SUMMIT COUNTY BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM SURVEY, 2008

SUMMIT COUNTY HEALTH DISTRICT

OFFICE OF EPIDEMIOLOGY AND BIOSTATISTICS

JANUARY, 2011

Table of Contents

Introduction

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based system of health surveys that collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. According to the Ohio Department of Health, the purpose of the Ohio BRFSS is to "…monitor the behaviors associated with the major causes of preventable morbidity and mortality in adult Ohio, e.g. heart disease, cancer, diabetes, and injuries. Data resulting from the survey are available to state and local level decision-makers. BRFSS information can serve as an aid in determining the focus of health promotion/risk reduction initiatives for Ohioans. BRFSS prevalence data should be used for planning purposes in combination with other measures such as mortality, morbidity, economic costs, preventability, potential years of life lost, resource availability, and effectiveness of interventions."

During 2008, the Ohio Department of Health conducted the BRFSS in all of the state's 88 counties. In Summit County, a coalition of partners joined forces to piggyback on the state survey, purchasing a large number of additional interviews. The purpose of these additional interviews was to increase the statistical reliability of the results for Summit County. This increased precision allows for a more detailed study of different subgroups in the population, and of much smaller geographic areas than the state survey alone would have made possible (please refer to the Methodology section at the end of the report for details about sample size and other important statistical information).

Summit County Behavioral Risk Factor Surveillance Survey Community Partners:

We would like to thank our community partners for making the investment in this critically important research project:

Akron General Medical Center

The Akron Health Department's Office on Minority Health

The Akron Health Department / Summit County Health Department Child and Family Health Services Grant

The Summit 2010 project

Summa Health Systems

Executive Summary

If there is one finding from the BRFSS which stands out from the others, it is the impact of socioeconomic status on people's health. In nearly every subject area studied in the survey, statistically significant differences were found between those with higher levels of education and/or higher incomes and those with lower levels of education and/or lower incomes. The pattern seen in these findings is very difficult to ignore (see "Summary of Findings by Subject Area" below).

These findings are consistent with an already-robust and growing body of research which links socioeconomic status and health outcomes nationwide. As Dr. Dennis Raphael, an internationally-recognized expert on social determinants of health, points out in a 2006 article entitled, *Social Determinants of Health: Present Status, Unanswered Questions, and Future Directions*, "Behavioral factors were weak predictors of health status as compared with sociodemographic measures. While obesity rate predicted 1 percent of unique variation and smoking rate 8 percent of unique variation among communities in life expectancy, sociodemographic factors predicted 56 percent of variation in life expectancy. Concerning self-reports of fair or poor health, obesity predicted 10 percent and smoking rate predicted 4 percent of variation among communities. But sociodemographic factors predicted 25 percent of differences among communities."

Viewed in the light of the growing body of knowledge about social determinants of health, the findings in this report related to the impact of income and education on health make it clear that poor health is far more than an individual person's problem. It is certainly true that an individual's ability to avoid obvious behavioral risk factors such as smoking, weight gain, and lack of exercise does have a direct impact on their own health. However, it is equally true that factors out of the direct control of individual people (like employment opportunities, income potential, and educational opportunities) also play a critical part. As the discussion guide to the documentary series, *Unnatural Causes*, states, "People who are middle to lower on the class pyramid are exposed to more health threats (material deprivation to chronic stressors) and have less access to the opportunities and resources needed to control their destinies. People middle to higher on the class pyramid have access to more power and resources and in general live longer, healthier lives. This is true not only for the bottom and top but at every level."

The discussion above suggests an active role for the community in improving the health of people at every socioeconomic level. By working to improve the quality of life of all members of the Summit County community, we can not only improve our socioeconomic status, but our health as well. Fortunately, the county's *Summit 2010: A Quality of Life Project*, is continuing its eight-year effort to improve the health status, income, educational attainment, and overall quality of life of all Summit County citizens. Hopefully, the community can use the findings of this report to make the point that everyone can have an impact, not just on their own health and wellbeing, but on the health and wellbeing of all our citizens as well.

Methodology – Data from the 2008 Ohio BRFSS was used to compare health risk factors for different subpopulations. The analysis was performed at both the state and county level. The sample size for state-wide data analysis was larger (n=12,962) compared to the county (n=2,080), and therefore has a greater ability to detect differences between groups. Statistical comparisons were made between demographic groups and different years using the t-test, at 5% significance level. Logistic regression was used in several analyses to adjust for different factors. Statistical comparison between the state and county was not considered as the county level data was a subset of the state sample.

To facilitate geographic analysis, the county was divided up into 4 broad areas composed of several Summit 2010 Quality of Life Project's 20 census tract clusters, West Akron, East Akron, North Suburbs, and South Suburbs. Appendix B contains a map showing which parts of the county fall into each of the four areas. Geographic comparisons are included in those tables where statistically significant differences between geographic areas could be found.

Summary of Findings by Subject Area:

- **Obesity** – About one-quarter of Summit County residents were obese in 2008. Obesity affects African-Americans and low income groups disproportionately. The estimates of obesity rates were lower for the county than the rate for the state, but remain very high compared to national standards.
- **Tobacco Use** – About one-fifth of Summit County residents were smokers in 2008. Smokers are more likely to be without a high school diploma, unmarried, have incomes below $25,000 per year, and be African-American.
- **Binge and Heavy Drinking** – About one in six Summit County residents engaged in binge drinking, while nearly 5% engaged in heavy drinking. Binge drinking was more prevalent among men, whites and residents with higher income, and tended to decrease with age. Heavy drinking was also higher among men and whites and also decreased with age. Rates of heavy drinking were lower for college graduates.
- **Diabetes** – About one-tenth of Summit County residents had diabetes in 2008. Rates of diabetes were higher among African-Americans than others. The prevalence of diabetes tended to be lower among those with college educations and who had higher incomes than others.
- **Asthma** – About one-tenth of Summit County residents had asthma in 2008. Asthma occurred disproportionately among women and African-Americans. Asthma prevalence tended to decline as income rose, and was highest among those who earned less than $25,000 per year.
- **Disability** – About one-in-five Summit County residents suffered from some form of disability in 2008. Disability tended to occur more frequently among females than males, and were lower for those with higher income and educational attainment. Disabilities also tend to increase with age.
- **Oral Health** – About three quarters of Summit County residents say they visited a dentist within the past year in 2008. Visits to a dentist were highest among those with college educations and with incomes over $50,000. The percentage of those who

visited a dentist within the past year were also higher among those who were married than those who were not.

- **Health Care Access / Coverage** – About 85% of adults (age 18-64) in Summit County say they had health coverage in 2008. As with several other risk factors discussed earlier, rates of health coverage were higher among those with higher income and education than others.
- **Coronary Heart Disease (CHD) / Heart Attack** – About 5% of Summit County residents had coronary heart disease in 2008, while just under 4% suffered a heart attack. Age-adjusted rates of CHD tended to be lower for those with college educations and those with higher incomes than others. Men were significantly more likely to suffer from a heart attack than women.
- **Influenza and Pneumonia Vaccination Coverage** – About three-quarters of Summit County residents say they received influenza and pneumonia vaccinations in 2008. Whites and women tended to receive influenza vaccinations more frequently than African-Americans or men. Influenza vaccination rates tended to rise with age, with those 65 or older being the most likely to say they were vaccinated. Pneumonia vaccinations were higher among women than men, and among those who were unmarried.
- **Physical Activity** – About one-in-five Summit County residents suffered from some form of disability in 2008. Physical activity tended to be higher among whites and males, and also among those who were younger. As with other factors, higher incomes and educations tended to be more physically active than others.
- **Women's Health** – About three-quarters of women in Summit County say they had a mammogram sometime during the past two years. Factors making women more likely to get a mammogram include having a personal doctor, health coverage, marital status and education. Nearly eight-in-ten women had a pap test with the past three years. Younger women (age 18-44) were more likely than older women to have had a pap test, as were married women. Higher levels of education and income also made having a pap test more likely.
- **Men's Health** – Nearly two-thirds of men over age 40 in Summit County say they had a Prostate-Specific Antigen (PSA) test sometime during the past two years. Factors making men more likely to get a PSA include being older and being married.
- **Colorectal Cancer Screening** – Nearly two-thirds of residents in Summit County say they had either a sigmoidoscopy or colonoscopy sometime in their lives. Older residents were more likely than younger residents to say they've had colorectal cancer screening, and both higher levels of education and income were also more likely to say they've had a screening. Those who are married were also more likely to have received a screening.
- **HIV Testing** – Nearly one-third of Summit County residents say they've been tested for HIV. The percentage of people having had a test were higher among African-Americans, women, and those age 18-44. Higher income persons and those with a high school diploma or college degree were less likely to have had an HIV test than others.
- **Seat Belt Usage / Drinking While Driving** – About eight-in-ten residents of Summit County say they always wear a seat belt. Factors making people more likely to wear a seat belt include women and white residents, as well as those with higher levels of

education and income. Nearly five percent of Summit County residents said that during the past 30 days they drove home at least once when they've had too much to drink. Women, older residents, and married residents were all significantly less likely to say they have driven drunk than others.

- **Health Status** – Nearly 14% of Summit County residents say they are in fair or poor health. African-Americans were more likely than others to say they are in fair or poor health. The percentage of those in fair or poor health also tends to rise as age rises, and to be higher for married people than unmarried ones. Percentages of those in fair or poor health tend to fall as educational attainment and income rises, and is higher for those who report dissatisfaction with life than others. A detailed regression analysis concluded that the most important factors associated with reducing the likelihood of fair or poor health include having higher income, being employed, and having a college education.

BRFSS Overview[1]

The BRFSS was established in 1984 by the Centers for Disease Control and Prevention (CDC); currently data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. The state of Ohio has used BRFSS since 1984. More than 350,000 adults are interviewed each year, making the BRFSS the largest telephone health survey in the world. States use BRFSS data to identify emerging health problems, establish and track health objectives, and develop and evaluate public health policies and programs. Many states also use BRFSS data to support health-related legislative efforts.

Measuring Health Risks Amongst Adults

For more than 20 years, CDC's Behavioral Risk Factor Surveillance System (BRFSS) has helped states survey U.S. adults in order to gather information about a wide range of behaviors that affect their health. The primary focus of these surveys has been on behaviors and conditions that are linked with the leading causes of death such as heart disease, cancer, stroke, diabetes, and injury—and other important health issues. Examples of these behaviors and conditions include

- Not getting enough physical activity.
- Being overweight.
- Not using seat belts.
- Using tobacco and alcohol.
- Not getting preventive medical care, such as flu shots, mammograms, Pap smears, and colorectal cancer screening tests.

Through the BRFSS surveys, state health departments, CDC, and other federal agencies have learned much about these and other harmful behaviors and conditions. This information is essential for planning, conducting, and evaluating public health programs at state, local, and national levels.

Future Directions

States and local areas will continue to rely on the BRFSS to gather the high-quality data they need to plan and evaluate public health programs and to allocate scarce resources. CDC will work closely with state and federal partners to ensure that the BRFSS continues to provide data that are useful for public health research and practice and for state and local health policy decisions.

---

[1] The primary source for this information is the BRFSS website: http://www.cdc.gov/BRFSS

In 2009, 45 states began using the pandemic influenza module. Monitoring the availability of influenza vaccination coverage is a critical element of CDC's response to a pandemic influenza outbreak. In the event of a pandemic flu outbreak, BRFSS will be prepared to provide local, state, and federal public health officials with vital information to help guide decision making and planning.

As telecommunication technology evolves, CDC is implementing the use of multimode data collection for BRFSS. CDC is also working to make the BRFSS more representative, by exploring new ways to reach hard-to-find populations. The challenge for BRFSS is to effectively manage an increasingly complex surveillance system, while adapting to changes in communications technology (increased use of cellular telephones and call-screening devices), societal behaviors (concerns about privacy and declining participation in surveys), and population diversity (increasing number of languages spoken in the United States and greater cultural and ethnic diversity). To address these challenges, BRFSS plans to:

Design and conduct innovative pilot studies to advance the current BRFSS methodology and is preparing to incorporate future methodologies, such as cell phone and mail surveys.

Identify and address potential threats to the validity and reliability of BRFSS data that might affect survey participations and data quality.

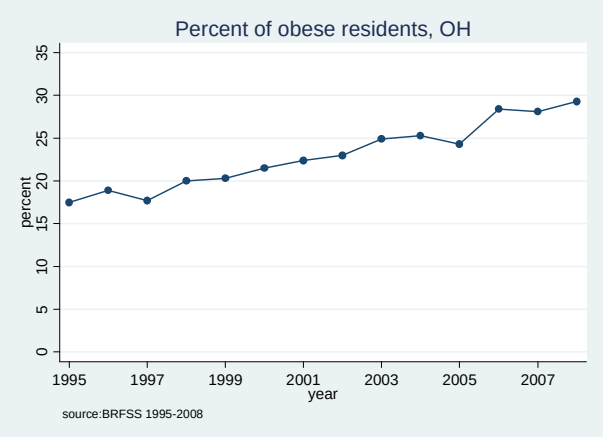
Expand the use of the system through special projects, such as rapid response surveillance efforts, and follow-up surveys of subpopulations identified by the BRFSS, such as people with asthma.

1. Obesity

Obesity is associated with increased health-care costs, reduced quality of life, and increased risk for premature death. Common morbidities associated with obesity include coronary heart disease, hypertension and stroke, type 2 diabetes, and certain types of cancer.

The prevalence of obesity in the United States has more than doubled in the past three decades. Similarly the rates have been increasing for the last 14 years in Ohio. Figure 1 illustrates this trend and the estimates with the corresponding 95% confidence intervals (CI) are presented in Table 1 at the end of this section:

Figure 1:



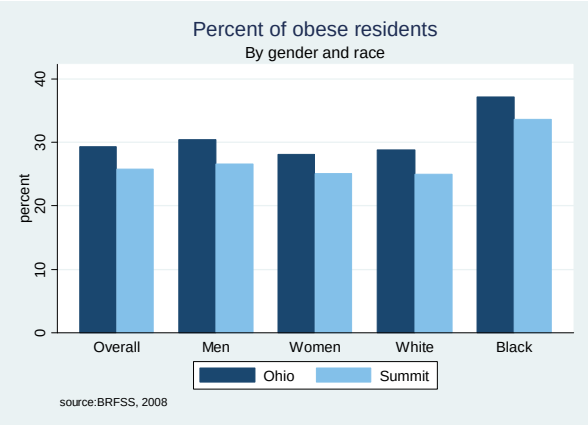
Clearly, the *Healthy People 2010* objective to reduce the prevalence of obesity among U.S. adults to 15% will not be met.

Gender and Race – Obesity was defined as having Body Mass Index (BMI) of 30 or larger[2]. The formula for BMI can be found at the bottom of this section. The overall rates for the state and the county were 29.25% and 25.8% (please refer to Figure 2).

There were no significant differences between obesity rates for males and females. The obesity rate for whites was 8.3% lower than for African-Americans in the state and 8.7% in the county.

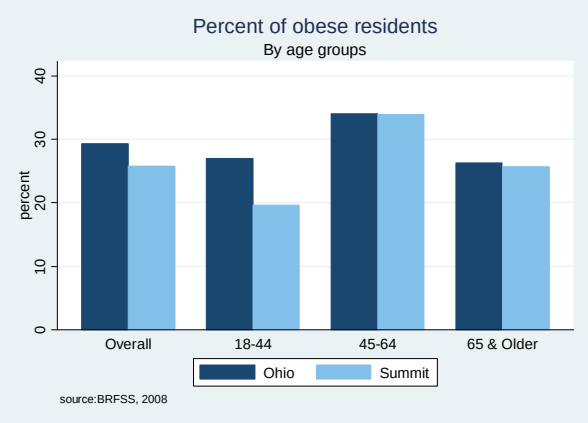
[2] In the BRFSS, obesity is calculated using Body Mass Index, or BMI. The BMI formula used is as follows: BMI ={(Weight in Pounds) x 703} / {(Height in inches) x (Height in inches)}

Figure 2:



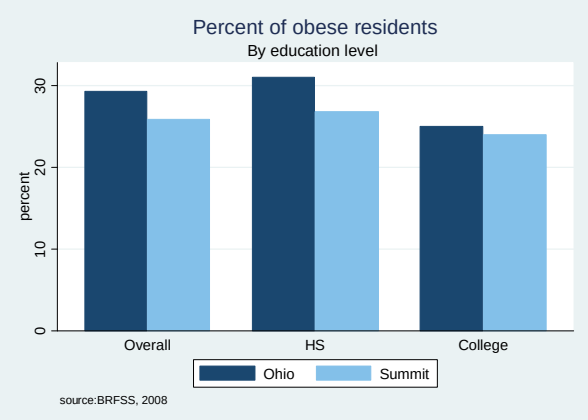
Age – As Figure 3 shows, the highest prevalence of obesity was in the 45-64 year age group in both the county and the state.

Figure 3:



Educational Attainment – The prevalence of obesity at the state level was significantly lower for residents with college degrees; there was a drop of 8.1% between the groups with lowest and highest educational attainment in the state. Since the estimates of obesity rates for residents of the county without high school diplomas were unreliable because of small sample sizes, this category was not included in Figure 4, below.

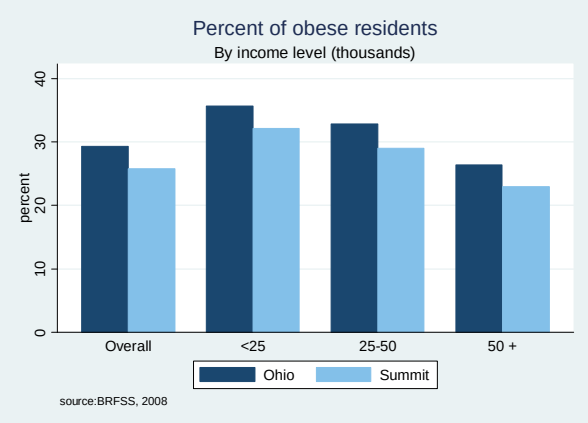
Figure 4:



Income – As shown in Figure 5, in both the state and the county, the likelihood of obesity decreases with higher income.

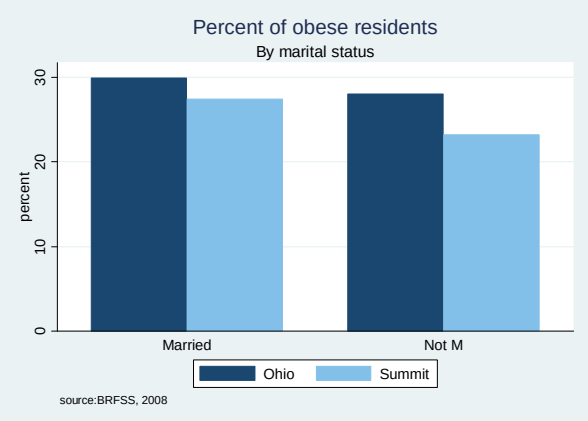
There were significant differences of 6.4% for Ohio and 6% for Summit between the obesity rates in the most affluent group and the middle income group.

Figure 5:



Marital status – Rates of obesity were lower for unmarried residents by 1.9% in Ohio and 4.2% in Summit. In both groups the county had lower rates than the state.

Figure 6:



All other factors being equal, the greatest difference in obesity rates was observed between the lowest and highest income groups, followed by the differences between the groups with lowest and highest education.

Summary:

The prevalence of obesity has been increasing for the last three decades. It was approaching 30% for the state. It affects African-Americans and low income groups disproportionately. The estimates of obesity rates were lower for the county than the rate for the state, but remain very high compared to national standards.

Table 1: Estimated Obesity Rates[3]

Ohio		
Year:	Rate (%)	95% CI
1995	17.5	(15.1-19.9)
1996	18.9	(16.4-21.4)
1997	17.7	(15.9-19.5)
1998	20	(17.9-22.1)
1999	20.3	(18.0-22.6)
2000	21.5	(19.5-23.5)
2001	22.4	(20.6-24.2)
2002	23	(21.4-24.6)
2003	24.9	(23.2-26.6)
2004	25.3	(23.2-27.4)
2005	24.3	(22.7-25.9)
2006	28.4	(26.0-30.8)
2007	28.1	(26.9-29.3)
2008	29.3	(28.0-30.5)

Table 2: Obesity[4]

Obesity		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	25.8	23.3 28.29	29.25	28.02 30.48
SEX	Men	26.61	22.76 30.46	30.45	28.5 32.41
	Women	25.03	21.82 28.23	28.08	26.57 29.59
RACE	White	24.96	22.43 27.49	28.81	27.51 30.12
	Black	33.67	22.49 44.85	37.13	32.48 41.78
	Other	*		25.23	18.98 31.47
SEX BY RACE	white ,male	26.78	22.76 30.8	30.5	28.43 32.57
	black ,male	27.58	13.73 41.43	33.89	25.83 41.94
	white ,female	23.21	20.11 26.32	27.14	25.53 28.75
	black ,female	38.83	20.64 57.02	39.57	34.09 45.05
AGE GROUP	18-44	19.63	15.63 23.62	26.96	24.8 29.11
	45-64	33.96	30.04 37.88	34.07	32.32 35.82

[3] In this and all subsequent tables, columns named "95% CI" are included. Because the data presented here are estimates, they have margins of error that should be taken into account. The two figures included in the "95% CI" columns represent that margin of error below and above the figure cited in the "Estimate" column. What this means is that, when relying on BRFSS data, we can be 95 percent confident that if all persons in the population were surveyed, the responses would fall within the identified margins of error. This concept is called the 95 percent confidence interval, or 95% CI. An asterisk (*) in a table means that the sample size for that particular variable was too small to generate a reliable estimate.

[4] Pregnant women and respondents reporting a weight ≥500 pounds or a height ≥7 feet were excluded as outliers.

	65 & Older	25.67	21.93	29.41	26.31	24.56 28.06
EDUCATION LEVEL	<High School	28.63	18.09	39.17	33.12	28.16 38.07
	HS / Some College	26.77	23.31	30.23	31.01	29.36 32.65
	4+ Yrs. College	24.00	20.17	27.84	24.99	23.05 26.94
ANNUAL INCOME	<$25,000	32.16	26.58	37.73	35.67	32.86 38.48
	$25,000-$49,999	28.95	23.62	34.28	32.78	30.24 35.32
	$50,000 or More	22.98	19.51	26.45	26.39	24.58 28.2
MARITAL STATUS	Married/Couple	27.38	24.21	30.55	29.92	28.44 31.39
	Not Married/Couple	23.18	19.24	27.12	28.04	25.84 30.25
GEOGRAPHY	West Akron	30.76	23.57	37.95		
	East Akron	32.59	26.02	39.17		
	North Suburbs	22.02	18.43	25.61		
	South Suburbs	28.6	23.66	33.54		

* Sample size was not large enough to obtain a reliable estimate.

2. Tobacco Use: Adults who are current smokers

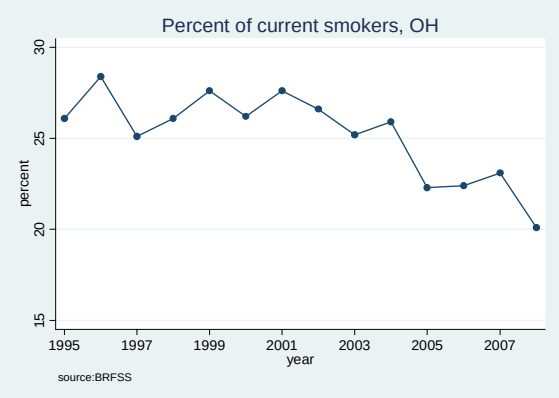
Smoking is the most important single preventable cause of death in the United States. It is a major risk factor for several diseases, including heart and cerebrovascular diseases, chronic bronchitis and cancer. In addition, secondhand smoke causes long-term adverse health effects in nonsmoking adults and children.

There has been a strong effort at national and state level for the reduction of smoking. One of the objectives for Healthy People 2010 was to achieve a prevalence of cigarette smoking among adults to <12% (objective 27-1a).

In line with the importance of this goal, one of the questions in the BRFSS was whether the participants were current smokers. Currently, median prevalence of current smoking for the 50 states and the District of Columbia is 18.4%. The national mean prevalence of 20.6% for current smoking among adults aged ≥18 years was calculated from the 2008 National Health Interview Survey (NHIS). The preference to use NHIS for the national level was that the focus of BRFSS was on state-level estimates - each state draws its own independent sample to produce a state-level estimate.

The percentages of current smokers have consistently decreased in the last decade in Ohio and in the nation. Figure 7, below, provides a comparison for the estimates for each year in Ohio. The drop of the percentage of current smokers from 1995 to 2008 was statistically significant ($p<0.005$). The percentages for each year are presented in Table 3.

Figure 7:



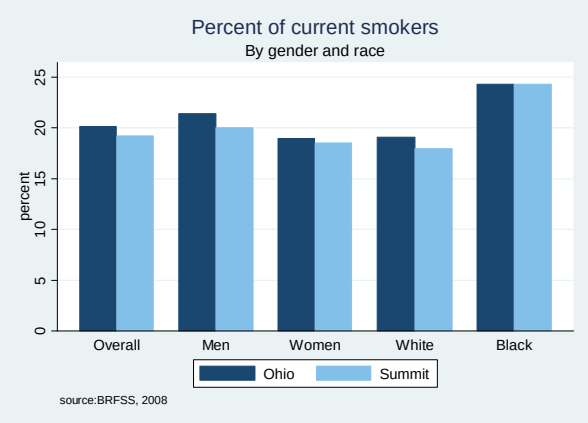
Next, we compare the rates for Ohio and Summit County. The complete results are presented in Figure 8.

Gender and Race – Among males, current smokers were 21.39% which was significantly larger than the 18.97% among women in Ohio. A less pronounced difference was also observed in Summit County.

The percentage of smokers was significantly higher among African-Americans, varying from approximately 5% in OH and 6% in Summit. The highest proportion of smokers was for male

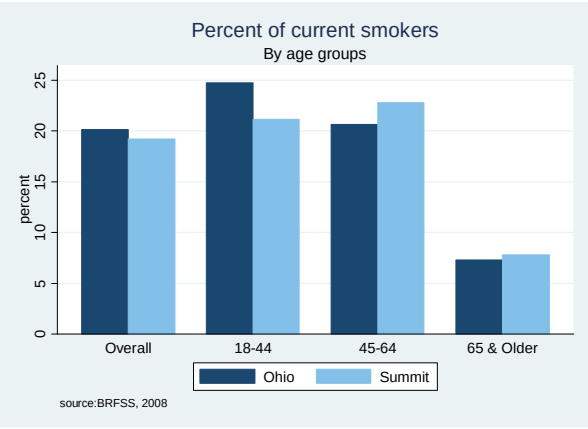
African-Americans in Summit- close to 30%. However, the CI was very wide, suggesting that this estimate was unreliable. The corresponding rate in OH was 26.33%.

Figure 8:



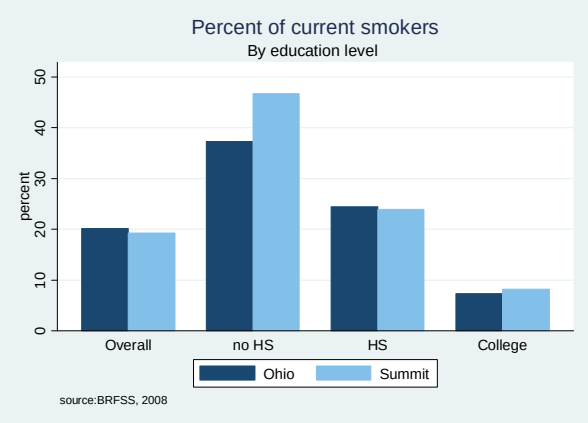
Age – The proportion of smokers decreased with age in OH, dropping to 7.31% for the age group 65 and older. The differences among age groups were statistically significant for OH. The estimates for Summit provided similar comparison for the elderly residents group, but were highest for the age group 45-64. The difference among age groups was not significant for Summit.

Figure 9:



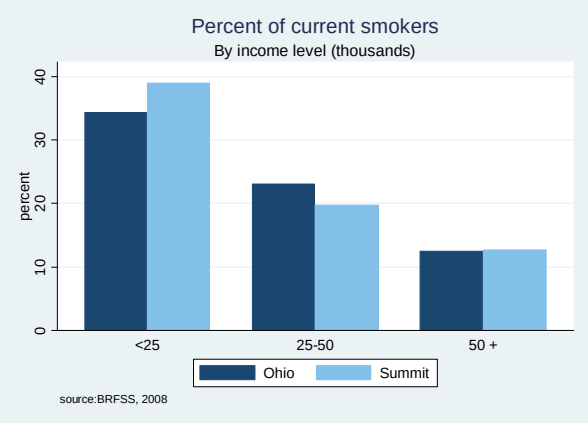
Educational Attainment – Variations in smoking prevalence were observed by education level. Smoking prevalence was highest among adults who had not graduated from High School (37.21% in OH) and was lowest among adults with a college degree (7.28% in OH). The same trend was observed in Summit, with even higher rate (46.66% for Summit) among the residents without High School diploma (see Figure 10).

Figure 10:



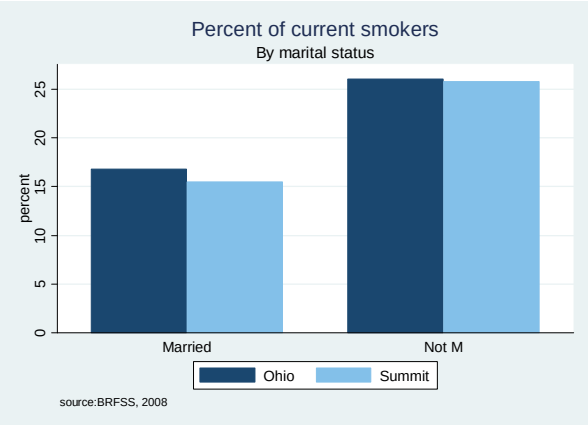
Income – As Figure 11 shows, the prevalence of smoking among different income levels showed trends similar to those for education levels. This was not surprising, since income and education were generally closely related.

Figure 11:



Marital status – The percentage of smokers was lower in married residents (including those living as couples). This was partially due to the fact that married residents were on average older. Another reason could be that family members reinforce healthy habits (see Figure 12).

Figure 12:



Summary:

There was an overall trend of decreasing rates of smoking over the last 13 years. Smoking continues to be a major health risk and the rates were well above the Healthy People 2010 goals of 12%. Certain groups had disproportionately higher rates of smoking. Although the proportion of smokers was very high 40 years ago, the proportion of smokers age 65 and older was found to be close to 7%.

Table 3: Current smoking

Ohio		
Year:	**Rate (%)**	**95% CI**
1995	26.1	(23.3-28.9)
1996	28.4	(25.8-31.0)
1997	25.1	(23.1-27.1)
1998	26.1	(23.8-28.4)
1999	27.6	(25.0-30.2)
2000	26.2	(24.0-28.4)
2001	27.6	(25.8-29.4)
2002	26.6	(25.0-28.2)
2003	25.2	(23.4-27.0)
2004	25.9	(23.7-28.1)
2005	22.3	(20.7-23.9)
2006	22.4	(20.1-24.7)
2007	23.1	(21.9-24.3)
2008	20.1	(19.0-21.3)

Table 4: Current Smoking

Current smoking		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	19.2	16.84 21.55	20.13	18.97 21.29
SEX	Men	19.98	16.16 23.8	21.39	19.49 23.28
	Women	18.49	15.63 21.35	18.97	17.58 20.36
RACE	White	17.91	15.53 20.29	19.09	17.88 20.3
	Black	24.31	15.04 33.58	24.27	20.1 28.45
	Other	27.97	13.32 42.63	33.67	26.27 41.06
SEX BY RACE	white ,male	18.42	14.49 22.35	20.08	18.11 22.04
	black ,male	29.55	14.62 44.48	26.33	19.13 33.52
	white ,female	17.45	14.63 20.26	18.16	16.69 19.63
	black ,female	20.1	9.5 30.69	22.81	17.81 27.81
AGE GROUP	18-44	21.13	16.84 25.43	24.75	22.6 26.91
	45-64	22.75	19.27 26.24	20.61	19.14 22.09
	65 & Older	7.82	5.53 10.11	7.31	6.37 8.25
EDUCATION LEVEL	<High School	46.66	34.81 58.5	37.21	31.78 42.64
	HS / Some College	23.86	20.33 27.4	24.37	22.77 25.97
	4+ Yrs. College	8.13	5.73 10.52	7.28	6.17 8.39
ANNUAL INCOME	<$25,000	38.98	32.79 45.18	34.32	31.51 37.13
	$25,000-$49,999	19.74	14.91 24.57	23.04	20.6 25.48
	$50,000 or More	12.67	9.82 15.52	12.51	11.04 13.97
MARITAL STATUS	Married/Couple	15.46	12.76 18.16	16.78	15.52 18.05
	Not Married/Couple	25.78	21.21 30.34	26.07	23.76 28.38
GEOGRAPHY	West Akron	14.27	9.58 18.97		
	East Akron	32.86	26.24 39.49		
	North Suburbs	10.57	7.62 13.51		
	South Suburbs	18.23	13.93 22.52		

3. Binge and Heavy Drinking

Alcohol drinking is a risk factor for numerous adverse health and social outcomes. The effects of heavy and binge ("episodic heavy drinking") drinking as well as the difficulties for overcoming it is a well recognized public health problem.

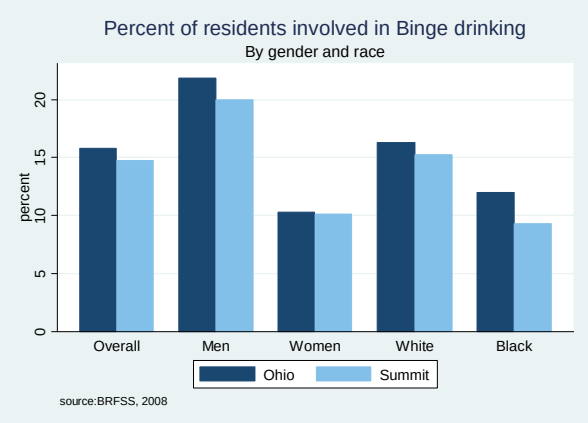
One of the *Healthy People 2010* objectives was for reducing the prevalence of binge drinking among adults from the 16.6% baseline in 1998 to 6.0% (*1*). There is a heavy stigma associated with heavy drinking and this may have created a bias since BRFSS relies on self-reported data. We focus on both heavy and binge drinking, as their burden differs for different subpopulations as well as for the fact that binge drinking was less stigmatized, and therefore should be less affected by the self-report bias. Teenage drinking cannot be address using BRFSS, since it uses data for ages 18 and older. Youth Risk Behavior Survey (YRBS) can be used for this subpopulation.

Binge Drinking

Binge drinkers were defined as males having five or more drinks on one occasion, females having four or more drinks on one occasion. The definition changed in 2005 for women (from 5 or more to 4 or more drinks) which made year-to-year comparisons difficult. The results for different demographic groups are presented in Table 6. The overall rate of 15.82 in Ohio indicated the seriousness of this risk factor.

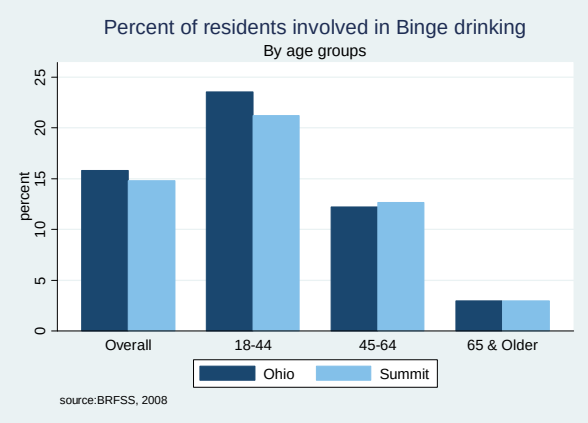
Gender and Race – Binge drinking was twice as common in males (21.87%) than in females (10.3%) in Ohio. The same ratio was observed in Summit County as well. The overall rate of 14.76% was slightly lower than in Ohio. The rates were significantly higher for Caucasians (16.30%) than for African-Americans (11.99%) in Ohio. The rates for both races were slightly lower in Summit: 15.23% for whites and 9.31% for African-Americans (see Figure 13).

Figure 13:



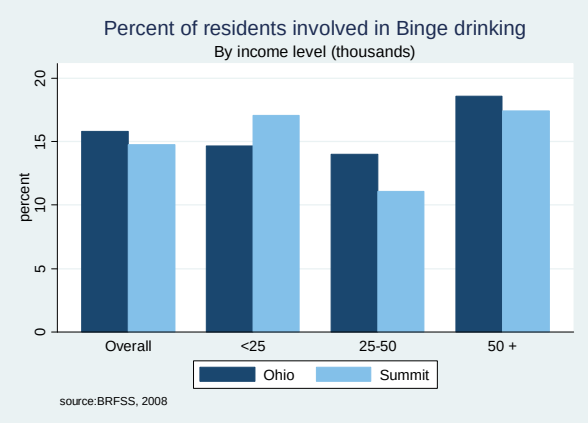
Age – As Figure 14 shows, the rates for binge drinking decrease with age, both in Ohio and Summit County. The trend appears to be linear.

Figure 14:



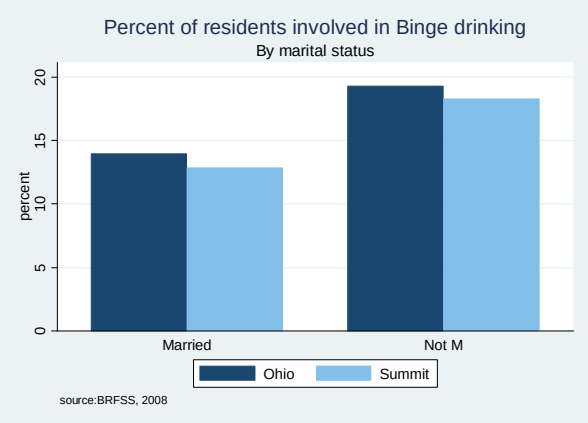
Educational attainment – The differences for the three educational levels were not significant in either the state or the county. However, the highest income group had the higher prevalence compared with the two lower income groups. Differences between the highest and middle income groups were statistically significant in both the state (4.6%) and the county (6.35%).

Figure 15:



Marital status –The prevalence of binge drinking for married residents was 5.4% less in Ohio and 5.5% in Summit.

Figure 16



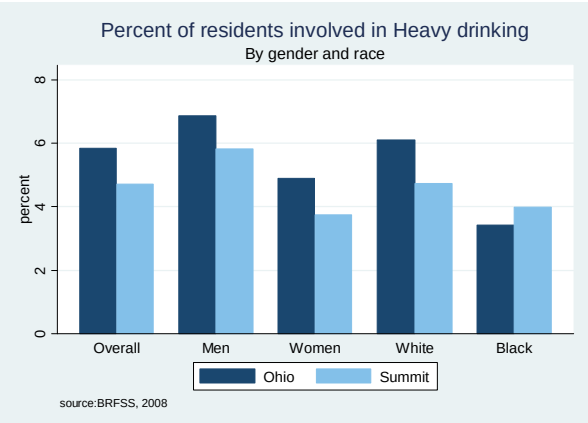
Heavy Drinking

Heavy drinkers were defined as males having more than two drinks per day, females having more than one drink per day.

The overall rate for heavy drinking was 5.84% for the state and 4.71% for the county. The rate did not change significantly from 2001 for Ohio, when it was 5.4%. The estimates with the CI for the years 2001-2008 are presented in Table 5.

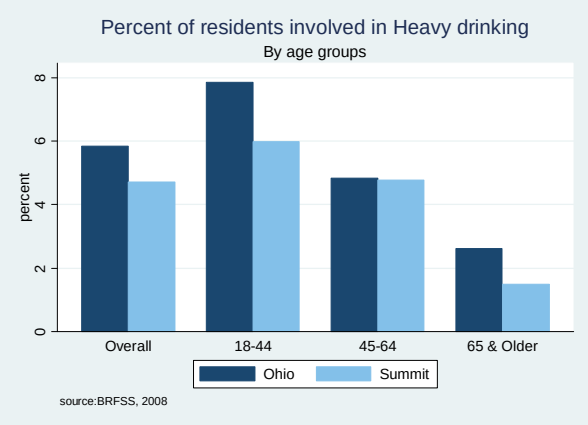
Gender and Race – Similar to binge drinking, the rates for heavy drinking were significantly higher for males (6.87%) than for females (4.89%) in Ohio, with similar difference in Summit. There was a significant difference between whites (6.10%) and African-Americans (3.42%) in the state. The difference was smaller for the county: 4.73% vs. 3.99%, due to the lower rate for whites in the county (see Figure 17).

Figure 17:



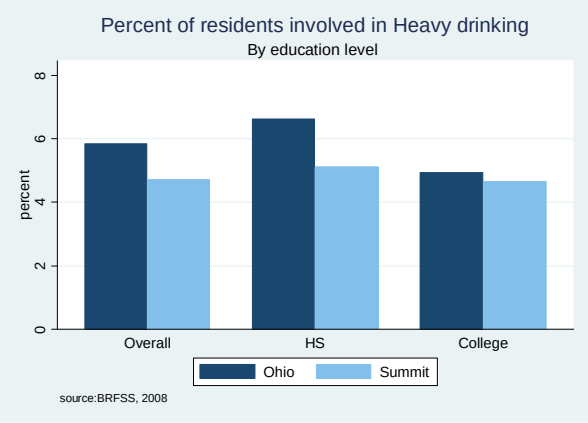
Age – As with binge drinking, the prevalence of heavy drinking decreased with age (see Figure 18). The rates for the county were lower for the youngest and the oldest groups, compared with the state.

Figure 18



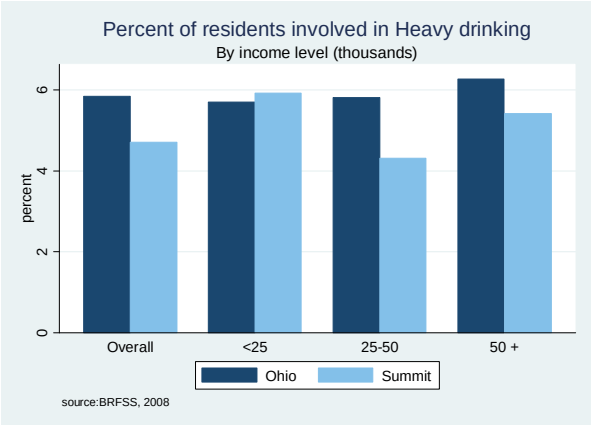
Educational Attainment – The rate of heavy drinking was the lowest in the group with college degree for the state and the county. Differences were statistically significant for the state, but not for the county.

Figure 19:



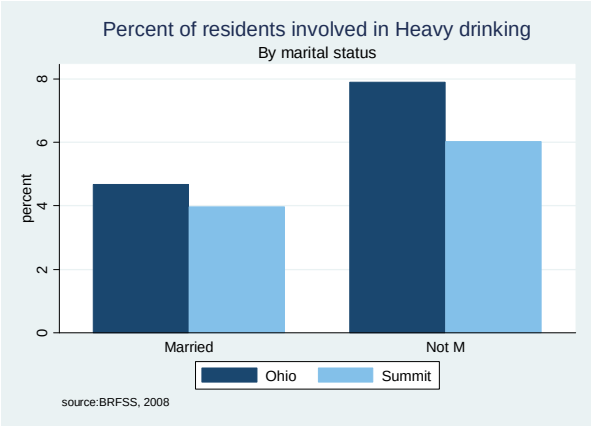
Income – Unlike binge drinking, the rate for heavy drinking in the highest earning group was not significantly larger than other groups (see Figure 20).

Figure 20:



Marital status – Married residents had 3.2% lower rate of heavy drinking compared to unmarried residents in the state, which was a significant difference (see Figure 21).

Figure 21:



Summary:

Binge drinking was more prevalent among men, whites and residents with higher income. It decreased with age. Heavy drinking was also higher among men and whites and also decreased with age. The rates were lower for college graduates. One difference between the two types of drinking might be that binge drinking occurs more often as social drinking and was less stigmatized (which in turn may have lead to biased estimates).

Table 5: Percent Heavy drinkers

Ohio		
Year	**Rate (%)**	**95% CI**
2001	5.4	(4.3-6.5)
2002	6.4	(5.4-7.4)
2003	6	(5.0-7.0)
2004	6.2	(4.8-7.6)
2005	4.8	(3.9-5.7)
2006	5.7	(4.3-7.1)
2007	5.5	(4.7-6.3)
2008	5.8	(5.1-6.6)

Table 6 Binge Drinking

Binge Drinking		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	14.76	12.53 17	15.82	14.71 16.93
SEX	Men	19.96	16.25 23.68	21.87	19.94 23.8
	Women	10.15	7.58 12.71	10.3	9.18 11.42
RACE	White	15.23	12.82 17.64	16.3	15.11 17.5
	Black	9.31	4.05 14.56	11.99	8.41 15.58
	Other	19.7	6.26 33.14	14.09	8.32 19.85
SEX BY RACE	white ,male	21.6	17.46 25.74	22.25	20.19 24.31
	black ,male	13.61	3.56 23.67	18.4	11.4 25.4
	white ,female	9.43	6.9 11.97	10.78	9.55 12
	black ,female	6.05	1.36 10.73	7.57	4.04 11.1
AGE GROUP	18-44	21.21	16.84 25.59	23.51	21.4 25.62
	45-64	12.67	9.94 15.39	12.21	10.99 13.42
	65 & Older	2.93	1.53 4.33	2.94	2.3 3.58
EDUCATION LEVEL	<High School	*	1.45 10.89	14	9.51 18.49
	HS / Some College	14.55	11.48 17.63	16.28	14.79 17.77
	4+ Yrs. College	16.47	12.83 20.11	15.48	13.75 17.2
ANNUAL INCOME	<$25,000	17.04	11.71 22.37	14.63	12.12 17.15
	$25,000-$49,999	11.07	7.48 14.67	13.99	11.89 16.08
	$50,000 or More	17.42	13.95 20.89	18.55	16.83 20.27
MARITAL STATUS	Married/Couple	12.82	10.34 15.31	13.94	12.77 15.11
	Not Married/Couple	18.28	13.93 22.64	19.3	17.01 21.58
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate.

Table 6 B: Heavy Drinking

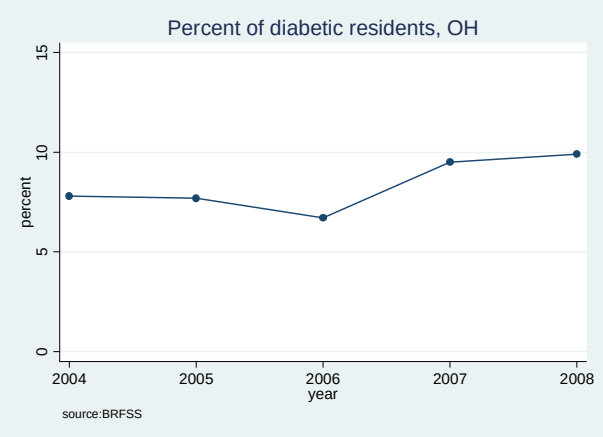
Heavy Drinking		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	4.71	3.38 6.03	5.84	5.1 6.58
SEX	Men	5.82	3.42 8.21	6.87	5.61 8.13
	Women	3.74	2.42 5.06	4.89	4.07 5.72
RACE	White	4.73	3.29 6.16	6.10	5.28 6.92
	Black	3.99	0.74 7.25	3.42	1.92 4.92
	Other	*		5.5	2.28 8.72
SEX BY RACE	white ,male	6.14	3.43 8.86	7.06	5.69 8.43
	black ,male	*		4.68	1.58 7.78
	white ,female	3.45	2.28 4.61	5.20	4.28 6.12
	black ,female	2.31	0 4.67	2.58	1.18 3.98
AGE GROUP	18-44	5.99	3.36 8.61	7.85	6.41 9.28
	45-64	4.77	3.24 6.29	4.83	4.05 5.61
	65 & Older	1.48	.51 2.46	2.61	1.99 3.23
EDUCATION LEVEL	<High School	*		3.88	1.83 5.93
	HS / Some College	5.11	3.22 7.00	6.62	5.53 7.7
	4+ Yrs. College	4.65	2.56 6.73	4.93	3.97 5.89
ANNUAL INCOME	<$25,000	5.92	2.86 8.99	5.69	4.07 7.32
	$25,000-$49,999	4.31	2.09 6.54	5.81	4.27 7.35
	$50,000 or More	5.42	3.15 7.69	6.27	5.18 7.37
MARITAL STATUS	Married/Couple	3.97	2.51 5.44	4.67	3.99 5.35
	Not Married/Couple	6.03	3.41 8.64	7.89	6.23 9.55
GEOGRAPHY	West Akron	2.86	0.88 4.83		
	East Akron	4.91	1.64 8.18		
	North Suburbs	5.55	2.87 8.22		
	South Suburbs	5.29	2.40 8.18		

* Sample size was not large enough to obtain a reliable estimate.

4. Diabetes

Diabetes is a major public health priority because of the long-term health implications. It is the sixth leading cause of death in the state. We excluded pregnancy related diabetes (estimated as 0.7 %) and pre-diabetes (0.6%) while calculating summary statistics. The prevalence of diabetes has increased over last 5 years, as Figure 22 illustrates. There was a statistically significant increase from 7.8% in 2004 to 9.9% in 2008 for the state. The actual estimates with the confidence intervals (CI) are presented in Table 7 for the state and in Table 8 for the different demographic groups in the state and the county.

Figure 22:



Gender and Race – The state prevalence for whites was 9.3 %, while it was 15.7% for black, a significant difference of 6.4%. There were only 36 African-Americans residents of Summit with diabetes and the rate cannot be estimated reliably. The next figure presents the rates for the state, clearly indicating the difference between the prevalence for whites and African-Americans. There was a significant gender difference of 1% in the state and 3% in the county (see Figures 23 and 24).

Figure 23:

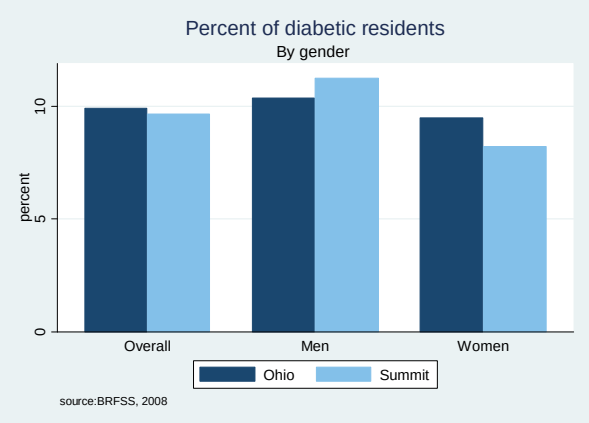
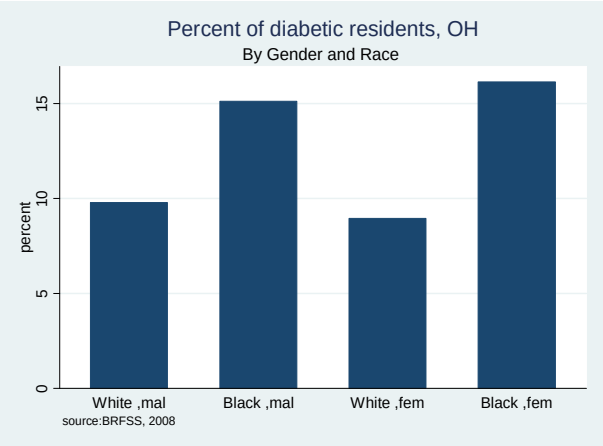
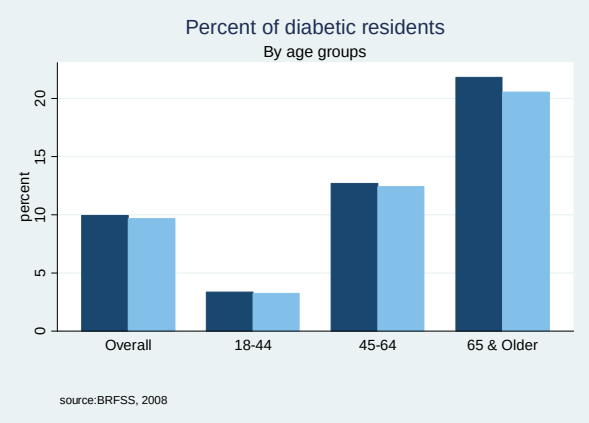


Figure 24:



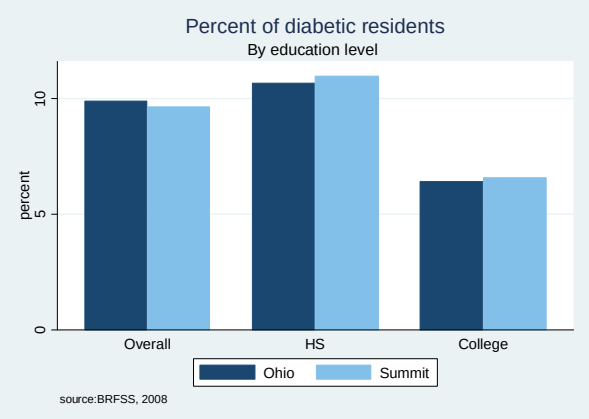
Age– The prevalence increased with age for both the state and the county. The increase was 9.3% and 9.1% for the consecutive age groups in Ohio (9.2% and 8.1% in Summit).

Figure 25:



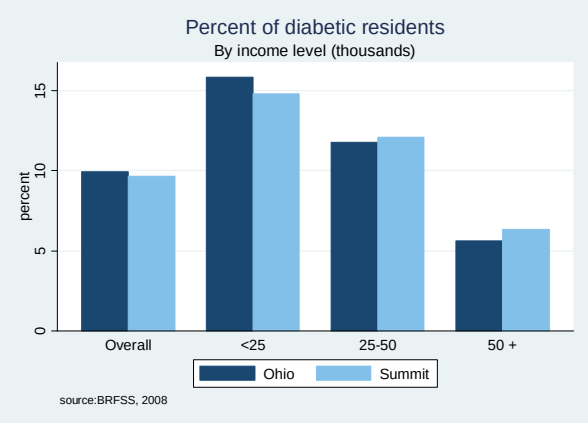
Educational attainment – Residents with higher education and income had significantly lower prevalence. For example, there was a 10% difference between the groups with lowest and highest education in the state.

Figure 26:



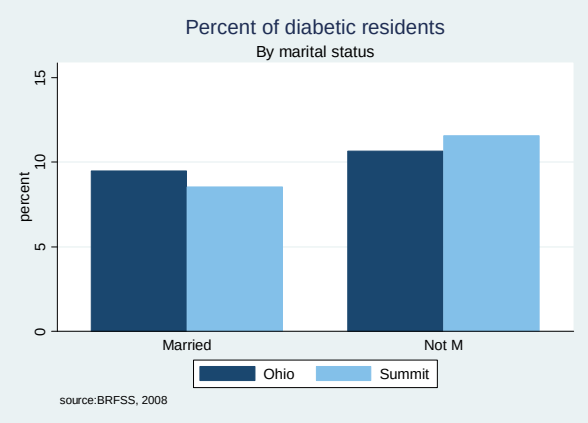
Income – Similarly, there was a 10% difference between the lowest and highest income groups in the state (8% in the county). The differences were statistically significant.

Figure 27:



Marital status – There was 1% (Ohio) and 3% (Summit) increase in the rates for not married residents.

Figure 28:



Summary:

Diabetes was the sixth leading cause of death in the state. The prevalence had increased 2% since the last 5 years in the state, reaching 10%. African-Americans had disproportionately higher rates in the state. The prevalence significantly decreased for higher income/education groups.

Table 7: Diabetes

Ohio		
Year:	**Rate (weighted percentage)**	**95% CI**
2004	7.8	(6.6-9.0)
2005	7.7	(6.9-8.5)
2006	6.7	(5.7-7.7)
2007	9.5	(8.9-10.1)
2008	9.9	(9.2-10.6)

Table 8: Diabetes

Diabetes		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	9.65	8.13 11.17	9.91	9.25 10.57
SEX	Men	11.24	8.65 13.84	10.35	9.32 11.38
	Women	8.2	6.52 9.88	9.49	8.65 10.34
RACE	White	9.66	8.03 11.28	9.35	8.66 10.04
	Black	*		15.72	12.82 18.61
	Other	*		10.3	6.98 13.62
SEX BY RACE	white ,male	11.76	8.88 14.63	9.78	8.71 10.84
	black ,male	*		15.12	10.23 20.01
	white ,female	7.73	6.09 9.37	8.95	8.06 9.84
	black ,female	*		16.14	12.6 19.67
AGE GROUP	18-44	3.24	1.41 5.08	3.36	2.54 4.17
	45-64	12.41	9.72 15.1	12.7	11.52 13.88
	65 & Older	20.53	16.71 24.36	21.81	20.17 23.45
EDUCATION LEVEL	<High School	*		17.13	13.58 20.69
	HS / Some College	10.99	8.79 13.2	10.69	9.82 11.57
	4+ Yrs. College	6.57	4.77 8.38	6.42	5.6 7.24
ANNUAL INCOME	<$25,000	14.81	11.03 18.59	15.84	14.05 17.63
	$25,000-$49,999	12.1	8.38 15.81	11.78	10.31 13.25
	$50,000 or More	6.33	4.36 8.31	5.63	4.89 6.37
MARITAL STATUS	Married/Couple	8.55	6.75 10.36	9.48	8.64 10.31
	Not Married/Couple	11.54	8.77 14.32	10.66	9.58 11.75
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate.

5. Asthma

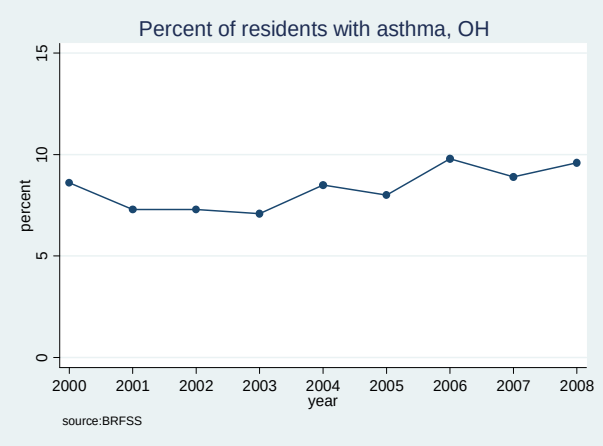
Asthma is a prevalent chronic illness in the United States with rates approaching 10% for the state of Ohio. The findings in the section were for adults who currently have asthma.

Figure 29 presents the estimated prevalence for the period 2000- 2008 in Ohio.

There was an overall increasing trend, after 2002. However the difference between 2000 and 2008 was not significant for the state.

The estimates with the Confidence Intervals (CI) are presented in Table 1 for the state over time and in Table 2 for the state and the county for 2008.

Figure 29:



Gender and Race – Figures 30 and 31 presents the rates by gender and race only in Ohio. The confidence intervals were wider and not as reliable for the county. The prevalence was higher for females and for African-Americans. The gender gap was also more pronounced for African-Americans. The rates were higher for women, in both the state and the county. The rate for men was substantially lower in the county- a finding that has to be observed over time in order to be accepted as a fact.

Figure 30:

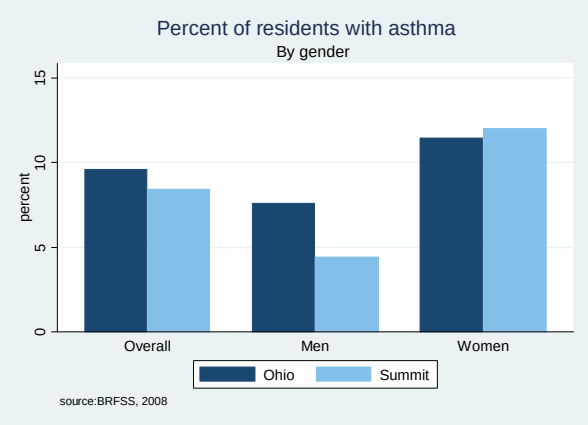
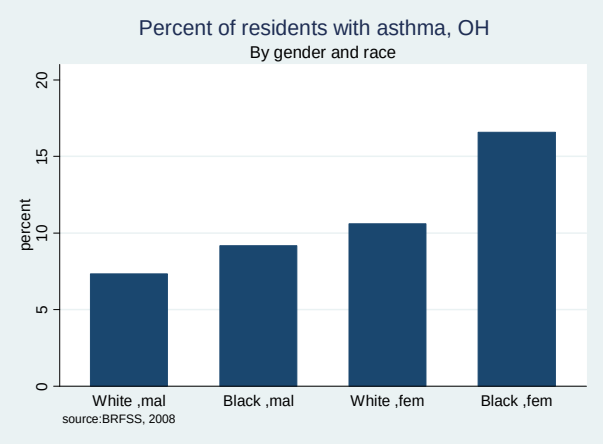


Figure 31:



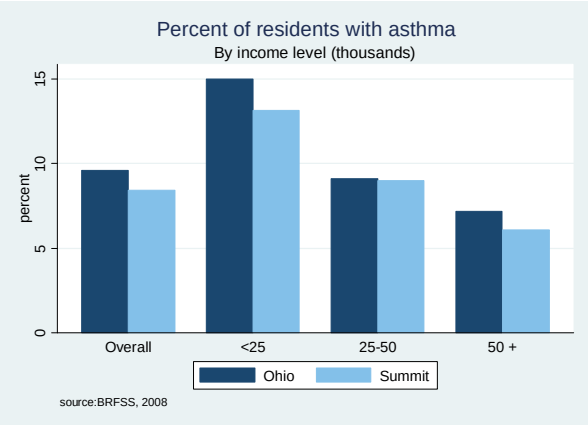
Income – Figure 32 illustrates the disproportionate rates seen in various income groups.

Educational attainment – There were no significant differences when examining educational attainment groups.

Age – There were no significant differences among the various age groups.

Marital status – Married residents had a 3.7% lower rate in Ohio and 5.4% in Summit.

Figure 32:



Summary:

Asthma affected disproportionately women and African-Americans. It decreased with higher educational attainment and higher income. There was no significant difference among the age groups. Summit County had overall lower rate, due to the lower rate for male.

Table 9: Asthma (Ohio)

Ohio		
Year:	**Rate (%)**	**95% CI**
2000	8.6	(7.2-10.0)
2001	7.3	(6.3-8.3)
2002	7.3	(6.4-8.2)
2003	7.1	(6.1-8.1)
2004	8.5	(7.2-9.8)
2005	8.0	(7.0-9.0)
2006	9.8	(8.2-11.4)
2007	8.9	(8.1-9.7)
2008	9.6	(8.8-10.4)

Table 10: Asthma

		Summit County 2008		Ohio State 2008	
		Estimate	95% CI	Estimate	95% CI
ALL	Overall	8.42	6.88 9.96	9.59	8.77 10.41
SEX	Men	4.4	2.79 6.01	7.59	6.43 8.74
	Women	12.02	9.51 14.52	11.45	10.29 12.61
RACE	White	7.69	6.16 9.21	9.02	8.18 9.86
	Black	8.42*	3.89 12.95	13.56	10.32 16.79
	Other	17.93	5.93 29.94	14.35	8.17 20.54
SEX BY RACE	white ,male	4.31	2.57 6.05	7.34	6.13 8.54
	black ,male	*	0 9.2	9.17	3.91 14.43
	white ,female	10.76	8.36 13.15	10.61	9.43 11.78
	black ,female	11.51*	3.97 19.05	16.59	12.51 20.67
AGE GROUP	18-44	7.49	4.7 10.29	9.77	8.27 11.26
	45-64	10.34	8.13 12.56	9.91	8.81 11.02
	65 & Older	7.1	5.19 9.01	8.67	7.6 9.74
EDUCATION LEVEL	<High School	10.6*	5.26 15.93	14.39	10.55 18.23
	HS / Some College	9.33	7.1 11.55	10.49	9.35 11.63
	4+ Yrs. College	6.79	4.53 9.05	6.64	5.64 7.65
ANNUAL INCOME	<$25,000	13.13	9.15 17.12	14.99	12.89 17.08
	$25,000-$49,999	8.97	5.89 12.05	9.08	7.45 10.72
	$50,000 or More	6.08	4.09 8.08	7.17	6.09 8.26
MARITAL STATUS	Married/Couple	6.4	4.82 7.98	8.3	7.42 9.19
	Not Married/Couple	11.75	8.54 14.97	12.01	10.33 13.7
GEOGRAPHY	West Akron	8.72	5.00 12.43		
	East Akron	8.02	4.17 11.87		
	North Suburbs	7.79	5.25 10.32		
	South Suburbs	7.95	5.02 10.88		

* Sample size is not large enough to obtain a reliable estimate.

6. Disability

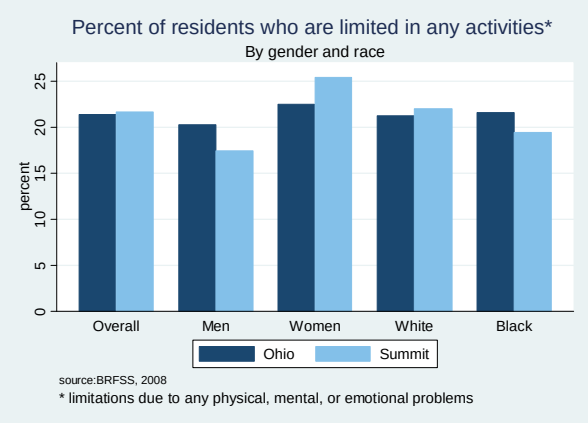
The percentage of adults who were limited in any activities because of physical, mental, or emotional problems has increased from 16.2% to 21.5% in Ohio since 2001. The estimated prevalence for the odd years since 2001 is presented in Table 12. The prevalence at the county was very similar in 2008.

Table 11: Disability

Ohio		
Year:	**Rate (%)**	**95% CI**
2001	16.2	(14.8-17.6)
2003	17.3	(15.8-18.8)
2005	17.8	(16.5-19.1)
2007	20.7	(19.7-21.7)
2008	21.5	(20.4-22.5)

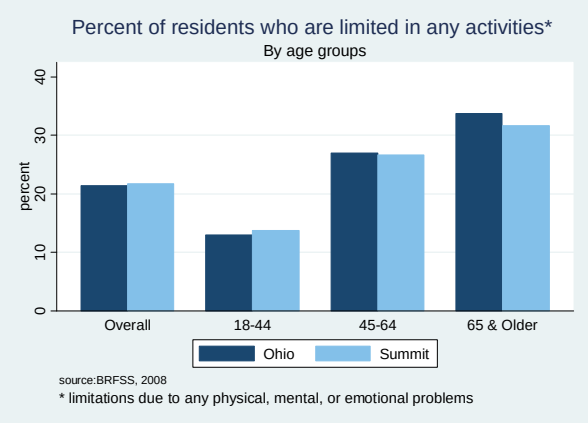
Gender and Race – The rates for women were significantly higher in both the county and the state. In fact, the gender gap was wider in Summit county (8%) compared to the state (2%). There was no significant difference between African-Americans and whites for the state and the county. The difference between the genders in the county was due to the gap between the white males (17.5 %) and females (26.2%), as seen in Table 12.

Figure 33:



Age – The rates in both the state and the county were very similar for the age groups, showing significant increase in the prevalence for older residents. The differences between the youngest and middle age groups were 14.1% for Ohio and 12.9% for Summit. The differences between the groups aged 45-64 and older than 65 were 6.7% and 5% for the state and the county.

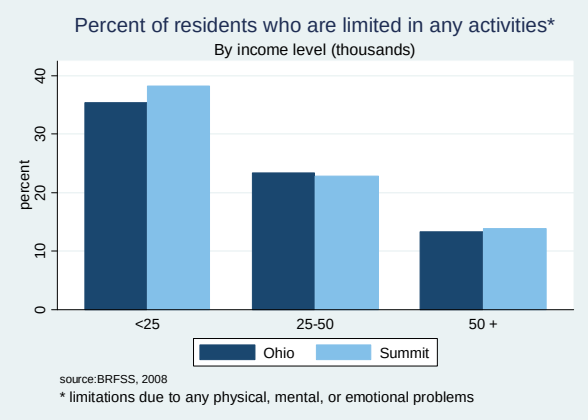
Figure 34:



Income – The percentages of residents with disability decreased significantly for residents with higher income.

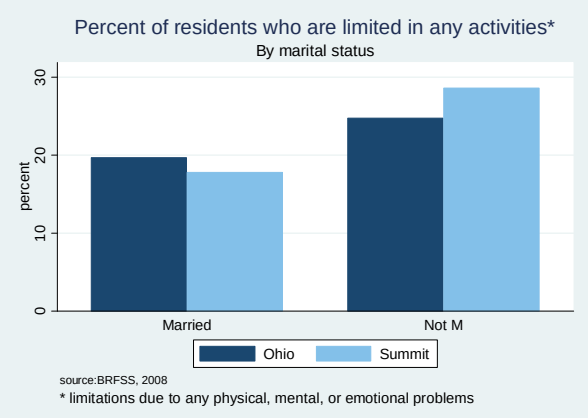
Educational attainment – The group with High school diploma had 8.7% lower rate in the state than the group without diploma. Further, college degree was associated with a drop of 6.2% in Ohio. The difference between the rates of the lowest and middle income groups was 11.9% in the state and 15.4% in the county. The highest earning group had 10.1% lower prevalence in the state (8.9% in the county) compared to the middle group.

Figure 35:



Marital status – There was a 5% decrease for the married residents, which was significant. The gap was even larger (9%) for the county.

Figure 36:



Summary:

The percentage of residents with disability (defined here as any Adults who were limited in any activities because of physical, mental, or emotional problems) is increasing. The question allows a broad interpretation and therefore difference between subpopulations need to be interpret with caution. There was no significant difference between the races, but it exists between the males and females, particularly for the county. The disability rates were lower for residents with higher income or higher education. The prevalence of disability increased with age.

Table 12: Disability

Disability		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	21.69	19.45 23.92	21.45	20.44 22.47
SEX	Men	17.48	14.29 20.67	20.3	18.76 21.83
	Women	25.47	22.33 28.61	22.53	21.19 23.86
RACE	White	22.04	19.69 24.39	21.27	20.22 22.33
	Black	19.49	12.04 26.94	21.61	18.22 24.99
	Other	19.59*	9.2 29.97	24.21	17.21 31.22
SEX BY RACE	white ,male	17.54	14.05 21.02	20.1	18.49 21.7
	black ,male	18.95*	8.43 29.48	20.3	14.52 26.08
	white ,female	26.17	23.03 29.3	22.38	20.99 23.77
	black ,female	19.91*	9.44 30.37	22.53	18.47 26.6
AGE GROUP	18-44	13.81	10.28 17.33	12.96	11.36 14.56
	45-64	26.7	23.32 30.08	27.01	25.44 28.57
	65 & Older	31.67	27.53 35.82	33.71	31.86 35.56
EDUCATION LEVEL	<High School	*		31.33	26.56 36.11
	HS / Some College	23.19	20.01 26.38	22.68	21.34 24.02
	4+ Yrs. College	15.76	12.79 18.73	16.51	15.05 17.97
ANNUAL INCOME	<$25,000	38.17	32.51 43.82	35.34	32.71 37.96
	$25,000-$49,999	22.81	18.18 27.44	23.41	21.25 25.57
	$50,000 or More	13.91	11.11 16.71	13.33	12.08 14.59
MARITAL STATUS	Married/Couple	17.76	15.31 20.21	19.69	18.5 20.88
	Not Married/Couple	28.58	24.06 33.11	24.76	22.86 26.67
GEOGRAPHY	West Akron	24.85	18.99 30.71		
	East Akron	28.22	22.31 34.12		
	North Suburbs	18.54	15.21 21.89		
	South Suburbs	19.91	15.84 23.97		

* Sample size is not large enough to obtain a reliable estimate.

7. Oral Health

One of the questions in BRFSS 2008 that addresses oral health was the following: "Have you visited the dentist or dental clinic within the past year for any reason?"

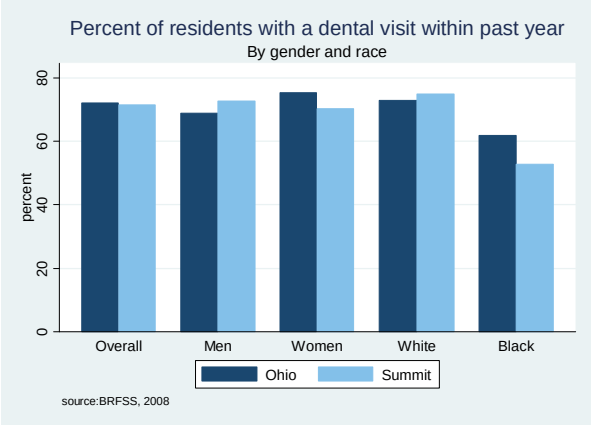
Most of the adult population in the BRFSS survey had visited a dentist or a dental clinic in the past year. There was a fluctuation in the estimated proportions over the last ten years, without much of a change. The data is presented in Table 14.

Table 13: Oral Health

Ohio		
Year:	**Rate (%)**	**95 % CI**
1999	70.3	(67.7-72.9)
2002	74.7	(73.0-76.4)
2004	72.2	(70.0-74.4)
2006	73.4	(71.1-75.7)
2008	72.2	(70.9-73.4)

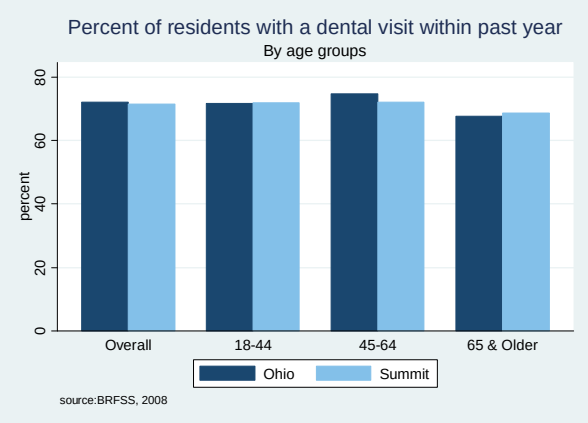
Gender and Race – The proportion of women who visited dental clinics was significantly higher (6%) for the state. The estimates for the county were 2% higher for men, which was not significant. There was a significant difference between the estimates for whites (72.9%) and African-Americans (61.7%); an 11% difference. The CI for the rates for African-Americans in the county were too wide to come to a reliable conclusion.

Figure 37:



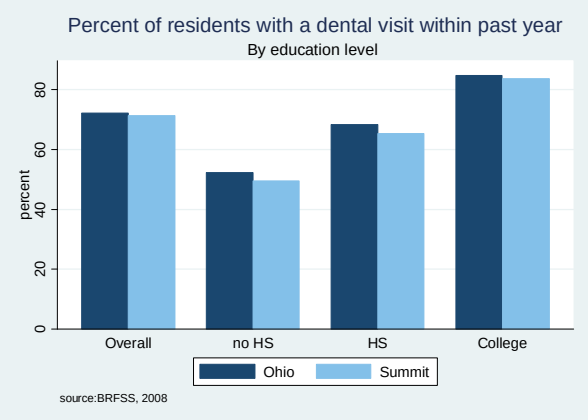
Age – There were small differences between the age groups, with the highest rates for the middle age group.

Figure 38:



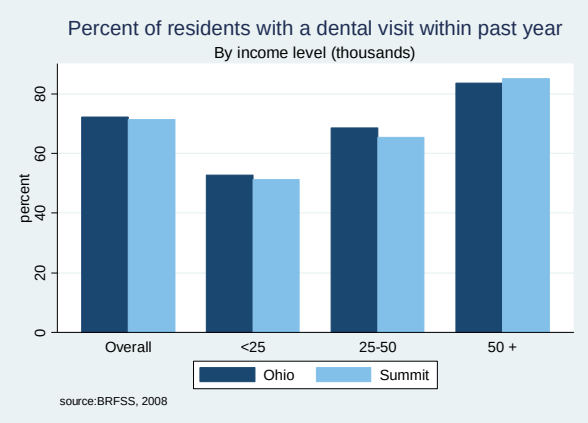
Educational attainment – There were significant differences by educational attainment. High School diploma was associated with an increase of 16% in the state and 15.8% in the county. Further, the college graduates had 16.5% higher rate in the state and 18.2% in the county.

Figure 39:



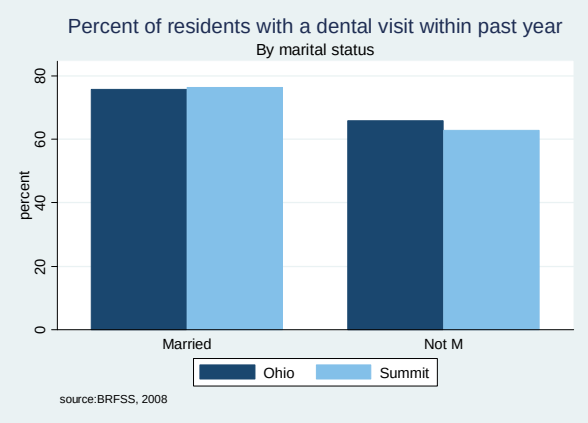
Income –Higher income increased the likelihood of regular dental visits. The difference between the lowest and the middle income group was 15.8% in the state (14.3% in the county). The highest income group had an additional 15.1% higher rate in Ohio (19.8%) in the state.

Figure 40:



Marital status – A significant difference of 10% (14% for Summit) was estimated for the difference between the married and unmarried residents in Ohio.

Figure 41:



Summary:

Most people had visited dental clinics in 2008 and the rates had not changed significantly in the last ten years. There were vast differences between the income/educational groups.

Table 14: Oral Health

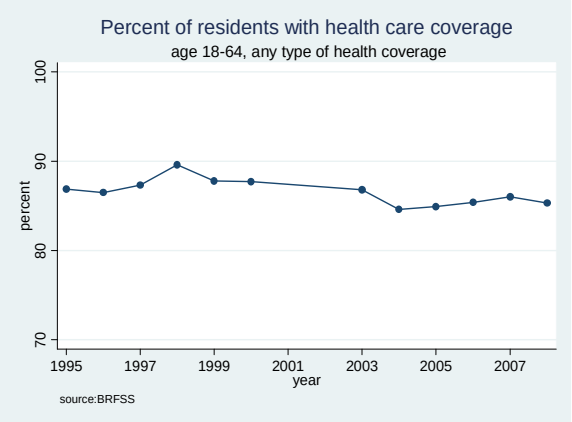
Oral Health		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	71.39	68.28 74.5	72.17	70.94 73.4
SEX	Men	72.59	68.53 76.65	68.86	66.84 70.88
	Women	70.31	65.69 74.92	75.24	73.78 76.69
RACE	White	74.86	72.28 77.44	72.92	71.61 74.23
	Black	52.85	38.59 67.11	61.73	57.02 66.44
	Other	63.54	48.64 78.44	73.22	66.98 79.47
SEX BY RACE	white ,male	75.49	71.49 79.49	69.47	67.33 71.62
	black ,male	54.85	37.47 72.23	58.21	49.92 66.5
	white ,female	74.28	70.96 77.6	76.17	74.62 77.71
	black ,female	51.27	30.28 72.26	64.24	58.71 69.76
AGE GROUP	18-44	71.82	65.79 77.86	71.74	69.5 73.98
	45-64	72	68.45 75.56	74.79	73.22 76.35
	65 & Older	68.59	64.61 72.58	67.74	65.9 69.57
EDUCATION LEVEL	<High School	49.59	37.76 61.41	52.4	46.92 57.87
	HS / Some College	65.42	60.78 70.07	68.35	66.69 70.01
	4+ Yrs. College	83.65	79.96 87.33	84.81	83.13 86.49
ANNUAL INCOME	<$25,000	51.15	45.15 57.16	52.77	49.88 55.67
	$25,000-$49,999	65.41	59.69 71.13	68.57	66.01 71.13
	$50,000 or More	85.19	81.9 88.47	83.68	82.09 85.26
MARITAL STATUS	Married/Couple	76.23	73.11 79.35	75.65	74.26 77.03
	Not Married/Couple	62.75	56.55 68.94	65.89	63.48 68.3
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size is not large enough to obtain a reliable estimate

8. Health Care Access/Coverage

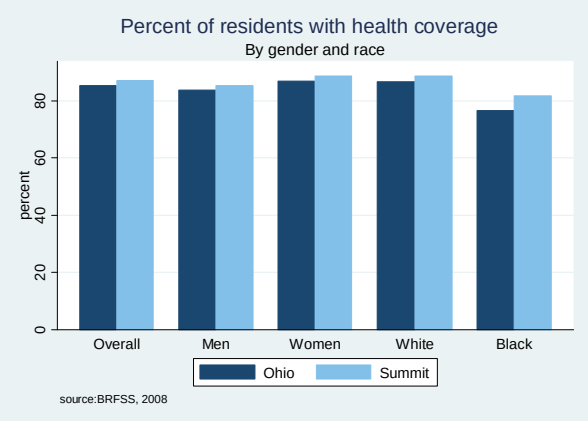
The percent of adults aged 18-64 who have any kind of health care coverage has not changed significantly for the last 14 years, as presented in the figure below and Table 15. The estimates with the confidence intervals are presented in Table 16.

Figure 42:



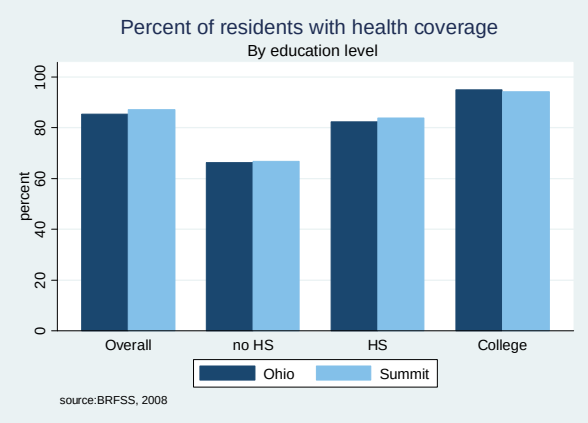
Gender and Race – The rates for women were significantly higher (by 3%) for the state. Whites had an estimated 10% higher rate in Ohio (7% in Summit) which was significant.

Figure 43:



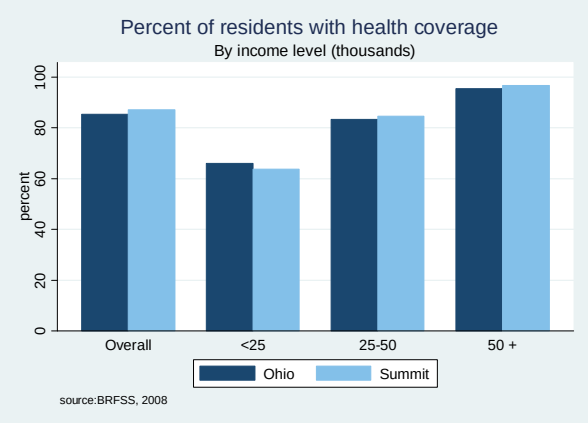
Educational attainment – Adults in Ohio with a high school diploma had a 16% higher percentage of coverage compared with the group without a diploma. Further, those with a college degree had an additional 13% increase relative to those without a high school diploma. Trends within Summit County were very similar to trends at the state level.

Figure 44:



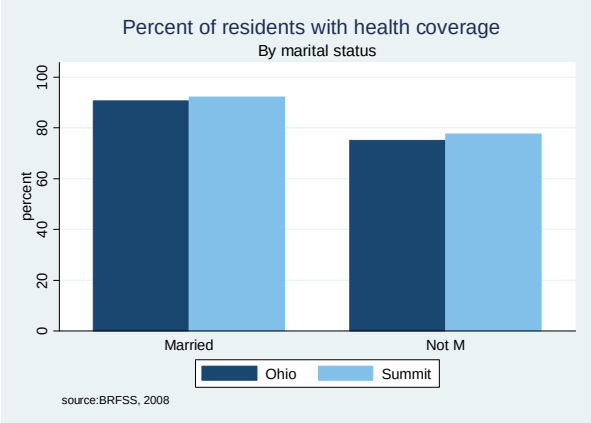
Income – The middle income group had 17% increase of health coverage compared with the bottom one. The highest earning group had an additional increase of 12% in Ohio. The differences were significant and were very similar for the county.

Figure 45:



Marital status – Married residents had 15% higher rates of coverage in the state and the county.

Figure 46:



Summary:

Health coverage has not changed significantly for the last 14 years. Women and whites had significantly higher rates. Higher income and education groups had a significantly higher proportion of health coverage.

Table 15: Health Coverage

Ohio (data unavailable for 2001 and 2002)		
Year:	**Rate (%)**	**95% CI**
1995	86.9	(84.4-89.4)
1996	86.5	(84.1-88.9)
1997	87.3	(85.6-89.0)
1998	89.6	(87.8-91.4)
1999	87.8	(85.5-90.1)
2000	87.7	(85.8-89.6)
2003	86.8	(85.2-88.4)
2004	84.6	(82.5-86.7)
2005	84.9	(83.1-86.7)
2006	85.4	(82.8-88.0)
2007	86.0	(84.8-87.2)
2008	85.3	(84.0-86.6)

Table 16: Health Coverage

Health Coverage		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	87.06	84.68 89.44	85.34	84.04 86.64
SEX	Men	85.37	81.61 89.14	83.74	81.67 85.8
	Women	88.68	85.75 91.61	86.92	85.34 88.49
RACE	White	88.7	86.3 91.11	86.55	85.18 87.92
	Black	81.67	72.9 90.45	76.6	71.67 81.52
	Other	85.59	75.66 95.52	78.13	71.25 85
SEX BY RACE	white ,male	88.31	84.56 92.06	85.33	83.17 87.49
	black ,male	71.69	56.66 86.73	69.17	60.3 78.03
	white ,female	89.08	86.03 92.14	87.76	86.07 89.45
	black ,female	90.6	83.55 97.65	82.09	76.69 87.48
AGE GROUP	18-44	85.7	81.93 89.47	82.23	80.15 84.31
	45-64	88.79	86.27 91.31	89.62	88.56 90.68
	65 & Older	NA	NA	NA	NA
EDUCATION LEVEL	<High School	66.62	51.98 81.25	66.29	59.11 73.47
	HS / Some College	83.73	80.07 87.4	82.19	80.37 84.02
	4+ Yrs. College	94.14	91.69 96.6	94.99	93.92 96.07
ANNUAL INCOME	<$25,000	63.67	56.21 71.13	65.94	62.26 69.61
	$25,000-$49,999	84.49	79.27 89.72	83.25	80.41 86.09
	$50,000 or More	96.62	94.58 98.65	95.46	94.24 96.68
MARITAL STATUS	Married/Couple	92.21	89.9 94.51	90.69	89.54 91.84
	Not Married/Couple	77.49	72.16 82.82	75	72.05 77.96
GEOGRAPHY	West Akron	83.53	76.43 90.62		
	East Akron	78.12	71.12 85.11		
	North Suburbs	94.16	91.53 96.79		
	South Suburbs	89.91	85.90 93.92		

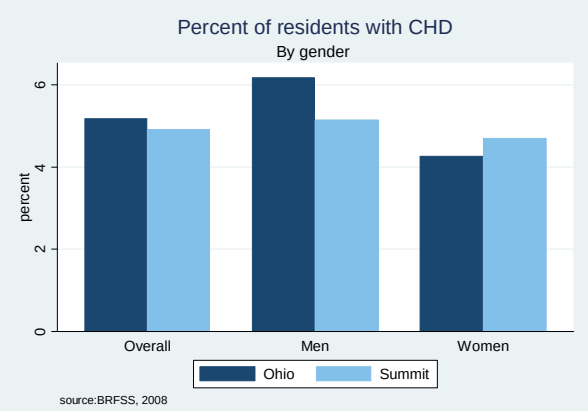
9. Coronary Heart Disease and Heart Attack

Coronary Heart Disease

Coronary heart disease (CHD) is the number one killer in the nation. CHD is the leading cause of death for both men and women, regardless of their race. Therefore the main focus was on CHD mortality based on death certificates data. Here we addressed the question of self-reported heart disease. The strongest predictor for the disease was age, which requires that comparisons between demographic groups were valid only if age adjustments were made. The difference between whites and African-Americans was not significant for Ohio. Only 9 African-Americans reported having CHD (out of the 195 African-Americans who answered this question), which made this estimation unreliable. The results are presented in Table 17.

Gender and Race – The rates were higher for males, in both the state and the county.

Figure 47:



Age, Educational attainment, and Income – Given the small sample sizes discussed in the previous paragraph, Figures 48-51 should be interpreted with caution, as indicated in the introduction. The rates for CHD were lower for the residents with college degree after adjusting for age. Similarly, higher income groups had significantly decreased prevalence. Logistic regression was used to adjust for age and other demographic factors. However, the graphs were based on weighted averages, not on the regression analysis.

Figure 48:

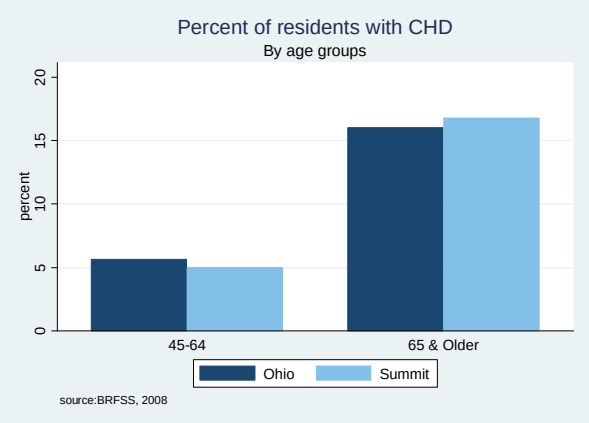


Figure 49:

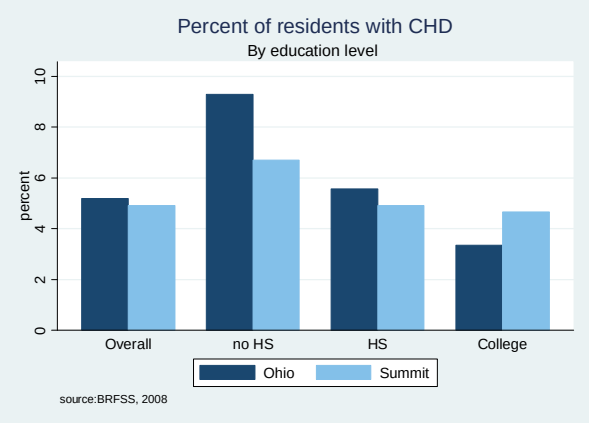
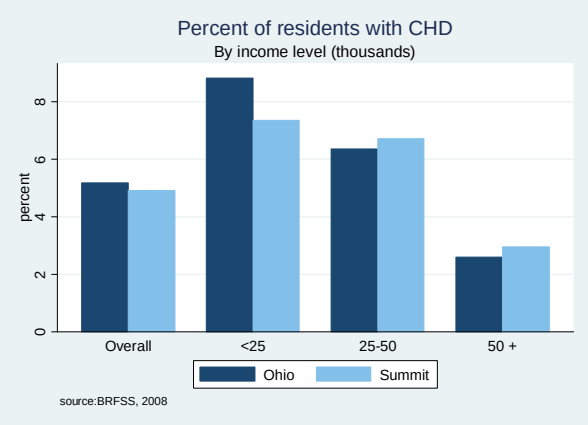
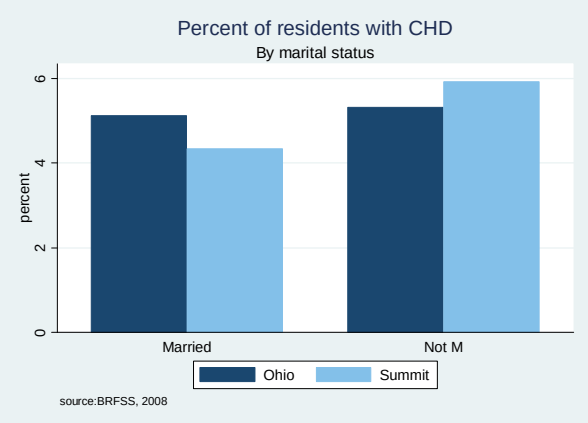


Figure 50:



Marital status – Married residents had lower rates in both the state and the county. However, the difference was not found to be significant after adjusting for the other demographic factors

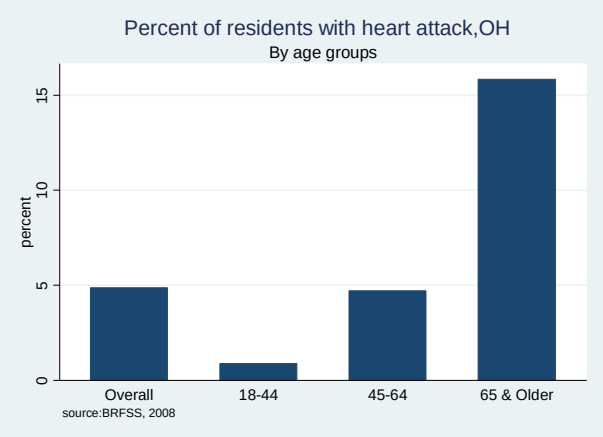
Figure 51:



Heart Attack (Myocardial Infarction, or MI)

Age – The rates for MI were also very strongly related to age, as the next figure illustrates for the state. The same trend was observed as in the case with CHD: decreasing rates of MI with higher education and higher income, which cannot be interpreted directly due to the confounding with age, as explained in the introduction.

Figure 52:



Gender and race – The estimates are presented in Table 18. The difference between the racial groups was not significant for the state. Men had significantly higher rates than women: 6.1% vs. 3.7% respectively. A similar difference was observed for the county as well. The county estimates were slightly lower than for the state.

Figure 53:

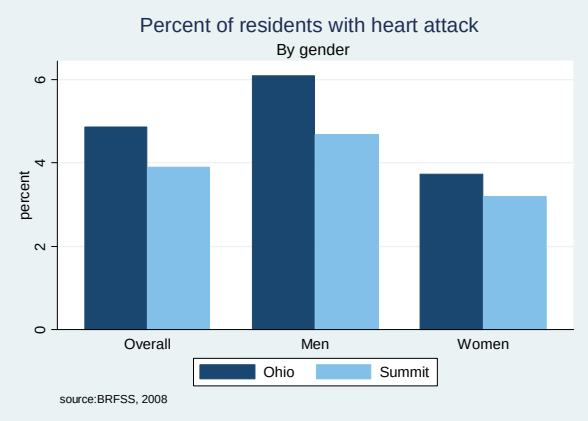


Table 17: CHD[5]

		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	4.91	4.04 5.78	5.18	4.7 5.65
SEX	Men	5.15	3.75 6.55	6.18	5.34 7.02
	Women	4.69	3.62 5.75	4.26	3.78 4.73
RACE	White	5.43	4.44 6.43	5.16	4.69 5.64
	Black	**		4.53	3.02 6.03
	Other	*		6.7	2.14 11.26
SEX BY RACE	white ,male	5.92	4.28 7.56	6.05	5.25 6.86
	black ,male	**		4.23	1.62 6.84
	white ,female	4.99	3.81 6.17	4.33	3.81 4.85
	black ,female	**		4.74	2.95 6.53
AGE GROUP	18-44	*		.87	.36 1.39
	45-64	4.97	3.37 6.58	5.63	4.8 6.46
	65 & Older	16.78	13.66 19.9	16.03	14.55 17.52
EDUCATION LEVEL	<High School	6.69	2.69 10.68	9.3	6.56 12.04
	HS / Some College	4.9	3.78 6.03	5.55	4.93 6.16
	4+ Yrs. College	4.65	3.2 6.1	3.34	2.75 3.92
ANNUAL INCOME	<$25,000	7.36	5.19 9.52	8.83	7.43 10.22
	$25,000-$49,999	6.72	4.56 8.88	6.35	5.25 7.45
	$50,000 or More	2.95	1.86 4.03	2.61	2.1 3.12
MARITAL STATUS	Married/Couple	4.33	3.25 5.41	5.12	4.48 5.76
	Not Married/Couple	5.92	4.43 7.4	5.32	4.66 5.99
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate.

[5] As noted earlier in this section, because there were only 9 African-American respondents reporting Coronary Heart Disease, results cannot be used to generate reliable estimates for the African-American population as a whole.

Table 18: Heart Attack

Heart Attack (MI)		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	3.89	3.14 4.65	4.86	4.43 5.28
SEX	Men	4.67	3.38 5.96	6.09	5.35 6.83
	Women	3.19	2.34 4.05	3.72	3.25 4.18
RACE	White	4.2	3.33 5.06	4.78	4.33 5.23
	Black	*		4.94	3.47 6.4
	Other	*		5.33	2.71 7.95
SEX BY RACE	white ,male	5.33	3.82 6.83	5.99	5.22 6.75
	black ,male	*		5.36	2.86 7.87
	white ,female	3.16	2.23 4.1	3.66	3.16 4.15
	black ,female	*		4.63	2.86 6.4
AGE GROUP	18-44	*		.87	.53 1.21
	45-64	3.39	2.18 4.6	4.72	3.97 5.48
	65 & Older	13.27	10.52 16.02	15.84	14.34 17.34
EDUCATION LEVEL	<High School	*		10.15	7.89 12.41
	HS / Some College	4.8	3.67 5.94	5.29	4.71 5.87
	4+ Yrs. College	1.86	.98 2.75	2.58	2.08 3.08
ANNUAL INCOME	<$25,000	8.06	5.73 10.39	9.45	8.18 10.72
	$25,000-$49,999	4.16	2.64 5.68	5.93	4.92 6.95
	$50,000 or More	1.49	.75 2.23	1.89	1.47 2.31
MARITAL STATUS	Married/Couple	3.03	2.16 3.9	4.57	4.03 5.12
	Not Married/Couple	5.33	3.88 6.78	5.4	4.71 6.09
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate.

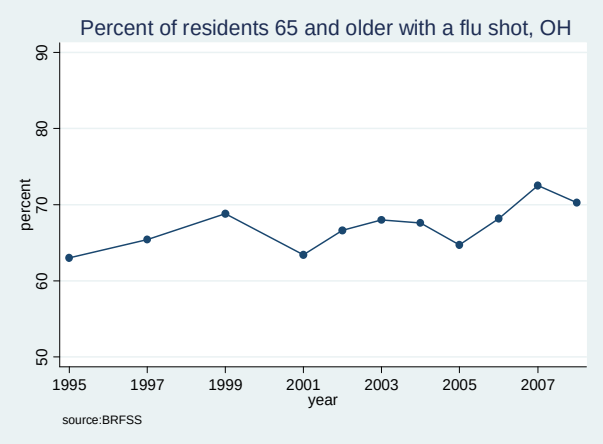
10. Influenza Vaccination Coverage

To determine influenza vaccination coverage, respondents were asked, "During the past 12 months, have you had a flu shot?" Since the calendar year overlaps with two flu seasons, the results cannot be interpreted directly for a particular flu season. There were two approaches that can be taken. One, which we adopted, was to use all the data available for 2008, assuming that there was not much change from the flu seasons in 2007/08 and 2008/09. The other approach was to restrict the data to only the interviews taking place during February-August period of 2008, therefore reducing the sample, but capturing only the flu season of 2007/08. Similarly, data from BRFSS 2009 can be used for the flu season 2008/09.

Healthy People 2010 has identified one of its goals to" Increase the proportion of adults who were vaccinated annually against influenza and ever vaccinated against pneumococcal disease" (objective 14-29). Particularly, one of the goals was to achieve the Influenza vaccine coverage for non-institutionalized adults aged 65 years and older to 90%.

Although this goal has not been achieved, there has been improvement, as the following figure illustrates the rates for Ohio for the last 14 years. The drop of 2.2% from 2007 to 2008 was significant.

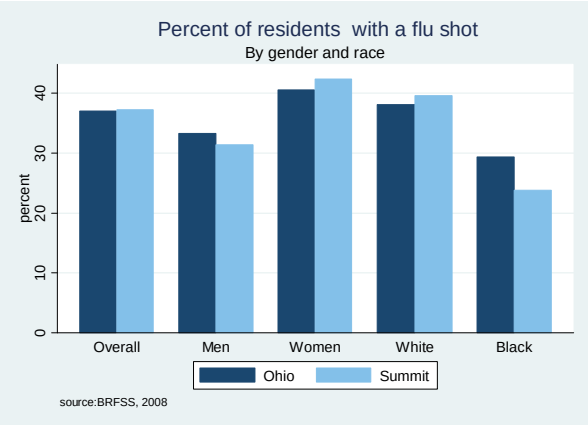
Figure 54:



The drop in 2005 was due to the vaccine shortage.

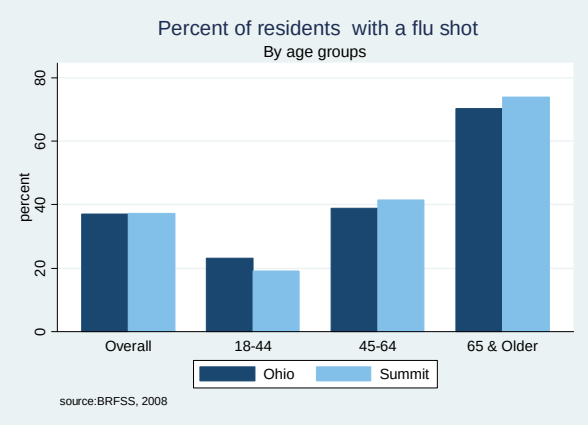
Gender and race – There was a significant gender gap (7% in the state and 11% in the county). Whites have 9% higher rates in the state and 16% in the county. The county rates for African-Americans were 6% lower than for the state.

Figure 55:



Age – The percentage of adults with flu coverage increased significantly with age. The group aged 45-64 has 15.7% higher rate in the state and 22.3% in the county than the youngest group. The oldest group had additionally 31.4% higher rate in Ohio and 32.5% in Summit.

Figure 56:



Educational attainment – Higher education increased the likelihood of getting a vaccination. College graduates had 5.6% higher rate in the state and 4.5% in the county compared with residents with high school diploma.

Marital status – There was no significant difference between the rates for married and unmarried residents.

Finally, logistic regression was used to examine the potential for differences in various subpopulations, adjusted for the other demographic factors. Adjusting for different factors, age was the strongest factor, followed by being in the highest educational and income groups.

Summary:

Influenza coverage rates have increased for the elderly in the past 10 years, but were below the national goal of Healthy People 2010. The rates for the women and for whites were significantly higher. Adults with higher education had higher rates.

The flu season of 2009 present different challenges with consequences that will be seen in the future.

Table 19: Flu Coverage

Ohio, age 65+		
Year:	**Rate (%)**	**95% CI**
1995	63	(56.5-69.5)
1997	65.4	(61.3-69.5)
1999	68.8	(63.6-74.0)
2001	63.4	(59.0-67.8)
2002	66.6	(62.2-71.0)
2003	68	(63.8-72.2)
2004	67.6	(63.2-72.0)
2005	64.7	(61.4-68.0)
2006	68.2	(63.9-72.5)
2007	72.5	(70.7-74.3)
2008	70.3	(68.5-72.1)

Table 20: Influenza Coverage

Flu Coverage		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	37.23	34.49 39.97	37.09	35.84 38.34
SEX	Men	31.43	27.59 35.27	33.34	31.42 35.26
	Women	42.43	38.53 46.33	40.55	38.94 42.15
RACE	White	39.58	36.78 42.38	38.1	36.76 39.44
	Black	23.79	15.56 32.01	29.34	25.33 33.36
	Other	28.99	15.58 42.39	29.5	23.41 35.59
SEX BY RACE	white ,male	33.81	29.67 37.95	34.08	32.02 36.13
	black ,male	18.21	7.24 29.18	25.42	18.82 32.02
	white ,female	44.84	41.18 48.49	41.87	40.14 43.6
	black ,female	28.24	15.32 41.17	32.12	27.14 37.09
AGE GROUP	18-44	19.17	15.15 23.18	23.17	21.12 25.22
	45-64	41.42	37.6 45.24	38.91	37.17 40.64
	65 & Older	73.88	70.27 77.5	70.27	68.47 72.07
EDUCATION LEVEL	<High School	27.98	19.23 36.72	35.56	30.35 40.77
	HS / Some College	36.00	32.19 39.82	35.28	33.68 36.88
	4+ Yrs. College	40.54	36.29 44.8	40.85	38.76 42.95

ANNUAL INCOME	<$25,000	35.91	30.71 41.11	34.66	32.13 37.2
	$25,000-$49,999	36.04	30.74 41.33	38.3	35.77 40.82
	$50,000 or More	36.9	32.93 40.87	36.49	34.57 38.4
MARITAL STATUS	Married/Couple	37.22	33.99 40.44	37.92	36.47 39.38
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate.

Pneumonia vaccination

BRFSS asked the respondents aged 65 and older if they have ever had a pneumonia vaccination.

The overall vaccination rates were 66.9% for the state and 73.2% for the county. The results are presented in Table 21.The overall rate has increased by 20.3% in Ohio since 1995 as presented in the figure below and Table 22.

Figure 57:

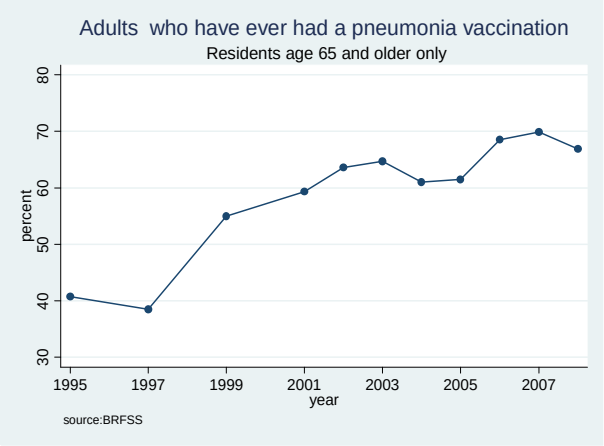


Table 21: Pneumonia vaccination, age 65 and older

	Ohio	
Year:	**Rate (%)**	**95% CI**
1995	40.7	(33.8-47.6)
1997	38.5	(34.0-43.0)
1999	55.0	(49.3-60.7)
2001	59.3	(54.7-63.9)
2002	63.6	(59.0-68.2)
2003	64.7	(60.3-69.1)
2004	61.0	(56.3-65.7)
2005	61.5	(58.0-65.0)
2006	68.5	(64.2-72.8)
2007	69.9	(67.9-71.9)
2008	66.9	(65.0-68.8)

Table 22: Adults aged 65+ who have ever had a pneumonia vaccination

		Summit County 2008		Ohio State 2008	
		Estimate	95% CI	Estimate	95% CI
ALL	Overall	73.23	69.45 77.02	66.9	65.03 68.77
SEX	Men	68.78	61.92 75.65	65.25	62.1 68.4
	Women	76.19	71.87 80.52	68.03	65.73 70.32
RACE	White	73.7	69.75 77.65	67.45	65.51 69.39
	Black	72.74	58.78 86.7	62.23	53.86 70.61
	Other	*		65.07	50.95 79.2
SEX BY RACE	white ,male	68.88	61.85 75.92	66.27	63 69.54
	black ,male	*		47.69	32.98 62.41
	white ,female	77.13	72.6 81.65	68.27	65.88 70.65
	black ,female	73.64	58.35 88.94	68.66	58.72 78.61
EDUCATION LEVEL	<High School	79.34	68.52 90.16	61.96	56.28 67.65
	HS / Some College	73.35	68.63 78.06	67.85	65.6 70.1
	4+ Yrs. College	70.83	63.25 78.4	66.6	62.51 70.68
ANNUAL INCOME	<$25,000	74.85	67.81 81.89	68.56	65.33 71.79
	$25,000-$49,999	74.51	67.84 81.19	68.28	64.76 71.8
	$50,000 or More	73.53	64.34 82.72	64.17	59.59 68.75
MARITAL STATUS	Married/Couple	68.96	63.39 74.53	65.55	62.92 68.19
	Not Married/Couple	78.82	74.17 83.47	68.84	66.32 71.35
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate.

11. Physical Activity

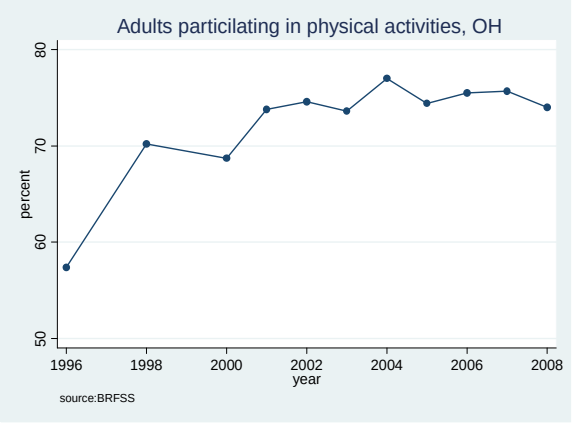
The health benefits of regular physical activities for overall physical and mental health are well documented. The weather and the landscape in Summit County provide excellent opportunities for exercises throughout the year. The specific question asked to the participants in the survey was the following:

Question: "During the past month, did you participate in any physical activities?"

It was expected that seasonal fluctuation will exist. However, the telephone interviews were spread throughout the year- therefore any comparisons between subpopulation should be valid.

The percentage of adults participating in physical activity has increased since 1996, as Figure 58 illustrates. The estimates and the confidence intervals are presented in Table 25.

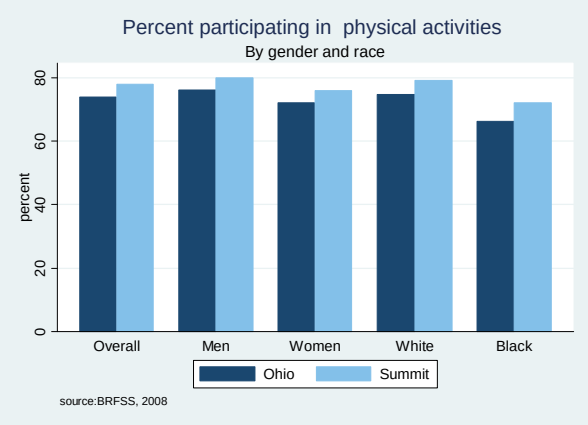
Figure 58:



Seventy four percent in the state and seventy eight percent of the adults in the county reported participating in physical activity.

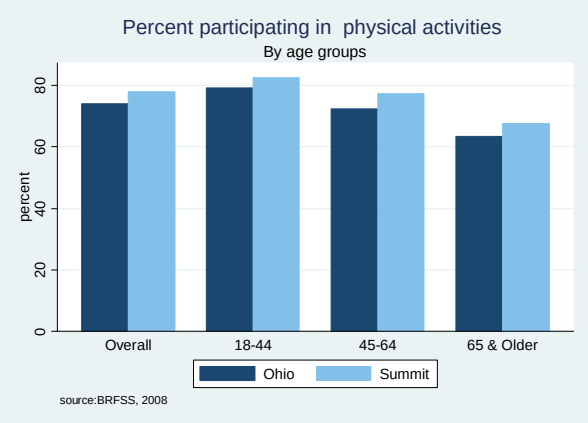
Gender and race – The rates were significantly higher for males (by 4% in both the state and the county) and for whites (by 8% in the state and 7% in the county), as seen in the next figure and in Table 26. The rates for Summit were slightly higher than for the state.

Figure 59:



Age – Rates were dropping with age; the trends were significant for the state and the county.

Figure 60:



Income and Educational attainment – Physical activity significantly increases with higher income and education. Family members also were engaged more in exercises by 5% in the state and 9% in the county.

Figure 61:

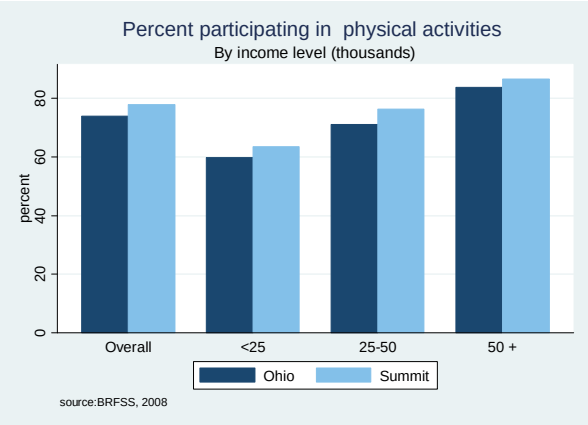
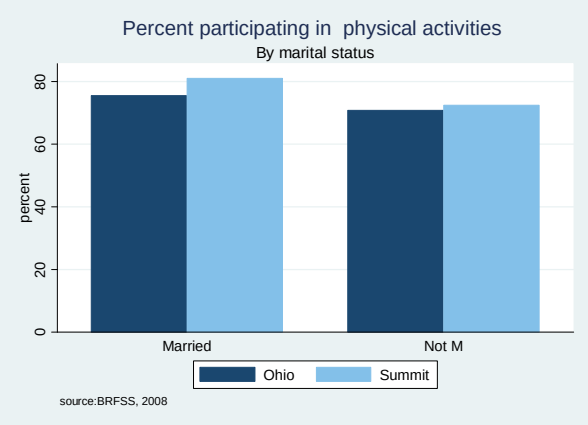


Figure 62:



Finally, logistic regression was also used here to examine the potential for differences in subpopulations, adjusted for the other demographic factors. All demographic factors were statistically significant (at 10% level). Being in the highest income group had the strongest effect (Adjusted Odds Ratio of 2.7).

Summary:

The percentage of adults who were involved in physical activity increased. It was significantly higher for males and whites. The rates increased with higher income and education. The rates for the county were slightly better than for the state.

Table 23: Physical Activity

		Summit County 2008		Ohio State 2008	
		Estimate	95% CI	Estimate	95% CI
ALL	Overall	77.94	75.67 80.21	73.98	72.85 75.12
SEX	Men	80.04	76.6 83.48	76.08	74.28 77.88
	Women	76.04	73.03 79.06	72.04	70.63 73.45
RACE	White	79.19	76.92 81.46	74.8	73.6 76
	Black	72.1	62.53 81.67	66.24	61.99 70.5
	Other	*		70.84	64.59 77.09
SEX BY RACE	white ,male	82.62	79.29 85.95	76.51	74.58 78.43
	black ,male	64.5*	49.09 79.92	72.33	65.67 78.98
	white ,female	76.06	73.00 79.11	73.2	71.72 74.68
	black ,female	78.13*	67.6 88.65	61.95	56.59 67.3
AGE GROUP	18-44	82.59	78.75 86.43	79.2	77.25 81.15
	45-64	77.34	74.06 80.61	72.3	70.71 73.88
	65 & Older	67.65	63.74 71.56	63.34	61.46 65.21
EDUCATION LEVEL	<High School	*		57.98	52.78 63.19
	HS / Some College	73.26	69.81 76.7	70.72	69.18 72.26
	4+ Yrs. College	87.5	84.85 90.14	84.57	83.06 86.08
ANNUAL INCOME	<$25,000	63.54	57.97 69.1	59.77	57.00 62.55
	$25,000-$49,999	76.36	71.68 81.05	71.13	68.76 73.51
	$50,000 or More	86.64	83.83 89.45	83.77	82.33 85.21
MARITAL STATUS	Married/Couple	81.09	78.45 83.74	75.61	74.28 76.94
	Not Married/Couple	72.39	68.05 76.73	70.9	68.78 73.02
GEOGRAPHY	West Akron	79.12	74.10 84.14		
	East Akron	66.88	60.42 73.35		
	North Suburbs	82.97	79.58 86.35		
	South Suburbs	74.91	70.21 79.62		

* Sample size was not large enough to obtain a reliable estimate.

Table 24: Physical Activity in Ohio

	Ohio	
Year:	Rate(%)	95% CI
1996	57.4	(54.6-60.2)
1998	70.2	(67.9-72.5)
2000	68.7	(66.4-71.0)
2001	73.8	(72.0-75.6)
2002	74.6	(72.9-76.3)
2003	73.6	(71.8-75.4)
2004	77.0	(75.1-78.9)
2005	74.4	(72.8-76.0)
2006	75.5	(73.3-77.7)
2007	75.7	(74.5-76.9)
2008	74.0	(72.8-75.1)

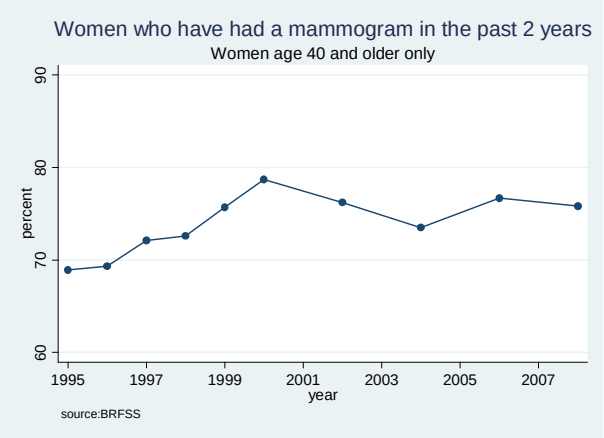
12. Women's Health

Breast cancer is the most frequent type of cancer in women, and the second leading cause of cancer-related death in women. The Age-Adjusted Invasive Cancer Incidence Rate for 2005 was 117.7 for U.S. (117.6 for Ohio) per 100,000. Scheduled mammogram exams decrease delayed diagnosis of breast cancer and increase the survival rates. Because of the importance of regular cancer screening, specific questions related to breast and cervical cancer were asked in BRFSS.

Breast Cancer

Women age 40 and older were asked for their latest mammogram exam. Overall 75.8% of the women age 40 and older in Ohio (73% in Summit) reported having had a mammogram within the last 2 years. This rate has significantly increased since 1995 in Ohio, but did not change the last few years- data is presented in Table 25 and in Figure 63, below.

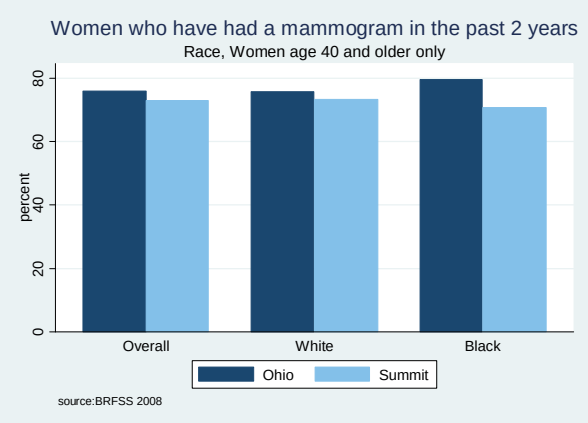
Figure 63:



Currently, there is some controversy surrounding the recommended frequency of mammogram exams, which was likely to affect the rates in the near future.

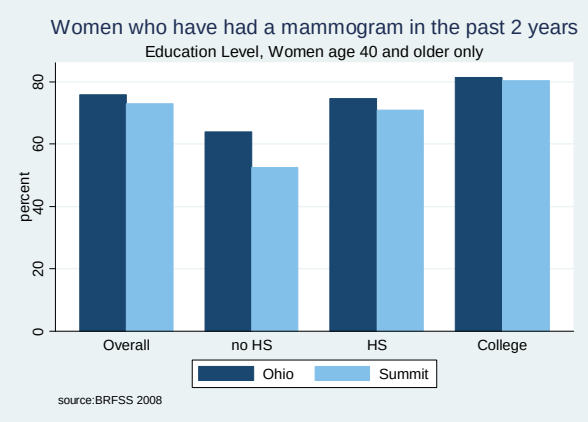
Race – There was no significant difference between the races in the state and the county. The proportion for African American women was 7% lower in the county, than in the state.

Figure 64:



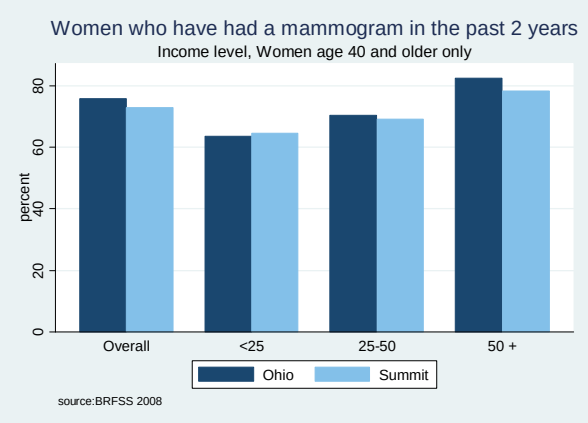
Educational attainment – There were significant differences between the rates for different educational groups. There was a 10.7% difference between the women with and without High School diploma for the state. The difference was even larger for the county. However, the confidence interval for African American women age 40 and older in the county was very wide. Women with college degree have 6.8% (9.4% for the county) higher rates than those with High school diploma.

Figure 65:



Income – There was an increase of 6.8% between the lowest and the middle income group in the state (4.8% in Summit). Additionally, the rate for women in the highest income group was 12.1% higher than the middle group in Ohio (9.1% in the county).

Figure 66:



Marital status – Married women had significantly higher rates – by 8.2% for the state and 5.3% for the county.

Factors impacting mammogram examinations – Next, we examine the association between different characteristics using a statistical model. Logistic regression was used to examine the association of factors which were expected to affect the likelihood to have a mammogram exam. Adjusted odds ratios (AORs) were calculated to describe the effects for different factors. The dependent variable (response) was the indicator whether a woman had had a mammogram in the last 2 years. The factors we included were health plan coverage, age, race, education, income, marital status and whether there was a personal doctor or health care provider. Our analysis concluded that a personal doctor was the most important factor (AOR=4.0), followed by being in the highest income group (AOR=2.7) for a woman to have a mammogram. Health coverage, marital status and education were also found to significantly increase the likelihood of having a mammogram.

Cervical Cancer

Regular Pap tests have led to a major decline in the number of cervical cancer cases and deaths. BRFSS specifically asked women age 18 and older if they had had a pap test the last three years. Overall rate for the state was 82.7% and 80.6% for the county- the data is presented in Table 25.

Gender and race – Black women had 6% higher rates for the state and 8% for the county, but the differences were not significant. The only significant difference was for women age 65 and older- they had 20% lower rate compared to the group aged 18-44 in Ohio. The results for the county were very similar (see Figures 67 and 68).

Figure 67:

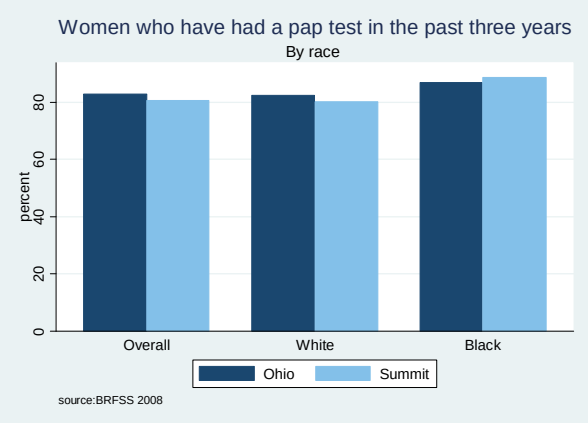
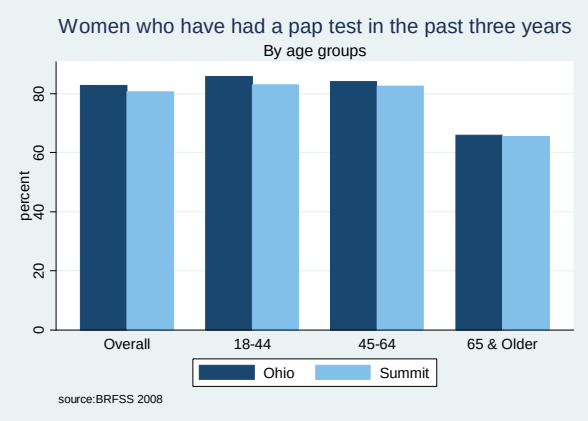
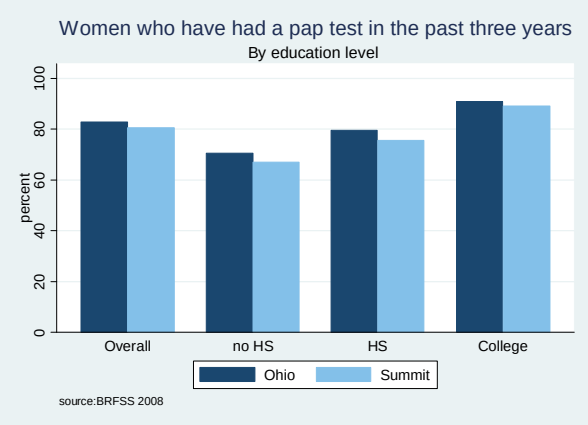


Figure 68:



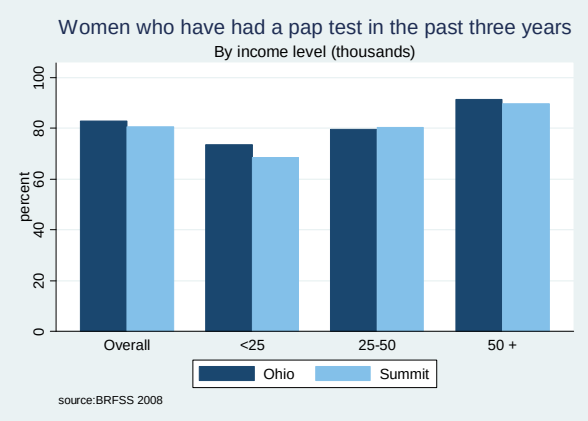
Educational attainment – The likelihood of having a Pap test during the preceding 3 years increased significantly with education and income levels. For example women with a High School diploma were 9.2% more likely to have the test compared to those without in Ohio. A college degree further increased the likelihood by 11.4% compared to the middle group. The results for the county were similar.

Figure 69:



Income – The rate in the middle income group was 6.3% higher than the lowest, and additionally 11.8% for the highest earning group in the state. The corresponding percentages for the county were 11.6% and 9.5%, respectively.

Figure 70:



Marital status – Married women had significantly higher rates- 13.7% in Ohio and 19.5% in Summit.

Table 25: Women age 40+, who have had a mammogram in the past two years

	Ohio	
Year:	**Rate (%)**	**95% CI**
1995	68.9	(64.3-73.5)
1996	69.3	(65.1-73.5)
1997	72.1	(68.7-75.5)
1998	72.6	(68.9-76.3)
1999	75.7	(72.0-79.4)
2000	78.7	(75.4-82.0)
2002	76.2	(73.7-78.7)
2004	73.5	(70.3-76.7)
2006	76.7	(73.7-79.7)
2008	75.8	(74.4-77.2)

Table 26: Women aged 40+ who have had a mammogram in the past two years

		Summit County 2008		Ohio State 2008	
		Estimate	95% CI	Estimate	95% CI
OVERALL	All	72.93	69.71 76.14	75.82	74.42 77.22
RACE	White	73.31	69.96 76.66	75.73	74.25 77.21
	Black	70.7	58.75 82.65	79.52	74.67 84.36
	Other	*		67.04	55.95 78.14
AGE GROUP	40-64	71.88	67.72 76.04	75.31	73.48 77.13
	65 & Older	75.24	70.61 79.87	76.93	74.91 78.95
EDUCATION LEVEL	<High School	52.54	38.58 66.49	63.95	58 69.89
	HS / Some College	71.00	66.87 75.12	74.68	72.9 76.46
	4+ Yrs. College	80.40	75.13 85.67	81.47	79.07 83.87
ANNUAL INCOME	<$25,000	64.5	57.85 71.16	63.53	60.51 66.54
	$25,000-$49,999	69.25	62.45 76.04	70.36	70.34 76.39
	$50,000 or More	78.31	73.01 83.62	82.52	80.26 84.79
MARITAL STATUS	Married/Couple	74.87	70.49 79.25	78.69	76.88 80.5
	Not Married/Couple	69.6	65.07 74.14	70.49	68.31 72.68
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate.

Table 27: Pap test in the last 3 years

		Summit County 2008 Estimate	95% CI		Ohio State 2008 Estimate	95% CI	
OVERALL	All	80.64	76.84	84.45	82.7	81.09	84.31
RACE	White	80.22	76.14	84.3	82.35	80.62	84.08
	Black	88.67	80.73	96.61	86.86	81.15	92.57
	Other	*			83.51	76.45	90.58
AGE GROUP	18-44	83.1	76.98	89.22	85.88	83.34	88.42
	45-64	82.62	77.73	87.51	84.03	82.07	85.99
	65 & Older	65.43	58.07	72.79	65.86	62.66	69.06
EDUCATION LEVEL	<High School	66.99	46.05	87.92	70.39	62.71	78.07
	HS / Some College	75.5	69.9	81.09	79.56	77.22	81.89
	4+ Yrs. College	89.17	84.62	93.72	90.96	89.38	92.53
ANNUAL INCOME	<$25,000	68.53	59.65	77.41	73.37	69.75	76.99
	$25,000-$49,999	80.17	71.88	88.46	79.66	76.25	83.06
	$50,000 or More	89.67	85.12	94.22	91.43	89.67	93.19
MARITAL STATUS	Married/Couple	88.25	84.66	91.83	87.9	86.44	89.36
	Not Married/Couple	68.71	61.25	76.18	74.23	70.85	77.61
GEOGRAPHY *	West Akron						
	East Akron						
	North Suburbs						
	South Suburbs						

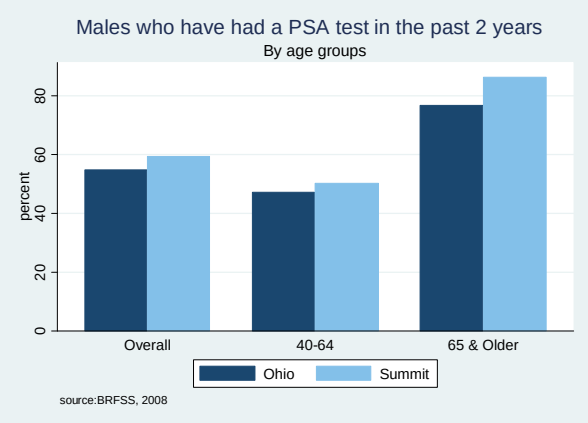
* Sample size was not large enough to obtain a reliable estimate.

13. Men's Health

The PSA test is a blood test that measures the level of Prostate-Specific Antigen (PSA) in the blood. The levels of PSA in the blood can be higher in men who have prostate cancer. CDC reports that not all medical experts agree that screening for prostate cancer will save lives. Currently, there is not enough evidence to decide if the potential benefits of prostate cancer screening outweigh the potential risks.

Age – BRFSS asked male respondents aged 40+ if they have had a PSA test in the past 2 years. The rate has increased by 3.3% for the last 6 years, as presented in Table 28. There was a significant difference between the two age groups. The older residents had 29.5% percent higher rate in the state and 36.1% in the county.

Figure 71:



Educational attainment – Higher education was not associated with higher rates. Married men had significantly higher rates- by 8.5% in the state and 12.3% in the county.

Table 28: PSA test in the last 2 years, OH

		Ohio
Year:	**Rate (%)**	**CI**
2002	51.3	(47.7-54.9)
2004	53.1	(48.5-57.7)
2006	56.1	(51.7-60.5)
2008	54.6	(52.4-56.9)

Table 29: PSA test

		Summit County 2008 Estimate	95% CI		Ohio State 2008 Estimate	95% CI	
ALL	Overall	59.23	54.29	64.18	54.63	52.41	56.85
RACE	White	60.7	55.54	65.85	54.82	52.49	57.16
	Black	46.51	26.55	66.46	54.46	44.55	64.37
	Other	38.5	10.64	66.35	47.54	35.58	59.51
AGE GROUP	40-64	50.15	44.08	56.22	47.09	44.39	49.79
	65 & Older	86.27	81.59	90.95	76.58	73.65	79.52
EDUCATION LEVEL	<High School	60.8	39.09	82.51	55.72	47.78	63.66
	HS / Some College	56.7	49.66	63.75	50.65	47.69	53.62
	4+ Yrs. College	61.7	54.45	68.95	60.26	56.65	63.87
ANNUAL INCOME	<$25,000	46.2	35.22	57.18	48.28	43.59	52.98
	$25,000-$49,999	63.35	54.22	72.49	54.15	49.79	58.52
	$50,000 or More	60.61	53.46	67.77	55.27	51.93	58.61
MARITAL STATUS	Married/Couple	62.57	56.68	68.46	56.38	53.77	59.00
	Not Married/Couple	50.26	41.42	59.1	47.93	44.01	51.86
GEOGRAPHY *	West Akron						
	East Akron						
	North Suburbs						
	South Suburbs						

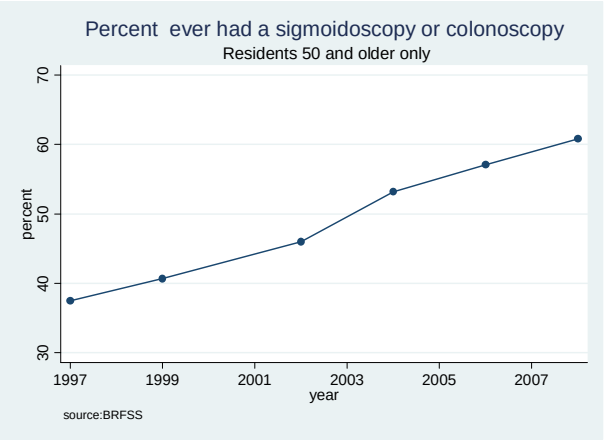
14. Colorectal Cancer Screening

Colorectal cancer is the second leading cancer killer in the United States. CDC estimates that if everyone aged 50 years or older had regular screening tests, at least 60% of deaths from this cancer could be avoided.

BRFSS respondents aged 50 or older were asked if they had ever had a sigmoidoscopy or colonoscopy. The overall rate for the state was 60.8% and 64.7% for the county.

The rate had increased by 23.3% in Ohio over the last 11 years, as the figure below illustrates. The data is presented in Table 30.

Figure 72:

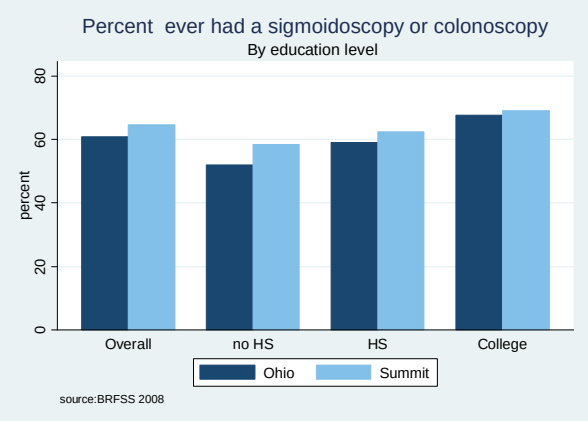


Gender and race – There were no significant differences between the genders or by racial groups in the state. The estimated percentage for black females for the county was 51.7%, well below the estimated 64.7% for the state. However, due to small sample sizes, the estimate for the county was too small to generate estimates for Summit County.

Age – The age group 65 and older had significantly higher rates in the state (by 13.6%) and in the county (by 14.5%).

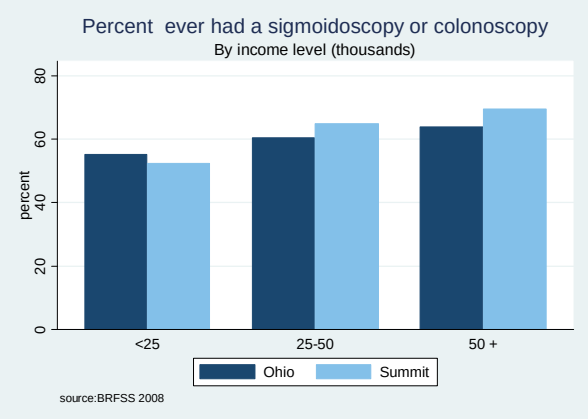
Educational attainment – Higher education increased the likelihood for having a screening test. The differences were significant in the state with an increase of 7% and 8.7% for each additional level of education.

Figure 73:



Income – Similarly, higher income was associated with higher rates in both the state and the county. The differences were significant between the lowest earning group and the rest. This difference was particularly noticeable in the county, where the middle income group has 12.5% higher rate than the lowest.

Figure 74:



Marital status – Married residents had significantly higher rates in the state (by 3.7%) and the county (by 9%).

Table 30: Colorectal Screening, OH

		Ohio
Year:	**Rate (%)**	**CI**
1997	37.5	(34.3-40.7)
1999	40.7	(36.5-44.9)
2002	46.0	(43.2-48.8)
2004	53.2	(49.8-56.6)
2006	57.1	(54.0-60.2)
2008	60.8	(59.4-62.3)

Table 31: Colorectal Screening

		Summit County 2008		Ohio State 2008	
		Estimate	95% CI	Estimate	95% CI
ALL	Overall	64.68	61.54 67.81	60.84	59.42 62.26
SEX	Men	66.86	61.54 72.18	59.54	57.17 61.91
	Women	62.85	59.15 66.55	61.92	60.2 63.63
RACE	White	65.87	62.62 69.13	61.23	59.75 62.71
	Black	52.46	39.93 64.98	60.3	54.38 66.22
	Other	*		49.97	38.86 61.09
SEX BY RACE	white ,male	68.41	62.98 73.83	60.53	58.09 62.96
	black ,male	53.43	29.93 76.93	53.01	42.1 63.93
	white ,female	63.75	59.84 67.67	61.82	60.02 63.62
	black ,female	51.67	39.27 64.07	64.73	58.2 71.26
AGE GROUP	18-44	NA		NA	
	50-64	58.87	54.35 63.39	55.25	53.22 57.27
	65 & Older	73.32	69.62 77.01	68.87	67.05 70.68
EDUCATION LEVEL	<High School	58.49	43.66 73.33	51.94	47.08 56.79
	HS / Some College	62.5	58.46 66.54	58.98	57.18 60.78
	4+ Yrs. College	69.11	63.94 74.28	67.63	65.04 70.23
ANNUAL INCOME	<$25,000	52.32	46.13 58.51	55.26	52.56 57.96
	$25,000-$49,999	64.81	58.42 71.21	60.44	57.51 63.37
	$50,000 or More	69.37	64.16 74.57	63.8	61.33 66.27
MARITAL STATUS	Married/Couple	67.74	63.65 71.84	62.09	60.26 63.92
	Not Married/Couple	58.71	54.00 63.41	58.4	56.29 60.51
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate.

15. HIV testing

CDC estimates approximately 16-22 million persons in the United States are tested for HIV. However, at the end of 2003, approximately 252,000-320,000 persons were unaware of their HIV infection.

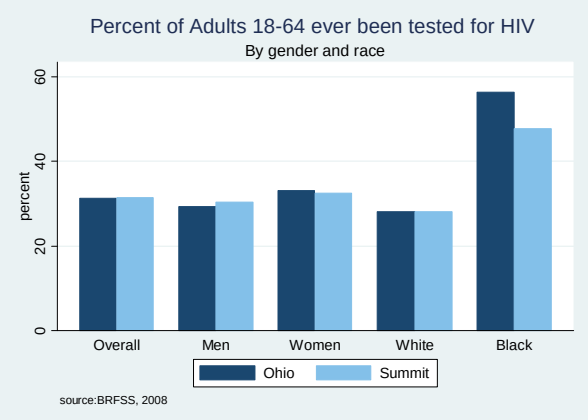
Considerable efforts have been made by public health officials to ensure that more people will know their HIV status. This will allow infected persons to take advantage of the therapies and take measures to reduce the spread of the virus.

BRFSS respondents aged 18-64 were asked if they have ever been tested for HIV.

The overall rate was 31.2% for the state and 31.4% for the county. The complete results are presented in Table 32.

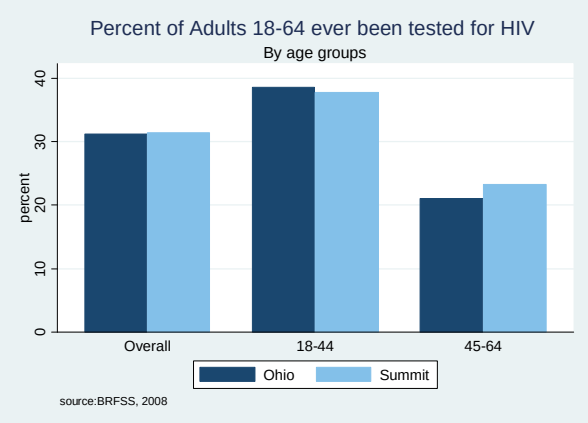
Gender and race – The rates for African-Americans were significantly higher: by 28.2% for the state and 19.7% for the county. Women had 3.8% higher rates in the state and 2.1% in Summit.

Figure 75:



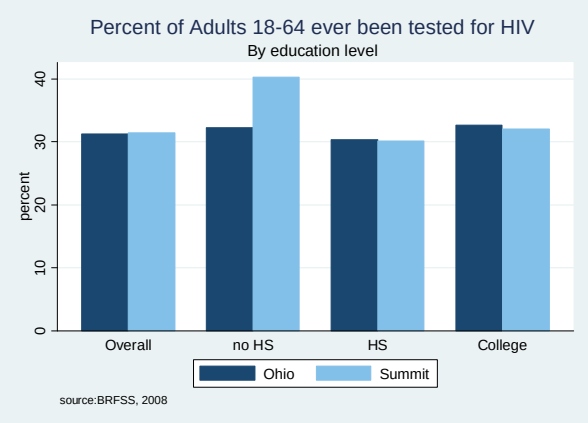
Age – The rates for the youngest age group were significantly higher for the state (by 17.5%) and the county (by 14.5%). This was not surprising since the age group 18-44 was at significantly higher risk for becoming infected with HIV.

Figure 76:



Income – The lowest income group had significantly higher rates in both the state (by 10%) and the county(by 10.1%) compared to the middle group.

Figure 77:



Marital status – The rate for married residents was lower by 4% in the state, which was significant. The estimates for the county were not significantly different and were actually lower by 4% for the unmarried residents.

Figure 78:

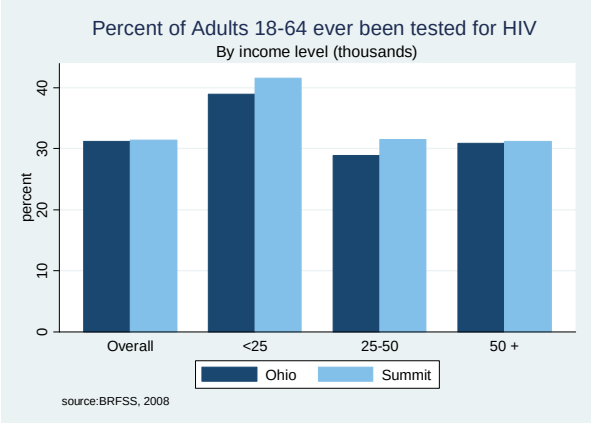


Table 32: Adults aged 18-64 that have ever been tested for HIV

		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	31.42	28.1 34.75	31.21	29.7 32.73
SEX	Men	30.33	25.24 35.41	29.3	26.99 31.61
	Women	32.46	28.08 36.84	33.08	31.11 35.06
RACE	White	28.04	24.82 31.25	28.15	26.57 29.74
	Black	47.71	32.46 62.97	56.37	50.87 61.87
	Other	43.41	26.73 60.09	47.05	39.17 54.93
SEX BY RACE	white ,male	24.86	19.99 29.73	26.72	24.3 29.13
	black ,male	63.36	45.67 81.05	58.93	49.59 68.27
	white ,female	31.1	26.9 35.31	29.61	27.55 31.67
	black ,female	34.28	16.14 52.41	54.5	47.9 61.10
AGE GROUP	18-44	37.76	32.39 43.14	38.55	36.19 40.9
	45-64	23.27	19.87 26.67	21.06	19.53 22.59
	65 & Older	NA		NA	
EDUCATION LEVEL	<High School	40.31	25.27 55.34	32.25	25.53 38.97
	HS / Some College	30.15	25.35 34.96	30.3	28.24 32.35
	4+ Yrs. College	32.01	27.26 36.75	32.63	30.32 34.94
ANNUAL INCOME	<$25,000	41.57	33.98 49.17	38.9	35.14 42.66
	$25,000-$49,999	31.49	23.73 39.25	28.88	25.79 31.97
	$50,000 or More	31.13	26.84 35.42	30.87	28.78 32.96
MARITAL STATUS	Married/Couple	32.85	28.8 36.91	29.87	28.13 31.61
	Not Married/Couple	28.73	23.07 34.4	34.06	31.1 37.03
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate

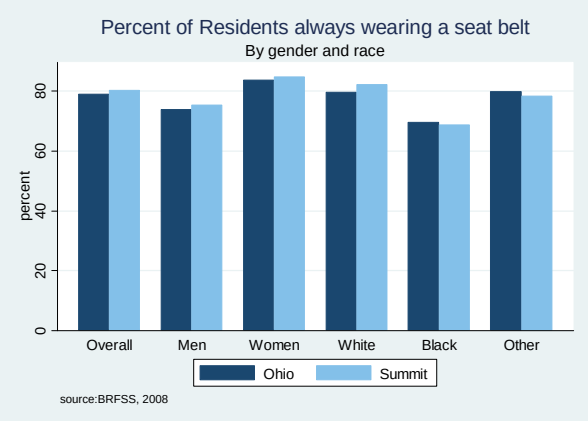
16. Seat Belt Usage

Ohio's safety belt law was enacted in March, 1986 and revised in November, 1992. The law requires front-seat passengers of cars, vans, pickup and delivery trucks, taxicabs, commercial trucks and tractor-trailers, and buses with safety belts installed to wear them when these vehicles were driven on public roadways. Ohio Department of Public Safety reported 46.5% of the drivers always used seat belt in 1990 and 65.3% in 2000.

The BRFSS estimates for 2008 were 79.1% for the state and 80.4% for the county. However, there were differences between different demographic groups. The complete results are presented in Table 33.

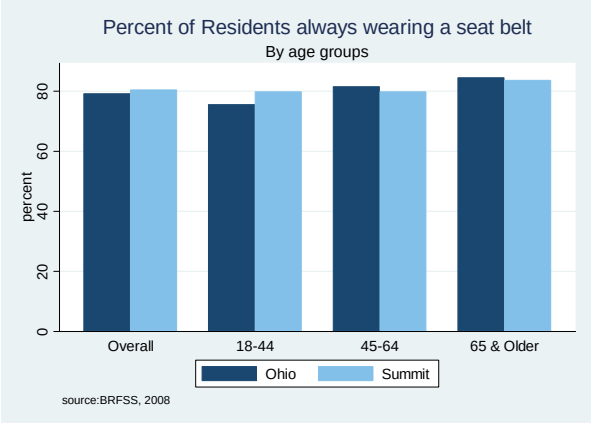
Gender and race – The rates for women were significantly higher by 9.9% in the state and 9.5% in the county. White residents have higher rates than black residents by 13.41 % in the state and 10.2% in the county.

Figure 79:



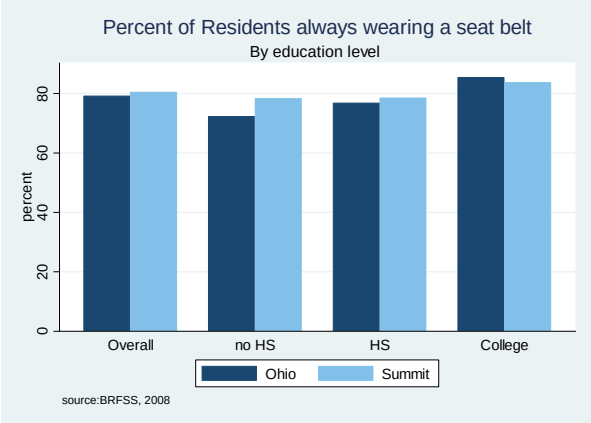
Age – There were significant differences between the age groups in the state. The middle age group had 6.1% higher rate than the group 18-44 years old. The age group 65 and older had the highest rate of 84.4%, 3% higher than the middle group. The differences in the county were not significant.

Figure 80:



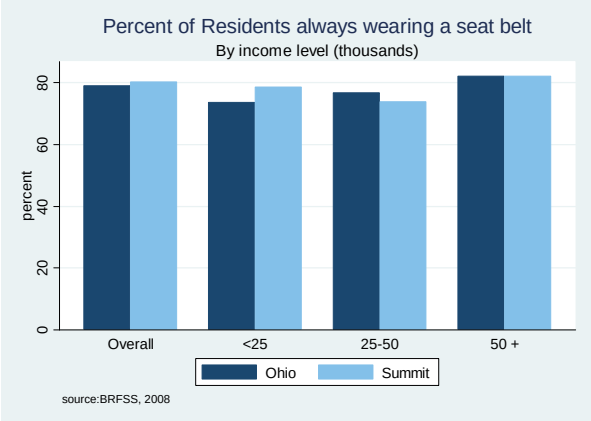
Educational attainment – The college graduates in both the state and the county had significantly higher rates than the other two groups. The differences between the rates for the college and high schools graduates were 8.6% for Ohio and 5% for Summit.

Figure 81:



Income – Similarly, the residents in the highest earning group had significantly higher rates. Their rate was 5.3% higher in the state and 8.3% higher in the county, compared to the middle group.

Figure 82:



Marital status – Married residents had 6% higher rate for the state and 4.3% in the state.

Drinking and Driving

Another question in BRFSS 2008 addressed drinking and driving.

The question was: During the past 30 days, how many times have you driven when you've had perhaps too much to drink?

The results for Ohio are presented in Table 34 with similar findings as for the seat belt usage: the rate was significantly lower for women, older and married residents. The only difference was that African-Americans had a lower rate (a finding which was not statistically significant).

Table 33: Always Wearing seat belt

		Summit County 2008 Estimate	95% CI	Ohio State 2008 Estimate	95% CI
ALL	Overall	80.38	77.95 82.82	79.09	77.96 80.22
SEX	Men	75.38	71.17 79.58	73.92	72.02 75.82
	Women	84.87	82.39 87.35	83.83	82.57 85.09
RACE	White	82.14	79.84 84.43	79.78	78.58 80.98
	Black	68.73	57.03 80.43	69.6	65 74.2
	Other	78.46	64.28 92.64	79.93	74.65 85.21
SEX BY RACE	white ,male	78.33	74.38 82.28	74.75	72.73 76.76
	black ,male	60.21	42.19 78.22	57.89	49.44 66.35
	white ,female	85.61	83.17 88.06	84.49	83.16 85.82
	black ,female	75.59	62.78 88.4	77.69	72.88 82.49
AGE GROUP	18-44	79.73	75.21 84.25	75.34	73.25 77.42
	45-64	79.64	76.52 82.76	81.41	79.99 82.83
	65 & Older	83.48	79.84 87.11	84.43	83.02 85.83
EDUCATION LEVEL	<High School	78.14	69.07 87.2	72.11	67.15 77.08
	HS / Some College	78.5	74.94 82.06	76.72	75.2 78.23
	4+ Yrs. College	83.49	80.04 86.93	85.36	83.71 87.00
ANNUAL INCOME	<$25,000	78.7	74.11 83.29	73.77	71.07 76.46
	$25,000-$49,999	73.94	67.84 80.04	76.84	74.39 79.28
	$50,000 or More	82.23	78.74 85.73	82.18	80.59 83.77
MARITAL STATUS	Married/Couple	81.95	78.92 84.97	81.15	79.86 82.44
	Not Married/Couple	77.63	73.41 81.84	75.19	73.02 77.37
GEOGRAPHY *	West Akron				
	East Akron				
	North Suburbs				
	South Suburbs				

* Sample size was not large enough to obtain a reliable estimate

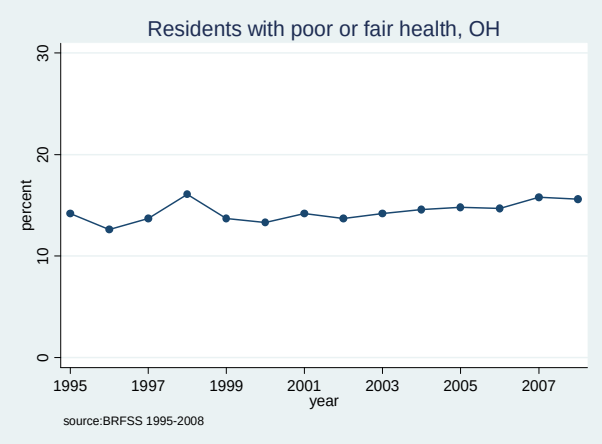
Table 34: Drinking and Driving

		Ohio State 2008 Estimate	95% CI
ALL	Overall	4.58	3.53 5.63
SEX	Men	6.13	4.54 7.73
	Women	2.77	1.47 4.08
RACE	White	4.69	3.55 5.83
	Black	2.57	.20 5.06
	Other	4.36	.23 8.48
AGE GROUP	18-44	6.28	4.41 8.15
	45-64	3.38	2.41 4.36
	65 & Older	.85	.30 1.39
EDUCATION LEVEL	<High School	4.63	1.05 8.2
	HS / Some College	5.76	4.03 7.48
	4+ Yrs. College	2.8	1.92 3.69
ANNUAL INCOME	<$25,000	3.38	1.81 4.94
	$25,000-$49,999	5.82	3.23 8.41
	$50,000 or More	4.21	3.01 5.4
MARITAL STATUS	Married/Couple	3.24	2.46 4.02
	Not Married/Couple	7.41	4.64 10.17
		Ohio	

17. Health Status

One of the questions for the participants in BRFSS was to self-identify their health status as Excellent, Very good, Good, Fair and Poor. Overall 15.6% in Ohio reported their health in the lowest two categories (13.4% in the county). The rates have not change significantly since 1995.

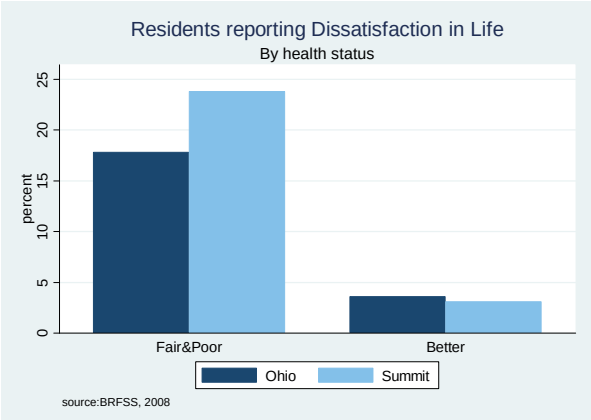
Figure 83:



The health status was closely related to the perception people had for the quality of their life. In another questions the participants were asked if they were satisfied with their life.

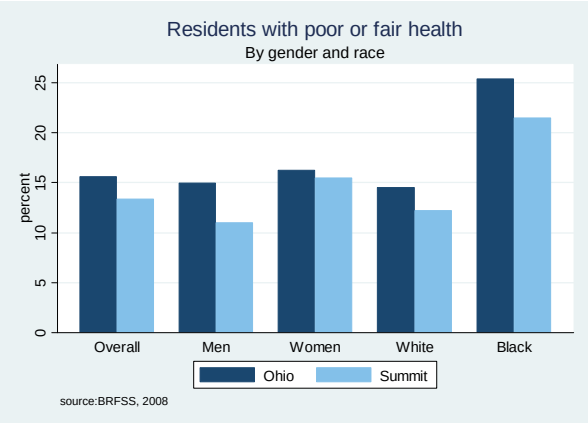
The figure below compares the percentages of those who reported they were dissatisfied with their life, based on their health status. The categories Good to Excellent were combined into Better. The percentage of residents reporting dissatisfaction was 3.6% for the state (3.1% for the county) in the group with "Better" health. In the "Poor and Fair Health" category, 17.8% of all Ohioans and 23.8% of Summit County residents were dissatisfied with their life.

Figure 84:



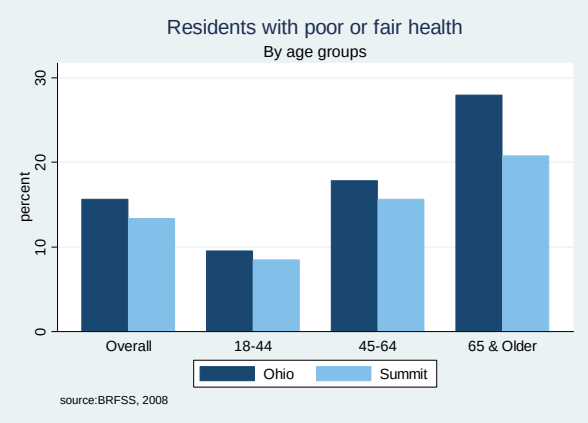
Gender and race – African-Americans had significantly higher rates than whites-10.9% for the state and 9.3% in the county.

Figure 85:



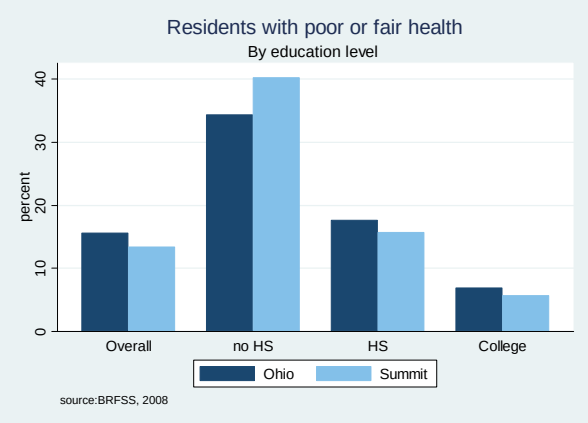
Age – There were significant differences between the age groups. The difference between the middle and youngest group was 8.3% for the state and 7.1% for the county. The age groups 65 and older had the highest rates - 27.9% for the state and 20.7% for the county. The percentages were 10.1% higher than the middle age group for the state and 5.2% for the county. Summit County had noticeably lower rate for the elderly residents.

Figure 86:



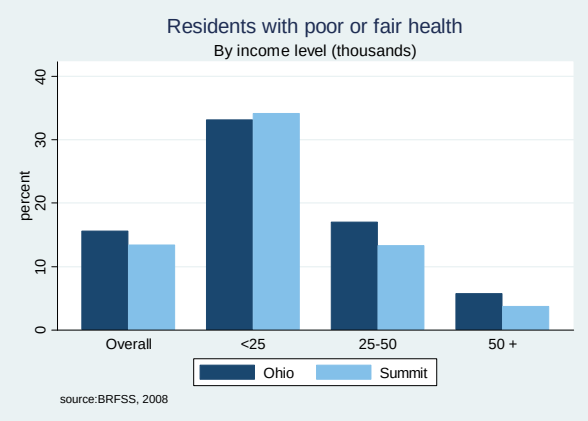
Educational attainment – There were 16.8% more residents with poor and fair health (24.5% for the county) in the group without High School compared to those with. College degree further reduced this percentage by 10.7% in the state and 10.1% in the county. All differences were significant.

Figure 87:



Income – Similarly, income level was strongly associated with the likelihood to have poor health. Differences between the first and the second groups were 16.1% and 20.9% for the state and the county, respectively. In addition, the rate for the most affluent group was further reduced by 11.3% for OH and 9.5% for Summit County.

Figure 88:



Marital status – Being married significantly reduced the rates for fair and poor health: by 8% in the state and 10.8% in the county.

Factors impacting health status – Next, we examined the association between different characteristics using logistic regression. Adjusted odds ratios (AORs) were calculated to describe the effects for different factors. The dependent variable (response) was the indicator whether a resident reported poor or fair health. The factors we included were health plan coverage, employment, age, race, education, income, marital status. Our analysis concluded that the most important factor reducing the likelihood of having poor or fair health was being in the highest income category (AOR=.26), followed by being employed (AOR=0.33) and having a college education (AOR=0.37).

Table 35: Health Status

		Summit County 2008		Ohio State 2008	
		Estimate	95% CI	Estimate	95% CI
ALL	Overall	13.35	11.56 15.14	15.62	14.7 16.54
SEX	Men	10.97	8.36 13.57	14.98	13.57 16.38
	Women	15.48	13.01 17.96	16.22	15.02 17.43
RACE	White	12.19	10.43 13.95	14.5	13.58 15.41
	Black	21.5	12.98 30.03	25.39	21.45 29.34
	Other	*		21.66	14.5 28.82
SEX BY RACE	white ,male	9.72	7.28 12.16	14.1	12.69 15.5
	black ,male	21.65	7.48 35.82	19.13	13.46 24.81
	white ,female	14.46	11.96 16.95	14.88	13.69 16.06
	black ,female	21.4	10.88 31.92	29.78	24.58 34.98
AGE GROUP	18-44	8.49	5.55 11.43	9.51	8.01 11
	45-64	15.63	12.93 18.33	17.83	16.46 19.2
	65 & Older	20.78	17.47 24.1	27.91	26.13 29.7
EDUCATION LEVEL	<High School	40.28	29.12 51.44	34.36	29.43 39.3
	HS / Some College	15.74	13.02 18.45	17.59	16.34 18.83
	4+ Yrs. College	5.67	4.00 7.35	6.87	5.86 7.88
ANNUAL INCOME	<$25,000	34.12	28.5 39.73	33.11	30.48 35.73
	$25,000-$49,999	13.27	9.75 16.79	17.01	15.03 18.99
	$50,000 or More	3.77	2.47 5.06	5.75	4.8 6.7
MARITAL STATUS	Married/Couple	9.37	7.52 11.21	12.73	11.72 13.75
	Not Married/Couple	20.15	16.36 23.95	20.7	18.87 22.53
GEOGRAPHY	West Akron	14.40	10.23 18.57		
	East Akron	17.95	13.23 22.67		
	North Suburbs	9.57	7.09 12.05		
	South Suburbs	13.24	9.86 16.62		

* Sample size was not large enough to obtain a reliable estimate.

Table 36: Health Status

	Ohio	
Year:	**Rate (%)**	**95% CI**
1995	14.2	(12.2-16.2)
1996	12.6	(10.9-14.3)
1997	13.7	(12.1-15.3)
1998	16.1	(14.3-17.9)
1999	13.7	(11.9-15.5)
2000	13.3	(11.6-15.0)
2001	14.2	(12.9-15.5)
2002	13.7	(12.4-15.0)
2003	14.2	(12.8-15.6)
2004	14.6	(13.0-16.2)
2005	14.8	(13.6-16.0)
2006	14.7	(13.1-16.3)
2007	15.8	(14.8-16.8)
2008	15.6	(14.7-16.5)

Appendix A: Methodology

Data from the 2008 Ohio BRFSS was used to compare health risk factors for different subpopulations. Where data was available, the trend for the last couple of years was indicated/estimated. The analysis was performed at both the state and county level. The sample size for state-wide data analysis was larger (n=12,962) compared to the county (n=2,080), and therefore has a greater ability to detect differences between groups. Statistical comparisons were made between demographic groups and different years using the t-test, at 5% significance level. Logistic regression was used in several analyses to adjust for different factors. Statistical comparison between the state and county was not considered as the county level data was a subset of the state sample. For most risk factors, there was a significant difference between the different income /educational attainment groups. For many of the risk factors, there was a significant difference between whites and African-Americans. All the analyses and plots were done in Stata10.

Weighting the BRFSS Data

The purposes of weighting the BRFSS data were to compensate for unequal probabilities of selection, to adjust for non-response and telephone non-coverage, to ensure that results were consistent with population data and to make population estimates.

BRFSS data were directly weighted for the probability of selection of a telephone number, the number of adults in a household, and the number of phones in a household. The weights for number of adults in a household and number of phones were needed because we want to make statistically valid inferences about individuals but we were sampling telephone numbers. Because only one person per household was interviewed, respondents in larger households have a smaller probability of selection than respondents in smaller households. For example, once the telephone number was selected, a person in a one-adult household has a 100% chance of being selected whereas a person in a two-adult household has only a 50% chance. A respondent in a one-adult household thus would get a weight of 1 for the number of adults factor whereas a respondent in a two-adult household would get a weight of 2. A similar logic applies to the number of phones: the more phones in the household, the greater the probability of selection of an individual and thus the smaller the weight.

With disproportionate stratified sampling (DSS), an adjustment was made based on whether the sampled telephone was from a bank of phones that was presumed to contain many households (a high density stratum) and telephone numbers from a bank that was presumed to contain few households (a low density stratum).

A final post-stratification adjustment was made for non-response and non-coverage of households without telephones. The weights for each relevant factor were multiplied together to get a final weight.

FINALWT = STRWT * (1/NPH) * NAD * POSTSTRAT

The computational formula above was intended to reflect all the possible factors that could be taken into account in weighting a state's data. Where a factor does not apply its value was set to one.

FINALWT was the final weight assigned to each respondent.

STRWT accounts for differences in the basic probability of selection among strata (subsets of area code/prefix combinations). It was the inverse of the sampling fraction of each stratum.

1/NPH was the inverse of the number of residential telephone numbers in the respondent's household.

NAD was the number of adults in the respondent's household.

POSTSTRAT was the number of people in an age-by-gender or age-by-race-by-gender category in the population of a region or a state divided by the sum of the products of the preceding weights for the respondents in that same age-by-gender or age-by-race-by-gender category. It adjusts for non-coverage and non-response and, before 1995, also adjusts for different probabilities of selection by region, where applicable.

Strengths and Weaknesses: As was the case with any survey-based research project, the BRFSS has important strengths and weaknesses which should be considered when thinking about the findings presented in this report:

Strengths: Among the strengths of this survey was the possibility to have State and County Estimates for important risk factors in a timely fashion. For many states, the BRFSS was the only available source of timely, accurate data on health-related behaviors. The use of land lines makes the survey cost effective and allows GIS and mapping capability. Another strength was the possibility of linking the survey to other data sources – EPA & Census data. Identifying subpopulations at higher risk allows the policy makers at state and county level to take actions and monitor the progress of programs (e.g. Asthma Follow-up).

Weaknesses: *Non-coverage Bias:* Non-coverage error occurs because not all members of the general population were capable of being included in the sample. Population groups typically excluded from most general population surveys include persons living in nonresidential settings, such as hospitals, nursing homes, prisons, military bases, and college dormitories. Compared with the size of the adult population of the state as a whole, the number of persons within the above-mentioned groups was generally small. Because the BRFSS uses telephone surveys, households without telephones were not included, making this a larger source of non-coverage error. For some populations (e.g. American Indians, African American in rural areas of some southern states), telephone non-coverage was much higher than for most populations. Persons

without telephones tend to have lower household incomes, and low income was associated with certain health risk behaviors.

As an example, where the use of landline telephones may cause bias estimates, the National Health Interview Survey (NHIS) estimates for the influenza vaccination rates were consistently lower than those from BRFSS (JAMA, Nov. 12, 2008-Vol. 300, No 18)

A pilot study has been developed for using cell phones to address another challenge - the non-coverage of households which use cell phones only.

Self-report Bias : The phone interviews allow easy access to information, but with the disadvantage of self report bias. A person may not remember (recall bias) whether he or she had had an influenza vaccination within the last year. Examples where one may expect self report bias was for information about income or reporting heavy drinking (because of the stigma that comes with it, they may have chosen not to reveal it).

Appendix B: Map of Geographic Breakdown