Fall 12-15-2012

Factors that Shape Environmental Perceptions: the Role of Health and Place

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Factors that Shape Environmental Perceptions: the Role of Health and Place

A Thesis

Submitted to the Graduate Faculty of the
University of New Orleans
In partial fulfillment of the
Requirements for the degree of

Master of Science
in
Urban Studies

by:

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B.A. Marquette University, 1988
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December 2012

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List of Abbreviations

CAEPH – Center for Applied Environmental Public Health

EPA – Environmental Protection Agency

EPCRA - Emergency Planning and Community Right-to-Know Act

EPHTN – Environmental Public Health Tracking Network

FLC – Fenceline Community

NFLC – Non-fenceline Community

TRI – Toxic Release Inventory

Abstract

Risk perception is the judgment people make about the characteristics and severity of a risk. Numerous theories and models exist which have identified the factors that influence risk perception. Among these factors, location, health status, and demographic characteristics are known to shape risk perception. To measure the influence of these factors on environmental perception, a series of surveys conducted in four Louisiana communities between 2004 and 2005 describe community perceptions about environmental issues and health status. The objective of the study was to characterize and compare environmental concerns relative to location, health status, and demographic characteristics. Results indicate that location has a strong influence in framing an individual's concerns about environmental issues, particularly those living close to industry. Concern for general environmental and natural preservation issues were comparable among the communities indicating that concern for these issues is independent of residential location.

Keywords: Risk Perception, Environment, Fenceline, Louisiana

INTRODUCTION

Historically, Louisiana ranks low on scales of health, social, and economic measures. Conversely, Louisiana ranks high on measures of toxic emissions and density of industry, particularly in southern Louisiana. The concurrence of a high volume of toxic emissions and industry and low rankings on health measures created a belief that environmental exposures were adversely affecting the health and quality of life for Louisiana residents. Layered onto this perceived relationship is the fact that Louisiana has 2.5 times the minority population and a higher proportion of households living in poverty compared to the rest of the country (US Census 2010). These racial and economic disparities combined with a high density of industry led to claims of racial discrimination in exposure to industrial pollution.

Louisiana is home to 159 chemical and petroleum facilities, which released more than 87 million pounds of chemicals in 2004 (EPA, 2012). Louisiana was second behind Texas in 2004, whose petrochemical facilities released more than 168 million pounds and ahead of Tennessee's facilities, which released more than 43 million pounds of chemicals in 2004. The high volume of industry congregated between New Orleans and Baton Rouge led to this stretch of the Mississippi River being dubbed the "Industrial Corridor" (Scott, 1993). More than half of the facilities are within a three-mile radius of residential areas. More importantly, many of these facilities are within a half-mile radius of residential areas, commonly referred to as "fenceline communities" (FLCs). A fenceline community is generally any community adjacent to large industrial or military complexes. However, the term adjacent does not have a standard definition, which makes designating a community as "fenceline" a matter of convenience, usually driven by the available data. Studies have used buffers ranging from a one-half mile to five miles to define a fenceline community. No matter how fenceline is determined, residents

bordering these facilities are concerned about the impact of environmental exposures on their health.

There is longstanding concern that these environmental exposures adversely affect residents' health (Bullard & Wright, 1993; Bullard & Johnson, 2000; LAC, 1993). News reports of what appeared to be a high incidence of childhood cancers in one community led the media and environmental activists to call the corridor "Cancer Alley" (Groves et al., 1996). However, several epidemiological studies have shown that rates of cancer prevalence and mortality are no higher in the Industrial Corridor as compared to other parts of the state and similar to patterns across the United States (Chen et al., 1996; Tsai et al., 2003). The research concluded that compared to Louisiana, there is no excess mortality risk among Industrial Corridor residents for all causes or all cancers, regardless of race or gender. While much attention is given to industrial pollution, access to health care, education, and behavior are well-documented determinants of health that have a greater impact on health than environmental exposure alone (CDC, 2012). However, a 1999 survey to assess health care practices and perceptions of environmental quality among Industrial Corridor residents revealed that the residents believed pollution and the environment were the most important causes of cancer (Fick, Thomas, Williams, & Hayden, 1999). Regardless of the scientific evidence, community concerns about environmental exposures are genuine and tied to their perceptions of their health, quality of life and environment.

Public opinions about risk, and how those opinions are formed, have a profound impact on the decision-making activities in our society. Perceived risk has been a focus of researchers and policy makers for decades. The development of this research was born from recognition that the public and experts understand risk differently. Experts relied on scientific risk estimates and

comparisons to communicate risk, however, the public did not understand or always believe these estimates. Efforts to improve risk communication strategies led researchers to explore how the public understands risk; hence, the discipline of risk perception emerged to identify those characteristics that influence how the public perceives risk. Initial studies focused on the technical estimates of risk and benefits, however, later research identified objective and subjective dimensions in how the public perceives risk (Sjoberg, 2000; McComas, 2004). Results of these findings have been incorporated into risk communication strategies and messaging to improve communication with communities. An understanding of risk perception is also important for shaping environmental policy and management decisions.

To determine whether a community's proximity to a petrochemical facility affects their health status and influences their concerns about health and the environment, the Center for Applied Environmental Public Health (CAEPH) at Tulane University administered a series of community surveys to describe community health status and perceptions of health and environmental issues from 2002-2005. Survey locations included four Louisiana communities: Norco, Pride, Baton Rouge and Shreveport. The surveys were in support of a larger research effort to develop risk communication strategies, investigate the representativeness of national health surveys compared to community-level surveys, as well as understand the factors that frame how residents in Louisiana perceive health and environmental issues.

The aim of this thesis is to identify the factors that frame how residents rate concern for environmental issues, particularly residential proximity to petro-chemical facilities and self-reported health status. Data for this thesis is a compilation of four community surveys obtained from CAEPH to examine the role of health and place in shaping environmental perceptions. This analysis identifies those environmental issues that are of significant concern for

communities in proximity to petro-chemical facilities compared to communities without petro-chemical facilities. Furthermore, the analysis examines which (if any) measures of self-reported health status significantly influence concern for a variety of environmental issues. Results indicate that location has a strong influence in framing an individual's concerns about environmental issues, particularly those living close to petro-chemical facilities. Self-reported health status does not significantly influence how an individual rates their concern for environmental issues. Concern for general environmental and natural preservation issues were comparable among all four communities indicating that concern for these issues is independent of residential location.

The thesis is organized as follows. First, a summary of risk perception theories and other factors that influence how people perceive risk to provide context for interpreting the study results. A description of the survey locations, survey tool, and methods follows to answer the research questions: does residential proximity to a petrochemical facility influence a resident's concern for environmental issues and does a resident's health status influence their perception of environmental issues. The thesis concludes with the survey results and discussion of those findings that contribute to differences in perceptions between the surveyed locations.

THEORY AND FACTORS THAT SHAPE RISK PERCEPTION

Risk perception is the judgment people make about the characteristics and severity of a risk. For example, scientists consider risk to be the degree of probability of injury, damage or loss usually expressed in the form of estimated annual mortality or morbidity. People perceive risk more subjectively based on their experiences, socio-demographic status and/or their health status. The study of risk perception originated from the observation that scientists and the public often disagreed on the riskiness of various technologies and natural hazards. Understanding risk perception is relevant to risk assessment, risk management and risk communication activities.

Research on risk perception began in the mid-1960 during the debate over the development of nuclear power. Fears of disaster and danger to the environment turned the public against this new technology as scientific experts declared the technology safe. Experts developed risk comparisons and estimates to convince the public that nuclear power was safe but soon realized there was a difference between the scientific facts and and public perception of the threats. This "gap" in understanding risk led researchers to examine how people perceive risk in order to improve their risk communication and messaging strategies. Chauncey Starr wrote a key paper in 1969 showing that risk acceptance was related to not only technical estimates of risks and benefits but also subjective factors such as voluntariness (Starr, 1969). Starr opened a new area of research spanning multiple disciplines including geography, sociology, political science, anthropology and psychology.

Numerous approaches to understanding risk perception have been proposed and studied over the past 30 years. Technical estimates of risk; heuristics; bias of belief; risk target; psychometric model; cultural theory of risk perception; risk sensitivity; and attitude have all been suggested as models to understand how people perceive risk (Sjoberg, 2000). Two of the more

recognized models on risk perception are the *Psychometric Paradigm* and *Socio-Cultural Theory of Risk*.

Psychometric Paradigm

A broad strategy for studying perceived risks is to create a taxonomy of hazards to predict and understand responses to risks. The most common approach to developing a taxonomic scheme employed a psychometric paradigm to produce quantitative representations or cognitive maps of risk attitudes and perceptions. The goal was to unveil the factors that determine how and why people perceive risks differently by asking people to make quantitative judgments about a variety of hazards. The psychometric model, first proposed in 1978 by Fischhoff and his colleagues used psychometric procedures to quantify judgments of perceived risk, acceptable risk, and perceived benefit for 30 activities and technologies (Fischhoff, et al. 1978). Participants were asked to evaluate sets of hazards using different rating scales. For example, respondents assessed newness (i.e., are the risks novel or familiar), knowledge of the risk (i.e. to what extents risks are known to science) and dread (i.e., do people have fear of the risk). Using factor analysis procedures, the authors reduced nine attributes of risk to two basic dimensions of risk: *dread risk* (fear of death should adversity occurs) and *unknown risk* (discrimination between familiar and unfamiliar activities). These two dimensions were effective predictors in the tradeoff between acceptable risk and perceived benefit. Slovic replicated these findings using 81 hazards to illustrate that perceived risk is quantifiable and predictable (Slovic, 1987). Slovic concluded that psychometric techniques are well suited to identifying similarities and differences in perceptions and attitudes among groups.

This model was the basis for expanded research on risk perception. Researchers identified scores of factors that influence the public's perception of risk acceptability (Fischhoff et al., 1978 and Slovic, 1987). Risk communication experts identified seven key variables as being influential to understanding the public's risk perception (Hance, et al., 1988). Table 1 summarizes these variables.

Table 1. Seven Most Influential Variables to Understanding Risk Perception

Voluntary vs. Involuntary Risks	People view voluntary risks (e.g., health risks due to smoking) as more acceptable than involuntary risks (e.g., industry polluting the air) even if engaging in the voluntary behavior carries a greater risk of harm
Familiar vs. Unfamiliar Risks	Familiarity with a risk tends to make it more acceptable than a risk considered exotic or unfamiliar
Risks Controlled by the Individual vs. Control by the "System	People feel safer when they are in control. Risks out of a person's control seem more threatening and therefore less acceptable, regardless of the hazard
Certain vs. Uncertain Risks	People are more cautious about uncertain risks and less likely to find them acceptable
Fair vs. Unfair Risks	A risk is considered fair if the benefits associated with exposure are going to the same people.
Natural vs. Man-made Risks	Acts of nature are more acceptable than ones created by people
Morally Irrelevant vs. Morally Objectionable Risks	Risks from exposures or circumstances considered objectionable (or unethical) are considered less acceptable compared to risks that do not have strong moral relevance to the public.

Adapted from: *Improving Dialogue with Communities: A Risk Communication Manual for Government (1998)*

While the psychometric paradigm laid a solid foundation for identifying two principal components (i.e., unknown and dread) to explain 70% or more of the variance in risk ranking and perception, these measures alone provided only one aspect of the complex process of risk perception (Sjoberg 2000). Critical review of this paradigm noted several limitations to the power of the model including: 1) the ranking scales were not large enough; 2) the scales were outdated; 3) the qualitative risk characteristics were attributes of the hazard and not the respondent; and 4) the results were based on aggregated, not raw data (Marris et al., 1998;

Sjoberg, 2000; Siegrist, et al., 2005). The greatest criticism lay in reason number 4. Since the psychometric model relied on the use of aggregated data (i.e., means), the model had greater power to estimate variance in risk rankings because it did not take into account individual differences and characteristics in perceptions. Few studies reported results on how the individual perceives risk, and for this reason sociologists, anthropologists and geographers began investigating the social and cultural processes that contribute to risk perception (Marris, et al. 1998; Bickerstaff, 2004).

Socio-Cultural Theory of Risk

Unlike the psychological studies that investigate the cognitive and attitudinal processes through which risks are interpreted, as well as factors that influence risks acceptability, the cultural theory examines the role society and culture play in risk perception. Proponents of this theory believe individual's form risk perceptions in the context of social, cultural and political factors. Cultural theory states that the structure and competition between social organizations influences perceptions. The cultural theory of risk, which has two components, originated from research by Douglas and Wildavsky who examined societal conflict over risk. The first is that individuals function within specific patterns of social relationships that determine their worldviews, referred to as "cultural biases". Membership in social organizations shape an individual's views and the degree to which the individual feels bounded to the organization attenuates or amplifies their perception. The second component identifies four ideologies that interact with cultural biases (i.e., hierarchical, egalitarian, individualistic and fatalistic) (Douglas and Wildavsky, 1983). Initial quantitative support for the theory came from Wildavsky and Dake who asked participants to rate the risks and benefits of various societal concerns (Wildavsky and Dake, 1990). They assessed measures of knowledge, personality, political

orientation and cultural bias to gauge an individual's risk perception. Cultural bias proved to be a more powerful measure of risk perception and risk taking preferences compared to knowledge or personality. Additionally, the researchers found that people perceive risks in a manner that supports their way of life. For example, egalitarians strongly believe that technology poses a serious problem for society. Wildavsky and Dake concluded that cultural theory provided the best framework for predicting and explaining who may be more likely to fear, fear more or fear less different kinds of dangers based upon their worldviews.

While the cultural theory is useful for understanding patterns of worldviews and their influences on the risk perception, critics of the cultural theory believe the theory is weak in explaining variance in risk perceptions (Sjoberg, 2000). Additionally, there appears to be at least two versions of the theory that diverge over the unit of analysis (Marris, et al. 1998). Still, over the last 15 years, there has been a convergence of the psychometric and cultural approaches to understanding risk perception. Bickerstaff, in her review of risk perception research, adopted the term "Socio-Cultural" theory to recognize that risk perception is multidimensional, influenced by complex interactions of psychological, social, political and cultural processes (Bickerstaff, 2004). Furthermore, the influence of individual characteristics on risk perception cannot be overlooked. A myriad of personal characteristics and personality facets have been studied to explain the variance in how people perceive risk. These factors range from demographic and socioeconomic status variables (e.g., age, gender, income) to religious orientation, political preferences, anxiety, self-efficacy and locus of control (Chauvin et al., 2007). Experience and anticipation of future outcomes also shape risk perception.

While the psychometric variables from the psychosocial model are more difficult to measure, the risk perception literature is rich in studies that identify individual characteristics

such as race, gender and income that are likely to influence a person's judgment of an environmental hazard. Few research studies have examined how a person's health status may or may not influence their assessment of environmental hazards as they relate to themselves and their community. The emphasis of this study is to examine the role location and health status play in shaping environmental risk perception. The following is an overview of the most frequently studied socio-demographic factors that shape perception. Additionally, studies examining the roles of location and health status in forming perception are reviewed.

Socio-demographic Influences on Risk Perception

Gender

Research on gender differences in risk beliefs and attitudes concluded there is a significant difference between genders. Numerous studies indicate that women generally judge risks higher than men's perception of risks (Flynn, et al., 2006; Finucane, et al., 2000; Rivers, et al., 2009; Gustafson, 1998). Differences in risk perception have been attributed to social norms that emphasize women as nurturers and caretakers whereas men are socialized to be breadwinners and provide economic stability for the family (Mohai, 1997). Other hypotheses include: women are more concerned about how risk may affect their families, are more concerned about future generations, and that they may feel more vulnerable than males (Savage, 1993; Johnson, 2002; Bord 1997). Further investigation into understanding the difference in how men and women perceive risk showed that white men in particular tend to judge risks to be lower than men of other races and women of any race (Flynn, et al. 1994, Finucane, et al., 2000; Rivers, et al., 2009; Davidson 1996). This phenomenon, known as the "white male" effect, highlighted the issue that aggregating data into one metric can mask significant differences between groups (Flynn, et al., 1994; Mohai, 1997). Other studies did not find an association

between gender and environmental concern (Greenberg and Scheider, 1995; Howel, et. al. 2002; Brody et al., 2004).

Race

Prevailing research prior to 1990 concluded that blacks were less concerned about the environment as whites (Jones, 1998; Jones and Carter 1994; Mohai 1990; Mohai 2003). However, there was little empirical evidence to support this belief. Race was often not controlled for in survey analysis because it was often confounded with socioeconomic status and location, which tended to explain variation in perception. A small, but growing body of evidence indicates that blacks are very concerned about the environment, particularly at the local level. Mohai and Bryant surveyed Detroit residents about their awareness, concern and involvement in local and national environmental issues (Mohai, 1997; Mohai and Bryant, 1998). Respondents were asked to rate the seriousness of nine environmental issues, among them neighborhood and global environmental issues. While there were no significant differences between blacks and whites in their rating of environmental issues, blacks were more concerned about neighborhood environmental problems than whites were. Burby and Strong (1997) examined the association between race and environmental pollution among residents in the seven parishes that comprise the Industrial Corridor along the Mississippi River through a phone survey. All residents surveyed were concerned about pollution along the Mississippi River corridor; however, blacks were significantly more concerned than whites were about industrial pollution, particularly odors, proximity of industry to homes and illnesses caused by industrial pollution. Jones and Rainey (2006) surveyed residents living in a polluted Tennessee community about their concern for neighborhood environmental issues. Unlike the previous studies, blacks were significantly more concerned about local environmental conditions than whites were.

Age, Education, Income and Marital Status

Few studies have examined the relationships between age, education, and income on risk perception. Generally, younger people have a higher concern about environmental hazards when compared to older people (Van Liere, 1980; Howel, et al., 2002). Differences have been attributed to older people seeing improvements in environmental quality over the years and younger people being more active in environmental issues, therefore, raising their sensitivity of risk perception. Level of education and income often measure the same factor, social status. Van Liere and Dunlap (1980) found that those with higher levels of education and income were more concerned about environmental issues than those with less education and income; however, the strength of the association was weak for income. A more current assessment of these variables indicates that those with less education and lower incomes had more concern for the environment (Lemyre, 2006). Because these variables are highly correlated, they are more likely to modify the effects of more strongly associated demographic characteristics rather than emerge as stronger predictors of environmental risk perception. Only one study examined the role of marital status in forming opinions about environmental issues. Greenberg and Schneider's (1995) analysis of American Housing Survey data showed white, married homeowners were more bothered by non-residential land uses than non-white, not married homeowners. Furthermore, residents in poor quality neighborhoods had higher levels of concern for bothersome neighborhood conditions, regardless of marital status. They concluded that race, marital status and housing status confound gender related perceptual differences.

Influence of Health Status on Risk Perception

The majority of risk perception studies examine the role socioeconomic factors play in modifying or confounding a person's perception of risk. Few studies have examined how a

respondent's personal health status may influence their perception of risk. For example, if a respondent has asthma or chronic obstructive pulmonary disease (COPD), is their concern about air quality different from those without disease? A survey of community health and environmental concerns asked respondents if they had an existing respiratory condition or were taking medication for the illness (Elliot et. al., 1999). Those who reported having a disease were more likely to express concern for air quality than those without disease. Howel and her colleagues conducted a survey to explore perceptions of urban air quality by contrasting neighborhood location and material deprivation and the respondents by gender, age and illness status (Howel, et al. 2002; 2003). To measure illness status, respondents were asked if they had a chronic illness that restricted their daily activities or work. Respondents who reported having a chronic condition were more likely to rate industrial air pollution and neighborhood air quality as serious problems compared to those who did not report having a chronic illness.

Role of Location on Risk Perception

The realization that place matters in understanding how the public perceives risk was first studied by Van Liere and Dunlap, who performed a meta-analysis to test a number of common hypotheses that may explain variation in environmental concern (Van Liere and Dunlap, 1980). In particular, the "Residence Hypothesis" posits that urban residents are more concerned about the environment than rural residents. Their analysis supported the hypothesis that urban residents are more concerned about environmental issues; however, the relationship between residence and concern may be dependent on the environmental concern under examination.

Greenberg and colleagues examined differences in environmental perceptions in stressed versus non-stressed environments (Greenberg et al., 1994). The researchers surveyed seven neighborhoods adjacent to hazardous waste sites. Greenberg and colleagues found that residents

in stressed neighborhoods, those next to hazardous waste sites, were significantly more concerned about environmental quality.

Additional support of the importance of residential location and its influence on environmental perception comes from Howel and her collaborators. They conducted a survey of residents in Northeast England to examine public perceptions of local air quality. Their analysis sought to determine how perceptions varied by individual characteristics, health status and proximity to industry. While they found few associations between population characteristics and perceptions of the local environment, there was a strong association between proximity to heavy industry and perception of the local environment (Howel et al., 2002). In particular, residents closest to industry expressed higher levels of concern over nuisances (e.g., dust, odor, noise) and potential health risks from air pollution or industrial accidents. The authors concluded that place or local setting plays a strong role in framing public perceptions.

METHODS

Many factors shape how an individual perceives environmental issues. Residential proximity to a particular industry and individual health status are two less studied factors. Because of the volume of petro-chemical industries in Louisiana, there is interest in examining the risk perception of residents living adjacent to these industries compared to residents living in areas without petro-chemical industrial facilities. Similarly, there is interest in understanding if an individual's health status influences their perception of environmental issues. This analysis seeks to identify which measures of self-reported health status significantly influence concern for a variety of environmental issues. Furthermore, this analysis will identify those environmental issues that are of significant concern in FLCs compared to NFLCs, including commonalities and differences. Data for this analysis is a compilation of survey responses from four Louisiana communities obtained from CAEPH at Tulane University.

To assess environmental perceptions, researchers at Tulane University conducted a series of surveys to measure community concerns for a variety of environmental issues in four communities across Louisiana. Research staff selected communities based on proximity to a petroleum or chemical facility and racial composition. Descriptive and multivariate analyses tested for factors hypothesized to influence concerns about environmental issues.

Community surveying on perception originated in Norco, Louisiana as part of a consulting project at the Tulane School of Public Health and Tropical Medicine, Center for Applied Environmental Public Health (CAEPH)[1]. In 2000, under a Louisiana Department of Environmental Quality (LDEQ) mandate, Shell/Motiva refinery initiated a long-term ambient air quality monitoring study for the Norco community. Two mandated requirements relevant to this

[1] I was a member of the CAEPH research team that designed communication messages, identified survey locations, participated in data analysis and presented the results at both community and professional meetings

research were: 1) Shell/Motiva was required to install additional air monitors throughout Norco for two years and 2) Shell/Motiva was required to assess community health and safety. The result was "Air Monitoring, Norco", a cooperative effort between the Community-Industrial Panel, Shell/Motiva refinery, LDEQ and CAEPH. The community asked CAEPH to serve as an independent third party to develop health and risk communication messages for the Norco community, as well as to conduct basic exposure assessments using the air monitoring data. Participation in this study provided an opportunity to obtain a holistic understanding of the association between air pollution and disease at the community level using air monitoring data and health and behavior surveys. Survey results were the basis for a series of health and environmental education mailings, in addition to presentations at several community meetings.

Concurrent with the consulting project, CAEPH obtained funding from the Centers for Disease Control and Prevention to participate in the development of an Environmental Public Health Tracking Network (EPHTN). The aim of the EPHTN was to create state and national systems to track many of the exposures and health effects possibly related to environmental hazards. The results of the EPHTN were to provide information to plan, apply, and evaluate actions to prevent and control environmentally related diseases. In addition to projects related to data quality, linkages and analysis, CAEPH also took part in a risk communication project to develop and evaluate strategies for disseminating and communicating findings from tracking systems. The EPHTN project built upon the Norco survey to conduct further surveys on health and environmental perceptions in fenceline (FLC) and non-fenceline (NFLC) communities to ascertain differences in perception and community health status. The goal of the project was to describe community health status and community perceptions and concerns about health and environmental issues. The objective of the survey was to investigate if location and which socio-

demographic characteristics account for differences between FLCs and NFLCs perceptions and their reported health status. For the purpose of this study, a fenceline community was any community located within a half-mile radius of a petroleum or chemical industrial facility.

The first Health and Environmental Perception survey (HEP-1) administered in Norco as part of the "Air Monitoring, Norco" project was a mail survey. The response rate was about 30% (N=1,309 households), which exceeds response rates for most mail surveys. Results indicated that the residents were most concerned about issues related to industrial operations, air quality and drinking water. While these results were expected, CAEPH researchers were interested in examining the degree to which location influences perception. There was also interest in characterizing health status at the community level as part of EPHTN. To achieve these goals, a second Health and Environmental Perception survey (HEP-2) was administered in Norco and Pride, Louisiana via telephone survey. Data from these surveys showed differences in environmental concern between the two communities. As in the previous survey, the Norco residents expressed more concern about issues related to industrial operations leading to the conclusion that baseline concerns for general environmental issues are comparable in FLCs and NFLCs but location is influential in shaping opinion.[2] Many studies have shown that black communities are disproportionately located near industrial facilities thereby negatively affecting their health and perceptions of environmental quality (Bullard, 1990; Mohai et al., 2009; Perlin et al., 1999; Perlin et al., 2001). In order to test this hypothesis, CAEPH researchers administered a third Health and Environmental Perception survey (HEP-3) among low-income black residents living in FLCs and NFLCs. Data from this survey was not analyzed due to the

[2] Results presented by E. Langlois at the National Environmental Public Health Conference, Atlanta, GA, October 2009.

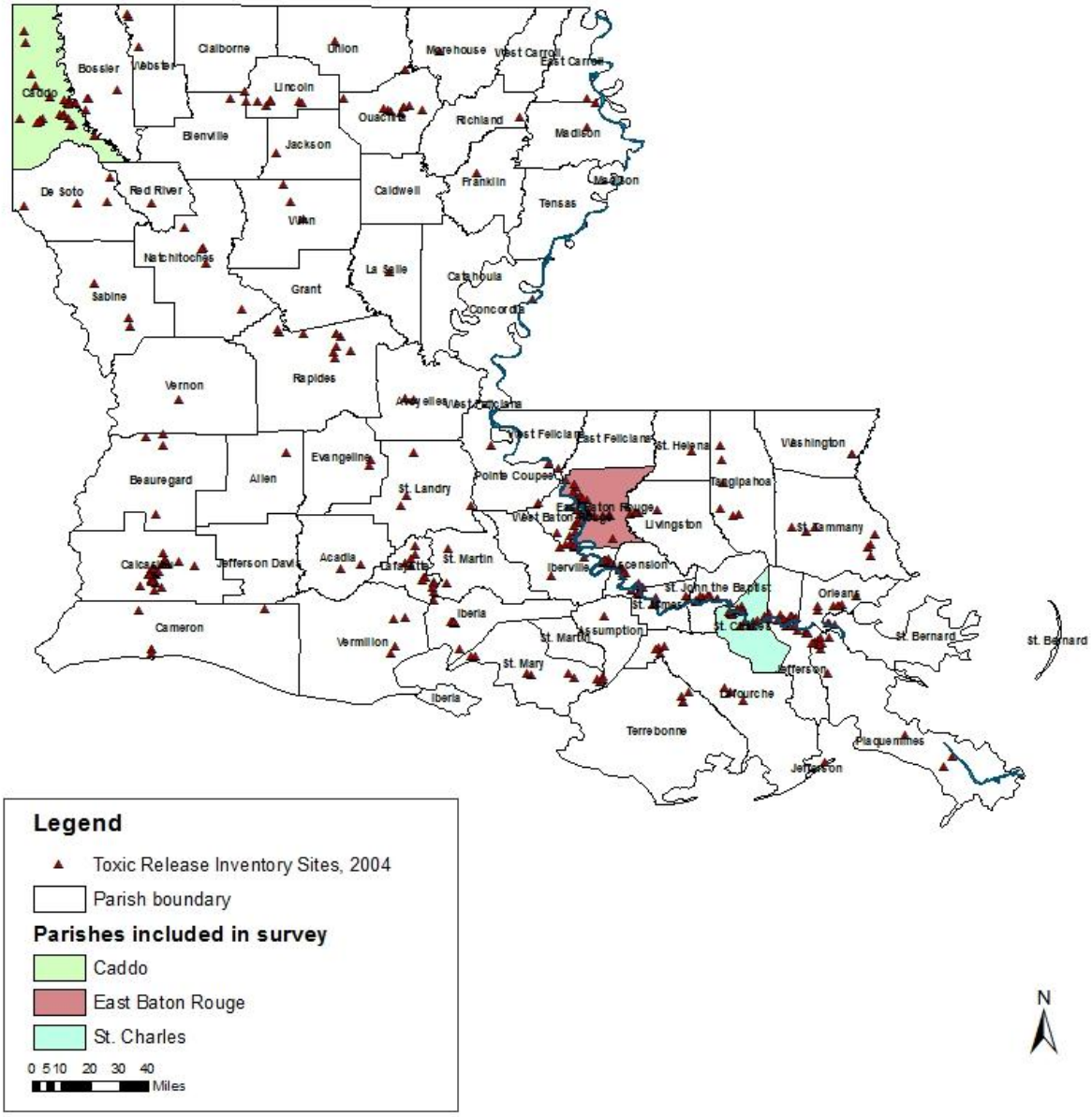
end of grant funding. The research presented here is based on the compilation of all telephone surveys (i.e., HEP-1, HEP-2 and HEP-3).

Survey Locations

The Health and Environmental Perception Survey was conducted in four Louisiana locations (Figure 1). The first round of surveys administered in Norco (FLC) and Pride (NFLC) occurred in the Summer 2004. A second round of surveys administered in selected areas of Baton Rouge and Shreveport took place in January 2005. The surveyed Fenceline/Non-Fenceline communities were matched on selected demographic factors (e.g., income and housing values) and proximity to industry.

Figure 1.

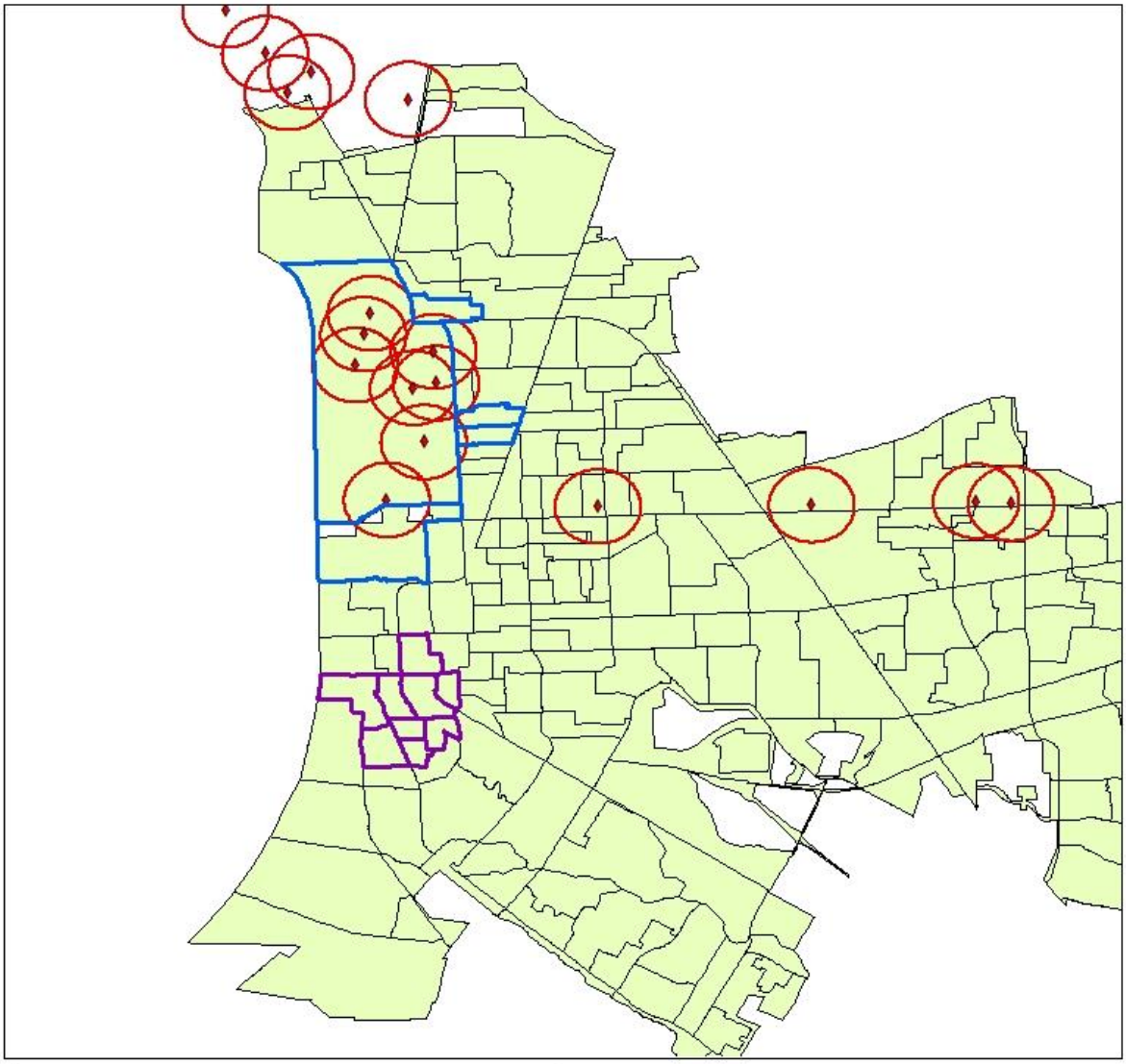
Health and Environmental Percerption Survey Parishes: Caddo, East Baton Rouge and St. Charles



Data Sources: US Census 2000 Tiger Line files; US Environmental Protection AgencyToxic Release Inventory, 2004
Author: Elizabeth Langlois, 9/12/2012

To identify potential survey locations in Baton Rouge and Shreveport, the research team created maps of Toxic Release Inventory (TRI) facility locations and US Census 2000 block groups (Figures 2 and 3). The TRI is a publicly available database maintained by the US Environmental Protection Agency that contains information about chemical releases and other waste management activities (EPA, 2012). The 1986 Emergency Planning and Community Right-to-Know Act (EPCRA) legislated that industrial facilities inform citizens of toxic chemical releases in their areas. Facilities within certain industrial sectors that manufacture or use chemicals above regulated thresholds are required to report annually any releases, spills, leaks or transfers of listed toxic chemicals released directly into the air, water, land or injected into underground wells. Additionally, data on these activities are made available to the public through the TRI. Standard Industrial Classification (SIC) is a system for classifying industries using a four-digit code. SIC codes are grouped together using a hierarchical structure: industry group, major group and division. Industrial sectors selected from the TRI for the present study were SIC 28 (Chemicals and Allied Products) and SIC 29 (Petroleum Refining and Related Industries). These codes were selected because these are the primary industries located in Norco, which was the first area surveyed. In selecting additional areas to survey, locations containing industry codes SIC 28 and/or 29 were chosen in order to match survey locations with similar industrial composition.

Figure 2.
Baton Rouge Petrochemical Facilities
and Selected Survey Census Block Groups, 2004



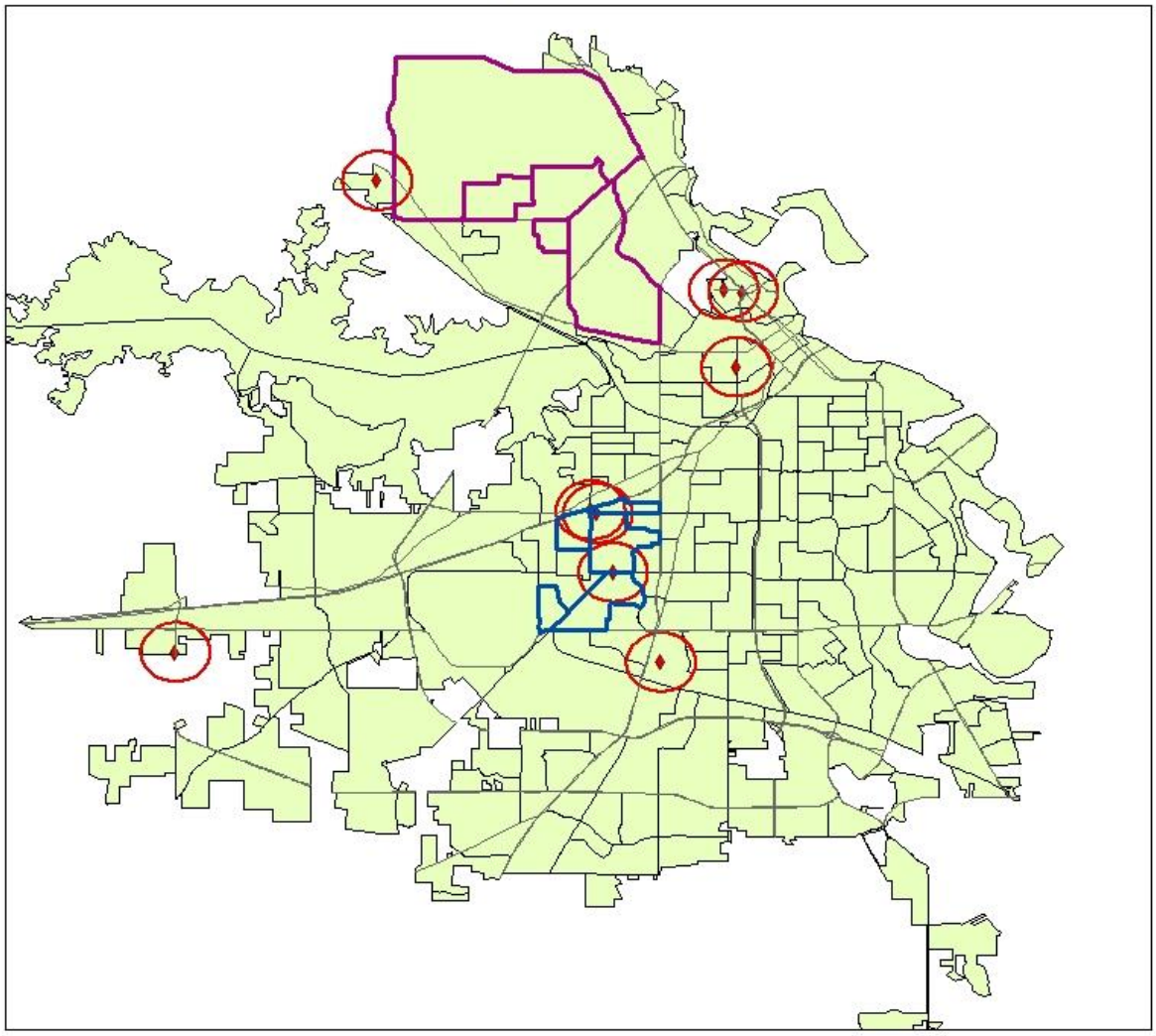
Legend

- 2004 TRI Facilities (SIC Codes 28 and 29)
- 1/2 mile Buffer
- East Baton Rouge Nonfenceline group
- East Baton Rouge Fenceline group

0 0.5 1 2 3 Miles

Data Sources: US Census 2000 Tiger Line files; US EPA Toxic Release Inventory, 2004
Author: Elizabeth Langlois, 9/25/2012

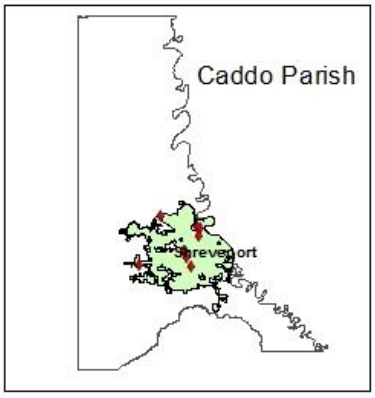
Figure 3.
Shreveport Petrochemical Facilities
and Selected Survey Census Block Groups, 2004



Legend

- 2004 TRI Facilities (SIC Codes 28 and 29)
- 1/2 mile buffer
- Shreveport Nonfenceline Survey Group
- Shreveport Fenceline Survey Group

0 0.25 0.5 1 1.5 2 Miles



Sources: US Census 2000 Tiger Line files; US EPA Toxic Release Inventory, 2004
Author: Elizabeth Langlois, 9/26/2012

Because the residential area in Norco was within a ½ mile of the industrial fenceline, this distance served as the definition for a FLC. To classify a census block group as FLC or NFLC, ½-mile buffers were drawn around each facility. Block groups falling at least partially within the ½-mile buffer from the eastern most boundary of the facility were designated as FLC. Census data for each block group were examined to match block groups on race, median age, and median household income. Non-Fenceline (NFLC) areas were any census block groups outside the ½-mile buffer. As with the FLC, NFLC census block groups were matched on race, median age and median household income.

Norco, located in St. Charles parish, is a small fence-line community along Louisiana's industrial corridor about 25 miles northwest of New Orleans. Approximately 3,579 residents live on 2.99 square miles of land directly adjacent to Shell Chemical Corporation and Shell/Motiva Enterprises L.L.C. Norco Refinery (Figure 4). (US Census, 2000). Diamond, an historic African-American neighborhood within Norco, was home to approximately 1,000 residents prior to 2002. A buyout program sponsored by Shell offered residents the opportunity to relocate away from Shell facilities. By 2004, almost all the African-American residents in the Diamond neighborhood moved out of Norco leaving Norco a predominately white community.

Figure 4. Aerial View of Norco, LA

Shell/Motiva Industrial Complex outlined in red
Source: "Norco, LA" Google Earth. November 29, 2011. Accessed 9/14/2012

Pride is approximately 22 miles north of Baton Rouge in East Baton Rouge parish. Pride is an exurban community, predominately residential and void of industry (Figure 5). The Louisiana Department of Environmental Quality located an ambient air monitoring station in Pride to serve as the background measurement location since there is little traffic and no industry in the area. Table 2 summarizes the population characteristics of Norco and Pride.

Figure 5. Aerial View of Pride, Louisiana

Aerial view of Pride, LA showing absence of industry
Source: "Pride, LA" Google Earth. November 16, 2011. Accessed 9/14/2012

Table 2. Population Characteristics of Norco and Pride Survey Locations

	Norco Fenceline	Pride Non-Fenceline
Total Population	3,579*	3,829
Race, White	2,809	3,707
Black	674*	86
Median Age, years	36.9	36.6
Household Income	$37,270	$51,822

* Note: Data from the US Census 2000 and does not reflect the buyout of more than 250 Black families in Norco in 2002

Baton Rouge, located in East Baton Rouge parish, is the second largest city and capital of Louisiana. It is also the northern-most city in Louisiana's "Industrial Corridor", which runs along the Mississippi River from New Orleans to Baton Rouge. Baton Rouge is the home of numerous

industries (predominately petrochemical production and manufacturing), businesses and two universities. Nineteen (19) petro-chemical facilities were identified in Baton Rouge. Table 3 summarizes the population of the selected census block groups.

Shreveport, located in Caddo parish, is the third largest city located in the northwest corner of Louisiana. It is a metropolitan area along the Red River. Shreveport was once home to the oil and gas industry, but over time, transitioned to a service economy and regional medical center. Shreveport had 22 industrial facilities reported in the 2004 Toxics Release Inventory (EPA, 2004). Table 3 summarizes the population of the selected census block groups. Tables 9-10 in Appendix C provide the demographic characteristics for each selected census block group in Baton Rouge and Shreveport.

Table 3. Population Characteristics of Selected Baton Rouge and Shreveport Survey Locations

	Baton Rouge/Shreveport Fenceline	Baton Rouge/Shreveport Non-Fenceline
Total Population	8,313	13,389
Race, White	1,134 (13.6%)	829 (6.2%)
Black	7,050 (84.8%)	12,333 (92.1%)
Median Age, years	28.6	32
Household Income	$17,504	$14,350

Note: Data from the US Census 2000

Behavioral Risk Factor and Health and Environmental Perception Survey

The survey instrument was developed using portions of the CDC's Behavioral Risk Factor Surveillance System (BRFSS) questionnaire and the Health and Environment Perception survey created by CAEPH researchers. The BRFSS includes questions about behaviors that affect health (e.g. tobacco use and woman's health), prevalence of disease (e.g., diabetes and asthma) and questions on demographic characteristics. The BRFSS has been in use since 1984 to collect uniform information on health conditions, preventive health practices and risk

behaviors in the United States (CDC, 2012). Data collection occurs through phone surveys administered in all 50 states, the District of Columbia, Puerto Rico, US Virgin Islands and Guam. The perception survey included the following core and optional modules from the BRFSS (Table 4). Questions selected for inclusion on the survey assessed individual health status, behavior, and environmental health as well chronic conditions that may be associated with environmental exposures.

Table 4. Selected BRFSS Core and Optional Modules

Core Sections	Optional Modules
Health Status	Women's Health
Health Care Access	Childhood Asthma
Exercise	Cardiovascular Disease
Diabetes	Tobacco Indicators
Hypertension Awareness	Other Tobacco Products
Cholesterol Awareness	Prostate Cancer Screening
Fruits and Vegetables	Chronic Obstructive Pulmonary Disease
Asthma	Environmental Factors
Tobacco Use	Indoor Air Quality
Alcohol Consumption	Home Environment
Cancer	

The Tulane Health and Environmental Perception Survey is a community survey to characterize resident opinions on health and the environment. The questionnaire consists of four sections. The first section asks respondents to rate their level of concern for 16 health issues on a scale from 1 (No concern) to 4 (Major concern) (Table 5). Section two asks respondents to rank four factors (genetics/family history, environment, behavior and social factors) they believe can lead to poor health. The third section asks respondents to rate their level of concern for 19

environmental issues on the 1-4 scale (Table 5). The last section collects demographic information about the respondent (see Interview Script in Appendix B).

Table 5. Health and Environmental Issues

The following is a list of health issues. Please indicate how concerned you are about the issue for yourself, those who live with you or others in your community.	The following is a list of environmental issues. Please indicate how concerned you are about the issue for yourself, those who live with you or others in your community.
1. Concern for own health	1. Overall concern for the environment
2. Getting sick	2. Quality of the air outside
3. Developing asthma or other respiratory diseases in children	3. Quality of the air inside where you live or work
4. Obesity or becoming sick due to poor diet or lack of exercise	4. Quality of the drinking water
5. Getting an infectious disease such as the flu	5. Quality of the water used for recreation such as swimming or fishing
6. Cancer, such as skin cancer, leukemia in children or lung cancer	6. Quality of the soil
7. Exposure to chemicals or toxic agents such as lead or mercury	7. Noise in the area
8. Being injured by firearms (guns) or other	8. Litter, trash or other solid waste
9. Being injured in an automobile crash	9. Leaking gasoline or other chemicals
10. Developing a sexually transmitted disease such as herpes, syphilis or HIV	10. Hazardous waste such as used medical supplies or sludge from water
11. Becoming sick because of the use of alcohol, tobacco or other drugs	11. Particles in the air such as falling ash
12. Problems with pregnancy and birth such as miscarriages, birth defects or low birth weight	12. Loss of natural, scenic or green areas
13. Skin rashes or other skin problems	13. Loss of natural places for fish and wildlife to live
14. Anemia or low red-blood cell counts	14. Plumes of smoke or steam
15. Heart problems	15. Industry too close to people's homes
16. Diabetes	16. Unpleasant odors
	17. Flaring or fire occasionally coming from industry chimneys at night
	18. Explosions
	19. Establishment of industries in the community without the involvement of the community

Sampling Methods/Data collection

A community survey of households occurred between 2004-2005 in Norco, Pride, Baton Rouge and Shreveport using random digit dialing (RDD) survey methods. CAEPH contracted with two survey research companies to carry out the RDD. Sample locations were matched on socio-demographic characteristics using US Census 2000 data. Sample calculations determined the optimal number of respondents from each community to provide appropriate power for statistical analysis. The sampling plan used a telephone exchange population density stratum to obtain an equal distribution of households in Norco (N=200) and in Pride (N=200) as well as in Baton Rouge (N=300) and Shreveport (N=300). One respondent at least 21 years of age or head of household was selected to complete the survey. Households were selected through RDD, using a master list of phone numbers in the areas maintained by the contracted survey company. All phone numbers were screened to exclude recognizable businesses and disconnected numbers. Each household received a minimum of 15 callback attempts (3 attempts in 5 calling periods). A pretest of approximately 30 respondents was completed prior to beginning full scale interviewing.

A unique identification number was assigned to each respondent. Other identifiers included their 5-digit zip code (if available from telephone sample or from respondent); phone prefix; street name and hundred block; and number of call attempts. Data were checked for inconsistent and erroneous responses using range and logic procedures.

Analysis

Individual data were pooled to provide information about health status and environmental perceptions of the residents in Norco, Pride, Baton Rouge and Shreveport. The sample design matched survey locations on selected demographics to minimize effect modification or

confounding of survey results. Baseline characteristics are reported as frequencies to describe demographic characteristics and health status of all respondents. Bivariate analysis identified any significant differences between the FLC and NFLC respondents. Respondents rated their level of concern regarding 19 environmental issues on a scale ranging from No Concern to Major Concern. Responses were dichotomized as Major Concern (Somewhat of a concern and Major concern) and No-Some Concern (No concern at all and Not much of a concern) for analysis. Because of the small number of respondents indicating their race as other racial groups, race responses were coded as Black and White. Marital status was grouped into two categories, Married and Not Married. Respondents provided their age in years, which was grouped into three categories (<40 years, 40 – 65 years, and > 65 years). Education was also recoded into three categories (HS/GED, Some College, and College Grad). Employment was grouped into four categories (Employed, Unemployed, Retired and Other). A respiratory status variable was created by assigning a respondent a "1" if they responded to ever having asthma, bronchitis or emphysema. Similarly, a cardiovascular health status variable was created by assigning a respondent a "1" if they had ever been told they had high blood pressure, high cholesterol, congestive heart disease, ever had a heart attack, or ever had a stroke. All other respondents were coded as "0" that is, not having any respiratory or cardiovascular disease. Crude and adjusted odds ratios were calculated using multinomial logistic models to identify differences in environmental concerns between FLC and NFLCs. All results were determined by modeling Major Concern relative to No-Some Concern. The model was fit using maximum likelihood techniques using the multinomial regression procedure in SPSS 18.0 (SPSS, 2009, Chicago, IL). All maps were created using ArcGIS 10.1 (ESRI, Redlands, CA)

RESULTS

One thousand and one (1,001) households completed interviews across the four survey locations. By design, half the respondents lived in FLCs and half lived in NFLCs. The majority of the respondents were black and more females completed the interview than men did. The median age of the respondents was 54 years of age. Almost half the respondents reported being married; the same proportion reported being employed. Forty percent of the interviewees graduated from high school, the remaining had some college or more education. Over one third of the respondents reported a household income of $20,000 or less per year. The majority of respondents (60.2%) rated their general health status as good to excellent. Less than one quarter of the respondents had ever had cancer (19.9%). Less than 10% of the respondents reported having a respiratory condition whereas more (57%) reported having a cardiovascular condition. Tables 11 and 12 show the detailed characteristics of the study sample population (Appendix C).

Bivariate correlational analysis identified any differences in demographic characteristics and health status of the FLC and NFLC respondents. Table 6 presents the characteristics of the survey respondents grouped by location. Respondents from both locations were similar across all demographic and health status indicators except for marital status. The number of married respondents was significantly greater in the NFLCs (55.3%) compared to the FLCs respondents (44.7%).

Table 6. Demographic and Health Status Characteristics by Location.

	FLC N = 500 N (%)	NFLC N = 501 N (%)	p-value†
Age			0.091
< 40 years	106 (21.5)	94 (18.9)	
40 – 65 years	238 (48.3)	275 (55.2)	
> 65 years	149 (30.2)	129 (12.9)	
Gender, Female	345 (69)	362 (72.3)	0.258
Race			0.61
White	188 (37.8)	196 (39.4)	
Black	310 (62.2)	302 (60.6)	
Married	220 (44.7)	275 (55.3)	0.001*
Education			0.83
HS/GED or less	273 (55.4)	277 (55.5)	
Some College	137 (27.8)	132 (26.5)	
College Grad	83 (16.8)	90 (18.0)	
Employment			0.464
Employed	249 (49.8)	242 (48.3)	
Unemployed	19 (3.8)	27 (5.4)	
Retired	140 (28.0)	129 (25.7)	
Other	92 (18.4)	103 (20.6)	
Annual Household Income			0.234
< $20,000	186 (39.5)	163 (34.6)	
$20,001 - $40,000	132 (28.0)	118 (25.1)	
$40,001 - $60,000	57 (12.1)	78 (16.6)	
> $60,000	65 (13.8)	77 (16.3)	
General Health Status			0.38
Excellent	72 (14.4)	64 (12.8)	
Very Good	137 (27.4)	145 (28.9)	
Good	171 (34.2)	149 (29.7)	
Fair	80 (16.0)	96 (19.2)	
Poor	40 (8.0)	47 (9.4)	
Ever Smoked	243 (48.6)	217 (43.3)	0.27
Cancer	104 (20.8)	95 (19.0)	0.465
Respiratory Disease	77 (15.4)	93 (18.6)	0.18
Cardiovascular Disease	279 (55.8)	292 (58.3)	0.427

† Pearson chi-square test significant at $p < 0.05$

Respondents rated their concern for 19 environmental issues. The results of correlation analysis identified four issues for which level of concern was significantly higher in FLCs compared to NFLCs. Respondents living in FLCs expressed more concern for noise, unpleasant odors, flaring or fires, and explosions; environmental issues typically associated with industrial processes (Table 7). Interestingly, residents in NFLCs were significantly more concerned about litter, trash and other solid waste. In regards to the other environmental issues, those in FLCs were more concerned about outdoor air quality, air particles, and location of industry too close to residential areas; however, these results were not significant. Residents in NFLCs expressed more concern over indoor air quality, water quality in recreational waterways, soil quality, and hazardous waste. None of those interviewed expressed somewhat to major concern over the location of new industry without community input. Table 13 presents all responses to concerns about environmental issues (Appendix C).

Table 7. Respondents Expressing Somewhat to Major Concern by Location

Environmental Issue	FLC N (%)	NFLC N (%)	p-value†
Overall concern for the environment	423 (85.1)	421 (84.9)	0.92
Quality of the air outside	427 (85.7)	407 (81.4)	0.06
Quality of the indoor air where you live or work	334 (66.9)	347 (69.8)	0.33
Quality of the drinking water	366 (73.5)	364 (72.8)	0.81
Quality of the water used for recreation	335 (68.6)	348 (71.8)	0.29
Quality of the soil	315 (64.5)	342 (99.5)	0.1
Noise in the area	349 (70.1)	280 (56.1)	<0.000*
Litter, trash or other solid waste	346 (69.6)	377 (75.2)	0.05
Leaking gasoline or other chemicals	368 (74.3)	347 (69.7)	0.10
Hazardous waste	336 (67.6)	347 (69.8)	0.45
Particles in the air such as falling ash	349 (70.4)	320 (64.9)	0.07
Loss of natural, scenic or green areas	349 (70.6)	355 (72.4)	0.53
Loss of natural places for fish and wildlife	383 (77.5)	389 (78.7)	0.64
Plumes of smoke or steam	354 (71.8)	337 (68.5)	0.26
Industry too close to people's homes	395 (79.5)	374 (74.9)	0.09
Unpleasant odors	411 (82.5)	356 (71.1)	< 0.000*
Flaring or fire coming from industry chimneys	380 (76.3)	321 (65)	< 0.000*
Explosions	395 (79.3)	342 (68.8)	< 0.000*

†Pearson chi-square test significant at $p < 0.05$
* $p > 0.001$

Multivariate regression modeling supported the results of the bivariate analysis; those living in FLCs have more concern for environmental issues related to industry. Results of the multivariate model that included demographic and health status variables indicated marital and employment status as the only variables significantly associated with environmental concerns. Married respondents in FLCs were less likely to be concerned about the environmental issues

compared to those living in NFLCs (OR = 0.68; 95% CI: 0.47, 0.90). Marital status was significant in the bivariate analysis but employment was not significantly different between the FLCs and NFLCs. A closer look at the number of people who responded "unemployed" showed that only 46 respondents reported being unemployed. This low number probably biased the results such that the status "unemployed" was significant in the regression model. To validate this assumption, employment status was reclassified as "employed" or "unemployed" (i.e., grouping Unemployed, Retired and Other). Employment was no longer associated with concern, confirming that the small number of unemployed biased the results. This new variable was used in all regression models to control for the low number of unemployed respondents.

There were no associations between views on environmental issues and the health status indicators in the multivariate model; therefore, health status was not included in further analyses. Gender, age, race, income, and education are variables shown to be important characteristics that influence risk perception; for that reason, they were included in multivariate modeling. Table 8 presents the crude and adjusted odds ratios of environmental concern by location.

Table 8. Crude and Adjusted Odds Ratios of Environmental Concern by Location

Environmental Issue	Crude OR	Adjusted OR†	95% CI
Overall concern for the environment	0.76	0.77	0.44 – 1.36
Quality of the air outside	1.63	1.53	0.82 – 2.84
Quality of the inside air where you live or work	0.71	0.75	0.47 – 1.19
Quality of the drinking water	.096	1.06	0.64 – 1.76
Quality of the water used for recreation	0.89	0.86	0.54 – 1.4
Quality of the soil	0.71	0.72	0.44 – 1.18
Noise in the area	2.43**	2.26**	1.50 – 3.99
Litter, trash or other solid waste	0.50**	0.49**	0.29 -0.81
Leaking gasoline or other chemicals	1.31	1.05	0.59 – 2.06
Hazardous waste	0.56*	0.62	0.33 – 1.16
Particles in the air such as falling ash	1.64*	1.83*	1.08 – 3.07
Loss of natural, scenic or green areas	0.70	0.78	0.43 – 1.4
Loss of natural places for fish and wildlife	1.10	1.00	0.57 – 1.78
Plumes of smoke or steam	0.70	0.80	0.47 – 1.38
Industry too close to people's homes	0.70	0.62	0.34 – 1.13
Unpleasant odors	2.14**	2.14*	1.19 – 3.83
Flaring or fire coming from industry chimneys	1.36	1.32	0.78 – 2.26
Explosions	1.82*	1.66	0.94 – 2.93

Reference group – Non-Fencline

† Adjusted for marital status, race, gender, household income, age, employment and education

** p < 0.05; ** p < 0.01*

Results of the multivariate regression indicate that concerns over environmental issues related to industrial processes are higher for those living in FLCs compared to those living in NCFLs. Respondents in FLCs are over twice as likely to be concerned about noise (OR = 2.26) and unpleasant odors (OR = 2.14). Those living in FLCs are also more concerned about particles in the air (OR = 1.83) compared to those living in NFLCs. Litter, trash and other solid waste are less of a concern for respondents in FLCs compared to those living in NLFCs (OR = 0.49). In other words, those living in NFLCs are twice as likely to be more concerned about litter and

trash than those living in FLCs. After adjusting for demographic characteristics, concern about explosions was no longer a significant concern for those respondents in FLCs.

Logistic analyses were conducted to examine which demographic characteristics influenced concern for the following significant outcomes: concern about noise in the area; concern about litter, trash or other solid waste; concern about particles in the air such as falling ash; and concern about unpleasant odors. Independent variables entered into the analysis were race, age group, gender, marital status, household income, education, employment, and location (fenceline/non-fenceline).

Race and location were significant variables to influence concern about noise in the area. Black respondents were two and a half times more likely to be concerned about noise in the area (OR = 2.49, 95% CI: 1.8, 3.5). Residents in FLCs were almost twice as likely to express concern about noise in the area compared to those living in NFLCs (OR = 1.87, 95% CI: 1.4, 2.5). When using concern about litter, trash and other solid waste as the outcome variable, race and age group were significant determinants of concern. Once again, black respondents were more likely to be concerned about litter and trash (OR = 2.46, 95% CI: 1.7, 3.5). Survey respondents less than 40 years and between 40 – 65 years expressed almost twice as much concern about trash and litter compared to those over 65 years (OR = 1.79, 95% CI: 1.1, 2.9 and OR = 1.83, 95% CI: 1.2, 2.7, respectively).

Race, age group and location were significant determinants of concern about air particles. Blacks were two times more likely to be concerned about air particles (OR = 2.05, 95% CI: 1.5, 2.9). Respondents > 40 years and those between 40 – 65 years were over twice as likely to be concerned about air particles than older respondents (OR = 2.55, 95% CI: 1.4, 4.2 and OR = 2.1,

95% CI: 1.4, 3.1, respectively). Residents in FLCs expressed more concern about air particles than those living in NFLCs (OR = 1.43, 95% CI: 1.0.1.9).

Finally, the model predicting respondent characteristics about concern over odors indicated race, gender, age group and location were significant determinants of concern. Blacks expressed more concern about odors (OR = 2.55, 95% CI: 1.7, 3.7). Females were more likely to be concerned about odors compared to men (OR= 1.61, 95% CI: 1.2, 2.3). Respondents less than 40 were almost three times more likely to be concerned about odors (OR = 2.73, 95% CI: 1.6, 4.7) while those 40 – 65 years were twice as likely to be concerned about odors compared to respondents 65 and older (OR = 2.25, 95% CI: 1.5, 3.5). Those living in FLCs were almost twice as concerned about odors as respondents living in NFLCs (OR = 1.99, 95% CI: 1.4, 2.8). Detailed results of the logistic models are in Tables 14 - 18 in Appendix C.

DISCUSSION

The literature is rich with studies exploring the factors that influence how individuals perceive risk. The aim of this study was to assess the role residential proximity to industry and health status plays in how individuals shape opinions about a variety of environmental issues. Survey results reveal that proximity to industrial facilities has a strong influence on how an individual rates their concern about environmental issues, particularly those related to industrial processes such as noise and odors. Marital status was also a significant factor in framing environmental perceptions. Self-reported health status did not play a significant role in how individuals rated their concern about environmental issues.

Differences in opinion on environmental issues varied based on the issue. Concerns regarding general environmental issues such as air quality, drinking water and soil, were comparable between the FLCs and NFLCs. Similarly, all communities expressed equal levels of concern for natural preservation issues such as loss of green space and loss of wildlife habitats. These results indicate that concern for these issues is independent of residential location.

Neighborhood setting and attributes serve as constant reminders of the potential hazards of living close to industry. This is demonstrated by the elevated levels of concern among FLC respondents centered on facility-related issues, particularly noise, air particles and odors. Although not statistically significant, FLC respondents expressed more concern for proximity of industry to residential areas, flaring/fires coming from industry chimneys and explosions. These results are consistent with other studies that found people living close to industry have higher levels of concern related to nuisance issues such as smell, noise and dust (Elliott et al., 1999, Howel et al., 2002; Wakefield et al., 1999).

Respondents living in nonfenceline communities were more concerned about litter, trash and solid waste. There is no obvious explanation for this finding. Residents surveyed in urban areas rated trash in the neighborhood as an important concern (Greenberg & Schneider, 1995; Mohai & Bryant, 1998). Similarly, the NFLC respondents live in urban areas, which may explain their greater concern for localized litter, trash and solid waste in their communities.

As expected, location is an important influence on shaping risk perception. However, there are other criteria shown to influence how individuals perceive risk, in this case, environmental conditions. While there are psychosocial measures to assess risk perception, this survey did not seek to measure these criteria (e.g., fear, dread, voluntariness of risk). The survey did collect information on demographic characteristics of the respondents as well as measures of health status. These measures have been shown to be influential in shaping level of concern.

Marital status was also the only significantly different demographic characteristic between the study locations. More respondents living in NFLCs (55.3%) were married compared to those living in FLCs (44.7%). Not surprisingly, marital status emerged as the only significant predictor variable in the multinomial regression model. In a model controlling for demographic characteristics (race, age, gender, marital status, household income, employment, education) and health status (overall health status, smoking, cancer, respiratory status and cardiovascular health status), marital status was the only significant explanatory variable contributing to the difference in concern between FLCs and NFLCs; married respondents in FLCs were less likely to express concern about the environmental issues. There is no obvious explanation for this result and no studies have examined the role of marital status in forming opinions about environmental issues. One suggestion is that marital status is interacting with or measuring another demographic variable. Greenberg and Schneider (1995) found that race,

marital status and housing status confounded gender related perceptual differences. Results from their analysis of American Housing Survey data showed white, married homeowners more bothered by non-residential land uses than non-white, not married homeowners. Furthermore, residents in poor quality neighborhoods had higher levels of concern for bothersome neighborhood conditions, regardless of marital status. Based on this study, it would be expected that married residents in a FLC would have greater concern for the environmental issues than those in NFLC. However, that was not the case in the analysis. Married respondents in NFLCs were almost twice as likely to be concerned about environmental issues. Further research should investigate any relationships between marital status and other socio-demographic characteristics and their influence on perceptual differences.

The finding that the health status measures were not significant variables was unexpected. The small number of respondents reporting a health condition potentially related to environmental exposures such as cancer, asthma, bronchitis, or emphysema, could explain the lack of association between environmental concern and health status. For example, the results of logistic regression modeling the association between concern about air particles with asthma, bronchitis and emphysema did not indicate that the presence of disease has a significant influence on concern (data not shown). Few studies have shown that health status does influence an individuals' perception of environmental hazards. The predominant focus of these studies was perceptions of air pollution. Two studies asked respondents to indicate if they or a family member had a respiratory condition (Elliott et al., 1999; El Zein et al., 2006). The results of both surveys found that the presence of a household member or the respondent having a respiratory condition influenced how the respondent viewed air quality in their area. Howel and colleagues (2002) measured health status by asking respondents if they had a chronic illness. They

concluded that those with a chronic condition were more likely to rate industrial air pollution as a serious problem and neighborhood air quality as poor. Because this survey asked respondents to rate concern for a myriad of environmental issues, their health status may not have been a driving influence on their response compared to other surveys that focused exclusively on air quality, which has a known impact on respiratory health.

Three environmental issues emerged as being of more concern for those living in FLCs: noise, air particles, and odors. Litter, trash and other solid waste were of more concern for those respondents living in NFLCs. Further investigation into respondent characteristics that were likely to explain these differences in opinion revealed that race, age group, gender and location were significant explanatory variables. Analyses performed removing location from the model yielded the same results. Results discussed here are from models excluding location.

Race was consistently associated with concerns about noise, trash and litter, air particles and odors. In particular, blacks were twice as likely to express somewhat to major concern for these issues. These findings are consistent with studies that investigated environmental concerns at the local level (Burby and Strong, 1997; Mohai, 1997; Mohai and Bryant, 1998; Jones and Rainey, 2006). All concluded that blacks were equally or more concerned about neighborhood environmental problems such as noise, trash, air particles and odors. Results from this study suggest that black respondents in FLCs may have greater concern for these issues because they tend to live in slightly more economically disadvantaged urban areas (e.g., Baton Rouge and Shreveport) compared to the suburban and ex-urban locations of Norco and Pride.

When comparing different age groups, respondents less than 40 years and between 40 – 65 years were more concerned about trash and litter, air particles and odors compared to those over 65 years. There is little evidence for the association between age and attitudes towards

environmental issues. A couple studies suggest that younger people tend to be more concerned about the environment compared to older people who have seen improvements in environmental quality over time (Van Liere et al., 1980; Howel et al., 2002). The findings of this analysis are consistent with these results.

Females were 1.5 times more likely to be concerned about odors than men were. This may because they are more concerned about risks for their families in their role as caretakers. Furthermore, women may spend more time at home making them more sensitive to odors released during industrial operations. However, this was the only issue for which gender was significant. Research on gender differences concludes that women are generally more concerned about environmental conditions so it was expected that gender would have a significant association with other environmental issues on the survey (Flynn et al., 1994; Greenberg and Schneider, 1995). In this survey, seventy percent of those interviewed were female. It is possible that the high response rate of females could bias the results; however, gender would have been significant across all issues if this were true. A closer look at the employment status of female respondents showed that 26% were retired, 13% were homemakers and 9% reported being unable to work. Since close to 50% of the respondents did not have traditional employment, it is likely that they spend more time at home with greater opportunity for exposure to unpleasant odors making this a more sensitive issue.

Limitations

There were several limitations to this research. The restriction of fenceline communities to those in close proximity to petrochemical industries limits the generalization of these results to other communities that are in proximity to other types of industry. It was not surprising that the results of this study showed that sensate factors associated with industrial operations were of

more concern for those living in FLCs. However, most of those interviewed rated all of the environmental issues to be of somewhat to major concern (Table 13). A survey administered in areas with other types of industry, particularly ones that are smaller and/or do not have obvious sensory characteristics (e.g. dry cleaners, machine shop), may result in a very different profile of environmental concern. Related to location, the definition of fenceline used in this study may have been too narrow. A fenceline community is generally defined as any community adjacent to large industrial or military complexes. Yet, the area within a fenceline boundary does not have a standard definition. Studies have used buffers ranging from a one-half mile to five miles to define a fenceline community. Since many facilities in Louisiana are within a half-mile of residential areas and Norco was the baseline survey community, the definition of fenceline was set at one half mile for this study.

This analysis did not attempt to examine the factors that influence concern for each environmental issue. The main objective was to examine the association of location, socio-demographic characteristics and health status on environmental concern. To control for demographic variability, surveyed block groups were matched on median age, median household income and race. This may be the reason why documented socio-demographic factors associated with perception were not significantly associated with respondents rating of concern in this analysis. In order to examine the association of socio-demographic factors on concern for each environmental issue, adjustment for multiple comparisons using the same data was required, which was beyond the scope of this analysis. Further analyses should decompose each concern by socio-demographic characteristics and health status to understand explore the relationship between these variables and their effect on how people rate different environmental issues.

Telephone survey research enables data collection across a geographically diverse sample area more quickly and cheaply than field interviews and without the limitations of postal surveys (e.g., poor response rates). Other advantages include consistent interview administration, supervision and quality control and greater control over the sampling design. Despite these advantages, there are limitations to telephone surveys that make their administration challenging, especially as people are discontinuing residential telephone service in favor of cellular services. Telephone surveys by their nature are restricted to households with telephone service. There is concern that exclusion of households without telephone service may result in biased survey estimates. Studies have shown that households without telephone service have different demographic characteristics compared to those with residential service. For example, those without residential service tend to have lower incomes, are younger and employed. This did not appear to be the case in this study since sample block groups were matched on socio-demographic characteristics to minimize bias.

CONCLUSION

Many theories and models exist to tease apart the factors that influence how an individual perceives risk. Perception is a complicated web of psychological, social and cultural factors that influence the way people interpret and make sense of risk. Public opinions about risk have a profound impact on the decision-making activities in our society. Risk perception is worthy of study because understanding the contextual factors that shape how individuals perceive risk is critical to risk management and communication activities. Furthermore, understanding perception and opinion facilitates anticipation of the public's responses to risk events and directing educational efforts.

Risk perception is not homogeneous. Moreover, many stereotypes exist as to how and who perceives risk. For example, many experts believed females and blacks tended to have greater concern for risks compared to men and whites. Research studies showed this was not always the case; there are countless, interrelated factors that shape risk perception. While it is impossible to survey every community about their concerns, breaking down the generalizations of who and what people believe is important for policy, management and communication. Conversely, understanding commonly shared opinions is equally important as acknowledging differing opinions. The results from this study highlight this point; most of the respondents expressed a greater concern for all environmental issues, regardless of location. However, as this study and many before illustrate, there is no set of universal predictive rules that can be applied *en masse* because people understand risks in multiple ways. Surveys such as this health and perception survey provide valuable information about community priorities and health status that scientists and policy makers can use to close the gap that exists between these groups and the

public. This in turn, improves efforts to provide not only scientific data about risk, but also to inform and educate communities about potential health and environmental hazards.

There was little variation in residents' concerns about a variety of environmental issues, regardless of residence in a FLCs or NFLCs. Respondents were equally concerned about general and natural preservation environmental issues. Issues related to industry, particularly those that can be seen, smelt or heard, were of more concern for those living in FLCs. The results are consistent with previous studies measuring attitudes towards the environment. However, socio-demographic characteristics, such as gender and race, typically associated with perception were significant for only a few issues. Nevertheless, the results confirm that location plays an important role in how people perceive their local environment (i.e., neighborhood).

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APPENDIX A

University Committee for the Protection of Human Subjects in Research
University of New Orleans

Campus Correspondence

Principal Investigator:	Renia Ehrenfeucht
Co-Investigator:	Elizabeth Langlois
Date:	March 5, 2012
Protocol Title:	"A Survey of Health Behaviors and Perceptions of Health and the Environment in a Fence-line and Nonfence-line Community"
IRB#:	01Mar10

The IRB has deemed that the research and procedures described in this protocol application are exempt from federal regulations under 45 CFR 46.101category 2 due to the fact that this research will involve the use of interview procedures. Although information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects, any disclosure of the human subjects' responses outside the research wouldn't reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Exempt protocols do not have an expiration date; however, if there are any changes made to this protocol that may cause it to be no longer exempt from CFR 46, the IRB requires another standard application from the investigator(s) which should provide the same information that is in this application with changes that may have changed the exempt status.

If an adverse, unforeseen event occurs (e.g., physical, social, or emotional harm), you are required to inform the IRB as soon as possible after the event.

Best wishes on your project!

Sincerely,

Robert D. Laird, Chair
UNO Committee for the Protection of Human Subjects in Research

Tulane University

Office of the Senior Vice President
for the Health Sciences
Committee on the Use of Human Subjects
FWA00002055

April 29, 2004

LuAnn White, Ph.D., DABT
Tidewater Suite 800

RE: **Our Study:** # W0248
Protocol Title: A Survey of Health Behaviors and Perceptions of Health and the Environment in a Fence-line and Nonfence-line Community (W0248)

Dear Dr. White:

This is to state that the above named project is EXEMPT RESEARCH in accordance with 45 CFR 46.101(b)(2) (anonymous questionnaire/survey) and as such is outside the purview of this Committee.

Sincerely, Ina Friedman, MSN, NP-C/rm

Ina Friedman, MSN, NP-C, CIM
Chair
Committee on Use of Human Subjects

IF/rm
FWA00002055

Health Sciences Center
1430 Tulane Ave., TW-36, New Orleans, LA 70112-2699 *tel* 504.584.2665 *fax* 586.3892 www.som.tulane.edu/irb/

APPENDIX B

Interviewer's Script

HELLO, I'm calling for Tulane University's Center for Applied Environmental Public Health. My name is **(_____).** We're gathering information on the health of Louisiana residents. Your telephone number has been chosen randomly, and I'd like to ask some questions about 3 distinct areas:

- Health and health practices
- Your home environment
- Your perceptions regarding health and the environment

A. Is this **(phone number)**? **If yes: Continue**
If "No," please read:
Thank you very much, but I seem to have dialed the wrong number. It's possible that your number may be called at a later time. **Terminate & Tally**

B. Is this a private residence? **If yes: Continue**
If "No," please read:
Thank you very much, but we are only interviewing private residences. **Terminate & Tally**

C. Are you the **male** / **female** head of the household?

If "Yes" → Go to Question "D"

If "No" ask: → Is the head of the household home?

If Yes ask: → May I speak with him/her? → **Continue below by reading the introduction to the correct respondent**.

If No ask: → When is a good time to call back?

D. I will ask for your zip code, street name, and the block identifer of your address, but I won't ask for any other personal information that can identify you. You don't have to answer any question you don't want to, and your participation is entirely voluntary. The interview takes a short time and any information you provide will be confidential. If you have any questions about this survey, upon completion of the survey I will provide a telephone number for you to call to get more information.

Begin with Question 1

To the correct respondent:

HELLO, I'm calling for the Tulane University's Center for Applied Environmental Public Health. My name is **(name) .** We're gathering information on the health of Louisiana residents. You have been chosen randomly, and I'd like to ask some questions about 3 distinct areas:

- Health and health practices
- Your home environment

- Your perceptions regarding health and the environment.

E. I will ask for your zip code, street name, and the block identifer of your address, but I won't ask for any other personal information that can identify you. You don't have to answer any question you don't want to, and your participation is entirely voluntary. The interview takes a short time and any information you provide will be confidential. If you have any questions about this survey, upon completion of the survey I will provide a telephone number for you to call to get more information.

Begin with Question 1

The first set of questions I will be asking pertain to your health and health status.
Card

Health Status

1. Would you say that in general your health is —

Please read: **Do not read:**

Excellent……. 9-1 Good….-3 or Poor….-5 Don't Know/Not Sure….-7

Very good…… -2 Fair…….-4 Refused……-8

2. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

__ __ Number of days **None**…-88 Don't Know/Not sure…-77 Refused…-99

3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

__ __ Number of days **None**…-88 Don't Know/Not sure…-77 Refused…-99

[If NONE in both Q.2 and Q.3 Skip to Q.5]

4. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

__ __ Number of days None…-88 Don't Know/Not sure…-77 Refused…-99

Health Care Access

5. Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare or Medicaid?

Yes….16-1 No…2 Don't know/Not Sure….-7 Refused….-9

6. Was there a time in the past 12 months when you needed to see a doctor but could not because of the cost?

Yes….17-1 No…2 Don't know/Not Sure….-7 Refused….-9

Exercise

7. During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?

Yes….18-1 No…2 Don't know/Not Sure….-7 Refused….-9

Diabetes

8. Have you ever been told by a doctor that you have diabetes?
If "Yes" and respondent is female, ask: "Was this only when you were pregnant?"

↓↓**Yes**……**Continue**…..-1
Yes, but female told only during pregnancy……...-2 → **Go to Q. 11**
No…-3 → **Go to Q. 11** Don't know/Not sure…..-7 → **Go to Q. 11**
Refused…..-9 → **Go to Q. 11**

9. Are you now taking insulin?
Yes…20-1 No….–2 Refused…-9

10. Are you now taking diabetes pills?
Yes….21-1 No…2 Don't know/Not Sure….-7 Refused….-9

Hypertension Awareness

11. Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?
(If respondent asks for a definition of high blood pressure, it is defined as a diastolic reading greater than 120 and a systolic greater than reading of 80)
If "Yes" and respondent is female, ask: "Was this only when you were pregnant?"

↓↓**Yes**……**Continue**…..22-1
Yes, but female told only during pregnancy……...-2 → **Go to Q. 13**

No…-3 → **Go to Q. 13** Don't know/Not sure…..-7 → **Go to Q. 13** Refused….-9 → **Go to Q. 13**

12. Are you currently taking medicine for your high blood pressure?
Yes….23-1 No…2 Don't know/Not Sure….-7 Refused….-9

Cholesterol Awareness

13. Have you ever been told by a doctor, nurse, or other health professional that your blood cholesterol is high?
(If respondent asks for a definition of high cholesterol, it is a blood cholesterol level over 200)

Yes….24-1 No…2 Don't know/Not Sure….-7 Refused….-9

Fruits and Vegetables

These next questions are about the foods you usually eat or drink. Remember, I am only interested in the foods **YOU** eat. Include all foods **YOU** eat, both at home and away from home.

14. On average**,** not counting juice, how often do you eat fruit? **(Ask about frequency only if needed)**
How many times per day/week/month…

Per day..__ __ __ Per week…__ __ __ Per month..__ __ __ Never…555 Don't know / Not sure…777 Refused…999
Day…28-1 Week…-2 Month-3

15. On average, not counting starches (such as potatoes, pasta salad, beans, and rice) how many servings of vegetables do you usually eat? (Example: A serving of vegetables at both lunch and dinner would be two servings.) **(Ask about frequency only if needed)**

Per day.__ __ __ Per week…__ __ __ Per month.. __ __ __ Never…555 Don't know / Not sure…777 Refused…999
Day…32-1 Week…-2 Month-3

Asthma

16. Have you ever been told by a doctor, nurse or other health professional that you had asthma?
↓↓**Yes**……**Continue**…..33-1 No…-2 → **Go to Q. 20**
Don't know/Not sure…..-7 → **Go to Q.** Refused….-9 → **Go to Q. 20**

17. Do you still have asthma?
↓↓**Yes**….34-1 No…2 → **Go to Q. 20**
D.K./Not Sure.-7 → **Go to Q. 20** Ref..-9 → **Go to Q. 20**

18. During the past 12 months, how many times did you visit an emergency room or urgent care center because of your asthma?

_____ Number of visits None…88 Don't know / Not sure…98 Refused…99

19. During the past 12 months, how many times did you see a doctor, nurse or other health professional for a routine checkup for your asthma?
_____ Number of visits None…88 Don't know / Not sure…98 Refused…99

Tobacco Use

20. Have you smoked at least 100 cigarettes in your entire life?
NOTE: 5 packs = 100 cigarettes

↓↓**Yes……Continue**…..39-1 No…-2 → **Go to Q. 22**
Don't know/Not sure…..-7 → **Go to Q. 22** Refused….-9 → **Go to Q. 22**

21. Do you now smoke cigarettes every day, some days, or not at all?

Everyday….40-1 Some days…-2 Not at all…-3 Refused…-4

Alcohol Consumption

22. A drink of alcohol is 1 can or bottle of beer, 1 glass of wine, 1 can or bottle of wine cooler, 1 cocktail, or 1 shot of liquor. During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage?

Days per week..__ __ __ Days per month..__ __ __ No drinks in past 30 days…888 →**Go to Q. 24**
Week…..44-1 Month-2 Refused…….999 →**Go to Q. 24**
Don't know / Not sure……..777

23. On the days when you drank, about how many drinks did you drink on average?

__ __ Number of drinks Don't know / Not sure…-77 Refused…-99
45/46

24. Have you ever been told by a doctor, nurse or other health professional that you or anyone in your household had cancer?

↓↓ **Yes**…47-1 No……-2 →**Female Go to Q.25 Male Go to Q.29**
Don't know/Not sure..-7 → **Female Go to Q.25 Male Go to Q.29**
Refused……...-9 → **Female Go to Q.25 Male Go to Q.29**

What type?

BLADDER	10	LEUKEMIA	21	SKIN (NON-MELANOMA)	32
BLOOD	11	LIVER	22	SKIN (DON'T KNOW TYPE)	33
BONE	12	LUNG	23	SOFT TISSUE (MUSCLE/ FAT)	34
BRAIN	13	LYMPHOMA/HODGKINS	24	STOMACH	35
BREAST	14	.MELANOMA	25	TESTIS (TESTICULAR)	36
CERVIX (CEVERICAL)	15	MOUTH/TONGUE/LIP	26	THYROID	37
COLON	16	NERVOUS SYSTEM	27	UTERUS (UTERINE)	38
ESOPHAGUS (ESOPHAGEAL)	17	OVARY (OVARIAN)	28	OTHER (Specify)	
GALLBLADDER	18	PANCREAS (PANCREATIC)	29	_____	39
KIDNEY	19	PROSTATE	30	**MORE THAN 3 KINDS**	66
LARYNX/WINDPIPE	20	RECTUM (RECTAL)	31	REFUSED	77
				DON'T KNOW	99

Women's Health If Female, continue. If Male, go to Q.29

25. A mammogram is an x-ray of each breast to look for breast cancer. Have you ever had a mammogram?

↓↓**Yes**…54-1 No……-2 ⇒**Go to Q.27**
Don't know / Not sure…-7 ⇒**Go to Q.27**
Refused…….. -9 ⇒**Go to Q.27**

26. How long has it been since you had your last mammogram?
Read only if necessary:
Within the past year (anytime less than 12 months ago)…….55-1
Within the past 2 years (1 year but less than 2 years ago)…. -2 Don't know / Not sure..-7
Within the past 3 years (2 years but less than 3 years ago)… -3 Refused……-9
Within the past 5 years (3 years but less than 5 years ago)… -4
5 or more years ago……..… -5

27. A clinical breast exam is when a doctor, nurse, or other health professional feels the breasts for lumps. Have you ever had a clinical breast exam?

↓↓**Yes**…56-1 No……-2 ⇒**Go to Q.29**
Don't know / Not sure…-7 ⇒**Go to Q.29**
Refused…….. -9 ⇒**Go to Q.29**

28. How long has it been since your last breast exam?
Read only if necessary:
Within the past year (anytime less than 12 months ago)…….57-1
Within the past 2 years (1 year but less than 2 years ago)…. -2
Within the past 3 years (2 years but less than 3 years ago)… -3
Within the past 5 years (3 years but less than 5 years ago)… -4
5 or more years ago…… -5
Don't know / Not sure..-7
Refused……..-9

Childhood Asthma

29. How many children ages 18 years or younger live in your household?

Number of children __ __ 58/59
None……88→ Go to Q.32
Refused……...99→ Go to Q.32

30. How many of these children have ever been diagnosed with asthma?

(Number of children) ___ ___
None……-88 ⇒ **Go to Q.32**
Don't know / Not sure. -77 ⇒ **Go to Q.32**
Refused ……-99 ⇒ **Go to Q.32**

31. **"Does this child" or "How many of these children" [from question 30]** still have asthma?

(Number of children) ___ ___
None……-88
Don't know / Not sure. .-77
Refused ……-99

Cardiovascular Disease

32. Has a doctor, nurse or other health professional ever told you that you had any of the following?

A heart attack, also called a myocardial infarction
Yes….64-1 No…2 Don't know/Not Sure….-7 Refused….-9

33. Angina or coronary heart disease
Yes….65-1 No…2 Don't know/Not Sure….-7 Refused….-9

34. A stroke
Yes….66-1 No…2 Don't know/Not Sure….-7 Refused….-9

Tobacco Indicators

35. Which statement best describes the rules about smoking inside your home?
Please read:
Smoking is not allowed anywhere inside your home…. 67-1
Smoking is allowed in some places or at some times... –2
Smoking is allowed anywhere inside the home…….. –3
Or
There are no rules about smoking inside the home…… -4

Do not read:
Don't know / Not sure…-7
Refused…….. -9

36. Other than cigarettes, do you regularly use other kinds of tobacco products?
↓↓**Yes**….68-1 No…-2 ⇒ **Go to Q.38** Don't know/Not Sure.-7 ⇒ **Go to Q.38** Refused.-9 ⇒ **Go to Q.38**

Other Tobacco Products

37. What type?
Read only if necessary:
Cigar……..69 -1
Chewing Tobacco.. -2
Snuff……. -3
Pipe ……. -4
Other…… -5

Do not read:
Don't know / Not sure…-7
Refused……..-9

Prostate Cancer Screening **If Male, continue. If Female, Go to Q.42**

38. **If respondent is male, ask:** Are you 40 years of age or older?
Yes…70-1 → **Continue**
No……-2 → **Go to Q.42**
Don't Know/Not sure…-3 → **Go to Q.42**
Refused……-4 → **Go to Q.42**

39. A Prostate-Specific Antigen test, also called a PSA test, is a blood test used to check men for prostate cancer. Have you ever had a PSA test?
↓↓**Yes**…71-1 No…-2 ⇒ **Go to Q.41**
Don't know / Not sure…-7 ⇒ **Go to Q.41** Refused..-9 ⇒ **Go to Q.41**

40. How long has it been since you had your last PSA test?
Read only if necessary:
Within the past year (anytime less than 12 months ago)…….72-1
Within the past 2 years (1 year but less than 2 years ago)…. -2
Within the past 3 years (2 years but less than 3 years ago)… -3
Within the past 5 years (3 years but less than 5 years ago)… -4
5 or more years ago…… -5
Don't know / Not sure..-7
Refused……-9

41. Have you ever been told by a doctor, nurse or other health professional that you had prostate cancer?
Yes….73-1 No…2 Don't know/Not Sure….-7 Refused….-9

Chronic Obstructive Pulmonary Disease

Have you ever been told by a doctor, nurse or other health professional that you have any of the following conditions?

42. Chronic bronchitis Yes….74-1 No…2 Don't know/Not Sure….-7 Refused….-9

43. Emphysema Yes….75-1 No…2 Don't know/Not Sure….-7 Refused….-9

Environmental Factors

The next two questions ask about things in the air you breathe that may make you ill, not about an illness you catch from other people, such as a cold.

44. Things like dust, mold, smoke and chemicals inside the home or office can cause poor indoor air quality. In the past 12 months have you had an illness or symptom that you think was caused by something in the air inside a home, office, or other building?

Yes….76-1 No…2 Don't know/Not Sure….-7 Refused….-9

45. Things like smog, automobile exhaust, and chemicals can cause outdoor air pollution. In the past 12 months have you had an illness or symptom that you think was caused by the pollution in the air outdoors? This question does not refer to natural agents like pollen or dust in outdoor air.

Yes….77-1 No…2 Don't know/Not Sure….-7 Refused….-9

Indoor Air Quality

The next two questions are about the air quality in your home. **Note:** Home refers to your primary residence.

46. What is the primary type of heating and/or air conditioning system in your home?

Central heating and air conditioning…78-1	Other(Specify)_____-5
Kerosene heater…… -2	No Heat…….-6
Gas space heater…….. -3	
Electric space heater…… -4	Don't Know/Not sure. .-7
Wood stove or fire place…… -5	Refused…….-9

47. Some homes are very well sealed and others are drafty. Would you say that your house is:

		Do Not Read:
Very well-sealed…..79-1	Drafty…….-3	Don't Know/Not sure…-7
Somewhat sealed… -2	Very Drafty…-4	Refused…….-9

Home Environment

The next four questions are about water used in your home and home pest control practices

48. What is the main source of your home water supply?
Please read if necessary: This refers to the water supply to taps or outlets inside the home.

A city, county, or town water system…….. 9-1	**Do not read:**
A small water system operated by a home association… -2	Don't know/ Not sure…-7
A private well serving your home…… -3	Refused……. -9
Other source(Specify)_____ -4	

49. Which of the following best describes the water that you drink at home **most often**?

Please read 1-4:		**Do not read:**
Unfiltered tap water……..10-1	Bottled or vended water…… -3	Don't know/ Not sure..-7
Filtered tap water…….. -2	Water from another source.. -4 (Specify)_____	Refused… ……..-9

50. How often are pesticides, sprays, or chemicals applied inside your home to kill bugs, mice or other pests?
Note: Include pesticide powders, but do not include pest traps, pest strips, or herbal treatments.

Note: If response is '777-- Don't Know' probe for approximate number of days
11/12/13

Please read:

Daily……001 Every 3 months…004 **Do not read:**
Weekly……002 Every 6 months…005 **Don't know/Not sure…777 ⇒** _____

 # days
Monthly…….. 003 Once a year……. 006 Refused…….999
None……. 888

51. How often are pesticides or chemicals applied in your yard or garden to kill weeds and/or insects and pests, including applications by lawn care services?

Please read if necessary: Do not include lime or fertilizer if no weed or bug killer used.

Note: If response is '777—Don't Know' probe for approximate number of days
14/15/16
Please read:

Daily……001 Every 3 months…004 **Do not read:**
Weekly……002 Every 6 months…005 **Don't know/Not sure…777 ⇒** _____

 # days
Monthly…….. 003 Once a year……. 006
None……..……..888
Do not have a yard or garden…… 555
Refused…….999

Next, I am going to ask you a few questions about health and the environment.

Health Perception

52. How much of a concern would you say your health is for you? **Do Not Read:**
No concern……17-1 Somewhat of a concern…-3 Don't know/Not sure…-7
Not much of a concern. -2 A major concern…….. -4 Refused…….-9

I am going to read to you a list of health issues. Please indicate how concerned you are about the issue for yourself, those who live with you, or others in your community.

Read answer choices only when necessary	No Concern	Not much of a concern	Somewhat of a concern	A major concern	D.K./ Not sure	Refused
53. Getting Sick	18-1	-2	-3	-4	-7	-9
54. Developing asthma or other respiratory diseases in	19-1	-2	-3	-4	-7	-9
55. Obesity or becoming sick due to poor diet or lack of	20-1	-2	-3	-4	-7	-9
56. Getting an infectious disease such as the flu	21-1	-2	-3	-4	-7	-9
57. Cancer, such as skin cancer, leukemia in children or	22-1	-2	-3	-4	-7	-9
58. Exposure to chemicals or toxic agents such as lead	23-1	-2	-3	-4	-7	-9
59. Being injured by firearms (guns) or other weapons	24-1	-2	-3	-4	-7	-9
60. Being injured in an automobile crash	25-1	-2	-3	-4	-7	-9
61. Developing a sexually transmitted disease such as herpes, syphilis or HIV	26-1	-2	-3	-4	-7	-9

62. Becoming sick because of the use of alcohol, tobacco or other drugs	27-1	-2	-3	-4	-7	-9
63. Problems with pregnancy and birth such as miscarriages, birth defects or low birth weight babies	28-1	-2	-3	-4	-7	-9
64. Skin rashes or other skin problems	29-1	-2	-3	-4	-7	-9
65. Anemia or low red blood cell counts	30-1	-2	-3	-4	-7	-9
66. Heart problems	31-1	-2	-3	-4	-7	-9
67. Diabetes	32-1	-2	-3	-4	-7	-9
68. Chronic bronchitis or emphysema	33-1	-2	-3	-4	-7	-9

Factors Leading to Poor Health

Thank you. Now I am going to read to you a list of possible factors that people believe can lead to poor health. I am going to ask you which factor you think is the most important factor leading to poor health, then the next most important and so on.

Please read definitions only when asked

Genetics/Family history: One person in a family inherits traits from another person in a family. For example, heart disease, sickle cell anemia, and mental illness can be passed on genetically.

Environment: The air you breathe, water you drink or place you live

Behavior: Actions people do such as smoking, drinking alcohol or over-eating

Social factors: Unemployment or having low income, lack of public health programs, or not having health insurance

1-Circle the item given by respondent. 2-DELETE this factor from the following list. Do this for each ranking until you are left with only one item for the fourth ranking.		Genetics/ Family history	Environment	Behavior	Social Factors	Don't Know	Refused
69	Which factor would you say leads to poor health?	34-1	-2	-3	-4	-7	-9
70	Which factor would you say is the next most Important factor that leads to poor health?	35-1	-2	-3	-4	-7	-9
71	Which factor would you say is the next most important factor that leads to poor health?	36-1	-2	-3	-4	-7	-9
72	This means that you believe that (**last one available**) is the least important factor leading to poor health	37-1	-2	-3	-4	-7	-9

Environmental Perception

73. How much of a concern would you say the environment is for you? **Do Not Read:**

No concern……38-1 Somewhat of a concern…-3 Don't know/Not sure…-7

Not much of a concern. -2 A major concern…….. -4 Refused…….-9

Now, I am going to read to you a list of factors having to do with the environment. Please indicate how concerned you are about each factor for yourself, those who live with you, or others in your community.

Read answer choices only when necessary	No Concern	Not much of a concern	Somewhat of a concern	A major concern	D.K./ Not sure	Refused
74. Quality of the air outside	39-1	-2	-3	-4	-7	-9
75. Quality of the air inside where you live or work	40-1	-2	-3	-4	-7	-9
76. Quality of the drinking water	41-1	-2	-3	-4	-7	-9
77. Quality of the water used for recreation such as swimming or fishing	42-1	-2	-3	-4	-7	-9
78. Quality of the soil	43-1	-2	-3	-4	-7	-9
79. Noise in the area	44-1	-2	-3	-4	-7	-9
80. Litter, trash, or other solid waste	45-1	-2	-3	-4	-7	-9
81. Leaking gasoline or other chemicals	46-1	-2	-3	-4	-7	-9
82. Hazardous waste such as used medical supplies or sludge from water treatment	47-1	-2	-3	-4	-7	-9
83. Particles in the air such as falling ash	48-1	-2	-3	-4	-7	-9
84. Loss of natural, scenic, or green areas	49-1	-2	-3	-4	-7	-9
85. Loss of natural places for fish and wildlife to live	50-1	-2	-3	-4	-7	-9
86. Plumes of smoke or steam	51-1	-2	-3	-4	-7	-9
87. Industry too close to people's homes	52-1	-2	-3	-4	-7	-9
88. Unpleasant odors	53-1	-2	-3	-4	-7	-9
89. Flaring or fire occasionally coming from industry chimneys at night	54-1	-2	-3	-4	-7	-9
90. Explosions	55-1	-2	-3	-4	-7	-9
91. Establishment of industries in the community without the involvement of the community	56-1	-2	-3	-4	-7	-9

Demographic

92. What is your age? Code age in years __ __ Don't know / Not sure…77 Refused…99

93. Which one of these groups would you say best represents your race?

White……59-1 Hispanic…….. -4 Don't know / Not sure…-7
Black or African American…-2 American Indian or Alaska Native…-5
Refused……-9
Asian…….…….. -3 Other (Specify]_____-6

94. Are you…? **Please read:**

Married…….60 -1 Separated…….-4 **Do not read:**
Divorced…….. .-2 Never married……..-5 Refused…….-9
Widowed……. -3 **Or** A member of an unmarried couple…-6

95. What is the highest grade or year of school you completed? **Read only if necessary:**

Never attended school or only attended kindergarten…61 –1
College 1 year to 3 years
Grades 1 through 8 (Elementary)…….. -2
Grades 9 through 11 (Some high school)…… -3
Grade 12 or GED (High school graduate)…… -4
Some college or technical school)……..-5
College 4 years or more (College graduate.…-6
Refused……-9

96. Are you currently…? **Please read:**

Employed for wages…….62- 1 A Homemaker….-5 **Do not read**:
Self-employed…… -2 A Student…….-6 Refused…….-9
Out of work for more than 1 year. -3 Retired……..-7
Out of work for less than 1 year.. -4 **Or** Unable to work…-8

97. Is your annual household income from all sources —
If respondent refuses at ANY income level, code '99 Refused' 63/64
Read as appropriate: **Do not read:**

$20,000 or less……...-01 $40,001 to $60,000…-03 Don't know/Not sure…77
$20,001 to $40,000…-02 $60,001 or more…….-04
Refused…….99

98. Have you or anyone in your household ever been employed by a chemical or petro-chemical company?

Yes…..65-1 No…-2 Don't Know…-3 Refused…-4

99. Indicate sex of respondent. Ask only if necessary.

↓↓**Female**…**Continue**……66-2 Male…66-1 ⇒ **Go to Geo-Reference Information**

100. To your knowledge, are you now pregnant? Yes…67-1 Don't know/Not sure..-7
No…. -2 Refused…-9

Geo-Reference Information

Now I'd like to ask you some questions that will help me to get an idea of the general area in which you live, but I don't want to know your exact address. This information will be used to determine if there are differences in people's health and health perceptions based on where they live.

101. In what **Zip Code** do you live? _____ Don't know…88888
Refused…99999

Number of attempts….74/75-_____

What is the name of your street?

Be sure to get Street / Place / Road / Highway/ etc. Don't know
Refused

103. What hundred block of your street do you live in? (Example, if your address is 3527 Main St., you live in the thirty-five hundred block of Main St.)

Don't know _____ Refused____

Interviewer: (ONLY if respondent gives you street and hundred block) Mark street & hundred block from sample sheet

---

Closing Statement

This concludes the survey, thank you for your participation. This will help us to learn about the health practices and perceptions of people living in Louisiana. At this time, if you have any questions or comments please call (504) 988-6074.

I certify that the data recorded on this and the previous pages are the complete and accurate responses reported to me by the respondent.

Interviewer_____ Date_____

APPENDIX C

Table 9. Fenceline US Census 2000 Block Group Demographics, East Baton Rouge and Shreveport

Parish	Block Group	Total Population	Median HH Income	Race				Median Age
				White	%White	Black	%Black	
East BR	3-3	581	$20,288.00	42	7.2%	539	92.8%	29.3
East BR	5-1	631	$17,009.00	47	7.4%	584	92.6%	26.7
East BR	8-1	878	$13,603.00	100	11.4%	712	81.1%	26.6
East BR	30-6	626	$3,594.00	18	2.9%	608	97.1%	19.1
East BR	33-5	800	$19,659.00	33	4.1%	767	95.9%	32
Caddo	223-4	1004	$19,671	217	21.6%	767	76.4%	27.9
Caddo	224-3	1459	$18,000	176	12.1%	1255	86.0%	24.4
Caddo	234-2	1331	$19,133	496	37.3%	823	61.8%	29.7
Caddo	235-1	483	$11,471	0	0.0%	483	100.0%	41.9
Caddo	235-4	520	$14,464	5	1.0%	512	98.5%	37.3
Total		8313	$17,504.50	1134	13.64%	7050	84.81%	28.6

Table 10. Non-Fenceline US Census 2000 Block Group Demographics, East Baton Rouge and Shreveport

Parish	Block Group	Total Population	Median HH Income	Race				Median Age
				White	%White	Black	%Black	
East BR	15-2	951	$16,176	44	4.6%	887	93.3%	32.7
East BR	21-1	1247	$12,686	24	1.9%	1223	98.1%	32
East BR	21-2	899	$12,955	112	12.5%	777	86.4%	21
East BR	22-1	830	$18,667	137	16.5%	669	80.6%	32
East BR	22-2	773	$14,375	0	0.0%	749	96.9%	34.6
East BR	24-2	1345	$15,625	179	13.3%	1099	81.7%	30.7
East BR	25-1	731	$13,141	0	0.0%	723	98.9%	38.4
East BR	25-2	699	$17,188	0	0.0%	684	97.9%	37.2
East BR	25-3	655	$19,194	14	2.1%	625	95.4%	37.4
Caddo	246.01-1	2329	$14,350	306	13.1%	1998	85.8%	25.4
Caddo	246.01-2	1431	$13,189	6	0.4%	1421	85.8%	23.8
Caddo	246.02 -3	634	$12,232	0	0.0%	633	99.3%	40.5
Caddo	246.02 -4	865	$12,734	7	0.8%	845	99.8%	31.6
Total		13389	$14,350	829	6.19%	12333	92.11%	32

Table 11 . Demographic Characteristics of the Sample Population

	N (%)
Age	
< 40 years	106 (21.5%)
40 – 65 years	238 (48.3%)
> 65 years	149 (30.2%)
Gender	
Female	707 (70.6%)
Male	294 (29.4%)
Race	
White	384 (38.4%)
Black	612 (61.1%)
Hispanic	3 (0.3%)
American Indian or Alaska Native	2 (0.2%)
Marital Status	
Married	495 (49.5%)
Divorced	137 (13.7%)
Widowed	177 (17.7%)
Separated	34 (3.4%)
Never married	123 (12.3%)
Member of unmarried couple	23 (2.3%)
Education	
Elementary	38 (3.8%)
Some high school	108 (10.8%)
High school graduate	404 (40.4%)
Some college/technical school	269 (26.9%)
College graduate or more	173 (17%)
Employment	
Working for wages	423 (42.3%)
Self-employed	68 (6.8%)
Unemployed for less than 1 year	26 (2.6%)
Unemployed for more than 1 year	20 (2%)
Homemaker	91 (9.1%)
Student	15 (1.5%)
Retired	269 (26.9%)
Unable to work	83 (8.3%)
Annual Household Income	
< $20,000	349 (34.9%)
$20,001 - $40,000	250 (25.0%)
$40,001 - $60,000	135 (13.5%)
> $60,000	142 (14.2%)

Table 12 . Health Status of the Sample Population

		N (%)
General Health Status		
	Excellent	136 (13.6%)
	Very Good	282 (28.2%)
	Good	320 (32%)
	Fair	176 (17.6%)
	Poor	87 (8.7%)
Smoked at least a 100 cigarettes		
	Yes	460 (46%)
	No	538 (53.7%)
Cancer		
	Yes	199 (19.9%)
	No	799 (79.9%)
Asthma		
	Yes	106 (10.6)
	No	895 (89.4%)
Bronchitis		
	Yes	93 (9.3%)
	No	908 (90.7%)
Emphysema		
	Yes	17 (1.7%)
	No	984 (98.3%)
Respiratory Status		
	Yes	170 (17%)
	No	831 (83%)
High Blood Pressure		
	Yes	462 (46.2%)
	No	539 (53.8%)
High Cholesterol		
	Yes	323 (32.3%)
	No	678 (67.7%)
Heart Attack		
	Yes	62 (6.2%)
	No	939 (93.8%)
Coronary Heart Disease		
	Yes	84 (8.4 %)
	No	917 (91.6%)
Stroke		
	Yes	33 (3.3%)
	No	968 (96.7%)
Cardiovascular Status		
	Yes	571 (57%)
	No	430 (43%)

Table 13. Crude Responses to Concerns about Environmental Issues Questions

The following is a list of factors having to do with the environment. Please indicate how concerned you are about each factor for yourself, those who live with you, or others in your community.						
	No Concern	Not much of a concern	Somewhat of a concern	A major concern	Don't know/ Not sure	Refused
Overall concern for the environment	58 (5.8%)	91 (9.1%)	354 (35.4%)	490 (49%)	7 (0.7%)	
Quality of the air outside	79 (7.9%)	85 (8.5%)	291 (29.1%)	543 (54.2%)	3 (0.3%)	
Quality of the air inside where you live or work	193 (19.3%)	122 (12.2%)	245 (24.5%)	436 (43.6%)	4 (0.4%)	1 (0.1%)
Quality of the drinking water	182 (18.2%)	86 (8.6%)	213 (21.3%)	517 (51.6%)	2 (0.2%)	
Quality of the water used for recreation such as swimming or fishing	193 (19.3%)	97 (9.7%)	257 (25.7%)	426 (42.6%)	19 (1.9%)	1 (0.1%)
Quality of the soil	211 (21.1%)	112 (11.2%)	254 (25.4%)	403 (40.3%)	15 (1.5%)	1 (0.1%)
Noise in the area	253 (25.3%)	115 (11.5%)	294 (29.4%)	335 (33.5%)	4 (0.4%)	
Litter, trash or other solid waste	187 (18.7%)	88 (8.8%)	206 (20.6%)	517 (51.6%)	2 (0.2%)	
Leaking gasoline or other chemicals	214 (21.4%)	64 (6.4%)	171 (17.1%)	544 (54.3%)	6 (0.6%)	
Hazardous waste such as used medical supplies or sludge from water	250 (25%)	61 (6.1%)	155 (15.5%)	528 (52.7%)	6 (0.6%)	1 (0.1%)
Particles in the air such as falling ash	243 (24.3%)	77 (7.7%)	232 (23.2%)	437 (43.7%)	9 (0.9%)	
Loss of natural, scenic or green areas	208 (20.8%)	72 (7.2%)	246 (24.6%)	458 (45.8%)	15 (1.5%)	1 (0.1%)
Loss of natural places for fish and wildlife to live	160 (16%)	56 (5.6%)	246 (24.6%)	526 (52.5%)	12 (1.2%)	
Plumes of smoke or steam	206 (20.6%)	88 (8.8%)	271 (27.1%)	420 (42.0)	12 (1.2%)	1 (0.1%)
Industry too close to people's homes	169 (16.9%)	58 (5.8%)	208 (20.8%)	561 (56%)	4 (0.4%)	
Unpleasant odors	176 (17.6%)	56 (5.6%)	201 (20.1%)	566 (56.5%)	1 (0.1%)	
Flaring or fire occasionally coming from industry chimneys at night	211 (21.1%)	80 (8%)	233 (23.3%)	468 (46.8%)	8 (0.8%)	
Explosions	198 (19.8%)	60 (6%)	153 (15.3%)	584 (58.3%)	2 (0.2%)	1 (0.1%)
Establishment of industries in the community without the involvement of the community	176 (17.6%)	61 (6.1%)	226 (22.6%)	524 (52.3%)	12 (1.2%)	1 (0.1%)

Table 14. Results of Logistic Regression for Concern about Noise

Concern about noise		95% C.I.		
	OR	Lower	Upper	p-value
Female	.985	.718	1.352	.926
< 40 years	1.429	.892	2.288	.137
40 – 65 years	1.432	.969	2.115	.071
> 65 years	–	–	–	–
Black	2.489	1.775	3.49	< 0.001
Married	1.285	.922	1.79	.138
HS/GED or less	.758	.49	1.173	.214
Some College	1.092	.691	1.725	.707
College Grad	–	–	–	–
Unemployed	1.036	.736	1.459	.837
< 20,000	1.581	.924	2.706	.095
$20,001 - $40,000	1.393	.861	2.247	.177
$40,001 - $60,000	1.358	.821	2.247	.233
> $60,000	–	–	–	–
Fenceline	1.87	1.395	2.507	< 0.001

Table 15. Results of Logistic Regression for Concern about Trash, Litter or Solid Waste

Concern about trash, litter or solid waste		95% C.I.		
	OR	Lower	Upper	p-value
Female	1.136	.811	1.591	
< 40 years	1.794	1.089	2.956	.022
40 – 65 years	1.825	1.217	2.736	.004
> 65 years	–	–	–	–
Black	2.459	1.714	3.529	.011
Married	1.197	.839	1.710	< 0.001
HS/GED or less	.875	.546	1.402	.601
Some College	1.057	.644	1.734	.578
College Grad	–	–	–	–
Unemployed	.748	.517	1.083	.827
< 20,000	1.012	.564	1.817	.984
$20,001 - $40,000	.975	.578	1.645	.968
$40,001 - $60,000	.917	.530	1.587	.923
> $60,000	–	–	–	–
Fenceline	.760	.556	1.040	.757

Table 16. Results of Logistic Regression for Concern about Air Particles

Concern about particles in the air	95% C.I.			
	OR	Lower	Upper	p-value
Female	1.096	.794	1.514	.577
< 40 years	2.545	1.558	4.155	< 0.001
40 – 65 years	2.101	1.413	3.123	< 0.001
> 65 years	_	_	_	_
Black	2.050	1.451	2.896	< 0.001
Married	1.300	.926	1.824	.130
HS/GED or less	1.092	.704	1.694	.695
Some College	1.229	.774	1.950	.382
College Grad	_	_	_	_
Unemployed	1.179	.826	1.684	.365
< 20,000	1.159	.665	2.020	.602
$20,001 - $40,000	1.056	.643	1.733	.830
$40,001 - $60,000	.990	.590	1.660	.969
> $60,000	_	_	_	_
Fenceline	1.433	1.061	1.935	.019

Table 17. Results of Logistic Regression for Concern about Odors

Concern about odors	95% C.I.			
	OR	Lower	Upper	p-value
Female	1.606	1.130	2.284	.008
< 40 years	2.731	1.571	4.748	<0.001
40 – 65 years	2.247	1.448	3.486	<0.001
> 65 years	_	_	_	_
Black	2.553	1.745	3.734	<0.001
Married	1.272	.869	1.862	.215
HS/GED or less	.757	.456	1.256	.281
Some College	.904	.534	1.530	.706
College Grad	_	_	_	_
Unemployed	1.168	.779	1.751	.452
< 20,000	1.105	.594	2.058	.752
$20,001 - $40,000	.943	.545	1.632	.834
$40,001 - $60,000	.760	.433	1.334	.339
> $60,000	_	_	_	_
Fenceline	1.985	1.411	2.791	<0.001

VITA

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