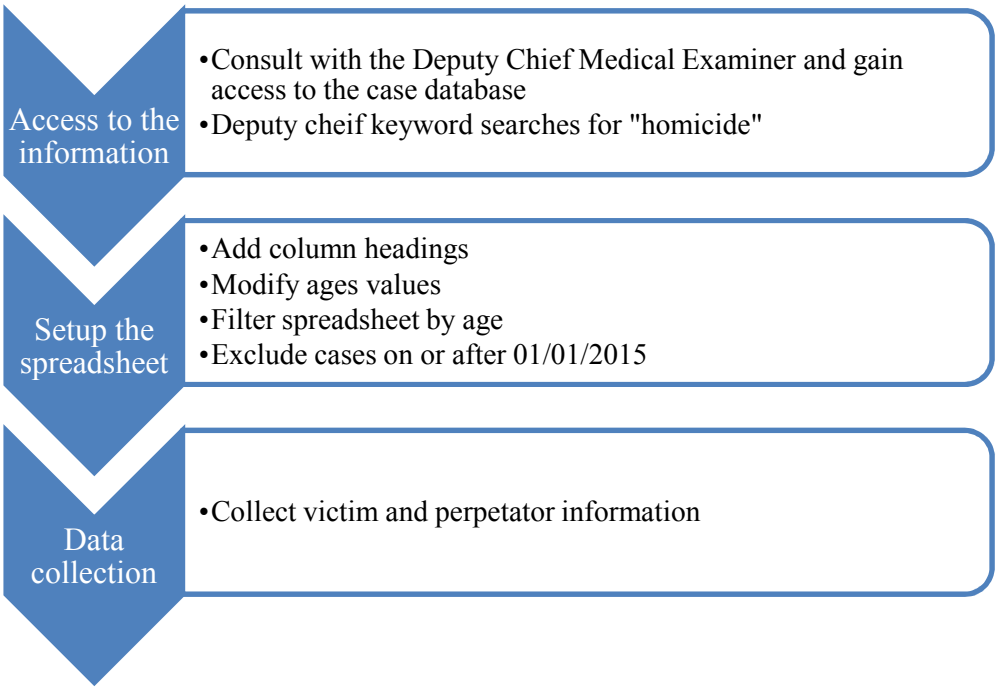
To aid in filtering data, the columns with the headings of age and age modifier were combined to a single column labeled "age." The modifier was changed to a letter that appears before the age of the decedent: D representing days, M representing months, and Y representing years. Not only does this conversion save space, but it also facilitated sorting from highest to lowest. Some examples are five days old (D05), twenty-four months old (M24), and fifteen years old (Y15). The spreadsheet now had the column headings: case number, date of death, pathologist, age, immediate cause, immediate secondary cause, immediate tertiary cause, CODE, county, race, type of injury, primary location of injury, secondary location of injury, perpetrator relation, perpetrator race, and perpetrator's sex. With all the column headings on the spreadsheet, the document could now be filtered.

The data was filtered first by age. Filtering for individuals under the age of 18 was the quickest way of reducing the number of cases that were examined during the course of the study. Cases that date on or after 01/01/2015 were excluded from the study due to many of the cases still being reported as open case investigations whose status may change from a child-abuse homicide to another homicide type. While filtering for cases until 01/01/2015 is possible and would eliminate the need for the above exclusions, the spreadsheet received from the assistant deputy chief contained cases after 2015 and therefore those cases needed to be excluded.

A second filter was applied to the spreadsheet for date of death. Data were retrieved from the spreadsheet for the years 2000 to 2014. The remaining cases were filtered to include cases that occurred between the dates of 01/01/2000 to 12/31/2014 that were coded as child abuse homicides. By definition, all cases remaining after filtration were those cases for individuals who are under the age of 18. Exceptions may occur in the age column, as explained by the following paragraph.

The definition of a homicide, as it applies to this study, is any direct event by an individual that causes death to another individual. If a child is abused, survives, and then makes it to adulthood and dies due to complications of the abuse, the death is ruled as a child abuse related homicide even if the person is no longer under the age of 18. Figure 1 summarizes the data collection strategy.

Figure 1. Flow chart documenting steps taken to prepare spreadsheet for data entry



Data Collection

Once data collection was complete, the OCME database was accessed for further details associated with each filtered case. The case number was input from the filtered spreadsheet into the case number search box. When the case number is used to search the database, it can retrieve all information and documents associated with that number from the OCME data servers. These documents are then accessible from clickable buttons on the database screen. By searching through the documents of the OCME database, columns for county, sex, race, injury type, and location of injury were added. These data were then used for comparison analysis. The narrative section in retrieved case documents contains the information about the county where the child abuse related death occurred. The sex and race of the decedent are found in the narrative as well. The location of injuries and the injury type are found in the pathologist report, which also gives detailed notes on what the pathologist found during the autopsy of the decedent. The primary

location of injury is listed first, followed by the secondary and, if needed, tertiary location of injuries.

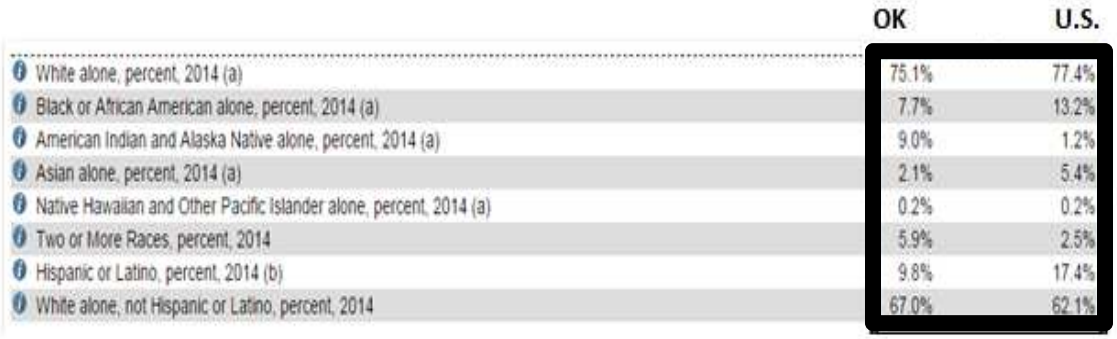
Information (to be listed under the columns of perpetrator sex, perpetrator relationship) can also be found in the narrative. However, the information regarding perpetrator demographics could be incomplete or nonexistent. If this information is available, the information was recorded in the respective columns. This data mining procedure for collecting decedent and perpetrator information was used for all of the case numbers present in the filtered spreadsheet.

The U.S. census information was retrieved by going to QuickFacts[28] at www.census.gov (Figure 2). In the census documents, the information collected included racial data (White, African American, Hispanic, Asian, Native Hawaiian, and American Indian) and gender ratio. QuickFacts provides both the U.S. and Oklahoma racial and ethnic distribution side-by-side.

Figure 2. The QuickFacts module on the www.census.gov website.

The information collected from the QuickFacts was placed in a separate spreadsheet with column headings labeled race and gender. This spreadsheet differs from the filtered spreadsheet in having row modifiers attached to the separate column headings. The row modifiers for race are White, African American, Hispanic, American Indian, Asian, and Native Hawaiian. The row modifiers for gender are male and female. The census data was collected for both Oklahoma and the U.S. (Figure 2).[28] Data analysis occurred once data had been collected from www.census.gov and the OCME database.

Figure 3: The demographic information for both Oklahoma and the U.S.



	OK	U.S.
White alone, percent, 2014 (a)	75.1%	77.4%
Black or African American alone, percent, 2014 (a)	7.7%	13.2%
American Indian and Alaska Native alone, percent, 2014 (a)	9.0%	1.2%
Asian alone, percent, 2014 (a)	2.1%	5.4%
Native Hawaiian and Other Pacific Islander alone, percent, 2014 (a)	0.2%	0.2%
Two or More Races, percent, 2014	5.9%	2.5%
Hispanic or Latino, percent, 2014 (b)	9.8%	17.4%
White alone, not Hispanic or Latino, percent, 2014	67.0%	62.1%

Data Analysis

Data analysis was performed using decedent demographics versus U.S. census information. This information was used for comparison analysis to identify relationships between different facts in the casefiles. The comparisons between Oklahoma and the U.S. that were investigated included:

- county with highest level of child abuse homicides
- month with the highest level of child abuse homicides
- most common type of child abuse injury
- victim demographics
- perpetrator demographics

Racial information was used to determine how the population of child abuse homicide victims compares to the total population of Oklahoma and how the population of child abuse homicide victims compares to the total population of the U.S. Comparisons were performed to determine if cross racial violence is more common than same race violence by asking questions like "are white perpetrators more likely to abuse white children or black children."

To perform the comparison studies, contingency tables were used for each of the variables. The goal of the analysis was to discover if the results obtained from the research are not based on chance but instead significant findings. Contingency tables allow for the detection of significant relationships between the different elements of each child abuse homicide case and also compare demographic information of victims to the U.S. population as a whole. From the data collected and analyzed, the following tables and graphic representations were created, similar to those in Table 1, for comparison and for demonstration of the results in an easily read format.

Table 1. Perpetrators who commit child abuse homicides broken up by gender and relation to the victim

Total Number	**Male**	**Female**
46	34	12
Biologically related abusers	17	11
Non-biologically related abusers	17	1

Conclusion

The data gathered here is considered non-human research by the IRB of Oklahoma State University Center for Health Sciences. The information gathered from the OCME database and from www.census.gov represents demographic information about decedents and the perpetrators

of the child abuse homicide. From the U.S. census, demographic information regarding population racial breakdown and gender breakdown is available for the population of Oklahoma and for the U.S. With all the data collected, contingency tables were used for comparison analysis to identify relationships between the variables of race, gender, and age. The aim of this study was to collect data and identify trends applicable to Oklahoma and the U.S. By collecting data, like the data suggested by Alsief et al.,[19] preventive measures can be planned and implemented.[12]

CHAPTER IV

FINDINGS

Demographic data was collected regarding both victims and perpetrators of child abuse homicides. The data included the following categories:

- Age
- Race
- Gender
- Urban vs. Rural
- Type of Injury
- Relation to perpetrator
- Day and Month of Death

A contingency table was used to determine if the data that has been collected are statistically significant findings. To utilize the contingency table, information from the U.S. Census was needed to provide "expected" or known population. For the results that are discussed below, the "observed" population will represent the Oklahoma child abuse victims included in this study.

Starting with the age of the victims, data collected from the Office of the Oklahoma Chief Medical Examiner indicates that 72.87% (188 of 258 victims) of the abuse victims were 5 years old or younger, while the expected population for the U.S. showed that only 25.15% (70 of 258

victims) of the population fell into this age range. The exact opposite was found to be true about those abused children who were over the age of 5 (27.13% observed vs. an expected population of 74.85%) (Table 2). These results show that a significant number of victims of child abuse are less than 5 years of age which is significant at the .001 level. A report stating that young children are victims of child abuse is by no means groundbreaking. Regardless of where in the world the abuse takes place, young children (<5 years old) constitute a large portion of abuse victims.[3-6] DiMaio and Dane summarize this phenomenon expertly by stating "If a child survives the immediate neonatal period, the next 2 years are the most dangerous[7]". While DiMaio and Dane focus on the first 2 years, it may be wise to expand the risk period to include the first 5 years of a child's life, based on the information shown in Table 2.

Table 2. Comparison between child abuse homicide victims observed versus the expected age proportions of the population.

Age	Observed Population	Expected population
Less than 5 years	72.87%	25.15%
5 years or greater	27.13%	74.85%

Children are inherently needy creatures. They are dependent upon their caretakers for all of their needs. Many times, caretakers are inexperienced and unprepared for the demand that caring for a child requires. This demand on stressed caretakers may result in lost tempers and subsequent abuse. Studies from cultures as disparate as Japan, Egypt, and India share similar results showing that children under the age of 5 make up at least 50% of the victim population of child abuse.[3-6]

In this study, when looking at the gender of the victims, the expected proportions of males and females under the age of 18 show no significant difference. It is therefore logical to

suggest that there is no gender bias for abuse. Any child, regardless of gender, can be a target for child abuse. See Table 3 for the breakdown of observed population versus expected population.

Table 3. Comparison of observed and expected gender of the abused victims versus the population as a whole

Gender	Observed Population (Child Abuse Victims)	Expected population (U.S. Census)
Male	56.98%	51.48%
Female	43.02%	48.52%

The race of the victims was broken down into five categories: American Indian, Black, Hispanic, White, and Other. For the purpose of this research, Hispanic is considered a race. Individuals are classified Hispanic if stated so in the pathologist report or the category of "Hispanic or Latino" as stated by the U.S. Census. The category of "Other," for the purpose of this research, is anyone whose race is not designated or who is not American Indian, Black, Hispanic or Black.

Table 4. Comparison of observed and expected races of the abused victims versus the Oklahoma's population as a whole.

Race	Observed Population (Child Abuse Victims)	Expected Population (U.S. Census)
White	62.02%	72.13%
Hispanic	8.91%	9.22%
Black	15.89%	7.14%
American Indian	10.08%	7.06%
Other	3.10%	4.45%

Notice that from the data in Table 4 that people who are identified as "White" make up a majority of the population both for victims of child abuse homicides and the U.S. population in

general. This result was expected and was first shown by Okoye and Okoye and Kajese et al.[1,2] These studies (Okoye and Okoye and Kajese et al.) were performed in Nebraska and Kansas respectively. With the inclusion of the study described here, it may be possible to make some general statements regarding child abuse homicide victims for Oklahoma and surrounding states. Kajese et al. has results most similar to the current Oklahoma study where 68.2% of abuse victims was White compared to 62.02% in Kansas. Meanwhile, Okoye and Okoye reported that 82.4% of their victim population was white.[1]

The Okoye and Okoye study focuses on child deaths for the state of Nebraska. This may explain the large discrepancy between the findings of the current study and the Nebraska and Kansas studies. By focusing on all child deaths, not just those defined as child abuse homicides, Okoye and Okoye's victim population more closely reflects the U. S. population. Kajese et al., however, focused their study on child abuse homicides and report similar findings to those presented here in regards to victim demographics, especially with respect to the proportion of victims who were classified as Black. An unexpected finding was the difference between the expected and observed populations of people who identify as "Black." Black individuals make up 15.89% of the Oklahoma population of victims (41 of 258 victims) while these same individuals only make up 7.14% of the U.S. population (see Table 4). With significance below the .001 level, it is safe to conclude that the observed populations are not equivalent to the overall population. Thus, it is likely that Black individuals are more susceptible to child abuse homicides.

This study collected data to see if child abuse homicides occurred during a certain day of the week or time of the year. It seems however that there is not a specific day nor month in which child abuse homicides occur more frequently. When looking at the days of the week and the frequency at which child abuse homicides occur, it is found that Tuesdays (48, 18.53%) have the highest frequency of child abuse homicides. Thursdays (43, 16.60%) and Mondays (40, 15.44%) followed Tuesdays in terms of highest frequency of child abuse homicides. The remaining days

are listed in terms of descending occurrences of abusive homicides: Sundays (36, 13.90%), Fridays (34, 13.13%) and Wednesdays (31, 11.97%). Surprisingly, the least number of homicides occurred on Saturdays (27, 10.42%). This data is summarized on Table 5 below. This data was found to fall above the .05 level of significance, meaning that child abuse homicides have an equal opportunity to occur on any given day of the week.

Table 5. Observed frequency of days in which child abuse homicides occurred over the reviewed 14 years.

Day of the Week	Frequency	Percent
Monday	40	15.44
Tuesday	48	18.53
Wednesday	31	11.97
Thursday	43	16.60
Friday	34	13.13
Saturday	27	10.42
Sunday	36	13.90

When comparing the frequency of child abuse homicides that occur on a monthly basis, our results were found to fall above the .05 significance level. Similar to the analysis of days of the week in which child abuse homicides occur, the conclusion must be drawn that child abuse homicides have an equal chance of occurring during any month. The information regarding the frequency of child abuse homicides grouped by month of death is located in Table 6.

Table 6. Observed frequency of months in which child abuse homicides occurred over the reviewed 14 years.

Month	Frequency	Percentage
January	18	6.95
February	28	10.81
March	17	6.56
April	23	8.88
May	20	7.72
June	19	7.34
July	28	10.81
August	33	12.74
September	13	5.02
October	24	9.27
November	18	6.95
December	18	6.95

Unfortunately, this study was a retrospective investigation, focusing on victims, whereas Kajese et al. was privileged to more holistic data. This allowed the Kajese study to look at child living conditions and past history of child abuse. Yet with this information, Kajese et al. could not offer opinions incorporating child living conditions or parental care within the context of the risk for child abuse. With more information such as living conditions and parental care, the effectiveness of prevention efforts might be enhanced through education and family intervention. For future studies, information regarding the living condition and family dynamics need to be of greater importance and available in larger (and more complete) quantities.

The study placed victims into the county in Oklahoma where they sustained the abuse that ultimately resulted in their demise. These counties were then divided into urban and rural counties as defined by the Oklahoma Office of Management and Budget.[29] Counties classified as urban have a population of over 50,000 people according to the Oklahoma Office of Management and Budget; rural counties are locations with less than 50,000. Victims living in rural counties comprised 38.62% of the observed victims compared to an expected population of 31.01%. Likewise, the urban counties made up 61.38% of the observed population of victims and 68.99% of the expected population. With significance below the .05 level, we can conclude these results are significant and the observed population is different than the observed population. Table 7 contains this data.

Table 7. The observed proportion of victims in Oklahoma compared to the population of the U.S.

County type	Observed proportion	Expected proportion
Rural	38.62%	31.01%
Urban	61.38%	68.99%

When looking at the perpetrator's gender, perpetrators are expected to be 49.53% male and 50.47% female based upon the population census: this differs greatly from the observed data that showed a breakdown of 70.45% male and 29.55% female. With significance below the .001 level, these results are highly significant showing that while males make up approximately half of the population, they are more likely to be perpetrators of child abuse homicide. The findings regarding the most frequent cause of child abuse homicides, blunt force trauma, can be seen over many studies. It is of interest however to look at the second most common type of injury. The results of this study demonstrate that gunshot wounds are the second highest cause of child abuse homicides (see Table 6 below) whereas a study from Kansas shows that asphyxia is the second highest frequency of occurrence.[12] It is interesting to see the difference in types of injuries between neighboring states.

The injuries found in each homicide varied; however, there are certain injuries that have higher frequencies than others. For the purpose of this research, the cause of death listed by the pathologist was tabulated in the results. The injuries were grouped based on an archetype, such as blunt force injuries (blunt force trauma, shaken baby syndrome, and blunt impact), gunshot injury, asphyxia-related injuries (smothering and choking), drowning, fire-related injury (thermal injury and smoke inhalation), and sharp force trauma to name a few. The three most common types of injuries sustained were blunt force injuries (frequency of 151, 61.38%), gunshot injuries (48, 19.51%), and asphyxia-related injuries (13, 5.28%). Sharp force trauma (10, 4.07%) and fire-related injuries (10, 4.07%) followed along with drowning (6, 2.44%), drug related death (5, 2.03%), homicidal violence (2, 0.81%), and unsafe sleep (1, 0.41%). Table 6 summarizes the data presented above.

Table 8. Observed frequency of victim injury types ordered by frequency of occurrence

Injury type	**Frequency**	**Percent**
Blunt force trauma-related	151	61.38
Gunshot wound	48	19.51
Asphyxia-related injuries	13	5.28
Fire-related injuries	10	4.07
Sharp force trauma	10	4.07
Drowning	6	2.44
Drug	5	2.03
Homicidal violence	2	0.81
Unsafe sleep	1	0.41

CHAPTER V

CONCLUSION

This study was a retrospective case review of child abuse homicide data obtained from the database of the Office of the Chief Medical Examiner in Oklahoma. The database contains information on every decedent who enters the morgue including information about a decedent's race, age, sex, manner, and cause of death. By using a keyword search, the number of cases retrieved from the database could be reduced to 245 individuals. By filtering the results from the keyword search for cases involving individuals under the age of 18, the number of cases was refined further. The cases matching the aforementioned parameters were reviewed and information was collected regarding the victim's:

- Age
- Sex
- Race
- Manner of Death
- Cause of Death
- Suspected Perpetrator
- Day and Month of Death

By compiling information about each victim in the study it was possible to draw conclusions from the data. One conclusion was that Black individuals are more likely to be abused and killed than any other race studied. This finding is congruent with results from other studies.[1] Another conclusion from this research that agrees with the current literature is that most individuals are physically abused via blunt force trauma.[1,2] This study concluded that males were

more likely than females to be the perpetrators of child abuse homicides, which is also in agreement with the literature.[1,3] Table 9 illustrates the similarities and differences between the results found in this study compared to results from various U.S. studies.[1,12]

Table 9. Comparison of likely victims of child abuse divided by the state of Oklahoma and the U.S.

Characteristics of Victims	**State of Oklahoma**	**United States of America***
Age of Victim	Under the age of 5 years	Ages 5 to 11
Sex of Victim	No preference seen	Male
Race of Victim	Black	Black
Cause of Death in Victims	Blunt force trauma injuries	Blunt force trauma injuries
Second Most Common Cause of Death	Gunshot wounds	Asphyxia
Likely Abuser of Victims	Biological abusers	Biological abusers

* Based on Coleman et al.'s analysis of the U.S.[17]

Table 7 reveals several similarities between current data and the information that is known about the U.S. Blunt force trauma injuries are the leading cause of child abuse death, which is most likely inflicted by biological abusers. The major differences seen between the studies is the age of victims and the sex of victims. Upon review of Table 2, almost 75% of the U.S. population is over the age of 5. This contributes to why victims over the age of 5 are more likely to be abused. However, the current study found that those under the age of 5 are more susceptible to child abuse homicides. Sources like DiMaio and Okoye and Okoye agree that young children below the age of 2.are the likely victims.[1,7] Being dependent upon a single person is likely to cause added stress on the caregiver that may precipitate child abuse homicides.

The other discrepancy or difference between the U.S. and Oklahoma demographics is the sex of the victim. Oklahoma showed almost an even distribution of males and females, while the U.S. showed a significantly increased risk for males to be the victims of abuse. One possible answer for this could be the amount of cases reviewed. This study focused on 245 individuals of child abuse homicides. By increasing the number of cases reviewed, this study might reflect the expected population (of living individuals) of the U.S.

Gender appears to have the most variability when reviewing the Kajese and the Okoye and Okoye reports; these studies looks at states that border one another and that border Oklahoma.[1,7] While there were other studies in the U.S. (see Coleman et al.[17]) which covered the U.S. in its entirety, the emphasis here is being placed on the drastic variation of victim's gender by two neighboring states. The predominance of male victims appears in Nebraska and Oklahoma, while females are the predominant victims in Kansas. These data lead to the conclusion that gender of child abuse victims varies from place to place. However, with all the variability, it should not be over-looked that child abuse is a problem, regardless of the gender of the victim. Prevention education about child abuse homicides was one of the principal goals for this research project. The goal was to delineate the characteristics of child abuse homicides so that the findings could be considered by organizations like Child Protective Services in formulating policies and programs designed to aid at-risk populations.

The current data is tailored to the specific Oklahoma demographic population. While much of these results are consistent with published research involving populations in other areas of the U.S. and the world, it is reasonable to conclude that a holistic approach could be easily implemented throughout the U.S. similar to holistic medicine that treats the entire person rather than just the symptoms. Creating a plan for child abuse homicides will require the consideration of multiple factors to implement effective country wide preventive action and policies. Once

country-wide policies are in place, states may need to adapt such a universal approach to find a better fit for the state's unique demographic.

Limitations of Study

This research dealt solely with information obtained from the OCME's case database. This database focused on the information that would assist the medical examiners in determining cause and manner of death for the victims. Very little information was available for perpetrators aside from the occasional report from law enforcement. Several possible comparisons could be investigated, but a more detailed analysis was not possible due to this lack of information. The best way to improve the information is to create and maintain a central database regarding death in Oklahoma. The medical examiner's case database has laid amazing groundwork for a central database. With input from the agencies who investigate the events surrounding the decedent's demise, this database could soon provide even more knowledge regarding trends in homicides and other manners of death. These reports may be lacking information since many contain information gathered at the beginning of a police investigation.

This study was limited not only from the lack of information but also in the form of definitions. Multiple times in this research the words "For the purpose of this research…" were used when defining variables such as race and what is classified as abuse, making this study limited in its ability to be generalized to other studies. While the definition of Hispanic used here is based on an understanding of the Medical Examiner's database, another study may define Hispanic differently, leading to differing data. Using definitions from state statutes is another limiting factor similar to the one stated above. There is also the possibility of subjective pathological findings, because the case database is not filled out by a single pathologist but by many pathologists, who may interpret findings differently.

A further limitation that was discovered as research progressed was, the definitions of "Biological abuser" vs. "Non-Biological abuser." While these terms were discussed and defined at the beginning of this paper, it was discovered that these definitions had changed and were not all inclusive after the data had been collected. In future studies more care will need to be taken to insure that these terms are defined in more concrete and less subjectively. In addition, defining the relationships more exactly, such as determining whether the listed "father" is the biological father or the step-father and determining whether the boyfriend/girlfriend is actually living in the household, could provide additional insight. While relationships are listed in the database it cannot always be substantiated that the relationship is entirely correct as listed.

Future Studies

This study considered only information gained from the Office of the Oklahoma Chief Medical Examiner and the U.S. census. Future studies should strive to involve the Child Death Review Board (CDRB) and Child Protective Services (CPS). The CDRB maintains detailed information very similar to the information in this study. The CDRB publishes an annual report documenting all of the child death cases that were reviewed by the Board. CPS collects demographic information concerned both with the child victims and also with the child's family. As stated earlier, by combining the access both organizations have to a victim's life and death, the groups could strive to form a child homicide database that would aid in tracking and discovering trends.

The CDRB publishes annual reports that encompass all the child death cases that were reviewed for this study. These cases include all accidental deaths, homicide deaths, and natural deaths that occurred in the state. With access to this information a researcher could reinforce the conclusions resulting from their own research. The CDRB will have criteria for determining what constitutes as abuse that could assist researchers in deciphering the Office of the Chief Medical

Examiner's database. The CDRB was not contacted during the course of this study, due to the fact that the information about child homicides would already be reported to the Medical Examiner's Office. In future studies this avenue should be explored to see if the CDRB could offer any additional information regarding circumstances pertaining to the victim.

CPS collects a great deal of information regarding the child victim and the child's environment. This information might be helpful in determining the root cause of child abuse. The current study lacks information about the victim's circumstances before they came to the Tulsa morgue. Information that could help with prevention of child abuse and child abuse homicides might include whether or not a victim is an only child, is the first child killed in this home, is the child of a single parent, and the like. By using the information from CPS, it could be possible to determine if racial or sexual differences result in higher likelihood of child abuse homicides. CPS would also be beneficial for determining if the cause of a child's death was a result of direct abuse or neglect.

One topic that was briefly mentioned during a comparison between Oklahoma and Kansas was the difference in the second most common cause of death (gunshot wounds for Oklahoma and asphyxia for Kansas). With these results one question is begged to be asked "Why do the states differ?" Is it because guns are more prevalent in Oklahoma versus Kansas? While that sounds like a logical conclusion, an article published by Business Insider shows that the percent of Oklahomans who own guns is 31.2% while the percentage of Kansans who own guns is 32.2%.[30] This information is taken from a study performed by Kalesan et al. and publicized by Business Insider. With knowledge provided by this paper, future topics will have to explore other factors that contribute to the difference between these two neighboring states.

More topics that can also be explored in future studies, with the help of previous mentioned additional sources, could be to investigate the age of the abuser, and ask questions like

"are abusers getting younger or are they getting older?" and one could compare data from a much later time period then just 14 years. Another potential topic could focus on who is the abuser. While this paper showed "who abuses," more emphasis could be given to see if there has been a change from one common abuser, like "mom's boyfriend", to a potential new abuser. Future studies could also look at sexual assault related homicides for both children and adults and see how the information differs or agrees with this study.

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