Rapid Health Impact Assessment on the Kings Ridge Complex Community Center in Jacksonville, Florida

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Abstract

This study utilizes the Health Impact Assessment (HIA) framework to evaluate the potential effects of three alternative uses of the community center located in a low-income apartment complex in Jacksonville, Florida called Kings Ridge. The community center was chosen because it was identified as a priority by the non-profit owner (Jacksonville Affordable Communities,) the current manager, and the resident representative at the June 2011 board meeting. The center is currently available for use to the residents, but does not have specific programmatic activities at this time. The priorities established by the Board of Directors include (in order): examining the:

- Best and highest use of the community center for health promotion among the residents.
- Evaluating the installation of a community garden for residents.
- Utilizing the small convenience store located on the property to provide healthy, affordable foods.
- Providing spaces for physical activity for the residents.

This study focuses on the best and highest use of the community center for health-promoting activities and/or education for residents, the majority of whom fall into a particular sub-population. While this narrow scope is a limitation, it was chosen because of financial constraints.

The health hazards to the community's population are cardiovascular disease, diabetes and breast cancer. The most predominant sub-population consists of low-income black women in their mid-30s, however, the program options would benefit all residents of the complex. The hazards were prioritized based on a risk assessment model of health impact assessment which combines descriptive qualitative data and quantitative methods.

This risk assessment utilized scale calibration with frequency as the standard of reference to determine the hazards with the highest severity of impact. It also determined that the hazards with the highest severity were diabetes, cardiovascular disease and breast cancer. In addition to the severity scale, the costs of these diseases to society as a whole were extracted from the existing literature. The highest cost of disease was cardiovascular disease followed by diabetes and breast cancer.

The risk management plan analyzed three proposed educational programs that would safeguard the population from these particular health hazards by promoting behavior changes. The three programs reviewed were: a cardiovascular educational program, an obesity prevention program and a breast and cervical cancer screening program for all residents. Using cost effectiveness and return on investment, the benefits and costs of each were determined.

The final recommendations were to implement all of the educational programs at the community center, prioritizing them by efficacy and cost. The community center provides a venue for high risk populations to obtain better health outcomes. These programs also seem to have the highest cost effectiveness based on return on investment

and will prevent residents who participate address or prevent the development of these diseases.

The Health Impact Assessment Methodology

The Health Impact Assessment (HIA) tool was chosen to conduct this study because its framework was the most effective and efficient way to offer alternatives based on the empirical data available. It also provides decision-makers, the non-profit owners, information about the public health risks of each alternative and estimates costs. This methodology presents this information in a precise and easy to understand format for the owners, residents and management.

The Committee on Health Impact Assessment defines a HIA as:

> "A system process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects" (Committee on Health Impact Assessment , 2011).

This definition provides a foundation for current practice. At this time, the steps involved in a health impact assessment, as defined by the Center for Disease Control (Centers for Disease Control) include:

- Screening (identify projects or policies for which an HIA would be useful including the context and background as applicable);
- Scoping (identify which health effects to consider);
- Assessing risks and benefits (identify which people may be affected and how they may be affected);

- Developing recommendations (suggest changes to proposals to promote positive or mitigate adverse health effects);
- Reporting (present the results to decision-makers); and
- Evaluating (determine the effect of the HIA on the decision).

Although it is an established practice in the United Kingdom and Australia, few HIAs have been published in the United States (primarily in California and Alaska where the practice has been funded and institutionalized), and it is not realistic to expect decision makers to adopt HIA in the absence of evidence of its effectiveness and value (Committee on Health Impact Assessment , 2011). The literature indicates that HIA is not widely used because there are few laws that mandate its use except as part of a required Environmental Impact Assessment (EIS). It is primarily a voluntary process, and in a time of shrinking public funding and workforces, un-mandated processes usually go undone. Therefore, the approach in the past ten years has been ad hoc and has produced a body of work which uses non-standardized nomenclature, various formats and some evidence-based results (Health Impact Assessment, 2011).

Although HIA has not been widely used by decision makers in the United States, its implementation has been increasing over the last ten years (Committee on Health Impact Assessment , 2011). This can be attributed to the fact that the lack of an assessment can have unexpected adverse health and economic consequences for many subsets of the population (Committee on Health Impact Assessment , 2011). One of the larger issues with current practice is also the lack of quantitative analysis (Mindell, 2004).

Many recent HIAs in the reviewed literature are aimed at highly-educated readers and are general in their assessment of health impacts, or are epidemiological in nature and

not presented in an understandable and usable format for lay persons, such as decision makers. The systematic assessment of the health consequences of policy, program, project and planning decisions is of major importance in protecting and promoting public health because it allows decision-makers to consider health impacts in conjunction with other factors (Committee on Health Impact Assessment, 2011), such as costs, and make trade-offs, which maximize the health promotion and minimize detrimental health effects. The failure to consider health consequences can result in unintended harm or in lost opportunities for health improvement and disease prevention, opening the decision-making body to liabilities in the future. Recently, more HIAs have been performed in the US using funding such as that available from the CDC, the Association of State and Territorial Health Officers and the Health Impact Project. While these grants have stimulated the use of HIAs, the resulting analyses are not standardized and most merely provide information to decision-makers who may or may not use it as part of their criteria for making choices.

Health Impact Assessments are especially useful as a tool for evaluation because, other public health evaluation tools tend to focus on one health effect of a particular project or policy and HIA widens the spectrum of analysis to multiple outcomes. This is vital to the decision-making process because interventions can be evaluated beyond simple risk or hazard reduction. HIAs also incorporate and consider the interests of many sets of stakeholders involved in a project, such as the non-profit owners, the residents, the surrounding neighborhood and the nearby Edward Waters College. Additionally, by shifting focus to the potential effects on health, including negative and positive effects, interventions can be evaluated in a way that removes the emotion from the decision

making process and uses empirical evidence to develop shared priorities among the stakeholders, thus creating shared values in the community. The more flexible framework of an HIA can also determine any health co-benefits the program provides which give a more comprehensive, value-added aspect to the decision alternatives to those allocating resources.

The decision to conduct this project a rapid health impact assessment was determined due to the lack of resources. A rapid or "mini" HIA, as the name suggests, is done quickly with limited time and resources. It is a "desk top" exercise, reliant on information which is already available "off the shelf" (Parry, 2001), or obtained through a half day or one day workshop with key stakeholders. In either case, there is usually a minimum quantification of the potential health impacts that are identified in this process. As this HIA was completed utilizing available existing data and with limited input from all of the stakeholders, it is considered a rapid assessment.

While utilizing the Health Impact Assessment framework has many benefits, it also has limitations. First, it is difficult to estimate the full range of health effects resulting from educational and behavioral interventions, because these are realized over a long period of time and often have confounding factors. The best way to overcome this would be to complete a longitudinal study as a part of the evaluation phase which would monitor the actual health effects over long spans of time while controlling for as many other variables as possible or using a control group and a randomized sample. This was simply not an option this study can accommodate, but it would be a worthwhile goal in the future.

Screening

The first step in the HIA process is Screening (CDC.gov, YEAR). This step should explicate all the known alternatives to the decision makers at the time the HIA is considered (North American HIA Practice Standards Working Group, 2010). The underlying purpose of this step is outline:

- The public health effects which will likely affect the population of interest, both intended and unintended
- Stakeholder concerns about these health impacts
- Availability of data and alternative opportunities

(North American HIA Practice Standards Working Group, 2010)

In a rapid HIA, these are preliminary, based upon best available data and can be refined throughout the process as more information becomes known. This apartment complex was selected for several reasons. First, it is located in an area of Jacksonville that has been historically ignored by health professionals, planners and academics. Second, the non-profit that manages the site is unique because they are genuinely interested in acting to improve the health and wellbeing of residents. Finally, the management has easily accessible and very specific data available to the researcher.

Context and Descriptive Data

This area of Jacksonville (see Map 1) has high rates of crime and the composition of the area is primarily non-white. This area lacks easily accessible community health resources. For example, Kings Ridge residents only have one available health clinic located within three miles. The Agape Community Center is a challenge to reach based on walking conditions. A person would have to cross heavily trafficked roads with few or no sidewalks. This demonstrates the neglect of this area of Jacksonville by city authorities, which is also apparent when examining the availability of healthy foods.

The nearest grocery store is over 3 miles away by foot or bus, which indicates that fresh fruit or vegetables are not easily available. While this particular research topic is focused on the community center, these points are important to consider, as they contribute to the social determinants of health. Other social determinants which come into play in this area are that residents are of low socio-economic status (as indicated by residing in Section Eight Housing), are of primarily African-American descent and have low educational attainment.

The lack of investment this area has been attributed to commonly perceived notions that it is located in a high crime area and is dangerous. The crime statistics, while seemingly overwhelming, have improved since the "cop stop" was installed at the complex in 2011. Since that time, gang activities virtually ceased following a police sweep which resulted in the incarceration of gang leadership in the area. However, the analysis of crime data still indicates that residents face issues with high crime rates, even though they are

not as high as they once were. The Duval County Sheriff's Office statistics for January 2012 within a one mile radius of Kings Ridge were:

- 5 aggravated assaults
- 6 commercial burglaries
- 25 residential burglaries
- 3 vehicle burglaries
- 33 instances of larceny
- 23 events of simple assault
- 13 cases of vandalism

Crime rates are, in actuality, still relatively high in this area, when compared to Duval County as a whole. This can be attributed to the high presence of unemployment and poverty as well as a historically large percentage of vulnerable residents such as: racial and ethnic minorities, the poor and very poor, elders, children, the disabled and veterans.

Vulnerable populations are defined as groups of people who do not have the same opportunities as other, more affluent groups in society (WHO, 2011). Examples include: the unemployed, refugees and others who are socially excluded. It is important to focus on vulnerable populations due to their increased susceptibility to adverse health outcomes. This differential vulnerability is demonstrated by higher rates of premature mortality and lower quality of life. These populations also historically have had fewer resources, and lower socio-economic status. Also, vulnerable populations normally have higher percentages of negative health outcomes and are usually victims of discrimination, intolerance, subordination and political marginalization (Flaskerud, 1998).

Social determinants of health are defined by the Centers for Disease Control as "the circumstances, in which people are born, grow up, live, work and age, and the systems put in place to deal with illness" (cdc.org, YEAR). Therefore, those populations who are underprivileged and lack health, food and political resources will have more negative health outcomes than those with more resources.

While this complex has been historically underserved, Jacksonville Affordable Communities (JAC) is committed to improving the quality of life for the residents. Their commitment is exhibited through their efforts at fostering a solid sense of social cohesion. The residents have a well- established rapport with the property manager, construction and administrative staff. The children know each other by name and the residents are comfortable relaxing in the abundant common spaces in the community, demonstrating a lack of fear of crime and trust in each other. Some of the more active residents even take it upon themselves to plan weekly, monthly and special occasion programs such as Christmas gift giveaways and Easter egg hunts for the children in the complex (See Appendix B for photos). Not only do the residents have a sense of belonging at the Kings Ridge Complex, but JAC is interested in the creation of a strategic plan based on the results of this HIA. If this HIA is successful, JAC wishes to incorporate future HIAs on the creation of community garden and expansion of the convenience store into its long term strategies which will improve the health and quality of life of the residents. This demonstrates the amount of interest, time and money that the non-profit is willing to invest in the success of this community.

Scoping

Scoping is the next stage in and HIA. The goal of this step is to define the scope, objectives, and approach to the analysis phase. This section defines:

- Which health effects should the HIA address?
- What concerns have stakeholders expressed about the pending decision?
- Who will be affected by the policy or project, and how? (Health Impact Project)

According to the North American HIA Practice Standards Working Group (2010), this stage determines the overall boundaries of the project and also determines:

- The project alternatives and cost of each
- Potential health impacts and vectors of each
- Demographic, geographic, temporal extent of likelihood and severity of disease
- Vulnerable populations
- Methodology or methodologies to be used
- Roles for stakeholders and key informants
- Plan for dissemination of information

The Kings Ridge complex is a mostly self-contained community because most of the amenities residents need in their daily life is located on site. It is equipped with a community center; a daycare center; a site for a future community garden; a convenience store; a "cop stop;" accessible transit; a job training center which provides access to computer and job training and a clothing and food bank. Other amenities on site include: two playgrounds; basketball courts and a thrift store Additionally, an on-site daycare center opened March 2012 and a convenience store which is required to sell healthy foods opened in November 2011.

The larger goal of this project will be to complete a rapid health impact assessment on each individual possible project over time, based on a strategic plan developed by the Director of Community Health Programming. By breaking up the HIA into several elements, each aspect can be studied more extensively, which is beneficial for the research team, the residents and Jacksonville Affordable Communities.

In order to understand the community itself, it is important to understand spatial context and history (see Appendix A). Kings Ridge was constructed in 1972 with 13 buildings consisting of 14 units each with a total of 182 units, 127 of which are currently occupied. These units consist of two-bedroom and three bedroom layouts.

Map 1 shows an aerial of the site with the US Census tract identified as the transparent pink area. The green area depicts separate smaller census blocks encompassed within the census tract. The green census blocks are almost entirely made up of the complex, therefore demographic data could be accurately used to describe the population living on the site.

Map 1: Location of Kings Ridge Complex, Duval County, FL

SOURCE: Emily Suter, 2012

US Census data was used to describe the demographic features of the area and identify some of the social determinants of health. These determinants are the "conditions in which people are born, grow, live, work and age" (WHO, 2010). These factors are especially important to describe community because they relate to both positive and negative health outcomes. The measures included in this analysis are:

- Age
- Sex
- Race
- Socio-economic status
- Crime

**Education was not included as it is a confounding factor closely correlated with race and socio-economic status.*

Based on the 2010 census data and the Kings Ridge apartment resident database, the most predominant sub-population is black women who are, on average, 34 years of age and female heads of household. Additionally, 88 children live in the complex, which indicates that many of these women are mothers (Smith, 2012). The average income level of all residents is under $17,000 per year, with some having no income at all (Kings Ridge Management Company, 2012). This income level is below the poverty threshold of $17,500, for a family with 1-2 children (United States Census, 2010). The census tract in which this complex is located is also 98 percent black and 99 percent renter-occupied.

The baseline health conditions of Kings Ridge further demonstrate the need for an HIA by outlining the numerous vulnerable populations that live on the site. According to Florida Charts (2012), some of the most prominent ailments in the black population in Duval County, which are at twice the level of the white population, include:

- Emergency visits due to asthma
- Death rate for heart disease
- Hospitalizations due to diabetes
- Number of HIV cases
- Death rate of breast cancer
- Death rate of stroke

One of the terms utilized throughout this research is “health hazard.” This term is defined by the researcher as the conditions which pose a source of danger of negative health outcomes. Chronic diseases increase the chances that a person will have worse health outcomes, and therefore can constitute as a “danger” (Kaplan, 1981). When

determining the health hazards for the Kings Ridge community, it is important to examine data at the national, state and community scale.

Because the known predominant population at the Kings Ridge complex are very low income black women in their mid-30's, the health hazards for this population were researched and compared at the national scale for context. It is known that the black female population in the United States has higher rates of some health conditions, especially when compared to the white population. The most prevalent diseases for black females in the United States include: heart disease, cancer (specifically, breast cancer), stroke and diabetes (US Department of Health and Human Services Office on Women's Health, YEAR).

Because the top three diseases in the US black female population were also the top ailments in Duval County's black population, the health hazards could be extrapolated easily in this brief screening process. These hazards include: cardiovascular disease, breast cancer and diabetes.

Risk Analysis

The risk analysis methodology is systematic and comprehensive. This analysis measures the quantitative risks related to the hazards by calibrating a unique scale. After the completion of the risk analysis, the hazards to a population and alternatives to address them were assessed.

It is important to understand the terminology and concepts employed. Risk, frequency and probability are all core definitions defined below and are specific to this analysis. This method is based on the definition of risk as defined by Kaplan, et al. in their seminal work, "On the Quantitative Definition of Risk," (1981). This paper is frequently cited in risk research (Garrick, 2004). The use of terminology for risk-based analysis is based upon the first systematic definition of risk as it is differentiated from probability and frequency. Even though this work is from 1981, it has been cited over 1,095 subsequent papers according to Google Scholar (Google Scholar, 2012) and has stood the test of time. Kaplan states that probability is the "numerical measure of a state of knowledge, a degree of belief, a state of confidence." Frequency is defined as the outcome of a repeatable experiment like a coin flip. Therefore, frequency is a more robust measure, at least conceptually (Kaplan, 1981). In other words, probability is a way to communicate one's experience and is seen as a way to calibrate collective experience in a methodological, therefore, repeatable way.

As with Kaplan's explanation of risk, the goal of this assessment is to outline a repeatable approach to calibrate a scale demonstrating the severity of each health outcome

relevant to particular populations. This is important because it assists in evaluating a health hazard, and, through the repetition and replication of this approach over time, the scale will become more accurate as more information becomes available. This is vital to health research because it allows the quantification of the hazards and advances it to the use of the scientific method, which requires a consistent, replicable methodology and this therefore more consistent with an evidence-based approach. Sir William Thompson, Lord Kelvin (1824-1907) best summarizes this advancement:

> When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge of it is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced it to the stage of science.

Another important sequence of terminology that needs to be understood prior to analysis is the differences of frequency, prevalence and incidence. While the three terms are utilized almost interchangeably in this analysis, it is due to data limitations, it is not due to concurrency in their definitions. The term frequency encompasses both prevalence and incidence in the epidemiological profession. In other words, prevalence and incidence are two measures of disease frequency (Aschengrau & Seage, 2008). Incidence measures the occurrence of new disease, while prevalence measures the existence of current disease (Aschengrau & Seage, 2008). This paper utilizes prevalence and incidence rates of the disease for simplicity purposes along with the lack of comprehensive health data. While it is important to understand the differences, for the purpose of the analysis, the differences are small enough to not be of significance.

To further explain this idea, it is important to understand what is involved in a risk analysis. According to Kaplan and Garrick (1981), a risk analysis is meant to answer a set of three questions:

What can happen? What are the possible health outcomes, in this case?

What is the likelihood of each occurring?

If they do occur, what are the consequences?

Because of data limitations, this paper only examines the first two questions, using a limited risk analysis based on available data that could be gathered. In answering these questions, it was necessary to create a list of "scenarios" to review in this analysis. For this community center, there are three "scenarios" which are possible, based on the most prevalent diseases in the most prominent population sub-group living in the complex: middle age black women. These are:

Cardiovascular Disease (Stroke, Coronary Heart Disease)

Breast Cancer

Diabetes

Kaplan and Garrick explain in their paper, "On the Quantitative Definition of Risk", that one may calibrate the entire probability scale utilizing frequency as a standard of reference. This is the basis upon which the risk analysis was carried out. This method shows the connection between probability and frequency as defined above (Kaplan, 1981).

Frequency, for purposes of this research is synonymous with prevalence of occurrence for the diseases studied. For cardiovascular disease, the frequency was the number of adults who have ever had a heart attack, angina, or coronary heart disease and the number of adult who have ever had a stroke in Duval County. Breast cancer frequency utilized the age-adjusted incidence rate. Finally, diabetes frequency was extracted from the number of persons who have been diagnosed. Beginning with the listed frequency, the probability scale could be constructed using frequency as a standard of reference.

In order to further explain the approach this paper takes, it is assumed that, given two meaningful statements or approaches to a problem, it is logical to say that one is more or less or equally likely as the other. This scenario is used as a means to compare uncertain statements utilizing a scale calibrated by the researcher based upon available data that relates to each hazard identified above for the relevant population. Kaplan, et al state that one may calibrate probability scales using frequency as a standard of reference (Kaplan, 1981). Frequency, in this paper, is used to calibrate the probability scale in the sense that the United States has a "bureau of standards," (Kaplan, 1981). After the scale is calibrated, then probability is used to discuss the state of confidence in areas where a knowledge base is still being developed. This process is further elaborated by DeMorgan:

> "We have lower grades of knowledge, which we usually call degrees of belief, but they are really degrees of knowledge…It may seem a strange thing to treat knowledge as a magnitude, in the same manner as length, or weight or surface. This is what all writers do who treat of probability, and what all their readers have done, long before they ever saw a book on the subject…By degree of probability, we really mean, or ought to mean, degree of belief…Probability then, refers to and implies belief, more or less, and belief is but another name for imperfect knowledge, or it may be, expresses the mind in a state of imperfect knowledge," (DeMorgan, 1847).

Probability, therefore, is the science of handling a lack of data and is suited to small population health analysis. This is unique in that it is not using the typical epidemiological approach to assessing risk. By utilizing both frequency and mortality data, this gives a more comprehensive approach to assessing risk in a population.

Using the best available data, which is at the county level, the instance and frequency of each of the prevalent disease in the population at the housing complex: breast cancer, cardiovascular disease and diabetes, a scale can be calibrated.

The concept of using risk in HIAs is an idea that has been gaining popularity in the past several years. Current HIA practice standards have developed checklists to identify the probable health outcomes; wheras the idea of using risk is one that is takes into account how the outcomes are "relative to the observer" (Kaplan, 1981). This implies that risk is dependent on what a person does and does not know. The method used to conduct the hazard analysis is based on the fact that small scale health data is not available for this particular population. Data limitations are common in health research, and so an approach was devised based on established risk models.

Cardiovascular disease was assumed to be comprised of two sub-sets of ailments: stroke and coronary heart disease based on the fact that they are usually concomitant. To create the severity of impact scale for stroke, the rate of occurrence per 1,000 persons and the hospitalization rate per 1,000 were divided by the mortality rate for stroke. These two numbers were added to create severity of impact for stroke in the Kings Ridge population as extrapolated from Duval County as a whole for the black population. The coronary heart disease severity scale was created in a similar fashion. The rate of those who have ever had

a heart attack per 1,000 and the hospitalization rate per 1,000 were divided by the mortality rate, and these numbers were combined to create the severity of impact for the community. The reason for dividing mortality rate by frequency was to eliminate death from the risk equation, so that those that die are not considering when discussing the community as a whole.

Stroke calculations:

- 31 persons who ever had a stroke/ 54.8 mortality rate from stroke = 0.5 persons who ever had a stroke severity of scale
- 481.7 hospitalization rate of stroke/ 54.8 mortality rate from stroke = 9 hospitalization severity of scale
- 0.5 persons who have ever had a stroke severity of scale + 9 hospitalization severity of scale= 9.5 severity of scale

Coronary Heart Disease calculations:

- 92 persons who have ever had a heart attack/127 mortality rate from heart attack=1 persons who have ever had a heart attack severity of scale
- 319 hospitalization rate for heart attack/127 mortality rate from heart attack = 3 hospitalization severity of scale
- 1 persons who have ever had a heart attack severity of scale + 3 hospitalization severity of scale = 4 severity of scale

To create a severity of impact scale for breast cancer as a point of reference for this measure, the rate of incidence per 1,000 is divided by the incidence of mortality from breast cancer per 1,000 which is equal to approximately 4. The underlying assumption is that death, on a population scale, is less severe than living with cancer. In order to determine the further dimensions of severity of impact, a "hardship factor" was created reflecting years of illness, cost associated with cancer and social costs. This hardship factor was created in the absence of data that shows the exact instance and severity of these other states of breast cancer, the hardship factor was calculated using intermediate data from the grey literature as cited. The secondary data available from Florida CHARTS provided only the incidence and mortality rates (Florida Charts, 2012). The calculations are below:

- 126 rate of incidence /35 incidence of mortality = 4 severity of impact
- 4 severity of impact/2 = 2 hardship factor
- 4 severity of impact + 2 hardship factor = 6 adjusted severity of impact

The diabetes severity of impact scale was unique because hospitalization rate per 1,000 people was close to 5,500. This could be due to repeat visits from the low-income community. This number needed to be normalized, so the readmission rates from the American Diabetes Association were used. Studies specifically demonstrate that the data on diabetes readmission rates are limited, thus the available data was specific to the Columbus Regional Medical Center and was generalized to the population of Duval County, making the assumption that all rates for diabetes readmissions would be similar. The readmission rates in that study were 22 persons readmitted per a 30 day period. The severity of impact scale was then created by dividing both the diagnosed diabetes rate and amputation rate

per 1,000 people by the mortality rate from diabetes per 1,000 persons in the population. The number of hospitalizations for diabetes (5,500) was divided by the number of readmissions for a 30 day period. This number was then divided by the death rate from diabetes per 1,000 people. This calculation was repeated for diagnosed diabetes and amputation rates. Then the three calculated severity of scales for amputation, hospitalization and diagnosed were added together. Calculations can be seen below:

- 5,500 hospitalization rate / 22 persons readmitted per 30 day period =250 hospitalization rate adjusted for readmission
- 250 adjusted hospitalization rate/ 46 death rate = 5 hospitalization severity of scale
- 106 diagnosed/ 46 death rate = 2 diagnosed severity of scale
- 93.2 amputation rate/ 46 death rate = 2 amputation severity of scale
- 5 hospitalization severity of scale + 2 diagnosed severity of scale + 2 amputation severity of scale= 9 severity of scale for diabetes

The calibrations created for cardiovascular disease, breast cancer and diabetes were all based on a scale from one to ten, one being no risk to ten being the most severe risk. These scales are based on the population scale, not the individual scale, meaning that the risk number was determined for the community, not for the individual. In other words, this analysis is based upon the underlying belief that when a person with a chronic disease dies, individually, that is the worst outcome. However, one death at the population level is not the worst outcome, but is less severe on the population scale since the costs of supporting

the treatment of a low-income person with diabetes is lowered though the reduction of persons with the disease. For instance, when a person with a chronic disease survives and continues to exhibit adverse symptoms, this provides a severe burden to the community, both in fiscal and social costs. This explains why both stroke and diabetes are the considered "riskiest" health burdens by this study in this community.

Table 1: Summary of Risk Findings

Hazard	Frequency of Occurrence*	Severity of Impact*
Breast Cancer	459 per 1,000 population	6
Cardiovascular Disease	Stroke: 31 per 1,000 population	9.5
	Coronary Heart Disease: 92 per 1,000 population	4
Diabetes	106 per 1,000 population	9

Source: Author's calculations

As shown in the above table (Table 1), the frequency of occurrence for the hazards ranged from 31 per 1,000 for stroke to 459 per 1,000 persons for breast cancer. Because these rates were utilized to calculate the severity of impact, referring to them individually would not be useful. Therefore, the severity of impact is the measure utilized for this analysis.

The hazards with the highest severity of impact included 9.5 for stroke and 9 for diabetes. Because stroke is only one of the two components in the cardiovascular hazard, it needed to be averaged with coronary heart disease's severity of impact of 4. After averaging the numbers, cardiovascular disease had a severity of impact of 6.75. Breast

cancer had a severity of impact of 6, which is the lowest of the hazards being reviewed. High risk, for the purposes of this study, is defined as a severity of impact over 5, resulting in all of the health hazards having "high risk" as shown above. There can be many explanations for the "high risk" in diabetes, breast cancer, and cardiovascular disease to the community.

According to the American Speech Language Hearing Association (2012), a stroke occurs when blood flow is interrupted to an area of the brain. When this happens, the brain cells begin to die resulting in sometimes extraordinary brain damage. A stroke's severity of impact is the highest of the hazards due, possibly, to the numerous lingering health impacts after the brain damaging episode. Strokes often cause a person to have limited mobility and are associated with disabilities in both basic and instrumental activities of daily living (Beaverson, 2005). Many stroke victims experience slurred speech, an inability to communicate and emotional distress that contributes to job loss and lack of community participation (American Speech Language Hearing Assocation, 2012). Therefore, the burden of stoke in the community is great for both the residents and their families.

Diabetes was also shown to pose a large burden on the Kings Ridge community. This disease is long-term and can be severely detrimental to a person's health. When diabetes develops, it indicates that the body has stopped producing insulin, which results in dangerous blood sugar levels. If untreated, this disease can result in amputation, sores, and blindness. This disease is a huge burden on the community due to the amount of care required to patients and its prevalence in high risk groups, such as obese persons in Kings Ridge. The limitation of using diabetes measures is that the disease can be attributable to

several factors besides social determinants such as genetic propensity, behaviors and the limited availability of healthy foods.

Breast cancer research and technology has been improving at faster rates than that associated with other diseases. There is also a large and stable support system established in Duval County. Thus, breast cancer survival is more likely and full re-integration post-treatment can be expected for many individuals. Jacksonville, specifically, has a health support network created by Donna Deegan whose mission is to raise money for cancer research and treatment for those diagnosed in the Duval area (Finish Breast Cancer, 2010). This support makes it easier for those diagnosed with the disease to reintegrate into the community, and provides validation for why breast cancer is a lesser burden on the Kings Ridge Community.

Risk Management Recommendations

The goal of the risk management plan for the community center is to find programming opportunities, which lessen the risk of the adverse health outcomes to the sub-population of interest. Because hazard is defined as a "source of danger" and risk is defined as the "possibility of loss or injury," it can be expressed in the following equation:

$$\text{Risk} = \frac{\text{Hazard}}{\text{Safeguard}}$$

This equation is based on the assumption that risk can be made smaller by increasing safeguards, even if these consist of simple awareness of the hazard and risks. This awareness of risk can therefore reduce risk (Kaplan, 1981). However, in order to maximize health benefits, other safegaurds are needed.

For the purposes of this rapid health impact assessment, three programs, or "safeguards" are analyzed. While the Duval County health department provides a multitude of programs that target certain health issues, the three which are most relevant to the health conditions were chosen. These are: cardiovascular disease, breast cancer, and diabetes. While the program choices were based on black women in their mid-30s because of their prevalence in the Kings Ridge population, these health opportunities provide benefits to the community as a whole. Programs offered to address the diseases in the

prevalent population are: Jacksonville's Community Cardiovascular Health Program, Obesity Prevention Program and Breast Cancer Prevention and Testing Program.

The programs chosen are either primary or secondary prevention techniques. Primary prevention "can be accomplished by modifying unhealthy behaviors, which causes many diseases" (Partnership for Prevention, 2009). The Obesity and Cardiovascular programs are examples of primary prevention because they offer walking programs, nutrition counseling, etc. Secondary prevention "can reduce the severity of disease, such as cancer, through screening programs that detect the disease or their risk factors at early stages, before they become symptomatic or disabling" (Partnership for Prevention, 2009). The breast and cervical cancer testing program is an example of a secondary educational program because mammograms are offered.

Safeguard 1:

Jacksonville's Community Cardiovascular Health Program, Hearts with Spirit, is "designed to complement and enhance ongoing efforts to reduce the sickness and deaths from heart disease" (Duval County Health Department, 2012). The sub-programs included in the cardiovascular program include:

- Hearts N Motion, an 8 week health and nutrition education program
- Cardio Kids, a 6 week children nutrition and weight management education program
- Moving Against Diabetes, a Diabetes Education series
- Gateway Shopping Center Walking Club

- NutriCize, a community physical activity class

These interventions are targeted to address five priority areas of the Health People 2010 objectives. These objectives are federal initiatives meant to support "prevention efforts across the U.S. to create a healthier nation" (Healthy People, 2012). Of these topics, the Jacksonville cardiovascular program targets heart disease and stroke, diabetes, nutrition and obesity, physical inactivity and adult and youth tobacco use.

Safeguard 2:

While there are no specific diabetes educational programs offered in Duval County, there is an Obesity Program available. Even though this program does not only target the population with diabetes, the two diseases are highly correlated. A CDC study recently found that from "1991 to 2001, there was a 61 percent increase in diabetes in Americans and a 74 percent increase in obesity, which reflects the strong correlation between obesity and the development of diabetes "(CDC, 2012). Additionally, one of the most prominent risk factors for developing diabetes is being overweight or obese. Therefore, by lessening body mass, the risk of diabetes is lessened (National Institutes of Health, 2008).

The goals of the Obesity Prevention Program in Duval County are to increase awareness of the impact obesity has on an individual's life and how it is directly correlated to the development and complications of other chronic diseases. The objectives of the program are to develop, evaluate and implement obesity prevention programs throughout Jacksonville. The Projects developed and implemented under the Obesity Prevention Program (Duval County Health Department, 2012) include:

- Shape UP Jacksonville Program
- GET Healthy Kids Club
- Raising Healthy Children Program
- Shape UP Jacksonville Walking Club
- Physician Training Program on Obesity Evaluation & Treatment Program

Safeguard 3:

The breast cancer prevention and testing program is affiliated with the National Breast and Cervical Cancer Early Detection Program (NBCCEDP). This program was created after the passage of the Breast and Cervical Cancer Mortality Act of 1990. Services included in this program for women include:

- Breast and Cervical cancer screening exams for "at need" populations
- Care coordination to all clients with abnormal exams
- Screenings through the program for all women; those diagnosed with breast or cervical cancer are referred to the Florida Medicaid program for eligibility determination
- Paid breast and cervical cancer treatment through Medicaid for eligible women screened through the program

(Centers for Disease Control, 2012)

Effectiveness of Safeguard 1:

Cardiovascular disease is one that is sometimes preventable- by eliminating tobacco use, improving diet, increasing physical activity and controlling high cholesterol and blood pressuring one can lessen the risk of this disease. It is one of those termed a "lifestyle diseases." Education is one of the most effective strategies in preventing this disease. Cardiovascular disease and obesity usually are comorbid, meaning that those affected by one, will be affected by both. "Obesity is a chronic metabolic disorder associated with cardiovascular disease and increased morbidity and mortality. It is apparent that a variety of adaptations/alterations in cardiac structure and function occur as excessive adipose tissue accumulates, even in the absence of comorbidities." (Poirier, 2002)

Effectiveness of Safeguard 2:

Diabetes educational and behavior modification programs have proven to be very effective. Lifestyle changes learned through educational programs can prevent the onset of type 2 diabetes among high risk groups and reduce their complications, therefore lessening premature death and disability (Florida Department of Health, 2010). For those with pre-diabetes, a 7 percent weight loss and adding at least 150 minutes of physical activity per week reduced the onset of type 2 diabetes by over 50 percent (Florida Department ofHealth, 2010).

An article by Melinda R. Stolley and Marian L. Fitzgibbon outlines the effectiveness of an Obesity Prevention Program specifically targeted to low-income, inner-city black women and their children. This program is similar to the Duval County Obesity program because it too addresses the importance of eating a healthy diet and increasing activity. By

randomly assigning the participants and measuring food intake pre- and post-program, effectiveness could be determined more precisely over time. The differences that could be attributed to this obesity program were significant because fat and calorie intake post educational program were lower (Stolley, 1997). By lowering the rates of obesity, this could lower the rates of diabetes and cardiovascular disease resulting in significant community financial savings in the long term.

Effectiveness of Safeguard 3:

A woman who receives an early diagnosis of breast cancer can completely recover. In other words, after surviving 5 years post-cancer treatment, it is very likely that a person *will* have normal lifespan expectancy. Additionally, analyses showed that treating early stage breast cancer is more cost-effective than treating late-stage disease (Groot, 2006).

The purpose of the recommendation stage of an HIA is to make suggestions to manage the health hazards identified, including alternatives to the decision, modifications to the programs or mitigations measures (North American HIA Practice Standards Working Group, 2010). This HIA outlines the target population, health hazards, risks and safeguards of this community to better understand and plan for future development and projects. The target community was low-income black women in their mid-30s because of their high prevalence at the complex. The health hazards affecting this community include diabetes, breast cancer and cardiovascular disease. Utilizing these outlined health hazards, three safeguards were chosen based on the Duval County Health department's list of available programs to the area.

After completing a thorough risk analysis, the health hazards could be ranked using their severity of impact. The most severe hazard, based on the calibrated scale, was diabetes, followed by cardiovascular disease, then breast cancer. Costs for these diseases were all extraordinary, but cardiovascular disease was the highest, followed by diabetes then breast cancer. This indicates that the top two hazards for this community include cardiovascular disease and diabetes.

The safeguards chosen for purpose of the analysis included Jacksonville's Community Cardiovascular Health program, Obesity Prevention Program and the Breast Cancer Prevention and Testing program. All of these programs have health and financial benefits and will ultimately aid in the prevention of cardiovascular, breast/cervical and diabetes diseases in the Kings Ridge community.

All of the safeguards, if utilized effectively, would provide benefits to both the residents of the complex and the stakeholders involved with Jacksonville Affordable Communities. While the residents will benefit from the direct health impacts; lessened rates of cardiovascular disease, diabetes and breast/cervical cancer, the Board of Directors will also see positive community level impacts. While the most favorable programming outcome for the Community Center would be to implement all three of the safeguards, that is not feasible due to the constraints the project already listed. Therefore, the program recommendation is the obesity coalition, because it has been shown to provide reductions in disease which pose the highest risk to the population; obesity, diabetes and breast cancer and have benefits for the entire population, rather than a specific sub-group.

The effectiveness of community-wide obesity programs is exemplified through the Ecological Model of Childhood Overweight, developed by University at Albany and Pennsylvania State University researchers Davison and Birch (2001). The model "focuses specifically on characteristics that could affect an individual child's weight status in relation to the multiple environments in which that child is embedded. This model is ideal for looking at the combined effects of society, family, and individual factors that would amplify or illuminate the causes of childhood obesity." (Davison & Birch, 2001) In other words, by providing the community with a specific obesity programming opportunity, several population level benefits can be seen not directly related to weight reduction.

Additionally, by providing the obesity programming opportunity, it has the potential to not only lessen the prevalence of obesity in the population, but of other comorbid diseases as well. There are several associations between obesity and type two diabetes, all cancers, cardiovascular disease, asthma, gallbladder disease, and chronic back pain. (Guh et al, 2009) More specifically, there is a strong link between hypertension and obesity. (Dustan, 1991) With all these diseases having a linkage with obesity, providing the obesity program will be the most effective, and be able to be of the most assistance to the community center in the Kings Ridge Apartment Complex.

Limitations

For this project, the limitations were primarily associated with data constraints. For the risk analysis, the only data available, from Florida Charts, was inconsistent in the aggregated data. This meant that for some of the diseases, it was 2008 data, and others it

was 2010 data. This could have been mitigated if the data had been available in raw form. However, Florida Charts did not have that level of detail accessible to the public.

The health cost data was another weakness in the study; cardiovascular and diabetes cost data was available at the state level, while breast cancer cost data was at the national scale. While this provides inconsistency, it was the only data available. Finally, the cost for the safeguards was a huge challenge and weakness for this HIA because there was not enough normalized data available; the costs that were available were specific to certain aspects of particular programs. Luckily, some of the Duval County programs were similar to the cost examples given, so the comparison could be utilized.

No HIA is completed after the production of the report. Arguably, the most important step in the health assessment is the follow up of decision makers, and monitoring of the population's health. This operation, and maintenance is "the longest life cycle phase, and requires correcting errors which are not discovered in earlier stages of the life cycle, improving the implementation of system units and enhancing the system's services as new requirements are discovered" (Somerville, 2007). Therefore, while monitoring is not finished with the completion of the report, Jacksonville Affordable Communities plans to continually update this study based on future health findings. One piece of that plan is hiring a director of community health programming to perform HIAs on other health promoting activities proposed such as the community garden, daycare center and convenience store, and monitoring through surveys and health records. This step was accomplished in June 2012. Additionally, the Director of Community Health Programming will conduct stakeholder charettes involving the residents, management and

the larger community to seek input on other programs and priorities they community might have.

Appendix A

Kings Ridge Timeline:

1966- The complex was constructed

1995- The property was probably foreclosed on by HUD

1996-

- The property was deeded to Jacksonville Affordable Communities – THC, Inc., a 501C2 non-profit which in turn was controlled by two 501C3's
- Rehabilitation of 3.4 million funded by HUD
- Name changed from Imperial Gardens to the present Kings Ridge
- The complex was managed by a Housing Partnership (Family First)

2010-11

- The parent 501c3 went into a form of bankruptcy (called "debtors in possession")
- JAC – THC, Inc. board of directors resigned and new directors elected
- A new 501c3 became the "parent" c3 for JAC-TAC
- A long term property management agreement was executed for stability.

Health Profile- Duval

Duval County Minority Health Profile - Black										
			COUNTY					STATE		
Measure	Year(s)	Rate Type	Black Number	Black Rate	White Number	White Rate	Blk/Wht Rate Ratio	Black Rate	White Rate	Blk/Wht Rate Ratio
Maternal and Child Health										
Mothers who initiate breastfeeding	2008-10	Percent	8,821	63.8%	18,165	81.2%	**0.8:1**	68.1%	82.0%	**0.8:1**
Births with 1st trimester prenatal care	2008-10	Percent	7,483	62.3%	15,592	77.3%	**0.8:1**	70.1%	80.5%	**0.9:1**
Births with no prenatal care	2008-10	Percent	574	4.8%	413	2.1%	**2.3:1**	3.0%	1.4%	**2.2:1**
Births < 37 weeks of gestation	2008-10	Percent	2,483	18.0%	2,621	11.7%	**1.5:1**	18.8%	12.5%	**1.5:1**
Births < 1500 grams (very low birth weight)	2008-10	Percent	420	3.0%	261	1.2%	**2.6:1**	3.0%	1.2%	**2.5:1**
Births < 2500 grams (low birth weight)	2008-10	Percent	1,801	13.0%	1,634	7.3%	**1.8:1**	13.6%	7.2%	**1.9:1**
Very low birthweight infants born in subspecialty perinatal centers	2008-10	Percent	272	64.8%	183	70.1%	**0.9:1**	81.9%	71.7%	**1.1:1**
Fetal deaths	2008-10	Per 1,000	171	12.4	132	5.9	**2.1:1**	12.7	5.6	**2.3:1**
Infant deaths (0-364 days)	2008-10	Per 1,000	181	13.1	137	6.1	**2.1:1**	12.6	5.1	**2.5:1**
Sudden Unexpected Infant Deaths (SUID)	2008-10	Per 100,000	25	180.8	22	98.3	**1.8:1**	178.7	73.1	**2.4:1**
Maternal deaths	2008-10	Per 100,000	4	28.9*(u)*	2	8.9*(u)*	**3.2:1**	37.1	15.4	**2.4:1**
Births with inter-pregnancy interval < 18 months	2008-10	Percent	3,317	42.4%	4,956	41.9%	**1:1**	39.6%	37.6%	**1.1:1**
Prenatal WIC participation	2008	Percent		79.2%		78.6%	**1:1**	81.2%	80.7%	**1:1**
Injuries and Injury-related Deaths										
Age-adjusted homicide death rate	2008-10	Per 100,000	242	26.1	84	4.8	**5.5:1**	16.8	4.1	**4.1:1**
Age-adjusted suicide death rate	2008-10	Per 100,000	45	5.4	342	18.4	**0.3:1**	4.5	15.7	**0.3:1**
Age-adjusted unintentional drowning death rate	2008-10	Per 100,000	18	1.9	27	1.5	**1.3:1**	2.2	1.9	**1.2:1**
Age-adjusted firearms-related death rate	2008-10	Per 100,000	237	25.8	240	13.1	**2:1**	15.7	10.5	**1.5:1**
Traumatic brain injury deaths	2008-10	Per 100,000	135	15.7	371	21.3	**0.7:1**	12.3	21.0	**0.6:1**
Age-adjusted motor vehicle crash death rate	2008-10	Per 100,000	78	9.7	267	14.9	**0.7:1**	12.6	14.5	**0.9:1**
Age-adjusted unintentional fall death rate	2008-10	Per 100,000	22	3.8	157	7.8	**0.5:1**	3.6	7.4	**0.5:1**
Hospitalizations for non-fatal firearm injuries	2008-10	Per 100,000	382	44.5	142	8.2	**5.4:1**	30.6	4.8	**6.4:1**
Hospitalizations for non-fatal traumatic brain injuries	2008-10	Per 100,000	588	68.5	1,845	106.1	**0.6:1**	62.2	96.3	**0.6:1**
Hospitalizations for non-fatal motor vehicle related injuries	2008-10	Per 100,000	526	61.3	1,358	78.1	**0.8:1**	70.6	77.4	**0.9:1**
Hospitalizations for non-fatal unintentional falls	2008-10	Per 100,000	772	89.9	5,008	287.9	**0.3:1**	102.6	343.8	**0.3:1**
Hospitalizations for non-fatal unintentional fire injuries	2008-10	Per 100,000	46	5.4	78	4.5	**1.2:1**	3.0	3.1	**1:1**

Duval County Minority Health Profile - Black										
			COUNTY					STATE		
Measure	Year(s)	Rate Type	Black Number	Black Rate	White Number	White Rate	Blk/Wht Rate Ratio	Black Rate	White Rate	Blk/Wht Rate Ratio
Leading Causes of Death										
Cardiovascular Disease										
Coronary Heart Disease										
Age-adjusted death rate	2008-10	Per 100,000	696	127.2	2,234	109.9	**1.2:1**	118.0	102.9	**1.1:1**
Age-adjusted hospitalization rate	2010	Per 100,000	685	318.9	2,351	344.5	**0.9:1**	353.6	353.4	**1:1**
Adults who have ever had a heart attack, angina, or coronary heart disease	2010	Percent		9.2%		7.1%	**1.3:1**	7.6%	10.6%	**0.7:1**
Stroke										
Age-adjusted death rate	2008-10	Per 100,000	306	54.8	608	30.0	**1.8:1**	50.1	28.2	**1.8:1**
Age-adjusted hospitalization rate	2010	Per 100,000	1,015	481.7	1,771	262.7	**1.8:1**	407.3	229.1	**1.8:1**
Adults who have ever had a stroke	2010	Percent		3.1%		2.3%	**1.3:1**	3.8%	3.5%	**1.1:1**
Congestive Heart Failure										
Age-adjusted death rate	2008-10	Per 100,000	56	10.3	172	8.5	**1.2:1**	9.7	7.4	**1.3:1**
Age-adjusted hospitalization rate	2010	Per 100,000	440	207.3	860	126.6	**1.6:1**	263.8	101.6	**2.6:1**
Cancer										
Age-adjusted cancer death rate	2008-10	Per 100,000	1,068	179.9	3,708	186.6	**1:1**	170.6	158.9	**1.1:1**
Cancer cases diagnosed at late stage	2006-08	Percent	1,275	44.1%	3,840	40.1%	**1.1:1**	43.2%	39.8%	**1.1:1**
Lung Cancer										
Age-adjusted death rate	2008-10	Per 100,000	273	46.4	1,164	58.9	**0.8:1**	38.4	47.6	**0.8:1**
Age-adjusted incidence rate	2006-08	Per 100,000	355	62.2	1,607	84.9	**0.7:1**	52.0	67.2	**0.8:1**
Colorectal Cancer										
Age-adjusted death rate	2008-10	Per 100,000	108	18.3	301	14.8	**1.2:1**	18.3	13.9	**1.3:1**
Age-adjusted incidence rate	2006-08	Per 100,000	320	53.0	796	41.7	**1.3:1**	44.2	41.0	**1.1:1**
Adults 50 and over who have ever had a sigmoidoscopy or colonoscopy	2010	Percent		50.0%		67.9%	**0.7:1**	63.9%	69.6%	**0.9:1**
Adults 50 and over who have had a blood stool test in the past year	2010	Percent		12.6%		8.7%	**1.5:1**	16.9%	14.7%	**1.2:1**
Breast Cancer										
Age-adjusted death rate	2008-10	Per 100,000	127	35.2	234	21.6	**1.6:1**	27.9	19.7	**1.4:1**
Age-adjusted incidence rate	2006-08	Per 100,000	459	126.2	1,253	124.6	**1:1**	98.1	112.7	**0.9:1**
Women 40 years of age and older who received a mammogram in the past year	2010	Percent		78.5%		62.7%	**1.3:1**	67.0%	61.6%	**1.1:1**

Duval County Minority Health Profile - Black										
					COUNTY			STATE		
Measure	Year(s)	Rate Type	Black Number	Black Rate	White Number	White Rate	Blk/Wht Rate Ratio	Black Rate	White Rate	Blk/Wht Rate Ratio
Cancer (continued)										
Prostate Cancer										
Age-adjusted death rate	2008-10	Per 100,000	75	40.1	138	17.1	**2.3:1**	41.9	15.7	**2.7:1**
Age-adjusted incidence rate	2006-08	Per 100,000	487	198.0	1,238	143.5	**1.4:1**	187.8	122.2	**1.5:1**
Men 50 years of age and older who received a digital rectal exam in the past year	2010	Percent				42.6%	**n/a**	42.3%	49.4%	**0.9:1**
Cervical Cancer										
Age-adjusted death rate	2008-10	Per 100,000	19	5.2	29	2.9	**1.8:1**	4.5	2.4	**1.9:1**
Age-adjusted incidence rate	2006-08	Per 100,000	42	10.4	84	9.1	**1.1:1**	11.1	8.6	**1.3:1**
Women 18 years of age and older who received a PAP test in the past year	2010	Percent		69.2%		61.2%	**1.1:1**	59.7%	57.2%	**1:1**
Diabetes										
Age-adjusted death rate	2008-10	Per 100,000	463	45.8	463	23.5	**1.9:1**	39.9	17.4	**2.3:1**
Age-adjusted hospitalization rate	2010	Per 100,000	11,682	5446.1	16,252	2444.2	**2.2:1**	4264.2	1867.8	**2.3:1**
Hospitalizations from amputation due to diabetes	2010	Per 100,000	204	93.2	150	21.7	**4.3:1**	68.0	19.6	**3.5:1**
Emergency room visits due to diabetes	2007-09	Per 100,000	3,432	397.5	4,477	257.9	**1.5:1**	406.2	318.7	**1.3:1**
Adults with diagnosed diabetes	2010	Percent		10.6%		11.4%	**0.9:1**	13.4%	10.1%	**1.3:1**
HIV/AIDS										
Reported AIDS Cases	2008-10	Per 100,000	588	68.5	172	9.9	**6.9:1**	71.7	7.3	**9.9:1**
Age-adjusted HIV/AIDS death rate	2008-10	Per 100,000	195	24.3	64	3.4	**7.1:1**	26.1	3.0	**8.8:1**
Reported HIV cases	2008-10	Per 100,000	790	92.0	251	14.4	**6.4:1**	88.6	12.5	**7.1:1**
Modifiable Behaviors Leading to Premature Deaths										
Adults who are current smokers	2010	Percent		16.6%		19.5%	**0.9:1**	13.2%	17.6%	**0.8:1**
Adults who are obese (BMI>=30)	2010	Percent		36.9%		25.6%	**1.4:1**	42.0%	25.9%	**1.6:1**
Adults who are overweight (BMI between 25.0 and 29.9)	2010	Percent		39.7%		37.5%	**1.1:1**	36.1%	37.9%	**1:1**
Adults who engage in at least regular moderate physical activity	2007	Percent		21.8%		35.1%	**0.6:1**	27.1%	36.2%	**0.7:1**
Adults who consume at least 5 servings of fruits and vegetables per day	2007	Percent		23.8%		23.6%	**1:1**	28.6%	25.8%	**1.1:1**
Adults who have had their cholesterol checked in last two years (of those ever measured)	2007	Percent		76.5%		80.5%	**1:1**	74.3%	81.8%	**0.9:1**

Notes
(r) Regional BRFSS estimates used instead of single county due to small sample size.
Click here for 2007 region listing
Click here for 2010 region listing

Appendix B

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