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THE ASSOCIATION BETWEEN THE RATE OF CHILD FATALITIES IN
TENNESSEE AND SELECTED NEIGHBORHOOD DEMOGRAPHIC AND
HOUSING CHARACTERISTICS

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Elizabeth Brown
December 2008

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DEDICATION

This dissertation is dedicated in memory of my grandmother, Evelyn Louise Jackson Brown, my mom Earlene Ruth Brown, and my uncle, Elbert Frederick Brown, Sr. for the encouragement to succeed and the empowerment to keep my faith.

ACKNOWLEDGMENTS

Special thanks are extended to my doctoral dissertation committee, Drs. Susan Smith, Gregory Petty, James Neutens, Paula Carney, and Mary Gunther for assisting me with the completion of this research. Dr. Smith, I want to express my sincere gratitude for your guidance, intuition, and encouragement in completing this research project. I would like to express my appreciation to Drs. Gregory Petty, James Neutens, Paula Carney and Mary Gunther especially for providing the professional assistance and patience with this project.

I would like to acknowledge the Department of Child and Maternal Health in the State of Tennessee Health Department, for permission to complete this research. I am very grateful to Cary Springer, one of the statistical consultants at The University of Tennessee, for providing the expertise and guidance from the beginning of this statistical journey to the resulting end.

Appreciation is expressed to all of the support staff of Health and Safety over the years that helped me to maintain and keep up with the necessary paperwork and updated me on the policy and procedure changes. I would especially like to thank my fellow Graduate Teaching Associates for their support and encouragement. I would like to thank Eunice, Dana, Aunt Eva, Aunt Gail, Carla, Joy and Vanessa for the extra special help, moral support and inspiration while I have been striving to achieve this goal. Finally, I want to thank all of my family for continuing to have the faith and loving unconditionally.

ABSTRACT

The purpose of this study was to determine if an association exists between housing characteristics and demographic characteristics of Tennessee neighborhoods (census tracts) and the rate of child fatalities (violent, accidental, and natural) in the neighborhoods reporting child fatalities for the years 1996-2003. The child fatalities, for the eight years, reported to each Tennessee Judicial District Child Fatality Review Team required by the Tennessee Department of Health's Maternal and Child Health Division were selected for use in the study. Data was selected from the Bureau of the Census' 2000 United States Census to obtain the housing characteristics and demographic characteristics of heads of households by census tract. The data were analyzed using descriptive statistics, Spearman Rho, and Chi-Square Cross-tabulation analyses.

The descriptive profile showed the under one year of age had the most child fatalities for the eight years. The children aged 15 - 18 years old were the second largest group of child fatalities for the years 1996-2003. Children aged one to four years made up the third largest group of fatalities in Tennessee for the years 1996-2003. More male children died than female children in Tennessee from 1996-2003. The top six most frequently reported causes of death were illness or other natural causes, prematurity, vehicular, Sudden Infant Death Syndrome (SIDS), and firearm fatalities. In Tennessee, the top two reported manners of death were natural and accidental. The following conclusions were drawn from the findings of the study; the neighborhood housing characteristics of the percent of rental housing and household size was associated with the rate of Tennessee child fatalities classified as violent and accidental deaths; the neighborhood demographic characteristic of Non-white heads of households was

associated with the rate of Tennessee violent and natural child fatalities; and the neighborhood housing characteristics of the percent of rental housing, vacancy status, household size, and urban location were associated with the rate of Tennessee child fatalities classified as natural deaths. More research needs to be conducted to determine the nature of the weak associations between the neighborhood housing and demographic characteristics and the rate of child fatalities.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION.....	1
The Need for the Study	4
Theoretical Framework.....	5
Purpose of the Study	8
Research Objectives.....	8
Assumptions.....	9
Delimitation	10
Limitations	10
Operational Definitions.....	11
Chapter Summary	15
II. REVIEW OF LITERATURE.....	16
Introduction.....	16
Research Literature Related to the Manner and Cause of Child Fatalities	18
Violent Child Fatalities	18
Accidental Child Fatalities.....	22
Natural Child Fatalities	26
Research Literature Related to the Impact of Health Status on Housing Characteristics.....	29
Introduction of Research Literature Related to Health and Housing Characteristics.....	29
The Relationship Between the Number of Rental Housing Units and Health Status.....	29
The Relationship Between the Number of Vacant Housing Units and Health Status.....	32
The Relationship Between the Number of Average Household Size Housing Characteristic and Health Status	34
The Relationship Between the Urban Location Housing Characteristic and Health Status	36
Research Literature Related to Demographic Characteristics of Heads of Households	39
The Relationship Between the Demographic Characteristic of Female Headed Households and Health Status	39
The Relationship Between the Demographic Characteristic of Single Headed Households and Health Status	41
The Relationship Between the Demographic Characteristic of Spanish/Hispanic/Latino Headed Households and Health Status.....	42
The Relationship Between the Demographic Characteristic of Non-white Headed Households and Health Status	44
Research Literature Focused on Methodology: Using the Census Tract To Represent a Neighborhood.....	46

The Neighborhood: A Unit for Study	46
The Census Tract: A Unit of Measurement	51
Chapter Summary	53
III. METHODOLOGY.....	55
Introduction.....	55
Purpose of the Study	55
Research Objectives.....	56
Data Sources	57
Tennessee Judicial Districts Child Fatality Review Team Reporting Form Data	57
United States 2000 Census.....	59
Neighborhood Characteristics.....	60
Housing Characteristics	60
Demographic Characteristics	61
Secondary Data Management and Handling.....	61
Neighborhoods Characterized by Census Tracts	66
Statistical Tests Applied to the Study Data.....	71
Descriptive Profile	71
Tennessee Child Fatalities	72
United States 2000 Census.....	72
Data Analysis	73
Introduction.....	73
Rate of Reported Total Child Fatalities in Tennessee Neighborhoods.....	76
Rate of Reported Violent Child Fatalities in Tennessee Neighborhoods	76
Rate of Reported Accidental Child Fatalities in Tennessee Neighborhoods	81
Rate of Reported Natural Child Fatalities in Tennessee Neighborhoods	81
Ranked and Grouped Tennessee Neighborhood Housing Characteristics	85
Ranked and Grouped Neighborhood Demographic Characteristics in Tennessee.....	88
Chapter Summary	93
IV. ANALYSIS, INTERPRETATION AND IMPLICATIONS OF THE DATA	95
Introduction.....	95
Descriptive Profile	96
Population Description.....	97
The Manner of Death Categories.....	100
Causes of Death Categories	100
Violent Child Fatalities by Cause.....	102
Accidental Child Fatalities by Cause	103
Natural Child Fatalities by Cause	104
Child Fatalities and Neighborhood Housing and Demographic Characteristics Data Management.....	106
Child Fatality Adjusted Rates	107
Vacant Housing Adjusted Rates	108
Testing for Association Between Neighborhood and Total Rate of Child Fatalities	109

Housing Characteristics-Total Child Fatalities	110
Demographic Characteristics of Heads of Households-Total Child Fatalities	110
Violent Child Fatalities	113
Housing Characteristics-Violent Child Fatalities	113
Demographic Characteristics of Heads of Households-Violent Child Fatalities.	113
Accidental Child Fatalities.....	114
Housing Characteristics-Accidental Child Fatalities	114
Demographic Characteristics Heads of Household Accidental Child Fatalities .	116
Natural Child Fatalities	118
Housing Characteristics-Natural Child Fatalities	118
Demographic Characteristics Heads of Households-Natural Child Fatalities	119
Adjusted Residuals for Total Child Fatalities	120
Ranked and Grouped Housing Characteristics	120
Ranked and Grouped Demographic Characteristics of Heads of Households	122
Adjusted Residuals for Housing Characteristics and Total Reported Child Fatalities	130
Demographic Characteristics of Heads of Households-Adjusted Residuals	132
Adjusted Residuals for Violent Child Fatalities	135
Housing Characteristics and Violent Child Fatalities-Adjusted Residuals.....	135
Demographic Characteristics of Heads of Households and Violent Child Fatalities-Adjusted Residuals.....	138
Adjusted Residuals for Accidental Child Fatalities	141
Housing Characteristics and Accidental Child Fatalities-Adjusted Residuals	141
Demographic Characteristics of Heads of Households and Accidental Child Fatalities-Adjusted Residuals.....	143
Adjusted Residuals for Natural Child Fatalities	146
Housing Characteristics and Natural Child Fatalities-Adjusted Residuals.....	146
Demographic Characteristics of Heads of Households and Natural Child Fatalities-Adjusted Residuals.....	149
Implications of the Data.....	149
Chapter Summary	153
V. FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS	156
Introduction.....	156
Profile of Child Fatalities.....	156
Total Child Fatalities.....	159
Housing Characteristics	159
Rental Housing.....	159
Vacancy Status.....	160
Average Size of Households.....	160
Urban Location	161
Demographic Characteristics of Heads of Households	162
Female Heads of Households.....	162
Single Heads of Households	163
Spanish/Hispanic/Latino Heads of Households.....	163

Non-white Heads of Households	164
Violent Child Fatalities	165
Housing Characteristics	165
Rental Housing.....	165
Vacancy Status.....	165
Average Size of Households.....	166
Urban Location	167
Demographic Characteristics of Heads of Households	168
Female Heads of Households.....	168
Single Heads of Households	168
Spanish/Hispanic/Latino Heads of Households.....	169
Non-white Heads of Households	170
Accidental Child Fatalities.....	171
Housing Characteristics	171
Rental Housing.....	171
Vacancy Status.....	171
Average Size of Households.....	172
Urban Location	173
Demographic Characteristics of Heads of Households	174
Female Heads of Households.....	174
Single Heads of Households	174
Spanish/Hispanic/Latino Heads of Households.....	175
Non-white Heads of Households	176
Natural Child Fatalities	176
Housing Characteristics	176
Rental Housing.....	177
Vacancy Status.....	177
Average Size of Households.....	178
Urban Location	178
Demographic Characteristics of Heads of Households	180
Female Heads of Households.....	180
Single Heads of Households	180
Spanish/Hispanic/Latino Heads of Households.....	181
Non-white Heads of Households	182
Conclusions.....	183
Recommendations.....	185
Chapter Summary	188
 VI. THE STUDY IN RETROSPECT	 189
 WORKS CITED.....	 194
 APPENDIX.....	 217
 VITA.....	 264

LIST OF TABLES

TABLE	PAGE
Table 1. Demographic Characteristic Questions Selected From the 2000 United States Census	62
Table 2. Demographic Data Selected To Create The Child Fatality Descriptive Profile .	72
Table 3. Housing Characteristic Date of Tennessee Neighborhoods and The Rate of Tennessee Child Fatalities (1996-2003)	77
Table 4. Demographic Characteristics Of Heads Of Households Data Of Tennessee Neighborhoods and The Rate Of Child Fatalities (1996-2003).....	78
Table 5. Housing Characteristics Data Of Tennessee Neighborhoods and The Rate of Violent Child Fatalities (1996-2003)	79
Table 6. Demographic Characteristics of Heads of Households In Tennessee Neighborhoods Data and The Rate Of Reported Violent Child Fatalities (1996-2003)...	80
Table 7. Data For Housing Characteristics Of Tennessee Neighborhoods And The Rate Of Reported Accidental Child Fatalities (1996-2003).....	82
Table 8. Demographic Factors of Head of Households of Tennessee Neighborhoods and The Rate of Reported Accidental Child Fatalities (1996-2003)	83
Table 9. Data for Housing Characteristics of Tennessee Neighborhoods and The Rate of Reported Tennessee Natural Child Fatalities (1996-2003).....	84
Table 10. Demographic Characteristics of Heads of Households in Tennessee Neighborhoods Data and the Rate of Reported Natural Child Fatalities (1996-2003).....	86
Table 11. Ranked And Grouped Percent Of Rental Housing	87
Table 12. Ranked And Grouped Percent Of Vacant Housing Units.....	87
Table 13. Ranked And Grouped Percent Of Average Household Size	88
Table 14. Ranked And Grouped Census Tracts Designated As Urban Cross-Tabulations	89
Table 15. Ranked And Grouped Percent Of Female Heads Of Households Cross-Tabulations.....	90

TABLE	PAGE
Table 16. Ranked And Grouped Percent Of Single Heads Of Households Cross-Tabulations.....	91
Table 17. Ranked and Grouped Percent of Spanish/Hispanic/Latino Heads of Households Cross-Tabulations	92
Table 18. Ranked and Grouped Percent of Non-white Heads of Households Cross-Tabulations.....	94
Table 19. Tennessee Child Fatalities Reported for the years 1996-2003 by Age Group .	99
Table 20. Tennessee Child Fatalities Reported by Gender for the Years 1996-2003.....	99
Table 21. Tennessee Child Fatalities for the Years 1996-2003 by Race	99
Table 22. Tennessee Child Fatalities for the Years 1996-2003 by Combined Categories of Race.....	100
Table 23. Tennessee Child Fatalities by Manner for the Years 1996-2003.....	101
Table 24. Tennessee Child Fatalities by Cause (1996-2003)	102
Table 25. Violent Child Fatalities by Cause of Death for the years 1996-2003	103
Table 26. Accidental Child Fatalities by Cause for the Years 1996-2003.....	105
Table 27. Natural Child Fatalities by Cause of Death 1996-2003	106
Table 28. Spearman Rho Correlations for Total Child Fatalities 1996-2003	112
Table 29. Spearman Rho Correlations for Violent Child Fatalities 1996-2003	115
Table 30. Spearman Rho Correlations for Accidental Child Fatalities 1996-2003	117
Table 31. Spearman Rho Correlations for Natural Child Fatalities 1996-2003	121
Table 32. Ranked and Grouped Percent of Rental Housing Cross-Tabulations.....	123
Table 33. Ranked and Grouped Percent of Vacant Housing Units Cross-Tabulations ..	123

TABLE	PAGE
Table 34. Ranked and Grouped by Average Household Size Cross-Tabulations	124
Table 35. Ranked and Grouped by Urban Location Cross-Tabulations	125
Table 36. Ranked and Grouped Percent of Female Heads of Households Cross-Tabulations.....	126
Table 37. Ranked and Grouped Percent of Single Heads of Households Cross-Tabulations.....	127
Table 38. Ranked and Grouped Percent of Spanish/Hispanic/Latino Heads of Households Cross-Tabulations	128
Table 39. Ranked and Grouped Percent of Non-white heads of households Cross-Tabulations.....	129
Table 40. Spearman Rho Correlation Summary Table	154
Table 41. Child Fatality/Neighborhood Characteristics-	155
Table 42. Rental Housing Units of Tennessee Neighborhoods and the Rate of Tennessee Child Fatalities (1996-2003)	230
Table 43. Vacancy Status in Tennessee Neighborhoods and the Rate of Tennessee Child Fatalities (1996-2003).....	231
Table 44. Average Household Size in Tennessee Neighborhoods and the Rate Child Fatalities Reported	232
Table 45. Urban Location of Tennessee Neighborhoods and the Rate of Child Fatalities Reported (1996-2003).....	233
Table 46. Female Heads of Households in Tennessee Neighborhoods and the Rate of Child Fatalities (1996-2003)	235
Table 47. Single Heads of Households in Tennessee Neighborhoods and the Rate of Child Fatalities (1996-2003)	236
Table 48. Spanish/Hispanic/Latino Heads of Households in Tennessee Neighborhoods and the Rate of Child Fatalities (1996-2003).....	237

TABLE	PAGE
Table 49. Non-white Heads of Households in Tennessee Neighborhoods and the Rate of Child Fatalities (1996-2003)	238
Table 50. Rental Housing Units in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)	239
Table 51. Vacancy Status in Tennessee Neighborhoods and the Rate of Violent Child Fatalities Reported (1996-2003)	240
Table 52. Average Household Size in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)	241
Table 53. Urban Location in Tennessee Neighborhoods and the Rate of Violent Child Fatalities Reported (1996-2003)	242
Table 54. Female Heads of Households in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)	243
Table 55. Single Heads of Households in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)	244
Table 56. Spanish/Hispanic/Latino Heads of Households in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)	245
Table 57. Non-white Heads of Households in Tennessee Neighborhoods and the Rate of Violent Child Fatalities Reported (1996-2003)	246
Table 58. Rental Housing of Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)	247
Table 59. Vacancy Status in Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)	248
Table 60. Average Household Size of Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)	249
Table 61. Urban Location of Tennessee Neighborhoods and the Rate of Accidental Child Fatalities Reported (1996-2003)	250
Table 62. Female Heads of Households of Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)	251

TABLE	PAGE
Table 63. Single Heads of Households in Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003).....	253
Table 64. Spanish/Hispanic/Latino Heads of Households in Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)	254
Table 65. Non-white Heads of Households in Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003).....	255
Table 66. Rental Housing in Tennessee Neighborhoods and the Rate of Natural Child Fatalities (1996-2003).....	256
Table 67. Vacancy Status in Tennessee Neighborhoods and the Rate of Natural Child Fatalities Reported (1996-2003)	257
Table 68. Average Household Size of Tennessee Neighborhoods and the Rate of Natural Child Fatalities (1996-2003).....	258
Table 69. Urban Location of Tennessee Neighborhoods and the Rate of Natural Child Fatalities Reported (1996-2003)	259
Table 70. Female Heads of Households in Tennessee Neighborhoods and the Rate of Natural Child Fatalities Reported (1996-2003)	260
Table 71. Single Heads of Households in Tennessee Neighborhoods and the Rate of Natural Child Fatalities (1996-2003)	261
Table 72. Spanish/Hispanic/Latino Heads of Households in Tennessee Neighborhoods and the Rate Natural Child Fatalities (1996-2003).....	262
Table 73. Non-white Heads of Households in Tennessee Neighborhoods and the Rate of Natural Child Fatalities (1996-2003).....	263

CHAPTER I

INTRODUCTION

Reducing the rate of child fatalities has been identified as a public-health priority internationally (UNICEF 2; Lopez 1173; & Healthy People 2010). According to UNICEF (2), an estimated 11 million preventable child fatalities occur annually world wide. One million children less than 15 years of age die each year from accidents, according to UNICEF (2) More than half of those children are likely to be younger than age five (UNICEF 2).

A report authored by the March of Dimes, in 2003, ranked the United States 28th out of 37 countries for a high infant-mortality rate of 6.9 per 1,000 live births (March of Dimes 2). In 2006, a report by UNICEF ranked the United States last out of 21 countries in the industrialized world in child health and safety, which was measured by infant-mortality, low birth weight, accident, and injury rates (www.usatoday.com). The countries ranked in the top ten included the Netherlands, Sweden, Denmark, Finland, Spain, Switzerland, Norway, Italy, Ireland, and Belgium. The Czech Republic ranked higher than “wealthier countries including France, Austria, the United States and the United Kingdom (www.usatoday.com).” Between 1996 and 2001, in the United States the number of child fatalities increased by 25,000 (Guyer, Martin, MacDorman, Anderson, and Strobino 916; MacDorman, Minino, Strobino, and Guyer 1049). In 2003, the United States’ rate of child fatalities was reported to be 65.9 per 100,000 children. The rate of child fatalities in Tennessee, for 2003, was reported to be higher at 83.5 per 100,000 children (National Center for Health Statistics 1).

In several states located in the southeastern United States, including Tennessee,

infant-mortality rates were reported, in 2007, to be rising (Lohr 1). Tennessee's infant-mortality rate was reported as 9.3 per 1,000 live births in 2002 (March of Dimes 2). In 2004, a report prepared at the University of Tennessee Safety Center and presented to the Tennessee Department of Health revealed a mortality rate for children less than one year of age to be 877.18 per 100,000 (Tennessee Department of Health 14). The rates exceeded the national infant mortality rate of 6.8 per 1,000 live births for both years (Mathews and MacDorman 1).

Injuries are the leading cause not only of child death and disability world wide but also of the approximately 20,000 child fatalities reported in the United States (Onwuachi-Saunders, Forjuoh, West, and Brooks 276). Surveillance, to track manner and cause of illness and death, has been used to identify populations and establish baseline data for prevention programs and initiatives (Jajosky and Groseclose n.p.; Lopez 1173; & Krieger, Williams, and Moss 369). Monitoring child fatalities also provides a way to track the cause and manner of death to determine if a death was preventable. Every state in the United States and the District of Columbia tracks fatalities by a child fatality review team process (National MCH Center For Child Death Review). The Tennessee Department of Health reports manner and cause of death for each child as a part of the Tennessee Child Fatality Review. The Tennessee Department of Health requires that each fatality be reviewed by the appropriate Judicial District Child Fatality Review Team. The result of each child fatality review was recorded on a Tennessee Child Fatality Review Team's Reporting Form maintained by the state (See Appendix A). The manner-of-death categories include homicide, suicide, natural causes, and accidental. For the purposes of this study, homicide and suicide child fatalities included deaths by firearms,

child maltreatment (child abuse and inadequate care), and inflicted injury. Natural deaths included congenital defects, Sudden Infant Death Syndrome, cancer, and illnesses.

Categories of causes include the following:

- Sudden Infant Death Syndrome (SIDS)
- Drowning
- Lack of adequate care
- Prematurity
- Suffocation and/or strangulation
- Inflicted injury
- Vehicular
- Poisonings
- Illnesses or other natural causes
- Fire/burns, firearms
- Other causes and unknown causes.

Because of differing manners and causes of child fatalities, two researchers pointed out more studies needed to be conducted to determine if socio- economic, demographic, or environmental factors affect health, illness, and fatality (Ellen & Turner 836). Studies have indicated that determinants of health for social, demographic and environmental characteristics of neighborhoods reveal whether these factors influence health, illness, or fatality (Hussey 218; Bosma, et al. 365). Determinants of health are the living conditions that determine health, illness, or fatality. These conditions include housing, neighborhoods, geographic location and social demographic factors (including gender, age, race, ethnicity, culture, income, employment, and health services) (World Health

Organization n.p.). When public-health professionals work to reduce child fatalities, the first considerations are health determinants (Ellen & Turner 836).

Neighborhood housing and demographic characteristics may determine health (Diez Roux 1783). Collins & Schulte (226) indicated neighborhood conditions and the environment also influence determinants of health. Research focusing on environmental factors provides a mechanism to determine if the environmental characteristics of neighborhood affect child fatalities. Healthy People 2010 has advocated that reducing child fatalities resulting from any manner or cause is important; according to Guyer, MacDorman, Martin, Peters, and Strobino (1348), efforts are needed to prevent child fatalities.

The Need for the Study

Between 1996 and 2003 in Tennessee, black children represented 36% of all reported child fatalities, which was 15% higher than for all other racial groups (Tennessee Department of Health). This disparity between the percentage of blacks and other races demonstrates the need for additional research to gain a broader knowledge of if and how neighborhood housing and demographic characteristics are associated with this high rate.

In the United States, Lee and Cubbin (428) reported in 2006 that their review of literature found no published articles focusing on health and its potential association with neighborhood-housing characteristics. Lee and Cubbin (428) indicated no studies had examined the neighborhood “context” and whether a relationship existed among race; ethnicity; socioeconomic status (SES); and specific health behaviors and health outcomes, such as preventable illnesses (i.e. cardiovascular disease, diabetes, and hypertension).

Tracking child fatalities and monitoring surveillance to gather information for baseline data has been supported in the literature as a need to carry out this investigation. The limited number of research studies in the United States and the lack of peer-reviewed published research on child fatalities in the State of Tennessee support the need for research related to reducing child fatalities

Theoretical Framework

A theoretical framework or model is important in research studies to provide an outline or map when developing the research-design and data-collection process. This map guides the research methodology, linking the theoretical components to form the research construct. Choosing the appropriate health theory guides the study design and methodology.

The Social Ecological Model is a framework reported in the literature as being appropriate to guide health research focusing on health protection and the public's health. This framework has guided multidisciplinary research, incorporating public health, social science, and medicine (Krieger , et al. 669; Stokols 286; Hill 369; Bronfenbrenner 117; Lawrence 543;Yen and Syme 297; Andrews 371; Fiscella and Franks; & Kaplan 126). Kaplan (127) advocated using the Social Ecological framework in his research because the “spatial scope over which determinants of specific outcomes such as all-cause mortality, infant mortality, or other outcomes, operate is less understood in the research ” (Kaplan 128). The Social Ecological Model has been recommended for understanding how diverse populations, living environment (including the neighborhood) and other (environmental factors can influence human health and illness (Stokols 286). Stokols

(290) suggested the neighborhood be considered to conduct research, develop interventions and create prevention programs. The Social Ecological Model forms a multi-integrated approach to health research for use in determining what associations or relationships exist between people and the neighborhood (Stokols 286; Winett 342; Wilkinson). Because the Social Ecological Model suggested neighborhoods and the environment might be related to human health and illness, the model was selected to guide this study. The Social Ecological Model addresses multiple factors and their effects on how an individual or people become ill, remain healthy, or die. This model has been shown to be used in health research for the purposes of studying child fatalities, causes and manners of child fatalities (National Cancer Institute 10; & Currie 514). Principles of the Ecological Framework as theorized by the National Cancer Institute indicated the different components of the framework include the following levels:

- Intrapersonal Level (i.e. knowledge, attitudes, and beliefs);
 - Interpersonal Level (i.e. family, friends, and peers for social support);
 - Community Level (i.e. institutional, community, and public policy)
- (National Cancer Institute 11).

Laflamme and Diderichsen (249) further supported using multiple factors to determine how social differences among people or areas affect health and safety. People might be affected by the relationship between social position and injury: “differential exposure (I) and differential susceptibility (II)” (294). These researchers postulated that contextual influences by the four entry points referring to different factors influenced health and safety. The social context included physical, cultural, social, and economic environments to characterize a neighborhood or society. Social context affects the social

position specific exposure, differential susceptibility and health. Laflamme and Diderichsen emphasized how physical and social settings were linked and influenced the pathways from social position to injury.

The Social Ecological Model was selected to guide this research study because this model addresses the possible association between the public-health issue of child fatalities and specific environmental and socioeconomic factors characterizing a Tennessee neighborhood where fatalities are reported. The factors include socioeconomic status of rental housing, vacancy status, average household size, urban location and the demographic characteristics of gender, marital status, ethnicity, and race for heads of households.

For this research study, the census tract was selected as the unit of analysis to represent the location of a neighborhood. The neighborhood was selected because previous research has indicated that the use of census tracts is an appropriate representation of a neighborhood (Shenassa, Stubbendick, & Brown 633; and Blakely 411). Shenassa, Stubbendick, & Brown (633) asserted that “conceptualizing the different components of the environment in which all children are part of a system forces the examination of the interconnections between different levels and the nature of interactions within the environment.” This premise is behind an ecological perspective. Furthermore, risk might be identified by examining each level’s factors that contribute to the positive development of children.

The following study has been designed to focus on whether an association exists between Tennessee neighborhood housing and demographic characteristics of heads of households in a neighborhood and the rate of child fatalities (violent, natural, and

accidental reported in a Tennessee neighborhood.

Purpose of the Study

The purpose of this study was to determine if an association exists between housing characteristics and demographic characteristics of Tennessee neighborhoods (census tracts) and the rate of child fatalities in the neighborhoods where child fatalities occurred between 1996 and 2003. The housing characteristics assessed included the amount of rental housing, vacancy status, average household size, and urban location. Demographic characteristics of household heads assessed in this study included gender, marital status, ethnicity, and racial group (Non-white).

Research Objectives

This research had the following objectives:

- to provide a descriptive profile of child fatalities in Tennessee between 1996 and 2003 by manner (including natural, accidental, homicide and suicide) and cause. For the purposes of this study, the manner-of-death categories for homicide and suicide are combined with the category of *violent* fatalities.
- to determine if an association exists between neighborhood-housing characteristics of rental housing, vacancy status, average household size, and urban location in Tennessee neighborhoods and the rate of child fatalities reported for Tennessee neighborhoods between 1996 and 2003.
- to determine if an association exists between the selected demographic

characteristics of heads of households in Tennessee neighborhoods and the rate of child fatalities reported for Tennessee neighborhoods between 1996 and 2003.

To address these research objectives, the following questions were formulated:

- Are neighborhood characteristics of housing (rental housing, vacancy status, average household size, and urban location) within a Tennessee census tract associated with the rate of child fatalities (violent, accidental, and natural) reported in Tennessee g 1996 and 2003?
- Are neighborhoods characterized by the demographic factors of heads of households (gender, marital status, ethnicity, and race) within a Tennessee census tract associated with the rate of child fatalities (violent, accidental, natural) reported in Tennessee neighborhoods from 1996 through 2003?

Assumptions

The following assumptions have been made:

- The Tennessee Child Fatality Review Team accurately reported manner and cause of child fatalities for 996-2003.
- The addresses recorded on the Tennessee Child Fatality Review Team Data Sheets were the addresses of the deceased children.
- The fatalities reported and reviewed by the Tennessee Child Fatality Review Team represented the majority of child fatalities reported in the State of Tennessee during 1996-2003.

- The census tracts recorded on the Child Fatality Review Team Data Sheets were the correct census tracts reported on the 2000 United States Census.
- The data retrieved from the 2000 United States Census short form was accurately reported by the respondents.

Delimitation

For the purpose of this research study, the following delimitation was made:

Because the data sources used in this study represented only Tennessee populations, results are not generalizable to other states in the United States.

Limitations

The research study was limited by the following:

- Child fatalities were reported by the Tennessee Child Fatality Review Team on the Child Fatality Review Team Reporting Form for an eight-year period between 1999-2003.
- The selected housing characteristics include the amount of rental housing, vacancy status, household size, and urban location self-reported and available in the Short Form Database and the Summary File 1 of the 2000 United States Census.
- The selected demographic characteristics of heads of households including gender, ethnicity, race, and marital status were self-reported and available

in the Short Form (D-61A) Database and Summary File 1 of the 2000 United States Census.

Operational Definitions

The following terms are defined for use in this study:

- Infant: a person from birth to age one
- Child: a person from age one to eighteen months. Ages are grouped as follows: 1) birth to age one year old; 2) age one to four years of age; 3) five years to nine years old; 4) Ten to fourteen years; and 5) fifteen to eighteen years of old.
- Accidental Child Fatalities: For the purposes of this study, this category was selected from the Tennessee Child Fatality Review Team Reporting form.
- Demographic factors: age, gender, and race for the descriptive profile. The demographic factors used to test the research questions and statistical hypotheses are gender, ethnicity, race, and marital status.
- Census tract: a small, relatively permanent statistical subdivision of a county delineated by a local committee of census data users for the purpose of presenting data. Census-tract boundaries normally follow visible features, but may follow governmental boundaries and other non-visible features in some instances; the census tracts are located within counties. Designed to be relatively homogeneous units regarding population, economic status, and living conditions at the time of establishment, census tracts average 4,000

inhabitants. They may be split by any sub-county geographic entity (United States Census Glossary 7).

- Head-of-household: a person self-reported on the 2000 United States Census short form that is living in a house, apartment, or mobile home and identified as 'Person 1' (United States Department of Commerce-Bureau of the Census).
- Householder: 'Person 1' as designated on the United States Census short form D-61A. For the purposes of this study, the 'householder' will be called 'head of household.' In most cases, this is the person, or one of the people, whose name under which the home is owned, being bought, or rented. If no person is designated as 'Person 1,' any household member fifteen years and older can serve as the householder for the purposes of the census (US Census).
- Household Size: total number of people living in a housing unit (US Census)
- Infant Mortality: infant death rate during a certain period of time.
- Manner of Death: classifications for manner of death, including Natural, Accidental, Homicide, and Suicide as listed on the Tennessee Child Fatality Team Data Sheets for 1996-2003.
- Marital Status: designation by respondent to 'Person 1' who self-reported by 'Person 2' on the United States 2000 Census Short Form (Form D-61A), in the category as 'husband/wife.' (See appendix.)
- Natural Child Fatalities: manner of death including congenital anomalies, Sudden Infant Death Syndrome, and other illnesses or causes.

- Neighborhood: rental housing, household composition reporting more than 2.60 members per household, Non-white heads of households, Spanish/Hispanic/Latino heads of households, single heads of households, and women-headed households. (The information will be collected from the 2000 United States Census' short form.)
- Occupancy and vacancy status: data on vacancy status obtained from the United State Census enumerators. The information was obtained from landlords, owners, neighbors, rental agents, and others (United States Census FactFinder 1). Unoccupied housing units are considered vacant by the United States Census FactFinder. Vacancy is determined with the terms by which the unit may be occupied, e.g. rent, for sale, or for seasonal utilization.
- Single head of household: the respondent designated as 'Person 1,' who is not reported by 'Person 2' on the United States 2000 Census Short Form (Form D-61A), as 'husband/wife.' (See appendix).
- Social Environment: housing characteristics and housing conditions.
- Social Epidemiology: the study of the role of social factors in the etiology of disease (Krieger, et al. 669).
- Spanish/Hispanic/Latino Head of Householder: 'Person 1' from the 2000 United States' Census Short Form, who self-reports as being 'Spanish/Hispanic/Latino.'
- Racial minorities: racial composition in this study will be categorized from the terms listed on the 2000 United States Census Short Form (D61-A) as 'Black' or 'Other' and those self-reported as any other race except 'White.'

- Rental Housing: all occupied housing units that are not owner occupied, whether rented for cash rent or occupied without payment of cash rent. ‘No cash unit.’ is separately identified in the rent tabulations by the United States 2000 Census.
- Tennessee Child Fatality Review Team: group that collects and reviews information of the death of each child under age eighteen reported in Tennessee. A 1995 law created the child-fatality review process managed by the State of Tennessee Department of Health. In each judicial district of Tennessee, a multidisciplinary team is composed of a medical examiner, physician, nurse, health department, social services, and law enforcement. In Tennessee, 34 of these teams have been established.
- The Total Number of Child Fatalities: the child fatalities reported by each Tennessee Judicial District Child Fatality Review Team for 1996-2003.
- Urban Locations: “territory, population, and housing units located within an urbanized area (UA) or an urban cluster (UC). The UA or UC consists of blocks that have a population density of at least 1,000 people per square mile and overall density of at least 500 people per square mile.” (United States Census Bureau 1)
- Violent Fatalities: homicides and suicides listed as the manner of death by the Tennessee Child Fatality Review Team on the Tennessee Child Fatality Review Data Sheets.

Chapter Summary

Chapter I provides background information and addressed the two-fold purpose of this study: to establish a descriptive profile by cause of child fatalities in Tennessee for an eight-year period (1996-2003) and to determine if neighborhood housing and demographic characteristics are associated with the rate of child fatalities (violent, natural and accidental) in Tennessee. Because of the need to reduce health disparities and prevent child fatalities, this study is crucial as indicated in published literature (Ehiri and Prowse⁵; and Durfee, Durfee, and West 629). Additionally, only a few studies have researched the association between the neighborhood environment and the socioeconomic factors to determine whether there is an effect on child fatalities. This introductory chapter presents the purpose of the study, the need for the study, theoretical framework, assumptions, delimitations, limitations, and the operational definitions. Chapter II provides a review of the literature.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter will address the literature and research related to child fatalities, housing characteristics, demographic characteristics, determinants of health, and the neighborhood as a unit of measure utilizing census tracts. Although research on various child health issues have been conducted, the research is devoid of studies performed with respect to child fatalities (Lopez 1173). Similarly, the published literature is scant regarding studies conducted focusing on the manner of child death including violent, accidental, and natural (Currie 522).

Studies have been conducted worldwide to determine the incidence and prevalence of child fatalities, the causes, risk factors, and influences of child fatalities. An estimated ten million children die every year throughout the world as a result of violent, accidental, and natural causes. Approximately 600,000 of the ten million child fatalities were indicated to have been preventable according to The Bellagio Study Group on Child Survival (323) and UNICEF (1). In “42 countries with 90% of child fatalities worldwide,” 63% of child fatalities could have been prevented (Bryce et al. 159). Internationally, the United Nations Millennium Development program has set a goal to reduce all child fatalities by the year 2015 (UNICEF 1). This goal includes concerted efforts from the member countries including the United States to reduce or prevent child fatalities. Research was found in published literature indicating there is a need to determine if any child fatalities in the United States could have been prevented (Guyer et al 1346; Guyer, MacDorman, Martin, Peters, and Strobino 1342; Schnitzer and Ewigman

421; Hoyert et al 1252; and Arias et al 1226). The research pointed out the United States had an estimated 25,000 children dying annually from violent, natural, and accidental manners during the years 1996-2001 and approximately 62% (17, 165 out of 27,489) of the child fatalities were preventable (Guyer, et al. 1348; and MacDorman et al 1049).

The United States ranked last out of 21 countries internationally for infant mortality rates, children's health and safety measured by accidents and injuries (Gifford 1). The State of Tennessee experienced a marked increase in child and infant mortality rates, of all 50 states in the United States (Kidscount 1). Tennessee ranked among the seven bottom states out of 50 states in the United States for overall child health including low birthweight infants, infant mortality, child fatalities, teen deaths, teen births, high school drop-out rates, and children living in families where no parent had full-time, year-round employment (Kidscount 1).

The National Maternal and Child Health Center for Child Death Review indicated, in 2003, for children aged zero to nineteen per 100,000 in United States, the rate of natural child fatalities was 44.8 per 100,000 (1). Tennessee had a natural child fatality rate of 57.3 per 100,000 for the same period. Accidental child fatalities were 14.8 per 100,000 in the United States and 20.2 per 100,000 in Tennessee, for the same year. A rate of 5.8 per 100,000 for violent child fatalities was reported in 2003, in the United States, and a violent child fatality rate of 5.3 per 100,000 in Tennessee. Tennessee child fatality rates exceeded the United States when sub-grouped by manner and causes of death (Kidscount 1; & National Maternal Child Health Center for Death Review 2) mortality rates by all causes and unintentional injury fatalities.

Neighborhood characteristics have been shown, in the literature, to be linked to

certain manner and causes of child fatalities (Onwauchi-Saunders, Forjuoh, West, and Brooks 279; Collins and Schulte 227; Shenassa, Stubbendick, and Brown 633; & Blakely, Atkinson, Kiro, Blaiklock, and D’Souza 414). Although the researchers determined a link in the individual neighborhood characteristics including household size, or other environmental housing characteristics, no research linked housing and demographic characteristics of a neighborhood. Prior published research by Onwauchi-Saunders, Forjuoh, West, and Brooks; Collins and Schulte; & Blakely, Atkinson, Kiro, Blaiklock, and D’Souza indicated more research needed to be conducted on the association by the rate of child fatality and neighborhood characteristics or environment (278; 230; & 416). Published research studies focusing on the potential association between child fatalities and census data in the United States and New Zealand indicated more surveillance, continued monitoring on child fatalities using the census tract as a way to assist in collecting the data (Onwuachi-Saunders, et al. 278; & Blakely, Atkinson, Kiro, Blaiklock, and D’Souza 411). The investigators reported the need for further research focusing on the potential association between child fatalities and census data.

Research Literature Related to the Manner and Cause of Child Fatalities

Violent Child Fatalities

Violent fatalities of children can result from injuries due to motor vehicle crashes, firearms, poisonings, suffocation, falls, fires, and drowning, child maltreatment, homicide, and suicide (Mac Dorman, Minino, Strobino, and Guyer 1049).

Homicide was identified as the fourth leading cause of death for children less than

15 years of age and was the second leading cause of death among American youth aged 15 to 19 years old, in 2000 (Mac Dorman, Minino, Strobino, and Guyer 1049). In 1997, more than 80 percent of American infant homicides were a result of child maltreatment (Healthy People 2010 n. p.; & MacDorman, Minino, Strobino, and Guyer 1049).

Homicide and suicide mortality attributable to firearm use have increased in the United States, since 1979. This increase is greater particularly for children 10 to 14 years old and teens 15 to 19 years of age (Hoyert, et al. 1253; Guyer, et al. 1346; Arias, et al. 1226; & Guyer, et al. 918).

Violence was reported as predominant across the United States. Tennessee is one of the states reporting more violent acts than other states (United Health Foundation 1). Tennessee is listed among 21 of the 50 states that have experienced an increase in the violent crime rate (United Health Foundation 1). Tennessee had an increase of 183 offenses per 100,000 of the population (United Health Foundation 1). In 2002, Tennessee ranked number 46 out of 50 states for having the highest number of violent crimes. Homicides were prevalent among Tennessee African-American males and White males aged 15 to 24 years of age (Tennessee Department of Health 5). Although children aged five and under make up 6.6% of the approximately five million people that live in Tennessee (Tennessee Department of Health 5). The child fatalities reported as a result of violent deaths comprised 25.51% of child fatalities in the eight-year period 1996-2003, according to the Tennessee Department of Health (5).

One population experiencing a “disproportionate share of violence (Rodriguez and Brindis)” is the Latino population. Homicide has been reported as the second leading cause of death among Latinos 15-24 years of age (Rodriguez and Brindis). Rodriguez

and Branis pointed out, although the Latino population is growing in the United States, limited research had been conducted focusing on violence and its association with illness or fatality within the Latino population. Rodriguez and Brindis sought to determine if social, economic, and political factors influence violence. The researchers recommend improving surveillance efforts before creating prevention or intervention programs (Tienda and Angel 510; & Woolf, Johnson, Fryer, Rust and Satcher 2080).

Reviewing the existing body of literature, studies have been found where neighborhood level factors were investigated to ascertain if neighborhood factors, such as housing or environmental factors, influenced violent acts and behavior (Yonas, et al. 670; Skogan 204; Myers and Thompson 258; & Sandel, Sharfstein, and Shaw 34). Yonas, et al. and Skogan examined neighborhoods located in the United States using socioeconomic factors (674; & 205). The investigators found the neighborhood factors of employment opportunities, vacant and dilapidated housing, trash management, ‘lack of legitimate businesses’ (676) and street lighting were related to youth violence. The authors further concluded to effectively address critical issues of public health such as youth violence, pursuing prevention and intervention efforts that honor and incorporate the culture of each neighborhood is essential (Yonas, et al. 682). Myers and Thompson (258) examined African-American child violence exposure from neighborhood factors including education, employment, income, vacant housing, and violence. The conclusion of the study was that “violence experienced was a significant predictor of posttraumatic stress symptoms...” (Myers and Thompson 263). Data suggested child coping was impacted by environmental stressors in the Myers and Thompson investigation (264). For African-American youth, “[L]ife events served as the strongest predictor of active ways

of coping” (Myers and Thompson 264). These findings also support the need to investigate child health issues (including mental health issues) and the factors that influence or impact child health to reduce or possibly prevent the propensity of youth violence in the future (Myers and Thompson 265).

Neighborhood characteristics were pointed out in the literature to predict violence, victimization, and homicide in Chicago, Illinois (Sampson, Raudenbush, and Earls 923). One objective of Sampson, Raudenbush and Earls was to show that violence is influenced by “socioeconomic and housing factors” (923). To meet the objective Sampson, Raudenbush, and Earls surveyed Chicago residents. The multilevel analysis showed the neighborhood was negatively associated with violence. As a result of the regression analysis associations of concentrated disadvantages and residential instability with violence being largely mediated by collective efficacy was found (Sampson, Raudenbush, and Earls 919). Collective efficacy in Sampson, Raudenbush, and Earls’ study was defined as the hypothesis “that residential tenure and homeownership promote collective efforts to maintain social control (919).” Risk factors have been found to not necessarily be the causes of violence, but upon identification can be used as predictors and markers for prevention programs or intervention initiatives (Yonas, et al. 682; Scholer, Hickson, and Ray 1186; and Youth Life Foundation of Tennessee 19). Measuring violence at the neighborhood level has been suggested to be an appropriate methodology for research in the literature (Skogan 205; & Ross and Mirowsky 262).

Accidental Child Fatalities

Internationally, accidents or unintentional injuries were reported to be a leading cause of child fatalities, in 2000 (Ellsaber and Berfenstam 42 and UNICEF 2). A 2001 UNICEF (2) report specified “injury is the principal cause of child fatality in all developed nations-accounting for almost 40% of deaths in the age group one to 14.” Published research have found accidental child fatalities or unintentional injuries to be a primary cause of child death, in the United States (Rivara and Grossman 791; Kypri, et al. 432; Powell and Tanz 42; Scholer, Mitchel, and Ray 342; & Onwuachi-Saunders, Forjuoh, West, and Brooks 277).

In 1999, research published by Scholer, Hickson, and Ray reported injuries to be the primary cause of sickness and death in youth, in the United States (1183). The leading cause of child fatalities for ages one to nineteen years were due to accidents and injuries, in 1996-1997 and 2000-2003, in the United States (Guyer, et al. 1346; Hoyert, Freedman, Strobino, and Guyer 1253; Arias, MacDorman, Strobino and Guyer 1226; & Scholer, Mitchel, and Ray 342).

Motor vehicle crashes have been indicated to be one of the more commonly reported causes of accidental child fatality, in the United States (Scholer, Mitchel, and Ray 343; and National Center for Injury Prevention and Control 4). Shultz, in 2004, reported motor-vehicle crashes were the leading cause of death among children older than 1 year of age in the United States (78). The study was designed to investigate the occurrence of child passenger deaths involving drinking drivers during 1997—2002. Using the Centers for Disease Control’s data from the Fatality Analysis Reporting System (FARS) of the National Highway Traffic Safety Administration, existing data

was collected and analyzed. The results of the analysis showed that among the 2,355 children who died in alcohol-related crashes, 1,588 (68%) were riding with drinking drivers; the majority of these children were not restrained. To reduce the number of child fatalities in alcohol-related motor-vehicle crashes, creating effective interventions were indicated to be needed to prevent alcohol-impaired driving and to increase use of child passenger restraints (Shultz 79). Other causes of child fatalities have been indicated to contribute to wide disparities especially by race, socioeconomic status, and gender (The National Center for Child Death Review 1). Vehicular crashes were the reported leading cause of child death in Tennessee between the years 1996-2003 (Tennessee Department of Health 17; Tennessee Department of Health 22; Tennessee Department of Health 22; Tennessee Department of Health 16; Tennessee Department of Health 20; and Tennessee Department of Health 21). One investigation studied Tennessee child fatalities and socio-demographic factors of maternal age, race, education, number of other children, marital status, twin or single birth, residence, and birth weight Scholer, Hickson, and Ray determined “[L]ow maternal education, young maternal age, increased number of other children, having an unmarried mother, and very low infant birth weight were strongly predictive of higher risk” for Tennessee child injury mortality (1186). Accidents and injury fatalities were also indicated to be the number two leading manner of death for children between the ages of one to seventeen, in Tennessee from 1997-2003 (Tennessee Department of Health 1; Tennessee Department of Health 1; Tennessee Department of Health 8; Tennessee Department of Health 10; Tennessee Department of Health 8; and Tennessee Department of Health 9).

Drowning fatalities among children were reported by Brenner to be prevalent

throughout the world (1049). Brenner reported an estimated 500,000 children in the world died from drowning in 1998(1049). Research, conducted by Brenner, determined child fatalities caused by drowning, in the United States, were similar to the worldwide figures (1050).

Investigations have found there is a need for further research to determine how unintentional and intentional child fatalities caused by firearms could be prevented (Onwuachi-Saunders, Forjuoh, West, and Brooks 277; Webster and Starnes 1467; Powell 1364; Kypri, Chalmers, Langley, and Wright 433; & Powell and Tanz 43; Rivara and Grossman 794). The Firearm Injury Surveillance Study, for the years 1993-1997, found an estimated 115,131 children were treated for a nonfatal gunshot wound during the study period. Boys five to nine and ten to fourteen years old had the highest rates of injury related to non-powder firearms, an estimated 36.2 and 99.8 per 100 000, respectively. Fifty-six percent of those fifteen to nineteen years old were assault victims.

Only three studies published in the literature linked neighborhood level effects with accidental fatalities (Aneshensel and Sucoff 301; Sandel, Megan, Sharfstein 30; & Cubbin, LeClere, and Smith 518). Neighborhood level effects were selected for analysis, in the study conducted by Cubbin, LeClere, and Smith to determine that a relationship existed between socioeconomic status including “age, sex, self reported race and ethnicity, marital status, income to needs ratio, educational attainment, employment status, and occupation (Cubbin, LeClere, and Smith 518)” and accidental fatalities (520). The neighborhood characteristics designated by census tracts included family income, poverty, education, rental housing units, crowded housing, mobility, unemployment, vacant housing, female headship, and marital status and were used in the study to identify

which characteristics had effects on fatalities due to injuries (Cubbin, LeClere, and Smith 518). Results of the study, by Cubbin, LeClere, and Smith reported more accidental deaths occurred in single males of lower economic status and lower educational level than single or married females in the study (520). Homicides were reported to be more likely to occur in the black youth population than white youth. White youth were more likely to die from suicide than black youth (Cubbin, LeClere, and Smith 520). Accidental fatalities were found in the study published by Cubbin, LeClere, and Smith to occur more frequently in impoverished and racially diverse (520). Other neighborhood factors were high rates of unemployment and single male heads of households. Vacant housing (at the $p < 0.01$ level) was found to be prevalent in the Cubbin, LeClere, and Smith study (521). Cubbin, LeClere, and Smith concluded socioeconomic and neighborhood characteristics were “independently associated with the risk” of accidental fatalities and recommend the need for more studies focusing on neighborhood factors (524). The research was asserted to be important to policy makers, health planners, and for creation of intervention programs (Cubbin, LeClere, and Smith 524). Cubbin, LeClere, and Smith; Braveman, et al.; & Aneshensel and Sucoff recommended more research be conducted on fatalities and neighborhood effects, which supports the need for this study focused on Tennessee child fatalities and whether an association exist with neighborhood housing and demographic characteristics (Cubbin, LeClere, and Smith 525; Braveman et al. 2881; & Aneshensel and Sucoff 296).

Additional characteristics might have turned out to be as significant as the selected variables understudy limited the study power due to confounding (Aneshensel and Sucoff 306; & Blakely, et. al. 415). The confounding factors included demographic

factors of race, education, income, and age, which showed the importance of studying socioeconomic status, demographic characteristics, and neighborhoods and children health issues (Aneshensel and Sucoff 298; Braveman et al 2885; & Blakely, et. al. 416). Determinants of health including the neighborhood, income, urban or rural location, and wealth were used to assess whether associations existed between the variables and fatalities supports the need for this study (Braveman et al. 2881; Aneshensel and Sucoff 307; & Blakely, et. al. 416). Child fatalities were identified by Braveman, et al.; Aneshensel and Sucoff; & Blakely, et al being affected by determinants of health including socioeconomic status, race, age, and neighborhood context (2881; 307; & 416).

Natural Child Fatalities

Natural child fatalities occur from illnesses such as cancer, diabetes, or heart conditions, congenital anomalies, genetic illnesses, low-birth weight infants, infections and asthma (National Maternal Child Health Center For Child Death Review 1). Four million infants were reported to die every year from complications of childbirth throughout the industrialized world (Save the Children 4). Across the world in 2006, infant mortality rates are high (Frey and Field 215). Frey and Field recommended developing policies, in Sub-Saharan Africa that promote financial incentives, increase maternal education, and reducing family debt to support reduction of infant mortality rates (230).

According to the National Maternal Child Health Center for Child Death Review there were 23,094 natural deaths {not including Sudden Infant Death Syndrome} of children under the age of one in the United States, in 2000. The National Maternal and

Child Health Center for Child Fatality Review reported child fatalities from natural causes were the leading category of child deaths, in the United States (<http://www.childdeathreview.org/>). Research associated with child fatalities from natural deaths has been reported as an effective method for designing future programs to reduce or prevent child fatalities (Hessol and Fuentes-Afflick e50). The rate of infant deaths is one critical indicator of a population's health (Healthy People 2010; Jain 408; & Hobcraft, McDonald, and Rutstein 375). The rate of death can indicate the overall state of maternal health and can be related to the quality and accessibility of primary health care, according to Healthy People 2010.

Despite a reduction in the rate of infant mortality, in the United States during the 1980's and 1990's, in 2004 the rate remains among the highest in the industrialized world (Spence). An assessment by Howse and Caldwell reported this trend reversing, in 2004, with the first increase in infant deaths reported in the United States of America in 40 years (1). On cause of infant death labeled as a 'natural death', Sudden Infant Death Syndrome (SIDS) is prevalent. Sudden Infant Death Syndrome is "the sudden death of an infant less than one year old" (March of Dimes 2). The etiology of the disease is not known and there is obviously no cure for Sudden Infant Death Syndrome. Infants that loose their life from SIDS die at a greater rate than infants who die from cancer, heart disease, pneumonia, violence, HIV/AIDS, cystic fibrosis, and muscular dystrophy all combined. SIDS is the lead cause of death for children between the ages of one month to one year old. More infants die from SIDS between two and four months of age. SIDS occurs in all races and ethnicities nationally and internationally. This syndrome is the leading cause of death among all racial and ethnic groups in the United States.

Nationally, black infants have a higher SIDS rate (1.38 per 1,000) greater than two times the national average (.66 per 1,000) (American Academy of Pediatrics 1350; Department of Health and Human Services). Native American infants (1.52 per 1,000) also have a higher SIDS rate than the national average (.66 per 1,000) and are two or three times more likely to die from SIDS than other races or ethnicities, according to the Department of Health and Human Services.

Infant mortality rates greater than the national average have been found to represent marked health disparities in certain groups (March of Dimes 2). Infant mortality rates in Tennessee exceed the national average. Tennessee's infant mortality rate of 9.2 per 1,000 live births was reported to exceed the national average of 4.5 per 1,000 live births consistently for the year 2003 (March of Dimes 2).

According to the Department of Health and Human Services at the federal level, 40% of Tennessee SIDS fatalities were reported as African-American or Non-white infants. Prematurity is defined as infants "born before 37 weeks gestation and weighing 2500 grams or less" (March of Dimes 2). The March of Dimes reported in 2003, that the number of babies dying from prematurity, in Tennessee, is increasing (1). In Tennessee, deaths from prematurity, illness and other natural causes fatalities have been reported as three of the leading causes of death in the child population less than one year of age (Tennessee Department of Health 17; Tennessee Department of Health 22; Tennessee Department of Health 22; Tennessee Department of Health 16; Tennessee Department of Health 20; and Tennessee Department of Health 21).

Increased surveillance and tracking have been recommended by prior research information for future reduction programs (Collins and Schulte 227). Before programs can be

enhanced, improved, or developed surveillance and tracking needs to continue for the purposes of collecting data. Surveillance and tracking have been suggested as ways to provide support for carrying out child fatality assessments (Tennessee Department of Health).

Research Literature Related to the Impact of Health Status on Housing Characteristics

Introduction of Research Literature Related to Health and Housing Characteristics

Housing characteristics, such as home rentals/ownership, urban/rural location, household size, vacancy/occupancy, and the internal/exterior environment, have been reported in published research to be important determinants of health (Lawrence 540; Lawrence 162; Kemeny 18; Krieger and Higgins 758; Ross and Mirowsky 259; & Thomson and Petticrew 5). The assessment of housing characteristics has been a research method used to measure the association or relationship between health status within a community (Thomson and Petticrew 11; Lawrence 163). In 2004, Lawrence reported in a research study reported housing characteristics were important to health status (163). Lawrence found housing characteristics were “pertinent because the environmental and social conditions in specific residential environments have an impact on human relations, induce stress, and can have a positive or negative impact on the health status of groups and individuals” (163).

The Relationship Between the Number of Rental Housing Units and Health Status

Published research focused on the relationship between the amount of rental housing in a neighborhood and health status was very limited (Bryant, Chisholm, and

Crowe 2; Ross and Mirowsky 264; Krieger, et al. 341; Krieger and Higgins 765; & Lawrence 542; Turner 66; Thomson and Petticrew 10; Shenassa, Stubbendick, and Brown 632; Mabry 194; Cubbin and Winkleby 561; Cubbin, LeClere, Smith 519; Chi and Voss 15; & Sandel, Sharfstein, and Shaw 9). In 1950, Mabry developed and used “a three-factor index of social rank (rent, education, and occupation)” to study social status differences in Connecticut neighborhoods by using census tracts (194). Mabry determined that rental and occupational variables were associated with urban census tracts (194). This study found, in Connecticut, census tracts varied according to rent, education, and occupation (196). In this study, a Spearman Correlation was selected as the statistical procedure to measure dispersion between rank-ordered census tracts, occupation, education and rental status, in Connecticut neighborhoods (Mabry 194).

In published research presentations given by Bryant, Chisholm, and Crowe, in 2002, indicated housing characteristics [including rental housing, homelessness, affordability, household size, and location of a neighborhood] were found to be a determinant of health (2). Research by Bryant, Chisholm, and Crowe found housing characteristics and demographic characteristics were shown to affect health (2). Housing tenure (renting versus ownership) has been measured can be considered as housing tenure because studies have indicated housing functions as “multiple connections between housing conditions and the lives of human related to human type of renters as opposed to owners and specific locations” (Turner 66) . Chi and Voss did not investigate health status as a variable in their study; however rental housing or ownership was studied to determine if there was an effect on migration patterns (15). The housing characteristic of renting versus ownership has also been reported to be a factor in

studying population migration (Chi and Voss¹⁵).

Research by Thomson and Petticrew; & Shenassa, Stubbendick, and Brown in 2004 confirmed home ownership or the neighborhood characteristics of rental housing were linked to health status (10; & 633). Studies showed rental housing units are directly correlated to the social determinants of health (Bryant, Chisholm, and Crowe 2; Lawrence 541; Sandel, Sharfstein, and Shaw 40 & Thomson and Petticrew 11). Research showed the more rental housing units the more likely there would be negative health effects (Bryant, Chisholm, and Crowe 2; Lawrence 541; Sandel, Sharfstein, and Shaw 40 & Thomson and Petticrew 11). The adverse health effects could be due to inability or difficulty to pay rent, household size, or lack of owned housing units. Thomson and Petticrew suggested an increase or decrease in neighborhood rental housing unit's effect on health, for examples if a person lived in rental housing, individuals were reported to have poor health (13). Rental housing units were identified as linked with poor health status and poverty and to be considerations in the decrease in rental housing units providing a population-based strategy to improve health and reduce health inequalities (Thomson and Petticrew 14; & Bryant, Chisholm, and Crowe 4). Other published research consistently showed how health status is effected when housing is unaffordable or vacated (Thomson and Petticrew 13; & Sandel, Sharfstein, and Shaw 8). Published research reported by Thomson and Petticrew; and Sandel, Sharfstein, and Shaw that general However, available research suggests that general housing improvement appears to have the potential to improve health, especially mental health (15; & 8). Internal and external factors have also been linked to neighborhood housing characteristics (Thomson and Petticrew¹⁰). Few studies have actually evaluated the health impact of interventions

to reduce exposure to these hazards, or the health impact of general housing improvement (type of housing units whether rental or ownership, socioeconomic factors and other neighborhood characteristics).

Increased housing satisfaction following housing improvements has been strongly linked to improvements in mental health. General housing improvements may also result in improvements in physical health and general well-being (Thomson and Petticrew 16). However, the potential that housing improvement has to generate health improvement cannot be considered separately from other changes that residents may experience as part of housing improvement, such as increased housing costs, relocation and more general neighborhood changes. Some of these may have additional health impacts, either negative or positive (Thomson and Petticrew 16).

Turner (67) asserted cultural, social, economic, political, environmental and individual human factors should be taken into consideration when assessing the characteristics of housing tenure such as housing type, and rental or home ownership.

The Relationship Between the Number of Vacant Housing Units and Health Status

The housing characteristic of the number of vacant housing units in a neighborhood was used as a measure to reflect a determinant of health for adults and families (City of Indianapolis Mayor's Office 2; Shai 151; Cohen, et al. 469; Cubbin, LeClere, and Smith 518; Coulton, Korbin, Su, and Chow 1271; Cohen, Mason, Bedimo, Scribner, Basolo, and Farley 468; Ross and Mirowsky 265; & Aneshensel, Carol S. and Clea A. Sucoff 301). This study did not specifically address child fatalities. However, of the few studies conducted assessing vacancy status none focused on child mortality and

vacant housing units (City of Indianapolis Mayor's Office 2; Shai 151; Cohen, et al. 469; Cubbin, LeClere, and Smith 518; & Aneshensel, Carol S. and Clea A. Sucoff 301). In two studies assessing vacancy rates, Shai sought to determine if an association existed between social and demographic factors (vacancy status, income level, age of houses, language, age, length of time living at the residence, employment) and the rate of reported nonfatal structural fire injuries for the civilian population for Philadelphia in specific census tracts for the years 1989-2000 and 1993-2001(121; & 151). Vacant houses were recommended to be effectively boarded up or renovated for residential use, because the implication was made that vacant housing promotes neighborhood "decline" (Shai 151).

Vacant units were studied as a housing characteristic by Cohen, et al. (468). Environmental demographic and neighborhood characteristics (race, marital status, educational level, employment status, income level, and vacant housing units) were assessed along with data collected from the 1990 United States Census in 107 American cities to determine if any of these neighborhood characteristics influenced the rate of premature deaths of individuals in those neighborhoods. Vacant housing units were found by Cohen, et al. to be statistically significant predictors of mortality in the subjects under study who reported to be married and black (469). In this study, vacant housing status was also associated with premature mortality caused by cancer, diabetes, and fatalities caused by violence from homicide and suicide (Cohen, et al. 470).

Research by Cohen, et al. recommended where future research studies are needed to examine specific socioeconomic and neighborhood characteristics as determinants of health and illness (City of Indianapolis Mayor's Office 2; Shai 151; Cohen, et al. 469;

Cubbin, LeClere, and Smith 518, HUD 2; & Aneshensel, Carol S. and Clea A. Sucoff 301).

The Relationship Between the Number of Average Household Size Housing Characteristic and Health Status

Household size has been identified by investigators as a determinant of health (Agran, Winn, Anderson, and Del Valle 190; Anderson, Agran, Winn, and Tran 33; UNICEF 2; Cubbin and Winkleby 563; Cubbin, LeClere, and Smith 518; Krieger, Williams, and Moss 362; Blakely et. al. 412; Turner 67; Angel and Tienda 1363; & Yen and Syme 297). Household size has been studied to assess the relationship between cultural, social, and psychological variables and illness and fatalities (Turner 67). Household size has also been linked to disease transmission and as a risk factor for illness, and fatalities (Agran, Winn, Anderson, and Del Valle 190; Krieger, Williams, and Moss 362; Shai and Lupinacci 117; & Sandel, Sharfstein, and Shaw 40).

Household composition in a study by Angel and Tienda was defined as “household members including ‘non-nuclear’ members” (1362). Angel and Tienda’s research focused on the relationship between income and household size (1362). Schnitzer and Ewigman completed research assessing the relationship between household size and adults committing child maltreatment fatalities (e692). Schnitzer and Ewigman’s study recommended a need for future research on child fatalities and household size (e693).

Blakely, Atkinson, Kiro, Blaiklock, and D’Souza’s research completed in 2003 found an independent association between household size and child mortality (411). A

study by Blakely, et al. reported lower socioeconomic position of a household and household crowding were associated with increased child mortality (Blakely, Atkinson, Kiro, Blaiklock, and D'Souza, 410). To complete this research Blakely, et al. compared information from census and mortality records (410). The gender, birth data, ethnicity, location of residence and origin of birth were documented. This study was conducted in New Zealand. Published reports of the study found a higher mortality rate among those household representing the lowest when compared to those households reporting the highest socioeconomic categories of education, household income (for boys only), and available transportation. There was an association between child mortality and household crowding" (411).

In a United States Census Bureau study, household size was assessed to determine if household size is associated with an increased risk of inflicted-injury related child fatality in single parent households (1). Research by Agran, et al. reported no increased risk of inflicted-injury child fatality in single parent households where no other adult resided (190). There was however a twofold increase in households where other adult relatives lived and a significant increase in death (50 times greater) in households including unrelated adults (1). Household size has been indicated to be a significant variable for inclusion in multilevel research (Agran, Winn, Anderson, and Del Valle 190). Household size was also indicated as an important risk factor of chronic illness and fatalities in research published by Krieger, et al. in 2002 (477).

The Relationship Between the Urban Location Housing Characteristic and Health Status

Existing published literature reported using urban, suburban, or rural location as housing characteristics effecting health status in studies completed abroad and in the United States (Clark and Savitz 142; Eberhardt, et. al. 4; Lee and Cubbin 430; Cubbin, LeClere, and Smith 519; Andrews 371; Buka, Brennan, Rich-Edwards, Raudenbush, and Earls 2; Blumenthal and Kagen 109; Weiss, Ompad, Galea, and Vlahov S155; Todd 143; McConnochie, Roghmann, Cohen and Swift n.p.; van Dis 108; Liptak 775; Ross and Mirowsky 266; Yen and Syme 291; Bosma, van de Mheen, Borsboom, and Mackenbach 364; Lawrence 169; Mabry 196; Chi and Voss 16; & Powell and Tanz 41) . Although published research had been conducted focusing on urban or rural location, few of the published research studies addressed the possible association between urban or rural location and child fatalities. Following a review of the literature, three published research studies were found analyzing the potential relationship between the urban/rural location of a household and the rate of child fatalities (Clark and Savitz 145; Powell and Tanz 42; & Tekce and Shorter 259). In one study, researchers investigated child fatalities caused by firearm assaults and whether an association existed with age, race and poverty; and profiled children's child fatalities in rural and urban locations. Clark and Savitz found that victimizations of rural residents have risen, in the past 20 years (146). However, the specific victimization of children, in the study, was found to be lower in rural areas and higher in urban areas. In this study, Clarke and Savitz defined urban location as a "metropolitan area" (142). In another study by Powell and Tanz utilized the 1990 United States Census Tracts to define an urban location in their research (41). In 1999, Powell and Tanz, from research conducted using data from 1984 to 1994, found that black youth

living in urban areas in Chicago, Illinois were at risk to be fatally wounded by a firearm (43).

Research studies conducted in India and Jordan focused on the association between child mortality and urban location of the child's household (Claeson, Eduard R. Bos, Tazim Mawji, & Indra Pathmananthan 1196; & Tekce and Shorter 258). In the research published by Claeson, Bos, Mawji, and Pathmananthan the rate of child fatalities was higher in the urban locales (1196). In the Tekce and Shorter study socioeconomic status and urban location, in Jordan, effected child mortality (277).

In published research urban location was included as a neighborhood characteristic and was used to determine if a relationship with child health issues including injury, child development, low birth weight infants, and cardiovascular health behaviors and all cause mortality across the age spectrum (Lee and Cubbin 432; Andrews 371; Buka et al. 2; Blumenthal and Kagen 109; Weiss, Ompad, Galea, and Vlahov S155; Todd 143; Bosma, van de Mheen, Borsboom, and Mackenbach 364; & McConnochie, Roghmann, and Liptak 775). A time-series (1996-1998) research analysis was used to track trends in mortality rates, in both urban and rural locations (Eberhardt, et. al. 4 and 44). From 1996-1998, the infant and child mortality rates were found to be higher in the rural south than in urban areas. During the two year time frame, the teen mortality rates, by gender, increased in the urban locales with males increasing from 47 to 78 per 100,000 people and females increasing from 23 to 38 per 100,000 people (Eberhardt, et. al. 44).

Chi and Voss used urban and rural characteristics for analysis to classify what type of location a family might migrate (16). In a study conducted by McConnochie,

Rogghmann, and Liptak (776) a cross-sectional and ecologic approach was utilized by applying *International Classification of Diseases* (ICD) codes to categorize 7883 hospitalizations for infants (age, <24 months) beyond the newborn period between 1985 and 1991. Postal zip codes defined socioeconomic areas as inner-city, other urban, and suburban for the population at risk. In the study, inner-city infants represented 62% black and 65% Medicaid-covered infants (McConnochie, Rogghmann, and Liptak 776). Only 3% of suburban infants were found to be black and 6% of the suburban infants were covered by Medicaid. Hospitalization rates were also compared among the three socioeconomic areas (McConnochie, Rogghmann, and Liptak 777). The investigators found the hospitalization rate for inner-city infants was much greater than the rate for suburban infants (McConnochie, Rogghmann, and Liptak 777).

Research by Andrews was conducted to determine whether the health and welfare of urban children could be improved with preventative services by measuring child development and space (371).

Expanding the traditional medical model to encompass a broader socioecological framework suggests additional shifts in the focus of prevention research. First, the focus on risk factors operating at the levels of the sociology rather than the physiology of health and disorder means that the social situations of everyday behaviors (homes, schools, neighborhoods, day-care centers) form a primary field of interest. Second, the interaction effects of social behavior require us to consider the influences of significant others in the lives of children: parents and families, teachers, peers, and representatives of institutions. The socioecological

model forces us to be aware of social phenomena that may be affecting the health status of the child, often at some distant source. (Andrews 372)

Furthermore, Mabry (196) maintained using urban location and determining association with a housing characteristic (rental units) and socioeconomic status factors (occupation and education) was important (196).

Research Literature Related to the Demographic Characteristics of Heads of Households

The Relationship Between the Demographic Characteristic of Female Headed Households and Health Status

The literature review identified few published studies addressing the relationship between the neighborhood demographic characteristic of the number of regarding female heads of households and the rate of child fatalities. A published study reported a child living in a single parent, female heads of household would have an increased risk of death from homicide occurring in the home (Hussey 220). This study also assessed family income and parental education as factors to determine if relationships existed, between these factors and death from injury in children ages zero to seventeen years (Hussey 221). The research published by Hussey, in 1997, found that in female headed households a greater risk of death from injury existed for African-American children (221). Other research studies found, assessed female headed households to determine what impact having a single female parent had on child health status and child deaths caused by fire (Krieger, Williams, and Moss 363; Coulton, Korbin, Su, and Chow 1271; & Shai and Lupinacci 117). Leclere, Rogers, and Peters concluded female headship of a household

was a predictor of African-American adult mortality risks (183). Leclere, Rogers, and Peters stated being “less interested in whether the density of female-headed households in neighborhoods affects the behavior of others...” (93) and rather focused on the individual household rather than the neighborhood. The investigation was carried out to determine the effects of female headed households in census tracts had on coronary heart disease (CHD) death rates for the years 1986-1990 (Leclere, Rogers, and Peters 92). Households headed by females put the women at greater risk to die from heart disease, as reported by Leclere, Rogers, and Peters (100).

The Census Bureau pointed out more than eight in ten single-parent families in urban areas were maintained by women. About five single parent mothers for every single parent father were estimated (1). Female heads of households and income level were reported by Angel and Tienda as units of measure under study (1379); & Chi and Voss (15). Although child fatalities were not under study in neither the Angel and Tienda nor the Chi and Voss (investigations, the female head of household variable was advocated as important to study in their research projects to determine if the size of the extended family households impacted the level of income and what impact the variable had on mobility of people versus staying in suburbia or in a rural location (1379; & 15). In the study by Angel and Tienda more extended family arrangements in homes headed by unmarried females of Mexican and Non-white decent were reported, in 1982 (1365). The demographic characteristic of female heads of household in neighborhoods were shown to affect health status (Cubbin, LeClere and Smith 523; Brooks-Gunn, Duncan, Klebanov, and Sealand; Xue, Levanthal, Brooks-Gunn, and Earls 557; & Ross and Mirowsky 264). Cubbin, LeClere and Smith (524) made the case, from the results of an

investigation that socioeconomic status and neighborhood characteristics such as female heads of households should be considered when writing policies or creating interventions to prevent or reduce injury mortality in adult age (years 18-64) individuals. In contrast, Brooks-Gunn, et al. (360) only give a brief mention of female and single heads of households, giving way to seemingly preconceived notions of the urban minority neighborhoods that an expected welfare culture existed, which definitely affect Non-white child and adolescent development. The stereotype was pervasive throughout the investigation and seemingly spilled over into the conclusion and results, although the researchers admittedly used “developmental data” for the purpose of analysis in the study (354). Researching demographic characteristics and child fatalities further guided the present investigation because of the lack of research that exists on female heads of households.

The Relationship Between the Demographic Characteristic of Single Headed Households and Health Status

Using the variable of single heads of households as a demographic characteristic unit of measure to study has been identified by researchers to be very important in determining the effects on health status (Anderson, Agran, Winn, and Tran 33; McDonough, Williams, House, and Duncan 18; Angel and Worobey 41; Schnitzer and Ewigman e693). Researchers, to further understand socioeconomic status, analyzed single heads of households and child fatalities (Schnitzer and Ewigman e693; McDonough, Williams, House, and Duncan 27; & Anderson, Agran, Winn, and Tran 37). The United States Census Bureau, in a 2005 report, indicated that a single-parent living in

rental housing was more likely to not be employed, have no mode of transportation, have no phone, and dwell in crowded housing (2). In the United States Census report, four out of ten single-parent renters were jobless and the rate of joblessness for single parents who were home owners was sixteen percent. Single-parents living in rental housing were reported to be over-crowded (2). The United States Census Bureau, in 2005, reported more than two-thirds (69 percent) of metropolitan area one-parent families rented a home rather than owning it (Bureau of Census 1).

The Relationship Between the Demographic Characteristic of Spanish/Hispanic/Latino Headed Households and Health Status

Although few published research studies were found assessing the demographic characteristics of Spanish, Hispanic, and Latino heads of households and the possible association between the percent of Spanish, Hispanic, and Latino heads of households and the rate of child fatalities in a neighborhood; studies have been conducted to determine whether there is an influence of individual and neighborhood socioeconomic status (SES) on mortality among black, Mexican-American, and white women and men in the United States (Angel and Worobey 43; Braveman, et al. 2882; Aneshensel, and Sucoff 296; Cubbin, LeClere, and Smith 519; Cubbin and Winkleby 561; LeClere, Rogers, and Peters 181; & Winkleby and Cubbin (445). The National Health Interview Survey (1987–1994) was linked with 1990 census tract (neighborhood proxy) and mortality data through 1997. One finding of the study by Winkleby and Cubbin was mortality rates for all six gender and racial/ethnic groups, including black men and women; white men and women; and Mexican-American men and women, were two to

four times higher for those with the lowest incomes compared with those with the highest incomes (445). Winkleby and Cubbin (450) concluded that living in a low SES neighborhood affected the additional mortality risk beyond individual SES.

Published research indicated the importance of conducting research among Spanish, Hispanic, and Latino people (Angel and Tienda 1363; Yen and Syme 297; Aber, Bennett, Conley, and Li 477; & Tienda and Angel 510). In the Angel and Tienda study, Hispanic and Mexican American families, in the United States, were chosen to study because there is “less” (1363) known about the Hispanic and Mexican American people living in the United States. However, the increase in the Hispanic, Latino, Spanish, and Mexican American populations make the need to inform and contribute to the small amount of published literature on Hispanic and Latinos provide an opportunity to effect health care change and improvement in the populations (Angel and Tienda 1363; & Tienda and Angel 510). The importance of studying Spanish, Hispanic, and Latino individuals has been identified in two studies conducted by Anderson, Agran, Winn, and Tran (33) and Agran, Winn, Anderson, and Del Valle (189). “In the US, minority ethnic and racial groups have had unprecedented rates of growth, with the Hispanic population predicted to become the second largest ethnic/racial minority in the next decade” (Anderson, Agran, Winn, and Tran 33). A study published by Anderson, Agran, Winn, and Tran investigated if an association between demographic characteristics, such as household size and poverty on Hispanic or non-Hispanic injury rates of children (34). Anderson, et al. found child injury rates were associated with the neighborhood characteristics of household size, English literacy rates, and the number of families who had lived in the United States less than five years (Anderson, Agran, Winn, and Tran 36).

Moreover, evidence was found in the literature, in agreement that because of the sparse research conducted on Spanish/Hispanic/Latino populations, reducing health disparities, child injuries, and child fatalities are important to further research studies (Agran, Winn, Anderson, and Del Valle 189).

The Relationship Between the Demographic Characteristic of Non-white Headed Households and Health Status

Published research showed an association between neighborhood level characteristics and health status by race (Taylor and Braithwaite 3; Powell and Tanz 41; Braveman, et al. 2882; Cubbin and Winkleby 562; Cubbin, LeClere, and Smith 519; & Aneshensel, and Sucoff 296). A review of the published research literature revealed the potential relationship of Non-white head of households with the rate of child fatalities in a neighborhood (Leclere, Rogers, and Peters 94; Yen and Syme 297; Woolf, Johnson, Fryer, Rust, and Satcher 2079; Cohen, Mason, Bedimo, Scribner, Basolo, and Farley 469; Aber, Bennett, Conley, Li 467; LeClere, Rogers, and Peters 181; & Cohall and Bannister 14). Published research has focused on the potential association between the ethnic or minority status of a child and the rate of intentional injuries and unintentional injuries. The published research, on individuals classified as Non-white, has found health disparities within the group. The disparities between white and Non-white groups have been reported to include infant mortality, violence, asthma, neighborhood environment, firearm assaults, life expectancy, SIDS, income, years of potential life lost, injuries, education, domestic violence, lead poisoning, adolescent sexuality, HIV/AIDS, mental health, substance abuse, physical exercise, and nutrition (Winkleby and Cubbin 445;

Datta, Subramanian, Colditz, Kawachi, Palmer, and Rosenberg 1036; American Academy of Pediatrics 1349; Collins and Schulte 225; Powell and Tanz 42; Tennessee Department of Health; Angel and Worobey 40; Aber, Bennett, Conley, and Li 477; Krieger, Chen, Waterman, Rehkopf, and Subramanian 1658; Subramanian, Chen, Rehkopf, Waterman, and Krieger 261; & Taylor and Braithwaite 7).

Only one study was focused on Non-white heads of households and the potential association with child fatalities in the United States of America (Collins and Schulte 225). Collins and Schulte indicated infants of African-American single mothers are at a greater risk of premature deaths compared to infants born to single African mothers (226). Collins and Schulte also investigated the relationship between Non-white heads of households and the rate of child fatalities at the neighborhood level (227).

Research by Datta, et al. developed a baseline study that assessed the relationship of black women in the United States who smoke and individual, neighborhood, and state socioeconomic characteristics (1036). Datta, et al. found an association between black females smoking and neighborhoods (1041). The results of published research by Datta, et al. found contextual factors (at both the neighborhood and state level) play a role in Black women's smoking behaviors over and above individual characteristics (1041).

Among the children aged one to fourteen years, disparities existed by race, cause and manner of child fatalities in Tennessee for the years 2001-2003 (Tennessee Department of Health, 21). For the years 2001-2003, black youth had higher mortality rates than white youth in Tennessee (Tennessee Department of Health, 4). The mortality rate for Tennessee females aged one to fourteen was 16.6 per 100,000. Black females, aged one to fourteen had a mortality rate, during the years 2001 to 2003, of 8.9 per 100,000 and white females in

the same age group had a death rate of 7.7 per 100,000. Black males, in Tennessee for the years 2001-2003 was 151.3 per 100,000 and white males death rate was 108.2 per 100,000 whereas white females' death rate was 39.4 per 100,000 and females death rate were 32 per 100,000 (Tennessee Department of Health, 4).

Research Literature Focused on Methodology: Using the Census Tract To Represent a Neighborhood

The Neighborhood: A Unit for Study

Research has been conducted identifying the neighborhood as a key determinant of health; however only a few studies exist related to content and methodology. Two studies showed the neighborhood environment has come to be viewed as an important focus for children's development (Parke and O'Neil 58; & Coulton, Korbin, Su, and Chow 1265). The studies have reported that neighborhood factors influence children's developmental outcomes and should be assessed along with people's individual social and economic circumstances (Parke and O'Neil 58; & Coulton, Korbin, Su, and Chow 1267).

Published research studies utilized the neighborhood as a unit of measurement to assess affects on health status (Yen and Syme 299; Blakely, Atkinson, Kiro, Blaiklock, & D'Souza 410; Heymann and Fischer 337; Arizona Comprehensive Planning Task Force 1; Bosma, van de Mheen, Borsboom, and Mackenbach 364; Parke and O'Neil 59; Sampson S53; Sampson, et al. 919; Weiss, et al. S155; Diez Roux 1784; Coulton, et al. 1265; Brooks-Gunn, et al. 355). Blakely, et al. researched neighborhoods by using

national census data (410). This study was conducted in New Zealand (410). One study was conducted, in New Zealand, using census data as a quantity of measurement to represent neighborhood deprivation (Blakely, et al. 410). A study by Yen and Kaplan was designed to use census data to represent neighborhoods (900). This study was conducted in Alameda County, California to determine if associations existed between neighborhood characteristics and adult death risk for an eleven year period of time between 1983-1994 (Yen and Kaplan 900).

Buka, et al used neighborhood clusters as “neighborhoods” (2). In this research, the neighborhood clusters were compared to United States census tracts (2). The United States census tracts were used as the unit of analysis. Single, large or combined census tracts were used to represent neighborhoods. These ‘neighborhood clusters’ were the unit of measurement to assess demographic characteristics such as racial and ethnic composition, household income, and housing density (Buka, et al 2).

Bosma, et al. (363) sought to determine the contribution of neighborhood socioeconomic status to all-cause mortality of the subjects and to explore the affects of housing conditions and social, psychological, and behavioral factors. The study was conducted to augment the current literature on the research measuring socioeconomic and adult mortality(Bosma, et al. 365). The study by Bosma, et al. selected twelve individual characteristics to explore the possible association among these characteristics and neighborhood socioeconomic status (365). The 12 characteristics were clustered into four groups (Bosma, et al. 364). The groups included housing conditions, and social psychological and behavior factors (364). Each separate neighborhood socioeconomic factor was found to be related to all-cause mortality. Low individual socioeconomic

status and low neighborhoods socioeconomic status were related to mortality. Bosma, et al. found low neighborhood socioeconomic status was related to increased risks of mortality in individuals reporting high or low socioeconomic status (366).

Lee and Cubbin indicated neither knew of any studies to have examined the relationships between neighborhood characteristics and cardiovascular health behaviors among young people (429). Both asserted documenting a relation between neighborhood characteristics and cardiovascular disease would help guide public health interventions and policies aimed at changing health behaviors (429). Lee and Cubbin using census tracts as the unit of study investigated whether characteristics of neighborhoods including SES, social disorganization, racial /ethnic minority concentration, and urbanization were associated with individual cardiovascular health behaviors (430).

In published research by O'Campo advocated the use of multilevel models assessing the effects of neighborhood residential environments on health outcomes have been the most common type of contextual study to date (10). Research has examined associations between neighborhood characteristics, frequently socioeconomic position, and a variety of health outcomes. The neighborhood residence was used by Xue, Leventhal, Brooks-Gunn, and Earls to determine the effect of neighborhood characteristics on mental health problems of children aged five to eleven years including anxiety, depression, and social isolation, in an investigation by (554). Ellen and Turner further supported the context that a neighborhood level characteristic does matter and that various neighborhood conditions do significantly affect studies outcomes (838).

The effects of the neighborhood on health were investigated by Diez Roux (1789). Diez Roux indicated more studies are needed to study the neighborhood effects

on health, including ecologic studies relating area characteristics to morbidity and mortality rates (1790). The data were categorized by the following: common commercial stores (grocery stores, supermarkets, laundries/fry cleaners, beauty parlors/barber shops and pharmacies), other area descriptors (injury motor vehicle crashes and parks), and 1980 census data as the source of data to assess (percent white-collar employees, renters, single-family dwellings, crowding, percent black, per capita income, population of census tract within a census tract) (Diez Roux 1790). The census tract was used to represent a neighborhood. Data were collected and then factor analyzed to identify clusters of related variables. These clusters were then combined to formulate an overall measure of neighborhood environment. “For the factor analysis, neighborhoods were ranked by each variable in census tracts, e.g., number of grocery stores per 1,000 populations or per capita income” (899). Combining the three components identified by the factor analysis created a neighborhood social environment score. The results of the analyses indicated that lower-quality social environments are associated with an increased risk of death during an 11-year follow –up period. The association was determined to exist after adjustment for age, sex, individual income, educations, race/ethnicity, smoking status, body mass index, alcohol consumptions, and perceived health status. The findings indicated neighborhood characteristics such as income level of the population, percent employed in white-collar occupations, presence of stores, and types of housing available contribute to a person’s risk of death in addition to individual risk factors.

Yen and Kaplan’s research indicated the neighborhood characteristics should be studied to produce outcomes useful for the development of interventions for disease prevention and health promotion (900). Published research by Parke and O’Neil found

the neighborhood directly affects children because it is “the child’s first turf . . . to explore, become a part of and to use” (58). This study found neighborhoods may also have an indirect influence on children’s social development when neighborhood characteristics prompt parents to regulate their children’s activities in the neighborhood. The research described findings from a study of children in two southern California communities to illustrate how school-age children’s activities and social development are supported or constrained by resources and problems in their neighborhoods.

When the parents are comfortable with the safety of their neighborhood, children are given greater opportunities to function spontaneously and independently of parental supervision, with the result that children feel less lonely and dissatisfied. The impact of neighborhood quality on children’s adjustment may intensify in more disadvantaged communities where families are less able to seek out resources and activities for their children beyond the neighborhood (Parke and O’Neil 62).

Researchers agreed studying neighborhood characteristics and health to further data about the social and environmental factors potentially leading to sickness is of the essence (Weiss, et al. S158; Arizona Comprehensive Planning Task Force 2; & Heyman and Fischer 345). The review of the literature makes clear, from the published research found, conducting investigations with the neighborhood as a unit of measure is pertinent in learning more about how the variable affects child fatalities, writing policies to improve child health issues, reducing child fatalities, and allocating resources to neighborhoods.

The Census Tract: A Unit of Measurement

Census tracts were found, in the literature, to represent neighborhoods, because tracts are a good approximation of the neighborhood environment and because reliable social and economic data are available from the US Bureau of the Census. The census tracts were coded and ranked by quartiles to identify the neighborhood characteristics.

Several studies have been conducted using census tracts to define a neighborhood (Yen and Kaplan 900; Cubbin, Leclere, and Smith 518; Lee and Cubbin 430; Winkleby and Cubbin 444; Anderson, Agran, Winn, and Tran 34; O'Campo 10; Datta, et al. 1038; Krieger, Williams, and Moss 353; Aneshensel and Sucoff 296; Ross and Mirowsky 262; Ellen and Turner 844; Subramanian, et al. 260; Buka, et al. 2; Xue, et al. 555; Leclere, Rogers, and Smith 94; & LeClere, Rogers, and Smith 175). Census tracts have been used in previous and current research studies because the tracts were designed to be 'relatively homogeneous units with respect to population characteristics, economic status, and living conditions' (Diez Roux 317). Census tracts have been used in past research to link the place of residence with neighborhood characteristics (Winkleby and Cubbin 444; Yen and Kaplan 905). Census tracts were used to represent a neighborhood where youth aged 12 to 17 lived for the purposes of the Aneshensel and Sucoff study (296). The census tract was used as the unit of measure to represent a neighborhood to determine the effects on youth mental health in the Aneshensel and Sucoff research project (296). The socioeconomic factors of educational levels and level of household income were included in this study. In addition, demographic characteristics found in the study consisted of gender, race, and ethnicity by percentage of blacks and Hispanics in the neighborhoods to determine mental health effects of the youth (Aneshensel and Sucoff 296).

A review of the literature showed where a census tract was used as a unit of measure, however not representing the neighborhood (Diez Roux 317; Collins and Schulte 227; Krieger, et al. 1657; Krieger, et al. 473; Shai and Lupinacci 117; Shai 151; & Mabry 194). A general consensus was evident in the research about census tracts providing a mechanism to categorize and classify characteristics of large populations (Diez Roux 317; Collins and Schulte 227; Krieger, et al. 1657; Krieger, et al. 473; Shai and Lupinacci 117; Shai 151; & Mabry 194).

In the Shai study there were 1,563 fire injuries selected by census tract to participate in the fire injury study. Data were selected using the 1990 census (Summary File Three) and unpublished data from the Office of the Fire Marshall of the Philadelphia Fire Department. “Injury rates were calculated per 1,000 residents of a given census tract” (Shai 121). Multiple regression analysis was used to assess if an association existed between the socioeconomic and demographic factors and fire injuries in a given census tract over the nine-year period and to determine if the study results could be used as a predictive model to prevent fire injuries at the neighborhood level (Shai 153). Vacancy status was significant at the $p < 0.001$ and income was significant at the $p < 0.001$ level (Shai 153). Further results of the study showed that older housing (prior to 1940), low income, and the ability to speak English had significant independent effects on fire injury rates in Philadelphia. In addition, the results showed a significant interaction between older housing units and low income. Shai (154) concluded the findings of very high rates of fire injuries in census tracts that are both low income and have older housing, could be used by fire departments to develop more fire injury prevention efforts. In addition, Shai (154) noted laws concerning the maintenance of older rental housing

need to be strictly enforced in Philadelphia. Fire prevention material should be distributed in a number of languages to meet local needs. This supports the current research project of using the census tract to categorize and classify the Tennessee neighborhood and demographic characteristics selected, from the 2000 United States Census Summary File 1, for the eight years 1996-2003.

Although, Diez Roux (1984) made an argument against using census tracts to define a neighborhood, the concession was made that until other disciplines, such as epidemiology and health researchers, investigate “people and their bodies without ignoring the interdependencies and mutual influences between people, between places, and between people and the places in which they live”, the census tracts will be continued to be the unit of measure to represent a neighborhood (1988).

Chapter Summary

The purpose of this chapter was to review literature and research studies related the neighborhood housing and demographic characteristics including rental housing, vacancy status, average household size, urban location, and the heads of households categorized as female, single, Spanish/Hispanic/Latino, and Non-white and child fatalities by manner (violence, accidental, and natural). Published literature revealed using housing and demographic characteristics to represent a neighborhood was supported. While the associations between housing and neighborhood characteristics and child fatalities were limited in the literature, the research showed studies had been conducted where either housing characteristics or demographic characteristics were used to determine health effects in adults and children.

Housing characteristics, in the literature, were found to affect health status in adults and children. The housing characteristics included rental units, household size and urban location. Very few studies were found including the housing characteristic of vacancy status to represent the neighborhoods. The demographic characteristics of neighborhoods were also found in the literature to affect health status. Demographic characteristics included female heads of households, single, Spanish/Latino/Hispanic, and Non-white used to determine health effects on adults and children.

Published research indicated using census tracts to further represent a neighborhood was important. The census tracts were shown to be a homogenous representation of a neighborhood in the literature. Chapter III describes the methodology procedures used in this investigation.

CHAPTER III

METHODOLOGY

Introduction

This chapter describes the methodology and research procedures and sources of data selected to complete this study. A description of the study population and sources used for secondary data analysis as well as a description of the procedures used to manage secondary data are included in this chapter. A discussion of the statistical tests applied to analyze the research questions addressed in this study was also included in this chapter. This study was conducted to determine if characteristics of a neighborhood were associated with the rate of child fatalities reported in Tennessee for the eight-years 1996-2003. The housing characteristics assessed in this study were the amount of rental housing, vacancy status, household size, and urban location. The demographic factors for heads of households assessed in this study included gender, ethnicity, race and marital status.

Purpose of the Study

The purpose of this study was to determine if an association exists between housing characteristics and demographic characteristics of Tennessee neighborhoods (census tracts) and the rate of child fatalities reported in Tennessee for the years 1996-2003. The housing characteristics the amount of rental housing, vacancy status, household size, and urban location were selected for the purposes of analyses in this study. Demographic variables of gender, marital status, ethnicity, and Non-white heads of households were also selected for the purposes of analysis in this research project.

Research Objectives

One objective of this research study was to provide a descriptive profile of child fatalities reported in Tennessee for the years 1996-2003, by cause and manner. The causes of death were categorized into thirteen different causes to select for each child fatality reviewed by the Tennessee Child Fatality Review Team for the eight years 1996-2003. For the purposes of this study the manner of death categories homicide and suicide were combined into the category of *violent* fatalities. The second research objective, of this study, was to determine if an association exists between neighborhood housing characteristics of rental housing, vacancy status, household size, and the rate of child fatalities reported for Tennessee neighborhoods in the years 1996-2003. The third research objective was to determine if an association existed between the selected neighborhood demographic characteristics of heads of households and the rate of child fatalities reported for Tennessee neighborhoods in the years 1996-2003. The selected demographic characteristics selected for use in this study were female, single, Spanish/Hispanic/Latino, and racial groups of Non-white only heads of households. In order to address the research objective the following questions were formulated:

- 1.) Are neighborhood characteristics of housing (rental housing, vacancy status, household size, and urban location) within a Tennessee census tract associated with the rate of child fatalities (violent, accidental, natural) reported in Tennessee for the years 1996-2003?
- 2.) Are neighborhoods characterized by the demographic factors of heads of households (gender, marital status, ethnicity, and race) within a Tennessee census tract associated with the rate of child fatalities (violent, accidental, natural) reported in Tennessee neighborhoods during the years 1996-2003?

Data Sources

Tennessee Judicial Districts' Child Fatality Review Team Reporting Form

The Tennessee Child Fatality Review Data was the first of the two secondary data sources selected for use in this study. The Tennessee child fatality data reported by each Tennessee Judicial District Child Fatality Review Team on the Tennessee Department of Health's Reporting Form for the years 1996-2003 was one selected source of data for use in this research project. Data was selected from specified fields provided by the State of Tennessee on each of the 8,531 child fatalities judicial district child fatality review team reporting form. The Child Fatality Review Data Report Form contained information regarding the identification of each child, the dates of when the child was born and when child died, address, census tract location, maternal information, dates of when the child fatality record was reviewed, cause of death and manner of death.

A copy of the Tennessee Child Fatality Review Data Sheet located in Appendix A provides an illustration of a confidential child fatality review data sheet, used to collect information about each child fatality in the State of Tennessee. However for the purposes of this study, the following fields of data was extracted for use in this study; date of death, date of birth, sex of the child, race, ethnicity, address, census tract, county of residence, cause and circumstances of death, manner of death as determined by the Tennessee Child Fatality Review Team for the years 1996-2003. Some fatalities were reviewed, however detailed information was not recorded on the data sheet, because the child might have not been a resident of Tennessee or vital records may not have been available at the time of death and review of the fatality.

To verify the accuracy of the Tennessee child fatality being place in the appropriate census tract location the data was verified using the census tract number provided on the Tennessee Department of Health's Reporting Form. When a Tennessee Department of Health's Child Fatality Review Reporting Form was determined to have only an address with no census tract provided the researcher took the specific street address reported on the Tennessee Department of Health's Child Fatality Review Reporting Form and determined the appropriate census tract location. This census tract number was then entered for the appropriate case in an electronic data file. If a data sheet was found to have no street address as well as the city and zip-code and no documented census tract the case for statistical purposes was considered missing data and could not be assigned to a census tract. Of the 8,531 cases reported by a Tennessee Department of Health's Child Fatality Review Reporting Form, nine child fatality data sheets were found to have an incomplete address and no census tract.

Causes of death categories used to create the descriptive profile were Sudden Infant Death Syndrome (SIDS), lack of adequate care, prematurity, suffocation and/or strangulation, inflicted injury, drowning, vehicular, poisonings, illnesses or other causes, fire/burns, firearms, other causes, and unknown causes. Categories of manner of death were natural, accidental, and violent fatalities included for the purposes of analysis. Selected data on child fatalities occurring in Tennessee for the years 1996-2003 was extracted to create the electronic Statistical Program for the Social Sciences (SPSS) 14.0 data set. The selected data was coded and entered into a computer file and structured for analysis using (SPSS) 14.0 to conduct statistical testing.

United States 2000 Census

The second source of data was obtained by extracting household responses from the United States 2000 Census Short Form (D-61A). A copy of the D-61A form may be found in Appendix B. The Census Short Form data was used to obtain responses related to neighborhood housing characteristics and the demographic characteristics of heads of households in Tennessee neighborhoods. The United States Census stores the information in Summary File One (1). The Summary File 1 contains all population and housing data collected for 100-percent of the responses to the 2000 United States Census inquiries. The file contained population and housing figures including age, gender, households, household relationship, housing units, and whether a residence is owned or rented. Some information contained in Summary File 1 was selected for a “limited number of race and Hispanic or Latino categories” (A-12). The information was accessible for the United States regions, divisions, states, counties, county subdivisions, places, census tracts, block groups, blocks, and metropolitan areas (A-12). The selected data used in this study was extracted and classified by Tennessee census tracts. For the purposes of this study, census tracts as assigned by the 2000 United States Census were used to represent a neighborhood in Tennessee. All census tracts assigned by the 2000 United States Census for the State of Tennessee were included in this research.

Aggregate responses associated with rental housing status, vacancy status, household size, and urban location were selected from the 2000 Census for use in this study. The information on vacancy was charted by the census enumerator for each of the 10,064 Tennessee census tracts and was not a question included on the actual 2000 Census Short Form (D-61A). The aggregated data included responses to demographic

Census questions to determine the characteristics of the head of household. Demographic characteristics considered for study review included census responses associated with gender, marital status, ethnicity, and race.

The selected census data extracted from the 2000 United States Census Summary File 1 was downloaded from the Census, entered into SPSS, and then coded for the purposes of analyses. Questions selected, for the purposes of this study, from the 2000 United States Census Short Form are outlined in Table 1.

Neighborhood Characteristics

Housing Characteristics

Previous studies have shown housing status, household size and housing availability to be determinants of health (Bosma, Dike van de Mheen, Borsboom, and Mackenbach 365; & Agran, Winn, Anderson, and Del Valle 189). Housing characteristics used to characterize a neighborhood for the purposes of this study, including rental housing; vacancy status, household size, and urban location were shown to have been linked to health status. As indicated in Chi and Voss' study the neighborhood housing characteristic of rental units were reported to be important to investigate, which supports selecting housing characteristics for the purposes of this research (15).

This study sought to determine whether or not an association existed between neighborhood housing characteristics and the total number of child fatalities and the rate of violent child fatalities reported in Tennessee during the years 1996-2003.

Characteristics of housing selected for analysis included the amount of rental housing, vacancy status, household size, and urban location. The statistical procedures chosen to assess whether or not the housing characteristics had an effect on child fatalities and violent child fatalities in Tennessee from 1996-2003 are included in Table 3.

Demographic Characteristics

The demographic characteristics of heads of households in Tennessee neighborhoods were analyzed in this study to determine if these neighborhood characteristics are associated with the total number of child fatalities and child fatalities due to violence in Tennessee neighborhoods. Demographic characteristics assessed included female, single, Spanish/Hispanic/Latino, and Non-white individuals were selected to review in this study. Previous published studies have reported that demographic characteristics of households can be important predictors of health status (Cubbin and Winkleby 563; Blakely, Atkinson, Kiro, Blaiklock and D'Souza 411).

Secondary Data Management and Handling

A descriptive profile of child fatalities in Tennessee for the eight-years 1996-2003 was generated to provide a detailed representation of Tennessee child fatality data collected. The descriptive profile was created by gender, race, cause and manner. The causes of death categories used for analyses included Sudden Infant Death Syndrome, lack of adequate care, prematurity, illness or other natural cause, drowning, suffocation and/or strangulation, vehicular, firearm, inflicted injury, poisoning/overdose, fire/burn, other cause not listed above, and unknown cause. The manner of death categories used in this

Table 1. Demographic Characteristic Questions Selected From the 2000 United States Census Short Form

Head of Household Characteristics	Census Questions	Census Question Response Options to Select
Household size	Question 1: PERSON 1- How many people were living or staying in this house, apartment, or mobile home on April 1, 2000? _____ ;	<i>Individuals are requested to provide a numeric response.</i> 'Number of people' _____
Rental/Ownership Status	Question 2: 'Is this house, apartment, or mobile home?'	The answer options included: (Mark ONE box) ☐ Owned by you or someone in this household with a mortgage or loan? ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)? ☐ Rented for cash rent? ☐ Occupied without payment or cash rent?
Occupancy/Vacancy Status	Vacancy data was collected by the census enumerator	

Table 1. Continued

Head of Household Characteristics	Census Questions	Census Question Response Options to Select
Gender	Question 5: ‘What is Person’s 1 sex?- where answer options included: Male or Female	The answer options included: Mark ONE box ☐ Male ☐ Female
Ethnicity	Question 7: Ethnicity measured by the Census responses to the following question- ‘Is Person 1 Spanish/Hispanic/Latino?’	The answer options included: Mark the “No” box if not Spanish/Hispanic/Latino. ☐ No, not Spanish/Hispanic/Latino ☐ Yes, Puerto Rican ☐ Yes, Mexican, Mexican American, Chicano ☐ Yes, Cuban ☐ Yes, Other Spanish/Hispanic/Latino- <i>Print Group</i> _____ ;
Race	Question 8: ‘What is Person 1’s race?’	The answer options included: Mark one or more races to indicate what this person considers himself/herself to be. ☐ White ☐ Black, African American or Negro ☐ American Indian or Alaska Native <i>Print the name of enrolled or principle tribe</i> _____ ☐ Asian Indian ☐ Samoan ☐ Japanese ☐ Vietnamese ☐ Korean ☐ Filipino; ☐ Native Hawaiian ☐ Other Asian-Print race_____ ☐ Chinese ☐ Other Pacific Islander-Print race_____ ☐ Guamanian or Chamorro ☐ Some other race-Print race_____.
Marital Status	Question 2: (Person 2)- ‘How is this person related to Person 1?’	The answer option included for review in this study was: Mark the box ☐ Husband/wife

study included accidental, natural, and violent. The categories reported on each Tennessee Judicial District Child Fatality Review Teams' Reporting Form included the manner and causes of child fatalities (See Appendix A).

In addition to the descriptive profile development, housing characteristics and demographic factors were assessed to determine if an association existed between the characteristics and the rate of Tennessee child fatalities that occurred from 1996-2003. The housing and demographic characteristics had to be adjusted before any statistical analyses would be run. Census tracts were grouped, from the 2000 United States Census' responses, by housing and percent of rental housing. The rate of rentals was divided by number of rentals and owners reported from responses on the 2000 census once this calculation was completed for each TN census tract a percent of rental housing was generated and assigned to each census tract. The vacancy status percent were divided by number of vacant and occupied units reported by the enumerators of the United States 2000 Census to generate the rate for each Tennessee census tract. Once generated this vacancy rate was assigned to its census tract. Urban location, for the purposes of this study was calculated by the rate of urban units being divided by the rate of housing units, designated by the 2000 census as an urban area or urban cluster, to generate a percentage for each Tennessee census tract. A percentage of urban units were assigned to each census tract.

The demographic characteristics of heads of households were also adjusted and grouped for use in this research project. Grouped census tracts by demographic characteristics according to the percent of female heads of households as reported on the

2000 United States Census were assigned. The rate of female heads of households was divided by the population in households reported from responses provided on the 2000 United States Census. Once this calculation was completed for each Tennessee census tract a percent of female heads of households was generated and assigned to each census tract. In addition, grouped census tracts by demographic characteristics according to the percent of female heads of households as reported on the 2000 United States Census were assigned. The rate of female heads of households was divided by the population in households reported from responses provided on the 2000 United States Census. Once this calculation was completed for each Tennessee census tract a percent of female heads of households was generated and assigned to each census tract. Grouped census tracts by demographic characteristics according to the percent of single heads of households as reported on the 2000 United States Census were also assigned. The rate of single heads of households was divided by the population in households, who were reported as not having a spouse by Person 2 on the Census (D-61A) Short Form. Once this calculation was completed for each Tennessee census tract a percent of single heads of households was generated and assigned to each census tract. Research studies have shown demographic characteristics of a neighborhood have been selected for analysis under study. In studies by Leclerc, Rogers, and Peters female heads of households from the United States Census were selected for analysis (94; & 174).

A racial group (Non-white only) percentage was calculated according to census tracts as reported on the 2000 United States Census. The rate of racial groups (Non-white only) was divided by the population in households reported from responses provided on

the 2000 United States Census. Once this calculation was completed for each Tennessee census tract a percent of racial groups (Non-white only) heads of households was generated and assigned to each census tract.

Neighborhoods Characterized by Census Tracts

This study examined characteristics of Tennessee neighborhood census tracts and whether the characteristics were associated with the rate of Tennessee child fatalities. The census tract was selected as a unit of measurement, for this study because and it was the most available unit (the tracts are smaller units than a county or city) that could be analyzed to research a neighborhood characteristic. Previous studies indicate that neighborhoods impact health (Diez Roux 1784). Brooks-Gunn, Duncan, Klebanov, and Sealand (355) selected neighborhoods as a unit of measurement to determine if the neighborhood influenced behavior, attitudes, values, and opportunities of child development. Ellen and Turner (836) used the socioeconomic composition of the neighborhoods in which low-income children lived to determine an association with neighborhood effects.

Research studies have indicated that census tracts are appropriate data to represent neighborhoods (Krieger, et al. 353 & Lee and Cubbin 429). One study was conducted in New Zealand on child fatalities using neighborhoods represented by census tracts. Census data has been used to show differences in neighborhood socioeconomic status by linking census records with gender, birth date, ethnicity, country of birth, and area of residence (Blakely, Atkinson, Kiro, Blaiklock, & D'Souza 411).

According the United States Census Bureau in the 2000 Census the census tracts

basically had between fewer than 1,500 and 8,000 people with the most favorable amount containing 4,000 people. The areas with fewer than 1,500 people had one single census tract. Census tracts were designed to “be relatively homogeneous with respect to population characteristics, economic status, and living conditions” (A-12). “Census tract boundaries are delineated with the intention of being maintained over many decades so that statistical comparisons can be made from decennial census to decennial census” (U.S. Census Bureau A-12). The census tracts numerically range from 1 to 9999 and are specifically classified within a county or by an identifier being a statistical equivalent to a census tract.

“The United States Census Bureau reserves the basic census tract numbers 9400 to 9499 for census tracts delineated within or to encompass American Indian reservations and off-reservation trust lands that exist in multiple states or counties. The rate 0000 in computer-readable files identifies a census tract delineated to provide complete coverage or water area in territorial seas and the Great Lakes” (U.S. Census Bureau A-12).

Census tracts have been indicated as providing a “stable set of geographic units for the presentation of decennial census data” (U.S. Census Bureau A-12). According to the United States Census Bureau (A-12), the decennial census was the first census to identify all of the United States using census tracts as another geographic designation. Census tracts were created by the United States Census Bureau to provide boundaries to neighborhoods (US Census A-12). Census tracts were originally designed to have a homogeneous structure or composition to neighborhood including population

characteristics, economic status, and living conditions (US Census & www.csub.edu).

Neighborhood characteristics were identified by data selected from the 2000 United States Census. The data used for analysis in this study was selected out of the Population and Housing Detailed Tables of the 2000 Census Summary File 1. The detailed tables for the State of Tennessee chosen to obtain data for use in this study included the total population (P1), race (P7), gender by age of total population (P12), households (P15), households (Hispanic or Latino Householder) (P15H), households (White alone, not Hispanic or Latino Householder) (P15I), population in households (P16), average household size (P17), household size, household type, and presence of own children (P18), households by presence of people under 18 years by household type (P19), family type by presence and age of own children (P34), housing units (tenure-owner/renter occupied units) (H1), urban and rural (H2), occupied housing units (tenure-owner/renter occupied units), average household size of occupied housing units by tenure (household type and household size) (H12), imputation of vacancy status (vacant housing units) (H19).

The detailed tables, from the 2000 United States Census Summary File 1 included the following information downloaded by all Tennessee census tracts:

1. Total population (P1) detailed table contained the total number of people in Tennessee's population reported on the 2000 United States Census.
2. Race (P7) included detailed categories of race (white, black or African American alone, American Indian/Alaska Native alone, Asian alone, Native Hawaiian and Other Pacific Islander alone, some other race alone,

and two or more races reported as residing in Tennessee.

3. Gender by age of total population (P12) contained the ages under five to 85 years and over the rate of people in Tennessee reported on the 2000 Census by gender (male or female).
4. Population in Households (P16) was a detailed table used in this study, containing all of the population in Tennessee who occupied a housing unit.
5. Households (P15) detailed table contained the total number of Tennessee households reported in the 2000 United States Census.
6. Households (Hispanic or Latino Householder) (P15H) table included Tennessee households with a householder who is Hispanic or Latino [the householder was Person 1 on the 2000 United States Census Short Form (D-61A), who had no spouse reported as Person 2 living in the same residence. In appendix an example of the Short Form illustrates the items responded to on the 2000 United States Census.
7. Households (White alone, not Hispanic or Latino Householder) (P15I), contained the total number of responses for Tennessee households with a householder who is White alone, not Hispanic or Latino.
8. Population in households (P16) included the total number of Tennessee households and families reported on the 2000 United States Census.
9. The average household size (P17) detailed table contained the rate for Tennessee's average household size.
10. Household size, household type, and presence of own children (P18)

included the subject characteristics of Tennessee children, household type, size, and relationship.

11. Households by presence of people under 18 years by household type (P19) included the total number of Tennessee households broken down by married, other family, non-family, and head of household with no people under 18 years.
12. Family type by presence and age of own children (P34) included the type of the Tennessee family single, married, or other with the presence of own children and the age of the children.
13. Housing units (tenure-owner/renter occupied units) (H1) included the total number of housing units in the State of Tennessee.
14. Urban and rural (H2), occupied housing units (tenure-owner/renter occupied units) included the total number of housing units designated as being in an urban location and a rural location.
15. Average household size of occupied housing units by tenure (household type and household size) (H12) included the average number of occupied housing units.
16. Imputation of vacancy status (vacant housing units) (H19) the rate of vacant units as recorded by the census enumerator.

In this study census tracts were selected to represent neighborhoods in Tennessee.

Census tracts were chosen as the unit of measurement for analysis in this study. Tennessee had 1,360 designated census tract identifiers for each of the 95 counties across the state.

Statistical Tests Applied to the Study Data

This study had three research objectives. The first research objective was to provide a descriptive profile of child fatalities in Tennessee for the years 1996-2003 by cause and manner (including natural, accidental, and violent). Secondly a research objective was to determine if an association existed between neighborhood housing characteristics of rental housing, vacancy status, household size, and urban location and the rate of child fatalities reported for the years 1996-2003. The third objective was to determine if an association exists between the selected neighborhood demographic characteristics of heads of households in Tennessee neighborhoods and the rate of child fatalities reported in Tennessee for the years 1996-2003. To accomplish these objectives the following adjustments were made to the extracted data.

Descriptive Profile

The electronic SPSS dataset of child fatalities reported to the Tennessee Department of Health's Judicial Districts Child Fatality Review Team for the years 1996-2003 were used to create the descriptive profile. The child fatalities were selected for the years 1996-2003 by gender, race, cause, and manner. The descriptive profile was created using the categorical data of gender, race, cause and manner of death to describe Tennessee child fatalities reported to the Tennessee Child Fatality Review Team for the years 1996-2003. Table 2 provides details of the descriptive profile by category.

Table 2. Demographic Data Selected To Create The Child Fatality Descriptive Profile

Child Fatality Data	Data	Statistical Analyses
Age	Categorical	Frequency
Gender	Categorical	Frequency
Race	Categorical	Frequency
Cause of Death	Categorical	Frequency
Manner of Death	Categorical	Frequency

Tennessee Child Fatalities

The child fatalities extracted from the Tennessee Child Fatality Review Team's Reporting Form were selected for analysis by Tennessee census tracts as listed in 2000 Tennessee Census. Because the extracted child population data from the 2000 United States Census included all children reported the rate of child fatalities had to be adjusted. An adjusted rate of child fatality was generated by dividing the rate of reported fatalities for 1996-2003 by total number of children reported by census to live in the specific census tract by 2000-adjusted the rate of child fatalities per census tract.

United States 2000 Census

Research questions were developed to address whether or not associations existed for the neighborhoods characterized by housing and demographic characteristics and the rate of child fatalities reported in Tennessee neighborhoods for the eight years 1996-2003. The two research questions were developed to determine if housing characteristics including the amount of rental housing, vacancy status, household size, and urban location and the selected demographic characteristics of heads of households including gender, marital status, ethnicity, and Non-white individuals were associated with the rate

of Tennessee child fatalities for the eight years 1996-2003.

Working with aggregate data responses to housing and demographic question by census tract, the extracted data was used to analyze to address the research questions.

The research questions were:

- 1.) Are neighborhood characteristics of housing (rental housing, vacancy status, household size, and urban location) within a Tennessee census tract associated with the rate of child fatalities (violent, accidental, natural) reported in Tennessee for the years 1996-2003?
- 2.) Are neighborhoods characterized by the demographic factors of heads of households (gender, marital status, ethnicity, and race) within a Tennessee census tract associated with the rate of child fatalities (violent, accidental, natural) reported in Tennessee neighborhoods during the years 1996-2003?

Data Analysis

Introduction

To answer the research questions, the data was analyzed, using SPSS 14.0 and 15.0. First a linear regression of the reported adjusted rate of Tennessee child fatalities was run against all housing characteristics and demographic characteristics of heads of households to determine if possible associations between reported child fatalities, housing characteristics, and demographic factors were linear in nature. Because the data was found not to be linear the Spearman rho correlation, rather than the Pearson r correlation was selected for use in this study. A primary determinant in the selection of

the Spearman rho statistical test was due to the non-linear nature of the data.

The Spearman Rho was determined by applying the ordinary Pearson R correlation to the ranked data. Please note that the distribution of the Spearman Rho is different from the distribution of the Pearson r statistical test, which is calculated for interval/ratio data. Unless the data is theoretically infinite the Spearman Rho is designated as the appropriate test for use in this study. While the datasets used in this study were of substantial size the data was ordinal in nature for child fatalities within Tennessee census tracts and the data was not normally distributed. Even though the child fatality data was adjusted to reduce the error introduced by the variation of the child population within individual census tracts, the resulting distribution of fatalities was found to be a non-normal distribution with a small percentage of census tracts reporting no deaths. Certain census tracts could report no child fatalities, while in other census tracts one or more child fatalities occurred.

The resulting Spearman correlation coefficient requires data in the ordinal positions only to match across two variables (Cohen 223). Where the Pearson correlation also requires the linear relationship not observed in the dataset under study. Cohen (222) reported “it is easier to obtain a higher correlation with ranks than it is with interval/ratio data, so the critical values or (r_s) are higher than the corresponding critical values for r . Healy (365) further indicated that Spearman’s Rho is a better statistical technique to apply for situations in which the variables have a wide range of possible values. The use of Nonparametric statistics has been supported in a few pieces of literature as appropriate for analysis use on data not normally distributed (Cohen 223; Mabry 194; Herring and

Bledsoe 250; McLaren and Dickerson 112; & Robinson, et al. 657).

The research questions were analyzed using Spearman Rho correlations to determine if associations exist between Tennessee neighborhoods characterized by a high level of household size, rental/ownership status, occupancy/vacancy status, and the demographic characteristics of heads of households including gender, Spanish/Hispanic/Latino individuals, racial minorities, and single individuals and the rate of child fatalities resulting from violence. Spearman rho was used as an index to test if associations existed between the variables characterizing Tennessee neighborhoods and the rate of Tennessee child fatalities from 1996-2003.

To interpret the Spearman Rho, within this study Milton's scale for interpreting data was selected for assessment of the correlation coefficient. When this scale is applied a correlation coefficient found to be +1 is reported as a perfect positive correlation. A correlation coefficient of +.9 to less than +1 is reported as a strong positive correlation. The correlation coefficient of less than +.9 to +.5 is reported as a moderate positive correlation. A correlation coefficient value of less than +.5 to zero is reported as a weak positive correlation. A statistical result of zero is reported as uncorrelated. A correlation coefficient with a value greater than zero and less than -.5 is reported as a weak negative correlation. Correlation coefficients greater than -.5 and less than -.9 are reported as moderate negative correlations. A correlation coefficient of -.9 to less than -1 is reported as a strong negative correlation. The correlation coefficient of -1 is reported as a perfect negative correlation.

Rate of Reported Total Child Fatalities in Tennessee Neighborhoods

The results of each Spearman Rho correlation are provided in the discussion in Chapter IV. Table 3 lists each housing characteristic tested using Spearman Rho for the total rate of Tennessee child fatalities reported during the years 1996-2003. The demographic factors of heads selected for analysis in this study are demonstrated in Table 4.

Rate of Reported Violent Child Fatalities in Tennessee Neighborhoods

Housing characteristics of rental housing, vacancy status, household size, and urban location under study in each Tennessee census tract were selected for analysis to determine if an association existed with the rate of violent child fatalities reported in Tennessee for the years 1996-2003. Table 5 included each housing characteristic tested using Spearman Rho for the rate of Tennessee violent child fatalities reported during the years 1996-2003.

Demographic characteristics of heads of households (female, single, Spanish/Hispanic/Latino, and Non-white) under study in each Tennessee census tract were selected for analysis to determine if an association existed with the rate of violent child fatalities reported in Tennessee for the years 1996-2003. Table 6 the Demographic Characteristic of Heads of Households in Tennessee Neighborhoods Data and the Rate of Reported Violent Child Fatalities (1996-2003) listed each demographic characteristic of heads of households tested using Spearman Rho for the rate of Tennessee violent child fatalities reported during the years 1996-2003.

Table 3. Housing Characteristic Data of Tennessee Neighborhoods and The Rate of Tennessee Child Fatalities (1996-2003)

Housing Characteristics/Total Child Fatalities	Census Response	Type of Data	Statistical Test
1. Housing Characteristics			
A. Is there an association between percent of rental housing in each Tennessee census tract and the rate of reported child fatalities?	Percent of non-owners	Ordinal	Spearman Rho
B. Is there an association between the percent of vacant units in each Tennessee census tract and the rate of reported child fatalities?	Vacant units	Ordinal	Spearman Rho
C. Is there an association between household size in each Tennessee census tract and the rate of child fatalities?	Household size	Ordinal	Spearman Rho
D. Whether a census tract classified as urban is associated with the rate of child fatalities reported in Tennessee census tracts?	Urban	Ordinal	Spearman Rho

Table 4. Demographic Characteristics of Heads of Households Data of Tennessee Neighborhoods and The Rate of Child Fatalities (1996-2003)

Demographic Characteristics/Total Child Fatalities	Census Response	Type of Data	Statistical Test
1. Heads of Households			
A. Is there an association between the percent of female heads of households in each Tennessee census tract and the rate of reported child fatalities?	Response to gender and head of household question	Ordinal	Spearman Rho
B. Is there an association between the percent of single heads of households in each Tennessee census tract and the rate of reported child fatalities?	Response to head of household question	Ordinal	Spearman Rho
C. Is there an association between the rate of Spanish/Hispanic/Latino heads of households in each Tennessee census tract and the rate of reported child fatalities?	Response to ethnicity and head of household question	Ordinal	Spearman Rho
D. Is there an association between the percent of Non-white heads of households in each Tennessee census tract and the rate of reported child fatalities?	Response to race and head of household question	Ordinal	Spearman Rho

Table 5. Housing Characteristics Data of Tennessee Neighborhoods and The Rate of Violent Child Fatalities (1996-2003)

Housing Characteristics/Violent Child Fatalities	Census Response	Type of Data	Statistical Test
1. Housing Characteristics			
A. Is there an association between the percentage of rental housing in each Tennessee census tract and the rate of reported violent child fatalities?	Percent of non-owners	Ordinal	Spearman Rho
B. Is there an association between the percent of vacant units in each Tennessee census tract and the rate of violent child fatalities?	Percent of Vacant units	Ordinal	Spearman Rho
C. Is there an association between household size in each Tennessee census tract and the rate of violent child fatalities?	Household	Ordinal	Spearman Rho
D. Whether a census tract classified as urban is associated with the rate of violent child fatalities reported in Tennessee census tracts?	Urban	Ordinal	Spearman Rho

Table 6. Demographic Characteristics Of Heads Of Households In Tennessee Neighborhoods Data And The Rate Of Reported Violent Child Fatalities (1996-2003)

Demographic Characteristics/Violent Child Fatalities	Census Response	Type of Data	Statistical Test
1. Heads of Households			
A. Is there an association between the percent of female headed households in each Tennessee census tract and the rate of violent child fatalities?	Response to gender and head of household question	Ordinal	Spearman Rho
B. Is there an association between the percent of single heads of households in each Tennessee census tract and the rate of violent child fatalities?	Single heads of households	Ordinal	Spearman Rho
C. Is there an association between the percent of Spanish/Hispanic/Latino Heads of Households in each Tennessee census tract and the rate of violent child fatalities?	Response to ethnicity and head of household question	Ordinal	Spearman Rho
D. Is there an association between the percent of Non-white heads of households in each Tennessee census tract and the rate of violent child fatalities?	Racial minorities	Ordinal	Spearman Rho

Rate of Reported Accidental Child Fatalities in Tennessee Neighborhoods

Housing characteristics of rental housing, vacancy status, household size, and urban location under study in each Tennessee census tract were selected for analysis to determine if an association existed with the rate of accidental child fatalities reported in Tennessee for the years 1996-2003. Table 7 lists each housing characteristic tested using Spearman Rho for the rate of Tennessee accidental child fatalities reported during the years 1996-2003.

Demographic characteristics of heads of households (female, single, Spanish/Hispanic/Latino, and Non-white) under study in each Tennessee census tract were selected for analysis to determine if an association existed with the rate of accidental child fatalities reported in Tennessee for the years 1996-2003. Table 8 included each demographic characteristic of heads of households tested using Spearman Rho for the rate of Tennessee accidental child fatalities reported during the years 1996-2003.

Rate of Reported Natural Child Fatalities in Tennessee Neighborhoods

Housing characteristics of rental housing, vacancy status, household size, and urban location under study in each Tennessee census tract were selected for analysis to determine if an association existed with the rate of natural child fatalities reported in Tennessee for the years 1996-2003. Table 9 lists each housing characteristic tested using Spearman Rho for the rate of Tennessee natural child fatalities reported during the years 1996-2003.

Table 7. Data For Housing Characteristics Of Tennessee Neighborhoods And The Rate Of Reported Accidental Child Fatalities (1996-2003)

Housing Characteristics/Accidental Child Fatalities	Census Response	Type of Data	Statistical Test
1. Housing Characteristics			
A. Is there an association between percent of rental housing in each Tennessee census tract and the rate of accidental child fatalities?	Percent rental	Ordinal	Spearman Rho
B. Is there an association between the percent of vacant units in each Tennessee census tract and the rate of accidental child fatalities?	Vacant units	Ordinal	Spearman Rho
C. Is there an association between household size in each Tennessee census tract and the rate of accidental child fatalities?	Household size	Ordinal	Spearman Rho
D. Whether a census tract classified as urban is associated with the rate of child fatalities reported in Tennessee census tracts?	Urban	Ordinal	Spearman Rho

Table 8. Demographic Factors Of Head Of Households Of Tennessee Neighborhoods And The Rate Of Reported Accidental Child Fatalities (1996-2003)

Demographic Characteristics	Census Response	Type of Data	Statistical Test
1. Heads of Households			
A. Is there an association between the percent of female heads of households in each Tennessee census tract and the rate of accidental child fatalities?	Response of gender and heads of households question	Ordinal	Spearman Rho
B. Is there an association between the percent of single heads of households in each Tennessee census tract and the rate of accidental child fatalities?	Response to individual heads of household	Ordinal	Spearman Rho
C. Is there an association between the amount of Spanish/Hispanic/Latino Heads of Households in each Tennessee census tract and the rate of accidental child fatalities?	Spanish/Hispanic/Latino	Ordinal	Spearman Rho
D. Is there an association between the percent of Non-white heads of households in each Tennessee census tract and the rate of accidental child fatalities?	Non-white	Ordinal	Spearman Rho

Table 9. Data For Housing Characteristics Of Tennessee Neighborhoods And The Rate Of Reported Tennessee Natural Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test
1. Housing Characteristics			
A. Is there an association between the percent of rental housing in each Tennessee census tract and the rate of natural child fatalities?	Percent Rental Units	Ordinal	Spearman Rho
B. Is there an association between the amount of vacant units in each Tennessee census tract and the rate of natural child fatalities?	Vacant Units	Ordinal	Spearman Rho
C. Is there an association between household size in each Tennessee census tract and the rate of natural child fatalities?	Household size	Ordinal	Spearman Rho
D. Whether a census tract classified as urban is associated with the rate of child fatalities reported in Tennessee census tracts?	Urban	Ordinal	Spearman Rho

Demographic characteristics of heads of households (female, single, Spanish/Hispanic/Latino, and Non-white) under study in each Tennessee census tract were selected for analysis to determine if an association existed with the rate of natural child fatalities reported in Tennessee for the years 1996-2003. Table 10 listed each demographic characteristic of heads of households tested using Spearman Rho for the rate of Tennessee natural child fatalities reported during the years 1996-2003.

Ranked and Grouped Neighborhood Housing Characteristics in Tennessee

Cross-tabulations were also run to calculate the adjusted residuals to further determine if any significant differences existed between the observed and expected child fatalities when the housing characteristics and demographic characteristics of heads of households data was ranked and grouped by manner of death (violent, accidental, and natural) during the years 1996-2003. The housing characteristics were ranked by tertiles (thirds) of child fatalities occurring in Tennessee census tracts. Table 11 lists the ranked and grouped data for the amount of rental housing.

Table 12 lists the ranked and grouped data for the percent of vacant housing units.

The ranked and grouped data for the percent of household size used to determine the adjusted residuals was included in Table13.

Table 10. Demographic Characteristics Of Heads Of Households In Tennessee Neighborhoods Data And The Rate Of Reported Natural Child Fatalities (1996-2003)

Demographic Characteristics	Census Response	Type of Data	Statistical Test
1. Heads of Households			
A. Is there an association between the percent of female headed households in each Tennessee census tract and the rate of natural child fatalities?	Response to gender and heads of household question	Ordinal	Spearman Rho
B. Is there an association between the percentage of single heads of households in each Tennessee census tract and the rate of natural child fatalities?	Response to heads of household	Ordinal	Spearman Rho
C. Is there an association between the amount of Spanish/Hispanic/Latino Heads of Households in each Tennessee census tract and the rate of natural child fatalities?	Spanish/Hispanic/Latino	Ordinal	Spearman Rho
D. Is there an association between the percent of Non-white heads of households in each Tennessee census tract and the rate of natural child fatalities?	Non-white	Ordinal	Spearman Rho

Table 11. Ranked and Grouped Percent of Rental Housing

Ranked and Grouped by percent of Rental Housing reported in each Tennessee Census Tract	Census Response	Type of Data
Ranked and grouped percent of rental housing within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal
Ranked and grouped percent of rental housing within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal
Ranked and grouped percent of rental housing within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal

Table 12. Ranked and Grouped Percent of Vacant Housing Units

Ranked and Grouped by percent of Vacant Housing units reported in each Tennessee Census Tract	Census Response	Type of Data
Ranked and grouped percent of vacant housing units within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal
Ranked and grouped percent of vacant housing units within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal
Ranked and grouped percent of vacant housing units within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal

Table 13. Ranked and Grouped Percent of Average Household Size

Ranked and Grouped Data by percent of average household size reported in each Tennessee Census Tract	Census Response	Type of Data
Ranked and grouped percent of average household size within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal
Ranked and grouped percent of average household size within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal
Ranked and grouped percent of average household size within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal

Urban location was ranked and grouped by quartiles. Table 14 lists the ranked and grouped data for the percent of census tracts designated as urban used to calculate the adjusted residuals.

Ranked and Grouped Neighborhood Demographic Characteristics in Tennessee

The demographic characteristics for heads of households (including female, single, Spanish/Hispanic/Latino) were ranked and grouped into tertiles, in this study. Table 15 lists the ranked and grouped data for the percent of Female Heads of Households used to calculate the adjusted residuals.

Table 16 lists the ranked and grouped data for the percent of Single Heads of Households used to calculate the adjusted residuals. Table 17 included the ranked and grouped data for the percent of Spanish/Hispanic/Latino Heads of Households

Table 14. Ranked and Grouped Census Tracts Designated as Urban Cross-Tabulations

Ranked and Grouped Census Tracts Designated as Urban Locations-Total Child Fatalities	Census Response	Type of Data
When ranked and grouped by non-urban group.	Non-urban Tennessee census tracts	Ordinal
When ranked and grouped by less than or equal to 25% urban group.	Less than or equal to 25% of Tennessee census tracts	Ordinal
When ranked and grouped by greater than 25% and less than or equal to 50% urban.	Greater than 25% and less than or equal to 50% of Tennessee census tracts	Ordinal
When ranked and grouped by greater than 50% and less than or equal to 75% urban.	Greater than 50% and less than or equal to 75% of Tennessee census tracts	Ordinal
When ranked and grouped by greater than 75% urban	Greater than 75% of Tennessee census tracts	Ordinal

Table 15. Ranked and Grouped Percent of Female Heads of Households Cross-Tabulations

Female heads of households	Census Response	Type of Data
Were more child fatalities observed than expected in a census tract when ranked and grouped by the rate of female heads of households reported in each census tract?		See groups listed below
When ranked and grouped by the percent of female heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal
When ranked and grouped by the percent of female heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal
When ranked and grouped by the percent of female heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal

Table 16. Ranked and Grouped Percent of Single Heads of Households Cross-Tabulations

Single Heads of Households	Census Response	Type of Data
Were more child fatalities observed than expected in a census tract when ranked and grouped by the rate of single heads of households reported in each census tract?		See groups listed below
When ranked and grouped by the percent of single heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal
When ranked and grouped by the percent of single heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal
When ranked and grouped by the percent of single heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal

Table 17. Ranked and Grouped Percent of Spanish/Hispanic/Latino Heads of Households Cross-Tabulations

Spanish/Hispanic/Latino heads of households	Census Response	Type of Data
Were more child fatalities observed than expected in a census tract when ranked and grouped by the rate of Spanish/Hispanic/Latino heads of households reported in each census tract?		See groups listed below
When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal
When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal
When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal

used to calculate the adjusted residuals. The percent of Non-white heads of households used to calculate the adjusted residuals were included in Table 18.

Chapter Summary

This chapter examined the methods of creation for a descriptive profile of Tennessee child fatalities reported by each Tennessee Judicial District for the eight-years 1996-2003. Data from two secondary sources was selected for analysis in this study. The study population consisted of the child fatalities reported in the state of Tennessee during the years 1996-2003. A second source of data included in this study was data extracted from the 2000 United States Census.

The aggregated data was coded and entered into the statistical software package SPSS. The type of recommended statistical analyses was included in this chapter. This study was conducted to determine if an association exists between the housing and demographic characteristics of heads of households and the rate of child fatalities (violent, accidental, and natural) reported in Tennessee during the years 1996-2003.

Table 18. Ranked and Grouped Percent of Non-white Heads of Households Cross-Tabulations

Non-white Heads of Households	Census Response	Type of Data
Is there an association between the percent of Non-white Heads of Households in each Tennessee census tract and the rate of reported (violent, accidental, and natural) child fatalities?	Response to head of household question	Ordinal
Were more child fatalities observed than expected in a census tract when ranked and grouped by the rate of Non-white Heads of Households reported in each census tract?		See groups listed below
When ranked and grouped by the percent of Non-white Heads of Households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal
When ranked and grouped by the percent of Non-white Heads of Households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal
When ranked and grouped by the percent of Non-white Heads of Households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal

CHAPTER IV ANALYSIS, INTERPRETATION AND IMPLICATIONS OF THE DATA

Introduction

The purpose of this chapter was to provide an analysis, interpretation and implication of data associated with this research study. A descriptive statistical profile of Tennessee child fatalities reported for the years 1996-2003 is provided. The descriptive profile of Tennessee child fatalities by age, gender, race, cause and manner of death determined by each Tennessee Judicial District Child Fatality Review Team for the years 1996-2003 were selected for use in this study. The results of the statistical test to determine whether an association existed between the neighborhood housing characteristics and the demographic characteristics of heads of households and the rate of Tennessee child fatalities reported for the years 1996-2003 are described.

Housing characteristic data extracted from the 2000 United States Census were used for the amount of rental housing, vacancy status, average size of households, and urban location. Specific household responses were selected from the Summary File 1's Population and Housing Detailed Tables of the 2000 Census. The detailed tables chosen for use in this study included the housing units (tenure-owner/renter occupied units) (H1), imputation of vacancy status (vacant housing units) (H19), occupied housing units (tenure-owner/renter occupied units), average household size (P17), average household size of occupied housing units by tenure (household type and household size) (H12), population in households (P16), and urban and rural (H2). Demographic characteristics of heads of households (gender, marital status, ethnicity, and Non-white racial group)

specifically selected from Summary File 1's Population and Housing tables included: households (P15), households by presence of people under 18 years by household type (P19), households (Hispanic or Latino Householder) (P15H), and households (White alone, not Hispanic or Latino Householder) (P15I).

Census fields were downloaded from the Population and Housing Detailed Tables in the 2000 Census and put into Microsoft Excel spreadsheets. These Excel files were then converted into a data file using the Statistical Package for the Social Sciences 14.0 (SPSS).

The analyzed data collected from the Tennessee Child Fatality Review Team's Reporting Form for the years 1996-2003 and data extracted from the 2000 United States Census was used to create the descriptive profile.

Descriptive Profile

The descriptive profile for Tennessee child fatalities reported from 1996-2003 was created by running cross tabulations and frequencies for the total number of child fatalities, age, gender, race, cause and manner of death. The eight thousand five hundred thirty-one (N=8,531) child fatalities reported by the Tennessee Judicial District Child Fatality Review Team for the eight years 1996-2003 were the population of deaths analyzed in this study. Each of the 8,531 child fatalities reported on the Tennessee Child Fatality Review Team Reporting Form included each child's date of birth, date of death, gender, race, census tract, address, and zip code, county of residence, designated cause, and manner of death.

Of the 8, 531 Tennessee child fatalities analyzed in this study 1,057 (12.4%) Tennessee child fatalities were reported for 1996. There were 1, 061 (12.4%) child fatalities reported in 1997. There were 1,049 (12.3%) Tennessee child fatalities reported in 1998. In 1999, 1,056 (12.4%) child fatalities were reported in the state of Tennessee. In 2000, there were 1,092 (12.8%) child fatalities reported in Tennessee. In 2001, 1,030 (12.1%) child fatalities were found to occur in Tennessee. There were 1,123 (13.1%) child fatalities reported in 2002. In 2003, there were 1,063 (12.5%) child fatalities reported to the state of Tennessee Judicial Districts' Child Fatality Review Team. Further analyses were run to determine if more observed than expected child fatalities by census tract occurred for the years 1996-2003. The adjusted residual run on the child fatalities for the eight years 1996-2003 resulted in no significant differences within the observed and expected child fatalities for the years 1996-2003. The analysis produced no adjusted residual values less than -2 or more than +2 indicating statistical significance (Know net.hhs.gov 2).

Population Description

This descriptive profile includes Tennessee child fatalities listed by age for the eight years 1996-2003. There were 5, 108 (59.9%) children under one year of age reported to have died in Tennessee for the eight year period under study. Of 7,716 child fatalities reported in the State of Tennessee for the years 1996-2003, 815 (9.6%) were aged one to four years old. Five hundred eighty-four (6.8%) of the total child fatalities were the age group five to nine. In the age group ten to fourteen 742 (8.7%) child

fatalities were reported in Tennessee for the years 1996-1998.

Of the 8,531 child fatalities reported in Tennessee for the years 1996-2003, 1,254 (14.7%) were fifteen to eighteen years of age at the time of death. Table 19 describes reported child fatalities by age groups for the years 1996-2003.

Additionally, of the 8,531 child fatalities reported in the state of Tennessee for the eight-year period 1996-2003, 4,990 (58.50%) were male and 3,470 (40.70%) were female. Gender was not included for 71 (0.80%) child fatality cases reviewed by each Tennessee Judicial District Child Fatality Review Team. Gender frequencies are displayed in the Table 20.

Of the 8,531 Tennessee child fatalities reported for the years 1996-2003, 5,099 (59.80%) were identified as White; 3,053 (35.80%) as Black; 47 (.55%) as Asian; and 252 (2.95%) were identified as Other for the category of race. For the purposes of the analysis in this research project, the following categories of race (Black, Asian, and Other) were combined and labeled as Non-white. In the eight-year period under study, there were 80 (0.9%) of the 8,531 child fatalities reported no category for race. Table 21 Tennessee Child Fatalities Reported for the Years 1996-2003 by all the racial group categories designated on the Tennessee Child Fatality Review Reporting Form. Prior to analysis groups were collapsed into the race categories, used in this study, of White (59.8%) and Non-white (39.3%). Table 22 lists the collapsed categories by race.

Table 19. Tennessee Child Fatalities Reported for the years 1996-2003 by Age Group

Age Group	Frequency	Percent (%)
<1 year	5108	59.8
1-4 years	815	9.6
5-9 years	584	6.9
10-14 years	742	8.7
15-18 years	1254	14.7
Missing Data	28	0.3
Total	8531	100

Table 20. Tennessee Child Fatalities Reported by Gender for the Years 1996-2003

Gender	Frequency	Percent (%)
Male	4,990	58.50
Female	3,470	40.70
Missing Data	71	0.80
Total	8,531	100.00

Table 21. Tennessee Child Fatalities for the Years 1996-2003 by Race

Race	Frequency	Percent (%)
White	5,099	59.80
Black	3,053	35.80
Asian	47	0.55
Other	252	2.95
Missing Data	80	0.90
TOTAL	8,531	100.00

Table 22. Tennessee Child Fatalities for the Years 1996-2003 by Combined Categories of Race

Race	Frequency	Percent (%)
White	5,099	59.80
Non-white	3,352	39.30
Missing Data	80	0.90
TOTAL	8,531	100.00

The Manner of Death Categories

The categories of death by manner reported by the child fatality review team were natural, accidental, homicide and suicide. For the purposes of this study homicide and suicide were grouped into a single category, labeled violent child fatalities. This study's use of the category combining deaths from homicides and suicides is consistent with previously published studies (Sampson, et al. 919).

When the 8, 531 child fatality deaths in Tennessee, for the years 1996-2003, were categorized by manner, 5,954 (70.20%) were reported as natural in manner of death. An accidental manner of death was reported for 1,790 (21.10%) child fatalities. Violence was reported for 539 (6.30%) child fatalities. Table 23 provides a description of Tennessee child fatalities categories by manner for the years 1996-2003.

Causes of Death Categories

Frequencies were generated for the cause categories of each fatality reported in Tennessee for the years 1996-2003. The categories reported for a Cause of Death on the Tennessee Judicial District Child Fatality Review Reporting Form included 1) Illness and other natural causes, 2) prematurity, 3) vehicular, 4) Sudden Infant Death

Table 23. Tennessee Child Fatalities by Manner for the Years 1996-2003

Manner of Death Categories**	Total Number of Child Fatalities	Percent (%)
Natural	5,954	70.2%
Accidental	1,790	21.1%
Violent	539	6.3%

**Note: For the purposes of this study only the manner of death categories including Natural, Accidental, and Violent as determined the Tennessee Judicial Districts Child Fatality Review Team were analyzed. The percent total may not equal 100%.

Syndrome (SIDS), 5) firearms, 6) suffocation and/or strangulation, 7) drowning, 8) fire/burn, 9) inflicted injury, 10) other cause (not listed above), 11) unknown cause, 12) poisoning/overdose, and 13) lack of adequate care. An analysis of all reported causes for the years 1996-2003 found the six most frequently reported causes of death to be 3,065 (36.00%) caused by illness and other natural causes. Prematurity was the second highest cause of death reported, 2,292 (26.90%). Deaths due to vehicles were reported as the cause of death for 1,101 (12.90%) child fatalities. Sudden Infant Death Syndrome was the fourth highest reported cause of child fatalities with 643 (7.50%) reported deaths. Firearms were the fifth highest reported cause of child fatalities with 372 (4.40%) child fatalities. Two hundred forty-eight 248 (2.90%) child fatalities were reported for suffocation and/or strangulation, the sixth most frequently reported cause of death. In addition to these top six causes of death, 790 (9.20%) combined causes included drowning, fire/burn, inflicted injury, other cause not listed above, unknown cause, poisoning/overdose, or lack of adequate care. No cause of death was listed for 20 (0.2%) Tennessee child fatalities reported for the years 1996-2003. Tennessee child fatalities by cause for the years 1996-2003 are profiled in Table 24.

Violent Child Fatalities by Cause

Frequencies were generated for each violent (homicide and suicide) child fatality by cause. Of the violent child fatalities reported for the years 1996-2003, 299 (55.5%) were caused by firearms. Inflicted injury was the second highest reported cause of violent child fatalities with 127 (23.6%) deaths.

Suffocation and/or strangulation were the third highest cause of violent death reported in Tennessee for the years 1996-2003 with 62 (11.5%) reported fatalities. Violent deaths caused by vehicles were the fourth highest reported cause of child fatalities in Tennessee with 17 (3.2%) reported deaths from 1996-2003. The poisoning and/or overdose category was the fifth highest reported cause of child deaths with 14

Table 24. Tennessee Child Fatalities by Cause (1996-2003)

Cause of Death*	Child Fatalities	Percent (%)
Illness or other natural cause	3065	36.00
Prematurity	2292	26.90
Vehicular	1101	12.90
Sudden Infant Death Syndrome	643	7.50
Firearm	372	4.40
Suffocation and/or strangulation	248	2.90
Drowning	196	2.30
Fire/burn	188	2.20
Inflicted Injury	140	1.60
Other cause not listed above	107	1.30
Unknown cause	95	1.10
Poisoning/overdose	44	0.50
Lack of adequate care	20	0.20
Missing	20	0.20
Total	8,531	100.0

*All Cause of Death data was selected from the Tennessee Child Fatality Reporting Form under the cause determined by each Judicial District Child Fatality Review Team.

Table 25. Violent Child Fatalities by Cause of Death for the years 1996-2003

Cause of Death	Frequency	Percent (%)
Firearm	299	55.5
Inflicted Injury	127	23.6
Suffocation and/or Strangulation	62	11.5
Vehicle	17	3.2
Poisoning or Overdose	14	2.6
Drowning	8	1.5
Lack of adequate care	6	1
Fire or Burn	4	0.7
Prematurity	1	0.2
Unknown Cause	1	0.2
Total	539	100

(2.6%) fatalities. The sixth leading cause of violent child fatalities reported in Tennessee for the years 1996-2003 was drowning deaths where eight fatal cases were reported to the Tennessee Child Fatality Review Team. Six (1%) violent child fatalities occurred from lack of adequate care, four (0.7%) fire or burn violent child fatalities were reported as the cause of death from 1996-2003. One violent child fatality (0.2%) was reported to the Tennessee Child Fatality Review Team for the causes of prematurity and an unknown cause. Tennessee violent child fatalities by cause for the years 1996-2003 are profiled in Table 25.

Accidental Child Fatalities by Cause

The six most frequently reported causes of accidental death for children in Tennessee for the years 1996-2003 were 1) vehicular, 2) drowning, 3) Fire and/or burn, 4) suffocation and/or strangulation, 5) other cause not listed, and 6) firearm. Of the 8,511 accidental child fatalities reported, 1,067 (59.6%) were listed as vehicular deaths.

Drowning was reported as the cause of 185 (10.3%) accidental child fatalities. Fire and/or burn were reported as the cause for 181 (10.1%) accidental Tennessee child fatalities. Suffocation and/or strangulation were reported as the cause of death for 165 (9.2%) accidental child fatalities. The Other causes not listed category was reported for 85 (4.8%) accidental child fatalities for the years 1996-2003. A firearm was reported as the cause for 60 (3.4%) of the accidental child fatalities. Poisoning and/or overdose were reported as the cause of death reported for 23 (1.3%) accidental child fatalities in Tennessee. Inflicted injury was reported as the cause of six (0.3%) accidental child fatalities. Prematurity was reported as the cause of death for five (0.3%) accidental child fatalities. Illness or other natural cause was reported as the cause of death for four (0.2%) accidental child fatalities for the years 1996-2003. Lack of adequate care was reported as the cause of death for three (0.2%) accidental child fatalities. Unknown cause was the cause of death for three (0.2%) accidental child fatalities. Sudden Infant Death Syndrome consisted of two accidental deaths (0.1%). Accidental child fatalities for the years 1996-2003 by cause are described in Table 26. Accidental Child Fatalities by Cause of Death for the years 1996-2003.

Natural Child Fatalities by Cause

The most frequently reported causes of death for natural child fatalities reported by manner were 1) illness or other natural cause, 2) prematurity, 3) Sudden Infant Death Syndrome, and 4) other causes not listed. Of the 5,954 reported Tennessee child fatalities classified by manner as natural, 3,031 (50.9%) reported the cause of death to be illness or

Table 26. Accidental Child Fatalities by Cause for the Years 1996-2003

Cause of Accidental Deaths	Frequency	Percent (%)
Vehicular	1,067	59.6
Drowning	185	10.3
Fire/burn	181	10.1
Suffocation and/or Strangulation	165	9.2
Other cause not listed above	85	4.8
Firearm	60	3.4
Poisoning or Overdose	23	1.3
Inflicted Injury	6	0.3
Prematurity	5	0.3
Illness or other natural cause	4	0.2
Lack of adequate care	3	0.2
Unknown cause	3	0.2
Sudden Infant Death Syndrome	2	0.1
Total	1789	100

Table 27. Natural Child Fatalities by Cause of Death 1996-2003

Cause of Death	Frequency	Percent (%)
Illness or other natural cause	3,031	50.9
Prematurity	2,274	38.2
Sudden Infant Syndrome	614	10.3
Other cause not listed above	11	0.2
Vehicular	10	0.2
Suffocation and/or Strangulation	6	0.1
Lack of Adequate Care	4	0.1
Drowning	1	0.0
Firearm	1	0.0
Fire/Burn	1	0.0
Unknown cause	1	0.0
Total	5954	100

other natural cause. Prematurity was reported as the second leading cause of natural deaths and was reported in 2,274 (38.2%) of Tennessee fatalities for the years 1996-2003. Sudden Infant Death Syndrome was reported as the third highest cause of deaths with 614 (10.3%) natural child fatalities. All causes of death classified as natural are described in Table 27- Natural Child Fatalities by Cause of Death Reported for the Years 1996-2003.

Child Fatality and Neighborhood Housing and Demographic Characteristics Data Management

The neighborhood housing and demographic characteristics of heads of households were selected for analysis in this study. The neighborhood housing characteristics of the amount of rental housing, vacant housing units, average size of households and urban location were extracted for use in this study. Before statistical analyses were run the neighborhood housing and demographic characteristics of heads of households were adjusted for the child population in each census tract. The housing

characteristics by census tract and demographic characteristics of heads of households selected for analysis in this study by census tract included household size (P16), rental housing (H4), vacancy status (H19), and urban location extracted from the United States 2000 Census' housing and population tables.

When all Tennessee census tracts for the 2000 Census were tabulated, there were found to be 1,361 census tracts recorded in the 2000 United States Census. For each year of the eight year study, all child fatalities were matched with their location into one of the 1,361 census listed for Tennessee in the 2000 census. This resulted in a total of 10,088 data points. When all eight years of child fatality data were assigned to the appropriate census tract had an assigned child fatality reported during a given year or not for the entire study period 1996-2003.

Child Fatality Adjusted Rates

The extracted data from each Tennessee Judicial District Child Fatality Review Team Reporting Form and the housing characteristic and head of household characteristic data selected from the 2000 United States Census were coded, downloaded, and input into a SPSS database. The research study examined all child fatalities reported in each Tennessee Judicial Districts' tracts. Before statistical analyses were run, the neighborhood housing and head of household characteristic for each census tract data were adjusted for the child population in each census tract. This adjusted rate was generated to control for the wide range of children reported in 2000 to live in each census tract (neighborhood) in Tennessee. Following the completion of this procedure a result of

an adjusted rate of child fatalities for each census tract (neighborhood) was produced.

Vacant Housing – Adjusted Rate

Housing characteristics were also adjusted before statistical analyses were conducted to determine if an association existed between a specific housing characteristic and the rate of Tennessee child fatalities that occurred from 1996-2003. Census enumerators report of the number of vacant housing units was divided by the number of vacant and occupied units reported by the enumerators of the United States 2000 Census, for each census tract, to generate a rate for each Tennessee census tract. This adjusted vacancy rate was created for each census tract. The average household size with a census tract provided in the United States 2000 Census was used as the unit of analysis for documenting an average number of persons per household in a census tract. For the purposes of this study was calculated by the rate of urban units being divided by the rate of housing units was generated for each census tract. This percentage of urban units within a tract was used as the unit of analysis for this study.

The percent of households reporting a specific head of household demographic characteristic was generated for each census tract. The percent of female heads of households for each census tract was generated. The percentage was found by taking the number of female heads of households reported in a census tract and dividing by the total number of heads of households in a census tract.

The percent of single heads of households was generated for each census in Tennessee. The percentage was found by taking the number of single heads of

households reported in a census tract and dividing by the total number of heads of households in a census tract. The percent of Spanish/Hispanic/Latino heads of households was generated for each census in Tennessee.

The percentage was found by taking the number of Spanish/Hispanic/Latino heads of households reported in a census tract and dividing by the total number of heads of households in a census tract. The Non-white heads of households in a census tract was generated using the self-reported racial group responses reported on the 2000 census for each head of household. The Spearman Rho statistical test and the adjusted residuals were generated using the final data fields resulting from the generation of adjusted rates. After adjustments were made the data was analyzed using the Spearman Rho statistical test and Cross tabulations. The Spearman Rho calculations were used to test the strength of association between the Tennessee neighborhood housing and demographic characteristics of heads of households and Tennessee child fatalities (total, violent, accidental, and natural) for the years 1996-2003.

Testing for Association between Neighborhood and the Rate of Child Fatalities

This section provides an analysis of the strength of association between neighborhood characteristics and the rate of child fatalities. Using the Spearman Rho and correlation coefficients and the related adjusted residuals for each individual neighborhood housing and demographic characteristic of head of household was assessed. Tennessee child fatalities were also assessed using the manner of death categories violent, natural, and accidental for the years 1996-2003.

Housing Characteristics-Total Child Fatalities

Spearman Rho rank correlations were used to assess the strength of the association between the neighborhood housing characteristics of, rental housing, vacancy status, household size, and urban location. A Spearman rho coefficient of $r_s = .072$ at the $p < .01$ level confirmed that a weak positive association existed between the amount of rental housing and the rate of total child fatalities reported in Tennessee neighborhoods for the eight year period. Table 42. Rental Housing Units of Tennessee Neighborhoods and the Rate of Tennessee Child Fatalities (1996-2003) included the census response, type of data, the results of the correlation and the outcome of the statistical analyses. Vacancy status was found to have a correlation coefficient of $r_s = .071$ at the $p < .01$ level which indicated a weak positive association exists between the percent of vacant housing units and the rate of child fatalities reported in Tennessee for the years 1996-2003. The generated correlation coefficient $r_s = .100$ indicates a weak positive association existed between household size and the rate of child fatalities reported in Tennessee neighborhoods during the years 1996-2003 when using a $p < .01$ value. No association was found to exist between urban location and the rate of child fatalities reported as occurring in Tennessee during the years 1996-2003.

Demographic Characteristics of Heads of Households-Total Child Fatalities

The demographic characteristics of heads of households were assessed to determine if an association existed with the rate of the total number of child fatalities reported in Tennessee for the years 1996-2003. A Spearman Rho correlation of $r_s = -.040$

at the $p < .01$ level was determined for the female heads of households and the rate of child fatalities reported in Tennessee for the years 1996-2003. The outcome was a weak negative association determined to exist between female heads of households and the rate of child fatalities reported in Tennessee neighborhoods for the years 1996-2003. A correlation coefficient of $r_s = -.023$ at the $p < .05$ level was obtained for single heads of households and the rate of child fatalities reported in Tennessee for the years 1996-2003. The result showed a significantly weak negative association indicated to exist between single heads of households and the rate of reported child fatalities in Tennessee from 1996-2003. No association was found to exist between Spanish/Hispanic/Latino heads of households and the rate of child fatalities reported in Tennessee for the years 1996-2003. A correlation coefficient of $r_s = .125$ at the $p < .01$ level was acquired for the racial group including Non-whites and the rate of child fatalities reported in Tennessee for the years 1996-2003. The correlation was an indicator that a weak positive association existed between the racial group of heads of households and the rate of reported child fatalities in Tennessee for the eight years. Table 28. Spanish/Hispanic/Latino Heads of Households in Tennessee Neighborhoods and the Rate of Child Fatalities (1996-2003) includes the census response, type of data, results, and the outcome of the statistical analyses. Table 28 includes the results of the Spearman Rho correlations and interpretations of the correlations.

Table 28. Spearman Rho Correlations for Total Child Fatalities 1996-2003

Neighborhood Characteristics	Total Number of Child Fatalities	Outcome+
Rental Housing	.072	Significantly weak positive
<i>Significance</i>	.000(**)	
Vacancy Status	.071	Significantly weak positive
<i>Significance</i>	.000(**)	
Household Size	.100	Significantly weak positive
<i>Significance</i>	.000(**)	
Urban Location	-.014	No significance
<i>Significance</i>	.160ns	
Female Heads of Households	-.040	Significantly weak negative
<i>Significance</i>	.000(**)	
Single Heads of Households	-.023	Significantly weak negative
<i>Significance</i>	.022(*)	
Spanish/Hispanic/Latino Heads of Households	-.011	No significance
<i>Significance</i>	.292ns	
Non-white Heads of Households	.125	Significantly weak positive
<i>Significance</i>	.000(**)	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

ns= Not significant

⁺**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Violent Child Fatalities

Housing Characteristics-Violent Child Fatalities

Spearman Rho correlations were run on the housing characteristics with the rate of violent child fatalities for the years 1996-2003. A correlation coefficient of $r_s = .034$ at the $p < .01$ level was obtained for the amount of rental housing and the rate of violent child fatalities for the years 1996-2003. The statistical analyses showed a weak positive association between the amount of rental housing and the rate of violent child fatalities for the years 1996-2003. No association was found to exist between vacancy status and the rate of violent child fatalities reported in Tennessee for the years 1996-2003. A Spearman Rho coefficient of $r_s = .055$ at the $p < .01$ level was obtained for household size and the rate of violent child fatalities reported in Tennessee for the years 1996-2003. A weak positive association was determined to exist between household size and the rate of violent child fatalities reported in Tennessee for the years 1996-2003. No association was found to exist between urban location and the rate of violent child fatalities reported in Tennessee for the years 1996-2003. In the appendix, tables 50-53 contain the results of the Spearman Rho correlations and the results of the cross-tabulations and adjusted residuals.

Demographic Characteristics of Heads of Households-Violent Child Fatalities

Demographic characteristics heads of households and the rate of violent child fatalities were assessed using Spearman Rho correlations. A correlation coefficient of $r_s =$

-.024 at the $p < .05$ level was acquired for female heads of households and the rate of violent child fatalities in Tennessee for the years 1996-2003.

No associations were determined to exist between single and Spanish/Hispanic/Latino heads of households and the rate of violent child fatalities reported in Tennessee for the years 1996-2003. A correlation coefficient of $r_s = .064$ at the $p < .01$ level was acquired for the racial group including Non-white individuals and the rate of violent child fatalities for the years 1996-2003. The Spearman Rho correlations and the interpretations of violent child fatalities are listed in Table 29.

Accidental Child Fatalities

Housing Characteristics-Accidental Child Fatalities

Spearman Rho correlation analyses were conducted on the housing characteristics and the rate of accidental child fatalities reported for the years 1996-2003. A correlation coefficient of $r_s = -.033$ at the $p < .01$ level was obtained for the amount of rental housing and the rate of violent child fatalities for the years 1996-2003. The statistical analyses produced a weak negative association between the amount of rental housing and the rate of accidental child fatalities reported in Tennessee for the years 1996-2003. The Spearman Rho correlation obtained a coefficient of $r_s = .041$ at the $p < .01$ level for vacancy status and the rate of accidental child fatalities reported in Tennessee for the years 1996-2003. The correlation coefficient confirmed a weak positive association between vacancy status and the rate of reported accidental child fatalities for the years 1996-2003. A correlation coefficient of $r_s = .065$ was determined for household size and

Table 29. Spearman Rho Correlations for Violent Child Fatalities 1996-2003

Neighborhood Characteristics	Violent Child Fatalities	Outcome+
Rental Housing	.034	Significantly weak positive
<i>Significance</i>	.001(**)	
Vacancy Status	-.006	No significance
<i>Significance</i>	.569ns	
Household Size	.055	Significantly weak positive
<i>Significance</i>	.000(**)	
Urban Location	.014	No significance
<i>Significance</i>	.165ns	
Female Heads of Households	-.024	Significantly weak negative
<i>Significance</i>	.018(*)	
Single Heads of Households	-.019	No significance
<i>Significance</i>	.063ns	
Spanish/Hispanic/Latino Heads of Households	-.010	No significance
<i>Significance</i>	.322ns	
Non-white Heads of Households	.064	Significantly weak positive
<i>Significance</i>	.000(**)	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

ns= Not significant

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

the rate of reported accidental child fatalities in Tennessee for the years 1996-2003. The Spearman Rho correlation determined a weak positive association existed between household size and the rate of accidental child fatalities reported in Tennessee from 1996-2003. A Spearman Rho coefficient of $r_s = -.081$ at the $p < .01$ level was obtained for urban location and the rate of accidental child fatalities reported in Tennessee for the years 1996-2003. A weak negative association was determined to exist between urban location and the rate of accidental child fatalities reported in Tennessee for the years 1996-2003. Spearman Rho correlation findings for accidental child fatalities 1996-2003 are located in Table 30.

Demographic Characteristics of Heads of Households-Accidental Child Fatalities

Demographic characteristics of heads of households and the rate of accidental child fatalities were assessed using Spearman Rho correlations. A correlation coefficient of $r_s = -.061$ at the $p < .01$ level was acquired for female heads of households and the rate of accidental child fatalities reported in Tennessee for the years 1996-2003. The coefficient showed a weak negative association existed between female heads of households and the rate of accidental child fatalities reported for the years 1996-2003. The Spearman Rho correlation produced a coefficient of $r_s = -.060$ at the $p < .01$ level for single heads of households and the rate of accidental child fatalities reported from 1996-2003, in Tennessee. The coefficient confirmed a weak negative association existed between single heads of households and the rate of accidental child fatalities reported in Tennessee from 1996-2003. A correlation coefficient of $r_s = -.032$ at the $p < .01$ level was

Table 30. Spearman Rho Correlations for Accidental Child Fatalities 1996-2003

Neighborhood Characteristics	Accidental Child Fatalities	Outcome+
Rental Housing	-.033	Significantly weak negative
<i>Significance</i>	.001(**)	
Vacancy Status	.041	Significantly weak positive
<i>Significance</i>	.000(**)	
Household Size	.065	Significantly weak positive
<i>Significance</i>	.000(**)	
Urban Location	-.081	Significantly weak negative
<i>Significance</i>	.000(**)	
Female Heads of Households	-.061	Significantly weak negative
<i>Significance</i>	.000(**)	
Single Heads of Households	-.060	Significantly weak negative
<i>Significance</i>	.000(**)	
Spanish/Hispanic/Latino Heads of Households	-.032	Significantly weak negative
<i>Significance</i>	.001(**)	
Non-white Heads of Households	-.029	Significantly weak negative
<i>Significance</i>	.004(**)	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

ns= Not significant

⁺**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

acquired for the Spanish/Hispanic/Latino heads of households and the rate of accidental child fatalities for the years 1996-2003. The coefficient acquired indicated a weak negative relationship existed between Spanish/Hispanic/Latino heads of households and the rate of accidental child fatalities reported in Tennessee for the years 1996-2003. The Spearman Rho correlation produced a coefficient of $r_s = -.029$ at the $p < .01$ level for the racial group including Non-white individual heads of households and the rate of accidental child fatalities reported for the years 1996-2003 in Tennessee. The coefficient showed a weak negative association existed between the racial group (Non-white) heads of households and the rate of accidental child fatalities reported in Tennessee for the years 1996-2003. Results of the Spearman Rho correlations and the interpretation of the scale, for accidental child fatalities, are included in Table 30.

Natural Child Fatalities

Housing Characteristics-Natural Child Fatalities

Spearman Rho correlations were run on the housing characteristics and the rate of natural child fatalities reported for the years 1996-2003. A correlation coefficient of $r_s = .091$ at the $p < .01$ level was obtained for the amount of rental housing and the rate of natural child fatalities for the years 1996-2003. The results showed a weak positive association between the amount of rental housing and the rate of natural child fatalities reported in Tennessee for the years 1996-2003. A correlation coefficient of $r_s = .033$ at the $p < .01$ level was obtained for vacancy status and the rate of reported natural child fatalities reported in Tennessee for the years 1996-2003. The Spearman Rho correlation

confirmed a positive association existed between vacancy status and the rate of reported natural child fatalities in Tennessee for the years 1996-2003. A Spearman Rho coefficient of $r_s = .090$ at the $p < .01$ level was obtained for household size and the rate of natural child fatalities reported in Tennessee for the years 1996-2003. A weak positive association was determined to exist between average household size and the rate of natural child fatalities reported in Tennessee for the years 1996-2003. A correlation coefficient of $r_s = .026$ at the $p < .01$ level was obtained for urban location and the rate of reported natural child fatalities reported in Tennessee for the years 1996-2003. The coefficient showed a weak positive association exists between urban location of housing units and the rate of reported child fatalities in Tennessee for the years 1996-2003. In the appendix, tables 66-69 include the neighborhood housing characteristics and the rate of natural Tennessee child fatalities for the years 1996-2003.

Demographic Characteristics of Heads of Households-Natural Child Fatalities

Demographic characteristics of heads of households and the rate of natural child fatalities were assessed using Spearman Rho correlations. A correlation coefficient of $r_s = -.024$ at the $p < .05$ level was acquired for female heads of households and the rate of natural child fatalities in Tennessee for the years 1996-2003. The results show a weak negative association existed between female heads of households and the rate of natural child fatalities reported in Tennessee for the years 1996-2003. No associations were determined to exist between single and Spanish/Hispanic/Latino heads of households and the rate of natural child fatalities reported in Tennessee for the years 1996-2003. A

correlation coefficient of $r_s = .155$ at the $p < .01$ level was acquired for the racial group including Non-white individuals and the rate of natural child fatalities for the years 1996-2003. Table 31 Spearman Rho Correlation Table summarizes the coefficients obtained for the housing characteristics and the demographic characteristics of heads of households.

Adjusted Residuals

Ranked and Grouped Housing Characteristics

Before the adjusted residuals were run, percentile values of a quantitative ordered variable were divided by groups so that a certain percentage was above and another percentage was below. Census tracts were divided into tertiles (lower 1/3, middle 1/3, and highest 1/3) for the housing characteristics including rental housing, vacant housing units, and average household size; and demographic characteristics of heads of households which included female, single, Spanish/Hispanic/Latino and Non-white individuals. Quartiles (the 25th, 50th, and 75th percentiles) divided the census tracts into four ranges of equal size (SPSS 1) for urban location in this research project.

Cross-tabulations were also run to calculate the adjusted residuals to further determine if any significant differences existed between the observed and expected total (violent, accidental, and natural) child fatalities when the housing characteristics and demographic characteristics of heads of households data was ranked and grouped.

Adjusted residuals are considered to be significant if the value is less than -2 or

Table 31. Spearman Rho Correlations for Natural Child Fatalities 1996-2003

Neighborhood Characteristics	Natural Fatalities	Outcome+
Rental Housing	.091	Significantly weak positive
<i>Significance</i>	.000(**)	
Vacancy Status	.033	Significantly weak positive
<i>Significance</i>	.001(**)	
Household Size	.090	Significantly weak positive
<i>Significance</i>	.000(**)	
Urban Location	.026	Significantly weak positive
<i>Significance</i>	.008(**)	
Female Heads of Households	-.024	Significantly weak negative
<i>Significance</i>	.017(*)	
Single Heads of Households	-.009	No significance
<i>Significance</i>	.381ns	
Spanish/Hispanic/Latino Heads of Households	.011	No significance
<i>Significance</i>	.272ns	
Non-white Heads of Households	.155	Significantly weak positive
<i>Significance</i>	.000(**)	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

ns= Not significant

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

more than a +2. Table 32 shows the divided categories into thirds of Tennessee census tracts with child fatalities for the years 1996-2003 grouped by the housing characteristic of rental housing.

The ranked and grouped Tennessee census tracts by percent of vacant housing are provided in Table 33. The rankings and groupings were divided into lower, middle, and highest tertiles as listed in Table 33 and Table 34. Tennessee census tracts with reported child fatalities were ranked and grouped by urban location into quartiles. The first ranking and grouping was less than or equal to 25% urban; the second ranking was greater than 25% and less than or equal to 50% urban grouping; the third ranking and grouping was greater than 50% and less than or equal to 75% urban; and the fourth ranking was greater than 75% urban as shown in Table 35.

Ranked and Grouped Demographic Characteristics of Heads of Households

Tables 36-39 showed the rankings and groupings of child fatalities reported in Tennessee census tracts by demographic characteristics of Tennessee neighborhoods for the years 1996-2003. The demographic characteristics of heads of households included female, single, Spanish/Hispanic/Latino, and Non-white heads of households.

Table 32. Ranked and Grouped Percent of Rental Housing Cross-Tabulations

Ranked and Grouped by percent of Rental Housing reported in each Tennessee Census Tract	Census Response	Type of Data	Statistical Test
Ranked and grouped percent of rental housing within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of rental housing within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of rental housing within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual

Table 33. Ranked and Grouped Percent of Vacant Housing Units Cross-Tabulations

Ranked and Grouped by percent of Vacant Housing Units reported in each Tennessee Census Tract	Census Response	Type of Data	Statistical Test
Ranked and grouped percent of vacant housing units within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of vacant housing units within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of vacant housing units within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual

Table 34. Ranked and Grouped by Average Household Size Cross-Tabulations

Ranked and Grouped by Average Household Size reported in each Tennessee Census Tract	Census Response	Type of Data	Statistical Test
Ranked and grouped percent of average household size within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of average household size within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of average household size within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual

Table 35. Ranked and Grouped by Urban Location Cross-Tabulations

Ranked and Grouped by Urban Location reported in each Tennessee Census Tract	Census Response	Type of Data	Statistical Test
Were more child fatalities observed than expected in a census tract when designated as urban?		See groups listed below	
When ranked and grouped by non-urban group.	Non-urban Tennessee census tracts	Ordinal	Adjusted Residual
When ranked and grouped by less than or equal to 25% urban group.	Less than or equal to 25% of Tennessee census tracts	Ordinal	Adjusted Residual
When ranked and grouped by greater than 25% and less than or equal to 50% urban.	Greater than 25% and less than or equal to 50% of Tennessee census tracts	Ordinal	Adjusted Residual
When ranked and grouped by greater than 50% and less than or equal to 75% urban.	Greater than 50% and less than or equal to 75% of Tennessee census tracts	Ordinal	Adjusted Residual
When ranked and grouped by greater than 75% urban	Greater than 75% of Tennessee census tracts	Ordinal	Adjusted Residual

Table 36. Ranked and Grouped Percent of Female Heads of Households Cross-Tabulations

Ranked and Grouped by percent of Female Heads of Households reported in each Tennessee Census Tract	Census Response	Type of Data	Statistical Test
Ranked and grouped percent of female heads of households within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of female heads of households within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of female heads of households within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual

Table 37. Ranked and Grouped Percent of Single Heads of Households Cross-Tabulations

Ranked and Grouped by percent of Single Heads of Households reported in each Tennessee Census Tract	Census Response	Type of Data	Statistical Test
Ranked and grouped percent of single heads of households within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of single heads of households within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of single heads of households within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual

Table 38. Ranked and Grouped Percent of Spanish/Hispanic/Latino Heads of Households Cross-Tabulations

Ranked and Grouped by percent of Spanish/Hispanic/Latino Heads of Households reported in each Tennessee Census Tract	Census Response	Type of Data	Statistical Test
Ranked and grouped percent of Spanish/Hispanic/Latino Heads of Households within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of Spanish/Hispanic/Latino Heads of Households within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of Spanish/Hispanic/Latino Heads of Households within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual

Table 39. Ranked and Grouped Percent of Non-white heads of households Cross-Tabulations

Ranked and Grouped by percent of Non-white Heads of Households reported in each Tennessee Census Tract	Census Response	Type of Data	Statistical Test
Ranked and grouped percent of Non-white Heads of Households within the lowest 1/3 of Tennessee census tracts	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of Non-white Heads of Households within the middle 1/3 of Tennessee census tracts	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual
Ranked and grouped percent of Non-white Heads of Households within the highest 1/3 of Tennessee census tracts	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual

Adjusted Residuals for Housing Characteristics and Total Reported Child Fatalities

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of rental housing an adjusted residual of -2.9 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of rental housing also had significantly less reported child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by rental housing an adjusted residual of -1.6 determined no significant difference between the observed and expected child fatalities reported in Tennessee census tracts for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of rental housing an adjusted residual of 4.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of rental housing also had significantly more reported child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by vacancy status an adjusted residual of -4.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of vacancy status also had significantly less reported child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of vacancy status an adjusted residual of 2.7 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of vacancy status also had significantly more reported child

fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by vacancy status an adjusted residual of 1.8 was found. This adjusted residual demonstrates no significant difference in observed and expected census tracts with reported child fatalities for the years 1996-2003.

An adjusted residual of -8.4 was found, when calculated for the lowest 1/3 of census tracts grouped by household size. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of average household size had significantly less reported child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by average household size, an adjusted residual adjusted residual of 2.6 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of average household size had significantly more reported child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by average household size, an adjusted residual of 5.9 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of average household size had significantly more reported child fatalities observed than could statistically be expected.

In the non-urban group, an adjusted residual of -0.6 determined no significant difference was found between observed than expected child fatalities. When an adjusted residual was calculated for the census tracts less than or equal to the 25th percentile of

census tracts ranked by urban households, an adjusted residual of 2.0 determined no significant difference was found between observed and expected child fatalities reported in Tennessee census tracts. When an adjusted residual was calculated for the census tracts greater than 25% and less than or equal to 50% urban, an adjusted residual of 0.9 indicates no significant difference was found between observed and expected census tracts with reported child fatalities. When an adjusted residual was calculated for the census tracts greater than 50% and less than or equal to 75% urban an adjusted residual of -2.8 indicates that significantly less reported child fatalities were observed than expected in census tracts greater than 50% and less than or equal to 75% urban. When an adjusted residual was calculated for the census tracts greater than 75% urban, an adjusted residual of -2.4 was found. This adjusted residual demonstrates significantly less reported child fatalities were observed than expected in census tracts greater than 75% urban. Table # in Appendix C details the adjusted residuals for the Urban Location by census tracts and reported child fatalities in Tennessee for the eight-years 1996-2003.

Demographic Characteristics of Heads of Household and Total Child Fatality Adjusted Residuals

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of 3.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of female heads of households had significantly more reported child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of female

heads of households an adjusted residual of 0.6 determined no significant difference between the observed and expected child fatalities reported in Tennessee census tracts for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of -4.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of female heads of households also had significantly less reported child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of 1.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of single heads of households determined no significant difference between observed and expected census tracts where child fatalities were reported. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of 2.4 determined significantly more census tracts with reported child fatalities were observed than expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of -3.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of single heads of households had significantly less reported child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual

of -0.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of Spanish/Hispanic/Latino heads of households had no significant difference between observed and expected census with reported child fatalities. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of 1.6 was found. This adjusted residual demonstrates that the middle 1/3 of census tracts reporting the middle percentage of Spanish/Hispanic/Latino heads of households had no significant difference between census tracts reporting child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of -1.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of Spanish/Hispanic/Latino heads of households had no significant difference between observed and expected census tracts reporting child fatalities for the years 1996-2003 (See appendix Table 48).

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of Non-white heads of households an adjusted residual of -3.7 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of Non-white heads of households also had significantly less reported child fatalities in Tennessee census tracts observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by Non-white heads of households an adjusted residual of -3.2 was

found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of Non-white heads of households had significantly less census tracts with child fatalities observed than could statistically be expected. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of Non-white heads of households an adjusted residual of 6.9 was found.

This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of Non-white heads of households had significantly more census tracts with reported child fatalities observed than could statistically be expected for the years 1996-2003.

Adjusted Residuals for Violent Child Fatalities

Housing Characteristics and Violent Child Fatalities-Adjusted Residuals

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of rental housing an adjusted residual of -1.9 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of rental housing had no significant difference in violent child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by rental housing an adjusted residual of -2.0 determined no significant difference between the observed and expected violent child fatalities reported in Tennessee census tracts for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of rental housing an adjusted residual of 3.9 was found. This adjusted

residual demonstrates that the 1/3 of census tracts reporting the highest percentage of rental housing also had significantly more reported violent child fatalities observed than could statistically be expected for the years 1996-2003 as shown in Table 50 located in appendix C.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by vacancy status an adjusted residual of 0.4 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of vacancy status also had no significant difference in reported violent child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of vacancy status an adjusted residual of 0.6 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of vacancy status had no significant difference in reported violent child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by vacancy status an adjusted residual of 0.9 was found. This adjusted residual demonstrates no significant difference in observed and expected census tracts with reported violent child fatalities for the years 1996-2003.

An adjusted residual of -4.2 was found, when calculated for the lowest 1/3 of census tracts grouped by average household size. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of household size had significantly less reported violent child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the

middle 1/3 of census tracts grouped by average household size, an adjusted residual adjusted residual of -0.9 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of average household size had no significantly difference in violent child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by average household size, an adjusted residual of 5.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of average household size had significantly more reported violent child fatalities observed than could statistically be expected.

An adjusted residual of -2.9 was found in the non-urban group, which indicates significantly less census tracts with violent child fatalities were observed than expected. When an adjusted residual was calculated for the census tracts less than or equal to the 25th percentile of census tracts ranked by non-urban households, an adjusted residual of -2.9 determined significantly less observed than expected violent child fatalities reported in Tennessee census tracts. When an adjusted residual was calculated for the census tracts less than or equal to 25% , an adjusted residual of -1.3 indicates no significant difference was found between observed and expected census tracts with reported violent child fatalities. An adjusted residual of 4.3 was found for the ranked and grouped census tracts greater than 25% and less than or equal to 50% urban, which indicates significantly more census tracts with child fatalities were observed than expected. When an adjusted residual was calculated for the census tracts greater than 50% and less than or equal to 75% urban an adjusted residual of 0.7 indicates that no significant difference was found between

observed and expected census tracts with violent child fatalities. When an adjusted residual was calculated for the census tracts greater than 75% urban, an adjusted residual of -0.7 was found. This adjusted residual demonstrates no significant difference was found between observed and expected child fatalities in census tracts with greater than 75% urban.

Table 53 urban location in Tennessee neighborhoods and the Rate of Violent Child Fatalities includes the Spearman Rho correlations and the adjusted residual results.

Demographic Characteristics of Heads of Households and Violent Child Fatalities-Adjusted Residuals

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of 2.0 was found. This adjusted residual demonstrates that no significant difference was found between observed and expected census tracts with violent child fatalities. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of 0.3 determined no significant difference between the observed and expected violent child fatalities reported in Tennessee census tracts for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of female heads of households a residual of -2.4 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of female heads of households also had significantly less reported violent child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of 2.3 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of single heads of households determined had significantly more census tracts with violent child fatalities observed than expected. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of -0.7 determined no significant difference existed in census tracts with reported violent child fatalities observed than expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of -1.7 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of single heads of households had no significant difference between observed violent child fatalities than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of 0.8 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of Spanish/Hispanic/Latino heads of households had no significant difference between observed and expected census with reported violent child fatalities. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of 0.6 was found. This adjusted residual demonstrates that the middle 1/3 of census tracts reporting the middle percentage of Spanish/Hispanic/Latino heads of households had no

significant difference between census tracts reporting violent child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of -1.3 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of Spanish/Hispanic/Latino heads of households had no significant difference between observed and expected census tracts reporting violent child fatalities for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of Non-white heads of households an adjusted residual of -2.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of Non-white heads of households also had significantly less reported violent child fatalities in Tennessee census tracts observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by Non-white heads of households an adjusted residual of -3.6 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of Non-white heads of households had significantly less census tracts with violent child fatalities observed than could statistically be expected. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of Non-white heads of households a residual of 6.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of Non-white heads of households had significantly more census

tracts with reported violent child fatalities observed than could statistically be expected for the years 1996-2003.

Adjusted Residuals for Accidental Child Fatalities

Housing Characteristics and Accidental Child Fatalities-Adjusted Residuals

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of rental housing an adjusted residual of 1.9 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of rental housing also had no significant difference reported accidental child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual of 2.2 was calculated for the middle 1/3 of census tracts grouped by rental housing significantly more observed than expected accidental child fatalities reported in Tennessee census tracts for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of rental housing an adjusted residual of -4.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of rental housing also had significantly less reported accidental child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by vacancy status an adjusted residual of -2.8 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of vacancy status also had significantly less reported accidental child fatalities observed than could

statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of vacancy status an adjusted residual of -0.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of vacancy status had no significant difference in reported accidental child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by vacancy status an adjusted residual of 3.3 was found. This adjusted residual demonstrates no significant difference in observed and expected census tracts with reported child fatalities for the years 1996-2003.

An adjusted residual of -7.3 was found, when calculated for the lowest 1/3 of census tracts grouped by average household size. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of average household size had significantly less reported accidental child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by average household size, an adjusted residual adjusted residual of 4.2 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of average household size had significantly more reported accidental child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by household size, an adjusted residual of 3.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of household size had significantly more reported child fatalities observed

than could statistically be expected.

An adjusted residual of 4.5 for the non-urban group indicated significantly more accidental child fatalities were observed than expected. When an adjusted residual was calculated for the census tracts less than or equal to the 25th percentile of census tracts ranked by urban households, an adjusted residual of 4.6 determined significantly more observed than expected accidental child fatalities reported in Tennessee census tracts. When an adjusted residual was calculated for the census tracts greater than 25% and less than or equal to 50% urban, an adjusted residual of -0.2 indicated no significant difference between observed and expected census tracts with reported accidental child fatalities. When an adjusted residual was calculated for the census tracts greater than 50% and less than or equal to 75% urban an adjusted residual of -2.2 indicated significantly less reported accidental child fatalities were observed than expected in census tracts greater than 50% and less than or equal to 75% urban. When an adjusted residual was calculated for the census tracts greater than 75% urban, an adjusted residual of -6.6 was found. This adjusted residual demonstrates significantly less reported accidental child fatalities were observed than expected in census tracts greater than 75% urban.

Demographic Characteristics of Heads of Households and Accidental Child Fatalities-Adjusted Residuals

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of 3.7 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest

percentage of female heads of households had significantly more reported accidental child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of 2.5 determined significantly more observed than expected accidental child fatalities reported in Tennessee census tracts for the years 1996-2003.

When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of -6.2 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of female heads of households also had significantly less reported accidental child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of 3.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of single heads of households determined significantly more observed than expected census tracts where accidental child fatalities were reported. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of 3.3 determined significantly more census tracts with reported accidental child fatalities were observed than expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of -6.7 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest

percentage of single heads of households had significantly less reported accidental child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of 3.2 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of Spanish/Hispanic/Latino heads of households had significantly more observed than expected census tracts with reported accidental child fatalities. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of 0.6 was found. This adjusted residual demonstrates that the middle 1/3 of census tracts reporting the middle percentage of Spanish/Hispanic/Latino heads of households had no significant difference between census tracts reporting accidental child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of -3.8 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of Spanish/Hispanic/Latino heads of households had significantly less census tracts with child fatalities were observed than expected census tracts reporting accidental child fatalities for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of Non-white heads of households an adjusted residual of 3.3 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the

lowest percentage of Non-white heads of households also had significantly more reported accidental child fatalities in Tennessee census tracts observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by Non-white heads of households an adjusted residual of -0.7 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of Non-white heads of households had no significant difference between census tracts with accidental child fatalities observed than could statistically be expected. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of Non-white heads of households an adjusted residual of -2.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of Non-white heads of households had significantly less census tracts with reported accidental child fatalities observed than could statistically be expected for the years 1996-2003.

Adjusted Residuals for Natural Child Fatalities

Housing Characteristics and Natural Child Fatalities-Adjusted Residuals

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of rental housing an adjusted residual of -4.5 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of rental housing had significantly lower census tracts reporting natural child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by rental

housing an adjusted residual of -3.1 determined a significantly lower number of census tracts with reported natural child fatalities observed than expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of rental housing an adjusted residual of 7.6 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of rental housing also had significantly more reported natural child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by vacancy status an adjusted residual of -2.0 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of vacancy status was not significantly different for reported natural child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of vacancy status an adjusted residual of 2.9 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of vacancy status also had significantly more reported child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by vacancy status an adjusted residual of -0.8 was found. This adjusted residual demonstrates no significant difference in observed and expected census tracts with reported child fatalities for the years 1996-2003.

An adjusted residual of -6.6 was found, when calculated for the lowest 1/3 of census tracts grouped by average household size. This adjusted residual demonstrates that

the 1/3 of census tracts reporting the lowest percentage of household size had significantly less reported natural child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by average household size, an adjusted residual of 0.2 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of average household size had significantly more reported natural child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by average household size, an adjusted residual of 6.4 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of household size had significantly more natural child fatalities observed than could statistically be expected to be reported for the years 1996-2003.

When an adjusted residual was calculated for the census tracts classified as non-urban a value of -3.7 was found. This adjusted residual determined significantly less census tracts with natural child fatalities were observed than expected for the years 1996-2003. When an adjusted residual was calculated for the census tracts with less than or equal to the 25th percentile of census tracts ranked by urban households, an adjusted residual of -0.2 determined no significant difference between the observed and expected natural child fatalities reported in Tennessee census tracts. When an adjusted residual was calculated for the census tracts greater than 25% and less than or equal to 50% urban, an adjusted residual of 4.5 indicates significantly more natural child fatalities existed between observed and expected census tracts with reported child fatalities. When an

adjusted residual was calculated for the census tracts greater than 50% and less than or equal to 75% urban an adjusted residual of -1.9 indicates no significant difference was found between observed nor expected census tracts with child fatalities in census tracts greater than 50% and less than or equal to 75% urban designation. When an adjusted residual was calculated for the census tracts greater than 75% urban, an adjusted residual of -1.5 was found. This adjusted residual demonstrates no significant difference between reported natural child fatalities observed than expected in census tracts greater than 75% urban.

Demographic Characteristics of Heads of Households and Natural Child Fatalities Adjusted Residuals

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of 2.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of female heads of households had significantly more reported natural child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of -0.3 determined no significant difference between the observed and expected natural child fatalities reported in Tennessee census tracts for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of female heads of households an adjusted residual of -1.8 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of female heads of

households had no significant difference between reported natural child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of 1.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of single heads of households determined no significant difference between observed and expected census tracts where natural child fatalities were reported. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of 0.1 determined no significant difference between census tracts with reported natural child fatalities observed than expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of single heads of households an adjusted residual of -1.2 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of single heads of households had no significant difference reported natural child fatalities observed than could statistically be expected for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of -1.8 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of Spanish/Hispanic/Latino heads of households had no significant difference between observed and expected census with reported natural child fatalities. When an adjusted residual was calculated for the middle 1/3 of census tracts

grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of 1.0 was found. This adjusted residual demonstrates that the middle 1/3 of census tracts reporting the middle percentage of Spanish/Hispanic/Latino heads of households had no significant difference between census tracts reporting natural child fatalities observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the highest 1/3 of census tracts grouped by percent of Spanish/Hispanic/Latino heads of households an adjusted residual of -0.9 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of Spanish/Hispanic/Latino heads of households had no significant difference between observed and expected census tracts reporting natural child fatalities for the years 1996-2003.

When an adjusted residual was calculated for the lowest 1/3 of census tracts grouped by percent of Non-white heads of households an adjusted residual of -7.1 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the lowest percentage of Non-white heads of households also had significantly less reported natural child fatalities in Tennessee census tracts observed than could statistically be expected for the years 1996-2003. When an adjusted residual was calculated for the middle 1/3 of census tracts grouped by Non-white heads of households an adjusted residual of -3.8 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the middle percentage of Non-white heads of households had significantly less census tracts with child fatalities observed than could statistically be expected. When an adjusted residual was calculated for the highest 1/3 of census tracts

grouped by percent of Non-white heads of households an adjusted residual of 10.8 was found. This adjusted residual demonstrates that the 1/3 of census tracts reporting the highest percentage of Non-white heads of households had significantly more census tracts with reported child fatalities observed than could statistically be expected for the years 1996-2003.

Implications of the Data

After examining the results, the following implications were made in the face of the limitations; the study provides an opportunity for practitioners and other community and public health officials to understand how a neighborhood or census tract factor(s) influences child fatalities. Based upon the review of the literature, researchers have not investigated the association between Tennessee neighborhood housing and demographic characteristics and the rate of child fatalities (violent, natural, and accidental). However, research has been conducted and findings show how and why neighborhoods and census level data should be utilized as units of measure to determine if child fatalities are preventable (Yonas, et al. 682; Skogan 223; and Coulton, et al. 1265). From this study, a framework for learning about the neighborhood and the census is provided for policy makers, community leaders, public health practitioners, local organizations, and others could form collaborations or partnerships to develop effective and appropriate prevention programs for child and adult fatalities.

Chapter Summary

This chapter purpose of this study was to investigate whether an association existed between housing characteristics and demographic characteristics for heads of households of Tennessee neighborhoods and the rate of child fatalities in the neighborhoods where child fatalities occurred for an eight-year period 1996-2003. Housing characteristics assessed were: amount of rental housing, vacancy status, average household size, and urban location. Demographic characteristics of heads of householders assessed included gender, ethnicity, race, and marital status. This chapter presented the statistical analysis and interpretation of the data collected from the 2000 United States Census and child fatalities reported in Tennessee for an eight-year period 1996-2003. Statistical analyses run on the demographic factors provided the descriptive profile of the deaths in Tennessee for the eight-year period 1996-2003. The statistical techniques chosen to answer the research questions in the study included Spearman rho correlation analysis, cross-tabulations, and adjusted residuals.

Implications for the results of the study were addressed. Table 40 Spearman Rho Correlation Table summarized the coefficients obtained for the housing characteristics and the demographic characteristics of heads of households. Table 41 includes the interpretative results of the Spearman Rho Correlations for the neighborhood housing and demographic characteristics of heads of households in Tennessee for the years 1996-2003.

Table 40. Spearman Rho Correlation Summary Table

Housing and Head of Household Demographic Characteristics	Spearman Rho Correlation Coefficients Total Number of Fatalities	Spearman Rho Correlation Coefficients Violent Fatalities	Spearman Rho Correlation Coefficients Accidental Fatalities	Spearman Rho Correlation Coefficients Natural Fatalities
Rental Housing	.072(**)	.034(**)	-.033(**)	.091(**)
Vacancy Status	.071(**)	-.006 ns	.041(**)	.033(**)
Household Size	.100(**)	.055(**)	.065(**)	.090(**)
Urban Location	-.014 ns	.014 ns	-.081(**)	.026(**)
Female Heads of Households	-.040(**)	-.024(*)	-.061(**)	-.024(*)
Single Heads of Households	-.023(*)	-.019 ns	-.060(**)	-.009 ns
Spanish/Hispanic/Latino Heads of Households	-.011 ns	-.010 ns	-.032(**)	.011 ns
Non-white Heads of Households	.125(**)	.064(**)	-.029(**)	.155(**)

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

ns= Not significant

**Table 41. Child Fatality/Neighborhood Characteristics-
Spearman Rho Correlation Summary Table⁺**

Housing and Head of Household Demographic Characteristics	Interpretation of Results for Total Number of Child Fatalities	Interpretation of Results for Violent Child Fatalities	Interpretation of Results for Accidental Child Fatalities	Interpretation of Results for Natural Child Fatalities
Rental Housing	Weak positive**	Weak positive**	Weak negative**	Weak positive**
Vacancy Status	Weak positive**	No association	Weak positive**	Weak positive**
Household Size	Weak positive**	Weak positive**	Weak positive**	Weak positive**
Urban Location	No association	No association	Weak negative**	Weak positive**
Female Heads of Households	Weak negative**	Weak negative*	Weak negative**	Weak negative*
Single Heads of Households	Weak negative*	No association	Weak negative**	No association
Spanish/Hispanic/Latino Heads of Households	No association	No association	Weak negative**	No association
Non-white Heads of Households	Weak positive**	Weak positive**	Weak negative**	Weak positive**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

⁺**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999 (pg 414).

CHAPTER V

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The purpose of this chapter was to summarize the findings, conclusions, and recommendations resulting from the research investigation. This study sought to create a descriptive profile of Tennessee child fatalities reported on each Tennessee Judicial District Child Fatality Review Team Reporting Form for the years 1996-2003 and to determine if an association existed between housing characteristics and demographic characteristics of heads of households in Tennessee neighborhoods and the rate of child fatalities (violent, accidental, and natural) reported for an eight-year period 1996-2003. For the purposes of this study the manner of death categories of homicide and suicide were combined into the category of *violent* fatalities. The neighborhood housing characteristics of rental housing, vacancy status, household size, and urban location in Tennessee neighborhoods were selected for analysis in this research project. The selected demographic characteristics of heads of households including gender, marital status, ethnicity, and racial group in Tennessee neighborhoods were used in this study.

Profile of Child Fatalities

The descriptive profile was developed using gender, race, cause of death, and manner categories extracted from the child fatalities reported on each Tennessee Judicial Districts' Child Fatality Review Team Reporting Form for the years 1996-2003. The data was analyzed using the frequency descriptive statistic. The descriptive profile findings of

the study were as follows:

- A. Of the total child fatalities in Tennessee, 59.5% were reported to be less than one year of age from 1996-2003.
- B. In the eight years, 9.6% of the total child fatalities were reported aged one to four years old.
- C. From 1996-2003, 6.8% of Tennessee child fatalities reported were five to nine years old.
- D. Of the total child fatalities in Tennessee, 8.7% were ten to fourteen years of age.
- E. Of the total child fatalities in Tennessee, 14.7% were fifteen to eighteen years of age.
- F. Male children were 58.50% of the 8,457 child fatalities with a reported gender in the state of Tennessee for the years 1996-2003.
- G. Female children were 40.70% of the 8,457 child fatalities with a reported gender in the state of Tennessee for the years 1996-2003.
- H. Non-white children were 39.30% of 8,451 child fatalities with a reported race in the state of Tennessee for the years 1996-2003.
- I. The two most frequently reported manner of deaths, for the years 1996-2003 were natural and accidental.
- J. Natural deaths were reported as the manner of death for 70.0% of Tennessee child fatalities.
- K. Accidental deaths were reported as the manner of death for 20.9% of

Tennessee child fatalities.

- L. The manner of death reported as violent was 6.3% of the child fatalities reported in the years 1996-2003.
- M. The six most frequently reported causes of death were illness or other natural causes, prematurity, vehicular, Sudden Infant Death Syndrome, firearms, and suffocation and/or strangulation.
- N. Illness and other natural causes was the cause of death for 36.00% of the 8,531 Tennessee child fatalities reported for the years 1996-2003.
- O. Prematurity was the cause of death for 26.90% of the 8,531 Tennessee child fatalities reported for the years 1996-2003.
- P. A vehicular accident was the cause of death for 19.90% of the 8,531 Tennessee child fatalities reported for the years 1996-2003.
- Q. Sudden Infant Death Syndrome was the cause of death for 7.50% of the 8,531 Tennessee child fatalities reported for the years 1996-2003.
- R. A firearm was the cause of death for 4.40% of the 8,531 Tennessee child fatalities reported for the years 1996-2003.
- S. Suffocation and/or strangulation were the cause of death for 2.90% of Tennessee child fatalities reported for the years 1996-2003.
- T. Violent death was the manner of death for 6.30% of the total 8,531 child fatalities reported in the state of Tennessee for the years 1996-2003.
- U. Accidental deaths was the manner of death for 21.10% of the total 8,531 child fatalities reported in the state of Tennessee for the years 1996-2003.

V. A natural death was the manner of death for 70.20% of the total 8,531 child fatalities reported for Tennessee in the years 1996-2003.

Total Child Fatalities

Housing Characteristics/Rate of Total Child Fatalities

Housing characteristics of Tennessee neighborhoods (census tracts) were as follows:

Rental Housing

1. A significant weak positive association was found between the percent of rental housing in each Tennessee neighborhood (census tract) and the rate of reported child fatalities in a census tract with a p value of .01.
2. A significantly lower rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of rental housing (the lowest one third).
3. No difference in the rate of child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of rental housing when a census tract was grouped within the middle one third.
4. A significantly higher rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of rental housing (the highest one third).

Vacancy Status

5. A significant weak positive association was found between the percent of vacant housing units in each Tennessee neighborhood (census tract) and the rate of reported child fatalities in a census tract with a p value of .01
6. A significantly lower rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of vacant housing units (lowest one third).
7. A significantly higher rate of child fatalities was observed than expected for census tracts (neighborhoods) ranked by percentage of vacant housing units when a census tract was grouped within the middle one third.
8. No difference in the rate of child fatalities reported was observed from those expected for census tracts (neighborhoods) reporting the highest percentage of vacant housing units (the highest one third).

Average Size of Households

9. A significant weak positive association was found between the reported average for size of household in each Tennessee neighborhood (census tract) and the rate of reported child fatalities in a census tract with a p value of .01
10. A significantly lower rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest average for size of household (lowest one third).
11. A significantly higher rate of child fatalities was observed than expected for census tracts (neighborhoods) when census tracts were ranked by average

household size for census tracts grouped within the middle one third.

12. A significantly higher rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest average for size of household (highest one third).

Urban Location

13. No significant association was found between the percent of residents reported living in an urban Tennessee neighborhood (census tract) and the rate of child fatalities reported in a census tract for the years 1996-2003 with a p value of .01.*
14. No significant difference was found in the rate of child fatalities reported by census tracts in the top 25% of all Tennessee census tracts when ranked by the percent of households reported not to be urban.
15. No significant difference was found in census tracts reporting and not reporting child fatalities within the group of census tracts representing the lowest 25% of census tracts when Tennessee census tracts were ranked by the percent of households reported to be urban.
16. No significant difference was found in census tracts reporting and not reporting child fatalities within the group of census tracts representing those census tracts reporting to have greater than 25% and less than 51% of households reported to be urban.
17. A significantly lower rate of child fatalities was found to be observed than expected for census tracts reported to have greater than 50% and less than 76% of the households in the tract reported to be urban.

18. A significantly lower rate of child fatalities was found to be observed than expected for census tracts reported to have greater than 75% of the households in the tract reported to be urban.

Demographic Characteristics of Heads of Households/Rate of Total Child Fatalities

Demographic characteristics of heads of households (gender, marital status, ethnicity, and race) in Tennessee neighborhood findings were as followed:

Female Heads of Households

19. A significant weak negative association was found between the percent of female heads of households reported in each Tennessee neighborhood (census tract) and the rate of reported child fatalities in a census tract with a p value of .01.
20. A significantly higher rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of female heads of households (the lowest one third).
21. No significant difference in the rate of child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of female heads of households when a census tract were grouped within the middle one third.
22. A significantly lower rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of female heads of households (the highest one third).

Single Heads of Households

23. A significant weak positive association was found between the percent of single heads of households in each Tennessee neighborhood (census tract) and the rate of reported child fatalities in a census tract with a p value of .01.
24. No significant difference in the rate of child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of single heads of households when a census tract were grouped within the lowest one third.
25. A significantly higher rate of child fatalities was observed from those expected for census tracts (neighborhoods) ranked by the percentage of single heads of households when a census tract were grouped within the middle one third.
26. A significantly lower rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of single heads of households (the highest one third).

Spanish/Hispanic/Latino Heads of Households

27. No significant association was found between the percent of Spanish/Hispanic/Latino heads of households reported living in a Tennessee neighborhood (census tract) and the rate of child fatalities reported in a Tennessee (census tract) neighborhood for the years 1996-2003 with a p value of .01.
28. No significant difference in the rate of child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of Spanish/Hispanic/Latino heads of households when a census tract were grouped

within the lowest one third.

29. No significant difference in the rate of child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of Spanish/Hispanic/Latino heads of households when a census tract was grouped within the middle one third
30. No significant difference in the rate of child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of Spanish/Hispanic/Latino heads of households when a census tract were grouped within the highest one third.

Non-white Heads of Households

31. A significant weak positive association was found between the percent of Non-white heads of households in each Tennessee neighborhood (census tract) and the rate of reported child fatalities in a census tract with a p value of .01.
32. A significantly lower rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of Non-white heads of households (the lowest one third).
33. A significantly lower rate of child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of Non-white heads of households when a census tract were grouped within the middle one third.
34. A significantly higher rate of child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of Non-white

heads of households (the highest one third).

Violent Child Fatalities

Housing Characteristics/Rate of Violent Child Fatalities

Housing characteristics of Tennessee neighborhoods (census tracts) were as follows:

Rental Housing

35. A significant weak positive association was found between the percent of rental housing in a Tennessee neighborhood (census tract) and the rate of reported violent child fatalities in a neighborhood with a p value of .01.
36. No difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of rental housing when a census tract were grouped within the lowest one third.
37. No difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) grouped by percentage of rental housing when a census tract ranked within the middle one third.
38. A significantly higher rate of violent child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of rental housing (the highest one third).

Vacancy Status

39. No significant association was found between the percent of vacant housing units in each Tennessee neighborhood (census tract) and the rate of violent child fatalities reported in a Tennessee neighborhood for the years 1996-2003 with a p value of .01.

40. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by vacancy status when a census tract were grouped within the lowest one third.
41. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by vacancy status when a census tract was grouped within the middle one third.
42. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by vacancy status when a census tract was grouped within the highest one third.

Average Size of Households

43. A significant weak positive association was found between the average for size of household reported in each Tennessee neighborhood (census tract) and the rate of reported violent child fatalities in a neighborhood with a p value of .01
44. A significantly lower rate of violent child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest average for size of household (lowest one third).
45. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by average for size of household when a census tract was grouped within the middle one third.
46. A significantly higher rate of violent child fatalities was observed than expected for census tracts (neighborhoods) ranked by the average for size of household

when a census tract was grouped within the highest one third.

Urban Location

47. No significant association was found between the percent of households reported to be urban in a Tennessee neighborhood (census tract) and the rate of reported violent child fatalities in a neighborhood with a p value of .05.*
48. A significantly lower rate of violent child fatalities was observed for census tracts than expected for census tract grouped in the top 25% of all Tennessee census tracts when ranked by the percent of households reported not to be urban.
49. No significant difference was found in census tracts reporting and not reporting violent child fatalities within the group of census tracts representing the lowest 25% of census tracts when Tennessee census tracts were ranked by the percent of households reported to be urban.
50. A significantly higher rate of violent child fatalities was observed than expected for census tracts grouped with those census tracts reporting to have greater than 25% and less than 51% of households reported to be urban.
51. No significant difference was found in census tracts reporting and not reporting violent child fatalities within the group of census tracts reported to have greater than 50% and less than 76% of the households in the tract were reported to be in an urban location.
52. No significant difference was found in the rate of violent child fatalities reported was observed from those expected within the group of census tracts reported to have greater than 75% of the households in the tract were urban.

Demographic Characteristics of Heads of Households/Rate of Violent Child Fatalities

Demographic characteristics of heads of households (gender, marital status, ethnicity, and race) in Tennessee neighborhood findings were as followed:

Female Heads of Households

53. A significant weak negative association was found between the percent of female heads of households reported in each Tennessee neighborhood (census tract) and the rate of reported violent child fatalities with a p value of .05.

54. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of female heads of households when a census tract was grouped within the lowest one third.

55. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of female heads of households when a census tract was grouped within the middle one third.

56. A significantly lower rate of violent child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of female heads of households (the highest one third).

Single Heads of Households

57. No significant association was found between the percent of single heads of households in each Tennessee neighborhood (census tract) and the rate of violent

child fatalities reported in a Tennessee neighborhood for the years 1996-2003 with a p value of .01.

58. A significantly higher rate of violent child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of single heads of households (the lowest one third).

59. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of single heads of households when a census tract was grouped within the middle one third.

60. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of single heads of households when a census tract was grouped within the highest one third.

Spanish/Hispanic/Latino Heads of Households

61. No significant association was found between the percent of Spanish/Hispanic/Latino heads of households reported living in a Tennessee neighborhood (census tract) and the rate of violent child fatalities reported in a Tennessee neighborhood for the years 1996-2003 with a p value of .01.

62. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of Spanish/Hispanic/Latino heads of households when a census tract was grouped within the lowest one third.

63. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) grouped by the percent of Spanish/Hispanic/Latino heads of households when a census tract ranked within the middle one third
64. No significant difference in the rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of Spanish/Hispanic/Latino heads of households when a census tract was grouped within the highest one third.

Non-white Heads of Households

65. A significant weak positive association was found between the percent of Non-white heads of households in each Tennessee neighborhood (census tract) and the rate of reported violent child fatalities with a p value of .01.
66. A significantly lower rate of violent child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of Non-white heads of households (the lowest one third).
67. A significantly lower rate of violent child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of Non-white heads of households when a census tract was grouped within the middle one third.
68. A significantly higher rate of violent child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of Non-white heads of households (the highest one third).

Accidental Child Fatalities

Housing Characteristics/Rates of Accidental Child Fatalities

Housing characteristics of Tennessee neighborhoods (census tracts) were as follows:

Rental Housing

69. A significant negative association was found between the percent of rental housing in each Tennessee neighborhood (census tract) and the rate of reported accidental child fatalities in a neighborhood with a p value of .01.
70. No significant difference in the rate of accidental child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of rental housing when a census tract was grouped within the lowest one third.
71. A significantly higher rate of accidental child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of rental housing when a census tract was grouped within the middle one third.
72. A significantly lower rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of rental housing (the highest one third).

Vacancy Status

73. A significant weak positive association was found between the percent of vacant housing units in each Tennessee neighborhood (census tract) and the rate of reported accidental child fatalities with a p value of .01

74. A significantly lower rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of vacancy status (the lowest one-third).
75. No significant difference in the rate of accidental child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by vacancy status when a census tract was grouped within the middle one third.
76. A significantly higher rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of vacant housing units (the lowest one-third).

Average Size of Households

77. A significant weak positive association was found between the reported average for size of household in each Tennessee neighborhood (census tract) and the rate of reported accidental child fatalities in a neighborhood with a p value of .01
78. A significantly lower rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest average for size of household (the lowest one-third).
79. A significantly higher rate of accidental child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the average for size of household when a census tract was grouped within the middle one third of census tracts.
80. A significantly higher rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest average for size

of household (the highest one-third).

Urban Location

81. A significant weak negative association was found between the percent of households reported to be in an urban location in a Tennessee neighborhood (census tract) and the rate of accidental child fatalities reported in a census tract for the years 1996-2003 with a p value of .01.*
82. A significantly higher rate of accidental child fatalities were reported by census tracts in the top 25% of all Tennessee census tracts when ranked and grouped by the percent of households reported not to be in an urban location.
83. A significantly higher rate of accidental child fatalities were reported by census tracts representing the lowest 25% of census tracts when Tennessee census tracts were ranked by the percent of households reported to be in an urban location.
84. No significant difference was found when accidental child fatalities were reported by census tracts representing those census tracts reporting to have greater than 25% and less than 51% of households reported to be in an urban location.
85. A significantly higher rate of accidental child fatalities was observed for census tracts reporting child fatalities were found to be observed than expected for census tracts reported to have greater than 50% and less than 76% of the households in the tract to be in an urban location.
86. A significantly lower rate of accidental child fatalities were observed than expected for census tracts reported to have greater than 75% of the households in the tract were reported to be in an urban location.

Demographic Characteristics of Heads of Households/Rate of Accidental Child Fatalities

Demographic characteristics of heads of households (gender, marital status, ethnicity, and race) in Tennessee neighborhood findings were as follows:

Female Heads of Households

87. A significant weak negative association was found between the percent of female heads of households in each Tennessee neighborhood (census tract) and the rate of reported accidental child fatalities in Tennessee neighborhoods with a p value of .01.

88. A significantly higher rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of female heads of households (the lowest one third).

89. A significantly higher rate of accidental child fatalities were observed than expected in the rate of accidental child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of female heads of households when a census tract grouped within the middle one third.

90. A significantly lower rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of female heads of households (the highest one third).

Single Heads of Households

91. A significant weak negative association was found between the percent of single heads of households in each Tennessee neighborhood (census tract) and the rate of reported accidental child fatalities in a neighborhood with a p value of .01.

92. A significantly higher rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of single heads of households (the lowest one third).
93. A significantly higher rate of accidental child fatalities was observed from those expected for census tracts (neighborhoods) ranked by the percent of single heads of households when a census tract grouped within the middle one third.
94. A significantly lower rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of single heads of households (the highest one third).

Spanish/Hispanic/Latino Heads of Households

95. A significant weak negative association was found between the percent of Spanish/Hispanic/Latino heads of households reported living in a Tennessee neighborhood (census tract) and the rate of accidental child fatalities reported in a Tennessee neighborhood for the years 1996-2003 with a p value of .01.
96. A significantly higher rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of Spanish/Hispanic/Latino heads of households (the lowest one third).
97. No significant difference in the rate of accidental child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of Spanish/Hispanic/Latino heads of households when a census tract was grouped within the middle one third by number of Spanish/Hispanic/Latino heads of households.

98. A significantly lower rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of Spanish/Hispanic/Latino heads of households (the highest one third).

Non-white Heads of Households

99. A significant weak negative association was found between the percent of Non-white heads of households in each Tennessee neighborhood (census tract) and the rate of reported accidental child fatalities in a neighborhood with a p value of .01.
100. A significantly higher rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of Non-white heads of households (the lowest one third).
101. No significant difference in the rate of accidental child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of Non-white heads of households when a census tract was grouped within the middle one third.
102. A significantly lower rate of accidental child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of Non-white heads of households (the highest one third).

Natural Child Fatalities

Housing Characteristics/Rate of Natural Child Fatalities

Housing characteristics of Tennessee neighborhoods (census tracts) were as follows:

Rental Housing

103. A significant weak positive association was found between the percent of rental housing in each Tennessee neighborhood (census tract) and the rate of reported natural child fatalities in a neighborhood with a p value of .01.
104. A significantly lower rate of natural child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of rental housing (the lowest one third).
105. A significantly lower rate of natural child fatalities was observed from those expected for census tracts (neighborhoods) ranked by percentage of rental housing when a census tract was grouped within the middle one third.
106. A significantly higher rate of natural child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of rental housing (the highest one third).

Vacancy Status

107. A significant weak positive association was found between the percent of vacant housing units in each Tennessee neighborhood (census tract) and the rate of reported natural child fatalities in a neighborhood with a p value of .01
108. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of vacancy status when a census tract was grouped within the lowest one third.
109. A significantly higher rate of natural child fatalities was observed from

those expected for census tracts (neighborhoods) ranked by percentage of vacancy status when a census tract was grouped within the middle one third.

110. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the percent of vacancy status when a census tract was grouped within the highest one third.

Average Size of Households

111. A significant weak positive association was found between the average for size of household in each Tennessee neighborhood (census tract) and the rate of natural reported child fatalities in a Tennessee neighborhood with a p value of .01
112. A significantly lower rate of natural child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest average for size household (the lowest one-third).
113. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by the average for size of households when a census tract was grouped within the middle one third.
114. A significantly higher rate of natural child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest average for size of household (the highest one-third).

Urban Location

115. A significant weak positive association was found between the percentage

of households reported in an urban location in a Tennessee neighborhood (census tract) and the rate of reported natural child fatalities in a neighborhood with a p value of .05.*

116. A significantly lower rate of natural child fatalities were reported by census tracts in the top 25% of all Tennessee census tracts when census tracts were ranked by the percent of households reported not to be in an urban location.
117. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by census tracts representing the lowest 25% of census tracts when Tennessee census tracts were grouped by the percent of households reported to be in an urban location.
118. A significantly higher rate of natural child fatalities were reported by census tracts representing those census tracts reporting to have greater than 25% and less than 51% of households reported to be in an urban location.
119. No significant difference in the rate of natural child fatalities was observed for census tracts reporting child fatalities were found to be observed than expected for census tracts reported to have greater than 50% and less than 76% of the households in the tract were reported as an urban location.
120. No significant difference in the rate of reported natural child fatalities were observed than expected for census tracts reported to have greater than 75% of the households in the tract were reported to be in an urban location.

Demographic Characteristics of Heads of Households/Rate of Natural Child Fatalities

Demographic characteristics of heads of households (gender, marital status, ethnicity, and race) in Tennessee neighborhood findings were as followed:

Female Heads of Households

121. A significant weak negative association was found between the percent of female heads of households in each Tennessee neighborhood (census tract) and the rate of reported natural child fatalities in a neighborhood with a p value of .05.
122. A significantly higher rate of natural child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of female heads of households (the lowest one third).
123. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of female heads of households when a census tract was grouped within the middle one third.
124. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by female heads of households when a census tract was grouped within the highest one third.

Single Heads of Households

125. No significant association was found between the percent of single heads of households in each Tennessee neighborhood (census tract) and the rate of reported natural child fatalities in a Tennessee neighborhood with a p value of .01.
126. No significant difference in the rate of natural child fatalities reported was

observed from those expected for census tracts (neighborhoods) ranked by percentage of single heads of households when a census tract was grouped within the lowest one third.

127. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of single heads of households when a census tract was grouped within the middle one third.

128. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of single heads of households when a census tract was grouped within the highest one third.

Spanish/Hispanic/Latino Heads of Households

129. No significant association was found between the percent of Spanish/Hispanic/Latino heads of households reported living in a Tennessee neighborhood (census tract) and the rate of natural child fatalities reported in a Tennessee neighborhood for the years 1996-2003 with a p value of .01.

130. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of Spanish/Hispanic/Latino heads of households when a census tract was grouped within the lowest one third.

131. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by

percentage of Spanish/Hispanic/Latino heads of households when a census tract was grouped within the middle one third.

132. No significant difference in the rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of Spanish/Hispanic/Latino heads of households when a census tract was grouped within the highest one third.

Non-white Heads of Households

133. A significant weak positive association was found between the percent of Non-white heads of households in each Tennessee neighborhood (census tract) and the rate of reported natural child fatalities in a neighborhood with a p value of .01.

134. A significantly lower rate of natural child fatalities was observed than expected for census tracts (neighborhoods) reporting the lowest percentage of Non-white heads of households (the lowest one third).

135. A significantly lower rate of natural child fatalities reported was observed from those expected for census tracts (neighborhoods) ranked by percentage of Non-white heads of households when a census tract was grouped within the middle one third.

136. A significantly higher rate of natural child fatalities was observed than expected for census tracts (neighborhoods) reporting the highest percentage of Non-white heads of households (the highest one third).

Conclusions

Based upon the findings of this study, the following conclusions were drawn:

1. No association was found between the neighborhood housing characteristic of urban location and the rate of total and violent child fatalities reported in a Tennessee neighborhood for the years 1996-2003.
2. A weak association in a positive manner was found between the neighborhood housing characteristics of rental housing, vacancy status, and household size and the rate of total and natural child fatalities reported in a Tennessee neighborhood for the years 1996-2003.
3. A weak association in a negative manner was found between the neighborhood demographic characteristics of percent female heads of households, and the percent single heads of household, and the rate of total, and accidental child fatalities reported in a Tennessee neighborhood for the years 1996-2003.
4. No association was found between the neighborhood demographic characteristic of percent Spanish/Hispanic/Latino heads of households and the rate of total, violent, and natural child fatalities reported in a Tennessee neighborhood for the years 1996-2003.
5. A weak association in a positive manner was found between the neighborhood housing characteristic of the percent of rental housing and the rate of violent child fatalities reported in Tennessee neighborhoods for the years 1996-2003.

6. A weak association in a negative manner was found between the neighborhood housing characteristics of the percent of rental housing, and urban location and the rate of accidental child fatalities reported in Tennessee neighborhoods for the years 1996-2003.
7. No association was found between the neighborhood housing characteristic of vacancy status and the rate of violent child fatalities reported in Tennessee neighborhoods for the years 1996-2003.
8. A weak association in a positive manner was found between the neighborhood housing characteristic of percent of vacancy status and the rate of accidental child fatalities reported in Tennessee neighborhoods for the years 1996-2003.
9. A weak association in a positive manner was found between the neighborhood housing characteristic of average household size and the rate of violent, accidental, and natural child fatalities reported in Tennessee neighborhoods for the years 1996-2003.
10. A weak association in a positive manner was found between the neighborhood housing characteristic of urban location and the rate of natural child fatalities reported in Tennessee neighborhoods for the years 1996-2003.
11. A weak association in a negative manner was found between the neighborhood demographic characteristic of percent of female heads of households and the rate of violent and natural child fatalities reported in Tennessee neighborhoods for the years 1996-2003.
12. No association was found between the neighborhood demographic

characteristic of percent single heads of households and the rate of violent and natural child fatalities reported in Tennessee neighborhoods for the years 1996-2003.

13. A weak association in a negative manner was found between the neighborhood demographic characteristic of percent Spanish/Hispanic/Latino heads of households and the rate of accidental child fatalities reported in Tennessee neighborhoods for the years 1996-2003.
14. A weak association in a positive manner was found between the neighborhood demographic characteristic of percent Non-white heads of households and the rate of total, violent, and natural child fatalities reported in Tennessee neighborhoods for the years 1996-2003.
15. A weak association in a negative manner was found between the neighborhood demographic characteristic of percent Non-white heads of households and the rate of accidental child fatalities reported in a Tennessee neighborhood for the years 1996-2003.

Recommendations

The following recommendations were made based upon the findings, conclusions, and literature review of the study:

1. When prioritizing neighborhoods for prevention programs to reduce total child fatalities in Tennessee, the factors used to identify neighborhoods at high risk, for child fatalities, should not include the neighborhood housing characteristic of the number of urban units and the demographic

characteristics of the percent of households' heads reported to be female, single, and Spanish/Hispanic/Latino.

2. When prioritizing neighborhoods for prevention programs to reduce violent child fatalities in Tennessee, the factors used to identify neighborhoods at high risk, for child fatalities, should not include the neighborhood housing characteristics of the percent of vacant housing units, the number of urban units and the neighborhood demographic characteristics of the percent of heads of households reported to be female, single, and Spanish/Hispanic/Latino.
3. When prioritizing neighborhoods for prevention programs to reduce accidental child fatalities in Tennessee, the factors used to identify neighborhoods at high risk, for child fatalities, should not include the neighborhood housing characteristic of the percent of rental housing, the number of urban units, and the neighborhood demographic characteristics, of the percent of heads of households reported to be female, single, Spanish/Hispanic/Latino and Non-white.
4. When prioritizing neighborhoods for prevention programs to reduce natural child fatalities in Tennessee, the factors used to identify neighborhoods at high risk, for child fatalities, should not include the neighborhood demographic characteristics, of the percent of heads of households reported to be female, single, and Spanish/Hispanic/Latino.
5. When prioritizing neighborhoods for prevention programs to reduce total

child fatalities in Tennessee, the factors used to identify neighborhoods at high risk, for child fatalities, should include the neighborhood housing characteristics of the number of rental housing units, vacant housing units, average household size and the demographic characteristic of the percent of households' heads reported to be Non-white.

6. When prioritizing neighborhoods for prevention programs to reduce violent child fatalities in Tennessee, the factors used to identify neighborhoods at high risk, for violent child fatalities, should include the neighborhood housing characteristic of the number of rental housing units, average household size and the demographic characteristic of the percent of households' heads reported to be Non-white.
7. When prioritizing neighborhoods for prevention programs to reduce accidental child fatalities in Tennessee, the factors used to identify neighborhoods at high risk, for accidental child fatalities, should include the neighborhood housing characteristics of the number of vacant housing units, and average household size.
8. When prioritizing neighborhoods for prevention programs to reduce natural child fatalities in Tennessee, the factors used to identify neighborhoods at high risk, for child fatalities, should include the neighborhood housing characteristic of the number of rental housing units, vacant housing status, average household size, urban units and the demographic characteristic of the percent of households' heads reported to be Non-white.

Chapter Summary

This chapter described the findings of this research project. Conclusions were described in this chapter. Weak positive associations were found between the neighborhood characteristics of rental housing, vacancy status, average household size; neighborhood demographic characteristic of Non-white heads of households and the rate of total child fatalities in Tennessee for the years 1996-2003. Weak positive associations were found between the neighborhood housing characteristic of rental housing; the neighborhood demographic characteristic of Non-white heads of households and the rate of violent child fatalities in Tennessee from 1996-2003. Accidental child fatalities reported in Tennessee for the years 1996-2003 were found to be weakly positively associated with the neighborhood housing characteristics of percent of vacant units, average household size. The rate of natural child fatalities reported in Tennessee for the years 1996-2003 were found to be weakly positively associated with the neighborhood housing characteristics of the percent of rental housing, vacant housing units, average household size, the number of urban units and the neighborhood demographic characteristic of Non-white heads of households. Recommendations were made based upon the findings, conclusions, and review of the literature. Chapter VI presents a retrospective view of this study.

CHAPTER VI

THE STUDY IN RETROSPECT

Based on the analysis of Tennessee neighborhood housing and demographic characteristics and the rate of child fatalities (violent, accidental, and natural) for the years 1996-2003, the study could not be used as a predictive model to definitively indicate whether or not a specific variable or multiple variables affected child fatalities occurring in Tennessee neighborhoods. The data available on the Tennessee Judicial District's Child Fatality Review Teams Reporting Forms was limited to only demographic information, the cause and manner of death. Other socio-economic data such as income level, educational level of the parent and/or child for example was not collected on the Tennessee reporting forms further limiting analysis. More information needs to be collected on the Tennessee Child Fatality Review Team Reporting Form for the purposes collecting data for inclusion in future studies and to strengthen the surveillance and tracking methods of Tennessee child fatalities.

Improving the surveillance efforts in Tennessee will provide more opportunities to produce more valid and reliable reports and findings. With more data, more health programs and collaborative community efforts can be developed to possibly help prevent and reduce child fatalities in Tennessee. Surveillance and tracking data might also prove beneficial when evaluating legislation, programs, and initiatives related to child fatalities (Bryce, et al., 163). As supported in the literature, The Bellagio Study Group on Child Survival (324) issued a call to action indicating it is necessary to reduce child fatalities specifically by expanded epidemiological capacity and funding; improved child survival

interventions; obtain delivery strategies for child survival and maternal health interventions; reduce health disparities; and improve monitoring standards. In the Lopez publication three conclusions were listed as to the significance and magnitude of reducing child mortality:

- 1) An estimated 10.5 million children still die each year. Subsequently, reducing child mortality rates must remain a focus of public policy.
- 2) Little is known about the causes of child mortality and the importance of fostering data collection for research on the factors which make for better child survival cannot be overemphasized.
- 3) Failure to maintain service delivery of interventions and progress and expand those efforts to control new threats to child survival, such as HIV/AIDS, could well see gains and improvements stagnate, or decline (1173).

The 2000 United States Census was effective for use in this study to provide neighborhood characteristics at the census tract level to compare to the data collected from the Tennessee Judicial Districts' Child Fatality Reporting Forms (Diez Roux 588). Based on the comparison of the 2000 United States' Census Housing and Population Tables with the linked data from the child fatality reporting forms, a future study should be conducted using methods such as logistic regressions to develop a predictive model. For example, in future research, interval/ratio data might be collected and a multiple logistic regression might be run using the housing characteristics and demographic characteristics of heads of households and removing each factor and running the multiple

logistic regression until the strongest variables are left to produce a predictive model. Using multiple linear regression analysis to study correlations for the purposes of prediction and forecasting models have been supported in the literature (Chi and Voss 3; & Chi and Voss 11). One method recommended to conduct studies to determine if correlations exist between selected variables is spatial regression analysis. Chi and Voss supported using spatial regression analyses, “which is combined with a theory-based [...] approach” (9). Spatial regression analysis and spatial regression modeling, built upon theoretical foundations, hypothesized the strength of correlations between population and socio-economic and environmental factors including spatial regression modeling (Chi and Voss 15). As evidenced in the literature, this ecological study could be replicated, the methodology expanded and the study furthered strengthened using spatial regression modeling (Chi and Voss 13).

Because of multi-collinearity, the study was limited in the findings. The housing characteristics and demographic characteristics of heads of households showed little variation when the attempt was made to run a multi-linear regression. For example the demographic characteristics of single and female heads of households resulted in high factor loadings however the variables were both independent variables and clustered together in the preliminary analysis. A population study could present ecological fallacy when inferences are drawn at the individual level based on group level data as asserted by A. V. Diez Roux (588). Correlations were supported for use by Diez Roux (589) to complete regression analyses when conducting a multilevel investigation. In this population study the correlations determined a weak positive association existed between

the percent of rental housing units, household size, households headed by Non-whites and violent child fatalities reported in Tennessee for the years 1996-2003. There were weak positive associations found between the percent of rental housing, vacant housing units, average household size, and the rate of natural child fatalities reported in Tennessee for the years 1996-2003.

Caution must be exercised when interpreting the findings and discussing future implications, because the results that were not found provided a wealth of information. No positive associations were found between female, single, Spanish/Hispanic/Latino heads of households and the rate of total, violent, accidental, or natural child fatalities reported in Tennessee for the years 1996-2003. The study findings did show some neighborhoods stereotyped in present society, such as Spanish/Hispanic/Latino households, female headed households, and single heads of households had less child fatalities reported in the eight years 1996-2003. Another non-finding contributed to the wealth of information determined in this study. Urban location was found to be significant when child fatalities by natural manners were reported. More research needs to be conducted in the rural census tracts in Tennessee.

The information provided by this study can be used by health educators to develop health promotion aimed at preventing or reducing child fatalities in Tennessee. The study can be used by health professionals as continuing education or for training purposes to improve cultural competencies and educate more health professionals about the Tennessee Child Fatality Review Team. Information provided by the study can be used by the Tennessee Department of Health and legislators across the state of Tennessee

focused on specific parts of the state to allocate funds to gain a broader understanding of where the funds might be equally if not more beneficially re-directed.

Before future studies could be carried out using the Tennessee Judicial Districts' Child Fatality Review Team Reporting Form, detailed and verified information should be collected from the child fatality review teams. A more detailed form has been approved for use in the State of Tennessee and should be used by each Tennessee Judicial District Child Fatality Review Team. Although the data provided in this study cannot be generalized to other states, a method of analysis is introduced further showing the benefit of surveillance and tracking for data collection on child fatalities and identifying areas of health where more research needs to be conducted.

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APPENDIX

APPENDIX A

Tennessee Judicial Districts Child Fatality Review Team Reporting Form

This information is confidential



2002
Tennessee Department of Health
CHILD FATALITY REVIEW TEAM
REVIEW/DATA COLLECTION

MCH 1/01

Judicial District No.: _____		Child Death Year/No.: ____/____/____/____/____/____	
Child's Name: _____ Last First Middle		Sex: ☐ Male ☐ Female	
Date of Death: ____/____/____		Date of Birth: ____/____/____	
Address: _____ Street City Zip Code: _____		Race: ☐ White ☐ African American ☐ Asian ☐ Other: _____ Ethnicity: Hispanic origin? ☐ Yes ☐ No	
Mother's Name: _____ Last First Middle		Maiden First Middle	
Mother's Date of Birth: ____/____/____ Month Day Year		County of Residence _____	
Census Tract: _____		Birth Weight: ____ kg ____ gm ____ lb ____ oz	
Abnormal Conditions: _____		Clinical Estimate of Gestation (weeks): _____	
Prenatal Care Questions:		Congenital Anomalies: _____	
Specify Month Prenatal Care Began _____		☐ No Prenatal Care ☐ Unknown	
Number of Prenatal Visits _____		☐ No Visits ☐ Unknown	
Risk Factors: Tobacco Use: ☐ Yes ☐ No		No. of cigarettes per day _____	
Alcohol Use: ☐ Yes ☐ No		No. of drinks per week _____	
Chemical Substance Abuse: ☐ Yes ☐ No		Specify _____	
To the best of the team's knowledge, is the Birth Certificate information correct/complete: ☐ Yes ☐ No			
Death Certificate Number _____		Is the Death Certificate adequate/complete? ☐ Yes ☐ No	
Manner of death on Death Certificate: ☐ Homicide ☐ Suicide ☐ Accidental ☐ Natural		☐ Pending Investigation ☐ Could not be determined ☐ Blank	
Place of Death: ☐ Hospital Inpatient ☐ At Scene of Incident		☐ Hospital Emergency Room ☐ Child's Residence	
☐ In Transit ☐ Relative's/Friend's Home		☐ Institutional Setting ☐ Child Care	
Was an autopsy performed? ☐ Yes ☐ No ☐ Unknown		If Yes, location: ☐ Medical Examiner ☐ Hospital ☐ Other _____	
Review team comments/recommendations and prevention issues (for local team use): _____		Recommended for additional review? ☐ Yes ☐ No	
_____		Which reports/records were requested for full review? ☐ Law enforcement ☐ Court ☐ DA report ☐ School ☐ DHS ☐ Health Dept. ☐ Med. Exam autopsy ☐ Hospital autopsy ☐ Attending physician ☐ Other: _____	
1 st Review: ____/____/____		2 nd Review: ____/____/____	
3 rd Review: ____/____/____		Date case closed by CFRT: ____/____/____	

PH-3668

RDA-pending

CAUSE AND CIRCUMSTANCES OF THE DEATH Complete one of blocks 1-12 as applicable to indicate cause of death.		
☐ 1. Sudden Infant Death Syndrome (SIDS) A. Position of infant on discovery? 1. ☐ On stomach, face down 2. ☐ On stomach, face to side 3. ☐ On back 4. ☐ On side 5. ☐ Unknown B. Sleeping with another person? ☐ Yes ☐ No ☐ Unknown C. Smoker in household? ☐ Yes ☐ No ☐ Unknown	☐ 7. Vehicular A. # and type of vehicles involved: 1. Cars _____ 2. All-terrain vehicles _____ 3. Motorcycles _____ 4. Riding mowers _____ 5. Bicycles _____ 6. Farm tractors _____ 7. Other farm vehicles _____ 8. Truck/RV _____ 9. Other _____ 10. Unknown _____ B. Position of decedent? 1. ☐ Driver 2. ☐ Pedestrian 3. ☐ Passenger 4. ☐ Back of truck 5. ☐ Other: _____ 6. ☐ Unknown C. Type vehicle in which decedent was occupant? 1. ☐ Car 2. ☐ All-terrain vehicle 3. ☐ Motorcycle 4. ☐ Riding mower 5. ☐ Bicycle 6. ☐ Farm tractor 7. ☐ Other farm vehicle 8. ☐ Truck/RV 9. ☐ Other: _____ 10. ☐ Unknown D. Decedent's safety belt use? 1. ☐ Present in vehicle, but not used 2. ☐ None in vehicle 3. ☐ Restraint used 4. ☐ Unknown 5. ☐ NA E. Decedent's infant/toddler seat use? 1. ☐ Present in vehicle, but not used 2. ☐ None in vehicle 3. ☐ Seat used correctly 4. ☐ Seat used incorrectly 5. ☐ NA F. Decedent was wearing a helmet? 1. ☐ Yes 2. ☐ No 3. ☐ Unknown 4. ☐ NA G. Vehicle in which decedent was occupant? 1. Age of driver _____ ☐ Unknown 2. ☐ Operator driving impaired (alcohol/drug) 3. ☐ Speed/recklessness indicated 4. ☐ Other violation by operator 5. ☐ Mechanical failure 6. ☐ Other _____ 7. ☐ Unknown 8. ☐ NA H. Vehicle in which decedent was not occupant? 1. Age of driver _____ ☐ Unknown 2. ☐ Operator driving impaired (alcohol/drug) 3. ☐ Speed/recklessness indicated 4. ☐ Other violation by operator 5. ☐ Mechanical failure 6. ☐ Other _____ 7. ☐ Unknown 8. ☐ NA I. Condition of road? 1. ☐ Normal 2. ☐ Loose gravel 3. ☐ Wet 4. ☐ Ice or snow 5. ☐ Other: _____ 6. ☐ Unknown 7. ☐ NA J. ☐ Circumstances unknown	☐ 9. Inflicted Injury (NOT firearm or suffocation/strangulation) A. Who inflicted the injury? 1. ☐ Self-inflicted 2. ☐ Parent 3. ☐ Relative: _____ 4. ☐ Other: _____ B. Person inflicting injury? 1. Age _____ ☐ Unknown 2. Gender: ☐ Male ☐ Female 3. Race: ☐ White ☐ African American ☐ Other: _____ ☐ Unknown C. Manner in which injury was inflicted? 1. ☐ Shaken 2. ☐ Struck 3. ☐ Thrown 4. ☐ Cut/stabbed 5. ☐ Sexual Assault 6. ☐ Other: _____ 7. ☐ Unknown D. Injury inflicted with? 1. ☐ Sharp object (e.g., knife, scissors) 2. ☐ Blunt object (e.g., hammer, bat) 3. ☐ Hot liquid or other substance 4. ☐ Hands/feet 5. ☐ Fire 6. ☐ Other: _____ 7. ☐ Unknown E. Where did injury occur? 1. ☐ Child's residence 2. ☐ School 3. ☐ Relative/friend's home 4. ☐ Child care 5. ☐ Other: _____ 6. ☐ Unknown F. ☐ Circumstances unknown
☐ 2. Lack of Adequate Care A. Apparent lack of supervision? ☐ Yes ☐ No B. Apparent lack of medical care? ☐ Yes ☐ No C. If yes: 1. ☐ Malnutrition or dehydration 2. ☐ Oral water intoxication 3. ☐ Delayed medical care 4. ☐ Inadequate medical attention 5. ☐ Out-of-hospital birth 6. ☐ Other: _____ 7. ☐ Unknown		
☐ 3. Prematurity (less than 37 weeks gestation) A. ☐ Known Condition _____		
☐ 4. Illness or Other Natural Cause A. ☐ Known condition _____ _____ B. ☐ Unknown		
☐ 5. Drowning A. Place of drowning? 1. ☐ Creek, river, pond or lake Location prior to drowning? a. ☐ Boat b. ☐ Waters edge c. ☐ Other _____ d. ☐ Unknown 2. ☐ Well, cistern, or septic tank 3. ☐ Bathtub 4. ☐ Swimming pool 5. ☐ Bucket 6. ☐ Wading pool 7. ☐ Other: _____ 8. ☐ Unknown B. Wearing flotation device? 1. ☐ Yes 2. ☐ No 3. ☐ Unknown 4. ☐ NA C. ☐ Circumstances Unknown		
☐ 6. Suffocation/Strangulation A. Circumstances of the event? 1. ☐ Other person overlying or rolling over decedent? 2. ☐ Caused by other person, not overlying or rolling over 3. ☐ Self-inflicted by decedent 4. ☐ Not inflicted by any person 5. ☐ Other: _____ 6. ☐ Unknown B. Object impeding breath? 1. ☐ Food 2. ☐ Other person's hand(s) 3. ☐ Small object or toy in mouth 4. ☐ Object (e.g., plastic bag) covering victim's mouth/nose 5. ☐ Object (e.g., rope) exerting pressure on victim's neck 6. ☐ Other: _____ 7. ☐ Unknown C. Injury occurred in bed, crib, or other sleeping arrangement? 1. ☐ Yes 2. ☐ No 3. ☐ Unknown D. If in bed/crib, due to: 1. ☐ Hazardous design of crib/bed 2. ☐ Malfunction/improper use of crib/bed 3. ☐ Placement on soft sleeping surface (e.g., waterbed) 4. ☐ Other: _____ 5. ☐ Unknown 6. ☐ NA E. Due to carbon monoxide inhalation? 1. ☐ Yes 2. ☐ No 3. ☐ Unknown F. ☐ Circumstances unknown		
	☐ 8. Firearm ☐ A. Person handling the firearm? 1. ☐ Decedent 2. ☐ Parent 3. ☐ Other: _____ 4. ☐ Unknown B. Type firearm involved? 1. ☐ Handgun 2. ☐ Rifle 3. ☐ Shotgun 4. ☐ Other: _____ 5. ☐ Unknown C. Age of person handling firearm: 1. years _____ 2. ☐ Unknown D. Use of firearm at time of injury? 1. ☐ Shooting at other person 2. ☐ Suicide 3. ☐ Hunting 4. ☐ Playing 5. ☐ Other: _____ 6. ☐ Unknown E. Was decedent's home source of firearm? 1. ☐ Yes 2. ☐ No 3. ☐ Unknown F. ☐ Circumstances unknown	☐ 10. Poisoning/overdose A. Name of drug or chemical? 1. ☐ Name _____ 2. ☐ Unknown B. ☐ Circumstances unknown
		☐ 11. Fire/burn A. If not a fire burn, its source? 1. ☐ Hot water, etc. 2. ☐ Appliance 3. ☐ Other: _____ 4. ☐ Unknown 5. ☐ NA B. If ignition/fire, what was source? 1. ☐ Oven/stove explosion 2. ☐ Cooking appliance used as heat source 3. ☐ Matches 4. ☐ Lit cigarette 5. ☐ Lighter 6. ☐ Space heater 7. ☐ Furnace 8. ☐ Explosives 9. ☐ Fireworks 10. ☐ Electrical wiring 11. ☐ Other: _____ 12. ☐ Unknown 13. ☐ NA C. Smoke alarm present at fire scene? 1. ☐ Yes 2. ☐ No 3. ☐ Unknown D. If alarm present, did it sound? 1. ☐ Yes 2. ☐ No 3. ☐ Unknown E. Was the fire started by a person? 1. ☐ Yes 2. ☐ No 3. ☐ Unknown F. If started by a person, his/her age: _____ years 1. ☐ Unknown 2. ☐ NA G. If started by a person, his/her activity 1. ☐ Playing 2. ☐ Smoking 3. ☐ Cooking 4. ☐ Suspected arson 5. ☐ Other: _____ 6. ☐ Unknown 7. ☐ NA H. Type of construction of building burned: 1. ☐ Wood frame 2. ☐ Brick/stone 3. ☐ Trailer 4. ☐ Other: _____ 5. ☐ Unknown 6. ☐ NA I. Smoke inhalation death: 1. ☐ Yes 2. ☐ No J. ☐ Circumstances unknown
		☐ 12. Other Cause Not Listed Above: _____ 2002 _____

APPENDIX B

**The United States Commerce Bureau of the Census' United States Census 2000
Short Form (D-61A)**

PLEASE DO NOT FILL OUT THIS FORM.
This is not an official census form. It is for informational purposes only.

United States Census 2000

U.S. Department of Commerce • Bureau of the Census



This is the official form for all the people at this address. It is quick and easy, and your answers are protected by law. Complete the Census and help your community get what it needs — today and in the future!

Start Here

Please use a
black or blue pen.

1. How many people were living or staying in this house, apartment, or mobile home on April 1, 2000?

Number of people

INCLUDE in this number:

- foster children, roomers, or housemates
- people staying here on April 1, 2000 who have no other permanent place to stay
- people living here most of the time while working, even if they have another place to live

DO NOT INCLUDE in this number:

- college students living away while attending college
- people in a correctional facility, nursing home, or mental hospital on April 1, 2000
- Armed Forces personnel living somewhere else
- people who live or stay at another place most of the time

2. Is this house, apartment, or mobile home —
Mark ☒ ONE box.

- ☐ Owned by you or someone in this household with a mortgage or loan?
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented for cash rent?
- ☐ Occupied without payment of cash rent?

3. Please answer the following questions for each person living in this house, apartment, or mobile home. Start with the name of one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here. We will refer to this person as Person 1.

What is this person's name? Print name below.

Last Name

First Name

MI

4. What is Person 1's telephone number? We may call this person if we don't understand an answer.

Area Code + Number

5. What is Person 1's sex? Mark ☒ ONE box.

☐ Male ☐ Female

6. What is Person 1's age and what is Person 1's date of birth?

Age on April 1, 2000

Print numbers in boxes.

Month Day Year of birth

→ NOTE: Please answer BOTH Questions 7 and 8.

7. Is Person 1 Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- ☐ No, not Spanish/Hispanic/Latino ☐ Yes, Puerto Rican
- ☐ Yes, Mexican, Mexican Am., Chicano ☐ Yes, Cuban
- ☐ Yes, other Spanish/Hispanic/Latino — Print group. ↗

8. What is Person 1's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — Print name of enrolled or principal tribe. ↗

- ☐ Asian Indian ☐ Japanese ☐ Native Hawaiian
- ☐ Chinese ☐ Korean ☐ Guamanian or Chamorro
- ☐ Filipino ☐ Vietnamese ☐ Samoan
- ☐ Other Asian — Print race. ↗ ☐ Other Pacific Islander — Print race. ↗

☐ Some other race — Print race. ↗

OMB No. 0607-0856: Approval Expires 12/31/2000

Form **D-61A**

→ If more people live here, continue with Person 2.

Person 2

Your answers are important!
Every person in the Census counts.

1. What is Person 2's name? *Print name below.*

Last Name

First Name

MI

2. How is this person related to Person 1? Mark ☒ ONE box.

- | | |
|--|--|
| ☐ Husband/wife | If NOT RELATED to Person 1: |
| ☐ Natural-born son/daughter | ☐ Roomer, boarder |
| ☐ Adopted son/daughter | ☐ Housemate, roommate |
| ☐ Stepson/stepdaughter | ☐ Unmarried partner |
| ☐ Brother/sister | ☐ Foster child |
| ☐ Father/mother | ☐ Other nonrelative |
| ☐ Grandchild | |
| ☐ Parent-in-law | |
| ☐ Son-in-law/daughter-in-law | |
| ☐ Other relative — <i>Print exact relationship.</i> | |

3. What is this person's sex? Mark ☒ ONE box.

- ☐ Male ☐ Female

4. What is this person's age and what is this person's date of birth?

Print numbers in boxes.
Age on April 1, 2000 Month Day Year of birth

→ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if not Spanish/Hispanic/Latino.

- | | |
|---|--|
| ☐ No, not Spanish/Hispanic/Latino | ☐ Yes, Puerto Rican |
| ☐ Yes, Mexican, Mexican Am., Chicano | ☐ Yes, Cuban |
| ☐ Yes, other Spanish/Hispanic/Latino — <i>Print group.</i> | |

6. What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*

- | | | |
|--|-------------------------------------|--|
| ☐ Asian Indian | ☐ Japanese | ☐ Native Hawaiian |
| ☐ Chinese | ☐ Korean | ☐ Guamanian or Chamorro |
| ☐ Filipino | ☐ Vietnamese | ☐ Samoan |
| ☐ Other Asian — <i>Print race.</i> | | |
| ☐ Other Pacific Islander — <i>Print race.</i> | | |

- ☐ Some other race — *Print race.*

→ If more people live here, continue with Person 3.

Person 3

Census information helps your community get financial assistance for roads, hospitals, schools, and more.

1. What is Person 3's name? *Print name below.*

Last Name

First Name

MI

2. How is this person related to Person 1? Mark ☒ ONE box.

- | | |
|--|--|
| ☐ Husband/wife | If NOT RELATED to Person 1: |
| ☐ Natural-born son/daughter | ☐ Roomer, boarder |
| ☐ Adopted son/daughter | ☐ Housemate, roommate |
| ☐ Stepson/stepdaughter | ☐ Unmarried partner |
| ☐ Brother/sister | ☐ Foster child |
| ☐ Father/mother | ☐ Other nonrelative |
| ☐ Grandchild | |
| ☐ Parent-in-law | |
| ☐ Son-in-law/daughter-in-law | |
| ☐ Other relative — <i>Print exact relationship.</i> | |

3. What is this person's sex? Mark ☒ ONE box.

- ☐ Male ☐ Female

4. What is this person's age and what is this person's date of birth?

Print numbers in boxes.
Age on April 1, 2000 Month Day Year of birth

→ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if not Spanish/Hispanic/Latino.

- | | |
|---|--|
| ☐ No, not Spanish/Hispanic/Latino | ☐ Yes, Puerto Rican |
| ☐ Yes, Mexican, Mexican Am., Chicano | ☐ Yes, Cuban |
| ☐ Yes, other Spanish/Hispanic/Latino — <i>Print group.</i> | |

6. What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*

- | | | |
|--|-------------------------------------|--|
| ☐ Asian Indian | ☐ Japanese | ☐ Native Hawaiian |
| ☐ Chinese | ☐ Korean | ☐ Guamanian or Chamorro |
| ☐ Filipino | ☐ Vietnamese | ☐ Samoan |
| ☐ Other Asian — <i>Print race.</i> | | |
| ☐ Other Pacific Islander — <i>Print race.</i> | | |

- ☐ Some other race — *Print race.*

→ If more people live here, continue with Person 4.

Person 2

Your answers are important!
Every person in the Census counts.

1. What is Person 2's name? *Print name below.*

Last Name

First Name

MI

2. How is this person related to Person 1? Mark ☒ ONE box.

- | | |
|--|--|
| ☐ Husband/wife | If NOT RELATED to Person 1: |
| ☐ Natural-born son/daughter | ☐ Roomer, boarder |
| ☐ Adopted son/daughter | ☐ Housemate, roommate |
| ☐ Stepson/stepdaughter | ☐ Unmarried partner |
| ☐ Brother/sister | ☐ Foster child |
| ☐ Father/mother | ☐ Other nonrelative |
| ☐ Grandchild | |
| ☐ Parent-in-law | |
| ☐ Son-in-law/daughter-in-law | |
| ☐ Other relative — <i>Print exact relationship.</i> | |

3. What is this person's sex? Mark ☒ ONE box.

- ☐ Male ☐ Female

4. What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000 Month Day Year of birth

→ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if not Spanish/Hispanic/Latino.

- | | |
|---|--|
| ☐ No, not Spanish/Hispanic/Latino | ☐ Yes, Puerto Rican |
| ☐ Yes, Mexican, Mexican Am., Chicano | ☐ Yes, Cuban |
| ☐ Yes, other Spanish/Hispanic/Latino — <i>Print group.</i> | |

6. What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*

- | | | |
|--|-------------------------------------|--|
| ☐ Asian Indian | ☐ Japanese | ☐ Native Hawaiian |
| ☐ Chinese | ☐ Korean | ☐ Guamanian or Chamorro |
| ☐ Filipino | ☐ Vietnamese | ☐ Samoan |
| ☐ Other Asian — <i>Print race.</i> | | |
| ☐ Other Pacific Islander — <i>Print race.</i> | | |

- ☐ Some other race — *Print race.*

→ If more people live here, continue with Person 3.

Person 3

Census information helps your community get financial assistance for roads, hospitals, schools, and more.

1. What is Person 3's name? *Print name below.*

Last Name

First Name

MI

2. How is this person related to Person 1? Mark ☒ ONE box.

- | | |
|--|--|
| ☐ Husband/wife | If NOT RELATED to Person 1: |
| ☐ Natural-born son/daughter | ☐ Roomer, boarder |
| ☐ Adopted son/daughter | ☐ Housemate, roommate |
| ☐ Stepson/stepdaughter | ☐ Unmarried partner |
| ☐ Brother/sister | ☐ Foster child |
| ☐ Father/mother | ☐ Other nonrelative |
| ☐ Grandchild | |
| ☐ Parent-in-law | |
| ☐ Son-in-law/daughter-in-law | |
| ☐ Other relative — <i>Print exact relationship.</i> | |

3. What is this person's sex? Mark ☒ ONE box.

- ☐ Male ☐ Female

4. What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000 Month Day Year of birth

→ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if not Spanish/Hispanic/Latino.

- | | |
|---|--|
| ☐ No, not Spanish/Hispanic/Latino | ☐ Yes, Puerto Rican |
| ☐ Yes, Mexican, Mexican Am., Chicano | ☐ Yes, Cuban |
| ☐ Yes, other Spanish/Hispanic/Latino — <i>Print group.</i> | |

6. What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*

- | | | |
|--|-------------------------------------|--|
| ☐ Asian Indian | ☐ Japanese | ☐ Native Hawaiian |
| ☐ Chinese | ☐ Korean | ☐ Guamanian or Chamorro |
| ☐ Filipino | ☐ Vietnamese | ☐ Samoan |
| ☐ Other Asian — <i>Print race.</i> | | |
| ☐ Other Pacific Islander — <i>Print race.</i> | | |

- ☐ Some other race — *Print race.*

→ If more people live here, continue with Person 4.

Person 4

Information about children helps
your community plan for child
care, education, and recreation.



What is Person 4's name? *Print name below.*
Last Name

First Name

MI

How is this person related to Person 1? Mark ☒ ONE box.

- | | |
|--|--|
| ☐ Husband/wife | If NOT RELATED to Person 1: |
| ☐ Natural-born son/daughter | ☐ Roomer, boarder |
| ☐ Adopted son/daughter | ☐ Housemate, roommate |
| ☐ Stepson/stepdaughter | ☐ Unmarried partner |
| ☐ Brother/sister | ☐ Foster child |
| ☐ Father/mother | ☐ Other nonrelative |
| ☐ Grandchild | |
| ☐ Parent-in-law | |
| ☐ Son-in-law/daughter-in-law | |
| ☐ Other relative — <i>Print exact relationship.</i> → | |

What is this person's sex? Mark ☒ ONE box.

- ☐ Male ☐ Female

What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000 Month Day Year of birth

NOTE: Please answer BOTH Questions 5 and 6.

Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- | | |
|---|--|
| ☐ No, not Spanish/Hispanic/Latino | ☐ Yes, Puerto Rican |
| ☐ Yes, Mexican, Mexican Am., Chicano | ☐ Yes, Cuban |
| ☐ Yes, other Spanish/Hispanic/Latino — <i>Print group.</i> → | |

What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* →

- | | | |
|---|-------------------------------------|--|
| ☐ Asian Indian | ☐ Japanese | ☐ Native Hawaiian |
| ☐ Chinese | ☐ Korean | ☐ Guamanian or Chamorro |
| ☐ Filipino | ☐ Vietnamese | ☐ Samoan |
| ☐ Other Asian — <i>Print race.</i> → | | ☐ Other Pacific Islander — <i>Print race.</i> → |

- ☐ Some other race — *Print race.* →

If more people live here, continue with Person 5.

Person 5

Knowing about age, race, and
sex helps your community
better meet the needs of
everyone.



1. What is Person 5's name? *Print name below.*
Last Name

First Name

MI

2. How is this person related to Person 1? Mark ☒ ONE box.

- | | |
|--|--|
| ☐ Husband/wife | If NOT RELATED to Person 1: |
| ☐ Natural-born son/daughter | ☐ Roomer, boarder |
| ☐ Adopted son/daughter | ☐ Housemate, roommate |
| ☐ Stepson/stepdaughter | ☐ Unmarried partner |
| ☐ Brother/sister | ☐ Foster child |
| ☐ Father/mother | ☐ Other nonrelative |
| ☐ Grandchild | |
| ☐ Parent-in-law | |
| ☐ Son-in-law/daughter-in-law | |
| ☐ Other relative — <i>Print exact relationship.</i> → | |

3. What is this person's sex? Mark ☒ ONE box.

- ☐ Male ☐ Female

4. What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000 Month Day Year of birth

→ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- | | |
|---|--|
| ☐ No, not Spanish/Hispanic/Latino | ☐ Yes, Puerto Rican |
| ☐ Yes, Mexican, Mexican Am., Chicano | ☐ Yes, Cuban |
| ☐ Yes, other Spanish/Hispanic/Latino — <i>Print group.</i> → | |

6. What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* →

- | | | |
|---|-------------------------------------|--|
| ☐ Asian Indian | ☐ Japanese | ☐ Native Hawaiian |
| ☐ Chinese | ☐ Korean | ☐ Guamanian or Chamorro |
| ☐ Filipino | ☐ Vietnamese | ☐ Samoan |
| ☐ Other Asian — <i>Print race.</i> → | | ☐ Other Pacific Islander — <i>Print race.</i> → |

- ☐ Some other race — *Print race.* →

→ If more people live here, continue with Person 6.

1. What is Person 6's name? *Print name below.*



Last Name

First Name

MI

2. How is this person related to Person 1? Mark ☒ ONE box.

- | | |
|--|--|
| ☐ Husband/wife | If NOT RELATED to Person 1: |
| ☐ Natural-born son/daughter | ☐ Roomer, boarder |
| ☐ Adopted son/daughter | ☐ Housemate, roommate |
| ☐ Stepson/stepdaughter | ☐ Unmarried partner |
| ☐ Brother/sister | ☐ Foster child |
| ☐ Father/mother | ☐ Other nonrelative |
| ☐ Grandchild | |
| ☐ Parent-in-law | |
| ☐ Son-in-law/daughter-in-law | |
| ☐ Other relative — <i>Print exact relationship.</i> ➤ | |

3. What is this person's sex? Mark ☒ ONE box.

- ☐ Male ☐ Female

4. What is this person's age and what is this person's date of birth? *Print numbers in boxes.*

Age on April 1, 2000 Month Day Year of birth

➔ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? Mark ☒ the "No" box if **not** Spanish/Hispanic/Latino.

- | | |
|---|--|
| ☐ No, not Spanish/Hispanic/Latino | ☐ Yes, Puerto Rican |
| ☐ Yes, Mexican, Mexican Am., Chicano | ☐ Yes, Cuban |
| ☐ Yes, other Spanish/Hispanic/Latino — <i>Print group.</i> ➤ | |

6. What is this person's race? Mark ☒ one or more races to indicate what this person considers himself/herself to be.

- ☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ➤

- | | | |
|---|-------------------------------------|--|
| ☐ Asian Indian | ☐ Japanese | ☐ Native Hawaiian |
| ☐ Chinese | ☐ Korean | ☐ Guamanian or Chamorro |
| ☐ Filipino | ☐ Vietnamese | ☐ Samoan |
| ☐ Other Asian — <i>Print race.</i> ➤ | | ☐ Other Pacific Islander — <i>Print race.</i> ➤ |

- ☐ Some other race — *Print race.* ➤

**Please turn
to go to last
page.**

➔ If more people live here, list their names on the

Persons 7 - 12

If you didn't have room to list everyone who lives in this house or apartment, please list the others below. You may be contacted by the Census Bureau for the same information about these people.

Person 7 — Last Name

First Name MI

Person 8 — Last Name

First Name MI

Person 9 — Last Name

First Name MI

Person 10 — Last Name

First Name MI

Person 11 — Last Name

First Name MI

Person 12 — Last Name

First Name MI

The Census Bureau estimates that, for the average household, this form will take about 10 minutes to complete, including the time for reviewing the instructions and answers. Comments about the estimate should be directed to the Associate Director for Finance and Administration, Attn: Paperwork Reduction Project 0607-0856, Room 3104, Federal Building 3, Bureau of the Census, Washington, DC 20233.

Respondents are not required to respond to any information collection unless it displays a valid approval number from the Office of Management and Budget.

**Thank you for
completing your official
U.S. Census 2000 form.**

The "Informational Copy" shows the content of the United States Census 2000 "short" form questionnaire. Each household will receive either a short form (100-percent questions) or a long form (100-percent and sample questions). The short form questionnaire contains 6 population questions and 1 housing question. On average, about 5 in every 6 households will receive the short form. The content of the forms resulted from reviewing the 1990 census data, consulting with federal and non-federal data users, and conducting tests.

For additional information about Census 2000, visit our website at **www.census.gov** or write to the Director, Bureau of the Census, Washington, DC 20233.

A. JIC1 B. JIC2 C. JIC3 D. JIC4

If you need help completing this form, call 1-800-XXX-XXXX between 8:00 a.m. and 9:00 p.m., 7 days a week. The telephone call is free.

TDD-Telephone display device for the hearing impaired. Call 1-800-XXX-XXXX between 8:00 a.m. and 9:00 p.m., 7 days a week. The telephone call is free.

¿Necesita Ayuda? Si usted necesita ayuda para completar este cuestionario llame al 1-800-XXX-XXXX entre las 8:00 a.m. y las 9:00 p.m., 7 días a la semana. La llamada telefónica es gratis.

APPENDIX C

Tables of Housing Characteristics and Demographic Characteristics of Heads of Households and The Rate of Tennessee (Violent, Accidental, and Natural) Child Fatalities Reported in Tennessee Neighborhoods 1996-2003

Table 42. Rental Housing Units of Tennessee Neighborhoods and the Rate of Tennessee Child Fatalities (1996-2003)

Research Topics Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Rental Housing					
A. Is there an association between percent of rental housing in each Tennessee census tract and the rate of reported child fatalities?	Percent of non-owners	Ordinal	Spearman Rho	rho=.072 p=.000*	****A significantly weak positive association
B. Were more child fatalities observed than expected in census tracts when ranked and grouped by the percent of rental housing reported in each census tract?			See groups listed below		
B-1. When ranked and grouped by the percent of rental housing within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-2.9**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of rental housing within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-1.6	No significant difference found in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of rental housing within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	4.5**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

***A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association. §

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 43. Vacancy Status in Tennessee Neighborhoods and the Rate of Tennessee Child Fatalities (1996-2003)

Research Topics-Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Vacancy Status					
A. Is there an association between the percent of vacant units in each Tennessee census tract and the rate of reported child fatalities?	Vacant units	Ordinal	Spearman Rho	rho=.071 p=.000*	*** ⁺ A significantly weak positive association
B. Were more child fatalities observed than expected in a census tract when ranked and grouped by the amount of vacant units reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of vacant units within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-4.5**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of vacant units within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	2.7**	Significantly more census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by the percent of vacant units within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	1.8	No significant difference found in observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

⁺**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 44. Average Household Size in Tennessee Neighborhoods and the Rate Child Fatalities Reported (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics of Household Size					
A. Is there an association between household size in each Tennessee census tract and the rate of child fatalities?	Household size		Spearman Rho	rho=.100 p=.000*	*** ^A significantly weak positive association
B. Were more child fatalities observed than expected in a census tract when ranked and grouped by household size reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by household size within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-8.4**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by household size within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	2.6**	Significantly more census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by household size within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	5.9**	Significantly more child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq +.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq -.5$ to $<-.9$ = a moderate negative association; $\geq -.9$ = a strong negative association; and -1 is a perfect association.

Note: The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 45. Urban Location of Tennessee Neighborhoods and the Rate of Child Fatalities Reported (1996-2003)

Research Topics-Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Urban Classification					
A. Whether a census tract classified as urban is associated with the rate of child fatalities reported in Tennessee census tracts?	Urban	Ordinal	Spearman Rho	rho=-.014 p=.160	***†No significant association was found
B. Were more child fatalities observed than expected in a census tract when designated as urban?		See groups listed below			
B-1. When ranked and grouped by non-urban group.	Non-urban Tennessee census tracts	Ordinal		-.6	No significant difference was found between observed and expected census tracts with child fatalities
B-2 When ranked and grouped by less than or equal to 25% urban group.	Less than or equal to 25% of Tennessee census tracts	Ordinal		2.0	No significant difference was found between observed and expected census tracts with child fatalities
B-3 When ranked and grouped by greater than 25% and less than or equal to 50% urban.	Greater than 25% and less than or equal to 50% of Tennessee census tracts	Ordinal		.9	No significant difference was found between observed and expected census tracts with child fatalities
B-4. When ranked and grouped by greater than 50% and less than or equal to 75% urban.	Greater than 50% and less than or equal to 75% of Tennessee census tracts	Ordinal		-2.8**	Significantly less census tracts with child fatalities were observed than expected
B-5. When ranked and grouped by greater than 75% urban	Greater than 75% of Tennessee census tracts	Ordinal		-2.4**	Significantly less census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

Table 45, cont.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 46. Female Heads of Households in Tennessee Neighborhoods and the Rate of Child Fatalities (1996-2003)

Research Topics-Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics-Female Heads of Households					
A. Is there an association between the percent of female heads of households in each Tennessee census tract and the rate of reported child fatalities?	Response to gender and head of household question	Ordinal	Spearman Rho	rho=-0.040 p=.000*	**** [†] A significantly weak negative association
B. Were more child fatalities observed than expected in a census tract when ranked and grouped by the rate of female heads of households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of female heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	3.5**	Significantly more census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of female heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	.6	No significant difference was found between observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of female heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-4.1**	Significantly less census tracts with child fatalities observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 47. Single Heads of Households in Tennessee Neighborhoods and the Rate of Child Fatalities (1996-2003)

Research Topics-Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics- Single heads of households					
A. Is there an association between the percent of single heads of households in each Tennessee census tract and the rate of reported child fatalities?	Response to head of household question	Ordinal	Spearman Rho	rho=-0.023 p=.022*	**** [†] A significantly weak positive association
B. Were more child fatalities observed than expected in a census tract when ranked and grouped by the rate of single heads of households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of single heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	1.1	No significant difference between observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of single heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	2.4**	Significantly more census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by the percent of single heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-3.5**	Significantly less census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 48. Spanish/Hispanic/Latino Heads of Households in Tennessee Neighborhoods and the Rate of Child Fatalities (1996-2003)

Research Topics- Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics- Spanish/Hispanic/Latino Heads of Households					
A. Is there an association between the rate of Spanish/Hispanic/Latino heads of households in each Tennessee census tract and the rate of reported child fatalities?	Response to ethnicity and head of household question	Ordinal	Spearman Rho	rho=-.011 p=.292	*** [†] No significant association was found
B. Were more child fatalities observed than expected in a census tract when ranked and grouped by the rate Spanish/Hispanic/Latino heads of households in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-.1	No significant difference between observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	1.6	No significant difference between observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-1.5	No significant difference between observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq +.9$ = a strong positive association. Below 0 to $<-.5$ = a weak negative association; $\geq -.5$ to $<-.9$ = a moderate negative association; $\geq -.9$ = a strong negative association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 49. Non-white Heads of Households in Tennessee Neighborhoods and the Rate Child Fatalities (1996-2003)

Research Topics-Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics-Non-white Heads of Households					
A. Is there an association between the percent of None-white heads households in each Tennessee census tract and the rate of reported child fatalities?	Response to race and head of household question		Spearman Rho	rho=.125 p=.000*	*** [†] A significantly weak positive association
B. Were more child fatalities observed than expected in a census tract when tracts were ranked and grouped by the percent of Non-white heads of households reported in each census tract when?		See groups listed below			
B-1. When ranked and grouped by the percent of Non-white heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-3.7**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent on Non-white heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-3.2**	Significantly less census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by the percent of Non-white heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	6.9**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 50. Rental Housing Units in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Rental Housing					
A. Is there an association between the percentage of rental housing in each Tennessee census tract and the rate of reported violent child fatalities?	Percent of non-owners	Ordinal	Spearman Rho	$\rho = .034$ $p = .001^*$	*** [†] A significantly weak positive association
B. Were more violent child fatalities observed than expected in a census tract when tracts were ranked and grouped by the percent amount of rental housing reported in each census tract when?		See groups listed below			
B-1. When ranked and grouped by the percent of rental housing within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-1.9	No significant difference between observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of rental housing within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-2.0	No significant difference between observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of rental housing within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	3.9**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 51. Vacancy Status in Tennessee Neighborhoods and the Rate of Violent Child Fatalities Reported (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Result	Outcome
1. Housing Characteristics-Vacancy Status					
A. Is there an association between the percent of vacant units in each Tennessee census tract and the rate of violent child fatalities?	Percent of Vacant units	Ordinal	Spearman Rho	rho= -.006 p= .569	*** [†] No significant association was found
B. Were more violent child fatalities observed than expected in a census tract when tracts were ranked and grouped by the percent of vacant units reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of vacant units within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	.4	No significant difference found in observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of vacant units within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	.6	No significant difference found in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of vacant units within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	.9	No significant difference found in observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 52. Average Household Size in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics of Household Size					
A. Is there an association between household size in each Tennessee census tract and the rate of violent child fatalities?	Household		Spearman Rho	$\rho = .055^*$ $p = .000$	****A significantly weak positive association
B. Were more violent child fatalities observed than expected in a census tract when tracts were ranked and grouped by household size reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by household size within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-4.2**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by household size within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-.9	No significant difference was found between observed and expected census tracts with child fatalities
B-3. When ranked and grouped by household size within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	5.1**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 53. Urban Location in Tennessee Neighborhoods and the Rate of Violent Child Fatalities Reported (1996-2003)

Research Topics-Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Urban Classification					
A. Whether a census tract classified as urban is associated with the rate of violent child fatalities reported in Tennessee census tracts?	Urban	Ordinal	Spearman Rho	rho=.014** p=.008	***+No significant association was found
B. Were more child fatalities observed than expected in a census tract when designated as urban?		See groups listed below			
B-1. When ranked and grouped by non-urban group.	Non-urban Tennessee census tracts	Ordinal		-2.9**	Significantly less census tracts with child fatalities were observed than expected
B-2 When ranked and grouped by less than or equal to 25% urban group.	Less than or equal to 25% of Tennessee census tracts	Ordinal		-1.3	No significant difference was found between observed and expected census tracts with child fatalities
B-3 When ranked and grouped by greater than 25% and less than or equal to 50% urban.	Greater than 25% and less than or equal to 50% of Tennessee census tracts	Ordinal		4.3**	Significantly more census tracts with child fatalities were observed than expected
B-4. When ranked and grouped by greater than 50% and less than or equal to 75% urban.	Greater than 50% and less than or equal to 75% of Tennessee census tracts	Ordinal		0.7	No significant difference was found between observed and expected census tracts with child fatalities
B-5. When ranked and grouped by greater than 75% urban	Greater than 75% of Tennessee census tracts	Ordinal		-0.7	No significant difference was found between observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

*a) Significance at the $p < .05$ level

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association.

***Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 54. Female Heads of Households in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics-Female Heads of Households					
A. Is there an association between the percent of female headed households in each Tennessee census tract and the rate of violent child fatalities?	Response to gender and head of household question	Ordinal	Spearman Rho	rho = -.024 p = .017*a	****A significantly weak negative association at the p<.05 level not at the p<.01 level
B. Were more violent child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of female headed households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of female headed households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	2.0	No significant difference found in observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of female headed households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	.3	No significant difference found in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of female headed households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-2.4**	Significantly less census tracts with child fatalities observed than expected

*Significance at the $p \leq .01$

*a) Significance at the $p \leq .05$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 55. Single Heads of Households in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics- Single heads of households					
A. Is there an association between the percent of single heads of households in each Tennessee census tract and the rate of violent child fatalities?	Single heads of households	Ordinal	Spearman Rho	rho=-.019 p=.063	*** [†] Not a significant association
B. Were more violent child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of single heads of households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of single heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	2.3**	Significantly more census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of single heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-0.7	No significant difference found in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of single heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-1.7	No significant difference found in observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 56. Spanish/Hispanic/Latino Heads of Households in Tennessee Neighborhoods and the Rate of Violent Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics- Spanish/Hispanic/Latino Heads of Households					
A. Is there an association between the percent of Spanish/Hispanic/Latino Heads of Households in each Tennessee census tract and the rate of violent child fatalities?	Response to ethnicity and head of household question	Ordinal	Spearman Rho	rho= -.010 p= .322	*** [†] Not a significant association
B. Were more violent child fatalities observed than expected in a census tract when tracts were ranked and grouped by the Spanish/Hispanic/Latino Heads of Households ?		See groups listed below			
B-1. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	.8	No significant difference found in observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	.6	No significant difference found in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-1.3	No significant difference found in observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 57. Non-white Heads of Households in Tennessee Neighborhoods and the Rate of Violent Child Fatalities Reported (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics-Non-white Heads of Households					
A. Is there an association between the percent of Non-white heads of households in each Tennessee census tract and the rate of violent child fatalities?	Racial minorities	Ordinal	Spearman Rho	rho=.064 p=.000**	*** [†] A significantly weak positive association
B. Were more violent child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of Non-white heads of households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of Non-white heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-2.5**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of Non-white heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-3.6**	Significantly less census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by the percent of Non-white heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	6.1**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. *Statistical Methods In The Biological and Health Science*. Boston: WCB/McGraw-Hill, 1999.

Table 58. Rental Housing of Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Rental Housing					
A. Is there an association between percent of rental housing in each Tennessee census tract and the rate of accidental child fatalities?	Percent rental	Ordinal	Spearman Rho	rho=-.033 p=.001**	*** [†] A significantly weak negative association
B. Were more accidental child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of rental housing reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of rental housing within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	1.9	No significant difference found in observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of rental housing within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	2.2**	Significantly more census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by the percent of rental housing within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-4.1**	Significantly less census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 59. Vacancy Status in Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Vacancy Status					
A. Is there an association between the percent of vacant units in each Tennessee census tract and the rate of accidental child fatalities?	Vacant units	Ordinal	Spearman Rho	rho=.041 p=.000*	**** [†] A significantly weak positive association
B. Were more accidental child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of vacant units reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of vacant units within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-2.8**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of vacant units within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-0.5	No significant difference found in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of vacant units within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	3.3**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 60. Average Household Size of Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics of Household Size					
A. Is there an association between household size in each Tennessee census tract and the rate of accidental child fatalities?	Household size		Spearman Rho	rho=.065 p=.000*	**** [†] A significantly weak positive association
B. Were more accidental child fatalities observed than expected in a census tract when tracts were ranked and grouped by household size reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by household size within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-7.3**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by household size within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	4.2**	Significantly more census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by household size within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	3.1**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 61. Urban Location of Tennessee Neighborhoods and the Rate of Accidental Child Fatalities Reported (1996-2003)

Research Topics-Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Urban Classification					
A. Whether a census tract classified as urban is associated with the rate of child fatalities reported in Tennessee census tracts?	Urban	Ordinal	Spearman Rho	rho=-.081 p=.000*	****A significantly weak negative association
B. Were more child fatalities observed than expected in a census tract when designated as urban?		See groups listed below			
B-1. When ranked and grouped by non-urban group.	Non-urban Tennessee census tracts	Ordinal		4.5**	Significantly more census tracts with child fatalities were observed than expected
B-2 When ranked and grouped by less than or equal to 25% urban group.	Less than or equal to 25% of Tennessee census tracts	Ordinal		4.6**	Significantly more census tracts with child fatalities were observed than expected
B-3 When ranked and grouped by greater than 25% and less than or equal to 50% urban.	Greater than 25% and less than or equal to 50% of Tennessee census tracts	Ordinal		-0.2	No significant difference was found in observed and expected census tracts with child fatalities
B-4. When ranked and grouped by greater than 50% and less than or equal to 75% urban.	Greater than 50% and less than or equal to 75% of Tennessee census tracts	Ordinal		2.2**	Significantly more census tracts with child fatalities were observed than expected
B-5. When ranked and grouped by greater than 75% urban	Greater than 75% of Tennessee census tracts	Ordinal		-6.6**	Significantly less census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association.

***Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 62. Female Heads of Households of Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics-Female Heads of Households					
A. Is there an association between the percent of female heads of households in each Tennessee census tract and the rate of accidental child fatalities?	Response of gender and heads of households question	Ordinal	Spearman Rho	rho=-.061 p=.000*	****A significantly weak negative association
B. Were more accidental child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of female heads of households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of female heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	3.7**	Significantly more census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of female heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	2.5**	Significantly more census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by the percent of female heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-6.2**	Significantly less census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

Table 62, continued.

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 63. Single Heads of Households in Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics- Single heads of households					
A. Is there an association between the percent of single heads of households in each Tennessee census tract and the rate of accidental child fatalities?	Response to individual heads of households	Ordinal	Spearman Rho	rho= -.060 p= .000*	****A significantly weak negative association
B. Were more accidental child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of single heads of households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of single heads of households in the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	3.5**	Significantly more census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of single heads of households in the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	3.3**	Significantly more census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by the percent of single heads of households in the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-6.7**	Significantly less census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq +.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq -.5$ to $<-.9$ = a moderate negative association; $\geq -.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 64. Spanish/Hispanic/Latino Heads of Households in Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
I. Demographic Characteristics-Spanish/Hispanic/Latino Heads of Households					
A. Is there an association between the amount of Spanish/Hispanic/Latino Heads of Households in each Tennessee census tract and the rate of accidental child fatalities?	Spanish/Hispanic/Latino	Ordinal	Spearman Rho	rho=-.032 p=.001*	*** ⁺ A significantly weak negative association
B. Were more accidental child fatalities observed than expected in a census tract when tracts were ranked and grouped by the Spanish/Hispanic/Latino Heads of Households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	3.2**	Significantly more census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	.6	No significant difference was found between observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-3.8**	Significantly less census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

⁺**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 65. Non-white Heads of Households in Tennessee Neighborhoods and the Rate of Accidental Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics-Non-white Heads of Households					
A. Is there an association between the percent of Non-white heads of households in each Tennessee census tract and the rate of accidental child fatalities?	Non-white	Ordinal	Spearman Rho	rho=-.029 p=.004*	**** [†] A significantly weak negative association
B. Were more accidental child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of Non-white heads of households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of Non-white heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	3.3**	Significantly more census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of Non-white heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-.7	No significant difference found in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of Non-white heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-2.5**	Significantly less census tracts with child fatalities observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 66. Rental Housing in Tennessee Neighborhoods and the Rate of Natural Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Rental Housing					
A. Is there an association between the percent of rental housing in each Tennessee census tract and the rate of natural child fatalities?	Percent Rental Units	Ordinal	Spearman Rho	rho=.091 p=.000*	*** [†] A significantly weak positive association
B. Were more natural child fatalities observed than expected in a census tract when tracts were ranked and grouped by the percent of rental housing reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of rental housing within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-4.5**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of rental housing within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-3.1**	Significantly less census tracts with child fatalities observed than expected
B-3. When ranked and grouped by the percent of rental housing within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	7.6**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 67. Vacancy Status in Tennessee Neighborhoods and the Rate of Natural Child Fatalities Reported (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Vacancy Status					
A. Is there an association between the amount of vacant units in each Tennessee census tract and the rate of natural child fatalities?	Vacant Units	Ordinal	Spearman Rho	rho=.033 p=.001*	****A significantly weak positive association
B. Were more natural child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of vacant units reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of vacant units within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-2.0**	No significant difference in observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of vacant units within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	2.9**	Significantly more census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by the percent of vacant units within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-.8	No significant difference in observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 68. Average Household Size of Tennessee Neighborhoods and the Rate of Natural Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics of Household Size					
A. Is there an association between household size in each Tennessee census tract and the rate of natural child fatalities?	Household size		Spearman Rho	rho=.090 p=.000*	****A significantly weak positive association
B. Were more natural child fatalities observed than expected in a census tract when tracts were ranked and grouped by household size reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by household size within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-6.6**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by household size within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	.2	No significant difference was found between observed and expected census tracts with child fatalities
B-3. When ranked and grouped by household size within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	6.4**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 69. Urban Location of Tennessee Neighborhoods and the Rate of Natural Child Fatalities Reported (1996-2003)

Research Topics-Total Child Fatalities	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Housing Characteristics-Urban Classification					
A. Whether a census tract classified as urban is associated with the rate of child fatalities reported in Tennessee census tracts?	Urban	Ordinal	Spearman Rho	rho=.026 p=.013*a	****A significantly weak positive association
B. Were more child fatalities observed than expected in a census tract when designated as urban?		See groups listed below			
B-1. When ranked and grouped by non-urban group.	Non-urban Tennessee census tracts	Ordinal		-3.7**	Significantly less census tracts with child fatalities were observed than expected
B-2 When ranked and grouped by less than or equal to 25% urban group.	Less than or equal to 25% of Tennessee census tracts	Ordinal		-.2	No significant difference was found between observed and expected census tracts with child fatalities
B-3 When ranked and grouped by greater than 25% and less than or equal to 50% urban.	Greater than 25% and less than or equal to 50% of Tennessee census tracts	Ordinal		4.5**	Significantly more census tracts with child fatalities were observed than expected
B-4. When ranked and grouped by greater than 50% and less than or equal to 75% urban.	Greater than 50% and less than or equal to 75% of Tennessee census tracts	Ordinal		-1.9	No significant difference was found between observed and expected census tracts with child fatalities
B-5. When ranked and grouped by greater than 75% urban	Greater than 75% of Tennessee census tracts	Ordinal		-1.1	No significant difference was found between observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$ level

*a Significance at the $p < .05$ level

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq-.9$ = a strong negative association.

*Note: The scale was interpreted in Milton, Janet Susan. *Statistical Methods In The Biological and Health Science*. Boston: WCB/McGraw-Hill, 1999

Table 70. Female Heads of Households in Tennessee Neighborhoods and the Rate of Natural Child Fatalities Reported (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics-Female Heads of Households					
A. Is there an association between the percent of female headed households in each Tennessee census tract and the rate of natural child fatalities?	Response to gender and heads of household question	Ordinal	Spearman Rho	rho= -.024 p= .017*a	****A significantly weak negative association at the p<.05 level
B. Were more natural child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of female headed households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of female headed households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	2.1*	Significantly more census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of female headed households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-.3	No significant difference in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of female headed households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-1.8	No significant difference in observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

*a) Significance at the $p < .05$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

Note: The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 71. Single Heads of Households in Tennessee Neighborhoods and the Rate of Natural Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics- Single heads of households					
A. Is there an association between the percentage of single heads of households in each Tennessee census tract and the rate of natural child fatalities?	Response to heads of household		Spearman Rho	rho= -.009 p= .381	***No significant association was found
B. Were more natural child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of single heads of households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of single heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	1.1	No significant difference in observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of single heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	.1	No significant difference in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of single heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	-1.2	No significant difference in observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

Note: The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 72. Spanish/Hispanic/Latino Heads of Households in Tennessee Neighborhoods and the Rate Natural Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics- Spanish/Hispanic/Latino Heads of Households					
A. Is there an association between the amount of Spanish/Hispanic/Latino Heads of Households in each Tennessee census tract and the rate of natural child fatalities?	Spanish/ Hispanic/ Latino		Spearman Rho	rho=.011 p=.272	***No significant association was found
B. Were more natural child fatalities observed than expected in a census tract when tracts were ranked and grouped by the Spanish/Hispanic/Latino Heads of Households?		See groups listed below			
B-1. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-1.8	No significant difference in observed and expected census tracts with child fatalities
B-2. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	1.0	No significant difference in observed and expected census tracts with child fatalities
B-3. When ranked and grouped by the percent of Spanish/Hispanic/Latino heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	.9	No significant difference in observed and expected census tracts with child fatalities

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq +.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

***Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

Table 73. Non-white Heads of Households in Tennessee Neighborhoods and the Rate of Natural Child Fatalities (1996-2003)

Research Topics	Census Response	Type of Data	Statistical Test	Results	Outcome
1. Demographic Characteristics-Non-white Heads of Households					
A. Is there an association between the percent of Non-white heads of households in each Tennessee census tract and the rate of natural child fatalities?	Non-white		Spearman Rho	rho=.155 p=.000*	*** [†] A significantly weak positive association
B. Were more natural child fatalities observed than expected in a census tract when tracts were ranked and grouped by the amount of Non-white heads of households reported in each census tract?		See groups listed below			
B-1. When ranked and grouped by the percent of Non-white heads of households within the lowest 1/3 of Tennessee census tracts.	Lower 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-7.1**	Significantly less census tracts with child fatalities were observed than expected
B-2. When ranked and grouped by the percent of Non-white heads of households within the middle 1/3 of Tennessee census tracts.	Middle 33.3% of Tennessee census tracts	Ordinal	Adjusted Residual	-3.8**	Significantly less census tracts with child fatalities were observed than expected
B-3. When ranked and grouped by the percent of Non-white heads of households within the highest 1/3 of Tennessee census tracts.	Higher 33.4% of Tennessee census tracts	Ordinal	Adjusted Residual	10.8**	Significantly more census tracts with child fatalities were observed than expected

*Significance at the $p \leq .01$

** Adjusted residual of less than -2 or more than +2 is significant.

*** A Spearman rho (r_s) above 0 to $<+.5$ = a weak positive association; $\geq+.5$ to $<+.9$ = a moderate positive association; $\geq+.9$ = a strong positive association; and +1 is a perfect association. Below 0 to $<-.5$ = a weak negative association; $\geq-.5$ to $<-.9$ = a moderate negative association; $\geq+.9$ = a strong negative association; and -1 is a perfect association.

[†]**Note:** The scale was interpreted in Milton, Janet Susan. Statistical Methods In The Biological and Health Science. Boston: WCB/McGraw-Hill, 1999.

VITA

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