Effects of Neighborhood Fear on Sleep in a Community Based Sample

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Dedication:

This work is dedicated to my wife, Debra Collins, in thanks for her unwavering support of me and this labor, and for allowing me the countless hours, weeks, and months, it has taken to research, write, analyze, review, correct, edit and assemble this document. Without her support and encouragement, this manuscript may have not come together. Thanks Sweetheart!

Acknowledgement:

I would like to personally thank Dr. John Sonnega for his leadership and guidance in helping me formulate this idea into a research question and thesis project. His deep love for the Social Sciences, and particularly his desire to look for reasons that people do not get adequate sleep, is infectious and attracted my interest in joining him in this quest for the very interesting and intricate network of influences that make up the human psyche. His teaching and support were instrumental in helping me understand how these issues affect all that we do, how we think, what prompts us to do the activities we pursue, and even what makes us sleep (or fail to sleep). Thank you to my dear friend, Dr. John.

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Abstract

Poor sleep and insufficient sleep, although often unreported, are documented to have a high prevalence in the United States and many other nations as well, and may be associated with various and multiple causes. Many questions remain regarding poor and insufficient sleep and the associations that exist with multiple other health maladies. Questions remain as to etiology, and whether poor sleep is secondary to other diseases, or if other diseases are secondary to poor sleep. Different national sleep study organizations and reporting agencies report that as many as 70 million Americans, or about one out of every four people, experience insufficient and/or non refreshing sleep on a regular basis. Additionally, poor quality and insufficient sleep are known to be associated with many negative health outcomes such as arthritis, cardiopulmonary diseases, diabetes, irritable bowel syndrome, obesity, depression and other psychological disorders. This study was completed to assess a cross sectional population based community survey to evaluate if the social capital issue of fear of crime/fear of personal harm in one's neighborhood is associated with poor quality and insufficient sleep. Using data from the 2009 Prevention Research Council of Michigan's (PRC/MI) "Speak to your Health! Community Survey", a population based random sample telephone survey, this study examined the relationship between (self-reported) perceived fear within one's neighborhood, and poor quality or insufficient sleep, as reported to trained interviewers using a scripted questionnaire developed by the PRC/MI staff and PRC's community stakeholders. Respondents from the City of Flint, and the surrounding Genesee County, Michigan, U.S.A. were surveyed in January through April 2009, by way of a random sample of residents from all Census Tracts in the county, utilizing a telephone interview methodology and employing a scripted/developed questionnaire to gather self-reported data regarding health and health related issues of the respondents.

Chapter I: Introduction-Problem Statement and Research Hypotheses

A. Problem Statement.

Research regarding the association between insufficient or poor sleep and other individual and public health concerns is crucial because an alarming proportion of people do not sleep the recommended seven to eight hours per night, and/or the quality of sleep they get is non-refreshing, and costs individuals and society billions of dollars annually in direct and indirect costs (Martin, Aikens, and Chervin, 2003). Additionally, poor sleep has negative associations with good health. Insufficient and poor quality sleep, often referred to as insomnia, is defined according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) as "the complaint of difficulty initiating or maintaining sleep, early awakening, and interrupted or non-restorative sleep. Additionally, nighttime symptoms are accompanied by clinically significant impairment in daytime functions, for which no identifiable cause is attributed," as cited in Chronic Insomnia and Stress System, (Basta, Chrousos, Vela-Bueno and Vgontzas, 2007). According to the National Sleep Disorders Research, insomnia (for convenience the terms insomnia, poor quality sleep, and insufficient sleep will be used interchangeably throughout the document to mean inadequate duration, or adequate duration but non-refreshing sleep) has long been associated with many negative health outcomes such as arthritis, cardiopulmonary diseases, diabetes, irritable bowel syndrome, obesity, depression and other psychological disorders (National Sleep Disorders Research, retrieved from http://www.nhlbi.nih.gov/health/prof/sleep/res_plan/section4/section4e.html), and could possibly be shown to have an etiological relationship to these other health maladies if additional research is completed in this field. Further, sleep related health and societal problems associated with poor sleep, cost Americans more than $1.8 billion dollars in direct costs and more than $80

billion dollars in indirect costs annually, further supporting that additional research, intervention, and analysis regarding insomnia and its related associations should be examined more thoroughly to gain knowledge and understanding of this debilitating and costly health problem (Martin, et. al., 2003).

1. Incidence/Prevalence.

According to the National Sleep Foundation (NSF), a nonprofit advocacy and research organization, Americans get an average of six hours, forty minutes of sleep per night on workdays, and seven hours, twenty five minutes of sleep on non-workdays. The recommended amount of sleep for most adults is seven to eight hours of sleep per night on all nights (*Sleep in America Poll*, 2008). The above statistics do not truly indicate the enormity of the problem that poor sleep is having on the health and quality of life of many individuals among the American public, because it is an average of all sleepers, many who are getting adequate sleep, i.e. seven to eight hours or more on a regular basis, therefore masking the enormity of the health problem of those getting inadequate sleep. The real and little studied problem is the wide spread prevalence of an inadequate amount of sleep being reported by the millions of individuals getting less than seven to eight hours per night or sleep that is non-refreshing sleep. Due to the averaging effect by good sleepers getting adequate sleep, we can extrapolate and better understand the magnitude of the problem of individuals getting insufficient sleep, and recognize this is an enormous health and societal problem. The biggest and most glaring concern regarding insufficient sleep can be easily illustrated in the number of people who regularly sleep less than six hours per night, approximately 16% of all respondents of the National Sleep Foundation's 2008 *Sleep in America Poll*. Assuming the results of this representative poll are indicative of the entire U.S. population, this equates to over 49 million people nationwide suffering the ill effects of insomnia on a

regular basis. Other agencies report an even greater incidence, "It is estimated that 50 to 70 million Americans [approximately one in four or five] suffer from a chronic disorder of sleep and wakefulness, hindering daily functioning and adversely affecting health" (Institute of Medicine in *Sleep disorders and sleep deprivation: an unmet public health problem*, 2006, p. 20). Because many of the ill effects of chronic insufficient sleep do not appear immediately but take years to manifest into diagnosable health problems, American society may be heading toward a virtual sleep deprivation "train wreck" if the present problem is not recognized and turned around. The enormity of this health dilemma warrants that research into the etiology of this widespread societal disorder continue, and solutions be identified.

2. Personal/Societal Costs.

a. Personal non-monetary costs of insomnia and non-refreshing sleep

According to Dr. Carlos Schenck (2007), some of the health and public concerns resulting from insufficient and poor quality non-refreshing sleep include:

1. Concentration decreases
2. Decision–making ability declines
3. Irritability and frustration increase
4. Motor function is impaired
5. Speech is impaired
6. Car accidents are more common
7. Workplace accidents are more common
8. Ability to fight illness and disease declines
9. Mental and physical health disorders worsen

10. The aging process increases

Additionally, stress and fear have been implicated as agents contributing to disrupted sleep. Research by to Meerlo, Sgoifo, and Suchecki (2008, p. 197), suggests "Studies on both humans and rodents have shown that sleep deprivation and sleep restriction are conditions often associated with mild, temporary increases in the activity of the major neuro-endocrine stress systems" or in other words, the physiological systems that are activated in situations associated with stress and fear. These same physiological systems working with the body's sympathetic nervous system go into action, and are the body's primitive and automatic response to a perceived threat or attack. According to Porth, when a perceived threat is experienced, the human body prepares for action by releasing adrenaline and cortisol into the bloodstream which cause the body to undergo some dramatic changes, including increased respiratory rate, pupil dilation, impulses quicken, and additional blood flows to the core muscles and limbs preparing to meet the supposed attacker (2006). Additionally, "The sympathetic nervous system manifestation of the stress reaction has been called the *fight or flight response*. This is the most rapid of the stress responses and represents the basic survival response of our primitive ancestors when confronted with the perils of the wilderness and its inhabitants" (Porth, 2006, p. 154). This heightened physiological response triggered by stress and fear is the antithetical opposite response needed to allow the human body to prepare for rest and sleep. Thus, it is very understandable if fear of one's neighborhood is ever present, quality sleep is difficult to attain. Also, this hormonal response to stress and fear is harmful to the body organs and tissues; while the fight or flight response is needed at times, a steady release of adrenaline and cortisol into the bloodstream is damaging to body and organ tissues, similar to driving an automobile at its maximum speed for days on end. Porth, in describing disorders of the stress response, said "For

the most part, the stress response is meant to be acute and time limited. The time-limited nature of the process renders the accompanying catabolic and immunosuppressive effects advantageous. It is the chronicity of the response that is thought to be disruptive to physical and mental health" (2006, p. 159). Not only does the heightened functioning of the organs tend to cause premature aging and tissue damage, but a steady diet of these excess hormones flowing through the body also cause weakening of the immune system, allowing increased opportunity for disease, in the form of opportunistic microbes and pathogens (Smeltzer, 2010). Thus, it seems very plausible to understand that increased stress and fear not only prevent restful and restorative sleep, but also launch a counter attack to good health by the action of too much of the hormonal stimulus of adrenaline and cortisol.

While personal costs of insomnia and non-refreshing sleep are high in terms of poorer quality of life, diminished health status, and increased co-morbidities, the personal dollar cost would be different from individual to individual and difficult to estimate. The personal cost of poor sleep seems more relevant to quantify in terms of lost opportunities, diminished health and health outcomes, and lessened quality of life issues.

b. Estimated Dollar Costs to Society in General.

Costs related to insomnia can, like any other health related problem, be viewed as direct and indirect costs. Personal direct costs are the actual dollars spent on visits to the clinic, hospital, or physician's office for examination, for diagnostic testing, to purchase over the counter (OTC) and prescription medications, and for various other therapies thought to improve the client's health condition and improve quality of life. Indirect costs are those costs that may be more difficult to quantify and measure, but include things like lost income for the patient and their

family, loss of regular productivity (including additional work to be done by employers, co-workers, family and friends), and the loss of innovative ideas and efficiencies that would be put into practice if employees were well rested, and on the job. Additionally, indirect costs include the assistance needed, both monetary, non-monetary, and work days lost by family members and friends of the ill individual, while providing care for them. While these costs are difficult to estimate, a meta-analysis done in 2003, estimated the national direct costs of insomnia in 1994 in the U.S., to be $1.8 billion directly attributable to the condition, and the indirect costs, again for 1994, to have been between $80 and 92 billion in the U. S. (Martin, et. al., 2003). While these appear to be the most recent compilation of costs estimated and published relative to insomnia, it could be easily predicted that these costs have risen exponentially from the dollar values reported in 2003, but reflecting dollar costs from 1994.

B. Key Definitions.

The following terms are defined to provide a foundation for the narrative of this work, and to help the reader follow the thought processes of the author.

1. **Insufficient sleep:** As defined by in the Sleep Syllabus, "altered sleep [that] is associated with some change in one's ability to function during the daytime." (retrieved from http://www.sleephomepages.org/sleepsyllabus/1.html)
2. **Poor quality sleep and non-refreshing sleep:** Sleep that has lasted for sufficient duration (recommended seven to eight hours per night for adults), but that does not refresh nor permit optimal wake time functioning, sometimes causing the individual to seek medical attention.
3. **Sleep Function:** "One hypothesis is that sleep serves to reverse and/or restore biochemical and/or physiological processes that are progressively degraded during

prior wakefulness. This classical view of sleep function has prevailed over competing hypotheses, largely because it is so intuitively reasonable." (retrieved from http://www.sleephomepages.org/sleepsyllabus/1.html)

4. **Negative health outcomes:** Less than optimal health consequences, both short and long term that may be exacerbated by insufficient or non-refreshing sleep.
5. **Etiological:** Referring to the doctrine of causes, specifically of the causes of diseases (retrieved from http://www.sleephomepages.org/sleepsyllabus/1.html)

C. Purpose of proposed research.

A statement from the National Sleep Foundation (NSF) in their 2003 *Sleep in America Poll*, builds a strong foundation for the purpose of the proposed research. It states "The better the person's overall health, the better his or her sleep. And vice versa: The higher the number of medical conditions, the more likely it is for the person to report sleep problems. This type of correlation also held true with lifestyle and outlooks: Those with more active lifestyles and a more positive out-look on life tended to have fewer sleep complaints" (*Sleep in America Poll*, 2003, p. 19). Therefore, better quality sleep should have a positive correlation with improved health, higher activity levels, and better psychological well-being. It stands to reason that continuing research to investigate the associations of these often very treatable correlates of poor sleep may have great positive effects on the health of millions of Americans, as well as billions of dollars of savings in both direct and indirect costs, not to mention a yet incalculable saving and reduced strain on the health care infrastructure of the nation.

Additional justification for the proposed research can be seen by assessing the value of sufficient and quality sleep as illustrated by identifying the unhealthy symptoms and problems associated with insufficient sleep duration, and non-refreshing sleep. According to Dr. Carlos

Schenck (2007, p. 11), speaking of the necessity of good sleep, said "Many experts believe it's to recharge our energy supplies and repair our bodies, much like charging up a cell phone after using it all day. Certain hormones, such as growth hormone, are released during sleep, and the body tissues go through repair processes." Sleep function has many possible positive effects on the human body, all of which are not fully understood. Fortunately today, the ill health effects due to insufficient and poor quality sleep are being recognized by greater numbers of clinicians and researchers, and are leading investigators to conduct further research to identify and better understand the need of sufficient quality sleep, coupled with supporting research correlations to make a stronger case that adequate sleep helps maintain optimal health throughout the lifespan.

Further, as stated by the NSF in their 2008 *Sleep in America Summary*, the report of their nationwide study, "Even though just over one-half of the respondents (52%) get seven or more hours of sleep on workdays, 44% get less than seven hours of sleep on workdays"(2008, p. 9). Similarly as reported by the Prevention Research Center of Michigan (PRC/MI), in 2008 speaking of their 2007 community survey results conducted in the city of Flint and Genesee County Michigan, the reported amount of sleep for this localized population closely mirrors the proportions and hours of sleep as the national statistic. The PRC/MI is one of 35 Prevention Research Centers (Funded by the Centers for Disease Control, Department of Health and Human Services, working in conjunction with the University of Michigan, School of Public Health) and is described as "an independent network of community, academic, and public health partners to conduct prevention research and promote the wide use of practices proven to promote good health" as stated on their website (University of Michigan School of Public Health, retrieved from http://www.sph.umich.edu/prc/). The PRC/MI "Speak to Your Health" 2007 summary reports 46% of adults aged 18 and above get less than seven hours of sleep per night with the average city of Flint resident getting only six hours, 27 minutes of sleep, and the average out

county resident getting six hours, 49 minutes of sleep each night. The 2009 PRC data closely mirrors the values reported in the 2007 PRC data. Additionally, PRC/MI reports in their April 2008 newsletter, *Sleep and Health in Genesee County*, that one out of nine residents county wide report poor sleep or trouble falling asleep every night of the month (PRC/MI, 2008). This seemingly inconsequential fact may appear to be just the result of the very busy lifestyles of Americans in the 21st century, but examination of the wider perspective of the present ill health effects, long term health ramifications, added burden to the health care system, and the direct and indirect costs associated with insufficient or non-restful sleep should be of major concern to the medical community, government health agencies, health care insurance providers, and to individuals and families alike.

Studies have been done attempting to isolate the etiology of why some Americans are sleeping so poorly, with various reasons being implicated. Researchers Kruger, Hutchison, Monroe, Reischl, and Morrel-Samuels looked at many social capital issues including fear of crime and fear of one's neighborhood in the context of possible ill health effects. Additionally, neighborhood fear or fear of crime has been suggested as a possible cause for loss of sufficient and restful sleep (Kruger, et al, 2007). This study has looked for an association between poor sleep and fear to determine if there exists a relationship between these two physiological processes.

D. Research Hypotheses.

This study attempts to determine if a relationship exists between insufficient sleep duration and/or non-restful sleep, and self-reported personal fear/fear of the neighborhood in which a person lives, based on the data of the 2009 PRC/MI survey, conducted in the in the City of Flint, and Genesee County, Michigan.

Chapter II: Literature Review-Sleep and Neighborhood Fear

A. Historical Overview.

Many studies have documented that sleep problems are reported among people with certain health issues. Darrel Drobnich states "You would expect to see poorer sleep within a chronically diseased population" (*Sleep in America Summary*, Press Release, 2008). The association of poor sleep with other co-morbid diseases and illnesses, while yet unproven, is widely recognized among those studying this topic, but the causal correlations have yet to be definitively established. According to the Institute of Medicine (IOM), speaking of the importance of adequate sleep reported "chronic sleep insufficiency is under-recognized as a public health problem, despite being associated with numerous physical and mental health problems, injury, loss of productivity, and mortality" (IOM, 2006, p. 20). As stated earlier, it is estimated that 50 - 70 million Americans suffer from some type of chronic sleep disorder that hinders daily functioning and adversely affects their health. This incidence rate is exacerbated even further according to Cortoos, Verstraeten, and Cluydts, as cited in Basta et al. considering that "60% of the people suffering from insomnia never talk to their physicians about their sleeping difficulties" (2007, p. 1). Based on this estimate of unreported insomnia sufferers, coupled with the above approximation of 50-70 million American insomniacs, the total number of Americans suffering with insomnia or chronic poor sleep could possibly be well over one third of the entire population. These studies demonstrate that poor sleep and insomnia have an immeasurable impact upon society, both in the personal realm as well as the financial drain on the healthcare industry and the losses of productivity to society.

The fact that poor sleep and other diseases are correlated, whether one causes the other, or if both are symptoms of yet another unidentified variable, reinforces the need to continue research, increase understanding of sleep and its importance to overall health, and ultimately to establish etiology of insomnia and non-restorative sleep. Further the IOM emphasizes "There around 90 distinct sleep disorders; most are marked by one of these symptoms: excessive daytime sleepiness, difficulty initiating or maintaining sleep, and abnormal events occurring during sleep. The cumulative long-term effects of sleep loss and sleep disorders have been associated with a wide range of deleterious health consequences including an increased risk of hypertension, diabetes, obesity, depression, heart attack, and stroke. After decades of research, the case can be confidently made that sleep loss and sleep disorders have profound and widespread effects on human health" (IOM, 2006, p. 55). Research by Ramsawh, Stein, Belik, Jacobi, and Sareen, studying anxiety disorders and insomnia found a significant association between reduced sleep quality and increased odds of one or more disability days (adjusted odds ratio of 2.72, 95% CI) among a community sample utilizing data from the German Health Survey, a stratified, cross-sectional, multistage nationally representative sample of individuals aged 18-79 from the non-institutionalized population of Germany (Ramsawh, et al, 2009). The historical case for poor sleep being associated with other comorbid conditions has a wide range of ill-health associations, yet sufficient research has yet to be competed to find answers and establish etiology.

B. Evaluation of Current Research.

The literature search terms and restrictions, detailed below in Table 1 below, directed the review of current research. The literature review for this study details the latest knowledge regarding the health problems associated with insufficient sleep, as well as time honored understanding about the benefits of restful sleep. Further, the literature review conducted for this

study examined articles describing research done considering topics similar to the PRC/MI survey of health related questions of a large urban phone survey like the PRC/MI data represents. Current literature was reviewed for studies that have looked for relationships or correlations between sleep quality and quantity, as it is associated with neighborhood fear, fear of crime, or personal fear for similar reasons. Studies were sought that used a similar self-report method of participants' fear or apprehension concerning their personal safety, along with self-report average quality and quantity of sleep of the respondents.

Table 1: Literature Search Table

Search:

Literature Search Results Using Social Works Abstracts, including optional databases *CINAHL Plus Full Text, PsycArticles, and PsycINFO*	
Search Criteria	Hits
"Sleep disorders", "neighborhood fear" using logical operator "and"	344
Refined Literature Search with Limiters (to the above combined search criteria)	
Search Criteria-Limiters	Hits
Publication Years: 2004-2009	108
Peer Reviewed	85
Age Group: Adults 19 & older	23

1. Deficiency in the Literature.

While a few studies have been done looking for an association between "fear of neighborhood crime" and "physiological and psychological stress" fewer still have been done researching "neighborhood fear" and "sleep disorders/insomnia."

a. Building on the Current Literature.

According to research done by LeBlanc, Beaulieu-Bonneau, Merette, Savard, Ivers, and Morin, a study examining the relationship between psychological and health related quality of life variables with insomnia, in a population based sample, found insomnia to be associated with an increased stress level and psychological symptomology, as well as an increased disposition to arousal resulting in greater impairment to the quality of health. This study, while not directly addressing the same variables as the present study, does lay the groundwork for an association between the inability to initiate sleep or to maintain sleep in the presence of perceived stress and psychological factors, and will serve as reference material for the proposed study (LeBlanc et al., 2007).

Another study conducted by Stafford, Chandola, and Marmot, among 50-75 year old adults in London, England, in 2002-2004, found an association between fear of crime and measures of anxiety and depression, by the adjusted odds ratio (AOR) of 1.93, meaning that participants reporting a fear of crime were nearly twice as likely to have been found with co-morbid anxiety or depression. Further, this study reported associations between fear of crime and reduced physical functioning, (or less participation in physical and social activities). The authors state "Although fear of crime could lead to poorer health, it is equally plausible that physical health limitations and poor mental health could increase a person's sense of vulnerability and fear of the effect of crime" (Stafford et al, 2007, p. 2076). Fear of crime was reported as being lowest

among participants who regularly participated in social functions and saw friends often, therefore the age old "chicken and the egg" argument of causation is again brought to mind. Does fear of crime limit people from getting out to social functions, which in turn increases insomnia, or does insomnia limit social functioning thereby increasing fear of crime victimization? While this referenced study did not report actual crime statistics for the neighborhoods of the participants of the study, the measure of fear of crime was self-report as attested by questionnaires mailed to participants and returned to the research staff. The scale for fear of crime was based on responses to four questions asking how fearful they were in their neighborhoods concerning: (1) their home being broken into, (2) being mugged or robbed, (3) car being stolen/items stolen from car, and (4) being raped. The responses were scored using a four point Likert scale and a rubric constructed creating a fear scale with a range of values from zero to twelve (Stafford, et al. 2007, p. 2076). While this study contributes to the body of knowledge regarding fear of crime and the associations of poor mental health, as well as reduced physical functioning, it does not address specifically the topic of neighborhood fear, and insomnia/poor sleep. This information may be useful as reference for the present study, between neighborhood fear and insomnia, but does not directly address this area of research.

Another related study undertaken in Malaga, Spain, in 2008, details a study of dynamic situational factors in an urban setting, and the fear of crime utilizing survey responses, (a research style which has its roots in the United States from the 1960s). The author noted that a definitive objective measure for fear of crime did not exist in those early studies, and still is rather subjective in studies being conducted yet today (Miller, 2008). This study also notes that "Mainstream scholarship on fear of crime increasingly recognizes its multidimensional character highlighting discrete concepts such as those concerned with: (1) perceptions of overall levels of crime or disorder; (2) perceptions of personal risk of being victimized; (3) intensity of fear or

worry about being a victim; and (4) behaviors that are taken as a response to crime fears." (p. 314). The author discusses the issue of the difficulty of measuring fear with a survey instrument, and introduces the idea that fear can be both episodic or an ongoing state of mind. While this debate continues, research by Hough, et al. (as cited in Miller, 2008, p. 309) argues that, "ongoing worries and anxieties should continue to be a key focus of fear of crime research" as opposed to episodic times of fear. While this article, in and of itself, does not constitute an empirically researched accepted answer regarding how fear in research studies should be measured, and in what context, i.e. episodic or state of mind, it seems prudent to use the state of mind measure of crime fear as the type of fear that may have long term health effects and influence insomnia. This study contributes to the knowledge base for creating a generally acceptable measure of what constitutes fear of crime using survey responses (the multi-dimensional discrete concepts), and thereby outlining a fairly uniform method of concepts to include for measuring this very subjective personal feeling. It also highlights the need to further the standardization of measures for future study in any research using fear of crime as a variable. While these dimensions of cognition of crime, and the resulting personal fear, are more global than the more specific dimensions of crime fear reported in the Stafford, et al. 2007 study mentioned above, together these findings contribute to the knowledge base by defining how fear and fear of personal harm are adequately measured in a self-report survey.

Another study undertaken by Hill, Burdette, and Hale, studied neighborhood disorder, sleep quality and psychological distress to test a model of structural amplification (Hill, et al, 2009). This study used data from the 2004 Survey of Texas Adults to "examine the association between perceived neighborhood disorder and psychological distress. Building on previous research, [they] tested whether the effect of neighborhood disorder is mediated or moderated by sleep quality" (p.1006). This study has some similarities to the proposed study, but does not mirror it.

The findings of this research are that disorder in the neighborhood is positively associated with poorer quality sleep and increased psychological distress. In other words, as neighborhood disorder increases, sleep quality decreases and stress levels increase. Further, this study reported that a positive association between neighborhood disorder and psychological distress is partially explained, and moderated (increased) by poor sleep quality (Hill, et al, 2009). This study may be the most similar to the present study found to date, yet it still does not speak to the same variables, because the definition of neighborhood disorder does not mean the same thing as neighborhood fear. The authors define neighborhood disorder as the elements of "structural dilapidation, pollution, noise, crime, public intoxication, and other incivilities" (p. 1006). While these concepts likely define neighborhood disorder very appropriately, this emphasis is on a much broader scale than the present study looking at the factors of neighborhood fear, or fear of crime, and the possible association with poor sleep.

Researchers Morin, Rodrigue, and Ivers, in their 2003 article, Role of Stress, Arousal, and Coping Skills in Primary Insomnia, looked at stressful life events to determine if the psychological arousal mechanisms experienced by individuals were associated with insomnia and/or poor sleep. Their findings, while very detailed and comprehensive, found no difference in the number of minor stressful life events occurring in the lives of good sleepers and insomniacs (respondents were categorized using the Insomnia Interview Schedule), but did report a difference in the perception of stress level between the two categories (insomniacs versus good sleepers) of respondents. The insomniacs "relied more on emotion-oriented coping strategies, and reported greater pre-sleep arousal than good sleepers." Additionally, the authors concluded "The findings suggest that the appraisal of stressors and the perceived lack of control over stressful events, rather than the number [of] stressful events per se, enhance the vulnerability to insomnia" (Morin, et al, 2003, p. 259). This finding relates to the present study of neighborhood

fear, including the respondents' perception of fear, and consequently if this level of fear and arousal then produces insomnia or poor sleep.

b. Measures and Design

Establishment of the criteria for insomnia has in many studies been established using the DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, as provided by the American Psychological Association, but due to the extensive and very clinical nature of the criteria, this tool will not be used in the present study. Another, shorter instrument that permits rapid evaluation of insomnia and its severity, is the Short Insomnia Questionnaire (SDQ), and is based on the DSM-IV. According to Violani, Devoto, Lucidi, Lombardo, and Russo, the developers of the SDQ, it is a self-report insomnia questionnaire and has been shown to be a valid instrument for detecting (prescreening) insomnia in patient populations. While this instrument may have considerable merit, the present study will be using data collected by the PRC/MI, which used a rubric of responses from several questions to determine participant level of good sleep/poor sleep (Violani, et al, 2004; PRC/MI, 2008).

As regards the body of knowledge using a telephone based cross sectional interview survey to assess the correlates of a sleep related study, research done by a group of researchers found that a telephone survey using a sample from a population was indeed effective in determining self-perceived sleep problems, as well as health related quality of life factors. "This new method of collecting survey data was evaluated in a randomized validation study of 150 employees who were ineligible for the [main] study, either because they had not met the minimum employment period at the company or they did not subscribe to the firm's fee-for-service health plan" (Kuppermann, Lubeck, Mazonson, Patrick, Stewart, Buesching, and Fifer, 1993, p. 26). The

research confirmed that the use of a telephone survey method of data collection was as effective in collecting self-report data from respondents as any other method of survey questionnaire.

C. Theoretical Model.

This study uses as a foundation the beliefs of the Transactional Model of Stress and Coping (TMSC) as the theoretical model for understanding and analyzing the responses from the participants regarding their perception of fear, and how that perception my influence their ability or inability to attain refreshing sleep (Wenzel, Glanz, and Lerman, 2002). The TMSC framework posits that when situations, events, or changes happen in a person's personal life, social structure, health, family situation, neighborhood, employment, or other life events, the person's primary appraisal of the situation results in one of two perceptions. If the situation is not viewed or appraised as a threat, then no stress results and the event does not precipitate any negative or positive stress. If the event or change is perceived as a threat, then a secondary appraisal is made by the individual which results in another dichotomous situation where the secondary appraisal produces either a perception of an inability to cope with the threat and is viewed as negative stress, or it produces a perception that the individual does have the ability to cope with the situation, which is viewed as positive stress (Lazarus and Folkman, 1984).

To better understand and differentiate between these two terms, we need to define and give some examples of each.

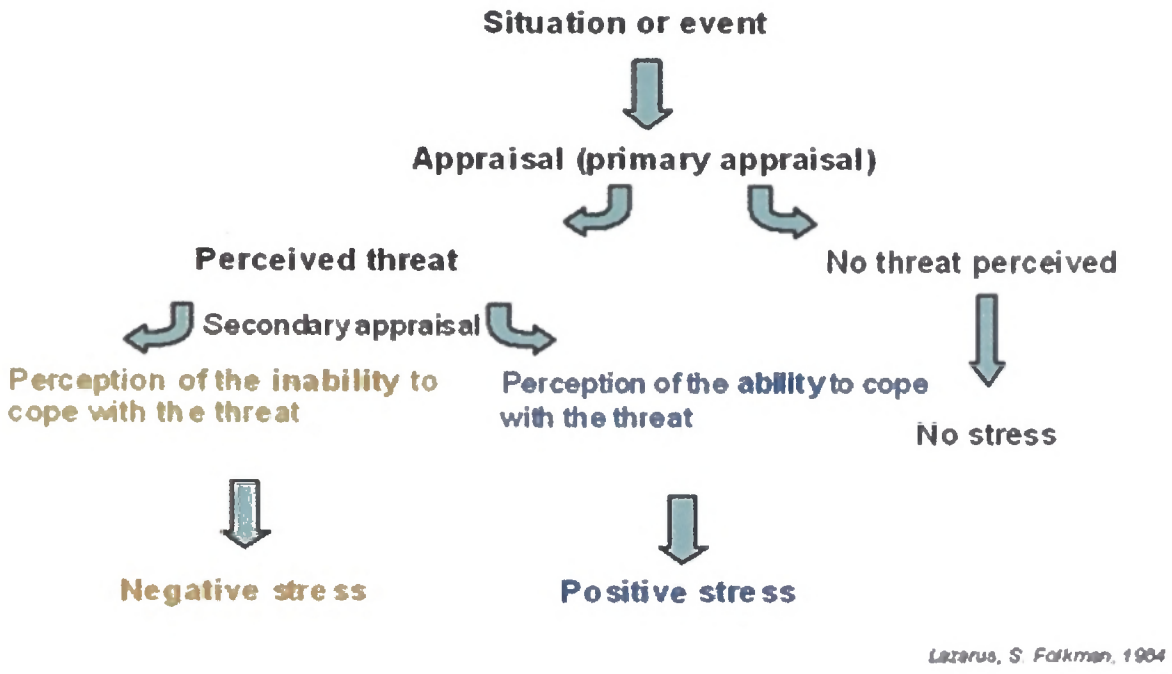
- **Positive Stress**: Vacation or party planning, getting married, a job interview, and accomplishing tasks prior to deadline can all involve stress, but normally these situations are considered positive stress because, while stressful to plan, get through, or anticipate, they normally give feelings of increased energy, excitement, and creativity. Positive

stress, in manageable amounts, is good and can increase human efficiency in performing tasks and finding new solutions to problems.

- **Negative Stress:** Negative stress is the uncomfortable and unsettling situation we normally think of when the term stress is mentioned; i.e. being stuck in traffic knowing that the boss will not understand why a meeting was missed, receiving the notification that someone we care about has been diagnosed with a terminal illness, loss of one's house or business due to financial difficulty, and even smaller things like car repairs that upset daily schedules, require alternate arrangements to make appointments, work, and school, and that wreak havoc on the personal budget.

Negative stressors are the events that we feel we have little or no control over, while positive stressors are the stressful events that we feel confident that we can handle and do have control over. While in reality there is an actual element of whether a person does or does not have control over a situation, attitude also plays a big part in whether life events become negative stressors or positive stressors. People do experience situations where they have absolutely no control, but the element of personal attitude toward the situation is often the determining factor in whether the event is viewed as a positive or negative stress in their life. The following flow chart is helpful in understanding how the individual processes situations or events, and whether the event then creates no stress, positive stress, or negative stress in the life of the individual.

Figure 1: Lazarus' Model of Positive and Negative Stress



The Transactional Model of Stress and Coping gives structure and organization, as well as previous theoretical research understanding as a foundation for the study, the plausibility of the research question, the methodology of data gathering, the analysis of the data, and the conclusions drawn from the findings (Wenzel, et al., 2002).

Chapter III: Methods and Design-Implementation of the Proposal

A. Subjects.

Genesee County, Michigan, has a population of 436,000 people according to the census of 2000. The racial composite of the county is 75.3% White, 20.4% Black/African American, 0.5% Native American, 0.8% Asian/Pacific Islander, 2.3% Hispanic or Latino, and 0.7% from other races. The county population had the following age representation: 27.40% under the age of 18, 8.90% from 18 to 24, 29.70% from 25 to 44, 22.40% from 45 to 64, and 11.60% who were 65 years of age or older. Wholly within the county is the City of Flint, whose population is made up 125,000 people, with the following racial makeup, 53.3% Black/African American, 41.4% White, 0.6% Native American, 0.4% Asian/Pacific Islander, and 4.3% from other races and mixed races. In the city the population age dispersion was as follows: 30.6% under the age of 18, 10.3% from 18 to 24, 29.4% from 25 to 44, 19.2% from 45 to 64, and 10.5% who were 65 years of age or older (U.S. Census Bureau, retrieved October 04, 2011).

1. Demographics of Sample.

The sample of the population was selected attempting to mirror the actual population. Households within the City of Flint and in the out county area were selected randomly by household and by census tracts, with the following demographic characteristics: 68.5% were female, 31.5% male, with the average age of respondents at 48 years, and the range of age at 18-100 years. 65% of the sample respondents were European American (White), and 27% of respondents were African American (Black), and the remaining 8% making up the remaining racial groups (PRC/MI, 2008).

2. Discussion of Sample Size.

The total sample size was 1862 respondents, with 54% of the sample being out county residents and the remaining 46% being residents of the City. Participants were selected based on census tract of residence. Further, city Census Tracts were over sampled compared to the out county tracts, i.e., twenty residents were obtained from each Flint Census Tract while only ten respondents were interviewed from each out county tract (Kruger, 2008).

B. Design.

The research design used to collect the data was a cross sectional population based community telephone survey conducted from January to April of 2009.

1. Discussion of Sampling by Census Tract.

Census tracts were selected as the geographic delineation for sampling the population to assure that survey respondents were representative of the entire geographic region.

2. Basis for Biannual Cross-Sectional Survey.

The PRC/MI partners desired to have current local data to assist in research and to address health disparity policy issues. The PRC/MI Speak to Your Health! Community Survey has been done in Flint and Genesee Count on a biannual basis beginning in 2003, and has now been completed five times (the most recent data collected in 2011 has not yet been released to the stakeholders or the public, at the time of data analysis of this study). The *Speak to Your Health! Community Survey* was funded by a grant from the Centers for Disease Control and Prevention Number U48 DP000055, and the Genesee County Health Department (Kruger, 2008).

C. Measures.

1. Detail of Survey Instrument and its Development.

The survey instrument was designed and developed through a collaborative process by the various stakeholders, including members from the University of Michigan's School of Public Health, the Genesee County Health Department, the Greater Flint Health Coalition, University of Michigan-Flint, Faith Access to Community Economic Development, Genesee County Community Action Resource Department, and the Flint Odyssey House-Health Awareness Center, and was approved by the Institutional Review Boards at the University of Michigan, and the Michigan Public Health Institute (PRC/MI, 2008). The actual survey instrument is a 160 question survey conducted by trained telephone interviewers using a scripted questionnaire to gather data from a random sample of residents from all Census Tracts in Genesee County, Michigan, including the City of Flint, which is wholly within the county. The questions were developed using the goals of the various stakeholders to determine the attitudes, practices, health concerns, and community factors related to the health of the participant sample.

The perception of fear of crime and fear of one's neighborhood were determined by summing the responses of the four rear related questions to obtain a more comprehensive single value of fear (Total Fear) for each respondent. The participant responses were answers to Likert style ordinal choices for perceived fear, therefore the summation of the individual responses into the value of "Total Fear" is used as an index to rank order the mean value of respondent fear among the census tracts, and has no quantifiable value of the relative and subjective value of personal fear. Thus the values of "Total Fear" are ordinal, and are used only as being relative to the values of "Total Fear" of other respondents.

D. Procedure

1. Discussion of Instructions to Survey Callers Making the Calls.

Residences in each of the Census Tracts were identified, and individual residences were randomly selected within each tract. Phone numbers were sought for each selected residence and the survey callers begin calling. The callers were given a script to work from, that allowed the callers to identify themselves and to describe the survey, gave the respondent the name of the PRC/MI Project Manager and his phone number, and explained why the PRC/MI and the Genesee County Health Department are implementing the survey, and asked if the person who took the call was an adult 18 years old or older. The callers also informed the respondent that all data would be kept confidential, that their answers were confidential, and no one would try to identify the respondents from the data. Respondents were also notified that they would receive no compensation, but that the data collected may help others in the future. They were also told they may feel uncomfortable talking about past experiences, and were offered resources to help them address these issues if they desired. They were told they may choose not to answer any question(s) and may at any time stop the survey without penalty. The respondents were given the opportunity to ask questions and to decline to complete the survey. If they agreed to begin, the callers began asking the questions (PRC/MI, 2008).

All data reported in the PRC survey has been de-identified, so that individual respondent's data cannot be linked or identified with the survey participant. Institutional Review Board (IRB) application and review for the present study using the data collected by the PRC was submitted indicating that secondary data is being used. The IRB determination was that this study is "exempt" due to use of secondary data.

Chapter IV: Analysis of Data and Results

A. Analysis:

Data analysis was done using the Statistical Package for the Social Sciences (SPSS, An IBM Company) to look for relationships between the four sleep related questions and the four fear related questions from the survey. Because the data has been collected and grouped by Census Tract, analyses will be completed by assessing the various census tracts to determine if varied social capital issues among the locations or other dynamics may have an effect on the data being studied to determine if residents fear of crime or fear of their neighborhood effects quantity and quality of sleep. The analysis will include rank ordering the census tracts by:

- Measures of fear (Total Fear)
- Hours of sleep
- Crime Severity (calculated value of crime indexed for crime severity)

We begin with a discussion of the survey questions used to conduct the analysis for fear of crime/fear of the neighborhood, and then of the questions that address sleep quantity and quality as asked in the community telephone survey conducted in early 2009 in the City of Flint, Michigan, and the surrounding out county communities of Genesee County, Michigan. While much analysis and research could be undertaken evaluating participant responses comparing and contrasting between the City of Flint respondent data, and that of the other regions of the county (smaller cities, suburban communities and rural townships) this study is limited to the data corresponding to the City of Flint. The four questions used addressing sleep are listed below, numbered one through four (although in the survey they were questions six through nine of the actual 160 survey questions). The questions asked were as follows:

1. How fearful are you about crime in your neighborhood? Are you…

    1) Very fearful
    2) Somewhat fearful
    3) Not very fearful
    4) Not at all fearful

2. How safe is it to walk around alone in your neighborhood during the daytime? Would you say it is…

    1) Extremely dangerous
    2) Somewhat dangerous
    3) Fairly safe
    4) Completely safe

3. How safe is it to walk around alone in your neighborhood after dark? Would you say it is…

    1) Extremely dangerous
    2) Somewhat dangerous
    3) Fairly safe
    4) Completely safe

4. Compared to other neighborhoods, the crime rate in your neighborhood is…

    1) Very high
    2) High
    3) About the same
    4) Low
    5) Very low

All four fear questions allowed respondents to convey their answers to the trained survey callers based on the above ordered responses, with the lowest numbered responses indicating high values of fear (i.e. "very fearful", "extremely dangerous", and "very high [crime rate]", all equal to a one (1) response on the ordinal (Likert) scale style answers from the participant, and lesser categories of fear resulting in quantitative data values of higher numeric value, i.e. responses of (2), (3), (4), and (5). Table 2 (below) lists the minimum and maximum values for each of the four fear questions from the survey for the entirety of the 40 census tracts, the

calculated mean value for each question, and the standard deviation. The four fear questions allowed a convenient calculation of a more comprehensive value of "fear" by way of using SPSS to create a new variable called "Total Fear" which is the summation of the values of each of the four individual fear questions. The table also shows these same value calculations for the summed value of "Total Fear" that is discussed in the next section.

Table 2: Descriptive of Fear Questions and (computed) Total Fear (Tracts 1-40)

	N	Minimum	Maximum	Mean	Std. Deviation
Q6, How fearful are you about crime in your neighborhood?	1812	1	4	2.32	.955
Q7, How safe is it to walk around alone in your neighborhood during the daytime?	1792	1	4	3.39	.728
Q8, How safe is it to walk around alone in your neighborhood after dark?	1666	1	4	2.72	.945
Q9, Compared to other neighborhoods, the crime rate in your neighborhood is	1747	1	5	2.20	1.129
Computed Total Fear	1602	6.00	14.00	10.6436	1.24748
Valid N (listwise)	1602				

Of interest also, note the mean value for "Total Fear" in the above Table 2, as this mean value of 10.6 (total of the four fear related survey responses) for all City of Flint survey respondents will be compared and contrasted with mean "Total Fear" in individual census tracts later in the analysis of data. Also, note in Table 3 (below) that the minimum, maximum, and mean hours of sleep for all City of Flint survey respondents is 6.5 hours, and similarly will be compared with the mean hours of sleep reported from individual census tracts.

Considering the four fear related questions, low values of respondent responses are associated with the highest indicated level of fear (fear of crime) as perceived by the participants, therefore lowest value of "Total Fear" also indicate the most perceived fear by the respondents and increasingly higher values for the "Total Fear" variable indicate lesser perceived fear. Since "Total Fear" is a summation of the individual values ranging from one through five of the original four questions dealing with respondent perceived fear, the range of values of "Total Fear" conceivably could range from a value of four, (indicating the highest perceived fear: respondents would have answered with a 1 response to all four questions), to seventeen, (representing the least feeling of perceived fear, or three 4 responses and one 5 response). The calculated variable, "Total Fear" has an actual respondent range of values of six through fourteen, and was used in calculating the quantitative relationships between perceived fear of crime, and hours of sleep in the following analysis. This totaling of actual respondent data to compute a more comprehensive data value is in keeping with standard research protocol, and was intended to high-light the participant response values in each census tract to simplify the data compilation, and in an attempt to get the larger picture of perceived fear of the residents per census tract for comparison with other census tracts. The calculations of "Total Fear" by census tract are reported in Table 8 along with similar calculations for Sleep Hours, and values for Actual Crime Severity.

Regarding respondents self–reported sleep quantity and quality, I looked at the questions that assessed the respondent's answers to questions 43 through 46 of the survey, which asked about the number of hours of sleep, if respondents encountered problems sleeping, quality of sleep, and if sleeping aid medications were used, and if so the frequency. The format of the questions asked was as follows:

How many hours and minutes do you sleep during a typical night?

43a. Hours
43b. Minutes

***ENTERED IN HOURS**

How many nights a week or month do you have problems sleeping?

44a. Days
44b. Indicate Per week or Per Month

***ENTERED IN DAYS/MONTH**

45. During the PAST MONTH, how often have you taken medicine (prescribed or "over the counter") to help you sleep?

1. Three or more times a week
2. Once or twice a week
3. Less than once a week
4. Not during the past month
5. Never

46. During the PAST MONTH, how would you rate your sleep quality overall?

1. Excellent
2. Very Good
3. Good
4. Fair
5. Poor

Table 3 (below) is the descriptive statistics of the variable Sleep Hours, asked in question 43 for the total of all 40 census tracts within the City of Flint, Michigan.

Table 3: Descriptive of Hours of Sleep Total (Tracts 1-40)

	N	Minimum	Maximum	Mean	Std. Deviation
SLEEP, HOURS slept during a typical night - CALCULATED	802	.0	12.0	6.546	1.7746
Valid N (listwise)	802				

The mean and standard deviation of the responses to these questions for all 40 of the census tracts was calculated using SPSS and the full results are in the Appendix. Just the "mean" values for the four sleep questions for each of the 40 census tracts are shown below in Table 4 below, due to the size of the full calculated document. Note also that the values for the mean responses in 13 of the census tract areas are highlighted. The reasoning for selection of the 13 tracts will be expanded further, but for now note the values of these responses for these sleep questions that relate to the 13 tract areas.

Table 4: Mean values by tract for sleep questions

TRACT	Q45, During the PAST MONTH, how often have you taken medicine to help you sleep?	Q46, During the PAST MONTH, how would you rate your sleep quality overall?	TRSL, Nights a MONTH problems sleeping - CALCULATED?	SLEEP, HOURS slept during a typical night - CALCULATED
1	1.41	3.32	2.810	6.705
2	2.09	2.82	9.762	6.614
3	2.33	2.86	10.850	6.225
4	1.45	3.18	6.350	6.625
5	1.73	2.91	6.909	6.136
6	2.27	2.95	7.591	6.750
7	2.20	2.55	11.737	6.000
8	2.04	3.00	9.087	5.688
9	1.55	3.50	5.773	6.408
10	1.64	2.96	8.227	5.909
11	1.75	3.15	3.056	6.850
12	1.38	3.24	6.950	6.048
13	1.65	2.85	7.900	6.475
14	1.73	2.82	8.905	6.606
15	1.50	3.15	6.600	6.474
16	1.57	2.81	7.200	7.071
17	2.20	2.60	10.550	6.289
18	2.75	2.63	13.636	6.109
19	1.95	3.10	4.889	7.000
20	2.63	2.47	13.316	6.763
22	1.90	2.30	15.684	6.338
23	1.77	2.68	12.364	6.455
24	1.80	2.38	13.250	6.400
25	2.15	2.70	8.263	6.525
26	1.70	3.00	11.053	6.974
27	1.90	3.05	8.571	6.810
28	1.73	3.27	8.450	6.333
29	1.85	3.15	6.050	6.421
30	2.10	3.38	5.450	7.452
31	1.71	3.00	6.286	6.464
32	2.43	3.10	7.400	6.525
33	1.95	2.95	8.238	6.048
34	1.84	2.90	9.158	6.500
35	2.52	3.10	7.048	6.583
36	1.90	3.19	10.857	6.863
37	2.10	2.76	9.700	6.952
38	1.95	2.80	9.600	6.875
39	2.40	3.20	6.050	7.075
40	1.43	2.86	7.952	7.190
Total	1.92	2.94	8.554	6.546

This study used primarily the responses from question 43 (hours and minutes of sleep) in analyzing the data to look for a relationship between fear of crime/fear of the neighborhood and amount of sleep. This decision is due to the possible confounding effects that might be encountered in trying to determine the amount of sleep of the respondents if we were to account for the induced sleep resulting from using prescribed or over the counter sleep medications helping respondents sleep more and better. While the actual hours of sleep reported may already be influenced by those participants using these medications, we have no way of calculating the "un-medicated actual hours" amount of sleep that participants might have had (assuming they had not taken any sleep inducing medications. This also assumes that sleep medications are helpful in causing and maintaining sleep, and participants do sleep more and better while taking sleep medications). While the use and effects of sleep medications are worthy questions that need to be researched to better understand the dynamics of sleep and how those dynamics can be altered, this analysis used the data collected in the PRC survey for Sleep Hours as presented.

While there are multiple associations that could possibly be analyzed, among the 40 census tracts regarding the amount of sleep reported by the survey respondents, with the level of "Total Fear" reported by residents of each tract, this study will look at the worst top twenty census tracts for both the mean "Total Fear" variable and calculated mean Sleep Hours. These values have been arranged by rank ordering of the values, including corresponding census tracts in Table 8 below (the two columns on the left), with the smallest "Total Fear" value at the top and then rank ordered for the remaining census tracts. To better interpret what these data values represent, recall that the variable "Total Fear" is a calculated sum of the values reported for each of the four individual fear related questions, with the lowest possible value of four. To gain better perspective, either a 1 or a 2 participant response to these four questions would have

indicated fear values of "very or somewhat fearful" and "extremely or somewhat dangerous," having a range of response values up to 8.0 (response of 2, times 4 questions = 8) indicating a high level of perceived fear. The actual range of mean values for "Total Fear" of these top twenty worst census tracts is 5.8 to 7.6, therefore it is evident that all twenty of the top worst areas are below, if not well below the value indicating that participants are experiencing what they perceive as "very/somewhat fearful," and "extremely or somewhat dangerous" feelings about fear in their neighborhoods. The two middle columns of Table 8 are a similar rank ordering of the census tracts, but these two columns represent the mean reported amount of sleep by residents in all tracts from the smallest amount of sleep hours to the largest. The right two columns of Table 8 represent the weighted crime statistic "Crime Severity Total" for all census tracts with the highest value or largest calculated crime value (number of crimes committed times severity factor) listed at the top of the column and then in following rank order.

To help highlight the above insights into a more manageable format, the following Table 5 shows just the 13 of the 20 census tracts that reported the most Total Fear and least amount of Sleep Hours. The results are helpful in seeing which census tracts are of greatest interest for further research into this possible association. The results were tabulated by rank ordering the census tracts with most fear and least sleep, and then looking for common census tracts among the lists of these two factors, with the following result.

Table 5: Census Tracts with most Total Fear corresponding with least Sleep Hours

Tract	Total Fear	Sleep hours
3	6.2	6.2
5	7.3	6.1
7	7.1	6.0
8	7.5	5.7
9	7.1	6.4
10	6.3	5.9
12	7.6	6.0
13	7.2	6.5
15	7.2	6.5
18	6.8	6.1
22	5.8	6.3
23	7.0	6.5
34	7.0	6.5

Note also that the mean number of sleep hours reported among these poorest sleepers and most fearful respondents, indicates that all of them are equal to or below the average amount of sleep compared with the average hours of sleep of all City residents who indicated 6.5 hours, as reported in Table 4. Also, take note that the mean values of Total Fear among these respondents in the 13 census tracts is likewise reported as having much greater perceived fear than the average City of Flint resident reported value of 10.6.

B. Perceived Fear of Crime compared with Actual Crimes Severity:

To better understand fear of crime or fear of one's neighborhood, the crime statistics for the City of Flint, MI, were sought out for the year 2008, (the most recent, relevant, and most likely to have influenced the participant responses related to the PRC data gathered in the late winter and early spring of 2009), and were reported by location of where the crime was committed, by Census Tract similar to the data reporting system of the PRC survey. The crimes reported in the annual crime statistics by the City of Flint Police Department (City of Flint, P.D. Crime

Statistics, 2008) were further categorized into seven crime categories; four as crimes committed against a person or persons, and three categories as committed against property. The crime categories as committed against a person include murder, rape, robbery, and assault; while the crime categories as committed against property are burglary, larceny, and auto theft. The summary crime statistics for City of Flint for 2008 are reported in Table 7, below.

The inclusion of actual crime statistics in the analysis of neighborhoods being studied was sought out with the idea of shedding light on the actual causes of fear among the residents of the City of Flint neighborhoods, and may prove to be valuable regarding the quantity and quality of sleep the resident's experience. Additionally, it seems intuitive that residents of neighborhoods near and surrounding where crimes have been committed would experience greater fear than residents of neighborhoods at farther distances from the crime locations. If fear is greater for residents closer to crime locations, and causes residents within those neighborhoods to have heightened levels of arousal and fear, then inclusion of the actual crime statistics will prove beneficial, thus the reasoning for incorporating this data into the assessment and analysis of fear of crime and its relationship to poor and un-refreshing sleep.

To evaluate the level of fear response elicited in residents in near and surrounding neighborhoods of the locations where the actual crimes were committed required an index to assess for crime severity so that all reported crimes could be weighted properly in assigning a value appropriate to the seriousness of the criminal act. It is assumed that more serious and heinous crimes elicit a greater fear response in the residents of the surrounding crime scene location and near neighborhoods, than does the fear response elicited from crimes of lesser magnitude within that locale and near neighborhoods. Likewise, it seems intuitive that higher severity crimes committed at farther distances from one's home neighborhood would elicit lesser

fear responses in residents as the distance from the actual crime location and the resident's home neighborhood increases. Further, less severe crimes committed at greater distances from one's home neighborhood would elicit little or no heightened fear response from the residents of these neighborhoods at greater distance from where crimes have been committed. To evaluate the various crimes reported equally, and to weigh more serious crimes as more fear eliciting to residents in the close and surrounding neighborhoods, a scale was sought out that would facilitate this weighting or factoring of the crimes by severity rather than using just raw numbers of crimes per census tract, which would not give a true depiction of the actual crime situation of each reporting location. The National Survey of Crime Severity (NSCS) was developed to take into account that various crimes differ in severity and should be viewed in their relative relationship among the scope of all crimes, related to this difference in perceived severity. The NSCS scale (See Table Six., Crime Severity Factors) was developed by the U.S. Department of Justice over a period of years from 1977, when the data was collected, until 1985 when the results were published. The data was gathered in 1977 using a survey of approximately 60,000 households, and was collected over a period of six months from July through December 1977, including in the sample households in all 50 states and the District of Columbia. The NSCS sample was drawn as a subset of the National Crime Survey, which was collected from a stratified random sample of respondents from all counties in every State and the District of Columbia. The NSCS' goal was to develop a scale of crime seriousness, with factors that rate crime severity in relationship to how much more serious the crime is compared to the theft of $1.00. Respondents were asked to rate crimes using various crime scenarios described by the trained survey takers, then to assign a number of how much more severe the crime in the scenario compared to the benchmark value of 1.0 assigned to the theft of $1.00. The National Survey of Crime Severity was not the first attempt to rate or rank order crimes based on crime

severity, but is considered a comprehensive and reliable assessment tool for this task, since it was published in 1985 by the U.S. Department of Justice (Wolfgang, Figlio, Tracy, and Singer, 1985). The values of crime severity as published by the NSCS for the above noted crimes (see Table 6 below) were applied to the number of crimes committed in 2008 as reported by City of Flint, MI police department, were compiled using the severity scale, and rank ordered by the computed Crime Severity Total for reported crimes in each of the 40 census tracts. Table 7, below, including census tracts, lists by rank order largest Crime Severity Total to smallest Crime Severity Total, the 2008 severity adjusted crime reported, and provides a clearer picture of actual crime in the various neighborhoods in the City of Flint, Michigan.

C. Key Legal Terms of often confused crimes: (Crimes A-Z, n.d.)

1. **Robbery**- the taking or attempting to take something of value from another by use of force, threats, or intimidation, committed in the presence of the victim
2. **Assault**- an intentional act by one person that creates an apprehension in another of an imminent harmful or offensive contact
3. **Burglary**-unlawful entry of a structure to commit a felony or a theft
4. **Larceny**-similar to burglary except the perpetrator did not illegally enter by using forcible or attempted forcible entry

Table 6: Crime Severity Factors (Wolfgang, et al., 1985)

Factors of Individual Crime Severity (based in comparison on theft of $1.00)						
Murder	Rape	Robbery	Assault	Burglary	Larceny	Auto Theft
35.6	25.8	7.3	11.9	3.2	3.6	10.9

Table 7: City of Flint 2008 Crime Statistics and Severity, by crime category

Tract	Crime statistics, City of Flint, MI, Reported for 2008							Crimes adjusted with National Survey of Crime Severity Factors							
	Rape	Auto Theft	Larceny	Burglary	Robbery	Homicide	Assault	Rape	Auto Theft	Larceny	Burglary	Robbery	Homicide	Assault	Severity Total/Tract
28	15	36	148	54	22	1	193	387.0	392.4	532.8	172.8	160.6	35.6	1640.5	3321.7
9	8	35	53	101	40	2	217	206.4	381.5	190.8	323.2	292.0	71.2	1844.5	3309.6
22	13	31	69	122	23	1	211	335.4	337.9	248.4	390.4	167.9	35.6	1793.5	3309.1
6	7	36	68	110	47	1	181	180.6	392.4	244.8	352.0	343.1	35.6	1538.5	3087.0
26	16	26	104	113	31	0	161	412.8	283.4	374.4	361.6	226.3	0.0	1368.5	3027.0
23	8	25	112	120	22	0	186	206.4	272.5	403.2	384.0	160.6	0.0	1581.0	3007.7
39	8	38	131	108	27	0	149	206.4	414.2	471.6	345.6	197.1	0.0	1266.5	2901.4
11	8	28	64	88	25	3	185	206.4	305.2	230.4	281.6	182.5	106.8	1572.5	2885.4
7	3	32	64	88	25	2	184	77.4	348.8	230.4	281.6	182.5	71.2	1564.0	2755.9
3	2	28	72	114	37	2	148	51.6	305.2	259.2	364.8	270.1	71.2	1258.0	2580.1
40	8	20	66	165	7	0	136	206.4	218.0	237.6	528.0	51.1	0.0	1156.0	2397.1
16	4	26	95	162	25	1	107	103.2	283.4	342.0	518.4	182.5	35.6	909.5	2374.6
15	4	32	70	82	29	0	139	103.2	348.8	252.0	262.4	211.7	0.0	1181.5	2359.6
13	4	24	63	135	18	1	136	103.2	261.6	226.8	432.0	131.4	35.6	1156.0	2346.6
10	3	26	53	89	32	0	145	77.4	283.4	190.8	284.8	233.6	0.0	1232.5	2302.5
4	4	40	33	83	16	5	125	103.2	436.0	118.8	265.6	116.8	178.0	1062.5	2280.9
36	4	31	90	138	18	0	103	103.2	337.9	324.0	441.6	131.4	0.0	875.5	2213.6
27	6	18	94	96	18	1	122	154.8	196.2	338.4	307.2	131.4	35.6	1037.0	2200.6
32	3	11	80	52	22	1	156	77.4	119.9	288.0	166.4	160.6	35.6	1326.0	2173.9
1	4	22	43	102	7	2	142	103.2	239.8	154.8	326.4	51.1	71.2	1207.0	2153.5
17	2	36	41	64	16	1	131	51.6	392.4	147.6	204.8	116.8	35.6	1113.5	2062.3
19	4	18	50	56	3	3	132	103.2	196.2	180.0	179.2	21.9	106.8	1122.0	1909.3
20	3	26	46	45	36	1	108	77.4	283.4	165.6	144.0	262.8	35.6	918.0	1886.8
38	7	16	57	50	8	1	123	180.6	174.4	205.2	160.0	58.4	35.6	1045.5	1859.7
12	0	17	50	92	10	0	132	0.0	185.3	180.0	294.4	73.0	0.0	1122.0	1854.7
34	2	13	22	45	6	1	157	51.6	141.7	79.2	144.0	43.8	35.6	1334.5	1830.4
14	5	17	31	60	14	0	118	129.0	185.3	111.6	192.0	102.2	0.0	1003.0	1723.1
24	4	16	64	74	13	0	101	103.2	174.4	230.4	236.8	94.9	0.0	858.5	1698.2
29	7	8	84	31	6	1	110	180.6	87.2	302.4	99.2	43.8	35.6	935.0	1683.8
8	0	14	26	55	17	3	114	0.0	152.6	93.6	176.0	124.1	106.8	969.0	1622.1
2	5	14	27	63	15	1	103	129.0	152.6	97.2	201.6	109.5	35.6	875.5	1601.0
37	3	15	72	71	11	0	92	77.4	163.5	259.2	227.2	80.3	0.0	782.0	1589.6
31	3	26	114	39	10	1	68	77.4	283.4	410.4	124.8	73.0	35.6	578.0	1582.6
18	3	18	24	48	0	0	106	77.4	196.2	86.4	153.6	0.0	0.0	901.0	1414.6
35	6	16	75	45	11	0	69	154.8	174.4	270.0	144.0	80.3	0.0	586.5	1410.0
5	0	8	37	34	17	2	95	0.0	87.2	133.2	108.8	124.1	71.2	807.5	1332.0
30	2	11	74	90	10	0	39	51.6	119.9	266.4	288.0	73.0	0.0	331.5	1130.4
33	8	6	60	50	11	0	45	206.4	65.4	216.0	160.0	80.3	0.0	382.5	1110.6
25	2	13	23	31	7	0	45	51.6	141.7	82.8	99.2	51.1	0.0	382.5	808.9
21	2	5	22	10	7	0	24	51.6	54.5	79.2	32.0	51.1	0.0	204.0	472.4

To better determine if a relationship exists between the variables of fear of crime, hours of sleep, and actual crime (factored by severity) in neighborhoods, Table 8 was constructed to compare these variables, and to note the locations, i.e. census tracts, where these occurrences took place.

Table 8: Comparison by Census Tract of Fear, Sleep, and Actual Crime Severity					
Tract	Total Fear	Tract	Sleep hours	Tract	Crime Severity Total/tract
22	5.8	8	5.7	*28*	3321.7
26	5.9	10	5.9	*9*	3309.6
3	6.2	7	6	*22*	3309.1
10	6.3	12	6	*6*	3087.0
2	6.7	33	6	*26*	3027.0
18	6.8	18	6.1	*23*	3007.7
6	6.8	5	6.1	*39*	2901.4
40	6.9	3	6.2	*11*	2885.4
23	7	22	6.3	*7*	2755.9
34	7	17	6.3	*3*	2580.1
14	7	28	6.3	*40*	2397.1
7	7.1	9	6.4	*16*	2374.6
9	7.1	24	6.4	*15*	2359.6
13	7.2	29	6.4	*13*	2346.6
15	7.2	23	6.5	*10*	2302.5
5	7.3	34	6.5	*4*	2280.9
4	7.4	13	6.5	*36*	2213.6
8	7.5	15	6.5	*27*	2200.6
37	7.5	32	6.5	*32*	2173.9
12	7.6	25	6.5	*1*	2153.5
20	7.6	31	6.5	*17*	2062.3
11	7.7	2	6.6	*19*	1909.3
17	7.8	14	6.6	*20*	1886.8
28	7.8	4	6.6	*38*	1859.7
19	7.9	35	6.6	*12*	1854.7
32	8	36	6.7	*34*	1830.4
16	8	1	6.7	*14*	1723.1
25	8.2	6	6.8	*24*	1698.2
38	8.2	20	6.8	*29*	1683.8
39	8.2	27	6.8	*8*	1622.1
33	8.4	11	6.9	*2*	1601.0
24	8.5	38	6.9	*37*	1589.6
36	8.5	26	7	*31*	1582.6
27	8.6	37	7	*18*	1414.6
29	8.7	19	7	*35*	1410.0
31	8.9	16	7	*5*	1332.0
35	9.3	39	7.1	*30*	1130.4
1	9.6	40	7.2	*33*	1110.6
30	9.8	30	7.5	*25*	808.9
21	ND	21	ND	*21*	472.4

Chapter V: Discussion, Summary, and Recommendations

One of the most glaring realities of Table 8 and the data it represents, is that in 36 of the 40 census tracts (actually 41, but Bishop International Air Terminal occupies all of census tract 41, thus no residences) that make up the City of Flint, MI, the mean hours of sleep is at or below the minimum recommended seven to eight hours of sleep for adults on all nights. This indicates that insomnia and poor sleep in Flint, MI, is definitely a chronic problem that needs to be addressed for a multitude of health, societal, and community related reasons. In attempting to find a relationship to associate with the poorest sleepers (lowest mean hours of sleep) in the study, another reality highlighted by the above table is that of the ten census tracts with the least mean hours (5.7 to 6.3 hours) of sleep, specifically tracts 8, 10, 7, 12, 33, 18, 5, 3, 22, and 17, only three of those tracts are in the highest calculated crime severity areas (census tracts with the highest calculated Crime Severity Total). Further, 60% or six of the ten poorest sleeping census tracts are in the safest 20 census tracts, or safest 50% of the city, as determined using the computed crime severity index. This would seem to indicate that insomnia and poor sleep are not related to actual crimes committed, or that the amount and severity of actual crime is, at least not directly related to causing residents to lose sleep.

Additionally, examination of the possible association between poor sleep and Total Fear, 40% of the ten poorest sleeping census tracts, (lowest mean sleep hours) are also in the ten most fearful (as measured by the variable Total Fear) census tract areas. This may be indicative that a relationship does exist between perceived fear and inability to achieve and maintain sleep for sufficient time to allow the human body to get adequate rest for the biological purposes of maintaining, restoring, and building cells and tissues to adequately perform the activities of daily living, and to effectively fight off infections, illnesses, and disease. If we look further down the

list, looking at the 20 poorest sleeping census tract areas, and comparing with the 20 tracts reporting the most fear as reported by the computed variable Total Fear, it again appears that a relationship between poor sleep and Total Fear may be present. Comparing these two groups of census tracts, 13 of the same 20 census tracts appear on both lists (tracts 3, 5, 7, 8, 9, 10, 12, 13, 15, 18, 22, 23, and 34) which equates to 65% of the census tracts reporting the highest level of perceived fear (as represented by Total Fear), are the same areas that indicate sleeping the poorest and least amount of hours. Table 5 lists just these 13 tracts with their respective values of Total Fear and Sleep Hours. While this comparison does not represent a statistical relationship, it is interesting to note that if more research were completed utilizing a longitudinal design and more specific survey questions about sleep and perceived fear among this population, a true relationship or correlation may exist, and be identified. The present analysis, while not etiological in purpose, does indicate that there may be a calculable relationship between perceived fear of crime/fear of one's neighborhood, and the inability of the residents to fall asleep and maintain adequate sleep. This finding does indicate that further and more in-depth research is necessary to determine the exact relationship of the factors that may be brought to light among these two very real aspects of daily living, fear and adequate sleep, in a mid-sized Midwestern U.S. city.

In summary, while the relationship appears to exist between self-reported perceived fear and insomnia or inadequate sleep, it is noteworthy that actual crimes, weighted for level of severity, do not seem to be indicative of neighborhood resident's ability to sleep. Further study and research into both of these factors that may affect a person's ability to sleep should be further studied, and could be used to illuminate why perceived fear is a stronger psychological influence than is fear induce by actual crime, within residents' neighborhoods and the surrounding areas.

References

American Psychiatric Association, Diagnostic and statistical manual of mental disorders (4th ed.). (2000). Washington, D.C.: American Psychiatric Association. *

Basta, M., Chrousos, G. P., Vela-Bueno, A., & Vgontzas, A. N. (2007, June). Chronic Insomnia and Stress Systems. *Sleep Medicine Clinics, 2*(2), 279-291.

City of Flint, Michigan, Police Department Crime Statistics [2008 Crime Statistics]. (n.d.). Retrieved March 8, 2011, from City of Flint, Michigan website: http://www.cityofflint.com/default_vs.asp

Crimes A-Z - FindLaw [Legal aid website]. (n.d.). Retrieved December 3, 2011, from http://criminal.findlaw.com/crimes/a-z/

Hill, T. D., Burdette, A. M., & Hale, L. (2009). Neighborhood disorder, sleep quality, and psychological distress: Testing a model of structural amplification. *Health & Place, 15*, 1006-1013.

Kruger, D. J., Hutchison, P., Monroe, M. G., Reischl, T., & Morrel-Samuels, S. (2007). Assault Injury Rates, Social Capital, and Fear of Neighborhood Crime. *Journal of Community Psychology, 35*(4), 483-498.

Kuppermann, M., Lubeck, D. P., Mazonson, P. D., Patrick, D. L., Stewart, A. L., Buesching, D. P., & Fifer, S. K. (1995). Sleep Problems and Their Correlates in a Working Population. *Journal of General Internal Medicine, 10*, 25-32. *

Lazarus, R. S., & Folkman, S. (1984). Stress, Appraisal, and Coping. New York, NY: Springer.

LeBlanc, M., Beaulieu-Bonneau, S., Merette, C., Savard, J., Ivers, H., & Morin, C. M. (2007). Psychological and health related quality of life factors associated with insomnia in a population-based sample. *Journal of Psychosomatic Research, 63*, 157-166.

Martin, S. A., Aikens, J. E., & Chervin, R. D. (2004). Toward cost-effectiveness analysis in the diagnosis and treatment of insomnia. *Sleep Medicine Reviews, 8*, 63-72.

Meerlo, P., Sgoifo, A., & Suchecki, D. (2008). Restricted and disrupted sleep: Effects on autonomic function, neuroendocrine stress systems and stress responsivity. *Sleep Medicine Reviews, 12*(3), 197-210. doi:10.1016/j.smrv.2007.07.007

Miller, J. (2008, October). Impact of Situational Factors on Survey Measured Fear of Crime. *International Journal of Social Justice Methodology, 11*(4), 307-325.

Morin, C. M., Rodrigue, S., & Ivers, H. (2003). Role of Stress, Arousal. and Coping Skills in Primary Insomnia. *Psychosomatic Medicine, 65*, 259-267. *

National Sleep Disorders Research, Retrieved from http://www.nhlbi.nih.gov/health/prof/sleep/res_plan/section4/section4e.html.

Porth, C. M. (2006). Stress and Adaptation. In *Essentials of Pathophysiology Concepts of Altered Health States* (Second ed., pp. 151-164). Philadelphia, PA: Lippincott Williams & Wilkins.

Prevention Research Center of Michigan (Ed.). (2008, April). *Sleep and Health in Genesee County*, (6).

Ramsawh, H. J., Stein, M. B., Belik, S.-L., Jacobi, F., & Sareen, J. (2009). Relationship of anxiety disorders, sleep quality, and functional impairment in a community sample. *Journal of Psychiatric Research, 43*, 926-933.

Schenck, C. H. (2007). *Sleep, a Groundbreaking Guide to the Mysteries, the Problems, and the Solutions*. New York: Avery, Penguin Group.

Sleep Disorders and Sleep Deprivation. (2006). Washington, D.C.: Institute of Medicine of the National Academies Press.

Sleep disorders and sleep deprivation: an unmet public health problem. (2006). *National Sleep Foundation.* Retrieved from http://www.sleepfoundation.org database.

Sleep Home Pages, Retrieved from http://www.sleephomepages.org/sleepsyllabus/l.html.

Smeltzer, S. C., Bare, B. G., Hinkle, J. L., & Cheever, K. H. (2010). Assessment of immune function. In Brunner & Suddarth's Textbook of Medical-Surgical Nursing (12th ed., pp. 1544-1560). Philadelphia, PA: Lippincott Williams & Wilkins.

Stafford, M., Chandola, T., & Marmot, M. (2007, November). Association Between Fear of Crime and Mental Health and Physical Functioning. *American Journal of Public Health, 97*, 2076-2081.

U.S. Census Bureau, Retrieved from http://www.census.gov/. Retrieved October 04, 2011

University of Michigan School of Public Health, Retrieved form http://www.sph.umich.edu/prc/.

Violani, C., Devoto, A., Lucidi, F., Lombardo, C., & Russo, P. M. (2004). Validity of a Short Insomnia Questionnaire: the SDQ. *Brain Research Bulletin, 63*, 415-421.

Wenzel, L., Glanz, K., & Lerman, C. (2002). Stress, Coping, and Health Education. In K. Glanz, B. K. Rimer, & F. M. Lewis (Eds.), Health Behavior and Health Education, Theory, Research, and Practice (Third ed., pp. 210-239). San Francisco, CA: Jossey-Bass.

Wolfgang, M. E., Figlio, R. M., Tracy, P. E., & Singer, S. I. (1985, June). *National Survey of Crime Severity* (Rep. No. NCJ-96017). Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office.

2003 Sleep in America Poll. (2003). Washington, DC: National Sleep Foundation.*

2008 Sleep in America Poll. (2008). Washington, DC: National Sleep Foundation.

2008 Sleep in America Summary. (2008). Washington, DC: National Sleep Foundation.

*Some references older than search criteria of 2004-2009, but were sought out as foundational material for the study, and no newer studies were found that adequately addressed these topics.

Appendix

City of Flint, MI, crime incidence by type and location (tract)

Crime statistics, City of Flint, MI, Reported for 2008

Tract	Rape	Auto Theft	Larceny	Burglary	Robbery	Homicide	Assault
28	15	36	148	54	22	1	193
9	8	35	53	101	40	2	217
22	13	31	69	122	23	1	211
6	7	36	68	110	47	1	181
26	16	26	104	113	31	0	161
23	8	25	112	120	22	0	186
39	8	38	131	108	27	0	149
11	8	28	64	88	25	3	185
7	3	32	64	88	25	2	184
3	2	28	72	114	37	2	148
40	8	20	66	165	7	0	136
16	4	26	95	162	25	1	107
15	4	32	70	82	29	0	139
13	4	24	63	135	18	1	136
10	3	26	53	89	32	0	145
4	4	40	33	83	16	5	125
36	4	31	90	138	18	0	103
27	6	18	94	96	18	1	122
32	3	11	80	52	22	1	156
1	4	22	43	102	7	2	142
17	2	36	41	64	16	1	131
19	4	18	50	56	3	3	132
20	3	26	46	45	36	1	108
38	7	16	57	50	8	1	123
12	0	17	50	92	10	0	132
34	2	13	22	45	6	1	157
14	5	17	31	60	14	0	118
24	4	16	64	74	13	0	101
29	7	8	84	31	6	1	110
8	0	14	26	55	17	3	114
2	5	14	27	63	15	1	103
37	3	15	72	71	11	0	92
31	3	26	114	39	10	1	68
18	3	18	24	48	0	0	106
35	6	16	75	45	11	0	69
5	0	8	37	34	17	2	95
30	2	11	74	90	10	0	39
33	8	6	60	50	11	0	45
25	2	13	23	31	7	0	45
21	2	5	22	10	7	0	24

Flint crime incidence by type/tract adjusted with National Survey of Crime Severity Factors

Tract	Rape	Auto Theft	Larceny	Burglary	Robbery	Homicide	Assault	Severity Total/Tract
28	387.0	392.4	532.8	172.8	160.6	35.6	1640.5	3321.7
9	206.4	381.5	190.8	323.2	292.0	71.2	1844.5	3309.6
22	335.4	337.9	248.4	390.4	167.9	35.6	1793.5	3309.1
6	180.6	392.4	244.8	352.0	343.1	35.6	1538.5	3087.0
26	412.8	283.4	374.4	361.6	226.3	0.0	1368.5	3027.0
23	206.4	272.5	403.2	384.0	160.6	0.0	1581.0	3007.7
39	206.4	414.2	471.6	345.6	197.1	0.0	1266.5	2901.4
11	206.4	305.2	230.4	281.6	182.5	106.8	1572.5	2885.4
7	77.4	348.8	230.4	281.6	182.5	71.2	1564.0	2755.9
3	51.6	305.2	259.2	364.8	270.1	71.2	1258.0	2580.1
40	206.4	218.0	237.6	528.0	51.1	0.0	1156.0	2397.1
16	103.2	283.4	342.0	518.4	182.5	35.6	909.5	2374.6
15	103.2	348.8	252.0	262.4	211.7	0.0	1181.5	2359.6
13	103.2	261.6	226.8	432.0	131.4	35.6	1156.0	2346.6
10	77.4	283.4	190.8	284.8	233.6	0.0	1232.5	2302.5
4	103.2	436.0	118.8	265.6	116.8	178.0	1062.5	2280.9
36	103.2	337.9	324.0	441.6	131.4	0.0	875.5	2213.6
27	154.8	196.2	338.4	307.2	131.4	35.6	1037.0	2200.6
32	77.4	119.9	288.0	166.4	160.6	35.6	1326.0	2173.9
1	103.2	239.8	154.8	326.4	51.1	71.2	1207.0	2153.5
17	51.6	392.4	147.6	204.8	116.8	35.6	1113.5	2062.3
19	103.2	196.2	180.0	179.2	21.9	106.8	1122.0	1909.3
20	77.4	283.4	165.6	144.0	262.8	35.6	918.0	1886.8
38	180.6	174.4	205.2	160.0	58.4	35.6	1045.5	1859.7
12	0.0	185.3	180.0	294.4	73.0	0.0	1122.0	1854.7
34	51.6	141.7	79.2	144.0	43.8	35.6	1334.5	1830.4
14	129.0	185.3	111.6	192.0	102.2	0.0	1003.0	1723.1
24	103.2	174.4	230.4	236.8	94.9	0.0	858.5	1698.2
29	180.6	87.2	302.4	99.2	43.8	35.6	935.0	1683.8
8	0.0	152.6	93.6	176.0	124.1	106.8	969.0	1622.1
2	129.0	152.6	97.2	201.6	109.5	35.6	875.5	1601.0
37	77.4	163.5	259.2	227.2	80.3	0.0	782.0	1589.6
31	77.4	283.4	410.4	124.8	73.0	35.6	578.0	1582.6
18	77.4	196.2	86.4	153.6	0.0	0.0	901.0	1414.6
35	154.8	174.4	270.0	144.0	80.3	0.0	586.5	1410.0
5	0.0	87.2	133.2	108.8	124.1	71.2	807.5	1332.0
30	51.6	119.9	266.4	288.0	73.0	0.0	331.5	1130.4
33	206.4	65.4	216.0	160.0	80.3	0.0	382.5	1110.6
25	51.6	141.7	82.8	99.2	51.1	0.0	382.5	808.9
21	51.6	54.5	79.2	32.0	51.1	0.0	204.0	472.4

Prevention Research Council 2009 Community Survey Questions

PREVENTION RESEARCH CENTER

2009 COMMUNITY SURVEY-INFORMED CONSENT PROCEDURE

TO BE READ TO THE RESPONDENT:

Hello, my name is _____ and I am calling to invite you to participate in the Speak to Your Health Community Survey! This is not a sales call. This is a survey being conducted by the Prevention Research Center of Michigan with the Genesee County Health Department and Greater Flint Health Coalition. Are you an adult between 18 and 45 years old? [If no] May I speak with someone between 18 and 45 years old?

The Speak to Your Health survey is a short survey about health-related issues. We are interested in how community factors relate to health. The information will be used to create, evaluate, and improve programs conducted by the Health Department and affiliated community organizations.

The survey takes about 25 minutes. I will ask you questions about your health and personal experiences. We will not pay you, ask you for any money, or try to sell you anything. Your participation is voluntary; you may stop at any time or choose not to answer any question without penalty.

Your phone number was randomly selected. Your answers will be anonymous; we don't need to know your name and will not try to identify you. Your answers will be kept confidential as allowed by law. We will not give your information to anyone not affiliated with the project and will keep it in a locked office.

This study has minimal risk to you; you may feel uncomfortable when talking about past experiences with discrimination. If you wish, we can provide you with resources to help address these issues. Although you may not receive direct benefit from your participation, others may ultimately benefit from the knowledge obtained in this study.

The manager of this project is Dr. Daniel Kruger at the University of Michigan and can be reached at (734) 936-4927. If you have any questions about your rights as a participant, you can call the University of Michigan's Institutional Review Board at (734) 936-0933.

Would you be willing to participate in this survey?

If yes…

Thank you! Do you have any questions before we begin?

If the respondent says NO, ask for the reason and try to address his or her concern. If that does not work then stop the interview and thank them for his or her time.