THE GEOGRAPHY OF DOMESTIC VIOLENCE:
ASSESSING REPORTED DOMESTIC VIOLENCE IN MISSOURI

A Thesis presented to the Faculty of the Graduate School
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Master of Arts

By
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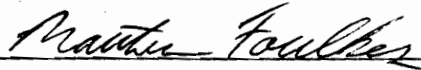
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THE GEOGRAPHY OF DOMESTIC VIOLENCE: ASSESSING REPORTED
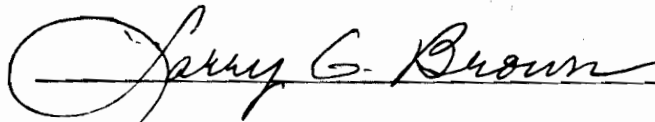DOMESTIC VIOLENCE IN MISSOURI

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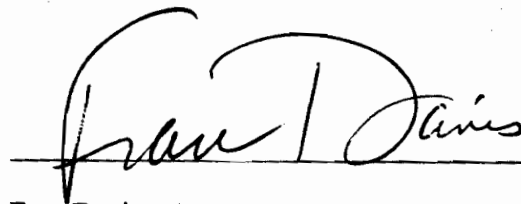a candidate for the degree of Master of Arts

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Chapter One

Introduction

The most conservative estimates state that 876,340 women are battered every year in the United States (Farmer, 2003) while some estimates put the number closer to four million (American Bar Association, 2001). Domestic violence has been called a "major public health problem" by former Secretary of Health and Human Services, Donna Shilala and Attorney General Janet Reno (Department of Justice, 1995). Domestic violence also disproportionately impacts women, with most estimates showing that women constitute 90-95% of all domestic violence victims (American Bar Association, 2001).

Despite the large impact domestic violence has on society, it has only been a part of the collective consciousness of society for the last twenty-five to thirty years. Awareness of domestic violence began to increase when former U.S. Surgeon General C. Everett Koop recognized domestic violence as a significant problem in the 1980's and focused research and funds to help alleviate the problem (Johnson and Elliot, 1997). Until recently, domestic violence data has been collected sporadically by police departments across the country indicating it was not as much a priority as collecting other types of crime data.

Despite the recognition of the domestic violence problem and the numerous studies that record its negative impacts to individuals and society as a whole, researchers still struggle to identify the true prevalence of the problem, specifically at the sub

national level. The chart below depicts various agencies attempts at estimating domestic

violence prevalence in the United States over the past ten years.

Table 1.1: National Estimates of Domestic Violence

Agency	U.S. Annual Estimate
American Bar Association (2001)	1 to 4 million
U.S. Department of Justice (2000)	1 million
Family Violence Prevention Fund (1994)	960,000-3 million
National Institute of Justice and Centers Disease Control and Prevention (2005)	1.5 Million

The most cited studies are the national surveys conducted by the Department of

Justice through its Bureau of Justice (BJS) Statistics and a cooperative effort between the

National Institute of Justice and the Centers for Disease Control. The BJS uses its survey

of all crime, the National Crime Victimization Survey (NCVS), to estimate domestic

violence prevalence whereas the cooperative effort between the NIJ and the CDC use a

survey tool called the National Violence Against Women (NVAW) Survey. While these

both provide invaluable information about the demographics, income, and other types of

information about domestic violence victims, these national samples do not provide local

information to help agencies better understand how domestic violence manifests itself in

their area. That kind of information is only available from police via statewide collection

agencies such as Highway Patrol statistical analysis centers, hospitals via state health

departments, and coalitions of shelter services.

The actual numbers of reported domestic violence occurrences are significantly

lower than the estimates. In 1998, the Department of Justice stated that approximately

half of all domestic violence cases are reported to police (Department of Justice, 1998). However, in 2000 that estimate was significantly revised by a different study of the Department of Justice to approximately a quarter of all domestic violence cases being reported to police (Tjaden, et al, 2000). Furthermore, according to health care research in domestic violence, between twenty-two and thirty-five percent of emergency room visits by women are a result of domestic violence (Acierno, 1997). While the variance is not as great as crime data, no one has been able to develop a reliable statistic to determine how many domestic violence victims of all that exist seek treatment in a hospital. Because estimates of the percentage of domestic violence incidents that are captured by police and health data vary, it is difficult to extrapolate national estimates of domestic violence incidence from reported incidences.

Furthermore, most data is examined at the national level and does not examine smaller geographies. Qualitative assessments of domestic violence in a specific place exist and data in one specific place has been examined but comparing domestic violence data at the county level or other similar geography does not. This thesis will examine that void in the domestic violence literature.

Additionally, no one has determined the degree of correlation that exists between the types of reported domestic violence. Research exists exploring why women report being battered to police and why they may not. Still other studies exist that examine why domestic violence victims seek out shelter services. Yet research has not proven whether the various means of reporting domestic violence complement or compete with one another. My purpose in this study is to assess the comparability of domestic violence

data in Missouri. This research was conducted to see if regional variability can be determined using reported domestic violence data.

Therefore, my work is focused by the following objectives.

1. The first objective is to analyze the three types of reported domestic violence data collected in Missouri (crime, Shelter, and Hospital data) and determine the strengths and weaknesses of each type.

2. The second objective is to compare the reported domestic violence data for each jurisdiction to the state looking for deviations from the norm. What counties in Missouri have particularly low and particularly high rates of reported domestic violence? Relative measures (z-scores) will be used to identify how counties compare with one another. These values will be mapped to help visualize any possible geographic patterns that may exist.

3. The third objective is to identify if the different data sources seem to be associated with one another. Pearson's correlation and scatterplots will be used to determine this.

4. The final objective is to look at statewide quantifiable domestic violence risk factors and compare that data to reported domestic violence data. This information will be depicted in maps and the Pearson's correlation coefficient will be used to test for an association between reported domestic violence data and the risk factors.

Chapter Two

Literature Review

Definition of Domestic Violence

The most important operational definition in this paper is the meaning of *domestic violence*. The term has come into the collective conscious of Americans over the past twenty years but it is important to elaborate on what the term actually means. For the purposes of this paper the author uses the definition provided by the Missouri Coalition Against Domestic Violence (MCADV). They define domestic violence as

> "a pattern of assaultive and/or coercive behaviors that adults or
> adolescents use against their current or former intimate partners. It occurs
> in intimate relationships where the perpetrator and the victim are currently
> or previously have been dating, living together, married, or divorced.
> They might have children in common, or not" (Missouri Coalition Against
> Domestic Violence, 2005).

This definition is also widely accepted among law enforcement agencies as acceptable except that the Missouri Uniform Crime Reports also include violence such as adolescent children abusing parents as domestic violence. Those types of cases were not included in this research. The UCR program defines domestic violence as

> "an act of violence upon a person with whom the actor is or has been
> involved in an intimate relationship. Domestic violence also includes any
> other crime against a person or any municipal ordinance violation against
> a person when used as a method of coercion, control, punishment,
> intimidation, or revenge directed against a person with whom the actor is
> or has been involved in an intimate relationship."

Emotional abuse is not captured using either of these definitions.

Estimates of Domestic Violence

Two large sources of national domestic violence information are the National Crime Victimization Survey (NCVS), and the National Violence Against Women Survey (NVAW), both administered by the Department of Justice, Bureau of Justice Statistics. As each of their names indicates, these data sources are done by random phone survey and serve as the foundation for many domestic violence studies. Offices around the country that report domestic violence prevalence often use statistics from these reports to inform legislative bodies, governmental agencies, and the general public about the pervasiveness of domestic violence in the country.

Other surveys conducted by social scientists have also been conducted to better assess domestic violence. Many have relied on the Conflict Tactics Scale, developed by Straus in 1979, and its predecessors, in an attempt to depict the nature and prevalence of domestic violence. However, domestic violence was not the sole issue being analyzed by this measurement tool. The Conflict Tactics Scale was designed as a measure to explore intrafamily conflict, not necessarily violent conflict. Prior to 1998 this scale was the most widely used and cited quantitative measures of victimization in North American intimate heterosexual relationships (DeKeseredy and Schwartz, 1998). While surveys that relied on this measurement tool have been helpful, these too do not fully help one understand domestic violence. Furthermore, DeKeseredy and Schwartz assert that these scales do not capture all domestic violence cases because of the questions asked in it and the fact that many victims will not come forward and report an instance of domestic violence.

While these surveys are useful in trying to understand domestic violence there are several problems with them when one wants to better estimate domestic

violence at a more local scale. First, both the NCVS and the NVAW surveys focus on the national level leaving smaller geographies out. Second, the NCVS looks at all crime in the country, not just domestic violence against women. Researchers have also found that estimates regarding domestic violence prevalence are seriously shaped by the methodology used (Ellsberg et al, 2001). Crime, health, and other surveys such as the National Crime Victimization Survey (NCVS) that do not solely attempt to capture domestic violence occurrences ostensibly do an inconsistent job in depicting the scope of domestic violence. However, the NVAW looks specifically at violence against women and domestic violence is a large component of that nationally. Third, both surveys fail to take into account the historic regional variation in defining what an incidence of domestic violence is. The NVAW survey was designed to address the fact that the NCVS did not adequately gather the data the Bureau of Justice Statistics wanted. While the NVAW survey does provide greater detail about domestic violence than the NCVS, it still lacks the geographic specificity needed to have a powerful impact on understanding domestic violence locally.

The Department of Justice even allows that their studies, while useful, do not fully provide an adequate picture of domestic violence at the local level. Their 1996 report on Domestic and Sexual Violence Data Collection details the need for crime, health, and social service data to be integrated in order to provide statistics that can be used at smaller geographies. Integrating the data would also allow national level researchers the ability to compare survey results with raw numbers recorded by police, hospital staff, and social service staff.

In contrast to survey data, agencies such as hospitals, police, and shelters collect data that is reported to them through the course of their day to day operations. This is different than the survey data collected by a random sample of the U.S. Remembering the distinction between survey data and reported data is important throughout this thesis.

Domestic Violence Risk Factors

When one thinks of domestic violence, images of poverty, drug abuse, and other societal maladies are often conjured up. Portrayed in the popular media through television shows like COPS and reinforced in the lexicon of American culture with terms like "wife beater" in reference to disheveled tank tops, images of poverty and domestic violence ostensibly connect. Reported instances of domestic violence support these images. Domestic violence in western societies tends to be reported in greater numbers by the disadvantaged members of society (DiBartolo, 2001; Benson et al, 2004). Poverty, unemployment, and violent histories correlate with high rates of reported domestic violence (DiBartolo, 2001; Tolman and Raphael, 2000). Women in poverty who have been abused in the past are more likely to report their abuse to police, hospital staff, and go to victims' shelters more than women with economic resources. Though women in poverty report their abuse more often, wealthy women may experience domestic violence at similar rates.

Race has frequently been associated with domestic violence. Since 1980 the National Family Violence Survey (NFVS) has revealed higher rates of domestic violence among African-Americans than the white population. In fact married African American women were 2.36 times as likely as married white women to experience severe partner

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violence according to Hampton and Gelles (1994). Greenfield et al (1998) found more recently that African American women were more likely to experience intimate partner violence than white women.

While these studies and others for the past two decades reveal that African American women experience higher rates of domestic violence than their white counterparts, these numbers do not accurately capture the ecological context surrounding the violence. Benson et al (2004) suggests that the ecological context in which African Americans and whites reside contributes to the disparity in numbers. It is the contention of Benson et al (2004) that the disparity between white and black domestic violence numbers has more to do with the fact that more blacks live in poverty and communities with fewer social constraints than do whites. Benson's research provides further evidence that in the realm of *reported* domestic violence, community context is an important consideration in assessing domestic violence. According to Benson et al (2004), when women in similar living and financial situations (i.e. similar ecological contexts) were compared, African-American women did not seem to report domestic violence any more than their white counter parts.

While race can be ruled out as a risk factor for domestic violence, according to the Centers for Disease Control and other researchers, there are multiple risk factors associated with perpetrating domestic violence that can be grouped into three categories; individual risk factors, community risk factors, and relationship risk factors. The categories and the associated risk factors are compiled as follows (table 2.1).

Table 2.1: Risk Factors for Domestic Violence

Individual Factors for Perpetrating IPV	Relationship Factors for Perpetrating IPV	Community Factors for Perpetrating IPV
Young age	Marital conflict	Poverty
Low self-esteem	Marital instability	Low social capital
Low income	Male dominance in the family	Factors associated with poverty such as overcrowding, hopelessness, stress, frustration
Low academic achievement	Poor family functioning	
Involvement in aggressive or delinquent behavior as a youth	Emotional dependence and insecurity	Weak sanctions against domestic violence
Alcohol use	Belief in strict gender roles	Racial category (African-Americans report domestic violence more than whites)
Drug use	Desire for power and control in relationships	
Witnessing or experiencing violence as a child	Exhibiting anger and hostility toward a partner	
Lack of social networks and social isolation		
Unemployment		

Table based on Black et al. 1999; Harway and O'Neil 1999; Heise and Garcia-Moreno 2002; Kantor and Jasinski 1998; Counts, Brown and Campbell 1992; Benson et al., 2004; Centers for Disease Control, 2005.

The factors listed above should not be interpreted to indicate that all of these factors are always associated with domestic violence. The factors can occur without domestic violence and domestic violence can occur absent of any of these factors. Also, some research has shown that men with high self-esteem batter (Prince and Arias, 1994). Statistically speaking however, reported domestic violence tends to correlate with these factors. The July 2000 report published by the National Institutes of Justice using National Violence Against Women Survey data depicts this phenomenon. It specifies

that low education levels, low income, prior abuse history, and unemployment all correlated with domestic violence.

Sub-National Sources of Domestic Violence

In many states, including Missouri, three separate bodies collect domestic violence data. In Missouri, the State Highway Patrol's Statistical Analysis Center collects domestic violence crime data from all police departments in the state. Hospital staff record domestic violence cases reported to them by the victim to the State Department of Health and Senior Services. And, shelters and domestic violence agencies across the state report how many domestic violence victims they serve to the Missouri Coalition Against Domestic Violence (MCADV) by counting the number of bednights shelters provide. These three groups all collect data from across the state, using different methods and tactics but each require that domestic violence be reported into some form of a central repository.

Reported domestic violence data like so much demographic data is fraught with potential problems. Domestic violence data is some of the most difficult to track for it is gathered by a variety of different agencies each with their own purposes in mind. Police, doctors, and social workers all report domestic violence under a different framework. In some areas and states any domestic violence victim that comes to an emergency room has to be reported to the local police. This has shown to be a burdensome process and not necessarily beneficial to the domestic violence victim (Rodriguez et al, 2001). Frequently primary care physicians and their assistants are not aware of domestic violence as a major health problem and reporting of domestic violence in this context is

consequently poor (Johnson et al, 1997). It has been documented that physicians may not even know how to collect and accurately report domestic violence cases (Johnson et al, 2000). Using police and restraining order data in regards to domestic violence has frequently been used as the most reliable information but this too has been shown to not fully shed light on domestic violence prevalence (Centers for Disease Control, 2000). Any research on domestic violence, particularly research that provides a fresh look at the problem, needs to be fully aware of the issues concerning data reliability and what biases exist by using different sources.   Ultimately, gathering data from all sources will make the analysis more meaningful (Missouri Uniform Crime Reporting Instruction Manual, Revision Number 3, 2004).

In 1996 the U.S. Department of Justice and the Bureau of Justice Statistics analyzed how states and the federal government collected and reported domestic violence. They found that 35 states collected domestic violence data in some form. They also found that while each state collected domestic violence data, there was a great degree of variation in what kinds of information was collected, who collected it, and how reliable it was. A survey was conducted of states in which 47 responded. In that survey they found the following information.

Table 2.2: States with Non-UCR Criminal Justice Data Bases for Domestic Violence

Data Source	Number of States (percent)
Protection order registries	10 (21%)
Protection order issued	11 (23%)
Community corrections	6 (13%)
Corrections	7 (15%)
State criminal history repository	14 (30%)
Civil/criminal courts	13 (28%)
Special data bases or flagging	9 (19%)

Adapted from *Domestic and Sexual Violence Data Collection: A Report to Congress under the Violence Against Women Act, 1996*

Table 2.3: States with Noncriminal or Civil Data Bases for Domestic Violence

Data Source	Number of States (percent)
Child protection services	8 (17%)
Health care providers	5 (11%)
Higher education institutions	3 (6%)
Victim services providers	18 (38%)

Adapted from *Domestic and Sexual Violence Data Collection: A Report to Congress under the Violence Against Women Act, 1996*

Some states collected data in multiple ways while other states did not collect any domestic violence data. The data was scattered between agencies causing instances of over reporting of some cases and under reporting in other cases. Having disparate and unreliable data makes it very hard to use the data for more than very coarse broad geographic patterns. By improving data collection, one might be better able to look at domestic violence data more locally, thus be better able to direct resources to combat the domestic violence problem.

The 1996 Department of Justice and Bureau of Justice Statistics Report was the first of its kind to look at what could be done to better capture domestic violence data across traditional departmental boundaries so police, health care workers, and social service agencies would be better able to use data to better serve the broader needs of the

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community. Nationally this report determined that vast improvements could be made in domestic violence reporting. Consistency across states in the operational definition of domestic violence, understanding the need to gather data from multiple source agencies, and improving data collection methods were all mentioned as important enhancements in the report.

Under Reporting of Domestic Violence

Despite these three types of reporting, a major problem in domestic violence research is the underreporting of domestic violence. According to DeKeseredy and Schwartz (1998) an unknown amount of underreporting occurs in all records of domestic violence. The reluctance to report a case of domestic violence can be attributed to factors such as privacy concerns, fear of reprisal, sympathy for the offender, and police leniency (Felson et al, 2002).

Bachman and Saltzman (1995) assert that underreporting is widely prevalent in instances of violence against women making it extremely difficult for law enforcement, researchers, and others to accurately capture the extent and nature of the problem. Reporting mechanisms such as the National Crime Victimization Survey (NCVS) have undergone changes to attempt to better capture victims' responses and get a better gauge of the violence problem with some limited success. But, overcoming the private nature of the act, the perceived stigma of being battered, and the hopelessness that little help will result from reporting the instance, combine to make underreporting a chronic reality of studying all types of violence against women. Furthermore, Bachman and Saltzman (1995) state that in the broad category of violence against women, the closer a victim is

to her assaulter, the less likely she is to report the crime. For instance, a woman will more likely report a casual friend who raped her than she would her husband or long time boyfriend. Because domestic violence often consists of violence committed against an intimate, domestic violence data reporting becomes harder to gather than other types of violence against women such as sexual assault. Though sexual assault and domestic violence share the private nature of the attack, domestic violence frequently has other considerations such as financial relationships and commitments not found in a random or near random sexual assault.

Researchers (Felson et al, 2002) also believe that the decision to report a domestic violence incidence depends on the severity and location of the event. If a domestic assault happens in the home, that space is often considered very personal by the victim and thus the violation is deemed greater than if the assault were some other place (car, other house, etc.). Therefore, Felson et al (2002) believes violence in the home may be reported more often than if violence occurs some place else.

Many researchers have demonstrated that women are more likely to report domestic violence to certain agencies over others. Rand (1997) found that domestic violence victims seeking emergency room treatment were four times higher than estimates of domestic violence that came to the attention of law enforcement. Broad assertions about domestic violence based on numbers such as Rand proposes should be avoided. All agencies are impacted by underreporting. Researchers have disagreed on how much domestic violence goes underreported, but widespread agreement exists on the point that many instances of domestic violence go unreported to police, health workers, and social workers. Rodriguez (2001) states that women are often not interested in

reporting their domestic violence occurrence to police and choose to go directly to the

emergency room and avoid police contact to remain anonymous. They often seek refuge

in emergency rooms because the act goes unreported to the state health department unless

the victim herself decides to file a report with the hospital that in turn makes a report to

the Department of Health and Senior Services. Rodriguez contends that by requiring

reporting of domestic violence cases to the police or state agencies by emergency room

physicians, battered women will not seek the medical care they require for fear of

retribution by their abuser. In circumstances such as this instances of domestic violence

are going unreported to police but being captured by hospitals, unbeknownst to state

health offices. Alternatively, women may call the police to respond to a domestic

violence incidence but refuse medical care even if the police suggest it when they arrive

on the scene. The police capture the incidence of domestic violence, but the health

agency does not. Similar patterns can be found in regards to domestic violence victims

seeking refuge in a shelter, but her case never being reported to the police or health

agency. All of this makes it hard to accurately assess domestic violence, particularly at

smaller geographies.   Any case of domestic violence that goes unreported makes it

harder for law enforcement, health workers, and social workers to gauge the scope of the

problem and adequately respond. Generalizations can be made, but specifics are harder

to arrive at when looking at these three different types of data.

Local Variations in Domestic Violence

        With improved data the opportunity to focus domestic violence resources in

certain areas of a state becomes possible. Currently, domestic violence estimates exist

only at national levels even though reported data is available at smaller geographies such as counties, police jurisdictions, and hospital service areas. National and State agencies supply domestic violence numbers through their literature and many state police agencies and health agencies supply data at smaller geography levels, but there is great suspicion on the reliability of that local data because of the inconsistencies in data collection. Some people have attempted to look at domestic violence data in smaller geographies than state and national levels such as Donnelly (2000). The previous work in this vein has been cursory in its approach to domestic violence and has proven to be limited in its scope (Lakeman, 2000; Donnelly, 2000).

As evidenced by the creation of the Atlas of Crime (2000) a growing number of law enforcement agencies and others interested in crime have been using GIS as a primary tool to help curb incidences of crime as well as better understand the spatial components of domestic violence (Turnbull et al, 2000). The United States Department of Justice routinely issues grants aimed at geographic analysis (specifically GIS) of crime and particularly violence against women (Crime Mapping, 2005). However, when taken into the context that domestic violence data collection methods vary greatly across the United States, the mapping of the phenomenon becomes problematic. The available technology may exist to easily map domestic violence data, but as the old adage says "garbage in equals garbage out." If the data does not accurately capture the phenomenon, why map it?

Donnelly (2000) provides a useful series of maps in her Atlas of Crime and an associated article that makes it one of the few works where domestic violence is looked upon spatially. The series of maps used put reported domestic violence in context for the

state of Georgia but does little in true analysis. This work's usefulness lies in its ability to establish a foundation from which to launch further analysis and it is in this vein where Donnelly's work will be most helpful. Donnely mapped domestic violence data at the state level but little analysis was offered. The raw crime data was mapped but in many ways simply mapping the raw data reported to police without analysis can lead the casual reader to false conclusions. For instance, if homicides are mapped by county, the layperson can look at that map and have confidence that some counties have higher homicide rates than others. Homicide is a crime that is easily noticed and usually reported. Mapping the raw numbers police record about domestic violence is less reliable than homicide numbers due to the complexity of domestic violence. Therefore, Donnelly's maps do not adequately depict the intricacies of domestic violence. This work proposes to better depict the nature of domestic violence statewide.

Another source that examines domestic violence geographically is DiBartolo's (2001) study in Australia. DiBartolo is one of the first author's who attempted to look at domestic violence crime data spatially. The most significant outcome of his research is his acknowledgement that there are significant geographic patterns associated with domestic violence, at least in Brisbane Australia, the site of his work. His research, demonstrating that domestic violence has a geographic pattern and can be correlated with other socio-economic variables, serves as a foundation for this research. Similarly DiBartolo's work has a public policy angle. The potential for significant reform or shift in policy related to how domestic violence funds are spent and allocated exists throughout both this research and DiBartolo's due in significant part to the inclusion of spatial analysis.

The Texas Council on Family Violence and Center for Social Work Research at the University of Texas at Austin published a Texas Domestic Violence Data Book in May, 1998. This resource provided a demographic breakdown and assessment of domestic violence for every county in Texas. This resource includes data from police agencies, and data from surveys of shelter providers. It provides a risk assessment for women based on the American Medical Associations estimate that "one in four women is likely to be abused by a partner in her lifetime" (Glazer, 1993). Taking a national statistic such as the one posited by Glazer and applying it locally may or may not be an accurate assessment of domestic violence risk. Other researchers would argue that one has to include domestic violence risk factors in the equation to assess what population is at risk in a given county (Centers for Disease Control, 2005). An overview such as this provides helpful information, but it does not compare the counties to one another and it does not include domestic violence data recorded at hospitals. However, data was collected at the county level for shelters. The data in the book was aggregated into one place, but no assessment of the data was made. The research put forth in the coming chapters attempts to make a more detailed assessment.

Missouri and Domestic Violence

In 1996 Missouri started to use the Missouri Crime Index Report Form to collect data from police agencies. Missouri only reported criminal data, and the data was supplied voluntarily by local agencies. By only collecting data at that level in 1996 one would find it difficult to make any conclusions about domestic violence in Missouri other than very generally. In 2001, Missouri instituted mandatory Uniform Crime Reporting

(UCR) on a statewide basis. Every law enforcement agency in the State has since been required to report crime data monthly to the Missouri State Highway Patrol (MSHP) since that time. Domestic violence data has been part of that collection since 2001 making Missouri a relative late comer in comparison to other states fully adopting the Uniform Crime Reporting program. Twenty-five states have moved towards the "next generation" of crime reporting, the National Incident Based Reporting System (NIBRS). Missouri is not yet one of those states.

Missouri Governor Bob Holden signed Executive Order 1-13 on August 10, 2001 initiating the development of the Missouri Domestic Violence Task Force for the purpose of finding "solutions for domestic violence in Missouri" (see Appendix for full text of the Executive Order). Governor Holden pointed to the turning away of 5,000 domestic violence victims by shelters in Missouri in 2000 as just one of the reasons for the development of the task force. He also pointed to the state's responsibility to provide its citizens with safe communities and domestic violence is a direct violation of that safety.

This research is conducted in the spirit of Governor Holden's Executive Order. While there is not a direct connection such as funding between Executive Order 1-13 and this work, the goals and premises are similar. Missouri, like all other states in the United States has a problem with domestic violence. According to Executive Order 1-13 4,500 women and 5,100 children were placed in emergency shelters in 2001 as a direct result of domestic violence. The Missouri Women's Council estimates that domestic violence shelters provide approximately 184,000 bednights every year in Missouri. Missouri Coalition Against Domestic Violence (MCADV) agencies answered over 58,000 emergency calls on their domestic violence hotline in 2000. These statistics and others

point very clearly to the reason for Governor Holden's Executive Order and the relevance of this research to public policy in Missouri.

Originally Executive Order 1-13 provided for the domestic task violence task force to exist for one year. At the culmination of the task forces' first year the Governor extended the task forces' life indefinitely because of the remaining work still needed. The work identified statewide statistics on domestic violence but did not refine those numbers regionally. Resources can be better allocated and delivery of services can be administered more quickly with better regional data. For instance maybe more resources need to be delivered to certain areas of the state whereas other areas are less needy of new resources.

The Governor's office is not the only statewide body that has identified domestic violence as a problem. The state legislature has also taken up the problem of domestic violence with increased attention paid to improving data collection on domestic violence (Aguierre, 2000). Specifically, the legislature in 2000 was interested in designing methods that would encourage domestic violence victims to report instances to appropriate agencies so prosecution of offenders could be enhanced.

The research laid out in this work will contribute to this agenda by looking at available domestic violence data and make suggestions for improving data collection for future comparisons and analyses. Ultimately this work can contribute to shaping policy that will help curb domestic violence.

The following chapters detail how this work will contribute to helping domestic violence victims in Missouri by examining how the sub-state domestic violence data sources correlate, how the data sources correlate with domestic violence risk factors, and

by making suggestions for what a domestic violence aggregate data index might look like.

Chapter Three

Methodology

This chapter will explore the data sources, materials, methods, and analysis tools used to conduct this research. First, the study site will be discussed. Second, domestic violence is defined. Third, the various data sources analyzed will be described. Fourth, a proposed method for better estimating domestic violence at a local level is provided.

Study Site

The data used in this research will all be concerned with the state of Missouri. This almost 70,000 square mile state was chosen as the study site for several reasons. The original ideas for this research were developed in conjunction with people who had specific knowledge about domestic violence in Missouri and were able to inform the author about resources necessary to start investigating the topic. Missouri, with its two major national urban centers in Kansas City and St. Louis, as well as a large rural population seemed like a logical place to explore domestic violence reporting. In terms of race, income levels, educational attainment, and other demographic and economic characteristics Missouri "looks like" the United States (see table 3.1). It is not as homogenous as some states and is fairly representative of the country as a whole potentially making this research more generally applicable to other states.

Table 3.1: Demographic Profile of US and Missouri in 2003

Characteristic	Missouri	USA
Population, 2003 estimate	5,704,484	290,809,777
Population, percent change, April 1, 2000 to July 1, 2003	1.90%	3.30%
Population, 2000	5,595,211	281,421,906
Population, percent change, 1990 to 2000	9.30%	13.10%
Persons under 5 years old, percent, 2000	6.60%	6.80%
Persons under 18 years old, percent, 2000	25.50%	25.70%
Persons 65 years old and over, percent, 2000	13.50%	12.40%
Female persons, percent, 2000	51.40%	50.90%
White persons, percent, 2000	84.90%	75.10%
Black or African American persons, percent, 2000	11.20%	12.30%
American Indian and Alaska Native persons, percent, 2000	0.40%	0.90%
Asian persons, percent, 2000	1.10%	3.60%
Native Hawaiian and Other Pacific Islander, percent, 2000	0.10%	0.10%
Persons reporting some other race, percent, 2000	0.80%	5.50%
Persons reporting two or more races, percent, 2000	1.50%	2.40%
Persons of Hispanic or Latino origin, percent, 2000	2.10%	12.50%
White persons, not of Hispanic/Latino origin, percent, 2000	83.80%	69.10%
Living in same house in 1995 and 2000', pct age 5+, 2000	53.60%	54.10%
Foreign born persons, percent, 2000	2.70%	11.10%
Language other than English spoken at home, pct age 5+, 2000	5.10%	17.90%
High school graduates, percent of persons age 25+, 2000	81.30%	80.40%
Bachelor's degree or higher, pct of persons age 25+, 2000	21.60%	24.40%
Persons with a disability, age 5+, 2000	973,637	49,746,248
Homeownership rate, 2000	70.30%	66.20%
Persons per household, 2000	2.48	2.59
Median household income, 1999	$37,934	$41,994
Per capita money income, 1999	$19,936	$21,587
Persons below poverty, percent, 1999	11.70%	12.40%

U.S. Census Bureau, Census 2000

The population center of the United States lies in Missouri (Getis et al, 2001) and the state has areas of intense growth in the southwestern part of the state while also having areas of depopulation in the north. Combining Missouri's central location in the United States with its demographic characteristics and regional traits makes it emblematic of the rest of the United States. Missouri's demographic diversity also potentially impacts how the reporting of domestic violence is done. For instance, an assumption of this research is that a difference exists between urban and rural areas in reporting domestic violence. Therefore, Missouri acts as a nice model in which to conduct an evaluation of domestic violence reporting.

<u>Data Sources</u>

The data required for this study comes from multiple agencies and organizations. The most readily available data source being analyzed in this research comes from the Department of Public Safety, Missouri Highway Patrol (MHP) – Uniform Crime Reporting (UCR) program. The UCR program was developed upon the model posited by the Federal Bureau of Investigation (FBI) which is in use in all fifty US states. The UCR program was developed in order to prevent crime through the dissemination of crime information, and serves as a social barometer – a "state of the state." (UCR Manual from the Missouri Highway Patrol, 2002). The Missouri UCR was officially recognized in Missouri with the passing of House Bill 1677 on July 11, 2000 and had additions with the passing of Missouri Revised Statutes Chapter 43 Section 43.505 on August 28, 2001. Missouri was the 49th state in the United States to fully adopt this federal program.

Under this law the Department of Public Safety and the Missouri Highway Patrol were "designated as the central repository for the collection, maintenance, analysis and reporting of crime incident activity generated by law enforcement activity in the state" The numbers generated by the UCR program are used to measure crime prevention, intervention, and enforcement over time (UCR Manual from the Missouri Highway Patrol, 2002). Furthermore, the statistics from the UCR program are released to the public in order to supply some transparency between law enforcement and the wider citizenry. The creation of the World Wide Web and the pervasiveness of personal computers have made it even easier for the general public and researchers to look at this data.

Prior to House Bill 1677 domestic violence data was only collected when there was a domestic violence related death. This lead to large holes in crime data as evidenced by the over 36,000 incidences of domestic violence counted in Missouri in the MoUCR program's first year. Missouri, having only recently adopted the UCR program in 2001, is ripe for early evaluation in how the program is manifesting itself throughout the state. Using the newly acquired data for evaluating domestic violence reporting will potentially allow the program administrators to make possible changes thus creating better information with which to work in the future.

However, this measurement tool is only as good as the reporting that goes into it. If there are large scale geographic disparities in the reporting of domestic violence, or any other crime for that matter, those areas need to be identified in order to better serve the needs of Missouri and the UCR program. It is that intersection between the goals of the UCR and the actual UCR statistics where this research lies. Without reliable data from

the onset, research regarding the "level of criminality within all segments of society" is useless. The Missouri Uniform Crime Report Manual (2001) states that UCR data, while very useful, does not adequately capture the actual numbers of domestic violence cases and needs to be integrated with other forms of data to fully depict the problem of domestic violence.

The Missouri Department of Health and Senior Services (DHSS) also collect domestic violence data. The DHSS reports any instance of domestic violence recorded in every Missouri hospital. Generally the victim comes to the emergency room and is treated by a physician who identifies that the woman was battered. An important element of this data is that the victim's case of domestic violence is not attributed to the county where the hospital is, rather it is attributed to the victim's home county.   Particularly in rural places in the state, domestic violence victims may have to go to a hospital outside of their county due to the fact that some counties may not have a hospital. Also, it may be closer to go to a hospital just over the county line than travel to the far side of the county in some instances.

This data is a vital element to the study of domestic violence for it will often capture the most severe instances. A trip to the emergency room means that the victim was battered beyond "just" band-aids and aspirin. Often stitches, splints, casts, and even surgery are required in these cases of battering. The Family Violence Prevention Fund (1994) states that as many as thirty percent of women who present themselves to an emergency room are there due to battering.

Similar to the UCR program, the DHSS data is easily available online along with many other types of heath data. This data is used by citizens interested in understanding

more about their community similar to the way the UCR data is meant to be used. With sound information such as DHSS data, people are better equipped to make sound decisions for themselves and their families. However, UCR and DHSS data may not fully provide the community a complete picture of the domestic violence phenomenon.

Domestic violence shelters gather another type of domestic violence incidence that police and hospitals may not get. According to Coulter et al (1999) almost half of the persons in a battered women's shelter went there without calling the police. Shelters are therefore capturing a significant number of domestic violence incidences that Uniform Crime Reporting and hospitals do not collect. With about 50% of the cases in a shelter never being reported to the police an obvious problem emerges in relying too heavily on UCR data. Combining the methods of the UCR program with the capturing of other types of domestic violence data provides a better picture of domestic violence rates at the county level. Indeed the Department of Justice (1996) believes health and social service data must be used in conjunction with crime data to better understand domestic violence. However, they do not offer a methodology for combining the data.

The police gather data from women who were willing to call the police regarding their case of domestic violence. The DHSS collects data from women that were badly injured and willing to seek medical attention and run the risk of reporting their instance of domestic violence. Shelters have data about women who have been emotionally abused, victimized multiple times (i.e. a shelter sees a woman 6 times before she leaves her abuser), and from women who were reluctant to contact the authorities. It is proposed here that combining these disparate data sources is the only way to fully understand domestic violence at a level smaller than nationwide.

In order to determine a method for better understanding domestic violence using the three types of data available, a discussion of the strengths' and weaknesses of each type of data collected is necessary. How does the method in which each agency collect data impact underreporting? How comfortable are women who have been abused reporting their instances of domestic violence to the police, social service agencies, and hospital staff? These types of questions and an analysis of the advantages and disadvantages of each data type are forthcoming in chapters 4 and 5.

While these agencies collect domestic violence data, they will not capture all instances. Many cases of domestic violence will never be reported because the instance was not severe enough to result in a call to police or a trip to the hospital or shelter. A slap or a punch may not result in a report, but it is still an instance of domestic violence.

Analysis: Information from Reported Domestic Violence Data

The final section of this methodology chapter explains how Missouri domestic violence data was analyzed in this thesis. Each method proposed here assumes that one can rank and identify counties based on their domestic violence reports.

One way to compare counties domestic violence reporting rates is to calculate a z-score for every county domestic violence rate and for every data type. Each data source was mapped using z-scores as a relative measure to better understand how county reports of domestic violence compared to one another. Using the z-score measurement also allows for ready identification of counties that have markedly different rates of domestic violence reporting. The z-score is calculated using the following equation where Z

equals the standardized score, Xi equals the number of domestic violence cases in each

county , X equals the mean of the data, and s equals the standard deviation of the data.

$$z = \frac{X_i - \overline{X}}{s}$$

A z-score calculation is useful for understanding how one record relates to the other

records in the population. A county z-score of one indicates that the value of reported

domestic violence is one standard deviation higher than the mean.

Maps were drawn using ArcView 3.2 with the calculated z-score for every county

to provide a visualization of any potential geographic patterns that may exist. Each map

was drawn using a dichromatic color scheme with red showing high levels of reporting

and blue showing low levels of reporting. The natural breaks method was used to break

up the data into five enumeration units. While the color scheme and method are the same

in each map produced, caution must be taken to not directly compare each map because

the five classifications are not identical across each map.

Upon completion of the maps, z-scores were compared across data types using the

Pearson's correlation coefficient test. For instance, the UCR data county z-scores were

compared directly to the DHSS data county z-scores to test for any association between

the two. One might expect to see high UCR scores in a county correlate with high DHSS

scores in that same county. The Pearson's correlation was used to test that theory.

Pearson's correlation is designed to test the linear association of two data sources. While

other types of associations exists other than linear, it is hypothesized here that higher

UCR domestic violence scores would be linearly associated with higher domestic

violence scores reported in emergency room visits. Pearson's correlation (r) is calculated using the following equation.

$$r = \frac{\Sigma z_x z_y}{N}$$

The Pearson's correlation coefficient will help determine the degree of similarity or difference between the data types by county. This correlation allows for a quantitative method to determine the association between variables (Rogerson, 2001) and will be potentially critical for helping identify underreporting in Missouri. Pearson's correlation is the appropriate correlation test to use because the data are not ranked, are assumed to be linear, and assumed to be from normally distributed populations (McGrew and Monroe, 1993).   Scatter plots are created to visualize the relationships between the various scores. In analyzing these plots, counties that greatly deviate from the trendline will be the ones most paid attention to because they show areas where domestic violence reporting is happening differently between agencies.

One way to determine how well local domestic violence reports connect to where one might expect them is to identify places in the state demonstrating the risk factors known to be associated with domestic violence nationally (see literature review for more detailed discussion). As mentioned previously, many researchers have identified risk factors for domestic violence including poverty, age, drug abuse, educational attainment, and employment. This does not mean women with high incomes, high levels of education, and drug free do not experience domestic violence. Research has shown however, that domestic violence is *reported* more by women falling into those categories.

In order to identify Missouri counties containing these risk factors, data from the U.S. Census Bureau, Missouri Department of Economic Development (DED), and the

Missouri State Highway Patrol, Statistical Analysis Center (MSHP) was used. Table 3.2

illustrates what data was used from each source.

Table 3.2: Risk Factors Used and Sources of Data

U.S. Census Bureau (Census 2000)	Missouri Department of Economic Development (DED)	Missouri State Highway Patrol, Statistical Analysis Center (MSHP)
Poverty by county (18-35 years old)	Unemployment by county	Drug related arrests by county
Educational Attainment by county (18-35 years old)		

Z-scores were calculated and mapped for each data type. The z-scores were then

summed to develop an assessment of the county's domestic violence risk factors and a

map of those summed scores was created. This allows one to easily visualize the places

in the state ostensibly most susceptible to seeing elevated reports of domestic violence.

The combined z-score for each county in Missouri can also be correlated with the

UCR and DHSS reported domestic violence z-scores using the Pearson's correlation

coefficient. This test can help identify if a linear association exists between reported

domestic violence z-scores and the risk factor composite z-score. Do counties with

elevated risk factors also have elevated reports of domestic violence like one might

think? Pearson's correlation and scatterplots helped visualize the association (or lack

thereof).

Chapter Four

Results

Introduction

  This chapter explores domestic violence reporting in Missouri in three ways.

First, an overview of the different data types and how the data is collected is provided.

Advantages and disadvantages to each data collection method and type are described.

Secondly, a visualization of mapped domestic violence data is provided in order to

ascertain any possible geographic patterns or correlations between data types. Thirdly,

domestic violence risk factors are mapped using z-scores to rank counties and compared

to reported domestic violence z-scores at the county level. Correlation tests and scatter

plots are provided to further examine the relationship between the risk factors and types

of domestic violence data.

Data Overview, Advantages, and Disadvantages

  The first objective is to explore how the three primary types of domestic violence

data are collected and draw possible conclusions as to how each data source may be used

to better understand domestic violence locally. The three types of data collected in

Missouri regarding domestic violence are crime data gathered by individual police

agencies for their jurisdictions, Department of Health and Senior Services data gathered

from hospitals throughout the state, and shelter and social service agency data collected

by individual domestic violence shelters and service groups and then reported to the Missouri Coalition Against Domestic Violence (MCADV).

Crime data

The domestic violence data collected by police agencies around Missouri is reported to the Missouri State Highway Patrol as part of the Uniform Crime Reporting (UCR) Program mandated by the Federal Bureau of Investigation (FBI). This program exists nationwide so crime analysts and other social researchers have a set of data that is comparable from state to state, county to county, and jurisdiction to jurisdiction over time. One can view the data by state, county, local jurisdiction, and college area. This level of detail offers researchers many ways to compare places and their reported domestic violence rates. In the UCR program, domestic violence data is collected as a circumstance of an assault; i.e. a man beats his wife and gets arrested for it, he will be arrested for assault and that assault will be classified as a domestic violence assault as opposed to two people in bar that get into a fistfight and get arrested for assault.

Every law enforcement agency in the country follows the same practices, principles, and guidelines in how each domestic violence crime is documented and reported so a researcher has confidence in comparing crime data in one region to another. Without a program such as the UCR, variations in reported criminal activity in one place could not accurately be compared to another place for different law enforcement agencies might not document crimes the same way. This could potentially lead to false characterizations of one area as being more crime ridden than another. The UCR

program is a robust attempt at limiting that problem as much as practically feasible (Missouri UCR Program Manual, 2004).

Data collected through the UCR program is published to the Missouri State Highway Patrol website regularly allowing for easy access and temporal comparisons of crime data. One can also compare crime rates by county, jurisdiction, and city boundaries. The regulated nature of UCR data, and the geographic coverage it entails, makes it the most robust form of domestic violence data collected. The UCR program captures all incidents reported to law enforcement agencies. This includes arrests made but also includes incidents that may not have resulted in an arrest. Uniform crime reports depict every call a police officer gets if that call concerns a suspicion that a certain crime is occurring. For instance, an officer gets a radio call that a domestic violence act is occurring, that officer will respond but may not be able to make an arrest due to lack of evidence The Missouri UCR Program Manual (2004) puts it this way. "Law enforcement can only react and report on those crimes it becomes aware of – those developed through self-initiated investigations and those reported to them." If those self-initiated investigations or items reported turn out to be bogus or not enough information can be gathered the incidence is still reported. The Statistical Analysis Center of the Missouri Highway Patrol describes specifically what the numbers collected by the UCR program capture:

> "Domestic Violence incidents are reported whether or not an arrest is
> made and include any dispute arising between spouses, persons with
> children in common regardless of whether they reside together, persons
> related by blood, persons related by marriage, non married persons
> currently residing together, and non-married persons who have resided
> together in the past. Domestic violence incidents are reported when an
> officer believes a dispute crosses an abuse threshold as indicated by
> harassment, stalking, coercion, assault, sexual assault, battery, or unlawful

imprisonment. Domestic violence incidents are reported by the highest ranked relationship between victim and offender, regardless of the number of persons or multiple relationships present during an incident."
                                    -Missouri Highway Patrol, Statistical Analysis Center (2005)

Acts of domestic violence garner the special attention of Missouri law enforcement for they go beyond the national requirements of the UCR program. Missouri law enforcement has to report if an incident of suicide pertains to domestic violence. Furthermore, the relationship between the victim and abuser is also recorded by the responding officer (Missouri UCR Program Manual, 2004).

While UCR data has the assets mentioned above – regulated, wide geographic coverage, easily accessible, designed to be compared spatially and temporally – one key disadvantage is the data is limited to criminal behavior and does not capture domestic violence instances not reported to law enforcement. Some domestic violence prevention advocacy groups state that many domestic violence instances never come to the attention of law enforcement (Rodriguez et al, 2001; Rodriguez, 2000; Stapleton, 1997). Indeed the Missouri UCR Program Manual (2004) acknowledges this, cautioning users of UCR data, particularly in the case of domestic violence, to be wary of drawing too many inferences. UCR data is only part of the solution to understanding domestic violence. The manual states the following:

> Health care providers (emergency room staffs), social service agency representatives, domestic violence shelters and others who are directly exposed to domestic violence, especially the victims, must also be included in the reporting effort to help complete the picture. And, the victims themselves must be willing to come forward and report the crime.
>   -Missouri UCR Program Manual (2004)

Additionally, crime data captures the physical battery that is reported to police but it neglects to encapsulate instances of emotional domestic violence and instances where the victim may be afraid to contact the authorities.

Theoretically, the county data collected by the UCR program counts every police department in the state's statistics. In practice however, there may be some counties that do not fully capture the statistics. For instance, many small and rural jurisdictions in the state report that they do not have any instances of domestic violence reported to them. While this could be true, it is likely that some data is being missed either intentionally or unintentionally resulting in incomplete data. For example, police go through domestic and family violence training while attending the police academy in Missouri and most other states. However, the inclusion of domestic violence as part of the training curriculum has been included only in recent years. Older officers who have not taken part in continuing education programs regarding domestic violence may be less aware than their younger counterparts on how to deal with and report an instance of domestic violence. Although the data may be the best the state has to offer, this fact makes one have to be wary of assessments of this data.

Department of Health and Senior Services Data

Over the last decade there has been an increased emphasis on recognizing and capturing domestic violence instances in the public health setting. Often a domestic violence victim may not report her abuse to law enforcement but may require medical attention due to the extent of her injuries. Even if she does report her abuse to police they may encourage or require her to visit the emergency room or clinic to tend to her injuries.

Therefore, the emergency room becomes important as a place for documenting domestic violence instances. In Missouri, the Department of Health and Senior Services (DHSS) collects the data reported to hospitals regarding domestic violence.

DHSS captures domestic violence incidences that might go unreported if left solely to law enforcement and social service agencies such as shelters. DHSS collects data on some of the more severe and serious cases of physical domestic violence because these reports are a result of injuries that drove a woman to the emergency room for medical assistance. While this study makes no distinction as to the severity of a reported domestic violence incidence, one might assume that any incidence of domestic violence that requires an emergency room visit likely caused serious physical damage. DHSS also reports if the ER visit lead to overnight hospitalization, another physical indicator of the severity of the incidence. DHSS data has a degree of robustness because of these factors.

DHSS also reports the home county and state of the battered woman. This allows for a geographic coverage of the state to be created with the data. If the only piece of geographic data collected was the hospital location, a statewide spatial picture of health data would be hard to compare with UCR data because there is not a hospital in every county in Missouri.

Unlike UCR data, DHSS (hospital) data is not as regulated and uniform. Whereas UCR data is by design as standardized as possible, the data collected at hospitals is not. Different staffs at different hospitals maybe more proficient than others at recognizing, dealing with, and reporting domestic violence. Police agencies have controlled the variation in reporting by requiring a certain degree of training in the recognition and reporting of domestic violence.

Another weakness of DHSS data is that all reports to DHSS are a result of the victim reporting her case to hospital staff. Unless the victim goes through the procedures to report her case to hospital staff, the instance goes un-captured (Daniel, 2005). This level of reporting differs starkly from the UCR program where every instance the police are aware of gets recorded. Emergency room staff can have suspicions that a woman was abused, but those suspicions do not materialize into data unless the woman agrees to formally file her abuse case (Daniel, 2005).

Hospital data captures the physical battery that is reported to staff but it neglects to encapsulate the instances of emotional domestic violence and the instances of violence that do not warrant emergency room care. The only other institutions that gather that kind of information are shelters.

Domestic Violence Shelter Data

In Missouri, the Missouri Coalition Against Domestic Violence (MCADV) collects data from all the shelters and advocacy organizations in the state. MCADV started in 1980 and exists for the following four reasons according to their promotional material and website:

1. Education: MCADV educates the general public about domestic violence, trains professionals, and advocates public policy to alleviate and prevent domestic violence
2. Assistance: MCADV provides technical assistance, training, and support to program members and related communities of service providers
3. Alliance: MCADV provides opportunities for communication among those working in the movement to end violence against women and children
4. Research: MCADV researches the extent of domestic violence to more effectively reduce its impact and occurrence in the lives of Missouri's women and children
   -Missouri Coaltion Against Domestic Violence, 2005

One of the things the MCADV does to help further their mission is collect data from each shelter in the state regarding things such as number of bednights served to women, number of bednights served to children, the duration of their stay, and associated types of data. See the appendix for a copy of the report form individual shelter staff complete and submit to MCADV. This information is compiled into an internal database and the data is aggregated by region. The current set up of the database does not allow for easy exploration of the data. For instance, it is difficult to determine trends at an individual shelter because that data only exists on paper. For the purposes of this project, a years worth of data was manually input from every shelter in the state so a determination of how many people each shelter served over a year could be viewed. Furthermore, the data could then be analyzed for comparison to other types of domestic violence information.

Domestic violence shelters provide a window into information not captured by police or hospital staff. Battered women may choose to go to a shelter over calling the police or going to a hospital because of the anonymity and security a shelter offers. Shelters do not advertise their location in the phone book and try to remain as anonymous as possible in the community so as not to tip off abusers into where their partner (victim) may be staying. In many places in Missouri, if you call the police, the local paper will print your address and reason the police were called to your house. Many people may not desire that kind of attention let alone just having the police at their door. Shelters are also places that serve women who may not have been physically battered but have undergone extreme emotional duress as a result of their partner. Police and hospitals usually enter the equation due to some form of violence being involved. It is hard for the police to

arrest someone for yelling and the emergency room concentrates on physical issues not emotional. Yet, emotional duress is absolutely a symptom of domestic violence (Kantor, 1998).

Shelters also see many repeat victims. The average victim leaves her abuser seven times before she makes a complete break (Berlinger, 2001). Often those seven trips away from her abuser are to the local emergency shelter. Therefore, shelters may see victims that the police refer but they also see women who know where the shelters are and are familiar with the services they provide.

A major advantage to crime and hospital data is that it exists for every county in Missouri. Unfortunately, shelter data exists only for the 56 shelters in the state, many of which are congregated around the larger cities of the state, and does not include the county of residence for the victims they help protect. Only 47 of the 115 counties in Missouri have domestic violence shelters or services. Indeed many of the counties are clustered in the southern half of the state. Some battered women have purposely traveled out of state or to a shelter far away from their residence to escape their abuser and find more anonymity. While shelters capture a certain element of domestic violence, the data gathered is not easily comparable at smaller geographies.

There is a good reason why the county of residence of the domestic violence victim does not appear on the forms. Women seek shelters primarily for the security and anonymity they provide. Shelter staff are very reluctant to do anything that may jeopardize, or even be perceived as jeopardizing, the security and anonymity of domestic violence victims. Reporting the county residence of a victim can be perceived as endangering that.

No one way exists to best capture actual domestic violence cases. Police, emergency room staff, and shelter staff all collect useful data but in many ways the data operates in three separate spheres. The three data types, while related, capture different populations within the domestic violence victim community. Police gather incidences reported to them through 911 calls and their own investigations. They collect information on people willing to call police and/or people who have no other options. Emergency room staff captures the severe physically abusive cases. And, shelter staff collect information on women who repeatedly seek solace from their abuser and look for anonymity. A victim might interact with each agency throughout her abuse at different times, but each source is geared towards collecting data for their sphere of influence. Devising a method to integrate these data sources and populations might result in better tracking of domestic violence victims and better ways to serve victims and drop overall rates of domestic violence.

Spatial Distribution of Reported Domestic Violence and Correlations

The second objective of this research is to explore the spatial distribution of domestic violence in Missouri using the aforementioned three types of data available. The impetus for this research was social workers inquiring if reported domestic violence seemed to occur more in one area of the state over another. They had no way to gauge regions of the state except their own subjective assessments. Therefore, three maps were made depicting the spatial variability of domestic violence in Missouri based on UCR (police) data, DHSS (hospital) data, and shelter data. The three types of data cannot be compared directly but each map allows for a general visualization of each data's spatial

variation across the state and provides an initial examination that can lead to other explorations.

Z-scores were calculated and mapped for both the UCR and ER data. A z-score calculation is useful for understanding how one record relates to the other records in the population. A Z-score indicates how many standard deviations a value differs from the mean of all the values. Z-scores provide a way to rank data and make comparisons between the different types of data.

An interesting phenomenon becomes apparent looking at the z-scores of 2002 UCR data mapped in Missouri (see map 4.1). On first observation the UCR z-score map demonstrates no obvious spatial patterns linking domestic violence reporting with urban areas, rural areas, or suburban areas. In fact no geographic pattern emerges. Rather, a random pattern materializes. When the data is plotted in a histogram however (see figure 4.1), positive skewness of the data is evident. At 1.552, the positive skewness of the data is pronounced, particularly when the standard error is only .226. As a general rule, any skewness value double its standard error is considered to have a significant departure from symmetry with the mean. In this case the skewness value is over 6.8 times the standard error.

The skewness in UCR data results from Taney, Crawford, Morgan, Warren, Clinton and Ray County significantly pulling the normal curve to the right. Ray County particularly draws the skewness to the right with a rate almost .01 higher than the next highest county. The UCR map identifies these counties that have very high reports of domestic violence to police in comparison to other counties in Missouri (see map 4.1).

Std. Dev = .00
Mean = .0058
N = 115.00
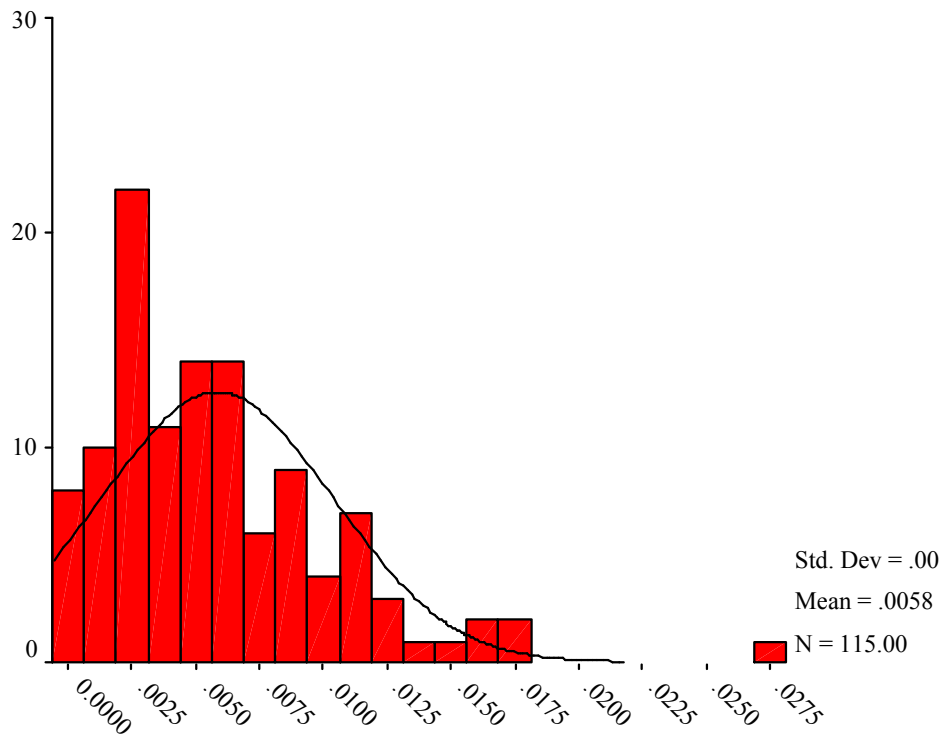
Uniform Crime Report Data

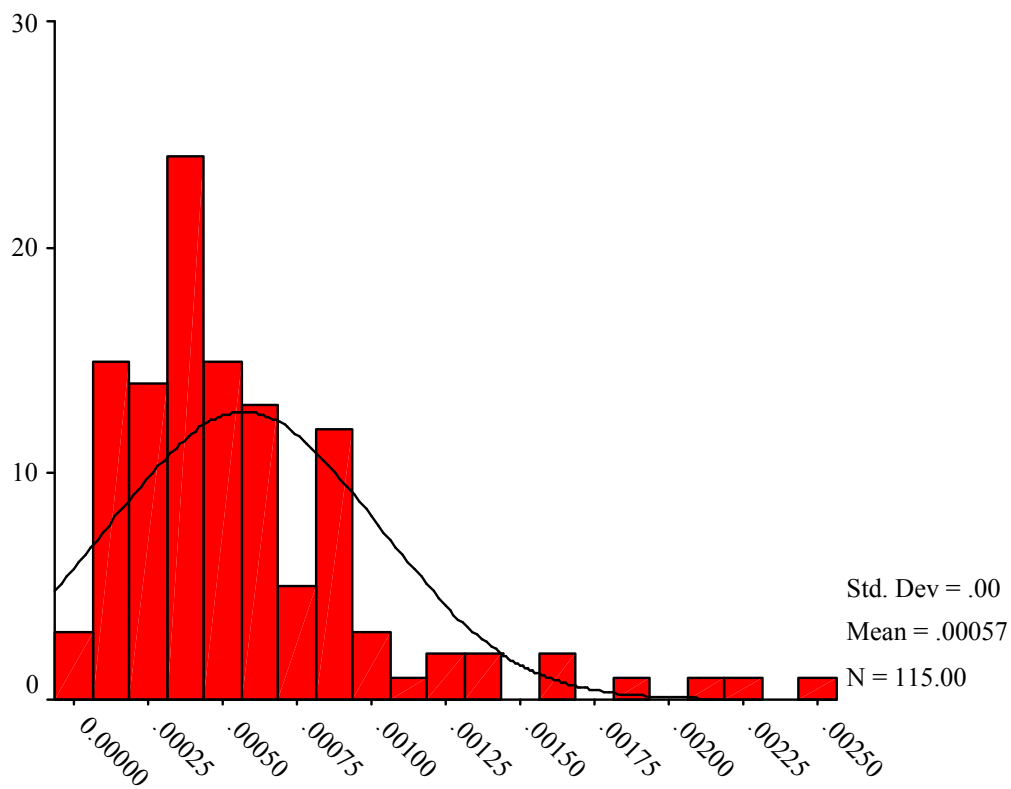Figure 4.1: Histogram Depicting Distribution of Uniform Crime Report Domestic Violence Rates

Using the natural breaks method to map UCR z-scores demonstrates that twenty-four counties in Missouri have comparably low rates of reporting, i.e. they fall into the lowest category while only six counties fall into the highest range (see Map 4.1). This finding in conjunction with the histogram and skewness results demonstrates how much a few counties in the state report domestic violence to police considerably more than others.
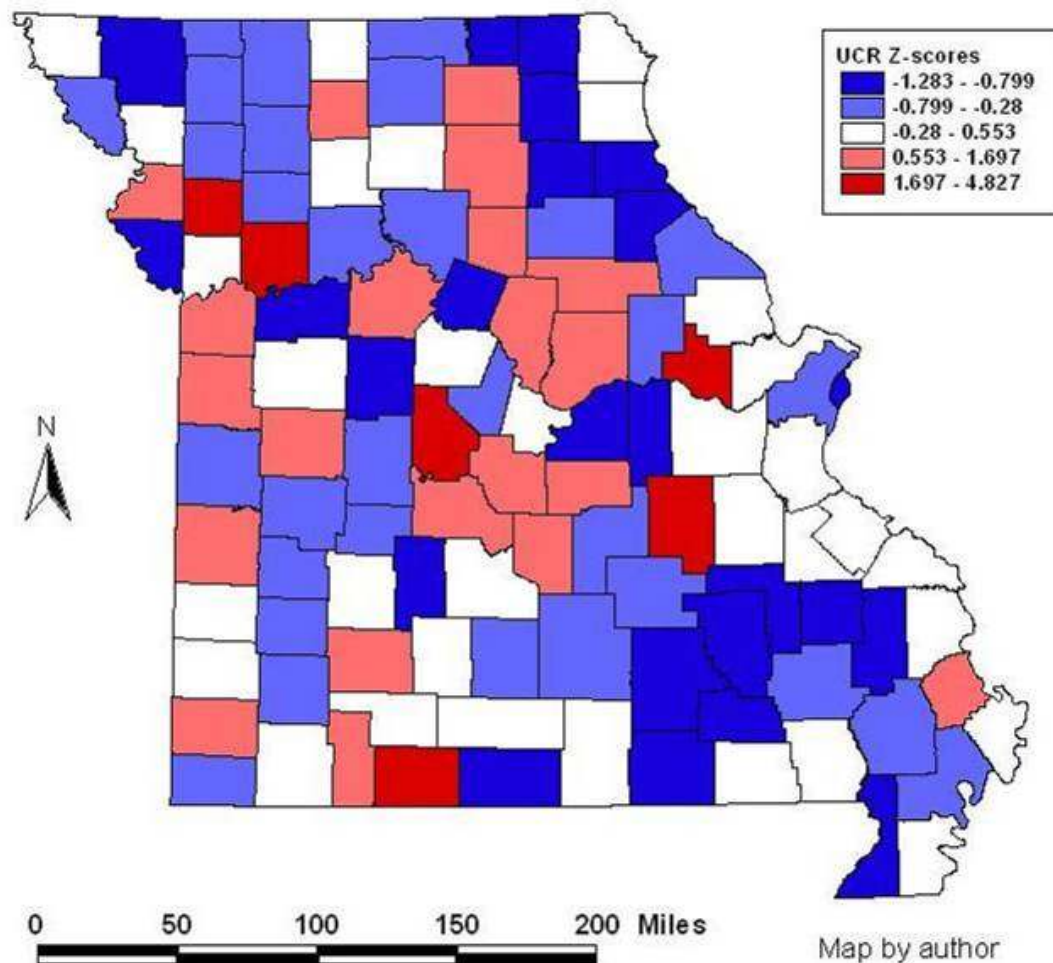
Map 4.1: 2002 Uniform Crime Report (UCR) Domestic Violence Z-Scores by County, Missouri Uniform Crime Report Data (Natural Breaks)

Similarly, domestic violence reported to the Department of Health and Senior

Services (DHSS) via hospitals is skewed positively with twenty six counties falling into

the lowest category and only six counties falling into the highest category using the

natural breaks method (see Map 4.2). The z-scores demonstrate little in terms of an

obvious spatial pattern, demonstrating that rural and urban places both report high and

45

low rates of domestic violence in hospitals. St Louis City had one of the highest scores

as did Sullivan, Washington, Dunklin, Dent and Ripley Counties. Mapped DHSS data

creates a map slightly more positively skewed toward negative z-scores than the UCR

data. With a skewness score of 1.89 the map and histogram (see figure 4.2) signify that

the data does not follow the normal curve one might expect. Six counties ostensibly
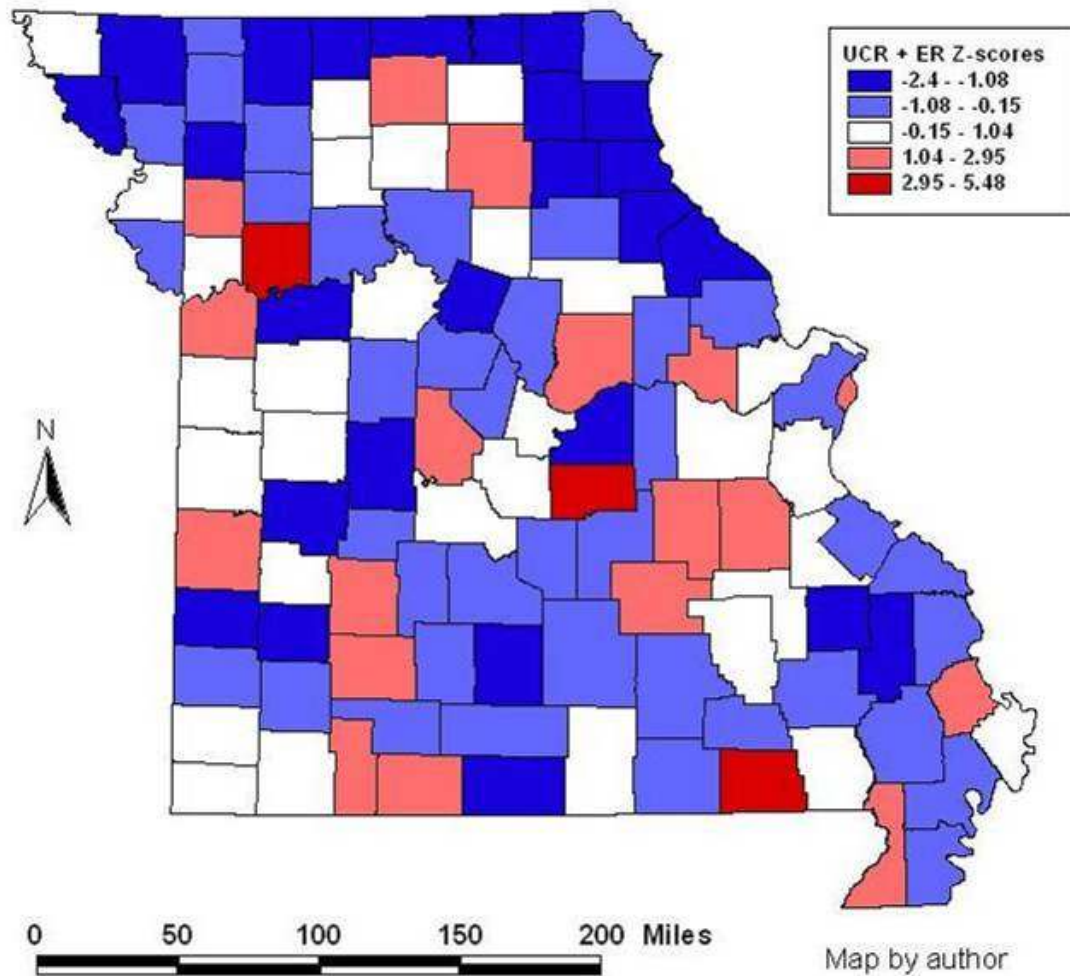
impact the ranking significantly.

Dept. of Health and Senior Services Data

Std. Dev = .00
Mean = .00057
N = 115.00

Figure 4.2: Histogram Depicting Distribution of Department of Health and Senior
Service Domestic Violence Rates
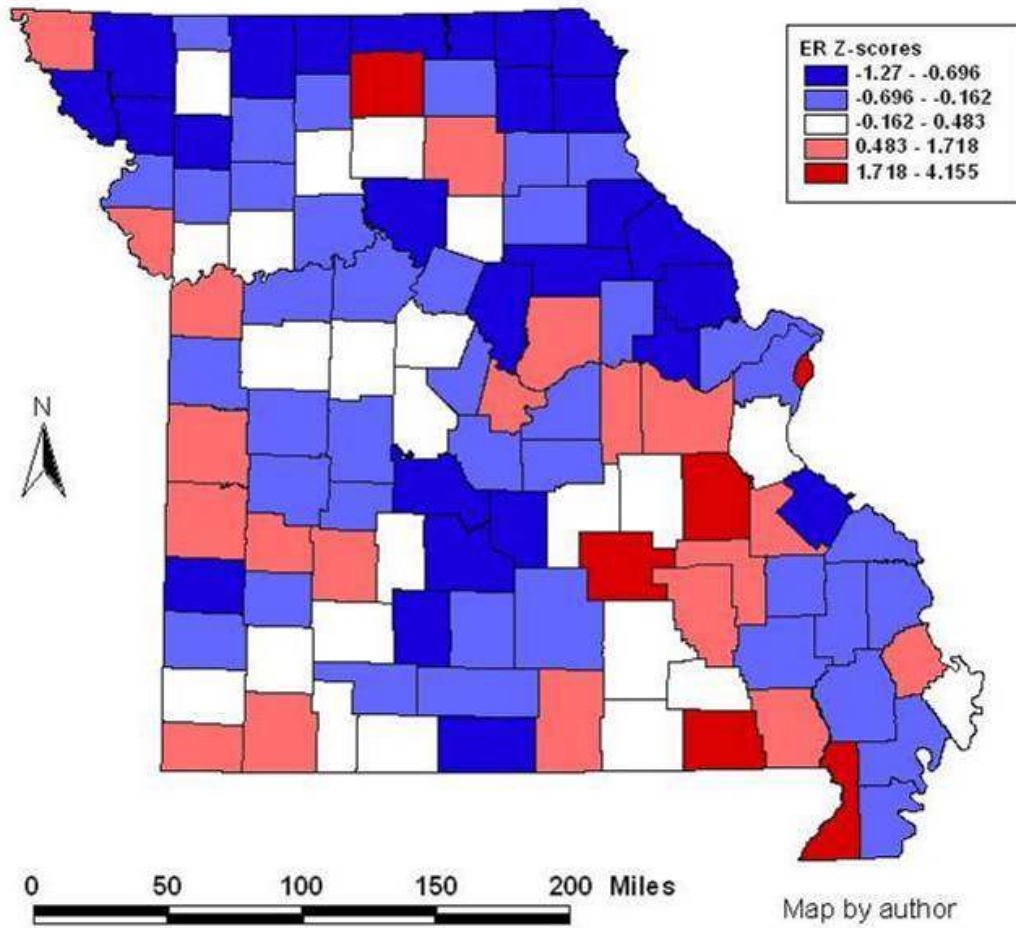
Map 4.2: 1994-2002 Missouri Department of Health and Senior Services Emergency Room (ER) Domestic Violence Z-score Data by County (Natural Breaks)

Map 4.3: UCR Z-scores and DHSS ER Z-scores summed (Natural Breaks)

Adding the UCR and DHSS z-scores together for each county in the state produced a

different slightly different pattern than the individual maps. Not surprisingly, many of

the counties with high UCR or DHSS Z-scores also have high combined scores. No

obvious geographic pattern emerges leading one to think that more reporting is done in

one area of the state more than another. The two largest urban areas of the state appear to report domestic violence more than many, not all, of their smaller counterparts.

One might assume that high rates of UCR domestic violence reporting in one county would correspond with high rates of DHSS domestic violence reporting. An examination of the maps indicates no apparent support for this hypothesis but a Pearson's correlation was run between the z-scores of the two data sources to see if any underlying associations might exist. The scatterplot specifies the results of the correlation (see figure 4.3).
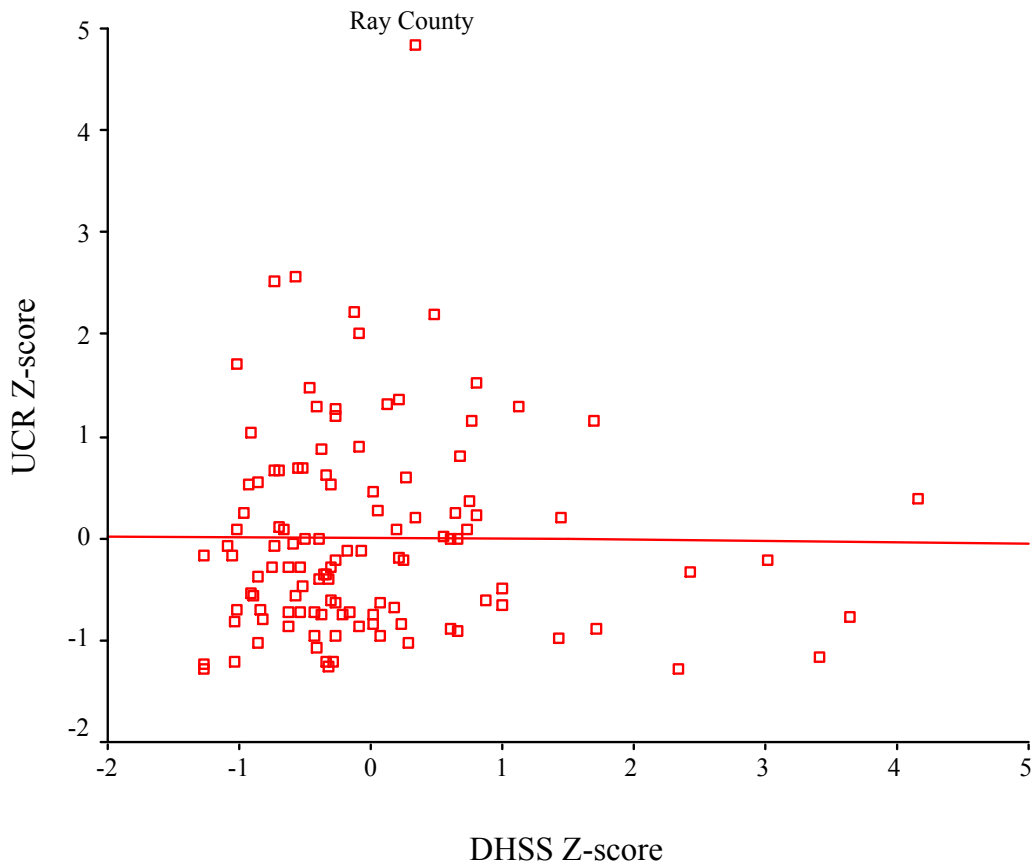

Figure 4.3: Scatterplot of UCR Z-scores and DHSS Z-scores

With a Pearson's score of only -.009 and a pattern as random as a text book example, it is safe to say that no association between UCR and DHSS domestic violence data exist. Ostensibly there is no connection between counties that report comparably high rates of domestic violence across agencies.

An interesting association to explore would be between shelter data and police and DHSS reports. Unfortunately, shelter data does not currently ascertain the home county of the victim thus making it impossible to compare to health and crime data. That problem limits the ability to take all quantitative data sources into account for an overall assessment or rating of an area's ability to report domestic violence.

Domestic Violence Risk Factors

Domestic violence research by social workers, health professionals, and criminal justice researchers all indicate that domestic violence has specific risk factors associated with it (see Chapter Two Literature Review for detailed description). While domestic violence occurs at all education and income levels (Nursing2004, 2004), poverty, low educational attainment, unemployment, and drug abuse have all been associated with higher rates of reported domestic violence. Knowing that demographic indicators exist for domestic violence, one can look at county level data and ascertain where domestic violence would be more likely to occur in higher numbers than other counties. Using U.S. Census Bureau, Missouri Highway Patrol, and Missouri Department of Economic Development (DED) data, z-scores for poverty, educational attainment, drug arrests, and unemployment were calculated. Those z-scores were then summed to create a composite

map of available risk factor data (see map 4.4).
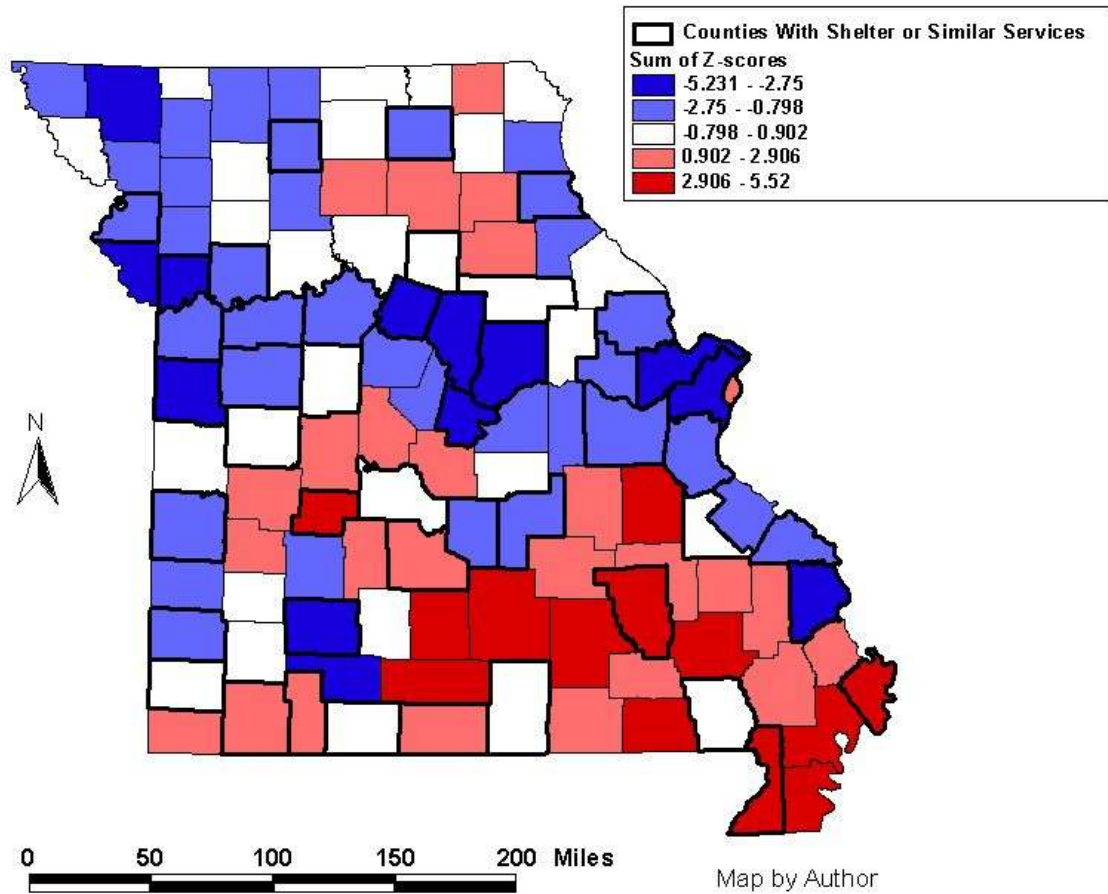
Map 4.4: Sum of Domestic Violence Risk Factor Z-Scores by County and Counties with Domestic Violence Shelter or Similar Services (Natural Breaks)

Creating a combined map of the domestic violence risk factor z-scores helps control for some of the disparities seen in the single poverty, educational attainment, drug abuse, and unemployment rate maps. For instance, poverty z-scores are very high in Boone, Nodaway, and Adair counties due to the high college student population found in each county. But each of these counties has relatively low unemployment (Boone has often been cited as having one of the lowest unemployment rates in the country) and high educational attainment levels. Therefore, it is important to control for

these disparities by adding the z-scores to get a better idea of which counties have a relative risk for domestic violence. The composite risk factor z-score map clearly points to southeast Missouri as the locus of where one might expect to find more domestic violence reporting based purely on quantitative information.

Analyzing the risk factors requires comparing the risk factors to actual counts of domestic violence to ascertain whether an association exists between demographic risk factors and actual reports of domestic violence. Using a Pearson's correlation and a scatterplot, z-scores were found not be significantly associated with one another in the case of the factors compared to UCR data (see figure 4.4). However, a significant correlation was found to exist between the sum of the risk factors and DHSS data (see figure 4.5).
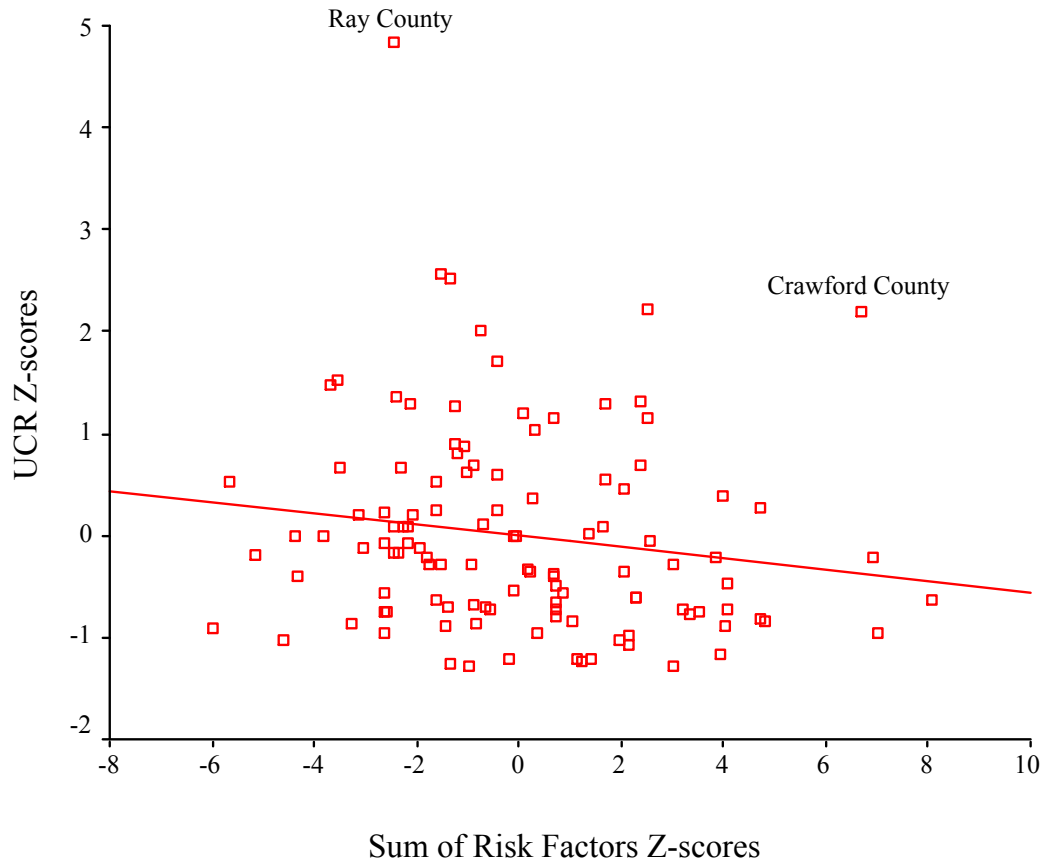
Figure 4.4: Scatterplot of UCR Z-scores and Sum of Risk Factors Z-scores
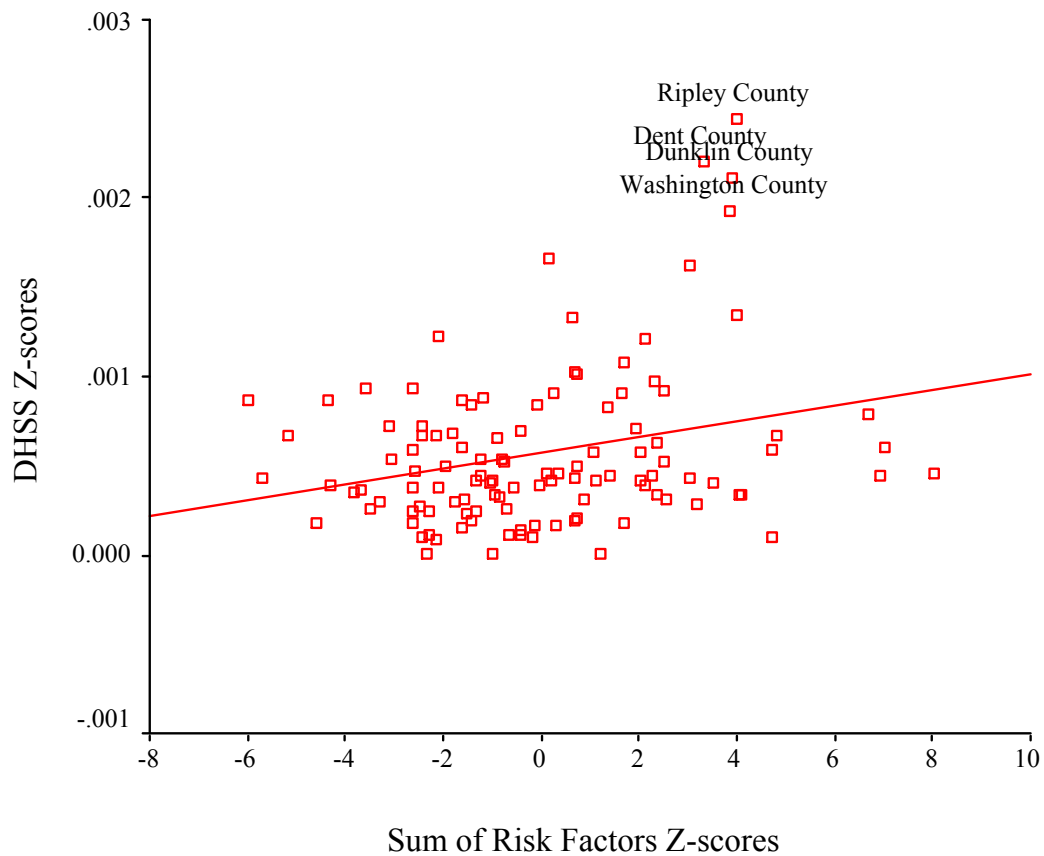
Figure 4.5: Scatterplot of DHSS Z-scores and the Sum of Risk Factors Z-Scores

Ripley, Dent, Dunklin, and Washington counties seemingly pull the line of best fit in the scatterplot up thus making the correlation stronger between the risk factors and the rate z-score of the DHSS emergency room data (see figure 4.5). To test that hypothesis, those four counties were removed and the correlation and scatterplot were re-drawn (see figure 4.6). The significance of the association is lost when the four outliers are removed. Therefore, the four outliers play a large role in making that correlation.
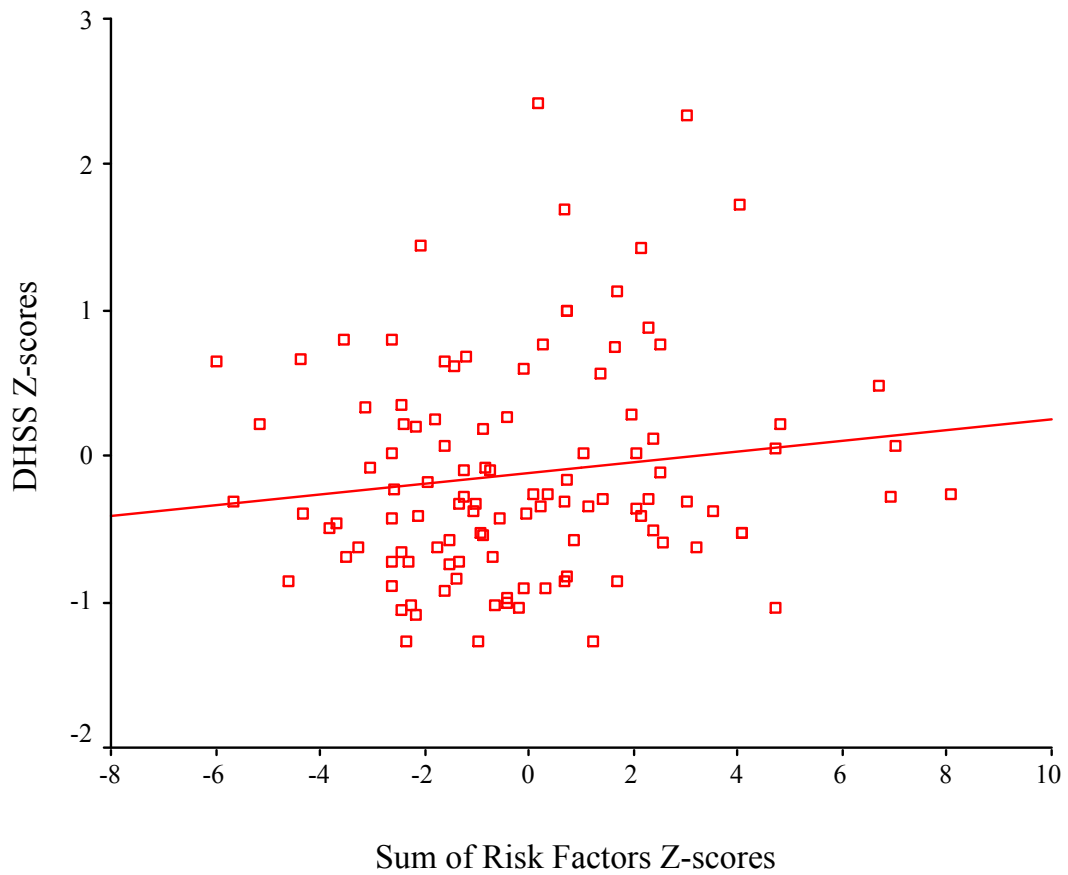
Figure 4.6: Scatterplot of DHSS Z-scores and the Sum of Risk Factors Z-scores with
Outliers Removed

Another mechanism that can be used to look at how the domestic violence risk

factors correlate with actual data is to map the risk factors and the counties with the

highest UCR and DHSS z-scores. Map 4.5 demonstrates that five of the six counties that

have high rates of domestic violence reported to hospitals, are in high risk factor counties.

The one county that has a high DHSS z-score that is not in a high risk factor county falls

in a "neutral county," i.e. a county that falls close to the mean.

In contrast, the high UCR z-score counties are found in various places around the state.   One is found in a high risk factor county (dark red), one is in the second tier high risk (light red), one is in a "neutral" county, and three are in low risk counties (light blue). This broad pattern varies from the stronger association seen between emergency room reports and risk factors.
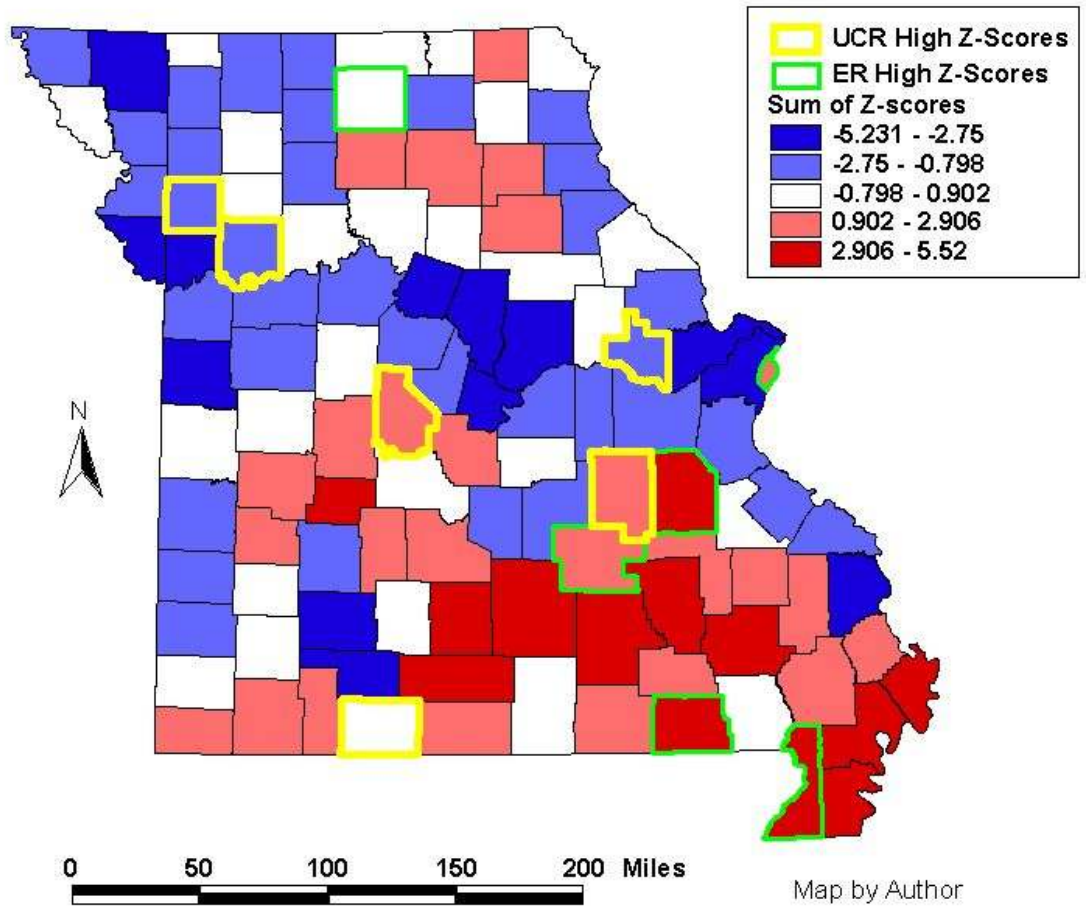
Map 4.5: Domestic Violence Risk Factors by County and the Highest Reported rates of
Domestic Violence to Police and the DHSS (Natural Breaks)

Unlike the UCR and DHSS data which exists for every county in Missouri, shelter data can only be tied to the county each shelter is in. The majority of counties in Missouri do not have a shelter. Most shelters, particularly in the rural parts of the state draw their clients from multiple counties and even states. Therefore, any spatial pattern that can be gleaned from mapping the shelter data has an inherent bias towards depicting the rural counties as having high rates of domestic violence. The corresponding map demonstrates this pattern (see map 4.6). Unfortunately, there is currently not an adequate way to measure shelter data spatially.
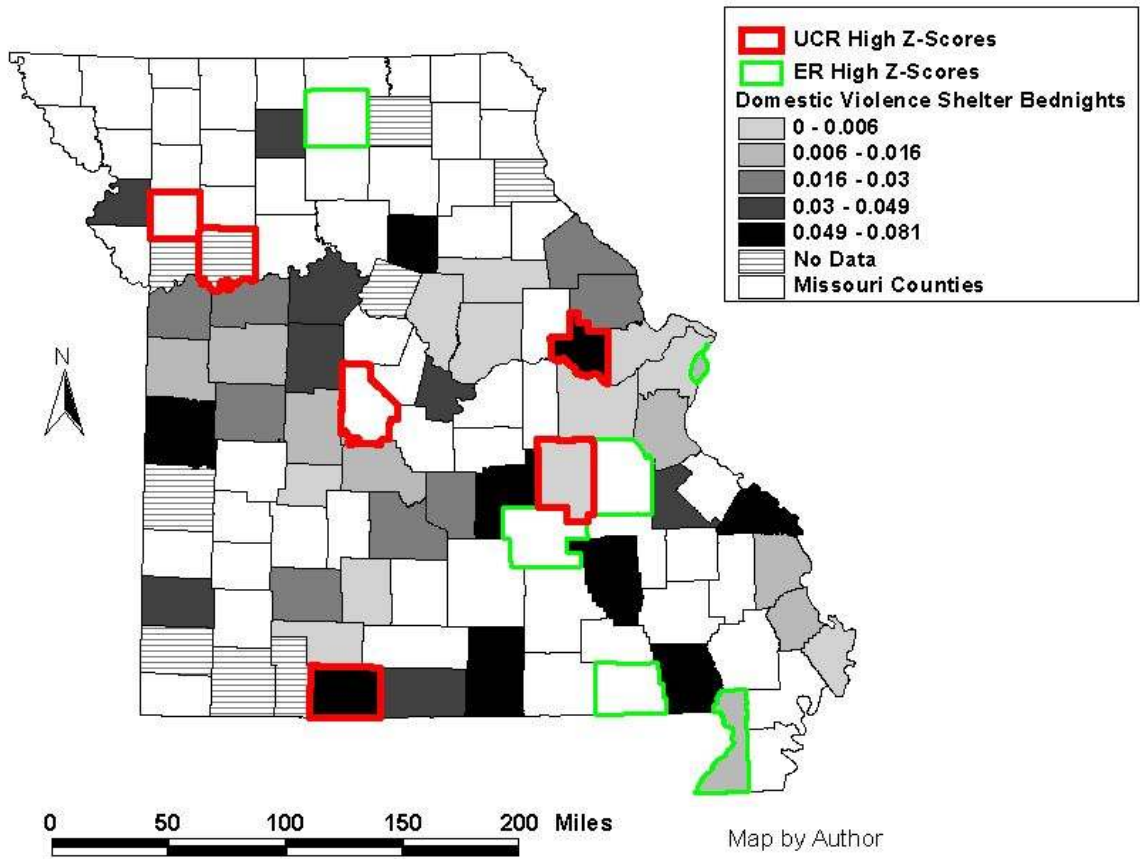
Map 4.6: Domestic Violence Shelter Bednights Reported to the Missouri Coalition Against Domestic Violence by County of Shelter (Natural Breaks)

Chapter Five

Discussion

Research such as Logan et al (2001) indicates that domestic violence manifests itself differently between rural, suburban, and urban areas. The community context in which domestic violence occurs plays a role in how domestic violence is reported (Benson et al, 2004). Each of the aforementioned statements describes a variation in how domestic violence manifests itself in different places and contexts. These statements were also made based on survey data not, not data supplied by agencies who interact with domestic violence every day. This research is an attempt to see if raw data can shed additional light onto the subject of domestic violence at the state and county level. It has been the assumption of this research that quantitative data reported to police, hospitals, and shelters should be able to identify regional variation in domestic violence reporting in order to better serve the needs of domestic violence victims and the communities in which they live. Assessing reported data may not provide a better understanding of the actual prevalence of domestic violence, however comparing reports of domestic violence may help police, hospitals, and shelters better target their efforts to best serve victims of domestic violence in their county and region. This chapter displays and interprets the results of this research to determine how one should use the raw reported data to make assessments of counties domestic violence phenomenon.

Discussion of Advantages and Disadvantages of Data Types

Each major collector of raw domestic violence data, police, hospitals, and shelters manage to collect data relevant to studying domestic violence. Each agency collects data for their own specific programmatic needs but they also share common overarching goals. They collect data so they can allocate resources better, understand the nature of the problems they are given, and develop methods to curb the problem.

Unfortunately, these agencies for the most part operate in separate spheres when it comes to providing data that can easily be compared to better understand reported domestic violence at a local level. Police arguably have the most sophisticated reporting procedure. The UCR program operates nationally and is designed with the intent to offer citizens, researchers, and others with information for comparisons between places, and over time. Theoretically, one should be able to look at domestic violence crime rates in one county in Missouri and compare that rate with rates in other counties across the country. Ranking county crime rates using UCR data was part of the initial intent of the UCR program and Missouri's decision to join it.

Data from the DHSS also provides consistent data over time related to domestic violence. However, it does not compare to the UCR program because it is not a federal program with rules and regulations that guide agencies across the country limiting he data's ability to be compared nationally. Also, in Missouri, hospitals only record those instances of domestic violence a victim is willing to report. There are specific guidelines for hospitals across Missouri that define domestic violence and control how it is reported by hospitals to the DHSS, but hospital staff suspicions of abuse are not sufficient to

warrant any reporting. Only elder and child abuse require hospital staff to make a report

based on their suspicions (Daniel, 2005; Robb-Welch, 2005).

In terms of being able to use a data source to help learn more about local domestic

violence cases, shelter data is the hardest to use. The data collected is mostly for internal

use by the Missouri Coalition Against Domestic Violence unlike the DHSS and police

data which is designed for both internal uses and public consumption.   Shelter data could

provide an integral source of information for researchers if it were collected at the county

level rather than just at the shelter level. Researchers would have the ability to compare

data from the three interfaces domestic violence victims have with external agencies and

potentially better understand several things. 1. How do the types of reporting relate to

one another? 2. Do high rates of police reporting correspond to high rates of emergency

room visits and high rates of shelter use? 3. Does shelter use correlate with domestic

violence risk factors more than DHSS or UCR data? 4. Is there a reliable way to use all

these data sources to better understand domestic violence regionally? These are critical

elements to better understanding domestic violence at the county level.

While data could in theory be collected by each agency using a method that is

more consistent across agency boundaries, very real and serious reasons exist as to why

each reporting system does not look the same. For instance, from a data comparison

standpoint DHSS emergency room data may be more robust if hospital staff were able to

count domestic violence cases they were suspicious of, not just ones where the victim

initiated reporting. However, this type of mandatory reporting runs the risk of

jeopardizing the victim more. If a woman goes to the emergency room and is guaranteed

anonymity, she does not have to worry about her abuser being enraged by her making the

abuse public (Robb-Welch, 2005). Anonymous care represents one of the most important

services a domestic violence victim can receive because she will get the immediate

attention she needs without the consequences of her abuser being reported. While first

instinct may make one think that reporting the abuse will help the victim that is not

always the case. If, for instance, the abuser becomes enraged by his being reported and

he hospitalizes or kills the woman as a result, reporting the instance of domestic violence

had very unintended consequences. Indeed, most shelters and advocacy services counsel

domestic violence victims to have a very thorough plan in place when a woman decides

to ultimately break from her abusive relationship. That plan should have her safety as the

paramount concern and the separation plan needs to take into account things such as

financial concerns, shelter, and children in the relationship. Deciding to make that

separation in the middle of the emergency room by making a report to hospital social

workers and/or police can jeopardize her children, financial security, and basic shelter.

While having that report of domestic violence recorded might help researchers and

program evaluators better ascertain domestic violence prevalence, violating the safety of

victims in the process would be counter productive. If a method could be devised that

collected the data and protected the woman's anonymity, that could be a solution.

However, any method to count domestic violence cases must have as its highest concern

the safety of the individual victim.

Similarly, domestic violence shelter data is collected with its paramount concern

being to protect the individual domestic violence victim. In that vein, shelters and

advocacy groups only collect information on things such as number of bednights

provided, and the duration of the stay. Personal information such as address or even

county of residence is not collected from victims for fear of violating anonymity and potentially making the individual more vulnerable to battering, abuse, or even homicide.

The more similar methods of collection can be across agencies, the better researchers, advocates, police, and hospital staff could understand domestic violence at local levels. This desire must be balanced by always keeping the safety of the individual as the supreme concern. Currently, each agency, at least programmatically, seems to be doing that. Therefore, the data that is currently collected must be used to draw the best conclusions possible. Could the conclusions be sharper or more robust with better data? The answer is probably. Is it worth jeopardizing the safety of the individual? The answer is clearly, no.

Discussion of the Spatial Distribution of Reported Domestic Violence

The data sources may not be perfect but conclusions can still be drawn about regional reported domestic violence and how studying the three data sources may help each agency respond to domestic violence better. While several reports and groups have called for an integrated look at domestic violence data, no one has attempted to devise a method to integrate data sources and spatially compare what separate agencies have reported at the state and county level (Robb-Welch, 2005). The results of this work have been an attempt to look at domestic violence data in this manner. Following is a discussion of the results of comparing data sources spatially and statistically.

Calculating z-scores and mapping the results for both UCR program data and DHSS emergency room data results in two patterns, particularly amongst the counties that have the highest z-scores for each reporting type. Taney, Crawford, Morgan,

Warren, Clinton and Ray Counties have disproportionately high UCR z-scores while Dent, Dunklin, Ripley, St. Louis City, Sullivan, and Washington Counties all had disproportionately high emergency room z-scores. Not one county with the highest z-score in one category had the highest z-score in the other category. A Pearson's correlation test further validated that there was no association of high scores in one category corresponding to high scores in the other. At first look, one might be surprised by this result. To further explore this outcome, an interview with the Director of the Missouri Coalition Against Domestic Violence, Cheryl Robb-Welch and two of her staff Cheryl Rafert and Jennifer Carter, was conducted to help explain this phenomenon. Their experience has demonstrated that women often only seek one service at a time. For instance, a domestic violence victim may seek services at the emergency room after a battering, but frequently will not invoke other services available to her such as a shelter or police. Similarly, she may contact the police during an incident, but either refuse or not require medical or shelter services. Furthermore, women will often seek services seven times before making the decision to separate from her abuser (Missouri Coalition Against Domestic Violence (MCADV), 2005). Often she will report her instance to the service she is either most familiar and/or comfortable with repeatedly as opposed to calling the police one time, seeking ER services another, and shelter services yet another time. This behavior may result in the lack of a correlation between the two data types. Factors such as how the police are perceived in an area, the close knit nature of a community, desire for anonymity, and response times for police may all impact who reports to police. Similarly, distance to a hospital or shelter, perceptions of those services

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in the region, and anonymity concerns may all impact where women in a given place seek out domestic violence services.

High rates of reporting in one area may therefore be most useful less to the agency that reports the high rate and more to other agencies in the region. If police in a given county are seeing high rates of reporting in comparison to their state peers, than maybe shelter services, advocates, and emergency room staff in the area need to be offering increased assistance to police by marketing their services to domestic violence victims. Likewise high emergency room rates correlated with low reporting to other agencies may mean that police in that region need to improve their training on domestic violence recognition and shelter staff need to develop their outreach to area hospitals.

Research has demonstrated that all agencies underreport actual domestic violence cases by as much as only capturing 25% to 50% of all cases (Tjaden and Thoeness, 2000). These percentages should be viewed with skepticism due to the extreme gap in the percentages. While there maybe no agreed upon number of the actual number of domestic violence cases, (which survey data such as the National Violence Against Women Survey and the National Crime Victimization Survey tries to do) reported data when mapped and statistically compared across agency boundaries, provides agencies a way to better gauge themselves then by relying solely on their own data.

For instance, one can have questions or reach the following conclusions about the high UCR z-scores seen in Taney, Crawford, Morgan, Warren, Clinton and Ray Counties

    1. These counties have something specific happening that is impacting domestic violence rates such as large scale layoffs, recent increase in drug abuse, or some

other unknown phenomenon associated with domestic violence and reporting to police.

2. Are police in Taney, Crawford, Morgan, Warren, Clinton and Ray County particularly skilled at identifying domestic violence due to recognition training and particular support to report domestic violence?

3. Conversely, are police in those counties identifying other crimes/occurrences as domestic violence causing an artificial increase?

All of these are possibilities, and warrant further exploration at the local level to better determine what makes them stick out in the map and histogram. Maybe more importantly, these high rates should be investigated by local hospital and shelter staff to see where they may be able to provide more services to victims and support police efforts.

Equally, the high z-scores reported to the DHSS in Dent, Dunklin, Ripley, St. Louis City, Sullivan, and Washington Counties should be explored by regional shelter and police agencies. The following conclusions could be reached about these counties.

1. Hospital staff encourage reporting of domestic violence incidences.

2. Hospitals are the primary provider of domestic violence services in the area.

Summing the z-scores of the emergency room and UCR data yields a map that identifies three counties with high domestic violence reporting rates. Ray, Maries, and Ripley Counties have the highest summed domestic violence z-score. Initially, it was hoped by summing the z-scores that certain counties might emerge as places where domestic violence was a particular problem in that area. But, stating that Ray, Maries, and Ripley Counties may have some phenomenon driving domestic violence rates

amongst agencies would be tenuous at best. Another explanation for these counties is that there is a degree of cooperation between agencies resulting in relatively high police and emergency room reports and/or there is a level of trust in both institutions in these counties by domestic violence victims.

Ranking domestic violence data, mapping, and then analyzing it across traditional jurisdictional boundaries have the potential to help each agency involved at the program level. Ascertaining actual domestic violence counts from the reported data is ostensibly impossible. However, knowing that reported data underreports the actual number of cases significantly, one can assume that higher reporting to either the police or hospitals indicates that those places are getting closer to the "truth" or the actual number of domestic violence cases and are therefore providing more services than those places reporting very low amounts. Looking at domestic violence data with a multi-agency lens can help agencies assess themselves and what they could do to provide more complete domestic violence services in their area. Next, an assessment of high reporting counties and risk factors for domestic violence are compared to ascertain if combining reported domestic violence data with demographic, crime, and economic information is helpful for gaining more insight.

Discussion of Domestic Violence Risk Factors

The risk factor maps presented in the previous chapter should not be viewed completely as a prediction of where one might expect to find domestic violence. More variables and research would be needed to adequately take into account all risk factors identified with domestic violence. However, it is helpful to determine which counties in

Missouri seem to initially have the demographic, crime, and economic characteristics

associated with domestic violence. For a complete regression to occur data would be

needed on local laws governing domestic violence, qualitative assessments about gender

roles, past abuse history of county residents and other characteristics would need to

measured. Those types of data were not available for this research.

The available data that was mapped, poverty by age, educational attainment by

age, unemployment, and drug arrests do portray a geographic pattern. With a few

exceptions, southeastern Missouri counties have the highest scores meaning they are the

counties one would anticipate being associated with higher reports of domestic violence

to any agency. This is seen when the risk factor z-scores are summed. An examination

of the available domestic violence data does not fully support this however. The UCR

data shows no obvious correlation with the combined risk factor data leading one to

believe that the risk factors may be correlated with high rates of surveyed domestic

violence, but not with reported domestic violence. This is supported by drawing a

scatterplot of the two data and a Pearson's correlation score of -.155 indicating only a

slight, not statistically significant, correlation.

One explanation for this lack of an expected correlation is that the UCR data is

somehow not collected well or uniformly across the state. This seems unlikely due to the

fact that the UCR program is designed to control for variations in how data is collected.

It is an attempt to standardize crime data across the country.

In contrast to the UCR data, the DHSS emergency room data seems to be

associated with the risk factors. Five of the six highest ER z-scores are in counties with

elevated risk factor scores ostensibly showing a correlation between risk factors and ER

reporting. Furthermore, a Pearson's correlation test of the ER z-scores and the risk factor z-scores gives a result of .271 which is statistically significant at the .01 level. The correlation is lost when Ripley, Dent, Dunklin, and Washington counties are removed from the test, but there still seems to a better association between reported domestic violence at hospital emergency rooms and the combined risk factors.

One explanation for this disparity between the seemingly random UCR data and risk factors and the seemingly associated DHSS data and risk factors may be that domestic violence victims of means (women with money, health insurance, etc.) may seek out medical treatment from private physicians rather than the local emergency room. As the director of MCADV questioned, "if she [domestic violence victim] makes $250,000 a year does she wait in the emergency room for hours or seek out private care" (Robb-Welch, 2005)? As documented as the risk factors for domestic violence are (Black et al. 1999; Harway and O'Neil 1999; Heise and Garcia-Moreno 2002; Kantor and Jasinski 1998; Counts, Brown and Campbell 1992; Benson et al., 2004; Intimate Partner Violence Prevention, 2005), shelter staff and advocates think that they need to be viewed carefully at best and suspiciously at worst. Women of means may be more protective of their privacy and have resources available to them that do not require them to get a public agency such as a hospital, police, or shelter involved. Her domestic violence may never be known. A correlation between high emergency room z-scores and elevated risk factors makes sense because women without means may have no choice but to seek service from an emergency room.

Conversely, UCR data does not correlate with elevated risk factor scores ostensibly contradicting the idea that risk factors for domestic violence can be quantified

and used to make conclusions about the efficacy of UCR reporting. If a correlation

existed between risk factors and DHSS data and risk factors and UCR data, the method of

quantifying risk factors for purposes of assessing reported domestic violence rates could

be more easily justified. But, with no association found between UCR z-scores and risk

factor z-scores only a few conclusions are possible.

1. Women of all socio-economic classes report their instance of domestic
   violence to police but not to hospitals.

2. Risk factors for domestic violence determined from *surveys* are not
   indicative of *reported* domestic violence.

Conclusion number one seems plausible because no correlation between UCR z-

scores and risk factors may mean there are limited alternatives to police services whereas

there are alternatives to emergency rooms. Women of means can go to a private clinic

for care thus resulting in a correlation between high emergency room z-scores and risk

factor z-scores. If someone is in the process of battering a woman, whatever her means

are, she requires police service for intervention. Calling friends or family to intervene

may escalate the problem internally and violate a woman's privacy in a way calling the

police does not. One can maintain a degree of anonymity by calling the police. The

neighbors and the police may know what is happening to her, but her friends and family

likely would not see the police cars at her house thus maintaining a degree of her privacy.

The second conclusion also seems plausible as a rationale for why high UCR z-

scores do not correlate with high risk factor scores. One would think that elevated UCR

z-scores would correlate with risk factors similarly to the way the emergency room z-

scores correlated with risk factors. The fact that the two do not share a correlation makes using the risk factors as a test of reported domestic violence problematic.

Conclusion of Discussion

Unfortunately, major obstacles currently do not allow for a full quantitative assessment of local domestic violence to occur due to data incompatibility and data consistency. While these issues are not small, neither are they insurmountable. Law enforcement has developed nationwide procedures that come as close as possible to guaranteeing the consistency and accuracy of crime data, including domestic violence data. The Department of Health and Senior Services in Missouri collects domestic violence data from every hospital and ensures that the victim is counted from her home county, not the county where the hospital she sought treatment was. The Missouri Coalition Against Domestic Violence (MCADV) collects data on how many women are served by the shelters around the state, but they do not collect the home counties of the women. While certainly confidentiality and safety must be of the utmost concern at domestic violence shelters, reporting what county a woman who seeks shelter comes from may help determine if certain counties seem more prone to domestic violence than others. If that data were available, resources and education could be directed to those area agencies to help alleviate the problem and develop a better coordinated response to domestic violence at the local level. This research does little to understand the actual number of domestic violence cases. That number may be unattainable. What this research can do is help devise a way for agencies to focus their efforts not necessarily on

specific populations in a region, rather they can focus their efforts on developing cross

agency partnerships to better respond to domestic violence.

Chapter Six

Conclusions

Evaluating domestic violence cannot be done without a serious understanding of the complexity of the problem. The private nature of the crime, the multiple agencies and places associated with responding to domestic violence, and the difficulty in capturing reliable and consistent data make any study of the problem more complex than one may initially expect. From an outsider's perspective, one may think that if a woman experiences any abuse, she should simply leave her abuser and move on with her life. An attitude such as this represents ignorance. An abused woman most often cannot simply "walk away" from her abuser due to concrete things such as financial and housing needs that bind her to her abuser. Emotional needs such as maintaining a connection between the father and children, and fear of reprisal also may play a role in keeping a woman with her abuser. These realities make domestic violence reporting problematic and therefore difficult to glean information from. Further complications include that each agency collects data in the best interests of their program which must place the safety of the individual above all other needs. These difficulties do not mean that reported data is useless however. It just means that care and a critical eye must be used in evaluating reported data.

This thesis set out to determine whether a geographic pattern could be seen when looking at reported domestic violence data at the county and state level. Clearly, this research found no apparent clustering of domestic violence in one area of the state over

another. What could be determined from this research is the need for agencies who work with domestic violence to look outside of their department boundaries and assess how other agencies are impacted by domestic violence. By analyzing data across boundaries and using methods proposed in this research, agencies can better assess how and where to implement domestic violence awareness training, shelters could provide better outreach to hospitals, and potential gaps in service areas can be identified.

Thesis Limitations and Areas for Improvement

Despite the uses of this work, serious limitations do exist. Using raw domestic violence data to investigate the spatial manifestation of the crime is fraught with problems. Underreporting, consistency of reporting, and regional variability in what gets reported, despite attempts at uniformity, all make drawing conclusions about the problem from raw reported data extremely difficult. Furthermore, no one way currently exists to assess how pervasive domestic violence awareness training for police and hospital staff has been around the state. This research does little to truly assess domestic violence regionally, despite the fact that that was the original intent of this work, and does more to warn the domestic violence researcher of quantitative data regarding this complex matter.

Secondly, the risk factors chosen in this work are only the factors that could be quantified. Qualitative risk factors for domestic violence were disregarded in this research due to the fact there was no way to assess all of the qualitative risk factors for every Missouri County. In addition, despite the fact that the risk factors used in this work are documented and supported by many researchers, MCADV staff look upon those factors with a great deal of skepticism. At best, those risk factors may be associated with *reported* domestic violence. MCADV staff raise a valid and serious criticism of the risk

factors stating that women with resources (money, transportation, health insurance, family doctor, and/or a close family/friend to escape to) may never report her case of domestic violence. This research overlooks women that may fall into this category. Indeed, the uses of this research overlook providing help to women of domestic violence who may not fall into one of the risk factor categories.

Thirdly, the fact that shelter data is not collected at the county level impairs the possibilities of this research in terms of being able to compare data sources at the same geography and provide help to all agencies. While the shelters need to maintain the privacy of their clients at all costs and that may mean not collecting the county of residence from their client base, having that data would greatly enhance the possibilities of this research. Alternatively, national domestic violence hotline data could be used if county level data was made available by that agency.

Fourthly, in contrast to the crime data, the information collected by the Department of Health and Senior Services (DHSS) deals with very low numbers per county. There are very few reports of domestic violence from some counties due to very low population numbers. This makes many of the counties in the state look as if there is nothing statistically significant regarding domestic violence when in fact there may be. But, due to the low numbers reported, statistical significance is a problem.

Future Research

A finding of this research is that agencies should look outside of their program boundaries and look at domestic violence data from other places to assess how they might improve their services for the domestic violence victim. In a few places around the country and Missouri, agencies have teamed up with one another to provide a coordinated

response to a report of domestic violence. If a woman calls the police about an instance of domestic violence, the police are intimately aware of community resources available to her outside of the police. These groups go by different names but a nationally recognized one is the Domestic Violence Early Response Team (DiVERT). Police are able to refer domestic violence victims to advocates who provide a wide array of emotional and legal assistance to the victim. The Columbia, MO police department and Boone County Sheriff have a special unit called the Domestic Violence Enforcement Unit (DOVE) which is made up of police and prosecutors who work specifically on domestic violence cases in an attempt to offer a coordinated response.

An interesting area for future research would be to find locales around the state that have these types of coordinated responses to domestic violence, categorize the service (i.e. – partnership between police and shelter, police and legal system, hospitals and shelter, etc.) and assess the reported domestic violence data in those communities versus non-coordinated response communities.

As data becomes more available for each source, analyzing this data temporally to look for patterns may also be helpful in determining agency efficacy. Applying the methodology used in this thesis over time may help determine if an area is ostensibly improving their reporting or not. Due to the fact that each data type has only been available for as little as three years in some cases, it may be several more years before enough data is available for this kind of application.

Policy Applications

Research such as Logan et al (2001) indicates that domestic violence manifests itself differently between rural, suburban, and urban areas. The community context in

which domestic violence occurs plays a role in how domestic violence is reported (Benson et al, 2004). Each of the aforementioned statements describes a variation in how domestic violence manifests itself in different places. It has been the assumption behind this work that domestic violence reported to police, hospitals, and shelters would have a regional variation. This may be the case, but this research was not able to find any geographic pattern. Rather, this work highlighted the fact that each data source operates on its own and attention needs to be paid by all groups interested in domestic violence data to the several of types of data available. The spheres of influence of each data type need to expand to cover more than just the health care, social service, or criminal justice communities. Instead, a more comprehensive look is needed.   The policy applications for this thesis are significant because a method to help programs develop assessment policy is proposed here. As data improves and more data becomes available, a consistent methodology can be developed and refined to take into account the various data sources. Having a system in place that can provide agencies who work with domestic violence a way to compare themselves with their counterparts in other agencies should help all involved and lead to a more coordinated response to domestic violence. The complexity of domestic violence as a societal problem requires that the response be coordinated to adequately address the intricacy of the problem.
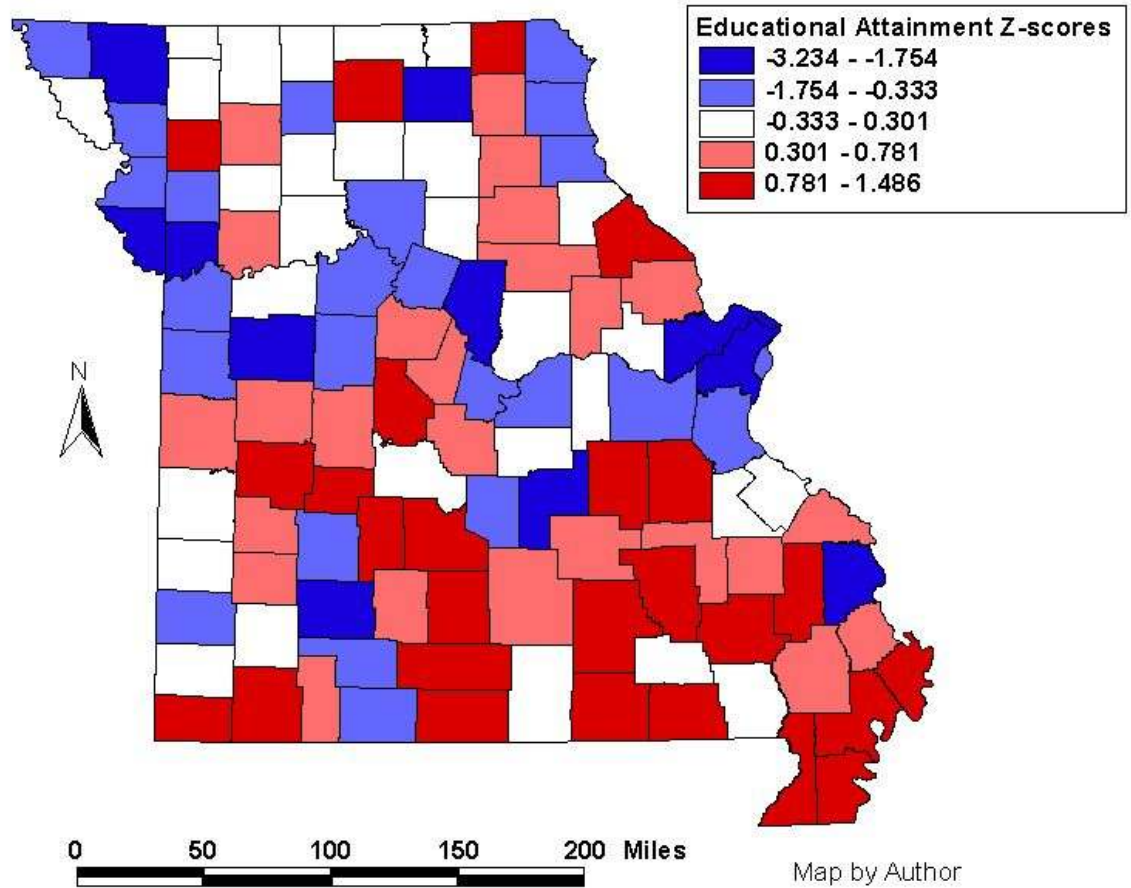
Appendix

Individual Risk Factor Maps
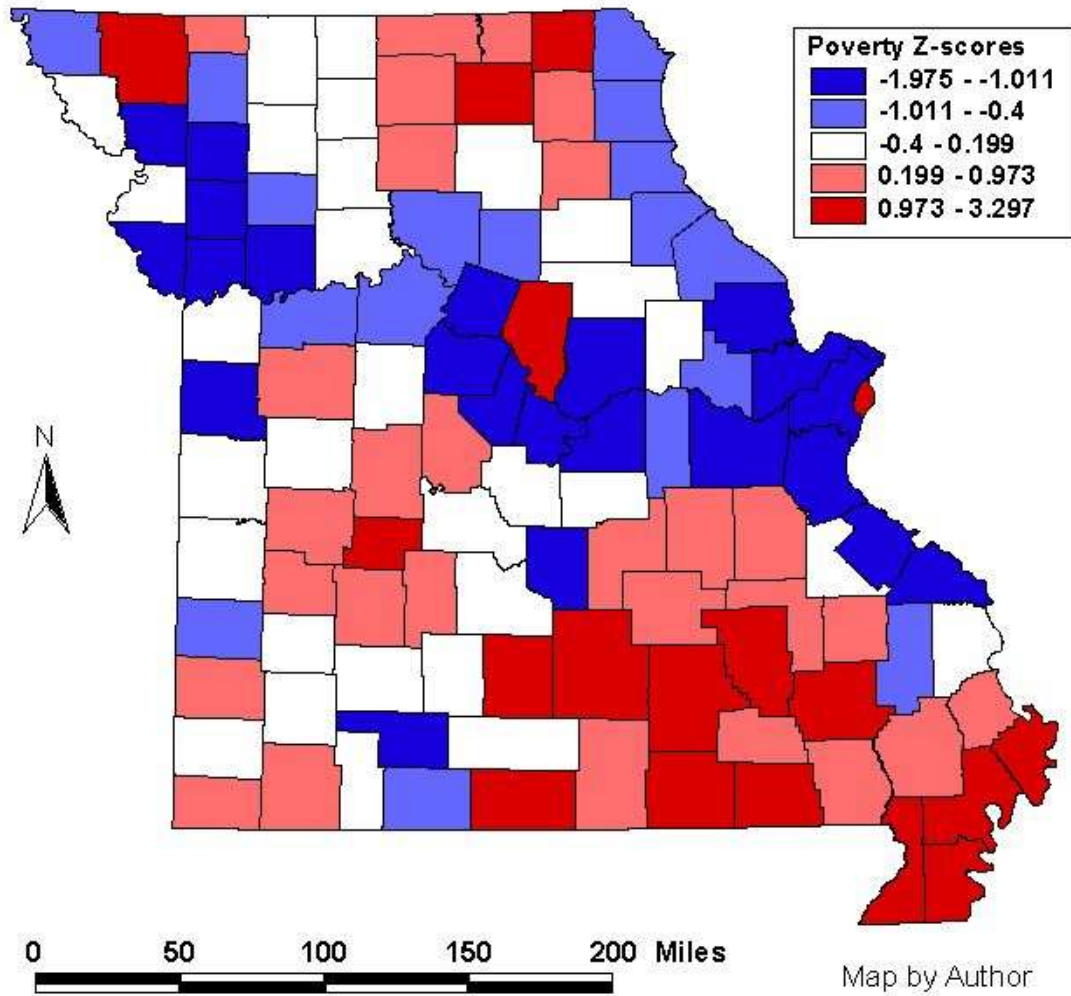
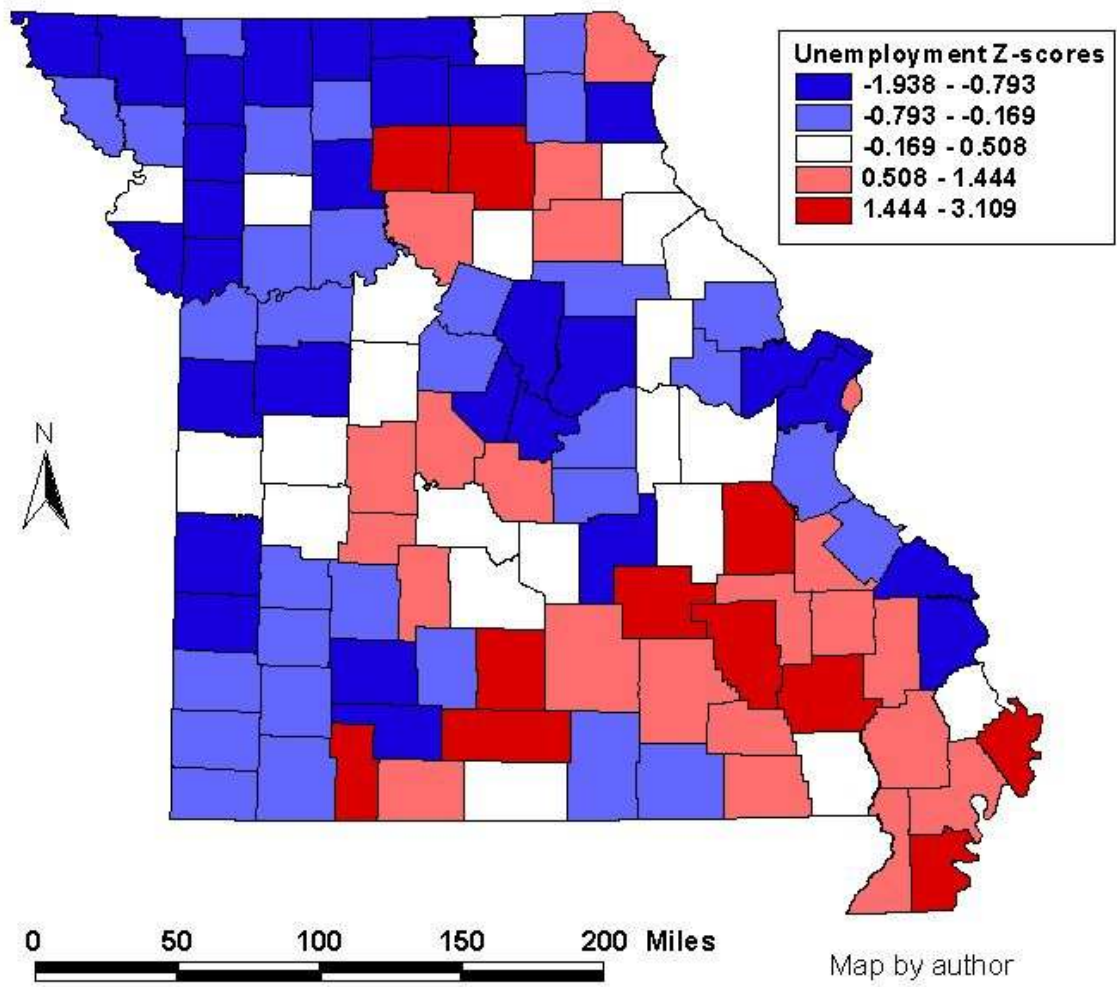Map A.1: Z-scores for Poverty by 18-34 Year-olds by County
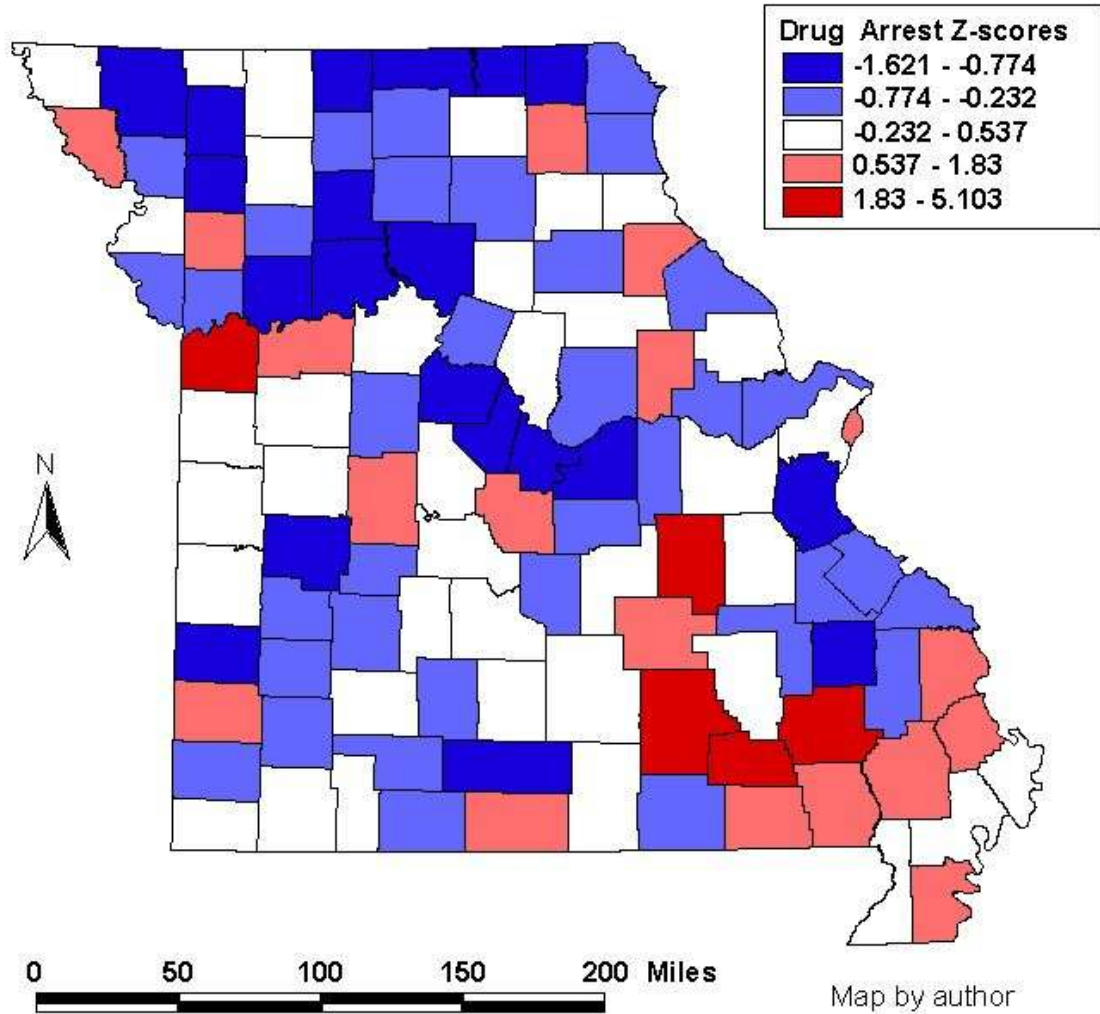
Map A.2: Z-scores for Drug Arrests by County (Missouri State Highway Patrol, Statistical Analysis Center)

Map A.3: Z-scores for Educational Attainment by 18-34 Year-olds by County

Map A.4: Z-scores for Unemployment by County, 2002 (Missouri Department of
Economic Development)

Appendix B

Table A.1: List of Pearson's Correlation Coefficient Scores

Correlations	Pearson's Correlation Coefficient
UCR Z-scores and DHSS Z-scores	-.009
UCR Z-scores and Sum of Risk Factors Z-scores	-.155
DHSS Z-scores and Sum of Risk Factors Z-scores	.271*
DHSS Z-scores and Sum of Risk Factors Z-scores with four outliers removed	.135

*Significant at the .01 level

Map A.5: Missouri County Reference Map

Bibliography

Acierno, Ron, and Heidi S. Resnick. Summer 1997. "Health Impact of Interpersonal Violence 1: Prevalence Rates, Case Identification, and Risk." *Behavioral Medicine* 23(2): 53-65.

Adler, M. A. 2002. The Utility of Modeling in Evaluation Planning: The case of the coordination of domestic violence services in Maryland. *Evaluation and Program Planning* 25(3): 203-213.

Aguierre, Danel. Februrary 14, 2000. "House Committee reports work in domestic violence." Missouri Digital News. http://www.mdn.org/2000/STORIES/DOMESTIC.HTM (Accessed February, 2005).

American Bar Association. 2001. American Bar Association Commission on Domestic Violence, American Bar Association. http://www.abanet.org/domviol/home.html (Accessed February, 2005).

Bachman and Saltzman, 1995. Violence Against Women: Estimates from the Redesigned Survey. U.S. Bureau of Justice Statistics.

Benson, Michael, John Wooldredge, Amy Thistlethwaite, Greer Fox. 2004. The Correlation between Race and Domestic Violence is Confounded with Community Context. *Social Problems* 51(3):326.342.

Berlinger, June Sheehan R.N., Why Don't You Just Leave Him http://www.tmh.org/thomf001.htm (Accessed February, 2005).

Black D.A., et al. 1999. Partner, child abuse risk factor literature review: national network of family resiliency, national network for health. (http://www.nnh.org/risk. Accessed January, 2005)

Centers for Disease Control. "Use of Medical Care, Police Assistance, and Restraining Orders by Women Reporting Intimate Partner Violence - Massachusetts 1996-1997." Morbidity and Mortality Weekly Report - Centers for Disease Control 49: 485-488.

Coulter, Martha, Kathryn Kuehnle, Robert Byers, and Moya Alfonso. 1999. Police-Reporting Behavior and Victim-Police Interactions as Described by Women in a Domestic Violence Shelter. *Journal of Interpersonal Violence 14(12):1290-1298*

Counts DA, Brown J, Campbell J. 1992. Sanctions and sanctuary: cultural perspectives on the beating of wives. Boulder (CO): Westview Press.

Crime Mapping (continued) – Funding GIS Assistance and Technical Assistance. U.S. Department of Justice. http://www.ojp.usdoj.gov/ovc/publications/infores/geoinfosys2003/cm3j.html (Accessed April, 2005)

Daniel, Lewis. 2005. Interview with author, February 14. (Emergency room staff at Boone Hospital Center, Columbia, MO)

DeKeseredy, Walter S. and Martin D. Schwartz**.** 1998. Measuring the Extent of Woman Abuse in Intimate Heterosexual Relationships: A Critique of the Conflict Tactics Scales. U.S. Department of Justice Violence Against Women Grants Office Electronic Resources (refereed publication) http://www.vaw.umn.edu/research.asp, (Accessed February, 2005).

Di Bartolo, L. 2001. The Geography of Reported Domestic Violence in Brisbane: a social justice perspective. *Australian Geographer* 32(3): 321-341.

Domestic and Sexual Violence Data Collection: A Report to Congress under the Violence Against Women Act, July 1996. Washington D.C.

Donnelly, D. A. (2000). Intimate Violence. Atlas of Crime: Mapping the Criminal Landscape. L. S. Turnbull, E. H. Hendrix and B. D. Dent. Phoenix, The Oryx Press: 91-99.

Ellsberg, Mary, Lori Heise, Rodolfo Pena, Sonia Agurto, and Ann Winkvist. 2001. Researching Domestic Violence Against Women: Methodological and Ethical Considerations. *Studies in Family Planning* 32(1):1-15

Family Violence Prevention Fund and the Trauma Foundation. 1994. The Health Care Response to Domestic Violence Fact Sheet. San Francisco. http://endabuse.org/programs/publiceducation/ (Accessed February, 2005).

Farmer, Amy and Jill Tiefenthaler. 2003. Explaining the Recent Decline in Domestic Violence. *Contemporary Economic Policy* 21 (2): 158-172

Felson, Richard B., Steven Messner, Anthony Hoskin, and Glenn Deane. 2002. Reasons for Reporting and not Reporting Domestic Violence to the Police. *Criminology* 40(3):617-647.

Getis, Arthur, Judith Getis, and I.E Quastler. 2001. The United States and Canada: The Land and the People. McGraw Hill, Boston.

Glazer, Sarah. February 1993. Violence Against Women. *Congressional Quarterly Researcher*, 3(8): 171.

Governor's Executive Order 01-13. August 10, 2001. Establishes the Missouri Domestic Violence Task Force. http://www.sos.mo.gov/library/reference/orders/2001/eo01_013.asp (Accessed January, 2004).

Haj-Yahia, Muhammad M. 2000. The Experience of Formerly Battered Women with Divorce: A Qualitative Descriptive Study. *Journal of Divorce and Remarriage*, 32 (3/4): 19-40.

Hampton, R. L. and Gelles, R. J. 1994. Violence toward Black Women in a Nationally Representative sample of Black Families. *Journal of Comparative Family Studies*, 25: 105-119.

Harway M, O'Neil JM, editors. 1999. What causes men's violence against women? Sage Publications, Thousand Oaks, CA.

Heise L, Garcia-Moreno C. 2002. Violence by intimate partners. World Report on Violence and Health. World Health Organization, Geneva.

Higgs, Georgett. 2001. Spatial Analysis in Louisville, Kentucky. Master's Thesis at the University of Louisville, Louisville, KY.

Intimate Partner Violence Prevention, Facts. National Center for Injury Prevention and Control. 2005. Centers for Disease Control. http://www.cdc.gov/ncipc/factsheets/ipvfacts.htm#Risk%20factors (Accessed March, 2005).

Johnson, M. M. and P. Barbara Elliott 1997. Domestic Violence Among Family Practice Patients in Midsized and Rural Communities. *The Journal of Family Practice* 44(4): 391-400.

Johnston, RJ. 1997. Geography and Geographers: Anglo-American Human Geography Since 1945. Arnold Publications, London.

Kantor GK, Jasinski JL. 1998. Dynamics and risk factors in partner violence. In: Jasinski JL, Williams LM, editors. Partner violence: a comprehensive review of 20 years of research. Sage Publications, Thousand Oaks, CA.

Kim, K. and Y. Cho 1992. Epidemiological survey of spousal abuse in Korea, In Intimate violence: interdisciplinary perspectives, Washington DC.

Lakeman, L. 2000. Why Law and Order Won't Stop Violence Against Women. *Herizons*. 14.

Logan, T.K., Robert Walker, Carl Leukefeld. 2001. Rural, Urban Influenced, and Urban Differences Among Domestic Violence Arrestees. *Journal of Interpersonal Violence* 16(3):266-283.

Massimo, C., R. Haining, et al. 2000. A Comparative Evaluation of Approaches to Urban Crime Pattern Analysis. *Urban Studies* 37(4): 711-729.

McGrew, J. Chapman and Charles Monroe. 1993. Statistical Problem Solving in Geography. Wm. C. Brown Publishers, Dubuque, Iowa.

Michalski, Joseph H. 2004. Making Sociological Sense Out of Trends in Intimate Partner Violence. *Violence Against Women* 10(6):652-675

Missouri Coalition Against Domestic Violence (MCADV). 2005. www.mocadv.org (Website most recently visited February, 2005)

Missouri Department of Economic Development (MO DED). 2005. Unemployment rates. http://www.ded.mo.gov/researchandplanning/indicators/unemp/index.stm (Accessed March, 2005)

Missouri Department of Health and Senior Services (MO DHSS). 2005. Community Data Profiles. http://www.dhss.mo.gov/CommunityDataProfiles. (Accessed January, 2005)

Missouri Revised Statute 43.505. Missouri General Assembly. http://www.moga.state.mo.us/statutes/c000-099/0430000505.htm (Accessed February, 2005)

Missouri State Highway Patrol – Uniform Crime Reports online http://www.mshp.dps.missouri.gov/MSHPWeb/SAC/Stats/UCRPublicQuery.html (Accessed online February, 2005)

Missouri Statistical Analysis Center, Highway Patrol. "Crime Statistics" http://www.mshp.dps.missouri.gov/MSHPWeb/SAC/Stats/CrimeStats.html (Accessed February, 2005)

Missouri Uniform Crime Reporting Instruction Manual, Revision Number 3, March 2004. Available online at http://www.mshp.dps.missouri.gov/MSHPWeb/Publications/Manuals/MoUCRManual3-04.pdf (Accessed February, 2005)

NCVS – Violence Against Women Survey, August, 1995. Available online at http://www.ojp.usdoj.gov/bjs/abstract/femvied.htm (Accessed February, 2005)

Myths and Facts About Domestic Violence. *Nursing2004,* September 2004.

Prince, Joni E. and Ileana Arias. Summer 1994. The Role of Perceived Control and Desirability of Control Among Abusive and Nonabusive Husbands. *American Journal of Family Therapy*, 22 (2):126-135

Rand, M.R. 1997. Violence-related Injuries Treated in Hospital Emergency Departments, Washington, D.C. U.S. Dept. of Justice.

Robb-Welch, Cheryl, Cheryl Rafert and Jennifer Carter. March 2, 2005. Interview by author with Missouri Coalition Against Domestic Violence (MCADV) Staff.

Rodriguez, M. M., MPH, E. M. ScD, et al. 2001. Mandatory Reporting of Domestic Violence Injuries to the Police. *JAMA*, August 1 286(5): 580-583.

Rogerson, Peter. 2001. Statistical Methods for Geography. Sage Publications, London.

Stapleton, S. 1997. Treating Domestic Violence: Victims Bypass Police Rely on Doctors. *American Medical News*.

Straus, M. A. 1979. Measuring intrafamily conflict and violence: The conflict tactics scales. *Journal of Marriage and the Family*, 41:75-88.

Texas Council on Family Violence, and Center for Social Work Research at The University of Texas at Austin. May 1998. *Texas Domestic Violence Databook.*

Tjaden, Patricia and Nancy Thoeness. 2000. *Extent, Nature, and Consequences of Domestic Violence: Findings from the National Violence Against Women Survey.* National Institutes of Justice, Washington D.C.

Tolman, R.M., & Raphael, J. 2000. A review of research on welfare and domestic violence. *Journal of Social Issues,* 56:655-682.

Turnbull, L. S., E. H. Hendrix, et al. 2000. Atlas of Crime: Mapping the Criminal Landscape. Phoenix, The Oryx Press.

United States Census Bureau. 2000. Summary File 3, Census 2000. Washington D.C.

United States Department of Justice 1995. Attorney General Reno and Health and Human Services Secretary Shalala Meet with Advisory Council on Violence Against Women. Washington D.C., United States Department of Justice.

United State Department of Justice – Bureau of Justice Statistics. 1998. Violence by Intimates: Analysis of Data on Crimes by Current or Former Spouses, Boyfriends, and Girlfriends. Department of Justice, Bureau of Justice Statistics Report. Washington D.C.

Williams, Stacey, and Kristin Mickelson. 2004. The Nexus of Domestic Violence and Poverty. *Violence Against Women,* 10(3):283-293.