

Secondary Analysis of BRFSS Data for Camden County

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Abstract

Introduction. A community health assessment is the foundation for improving and promoting the health of community members. The Behavioral Risk Factor Surveillance System (BRFSS) is a tool that is used to collect data on adult (≥ 18 years of age) behavior that can be used to develop, implement, and evaluate health promotion and disease prevention programs in the corresponding population. Camden County's 2005 BRFSS data is an initial step in the community health assessment to plan for the health needs of residents in the City of Camden.

The purpose of this study was to determine what factors are associated with the differences in self-reported health between the City of Camden (CC) and the Remainder of Camden County (RC) residents.

Methods. Using SPSS software, a secondary analysis of the existing Camden County 2005 BRFSS data was conducted to determine whether there are important differences in self-reported health between CC and RC residents and to identify what factors are associated with these differences. BRFSS responses were recoded, dichotomized, and categorized as either POOR or ADEQUATE.

Results. The secondary analysis indicated that there are significant differences between the residential variable (CC vs. RC) and the following health indicators: access to health care, substance use (alcohol and tobacco), responsible sexual behavior (HIV/AIDS), mental and physical health, violence, and demographic barriers (finances, education, etc.). Findings suggest that demographics are major factors associated with the differences in self-reported health between CC and RC.

Conclusion. The findings from both the Camden County BRFSS study and this secondary analysis can assist stakeholders, as an initial step, in identifying health issues, designing public health intervention strategies, and evaluating their impact within the City of Camden.

INTRODUCTION

Purpose of Study

A community health assessment is the foundation for improving and promoting the health of community members. By performing an assessment, community stakeholders can begin to answer strategic questions about the strengths of a community, health concerns of community members, resources available in the community, and what is needed in the community to address these concerns.^[1] As an important step in the process of assessing community health needs, the Camden County Health Department conducted the CDC's Behavioral Risk Factor Surveillance Survey (BRFSS) in 2005. This was an anonymous telephone survey conducted with a sample of 1,126 residents in the county. The Camden County Health Department has provided access to this data for a secondary analysis using SPSS software.

Background and Significance

The City of Camden is ranked the poorest municipality (566 out of 566) in the State of New Jersey with a per capita income of \$9,815 (\$27,006 NJ) and 35.5% (8.5% NJ) of its residents having an income that is below the federal poverty level. The 2000 Census data reports a total population of 79,904, nearly a 10% decline from 1990 and 34.6% of the population consists of individuals less than 18 years of age. The population consists mainly of racial/ethnic minorities, 53.3% African Americans (13.6% NJ) and 38.8% Hispanics (13.3% NJ), and language other than English is spoken in 39.6% (25.5% NJ) of the homes.^[2, 3] This population suffers from the chronic diseases of high blood pressure, diabetes, heart problems, and high cholesterol. The city residents experience elevated rates of asthma and other respiratory illnesses. The Camden City children are also more likely than remainder of the county children to suffer from chronic health conditions. The city's housing stock is seriously deteriorating, with 34% of the housing built prior to 1940; which exacerbates many health concerns.^[4]

The Behavioral Risk Factor Surveillance System (BRFSS) is a tool that was established in 1984 by the Centers for Disease Control and Prevention (CDC) to collect state-level data about personal health behaviors. This survey was designed as a result of research demonstrating that personal health behaviors of adults have an impact on premature morbidity and mortality. The purpose of the BRFSS is to collect data on adult behaviors that could then be used to develop, implement, and evaluate health promotion and disease prevention programs in the corresponding population.^[5] In addition to collecting state-level data, some states use the BRFSS to collect data for different regions within the state e.g. urban, rural, or low socioeconomic. The BRFSS consists of a standard core set of questions that must be used in all of the state surveys. This allows for state to state comparisons. States may include additional questions in their survey from the CDC's optional modules that are based on their needs as well as state-added questions. The state-added questions are not funded by the CDC and not considered a part of the official BRFSS questionnaire results that are posted on the CDC's website.^[5]

The information obtained from the BRFSS is one data source that is used to assess the health status of a population. Vital statistics (birth and death records), hospital discharge data, health care records, physical examinations and personal interviews are examples of other types of data that are used to assess the health status of a population. Information obtained from these sources is reported in a variety of publications that public health officials and policy makers use to develop, implement, and evaluate health promotion and disease prevention initiatives.^[7]

The BRFSS is one of the data sources used in the Healthy People 2010, a national health promotion and disease prevention initiative. Its goals are to increase the quality and years of healthy life. A key aspect of the initiative has been the setting of health objectives, by the U.S. Department of Health and Human Services with many participating constituents, that can be used by States, communities, professional organizations, community based organizations, etc. to compare health status on the various measures and develop programs to improve the health of their respective communities. Healthy People 2010's leading health indicators reflect the major public health concerns in the United States and are the source for the specific objectives that are developed and measured to monitor progress addressing the health status of communities and ultimately this nation. The leading health indicators identified in Healthy People 2010 include: access to health care, environmental quality, immunization, injury and violence, mental health, overweight and obesity, physical activity, responsible sexual behavior, substance abuse, and tobacco use.^[8]

Healthy People 2010 states that "leading health indicators illuminate individual behaviors, physical and social environmental factors, and important health system issues that greatly affect the health of individuals and communities and that income and education are also significant influences."^[8] Since the core questions contained within the BRFSS reflect these indicators, the behavioral risk factor data obtained in the Camden County BRFSS Study can be used as a component of the Camden City Community Health Assessment Process. The State of New Jersey uses the BRFSS data for Healthy NJ 2010, to develop intervention programs on immunization and tobacco control, measure progress toward goals related to the leading health indicators; assess health behaviors between minority and non-minority groups, and to evaluate the progress toward state and national Healthy People 2010 objectives. Camden County's MAPP (Mobilizing for Action through Partnerships and Planning) is using the BRFSS data in the community health assessment as Camden City stakeholders plan for the health needs of residents in the City of Camden.

The purpose of this study was to determine what factors are associated with the differences in self-reported health between the City of Camden and the remainder of Camden County residents. To achieve this goal, a secondary analysis of the existing BRFSS data collected by the Camden County Health Department through Holleran, an independent research firm was conducted to determine whether there are important differences in self-reported health between the City of Camden and the remainder of the County residents. If there is a difference in self-reported health, to identify what factors such as, barriers to care or behavioral risks that are associated with these differences.

METHODS

Data Source

Camden County Department of Health and Human Services provided a compact disc containing the results of the BRFSS study that was conducted and analyzed by Holleran among the Camden County adult community. This survey tool contained questions from the BRFSS core sections, optional modules, and individualized questions that were specific to the Camden County area [Appendix A]. This BRFSS study was a cross-sectional telephone survey that sampled various municipalities within Camden County, with an over-sampling of municipalities that are deemed "distressed" by the New Jersey Department of Health and Senior Services [Appendix B]. The data collections took place between August 1 and August 26, 2005, with a

26.4% response rate. Holleran weighted the Camden County data to account for the over-sampling of the “distressed” municipalities and to represent the gender breakdown. Holleran further reported that the BRFSS sample of 1,126 Camden County respondents had an overall error rate of +/-2.0% at a 95% confidence level.^[9] The Camden County BRFSS data was provided in a SPSS Data Document File for this project’s secondary analysis.

Data Analysis

Using Camden County’s BRFSS data, a secondary analysis was conducted using SPSS to compare the responses of City of Camden residents (CC) to the responses from the remainder of county residents (RC). Using SPSS, the chi-square test was used to determine if the prevalence of each health behavior or factor was significantly associated ($p \leq 0.05$) with the residential variables, City of Camden resident vs. remainder of Camden County resident.^[10, 11] The data were reviewed and noted for any violations of the assumption of chi-square regarding the minimum expected frequency, that is, eighty percent of the cells have expected frequencies of five or more [Appendix C].

Using the logistic model, the BRFSS responses were recoded and dichotomized into POOR or ADEQUATE levels of self-reported health or risk factors, creating 2 x 2 tables for each BRFSS question. SPSS was employed to perform the chi-square test on the recoded data to determine whether each health factor was significantly associated ($p \leq 0.05$) with the residential variable CC vs. RC. The data were reviewed and noted for any violations of the assumption of chi-square regarding the minimum expected frequency. Yates’ Correction for Continuity was applied to compensate for the overestimate of the chi-square value when used with a 2 x 2 table [Appendix C].^[10, 12] Factors that were determined to not have a statistically significant association with the residential variable or violated the assumptions of chi-square were not further explored [Appendix D]. An analysis of proportions was performed on the remaining factors. The relative risk (RR), odds ratio (OR), and 95% confidence interval (CI) were determined for these factors to further measure the relationship between CC and RC and the self-reported health factors [Appendix E].^[10, 13] OR values greater than one indicate that the self-reported health factor was related to the variable and possibly causal, values less than one indicate that the factor was negatively related to the CC vs. RC variable and possibly protective in nature, and values equal to one indicate that there was not an association between the self-reported health factors and the residential variables (CC vs. RC). Analyses run in SPSS were converted and imported into Microsoft Excel. For reporting purposes of the secondary analysis, similar BRFSS questions were categorized according to subject. The statistically significant self-reported health factors were grouped into the following categories: Demographics; Health Related Quality of Life - Healthy Days; Health Care Access; Substance Use; Oral Health; Preventive Health Screenings; HIV/AIDS; Cardiovascular Health; and Safety-Firearms and Crime [Appendices F, G].

Data Re-coding

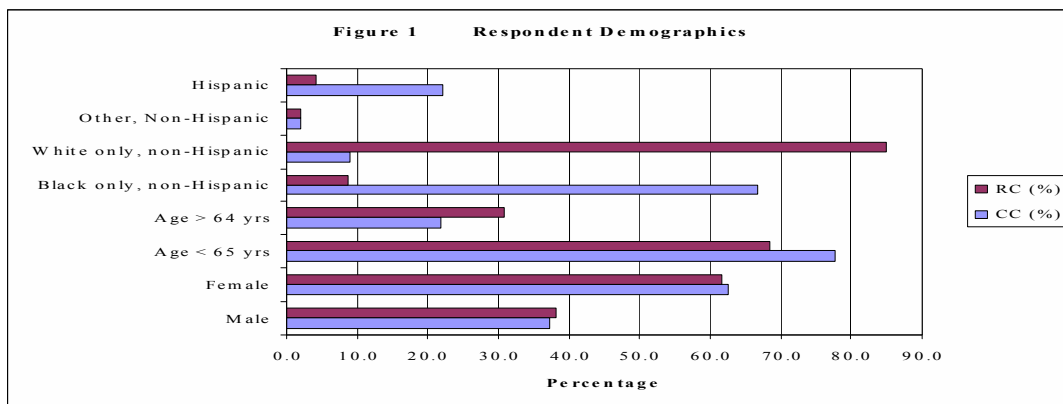
BRFSS responses were recoded and dichotomized into POOR vs. ADEQUATE levels of self-reported health or risk factors [Appendix C]. For example, the scales for how many days during the past 30-days was your physical health, mental health not good or keep you from doing your usual activities were collapsed so that 3 or more days were categorized as POOR while 2 or less were categorized as ADEQUATE. The scales for preventive health screenings were collapsed based on the American Cancer Society guidelines for prevention and early detection. The scales for length of time since last mammogram, breast exam, pap test, prostate-specific

antigen (PSA), digital rectal exam, and blood stool test were collapsed so that within past year was categorized as adequate while anything greater than 12 months were categorized as poor. The scale for length of time since last sigmoidoscopy or colonoscopy was collapsed based on the guidelines for sigmoidoscopy so that less than 5 years were categorized as ADEQUATE while anything 5 years or greater was categorized as POOR.^[14, 15, 16] The scale for number of days per week or month did you have at least one drink of alcoholic beverage and on those days, how many drinks did you drink on average were collapsed so that less than three times per week/month and less than three drinks respectively were categorized as ADEQUATE while three or more times per week/month and three or more drinks were categorized as POOR.^[17] The responses to the scale based on the question, “Which of the following best describes the water that you drink at home most often?”, were collapsed so that unfiltered/filtered tap water were categorized as ADEQUATE and bottled, vended, or water from another source were categorized as POOR. Though it is positive that respondents were counseled about use of condoms to prevent STDs and about being tested for HIV, because the CC respondent risk factors were higher for acquiring or transmitting the disease, being tested was considered a POOR outcome. Appendix C – BRFSS Analysis (all questions), contains the complete re-coding of the BRFSS questions and Appendix J – Dichotomized Questions, contains the listing and respective data for all dichotomized BRFSS questions.

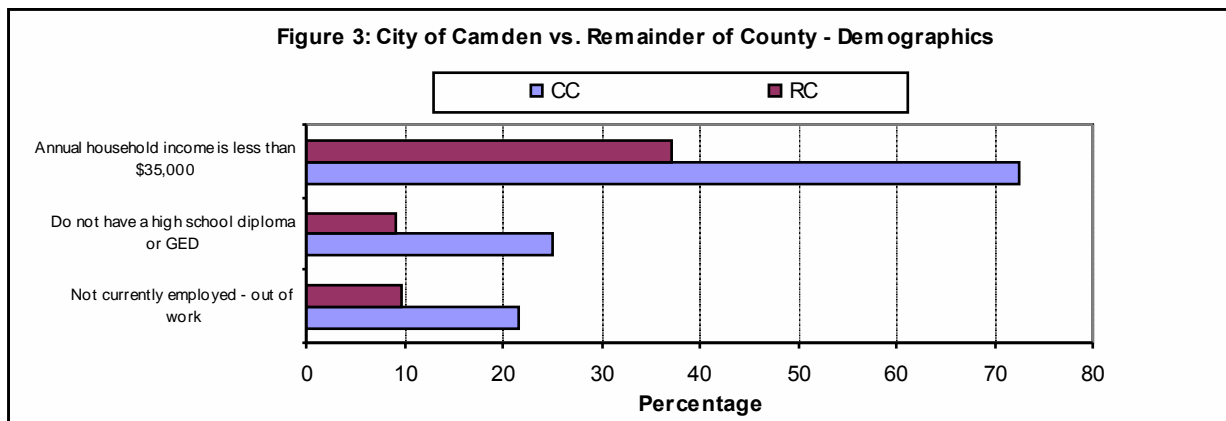
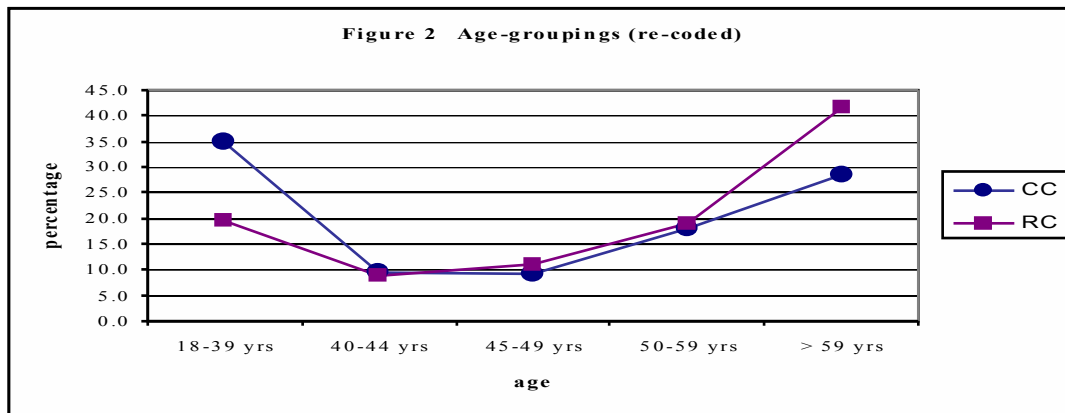
RESULTS

Description of BRFSS respondents

A total of 1,126 individuals responded to Camden County’s BRFSS; 30.9% (n = 348) City of Camden residents (CC) and 69.1% (n = 778) remainder of the county residents (RC). The respondents were predominantly female and based on chi-square analysis, there was no significant difference between the two groups (CC = 62.6%; RC = 61.8%). The majority of respondents were less than 65 years of age; CC = 77.6% and RC 68.5%. Chi-square analysis revealed a significant difference ($p \leq 0.05$) between the race of respondents based on the variables identified in Figure 1. Overall, Hispanic or Latino’s comprised 21.7% of CC respondents and 4.2% of RC respondents. The age-grouping variable was re-coded corresponding to the age limitations contained within various BRFSS questions. A significant difference ($p \leq 0.05$) was determined in the new age-grouping variable using chi-square analysis. Figure 2 provides a percentage breakdown of the revised age-groupings. City of Camden had a greater percentage of residents less than forty years of age whereas the Remainder of the County had a greater percentage of residents greater than fifty-nine years of age.

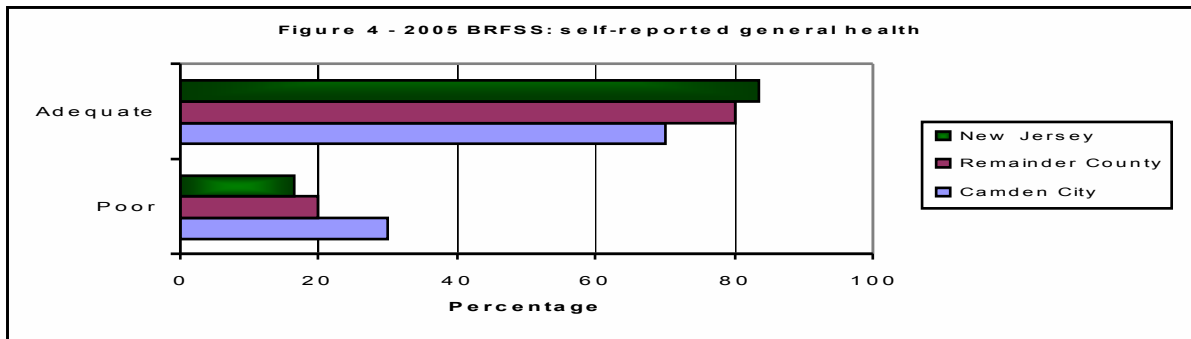


There was a significant difference in the annual household income, education, and employment status between the two groups [Figure 3]. The estimated odds of having an annual household income categorized as POOR were higher for the City residents (OR = 4.45, 95% CI=3.28, 6.03). There was a significant difference in the income categorized as POOR with 73% CC residents, 37% of RC residents, and 33.4% of NJ^[2] residents with less than \$35,000 annual household income. The odds of having less than a high school diploma was higher for the City residents (OR = 3.38, 95% CI = 2.4, 4.78). The percentage with educational status categorized as poor was 25% CC residents vs. 9% RC residents having less than an high school diploma compared to the state of NJ at 10.4%.^[2] The estimated odds of being categorized as having a POOR employment status, (either out of work or unable to work), was also higher for the City residents (OR = 2.54, 95% CI = 1.79, 3.59).



General Health Status

Fair or poor responses to the question regarding self-reported general health were categorized as POOR and excellent, very good, or good responses were categorized as ADEQUATE. There was a significant difference in the self-reported health between the residents of the City of Camden vs. Remainder of the County with 29% CC respondents vs. 19.7% RC respondents reporting POOR general health (Figure 4). In the NJ BRFSS, 16.6% of the responses (fair, poor) were categorized as POOR general health.^[2] City of Camden respondents were 1.73 times more likely to report POOR general health as those residents in the Remainder of the County (OR = 1.73, 95% CI = 1.29, 2.31).



Health-Related Quality of Life - Healthy Days

This category included eight factors that were significantly associated with the residential variables. CC was less healthy than the RC in seven of these eight factors.

Table 1 Health-Related Quality of Life ~ Healthy Days	Less healthy than the County (POOR)	More healthy than the County (ADEQUATE)
Drinking water source is other than household tap	√	
Went without food to pay other bills	√	
Physically care for someone who is disabled (caregiver role)	√	
Participate in physical activity in the past 30 days	√	
Poor physical/mental health interfering with usual activities	√	
Physical health in past 30 days	√	
Mental health in past 30 days	√	
Felt worried, tense, or anxious in past 30 days		√

The CC respondents indicated that they were actually better than RC in their response to the number of days of feeling worried, tense, or anxious (OR = 0.64). However, there was no significant difference between the two residential variables for the factors concerning feelings of sadness or depression; any limitation in usual activities due to pain; disabilities; diabetes; childhood asthma; or indoor air quality.

Table 2: Health Related Quality of Life - Healthy Days -	% Poor		Odds Ratio	95% CI
	CC	RC		
Drinks bottle, vended or another source water at home...	65.96	31.9	4.14	(3.15, 5.43)
Have gone without food to pay other bills?	22.53	8.04	3.33	(2.30, 4.81)
Have physically cared for another person...?	21.32	11.49	2.09	(1.48, 2.94)
No participation in physical activities in past 30 days	39.37	25.16	1.93	(1.48, 2.53)
How many days >3 in past 30 was your physical or mental health not good?	53.09	37.9	1.85	(1.27, 2.70)
How many days >3 in past 30 was your physical health not good?	34.21	26.14	1.47	(1.12, 1.93)
How many days >3 in past 30 was your mental health not good?	23.84	17.71	1.45	(1.06, 1.98)
How many days feeling worried, tense, or anxious >3days/mos	29.85	36.64	0.64	(0.49, 0.83)

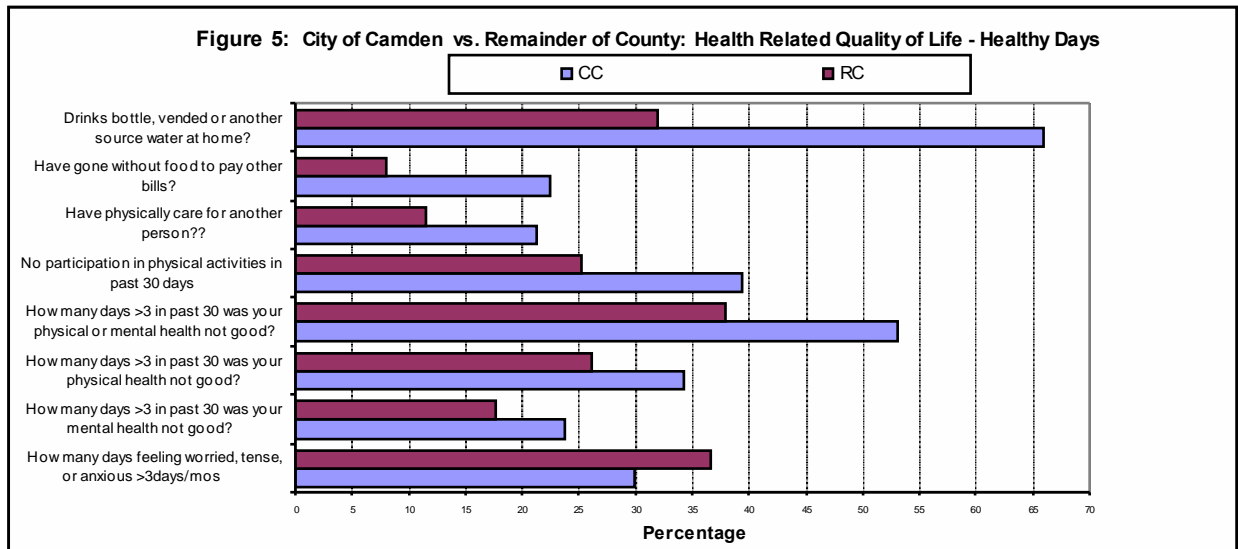
CI = Confidence Interval

(chi-square 2-sided significance $p \leq 0.05$)

There was a significant difference in the source of water drunk within the home. CC residents were 4.14 times more likely to report drinking bottled, vended, or other source of water at home than RC residents. Based largely on the higher percentage of CC residents with very low incomes and the fact that they go without food to pay other bills, this difference (in water usage) was considered to be a POOR outcome (i.e., a necessity likely due to poor water quality). The percentage of CC respondents reporting their drinking water at home is from a source other than tap water is more than twice that of RC respondents, 66% vs. 32% respectively [Table 2]. The odds of fulfilling the role as a caregiver for someone who is disabled was also higher for the city

respondents (OR 2.09). CC respondents were 3.33 times more likely to report going without food to pay other bills than RC respondents, 23% vs. 8% respectively [Figure 5]. Other factors contributing to CC respondents' poor health status include: number of days physical health and mental health not good; number of days that physical or mental health limited residents' normal activities; and participation in physical activities or exercise.

There was no significant difference in the BMI calculations that were re-coded as POOR (CC 70.4%; RC 64.4%) vs. ADEQUATE self-reported health or risk factors. However, they appear to be trending towards significance ($p = 0.064$).



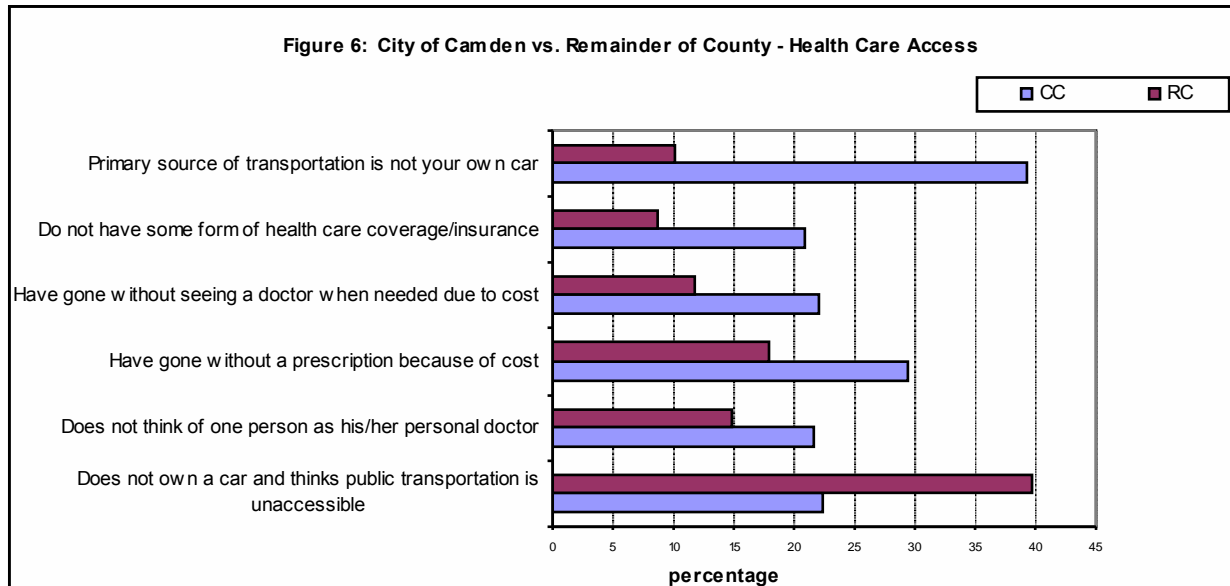
Health Care Access

There were significant differences between the residential variables for factors relevant to health care access, including transportation, health care insurance, and inability to obtain medical services due to cost [Table 3, Appendix G]. CC respondents were more likely to be categorized as having POOR transportation, 39% not having their own car and relying on either public transportation or someone else vs. 10% of RC respondents [Figure 6]. However, of those individuals who did not have their own means of transportation, CC respondents were more likely than RC respondents to think that public transportation was accessible and therefore was considered ADEQUATE.

CC respondents were 2.8 times more likely not to have any kind of health care insurance as the RC respondents, 21% vs. 9% respectively (OR = 2.8, 95% CI – 1.95, 4.01). However, of those individuals with health insurance, the odds ratio of CC respondents having Medicaid coverage was protective (OR = 0.35, CI 0.23, 0.5), that is 13.3% of CC respondents had Medicaid coverage compared to 5.2% RC respondents.

Table 3: Health Care Access	Less healthy than the County (POOR)	More healthy than the County (ADEQUATE)
Primary source of transportation	√	
Health care coverage, insurance or government plans	√	
Unable to see doctor because of cost	√	
Gone without medication because of cost	√	
One person think of as PCP	√	
Public transportation is accessible		√

The estimated odds for having gone without seeing a health care provider or without a prescription when needed due to cost was 2.13 and 1.91 respectively for CC respondents vs. RC respondents [Table 4]. Of the CC respondents, 22% reported not seeing a doctor and 29.5% report going without a prescription due to cost. Having more than one or no one the respondent considered as his/her personal doctor was categorized as POOR. CC respondents were 1.59 times as likely as RC respondents to not have a one person as his/her personal doctor.



	% Poor		Odds Ratio	95% CI
	CC	RC		
Primary source of transportation is not your own car	39.27	10.12	5.75	(4.16, 7.93)
Do not have some form of health care coverage/insurance	20.93	8.63	2.80	(1.95, 4.01)
Have gone without seeing a doctor when needed due to cost	22.03	11.73	2.13	(1.52, 2.97)
Have gone without a prescription because of cost	29.48	17.96	1.91	(1.42, 2.56)
Does not think of one person as his/her personal doctor	21.68	14.8	1.59	(1.15, 2.20)
Does not own a car and thinks public transportation is inaccessible	22.31	39.74	0.44	(0.24, 0.80)

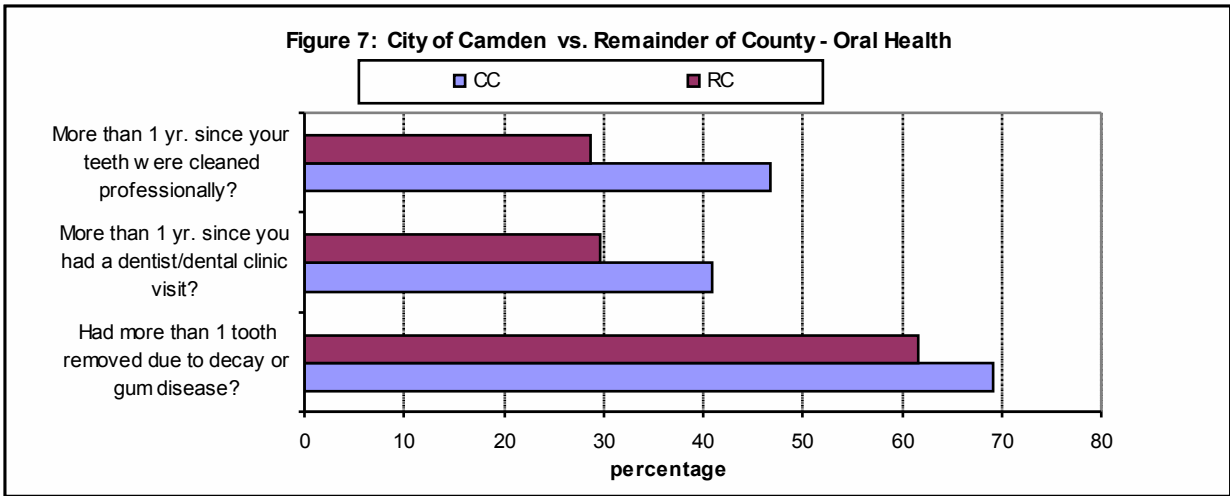
CI = Confidence Interval (chi-square 2-sided significance $p \leq 0.05$)

Oral Health

Length of time more than one year was categorized as POOR for both visiting a dentist and having your teeth cleaned. The removal of any teeth due to tooth decay or gum disease was also categorized as POOR. There was a significant difference between the residential variable for all three factors, with CC respondents less healthy than RC respondents. CC respondents were 2.17 times more likely to report that the length of time was greater than one year since they last had their teeth cleaned than RC respondents [Table 5]. Over 40% of CC respondents last visited a dentist more than a year ago as opposed to 30% of RC respondents [Figure 7].

	% Poor		Odds Ratio	95% CI
	CC	RC		
More than 1 yr. since your teeth were cleaned professionally?	46.67	28.69	2.17	(1.64, 2.88)
More than 1 yr. since you had a dentist/dental clinic visit?	40.94	29.61	1.65	(1.26, 2.15)
Had more than 1 tooth removed due to decay or gum disease?	69.12	61.6	1.40	(1.06, 1.83)

CI = Confidence Interval (chi-square 2-sided significance $p \leq 0.05$)

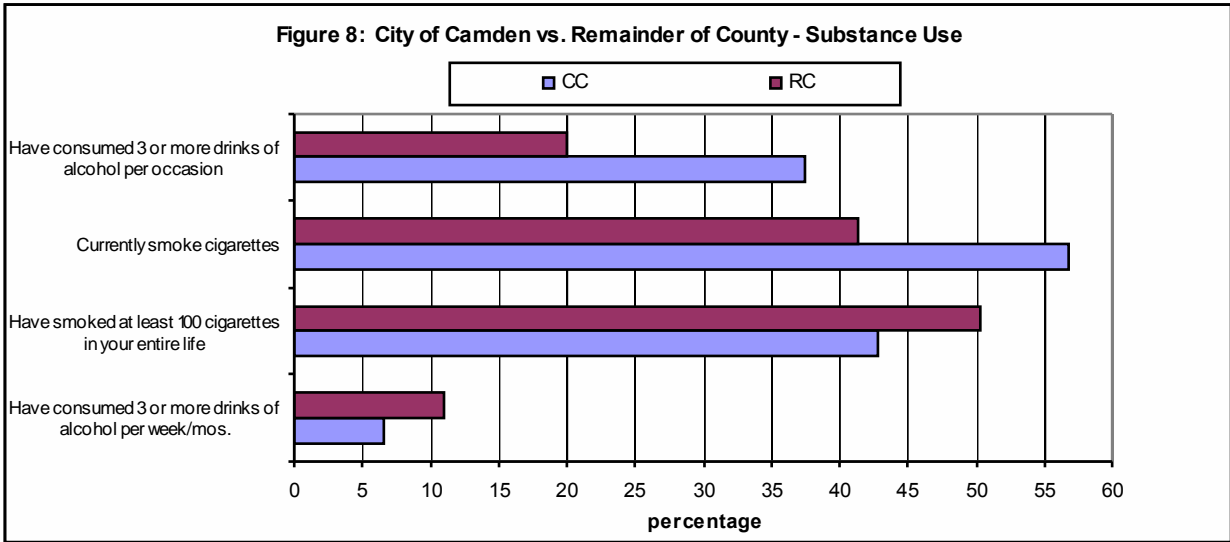


Substance Use

Four of the nine factors within this category were significantly different between the CC and RC respondent’s variable. Three or more days per week/month and three or more drinks per occasion were both categorized as POOR. RC respondents were more likely to report having an alcoholic drink three or more times per week/month than CC respondents. Figure 8 indicates 11% of RC respondents vs. 7% of CC respondents are categorized as POOR relevant to number of times having an alcoholic drink per week/month. Although RC respondents were more likely to have a few drinks per week/month, CC respondents were 2.4 times more likely to have consumed three or more alcoholic beverages per occasion. The percentage of respondents consuming more than three drinks per occasion were CC 37.5% and RC 20%.

	% Poor		Odds Ratio	95% CI
	CC	RC		
Have consumed 3 or more drinks of alcohol per occasion	37.5	20	2.40	(1.46, 3.94)
Currently smoke cigarettes	56.76	41.28	1.87	(1.27, 2.73)
Have smoked at least 100 cigarettes in your entire life	42.77	50.39	0.74	(0.57, 0.95)
Have consumed 3 or more drinks of alcohol per week/mos.	6.63	10.95	0.58	(0.36, 0.93)

CI = Confidence Interval (chi-square 2-sided significance $p \leq 0.05$)



Having smoked at least 100 cigarettes in entire life and currently smoking everyday or some days were both categorized as POOR. A greater percentage of RC respondents (50.4%) than CC respondents (42.8%) reported smoking at least 100 cigarettes within entire life. However, CC respondents were 1.87 times more likely to currently smoke cigarettes now than the RC respondents [Table 6, Figure 8]. There was not significant difference between the CC and RC residential variable relevant to the factors of being advised to quit smoking by a health care professional or trying to quit smoking within the past year. Two modules, binge drinking and other tobacco products, were not analyzed as the data either violated the assumption of chi-square regarding the minimum expected frequency or there were no significant difference in the data.

Preventive Health Screenings

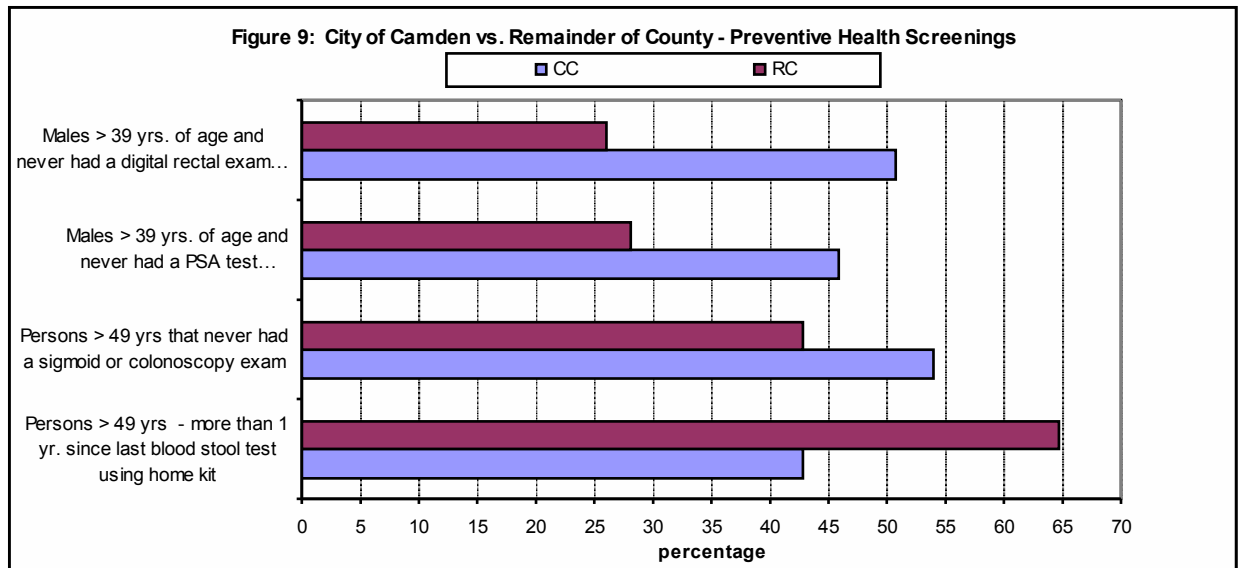
There was no significant difference between the CC and RC residential variable concerning immunizations or women’s health issues such as mammography, breast exam, and Pap test. There were a greater percentage of CC female respondents who did not have a mammogram (29% CC vs. 24.2% RC) or did not have a mammogram within the past year (CC 40.9% vs. RC 36.1%). A greater percentage of CC female respondents did not have a clinical breast exam (18.1% CC vs. 7.9% RC) or a Pap test (10.2% CC vs. 6.1% RC). Of those female respondents who did have a clinical breast exam or Pap test, RC respondents were slightly longer than CC in the length of time since each exam or test: Breast exam RC 29.4% vs. CC 22.5% and Pap test RC 37.7% vs. CC 28.4%. However, the overall pattern of responses concerning women’s health issues indicate that CC residents reported more worrisome patterns than RC residents pertaining to screenings and suggestive of the need for further research.

There was a significant difference between CC and RC variable for male responses to questions regarding prostate cancer screening. Males 40-years of age and older were questioned and 51% CC residents responded that they have never received a digital rectal exam vs. 26% of RC respondents [Figure 9]. There were 46% CC respondents vs. 28% RC respondents who reported never having a PSA test (prostate-specific antigen test). Male CC respondents were 2.92 times more likely to never have had a digital rectal exam and 2.18 times more likely to never had a PSA test than RC respondents. While there was no significant difference between CC and RC variable for responses to the questions concerning length of time since last digital rectal exam or PSA test, CC male respondents reported lower rates than RC respondents: digital rectal exam or PSA test more than 12-months ago CC 56.8% vs. RC 48.3% and CC 47.5% vs. RC 31.9% respectively. The overall pattern of responses concerning men’s health issues is consistent and indicated that CC respondents were screened at lower rates than RC.

Table 7: <i>Preventive Health Screenings</i>	% Poor		Odds Ratio	95% CI
	CC	RC		
Males > 39 yrs. of age and never had a digital rectal exam...	50.67	26.05	2.92	(1.71, 4.97)
Males > 39 yrs. of age and never had a PSA test...	45.95	28.02	2.18	(1.28, 3.73)
Persons > 49 yrs that never had a sigmoid or colonoscopy exam	53.9	42.86	1.56	(1.08, 2.25)
Persons > 49 yrs - more than 1 yr. since last blood stool test using home kit	42.86	64.64	0.41	(0.23, 0.73)

CI = Confidence Interval

(chi-square 2-sided significance $p \leq 0.05$)



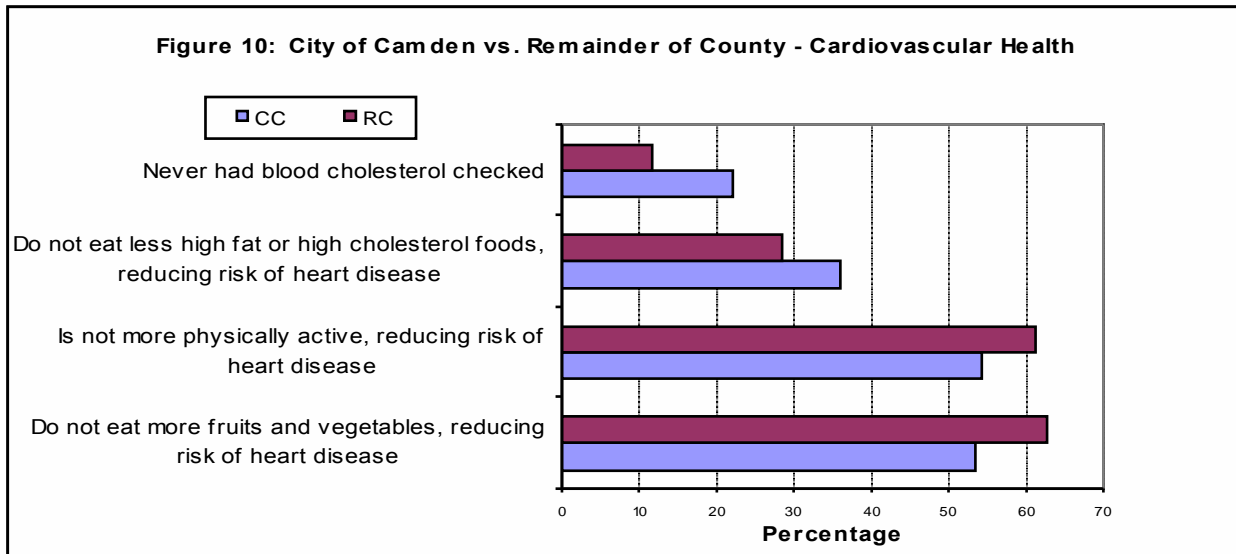
Colorectal cancer screening questions were asked of respondents that were 50-years of age and older. There was a significant difference between the residential variable for two factors; having a sigmoidoscopy or colonoscopy exam and length of time since last blood stool test using a home kit. The estimated odds of never having a sigmoidoscopy/colonoscopy were higher for CC (OR = 1.56, CI 1.08, 2.25), yet length of time since last blood stool test using a home kit was higher for RC. Just over half (54%) of CC respondents vs. 43% RC respondents reported never having a sigmoidoscopy or colonoscopy. Greater than 12-months since last blood stool test using a home kit was categorized as POOR. A larger percentage of RC respondents (65%) vs. CC respondents (43%) were categorized as POOR for this factor.

Cardiovascular Health

There were only two areas that resulted in a statistical difference between the residential variable for this health indicator. Of the three modules relevant to cardiovascular disease, only one module was statistically different. There was no significant difference between the residential variable for the modules involving a health professional advising or directing the individual in topics concerning cardiovascular disease or that an individual had cardiovascular disease. However, there was a difference in the module topic pertaining to an individual engaging in healthy behaviors to prevent cardiovascular disease. The age demographics of the two residential variables may impact these results. The CC is a younger population with 46.5% CC respondents 50 years of age and older compared with 60.5% of RC respondents. Another factor that was statistically different pertained to blood cholesterol screening [Table 8 and Figure 10]. CC respondents were 2.17 times more likely to never have had their blood cholesterol checked and 1.4 times more likely to report not eating less high fat or high cholesterol foods to reduce their risk of heart disease compared with RC respondents. More RC respondents vs. CC respondents (61.4% vs. 54.4%) reported they were not more physically active to reduce their risk of heart disease. There were more RC respondents (62.83%) than CC respondents (53.45%) who reported they do not eat more fruits and vegetables to reduce their risk of heart disease.

	% Poor		Odds Ratio	95% CI
	CC	RC		
Never had blood cholesterol checked	22.09	11.55	2.17	(1.55, 3.05)
Do not eat less high fat or high cholesterol foods, reducing risk of heart disease	35.89	28.5	1.40	(1.07, 1.85)
Is not more physically active, reducing risk of heart disease	54.38	61.43	0.75	(0.58, 0.97)
Do not eat more fruits and vegetables, reducing risk of heart disease	53.45	62.83	0.68	(0.52, 0.88)

CI = Confidence Interval (chi-square 2-sided significance $p \leq 0.05$)



HIV / AIDS

Factors in this section included history of HIV/AIDS testing and awareness of medical treatments to assist someone with HIV to live longer, HIV risk factors, and health care professional counseling to prevent sexually transmitted disease (STD) through condom use. There was a statistical difference for the residential variable in all factors, with CC more likely to be rated POOR compared with RC [Table 9]. There were a greater percentage of CC respondents (27.3%) than RC respondents (9.8%) who received counseling from a health care professional on STD prevention through condom use. The estimated odds of being tested one or more times for HIV in the past year was higher for CC respondents than RC (OR = 3.12, 95% CI = 2.03, 4.79). Additionally, the estimated odds of ever being tested for HIV was higher for CC than RC respondents (OR = 2.1, 95% CI = 1.55, 2.84).

Table 9: HIV / AIDS (< 65 yrs. of age)	Less healthy than the County (POOR)	More healthy than the County (ADEQUATE)
Told about preventing STD through condom use	√	
Amount tested in past year	√	
HIV risk factors	√	
Treatments help someone with HIV live longer (knowledge)	√	
Tested for HIV infection	√	
Reason for the last HIV test	√	

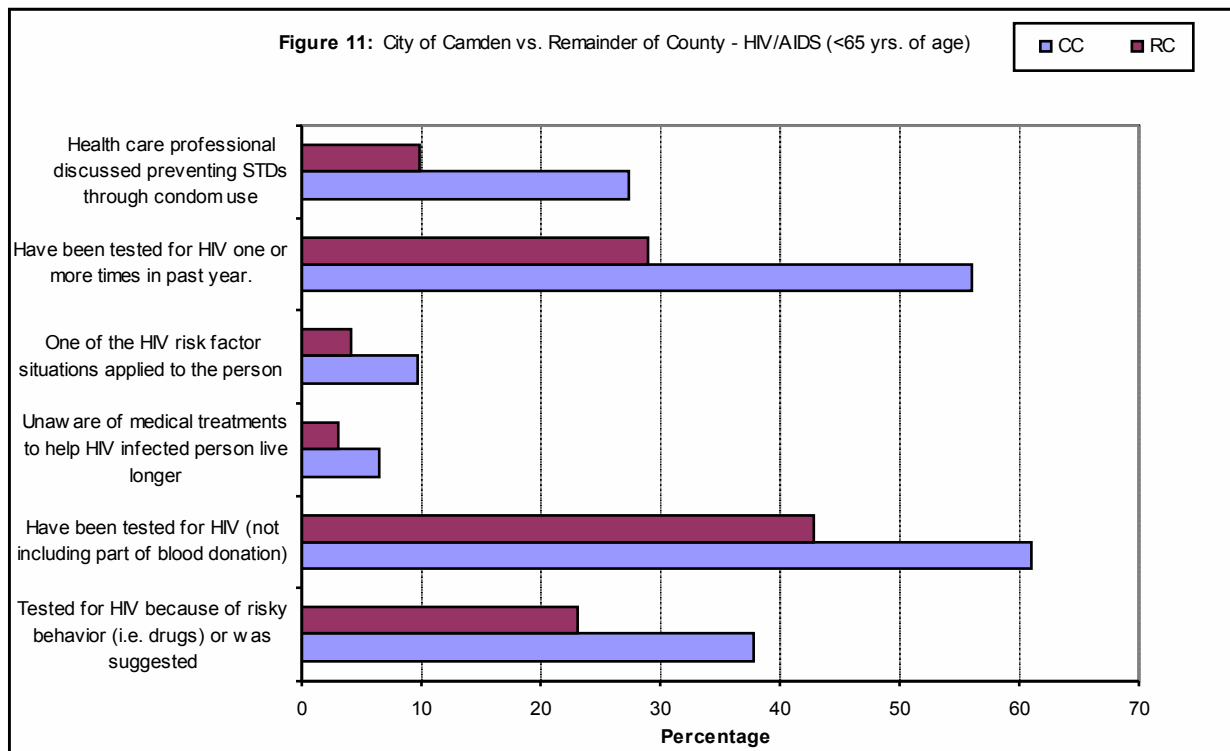
Respondents who answered positively or unsure if one of the following situations (risk factors) applied to them were categorized as POOR: used intravenous drugs in the past year; was treated for a sexually transmitted or venereal disease in past year; given or received money or drugs in exchange for sex in past year; or had anal sex without a condom in the past year. CC

respondents were 2.54 times more likely to report that one of these situations (HIV risk factors) applied to them compared with RC respondents [Table 10]. The percentage of CC respondents (9.7%) with at least one of the HIV risk factors was greater than RC respondents (4.1%) [Figure 11].

Table 10: <i>HIV / AIDS (<65 yrs. of age)</i>	% Poor		Odds Ratio	95% CI
	CC	RC		
Health care professional discussed preventing STDs through condom use	27.34	9.79	3.47	(2.33, 5.16)
Have been tested for HIV one or more times in past year.	56.05	29.03	3.12	(2.03, 4.79)
One of the HIV risk factor situations applied to the person	9.73	4.07	2.54	(1.40, 4.60)
Unaware of medical treatments to help HIV infected person live longer	6.45	3.02	2.22	(1.09, 4.51)
Have been tested for HIV (not including part of blood donation)	61.07	42.77	2.10	(1.55, 2.84)
Tested for HIV because of risky behavior (i.e. drugs) or was suggested	37.82	23.04	2.03	(1.29, 3.19)

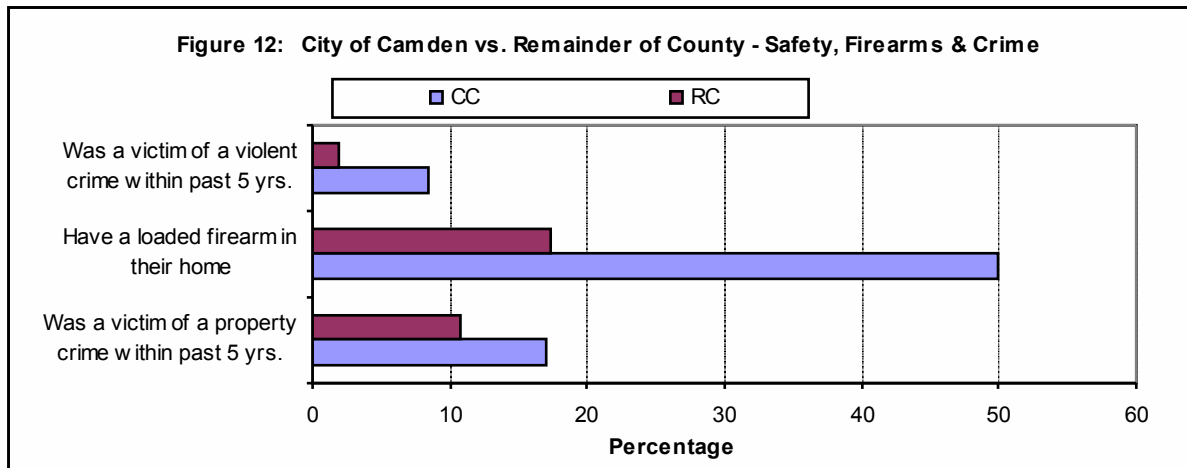
CI = Confidence Interval (chi-square 2-sided significance $p \leq 0.05$)

Individuals who responded that the main reason for their last HIV test was because someone suggested they should be tested; thought they may have gotten HIV through sex or drug use; just wanted to find out if they had HIV; or were worried that they could give HIV to someone were categorized as POOR. Responses that were categorized as ADEQUATE included: person was female and pregnant; was part of a routine medical check-up; or tested for some other reason. There was a significant difference between CC vs. RC for this factor, with 37.8% CC respondents vs. 23% RC respondents' reason for their last HIV test categorized as POOR. The estimated odds of the main reason for a respondents last HIV test being categorized as POOR was higher for CC residents than RC residents (OR = 2.03, 95% CI = 1.29, 3.19).



Safety - Firearms and Crime

There was no significant difference between CC and RC variable regarding firearm being kept in or around the home. Of those respondents who responded in the affirmative to having a firearm in the home, there was a significant difference in the number of firearms that were currently loaded. CC respondents were more likely to report having loaded firearms (50%) vs. RC respondents (17.3%) [Figure 12]. The estimated odds of reporting having been a victim of a violent crime within the past 5-years was higher for CC respondents (OR = 4.98, 95% CI = 2.61, 9.51).



CC respondents were 1.71 times more likely to report having been a victim of a property crime within the past 5 years than RC respondents [Table 11]. A greater percentage of CC respondents were categorized as POOR concerning the factor of being a victim of property crime, 17.07% CC as compared to 10.73% RC.

	% Poor		Odds Ratio	95% CI
	CC	RC		
Was a victim of a property crime within past 5 yrs.	17.07	10.73	1.71	(1.19, 2.47)
Have a loaded firearm in their home	50	17.33	4.77	(1.79, 12.71)
Was a victim of a violent crime within past 5 yrs.	8.51	1.83	4.98	(2.61, 9.51)

CI = Confidence Interval (chi-square 2-sided significance $p \leq 0.05$)

DISCUSSION

This project attempts to identify the factors that are associated with the differences in self-reported health and behavioral risk between residents of the City of Camden (CC) and residents of the remainder of Camden County (RC). A secondary analysis of the BRFSS data was conducted using SPSS software to compare the responses of CC residents to RC residents. BRFSS responses were recoded and dichotomized as either POOR or ADEQUATE in terms of self-reported health or risk factors, creating a 2 x 2 table for each BRFSS question. This secondary analysis provides an initial step in the process of assessing a community’s health needs.

The results of the secondary analysis indicate that there are significant differences between the residential variable (City of Camden vs. Remainder of Camden County) and Healthy People 2010 leading health indicators: access to health care, substance use (alcohol and tobacco), responsible sexual behavior (HIV/AIDS), mental and physical health, violence, and demographic barriers (finances, language differences, cultural differences, education, etc.). Findings suggest that demographics are major factors associated with the differences in self-reported health between CC and RC. As stated in Healthy People 2010, income and education are significant influences affecting the health of individuals and their communities.^[8] Based on the analysis of proportions (odds ratio) measuring the strength of the relationship between CC and RC, five of the top twenty factors were relevant to income and education. Most notable was income. The estimated odds of having an annual household income less than \$35,000 were higher for CC respondents than RC respondents. This result is consistent with the 2000 census data ranking the City of Camden as the poorest municipality in the State of NJ with a per capita income of \$9,815 and 35.5% of the City's residents with income below the federal poverty level.^[4] The odds of having less than a high school diploma were also higher for CC (OR = 3.38, 95% CI = 2.40, 4.78). The poor educational status of CC is a contributing factor to the poor employment status of CC respondents. CC respondents were 2.54 times more likely to report being out of work or being unable to work than RC respondents. CC respondents were also more likely to report having gone without food to pay their bills (OR = 3.33, 95% CI = 2.30, 4.81) and not see a doctor when necessary due to cost (OR = 2.13, 95% CI = 1.52, 2.97).

A couple of factors relevant to health care access indicator were in the top 20 results for the analysis of proportions that measure the strength of association between the residential variable and the health factor. CC respondents were more likely than RC respondents to be categorized as POOR in terms of transportation defined as not having their own car and relying on either public transportation or someone else (OR = 5.75, 95% CI = 4.16, 7.93). However, of those individuals who did not have their own means of transportation, CC respondents were more likely than RC respondents to think that public transportation was accessible. The odds of not having some form of health care coverage/insurance were higher for CC. Of those individuals reporting health care coverage, findings indicate that association for CC respondents was protective with Medicaid coverage (OR = 0.35, 95% CI = 0.23, 0.55). Having Medicaid coverage is beneficial providing that there are health care providers (physicians, pharmacies, specialists, etc.) willing to enroll as Medicaid providers and accept the fiscal reimbursement.

Being a victim of a violent crime and loaded firearms, factors related to violence, ranked second and third in the top 20 proportional analyses for odds ratio. CC respondents were 4.98 times more likely to have been a victim of a violent crime within the past five years than RC respondents. Of the 9.2% individuals that reported keeping a firearm in or around their home, the estimated odds for CC respondents having loaded firearms was greater than RC respondents. Drinking water within the home was a factor that had a significant association with the residential variable. CC respondents reported a greater percentage of their home drinking water coming from a source other than filtered/unfiltered tap water than RC respondents, 66% vs. 32% respectively. CC residents were 4.14 times more likely to respond that drinking water in the home was categorized as POOR compared with RC residents. This finding is consistent with the City of Camden Community Health Assessment Focus Group Project conducted in the Spring/Summer 2005¹⁸. Other findings suggest that there are significant differences between the residential variable and health indicators regarding responsible sexual behavior; HIV/AIDS. CC

residents were more likely to be rated POOR compared with RC residents regarding HIV testing and HIV risk factors. CC respondents were more likely than RC respondents to have a health care professional counsel them on methods to prevent sexually transmitted diseases; condom use. Additional health and risk factors that were strongly associated with the CC residential status include: prostate cancer screening (digital rectal exam and PSA test); blood cholesterol test; oral hygiene (teeth cleaning); and the amount of alcoholic drinks consumed by individuals that responded positively to having a drink within the prior week/month. Although oral hygiene was one of the top 20 factors in the proportional analyses, CC respondents were worse off in terms of all aspects of oral health care compared with RC respondents.

Limitations of this research include the errors inherent in a survey study design. The data collected in a BRFSS is reliant on self-reporting from the person answering the telephone. To minimize data collection errors, there is a BRFSS operational and users guide that surveyors are required to follow. Training and supervision of the interviewer are important to minimize common sources of data collection errors. Common types of data collection errors that could have occurred with the Camden County BRFSS could result from the design of the questionnaire, interviewer, respondent, or data entry error. Questionnaire errors include the wording of the question, question order (respondents answer same question differently depending on location in the questionnaire), precision of the coding of the responses, and the length of the interview. Interview errors include: lack of training and experience that results in misleading the respondent on unclear questions, misinterpreting respondent's answer resulting in a coding error, sampling error – not surveying the head of the household, incorrectly asking a question, failing to follow survey instructions. Respondent errors include: refusing to answer a question or not answering truthfully and recall error. The Camden County BRFSS data was already coded and weighted and provided in SPSS, a statistical software package, for this secondary analysis. Various questions in the BRFSS contained respondent limitations based on age, gender or eligibility to respond (must have responded to previous question in the series positively). However, the coding of the data did not accurately capture the number missing responses. The response and missing data values are based on sample size 1,126 throughout instead of the number of eligible respondents within the sample size per question. For example, if a respondent was male, the interviewer was to skip the women's health section and ask these questions of only females within the sample (n = 699 females). This coding error affects the data when reporting the percentage of individuals responding to a question as evident by 694 females responding to a women's health question being a 61.6% response rate with a 38.4% missing data rate (n = 432 instead of n = 5 missing females).

To minimize potential survey design errors, Camden County Department of Health and Human Services hired a consultant firm, Holleran, which is experienced in community health research and strategic planning to conduct the BRFSS study among its adult community using the CDC BRFSS tool. Holleran followed the guidelines for survey research quality established by the Council of American Survey Research Organizations and the CDC BRFSS operational guidelines.

The U.S. Census Bureau reports that 34.6% of Camden City's population consists of individuals less than 18-years of age. The BRFSS study targets individuals 18-years of age and older. Given that the City of Camden has a significantly larger youth population; it is recommended that a future assessment include the Youth Risk Behavioral Surveillance System

(YRBSS). The YRBSS monitors categories of priority health-risk behaviors among youth and young adults similar to the BRFSS. A secondary analysis could then be conducted comparing the youth of Camden City to the neighboring communities within the county.

Despite the potential limitations in a survey study design, BRFSS data is used on a national and local level to identify emerging health problems, establish and track health objectives; develop, implement, and evaluate disease prevention activities; and support health-related legislative efforts. The findings from both the Camden County BRFSS study and this secondary analysis can assist policymakers or stakeholders in identifying health issues, designing public health intervention strategies, and evaluating their impact within the City of Camden.

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APPENDICES

- **Appendix A:** BRFSS 2005 Behavioral Risk Factor Surveillance System Questionnaire – Camden County, New Jersey.
- **Appendix B:** ‘N’ Respondents by Municipalities
- **Appendix C:** BRFSS Analysis – All Questions
- **Appendix D:** Data Results exceeding minimum expected frequency (>20%) and statistical significance $p > 0.05$
- **Appendix E:** Analysis of Proportions (OR, CI, ‘Incidence’ per 100, and RR) [note – requires re-formatting to letter size paper, will complete and forward]
- **Appendix F:** Secondary Analysis BRFSS Categories
- **Appendix G:** Handout – Comparison Camden City vs. Remainder of Camden County Table
- **Appendix H:** Statistical significant data summary grouped by category
- **Appendix I:** Percentages and Graphs
- **Appendix J:** Dichotomized Questions (POOR; ADEQUATE)