Wake County Human Services
Public Health Report

Chronic Diseases
2017

Heart Health Month – Feel the Beat Event - Zumba
Chavis Community Center – February 2017

2017 Summer Nutrition Program
Sunnybrook Site

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1.0 Overview

According to the Centers for Disease Control and Prevention (CDC), chronic diseases and conditions are among the most common, costly and deadly (yet at the same time preventable) of all health problems. The CDC defines chronic disease as a disease that has a prolonged course, does not resolve spontaneously, and for which a complete cure is rarely achieved, even with treatment (1). As of 2012, about half of all American adults—117 million people—had one or more chronic health conditions and one in four adults had two or more chronic health conditions (2).

Chronic diseases and conditions have an immense impact on the American healthcare system, with direct medical costs exceeding $750 billion each year (3). They are the leading cause of death and disability in the United States. In 2014, chronic diseases killed over 1.7 million Americans, representing 67% of all deaths. Heart disease and cancer alone killed 1.2 million Americans (nearly 46% of total deaths)(4). Yet despite the negative consequences for public health, the following statement from the public health journal *The Lancet* remains true: "The chronic disease burden in the USA largely results from a short list of risk factors--including tobacco use, poor diet and physical inactivity (both strongly associated with obesity), excessive alcohol consumption, uncontrolled high blood pressure, and hyperlipidemia--that can be effectively addressed for individuals and populations" (5).

This report contains information on the burden of chronic diseases in Wake County including:

- the leading causes of death that were chronic diseases (seven out of ten in 2016)
    - additional analysis for cancer, since the five most common types cancers that lead to death differ in their impact on the population
- the emergent issue of chronic liver disease and cirrhosis, in light of increases in hepatitis C cases and opioid-related overdose deaths
- risk factors for chronic diseases
- Wake County Human Services (WCHS) programs working to prevent these diseases and their health impacts

One limitation of this report is that except for overall mortality data for cancer and heart disease, the small numbers of deaths for Wake County's non-Hispanic American Indians, non-Hispanic other races and Hispanics do not allow for death rate calculations in most of the figures and tables. As a result, comparisons could only be made between White and African-American males and females.

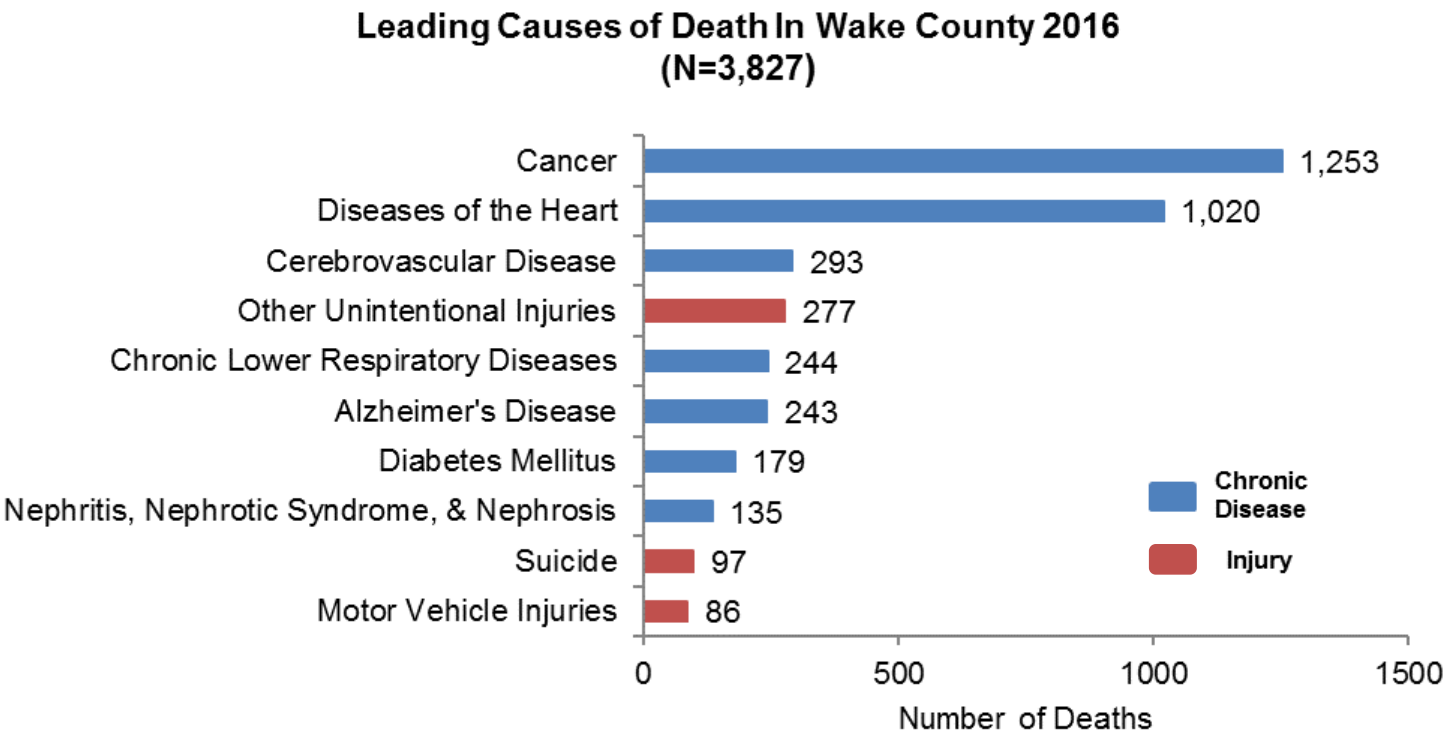
2.0 Leading Causes of Death

Mortality levels are regarded as accurate indicators of the overall health of a jurisdiction's population and its subgroups. They reflect quantity of life (in terms of life years gained for populations with low mortality rates and life years lost for those with high mortality rates). Links between mortality and morbidity also reflect quality of life (6).

Cancer remained the number one cause of death in Wake County in 2016 (Figure 1). The top seven leading causes of death in Wake County were ranked the same from 2015 to 2016. In 2016 nephritis, nephrotic syndrome and nephrosis ranked as the eighth leading cause of death, suicide ranked ninth, and motor vehicle injuries ranked tenth .

There were 5,558 total deaths in Wake County in 2016. The 1,731 deaths not shown in Figure 1 were from residual causes (residual death data not shown). "Residual causes" are all other causes of death not categorized here. There were 219 different residual causes of death in Wake County in 2016 and none of those causes represented more than 7% of all causes of death.

Figure 1



Source: Special report prepared by the NC State Center for Health Statistics (NC SCHS) 11/13/17.

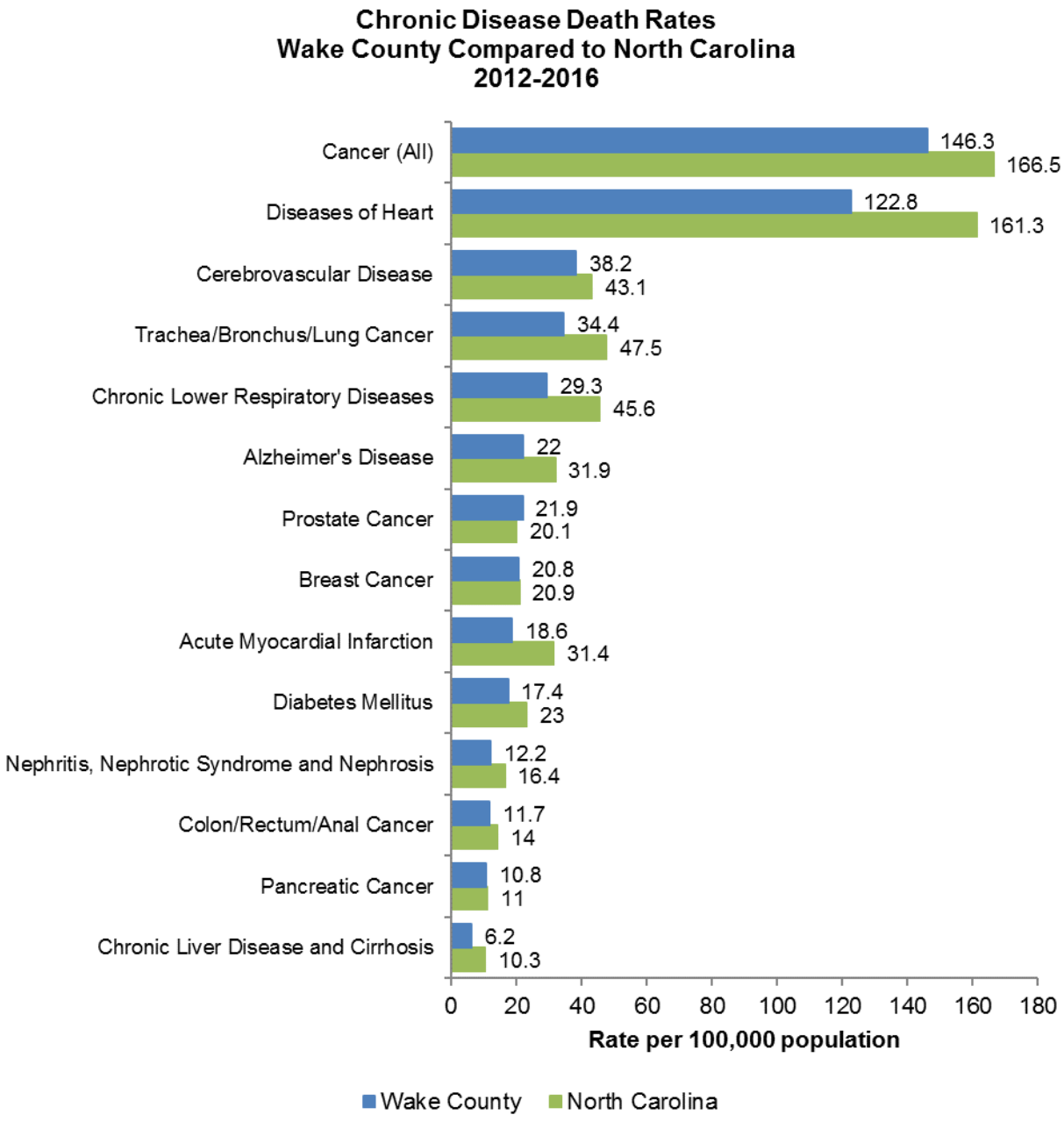
North Carolina's leading causes of death in 2016 were similar to Wake County's. The top eight causes of death in North Carolina were the same as in Wake County, though their ranks at the state level differed. Whereas suicide ranked ninth and motor vehicle injuries ranked tenth in Wake County, pneumonia and influenza ranked ninth and septicemia tenth in North Carolina.

Figure 2 shows Wake County had lower death rates than North Carolina for every chronic disease except prostate cancer in 2012-16.

2.1 Cancer

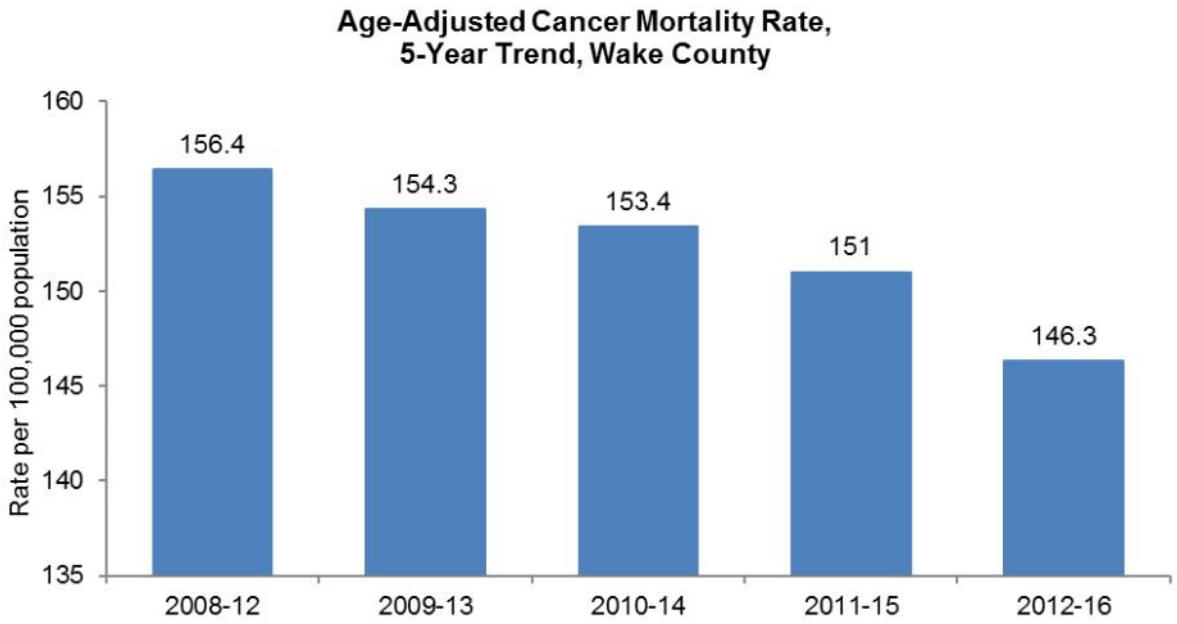
Cancer has almost overtaken heart disease as the number one killer both globally and nationally. It is the second leading cause of death worldwide (8.8 million deaths in 2015) as well as in the US (595,930 deaths in 2015)(7, 8). In North Carolina and Wake County, cancer is the leading cause of death. Wake County's overall cancer mortality rate was 12.1% lower than NC's in 2012-16 (Figure 2) and decreased by 6.5% (Figure 3).

Figure 2



Source: "Race/Ethnicity-Specific and Sex-Specific Age-Adjusted Death Rates". County Health Data Book 2018. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/, Accessed 11/13/17.

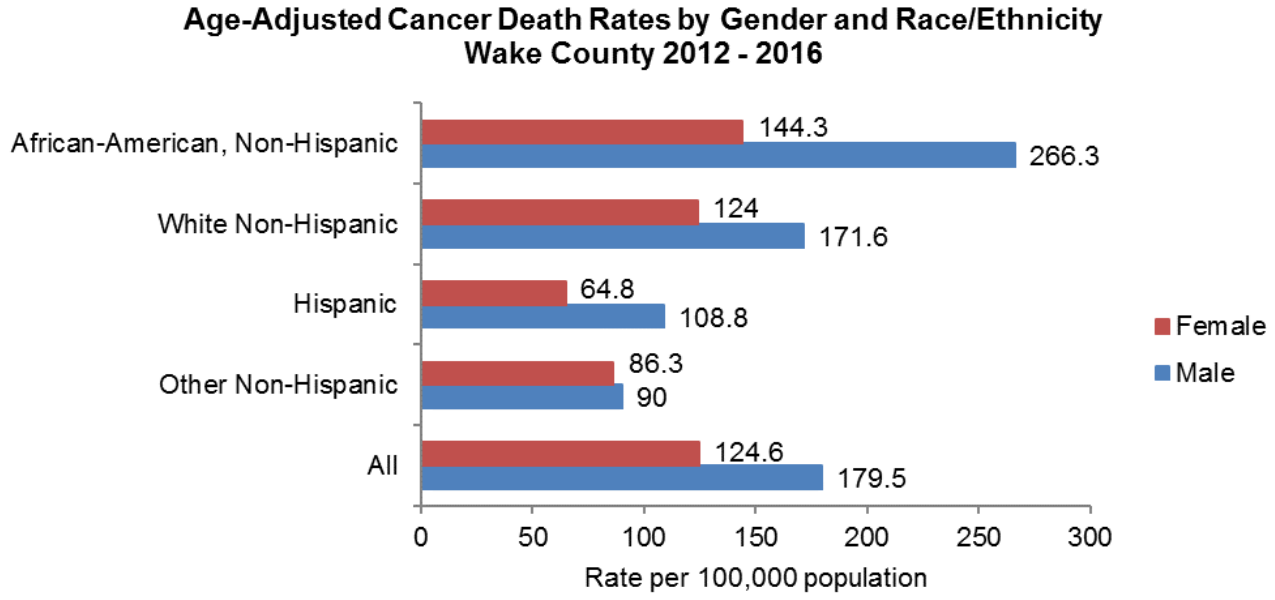
Figure 3



Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

Gender and racial disparities in cancer death rates persist in Wake County. In 2012-2016, men died at higher rates than women, and African-American Non-Hispanic males died at higher rates than individuals of both genders in other racial and ethnic groups (Figure 4).

Figure 4



Source: "Race/Ethnicity-Specific and Sex-Specific Age-Adjusted Death Rates". County Health Data Book 2018. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

When comparing cancer mortality and incidence by site, trachea/bronchus/lung cancer had the highest mortality rate in Wake County while breast cancer had the highest incidence rate (Table 1).

Table 1

Cancer Mortality and Incidence by Site Wake County 2011 - 2015*								
	Lung/ Bronchus		Female Breast		Prostate		Colon/Rectum	
Mortality	DEATHS	RATE	DEATHS	RATE	DEATHS	RATE	DEATHS	RATE
	1,406	36.4	520	21.6	305	22.7	469	11.5
Incidence	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
	2,172	54.2	4,265	169.7	2,558	121.5	1,392	32

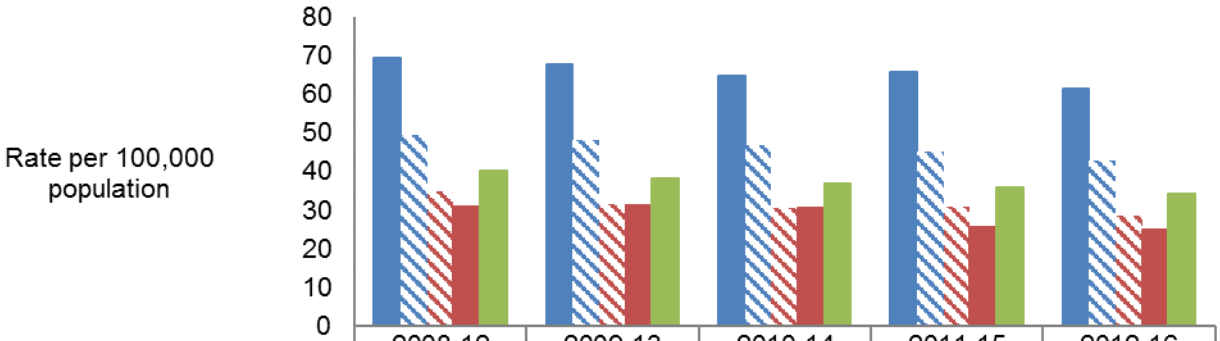
*2011-15 is the latest time period available for cancer mortality and incidence data.
Source:
Mortality rates: 2011—2015 Cancer Mortality Rates by County for Selected Sites. State Center for Health Statistics. http://www.schs.state.nc.us/schs/CCR/mort1115cnty.pdf. Accessed 12/18/17.
Incidence rates: Preliminary 2011—2015 Cancer Incidence Rates by County for Selected Sites. State Center for Health Statistics. http://www.schs.state.nc.us/schs/CCR/incidence/2015/5yearRates.pdf. Accessed 12/18/17.

2.1a Trachea/Bronchus/Lung Cancer

Trachea/bronchus/lung cancer was the leading cause of cancer-related deaths in Wake County from 2012-2016. The overall trachea/bronchus/lung cancer death rate in Wake County dropped 14.9% over the last five years. Men died at significantly higher rates than women, and African-American men died at significantly higher rates than white men. All four groups experienced double-digit percentage decreases in death rates over the last five years, with African-American women seeing the largest drop (18.8%) (Figure 5).

Figure 5

Trachea/Bronchus/Lung Cancer Death Rates by Race and Gender
5-Year Trend, Wake County



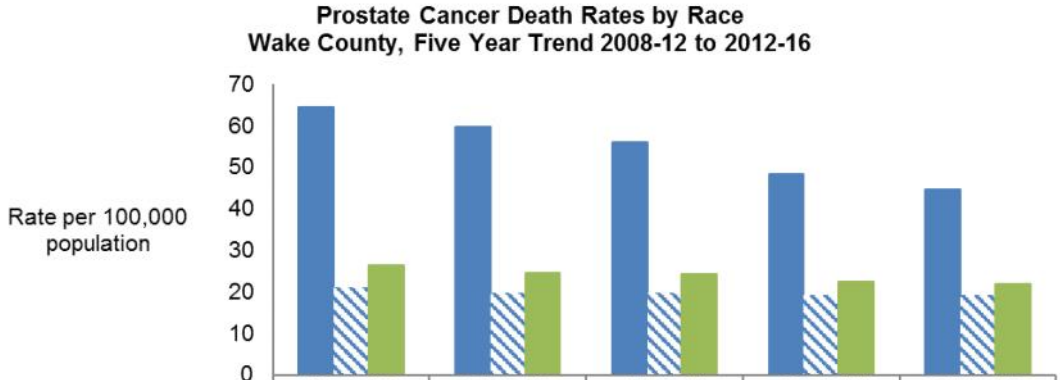
	2008-12	2009-13	2010-14	2011-15	2012-16
African-American Men	69.4	67.7	64.7	65.8	61.6
White Men	49.4	48.1	46.9	45.2	43
White Women	35	31.7	30.6	30.8	28.7
African-American Women	30.8	31.3	30.6	25.5	25
ALL	40.4	38.3	36.9	35.9	34.4

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC StateCenter for Health Statistics. http://www.schs.state.nc.us/data/databook/, Accessed 11/13/17.

2.1 b. Prostate Cancer

Prostate cancer was the second leading cause of cancer-related death in Wake County from 2012-16. While prostate cancer was the only chronic disease in which Wake County's mortality rates were higher than North Carolina's from 2012-2016 (Figure 2), prostate cancer mortality rates have declined over the past five years (Figure 6). African-American men have experienced much higher death rates than white men, yet African-American men's death rates decreased more sharply over five years. This drove an overall decline of 16.7% in the prostate cancer death rate from 2008-2012 to 2012-2016.

Figure 6



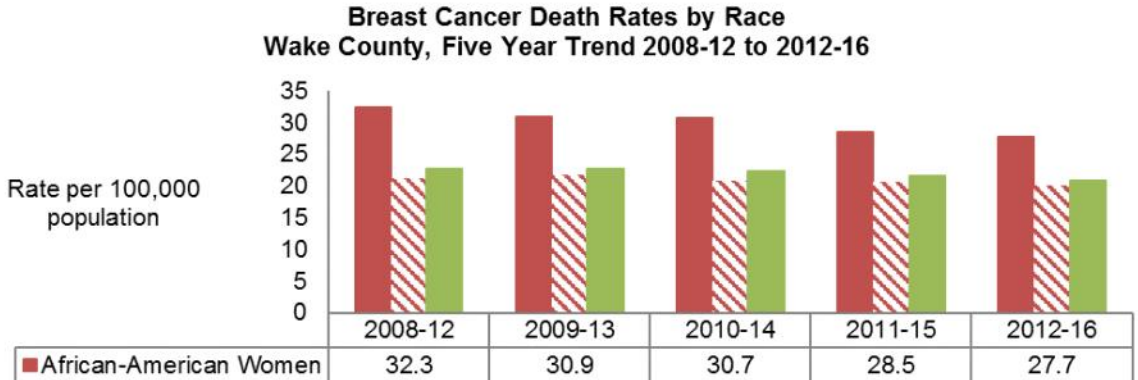
	2008-12	2009-13	2010-14	2011-15	2012-16
African-American Men	64.4	59.6	56.1	48.3	44.5
White Men	21	19.6	19.7	19.3	19.1
ALL	26.3	24.5	24.1	22.4	21.9

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

2.1c Breast Cancer

Breast cancer was the third leading cause of cancer-related death in Wake County from 2012-2016. Death rate dynamics for breast cancer in Wake County were similar to those of prostate cancer over the last five years (Figure 7). African-American women died at higher rates than white women, but the decline in death rates was steeper for African-American women than for white women (14.2% compared to 5.7%). Breast cancer death rates dropped overall by 8.4% from 2008-12 to 2012-16.

Figure 7



	2008-12	2009-13	2010-14	2011-15	2012-16
African-American Women	32.3	30.9	30.7	28.5	27.7
White Women	21.2	21.8	20.9	20.7	20
ALL	22.7	22.7	22.3	21.6	20.8

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

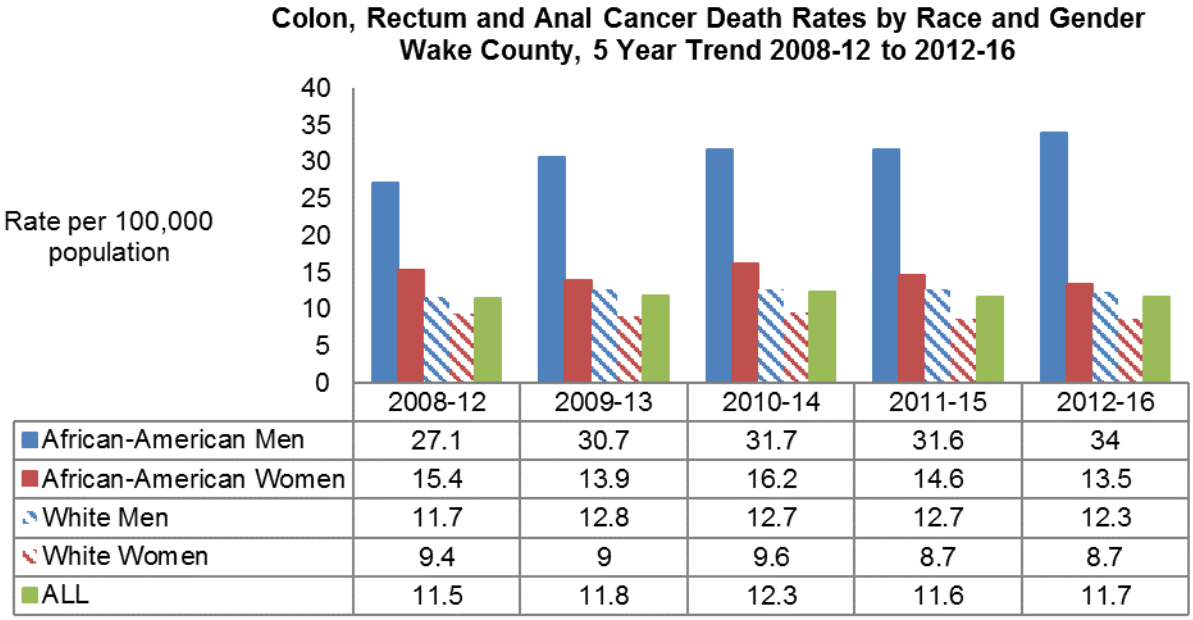
2.1d Colon/Rectum/Anal Cancer

Colon/rectum/anal cancer was the fourth leading cause of cancer-related death in Wake County from 2012-2016. Figure 8 shows that while the overall death rate barely budged in five years, there were significant disparities:

- African-Americans died at higher rates than whites
- African-American men died at much higher rates than other groups.
- Male death rates rose and female death rates fell.

The 25.4% increase in colon/rectum/anal cancer death rates in African-American men over five year trends is noteworthy, because African-American men were already experiencing the highest death rates from these cancers.

Figure 8



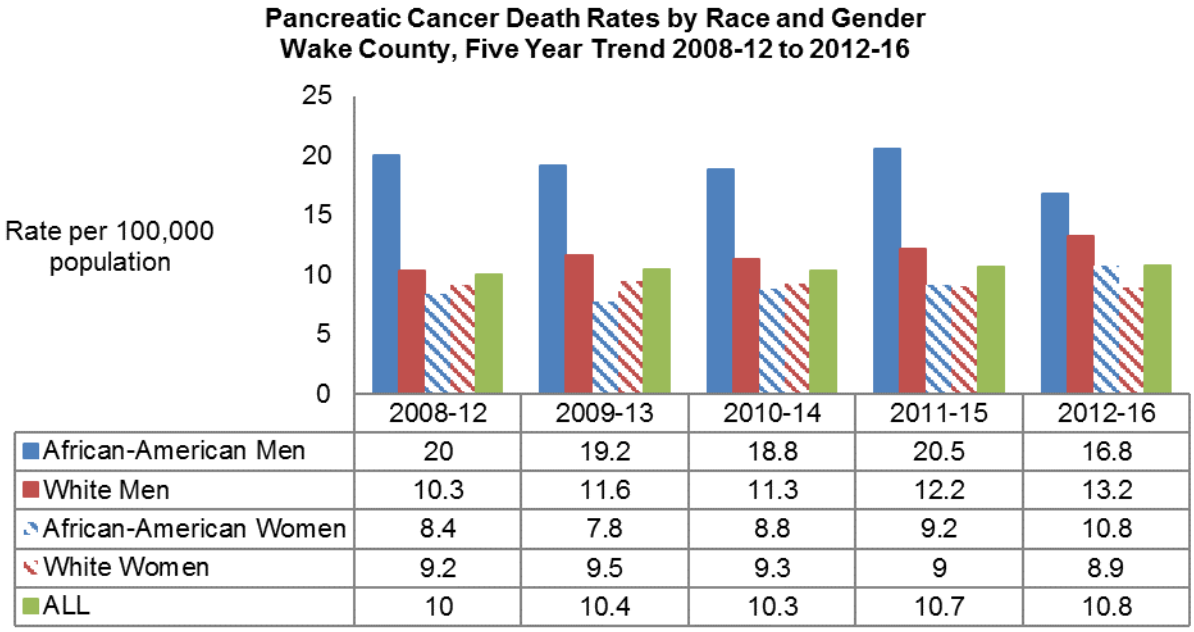
	2008-12	2009-13	2010-14	2011-15	2012-16
African-American Men	27.1	30.7	31.7	31.6	34
African-American Women	15.4	13.9	16.2	14.6	13.5
White Men	11.7	12.8	12.7	12.7	12.3
White Women	9.4	9	9.6	8.7	8.7
ALL	11.5	11.8	12.3	11.6	11.7

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

2.1e Pancreatic Cancer

Pancreatic cancer was the fifth leading cause of cancer-related death in Wake County in 2012-16. Figure 9 shows African-American men had the highest death rates from pancreatic cancer. However, over the last five years the death rate gap between African-American and White men has shrunk, due to a 28.2% death rate jump in White men. African-American women also experienced a significant increase over the five-year period (28.6%).

Figure 9



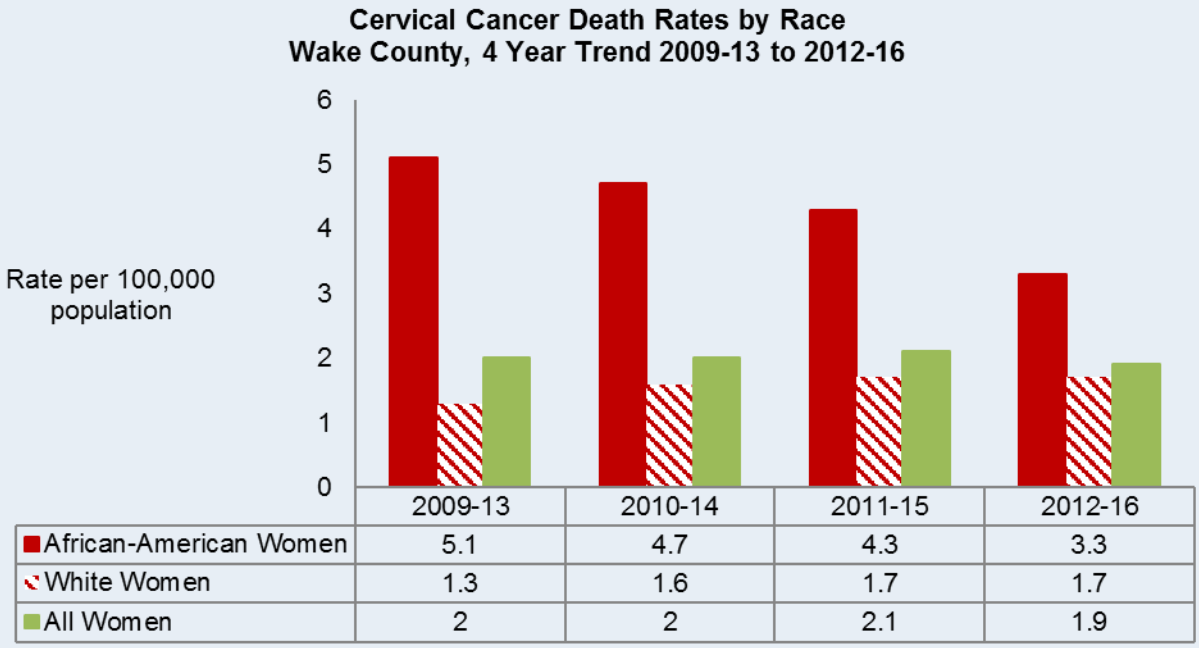
	2008-12	2009-13	2010-14	2011-15	2012-16
African-American Men	20	19.2	18.8	20.5	16.8
White Men	10.3	11.6	11.3	12.2	13.2
African-American Women	8.4	7.8	8.8	9.2	10.8
White Women	9.2	9.5	9.3	9	8.9
ALL	10	10.4	10.3	10.7	10.8

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

2.1f. HIGHLIGHT--Cervical Cancer

While not one of Wake County's leading causes of cancer deaths, cervical cancer deserves mention for the decline in its mortality rate racial disparity. From 2009-2013, the African-American cervical cancer death rate was almost four times the white rate, but from 2012-2016, the African-American rate had dropped to slightly less than double the white rate (Figure 10). The overall Wake County cervical cancer death rate decreased slightly from 2009-2013 to 2012-2016.

Figure 10



	2009-13	2010-14	2011-15	2012-16
African-American Women	5.1	4.7	4.3	3.3
White Women	1.3	1.6	1.7	1.7
All Women	2	2	2.1	1.9

Source: Special report prepared for WCHS by the NC SCHS 12/6/17.

The human papillomavirus (HPV) vaccine is a proven measure in reducing the incidence of cervical cancer. Table 2 shows how many HPV vaccine doses were administered to WCHS clients in each of the last two fiscal years (FY). The number of clients vaccinated increased over 15% and the number of clients ages 13-18 receiving vaccines increased 33.5% from FY 2016 to FY 2017.

Also of interest, effective in October 2017, the CDC recommends that all 11 to 12 year olds receive two doses of HPV vaccine at least five months apart, rather than the previously recommended three doses. This schedule was implemented at WCHS in December 2016.

Table 2

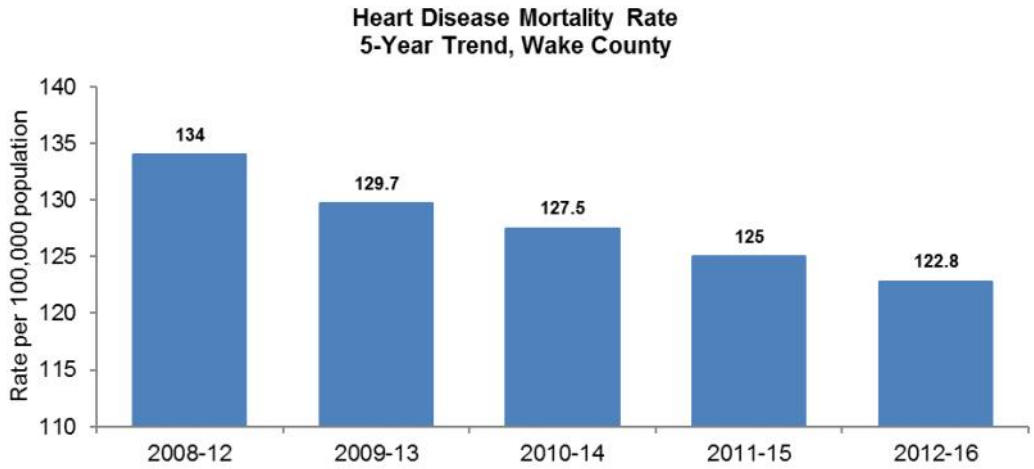
HPV VACCINE DOSES ADMINISTERED TO WCHS CLIENTS FY 2016 Compared to FY 2017		
	Total Doses Administered (All Clients)	**Total Doses Administered (%) to Clients ages 13-18**
FY 2016	2,289	923 (40%)
FY 2017	2,636	1,232 (47%)

Source: WCHS Immunization Tracking Team. 11/29/17.

2.2 Heart Disease

Heart disease was the second leading cause of death in Wake County from 2012-2016. Figure 11 shows that Wake County's heart disease death rate dropped 8.4% over the last five years.

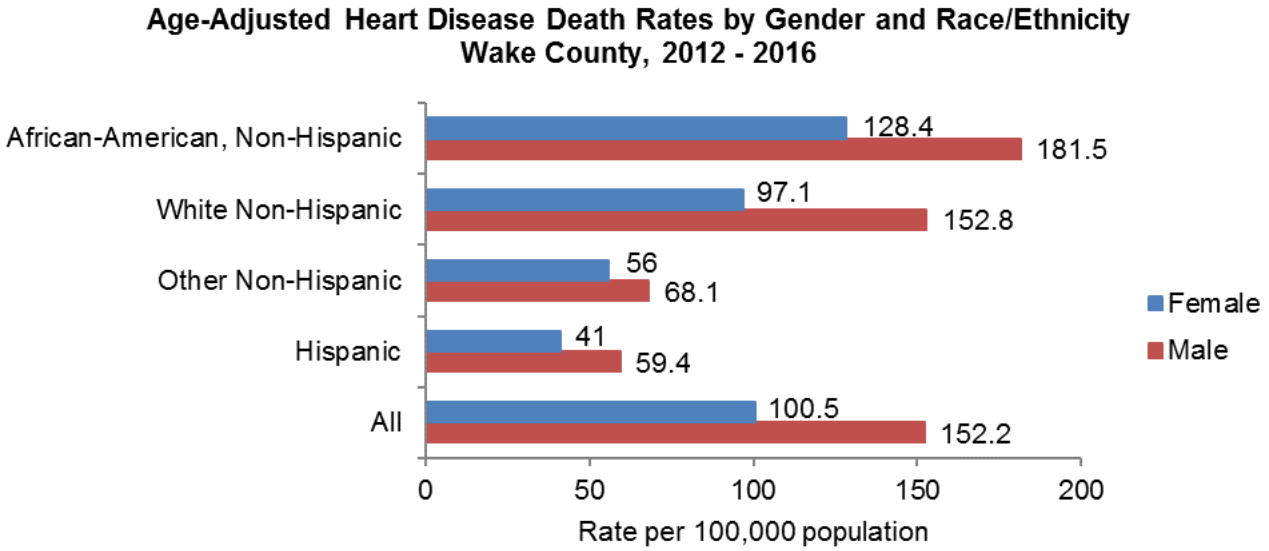
Figure 11



Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

Within populations, death rate disparities for heart disease were similar to those for cancer--men died at higher rates than women, and African-American Non-Hispanic males died at higher rates than individuals of both genders in other racial and ethnic groups (Figure 12).

Figure 12

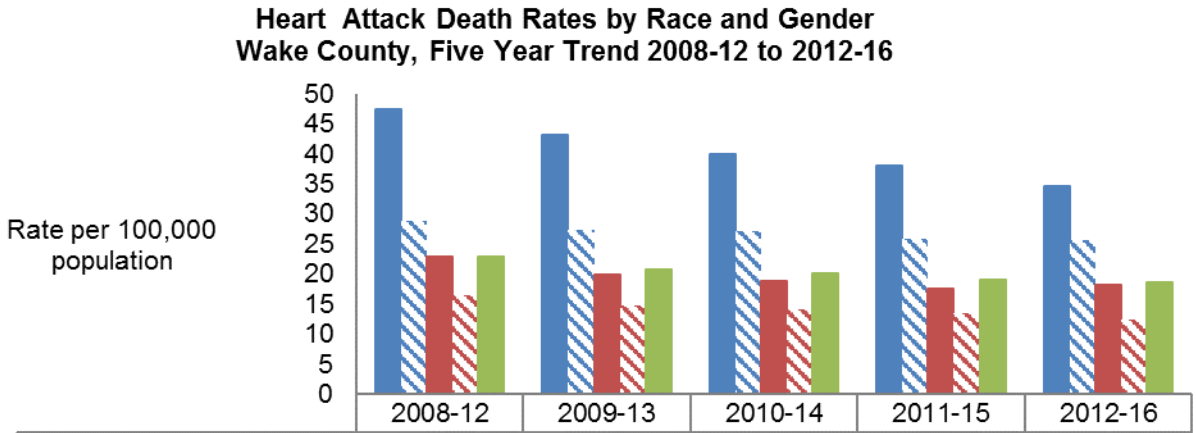


Source: "Race/Ethnicity-Specific and Sex-Specific Age-Adjusted Death Rates". County Health Data Book 2018. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

2.2a Heart Attack

Looking specifically at acute myocardial infarction (heart attack) death rates in Wake County (Figure 13), the overall rate dropped 18.8% over five years. Men died at higher rates than women, yet all groups experienced double-digit percentage decreases, with African-American men experiencing the largest decrease (26.8%). Though African-American men consistently had higher heart attack death rates than others, the gap between them and other groups diminished significantly as of 2012-2016.

Figure 13



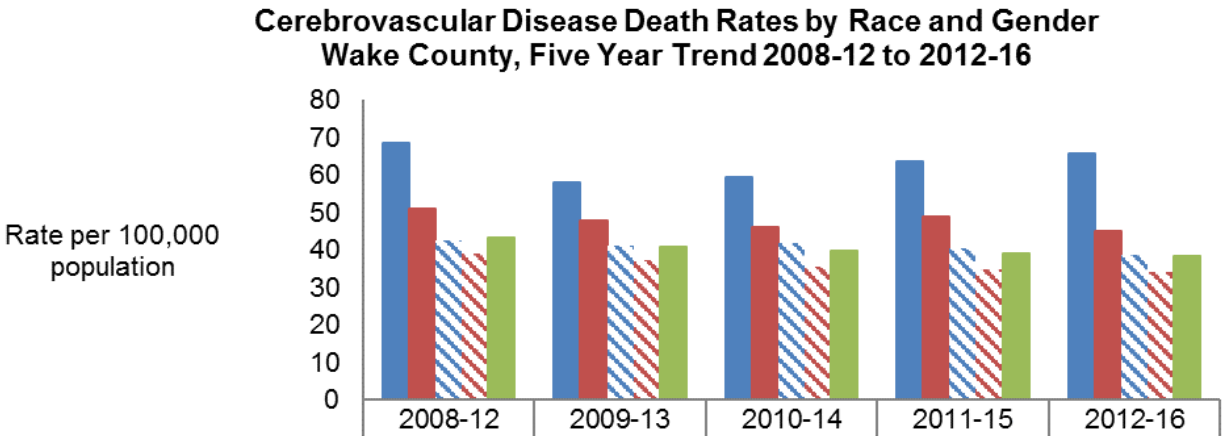
	2008-12	2009-13	2010-14	2011-15	2012-16
African-American Men	47.4	43.1	40	38	34.7
White Men	28.9	27.3	27.2	25.8	25.6
African-American Women	22.9	20	18.9	17.6	18.3
White Women	16.5	14.8	14.1	13.4	12.5
ALL	22.9	20.8	20.1	19.1	18.6

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

2.3 Stroke

Stroke, a common result of cerebrovascular disease, was the third leading cause of death in Wake County in 2012 - 2016. Figure 14 shows a more marked racial than gender disparity in stroke death rates over the last five years. African-American male death rates were higher than other groups, yet they were the only group that did not experience a double-digit percentage decrease (3.9%). The disparity gap between African-American men and others is now wider than it was five years ago. The overall stroke death rate declined 11.8% from 2008-12 to 2012-16.

Figure 14



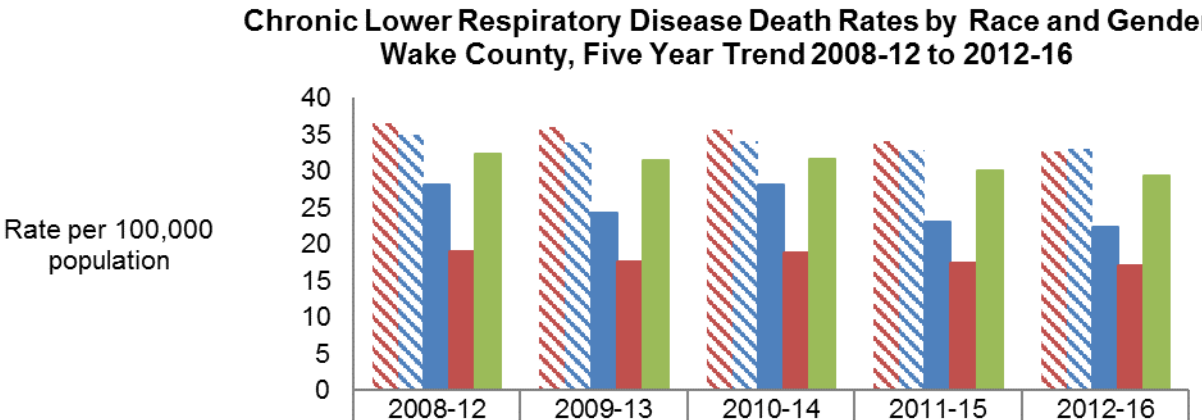
	2008-12	2009-13	2010-14	2011-15	2012-16
African-American Men	68.5	57.9	59.4	63.7	65.8
African-American Women	51	47.8	46.2	49	45
White Men	42.5	41	41.9	40.3	38.8
White Women	39.2	37.2	35.4	34.7	34.1
ALL	43.3	40.7	39.7	39.1	38.2

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

2.4 Chronic Lower Respiratory Disease

Chronic lower respiratory disease, which includes conditions such as asthma, chronic bronchitis, emphysema and chronic obstructive pulmonary disease (COPD), was the fifth leading cause of death in Wake County from 2012-2016. It was also one of two chronic diseases (along with Alzheimer's disease) in which death rates were higher for whites than for African-Americans (Figure 15). White men and women died at essentially the same rate. African-American women had the lowest death rate in each of the last five years and the death rate for African-American men showed the largest percentage decrease (20.6%). The overall death rate dropped 9.3% from 2008-12 to 2012-16.

Figure 15



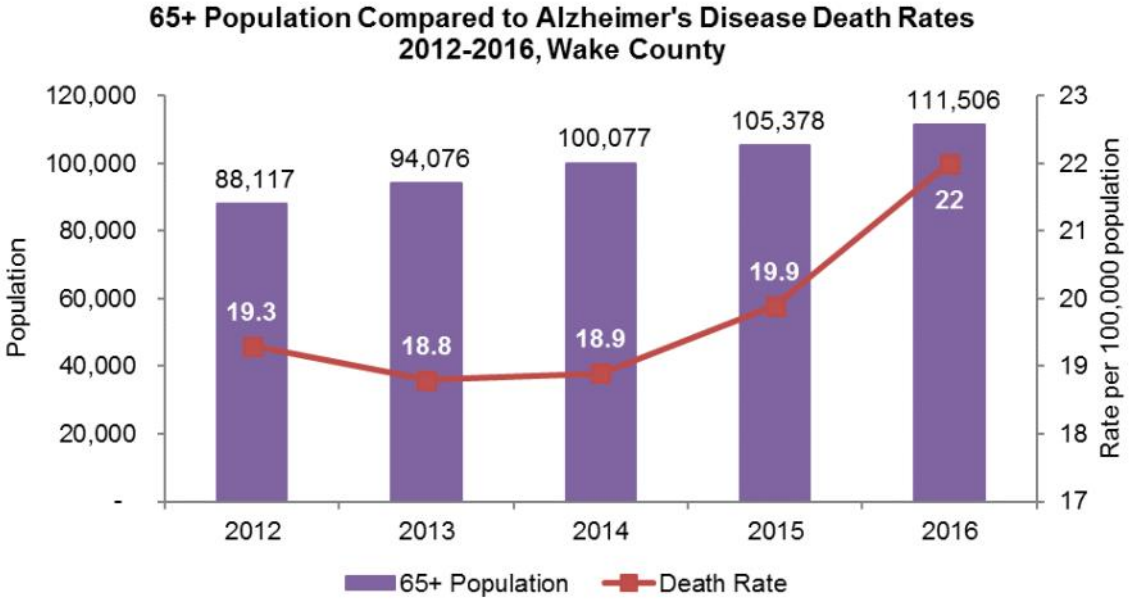
	2008-12	2009-13	2010-14	2011-15	2012-16
White Women	36.6	36	35.6	34.1	32.7
White Men	35	34	34.1	32.8	33
African-American Men	28.2	24.2	28.1	23.1	22.4
African-American Women	19	17.6	18.9	17.4	17.1
ALL	32.3	31.5	31.7	30	29.3

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

2.5 Alzheimer's Disease

Alzheimer's disease was the sixth leading cause of death in Wake County from 2012-2016. Figure 16 shows that as Wake County's 65+ population has increased, so has the Alzheimer's disease death rate.

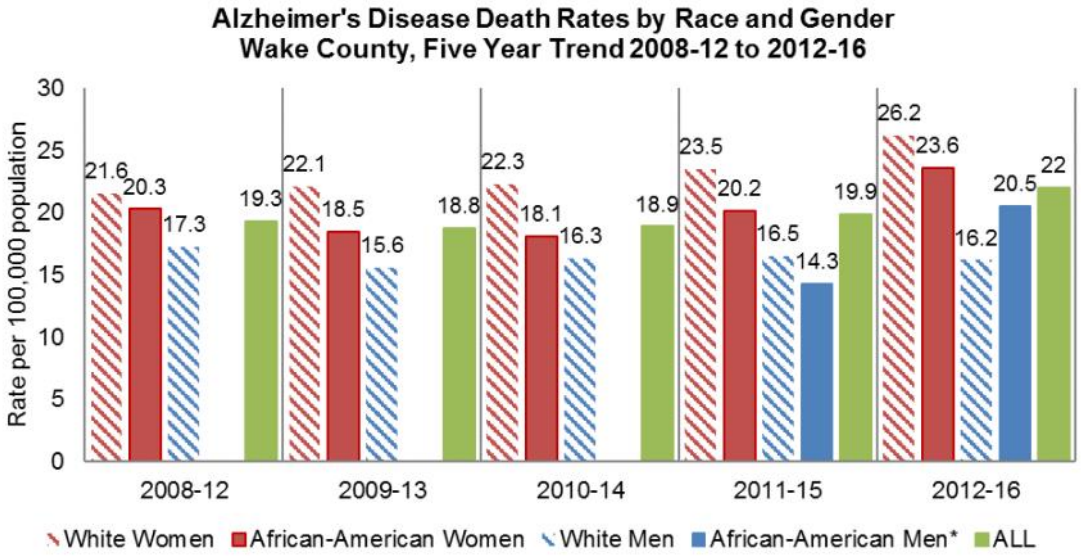
Figure 16



Sources:
Population data: NC Communicable Disease Branch, 9/28/17.
Death rates: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

Figure 17 five year trend analyses show an increase in the Alzheimer's death rate for both white (21.3%) and African American (16.3%) women. The overall Alzheimer's death rate increased 14% over five years.

Figure 17

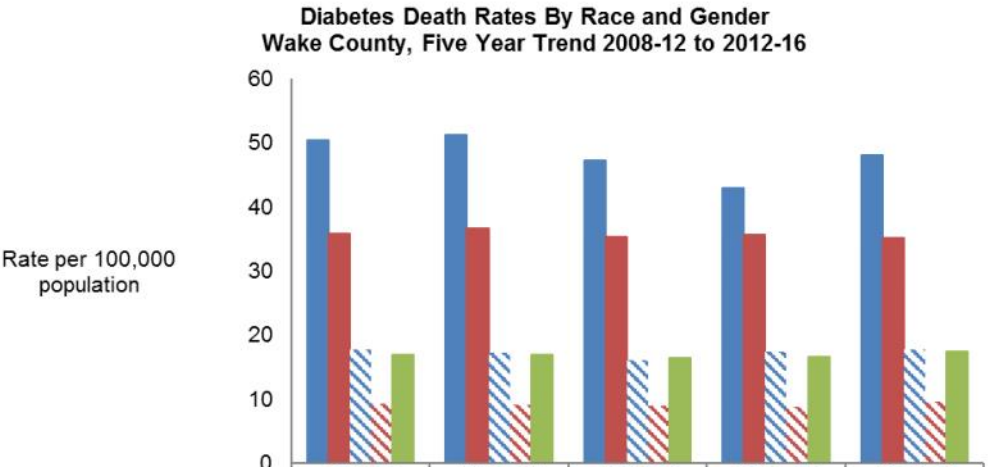


*The number of deaths for African-American men between was too low to calculate a rate for all years.
Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

2.6 Diabetes

Diabetes mellitus was the seventh-leading cause of death in Wake from 2012-2016. Figure 18 shows that no population group experienced a significant change in diabetes death rates over the last five years. However, the racial disparity in diabetes death rates is particularly pronounced. African-Americans died at significantly higher rates than whites. It is also noteworthy that males died at higher rates than their female counterparts *within each racial group.*

Figure 18



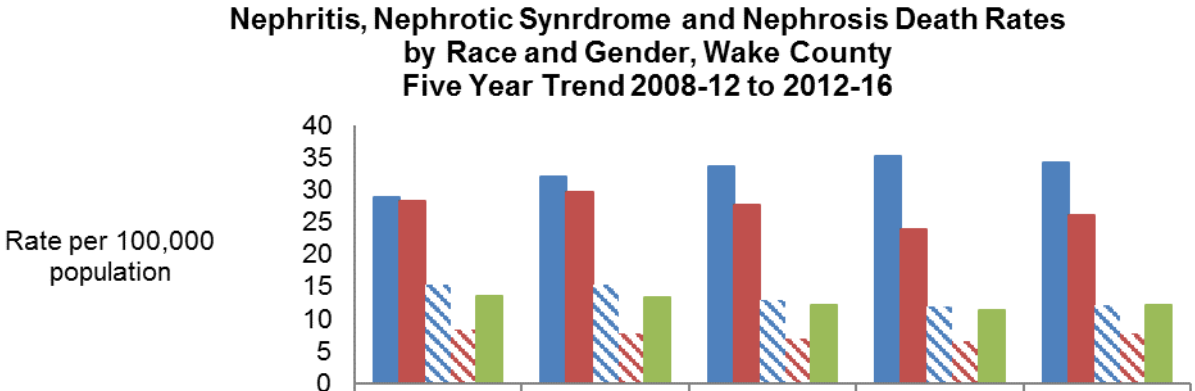
	2008-12	2009-13	2010-14	2011-15	2012-16
African-American Men	50.4	51.3	47.2	42.9	48
African-American Women	35.9	36.7	35.4	35.6	35.2
White Men	17.7	17.2	16.1	17.5	17.7
White Women	9.4	9.1	9	8.9	9.7
ALL	17	16.9	16.4	16.6	17.4

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

2.7 Nephritis, Nephrotic Syndrome and Nephrosis

Nephritis, nephrotic syndrome and nephrosis (also known as "kidney disease") was the eighth leading cause of death in Wake County from 2012-16. Figure 19 shows that, like for stroke and diabetes, there was a pronounced racial disparity in death rates. African-American men had the highest death rates for each of the last five years, and their death rate increased 18.8%. African-American women's death rates decreased 8.1%, but their death rates were consistently higher than those of white men and white women. The overall death rate went down 9.6% from 2008-12 to 2012-16.

Figure 19



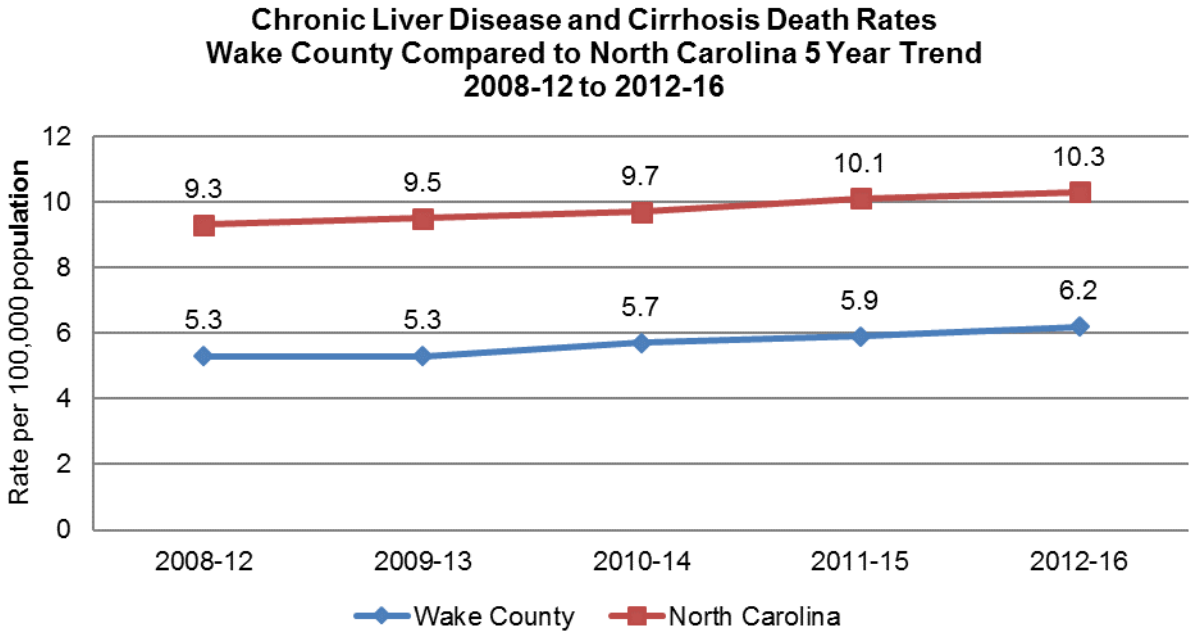
	2008-12	2009-13	2010-14	2011-15	2012-16
African-American Men	28.8	32.1	33.5	35.1	34.2
African-American Women	28.3	29.7	27.6	23.8	26
White Men	15.4	15.3	12.9	12	12.1
White Women	8.4	7.7	7	6.6	7.7
ALL	13.5	13.4	12.2	11.4	12.2

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

3.0 Emerging Issue: Chronic Liver Disease and Cirrhosis

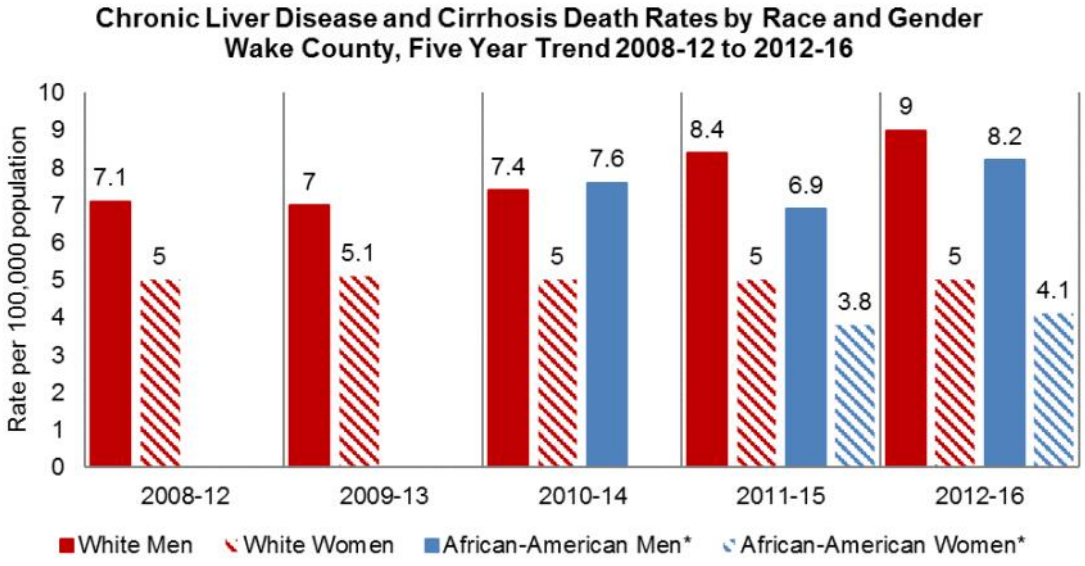
Both North Carolina and Wake County have seen overall chronic liver disease and cirrhosis death rate increases in the last five years (Figure 20). Figure 21 shows that in Wake County, chronic liver disease and cirrhosis mortality increased 26.8% for white males over the last five years. White males are also the population predominantly affected by opioid deaths and overdoses. The previous WCHS public health report on injuries (http://bit.ly/2Doq1BU) detailed the synergy between hepatitis C and the opioid epidemic in Wake County and North Carolina. An increase in chronic liver disease and cirrhosis mortality may be yet another facet of the opioid epidemic.

Figure 20



Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

Figure 21



*The number of deaths for African-American men and women was too low to calculate a rate for 2008-12 and 2009-13.

Source: "Race/Ethnicity and Sex-Specific Age-Adjusted Death Rates". County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

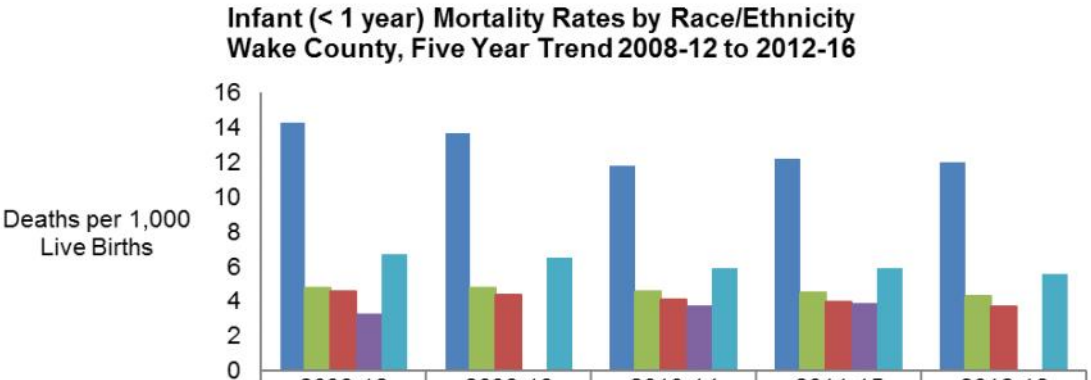
4.0 Risk Factors

4.1 Infant Mortality and Health

In a CDC publication entitled *Ties That Bind: Maternal and Child Health and Chronic Disease Prevention at the Centers for Disease Control and Prevention*, the authors make the following observation:
"As we move from childhood into early adulthood, too many women of childbearing age already suffer from chronic conditions or use substances that can adversely affect pregnancy outcomes, leading to miscarriage, infant death, birth defects, or other complications for mothers and infants. Approximately 7% of adult women aged 18 to 44 years have asthma, 36% are overweight or obese before pregnancy, 13% are underweight, 22% use tobacco, 3% are hypertensive, 2% have diabetes, and 15% report feelings of depression during the postpartum period. The need to intervene early in the lives of women, for their own health and that of their babies, can best be met through the joint efforts of maternal and child health and chronic disease prevention and health promotion" (9).

Infant mortality is the death of a baby before its first birthday. Figure 22 shows the five-year trend for infant death rates in Wake County.

Figure 22



	2008-12	2009-13	2010-14	2011-15	2012-16
African-American	14.3	13.7	11.8	12.2	12
Hispanic	4.8	4.8	4.6	4.5	4.3
White	4.6	4.4	4.1	4	3.7
Other non-Hispanic*	3.3		3.8	3.9	
Total	6.7	6.5	5.9	5.9	5.6

*Number of deaths was too low to calculate rates for Other non-Hispanics in 2009-13 and 2012-16.

Source: "Infant Death Rates per 1,000 Live Births by Race/Ethnicity." County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17

African-Americans had much higher infant mortality rates compared to other groups. However, the African-American death rate dropped 16.1% and the disparity narrowed over five years. Hispanics had slightly higher death rates than whites in each year. Whites experienced the largest five-year percentage drop, 19.6%. The total infant mortality rate dropped 16.4% over five years.

Pregnant women with chronic diseases have an increased risk of having low birthweight babies as well as babies having chronic health conditions later in life (10). Table 3 shows the five-year trend for low and very low weight births by race/ethnicity. African-Americans had the highest percentage of low or very low birthweight babies, and Hispanics had the lowest percentage. The percentage of low and very low birthweight babies in Wake County stayed essentially the same over the last five years.

Table 3

Number and Percent of Low and Very Low Birth Weight Births Wake County, Five Year Trend 2008-12 to 2012-16

		2008-12		2009-13		2010-14		2011-15		2012-16	
		Low	Very Low	Low	Very Low	Low	Very Low	Low	Very Low	Low	Very Low
Total	Births	5,154	1,041	5,095	1,033	5,083	1,015	5,042	992	5,046	942
	%	8.1	1.6	8.1	1.6	8.1	1.6	8	1.6	8	1.5
White	Births	2,265	409	2,224	395	2,243	391	2,208	356	2,208	342
	%	6.7	1.2	6.6	1.2	6.7	1.2	6.6	1.1	6.6	1
Black/ African-American	Births	1,803	463	1,798	464	1,772	449	1,777	465	1,757	442
	%	12.7	3.3	12.7	3.3	12.5	3.2	12.5	3.3	12.4	3.1
Other non-Hispanic	Births	404	51	437	59	458	60	456	57	482	52
	%	8.2	1	8.7	1.2	8.8	1.1	8.5	1.1	8.5	0.9
Hispanic	Births	682	118	636	115	610	115	601	114	599	106
	%	6.3	1.1	6.3	1.1	6.2	1.2	6.2	1.2	6.1	1.1

Source: "Low (<2500 grams) and Very Low (<1500 grams) Weight Births by Race/Ethnicity." County Health Data Books 2018, 2017, 2016, 2015 and 2014. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17.

Table 4 shows life expectancy at birth for Wake County residents born between 2014 and 2016, and where Wake County ranks among North Carolina counties (1 is the best, 100 the worst).

Table 4

Wake County Life Expectancy at Birth With Rank Among NC Counties, 2014-2016*

Population	Life Expectancy (Years)	Rank
All Residents	81.5	4
Males	79.3	5
Females	83.5	3
Whites	82.4	3
African-Americans	77.6	13*

*14 NC counties had African-American populations too small to calculate life expectancy, so African-Americans in Wake ranked 13th out of 86 NC counties

Source: "Life Expectancy at Birth for State, 2016 and County, 2014-2016." County Health Data Book 2018. NC State Center for Health Statistics. http://www.schs.state.nc.us/data/databook/. Accessed 11/13/17

4.2. Tobacco Use

4.2a Smoking

Smoking is the leading risk factor for lung cancer. The 2016 County Health Rankings report that 15% of Wake County adults smoke every day or most days and have smoked at least 100 cigarettes in their lifetime (11). The percentage of adults who smoke cigarettes in Wake County was less than that of North Carolina (19%). Premature death is attributed to smoking, and smoking is also identified as a cause of:

- More than twelve types of cancer
- Cardiovascular disease
- Respiratory conditions, such as chronic obstructive pulmonary disease (COPD) and emphysema
- Low birth weight
- Other adverse health outcomes (12)

4.2b Electronic Cigarettes (e-cigarettes)

E-cigarettes are known by many different names, including vapes, vape pens, and e-hookah. (Figure 23). They are generally composed of a battery, a heating element, and a place to hold a liquid. When used, they produce an aerosol by heating up the e-liquid solution; the aerosol then exposes users to:

- Potentially harmful substances, such as nicotine
- Ultrafine particles that can be inhaled deep into the lungs
- Flavorings such as diacetyl, a chemical linked to a serious lung disease
- Volatile organic compounds
- Cancer-causing chemicals
- Heavy metals, such as nickel, tin and lead (13)

Bystanders also become exposed to the same chemical-containing aerosol when the user exhales. E-cigarettes are not an FDA-approved cessation aid, and can be modified to deliver marijuana and other drugs (14).

Figure 23

Examples of E-cigarettes

Image source: "Electronic Cigarettes" Centers for Disease Control and Prevention. https://www.cdc.gov/tobacco/basic_information/e-cigarettes/index.htm, Accessed 11/30/17.

In 2016, more than 2 million U.S. middle and high school students reported using e-cigarettes in the past 30 days (14). However, the 2016 National Youth Tobacco Survey showed that use of e-cigarettes among youth declined for the first time. While cigarette smoking among youth is down in North Carolina, there was an 888% increase in use of e-cigarettes among youth from 2011 to 2015.

Under North Carolina General Statute § 14-401.18A(b)-(c), e-liquid products containing nicotine must be sold in child-resistant containers and must state the product contains nicotine (15). Once this law was enacted on December 1, 2015, Carolinas Poison Center saw a decrease in the number of e-cigarette related incidents from 149 in North Carolina and 12 in Wake County in 2015 to 121 in North Carolina and 4 in Wake County in 2016 (Table 5).

Table 5

Tobacco-Related Calls to Carolinas Poison Center By Exposure Type 2012-2016 Wake County					
EXPOSURE	**2012**	**2013**	**2014**	**2015**	**2016**
Chewing Tobacco	0	2	5	2	1
Cigarettes	8	17	9	8	15
Cigars	1	0	1	0	0
Dissolvable Tobacco	0	0	0	0	0
Filter tips (cigarette butts)	0	0	1	0	0
Snuff	0	0	0	3	1
Other tobacco	0	0	1	0	0
Unknown tobacco	3	4	0	7	3
E-cigarettes containing nicotine or nicotine liquid	2	2	10	12	4
TOTAL	**14**	**25**	**27**	**32**	**24**

Source: Carolinas Poison Control Center, 11/27/17.

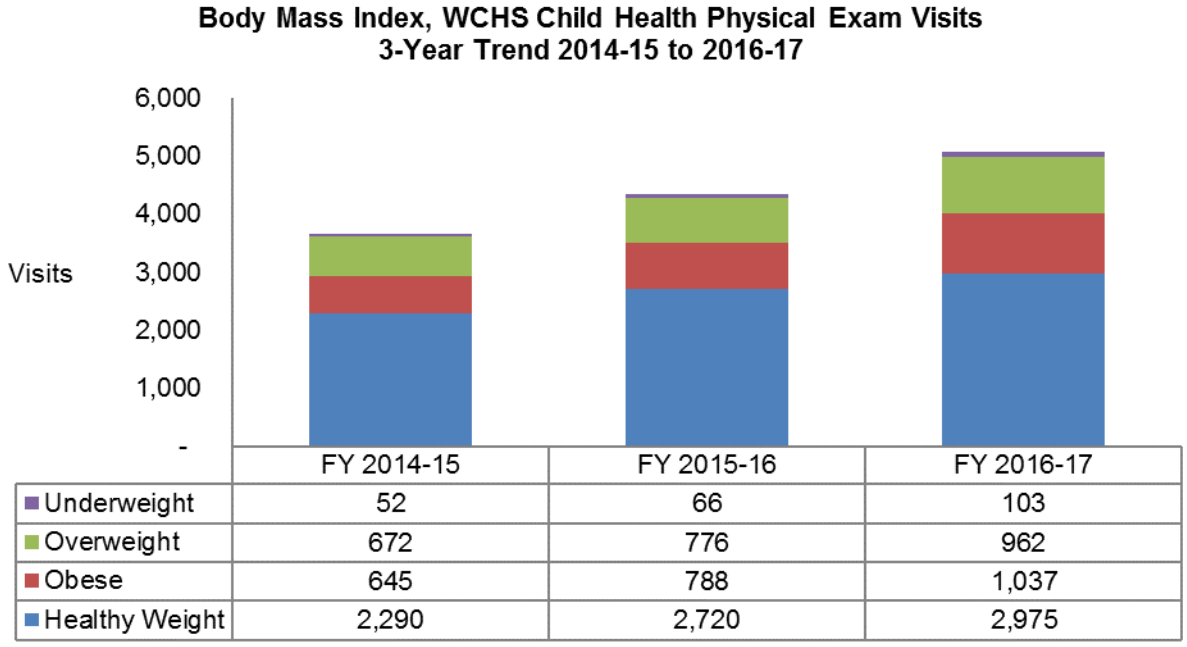
General Statute § 130A Article 23 prohibits smoking in North Carolina bars and restaurants and grants local government the authority to regulate smoking in public places. It also defines smoking as use of a "lighted" tobacco product. The Wake County tobacco free policy, which went into effect in 2016, prohibits the use of tobacco products, including e-cigarettes, in all Wake County Government buildings, vehicles, and on County grounds, including parks and recreation centers.

4.3. Obesity

Body mass index (BMI) is a useful screening tool, using height and weight to classify underweight, healthy or recommended weight, overweight and obesity. A child's (ages 2-20) BMI is plotted on a growth chart, using age and gender to determine a percentile which corresponds to his/her weight classification.

WCHS's Child Health Clinic provides well-child visits that include a complete physical examination. A child's BMI measurement is taken at these visits. For the last three years, the percentage of children who were overweight or obese hovered between 36% and 39%; the number of children receiving BMI measurements increased by 39% over the same time period (Figure 24).

Figure 24



	FY 2014-15	FY 2015-16	FY 2016-17
Underweight	52	66	103
Overweight	672	776	962
Obese	645	788	1,037
Healthy Weight	2,290	2,720	2,975

Source: Wake County Human Services GE Centricity Electronic Health Record. Accessed 11/17/17, 10/20/16 and 9/29/15.

The National Committee for Quality Assurance (NCQA) endorses weight assessment and counseling for children by a health care provider to promote regular physical activity, healthy eating, and behavioral changes that support a healthy weight.

4.4 Lack of Health Insurance

According to the Kaiser Family Foundation, the lack of health insurance has an extraordinary impact on a person's health. Uninsured people are much more likely than publicly- or privately-insured individuals to have

- No usual source of care
- Postponed seeking care due to cost
- Gone without needed care due to cost
- Not been able to afford prescription drugs (16)

Many silent health problems go undetected without routine checkups, so uninsured individuals are at much higher risk of being diagnosed in later stages of diseases and have higher mortality rates than those with insurance. Table 6 illustrates what an uninsured Wake County resident would have to pay *in a single visit* to treat certain chronic conditions at our four main inpatient hospitals.

Table 6

Average Gross Charge* for Selected Diagnostic-Related Groups by Hospital 10/1/15 - 9/30/16				
Diagnostic-Related Group (DRG)	**Duke Raleigh**	**WakeMed Raleigh**	**Rex**	**WakeMed Cary**
Bronchitis and asthma **with** complications and comorbidities or major complications and comorbidities	$19,882	$21,183	$13,904	$16,252
Acute myocardial infarction, discharged alive **with** major complications and comorbidities	$39,189	$47,000	$26,901	$28,877
Operating room procedures for obesity **without** complications and comorbidities or major complications and comorbidities	$39,541	$13,792	$41,534	$48,568
Diabetes **with** complications and comorbidities	$17,115	$20,647	$11,830	$16,065
Intracranial hemorrhage or cerebral infarction **with** major complications and comorbidities	$48,749	$55,704	$38,495	$58,710
Renal failure **with** major complications and comorbidities	$38,239	$41,803	$54,060	$34,939

* Average Gross Charge: the amount that will be charged to a patient if all charges are paid in full without a public or private third-party paying for any portion of the charges.
Source: "Transparency in Health Care Costs". NC Division of Health and Human Services. https://www2.ncdhhs.gov/dhsr/ahc/hb834/compare.asp. Accessed 12/1/17.

The significant variation in costs between hospitals notwithstanding, any of the figures shown in the table could conceivably saddle an uninsured person with a huge medical debt and thereby increase their chances of having to file for medical bankruptcy (17).

5.0 Service Matrix

Health Promotion Chronic Disease Prevention (HPCDP) Section
Public Health Division, Wake County Human Services

Health Promotion Chronic Disease Prevention provides a set of chronic disease prevention and management services to people and communities experiencing the greatest health disparities. These services address obesity, cardiovascular disease, stroke, diabetes, breast and cervical cancers, and tobacco cessation. Health Promotion staff help to empower community organizations, including faith partners and worksites, by creating healthy environments and improving health behaviors.

Staff: County Funded: 6.5 FTE County Funded Direct Service: 3.5 FTE Grant Funded: 3.5 FTE

Programs and Services			Results Fiscal Year '16/17
Clinical Services	**Community Screenings**	Staff provide community screenings to low-resource individuals that include analysis of blood pressure, body mass index (BMI) and body fat. Participants then receive nutrition counseling to encourage healthy behavior change based on his/her screening results. **Information: 919-250-4746**	•Total 292 individuals screened •Of the 258 individuals screened for BMI, 83% were overweight or obese and 50% were obese
	Clinical Screenings	Staff provide screenings services such as mammography, clinical breast exams and pap smears. Refer to BCCCP description below for more details. **Information: 919-212-9310**	•528 mammography services provided •58 cervical screenings provided
	Breast and Cervical Cancer Control Program (BCCCP)	Wake County BCCCP provides free or low cost breast and cervical cancer screenings and follow up services to eligible women in Wake County. Women are eligible if they are uninsured or underinsured, are between the ages of 40-64 for breast screening services and 21-64 for cervical screening services, and have a household income at or below 250% of the federal poverty level. **Information: 919-212-9310**	•423 women served •528 mammography services provided •14 breast cancers detected and referred for treatment •58 cervical screenings provided
	WISEWOMAN	Wake County WISEWOMAN provides free cardiovascular health screenings to the women enrolled in BCCCP. Women are screened for blood pressure, cholesterol, diabetes, and BMI. Participants also receive counseling on physical activity and nutrition. If necessary, women are referred to a medial provider for follow up treatment for abnormal lab values. **Information: 919-250-3990**	•184 women received services including screening, health coaching and being referred to a medical provider to manage chronic diseases

Clinical Services cont.	Medical Nutrition Therapy	Nutrition counseling provided by Health Promotion Registered Dietitian (RD) to patients of WCHS Women's Clinic Nutrition counseling provided by Health Promotion RD to patients of Shepherd's Care Medical Clinic (SCMC) and Eastern Regional Center (ERC)	•34 clients seen •75% showed positive change •40 clients seen •45% showed positive change
Health Education Training and Workshops	Health and Wellness Community Presentations	Various interactive workshops for adults on healthy eating and physical activity to reduce risk and/or manage chronic diseases. **Information: 919-212-8376**	•225 participants •Participants report willingness to make positive health behavior changes
	Club CHOICE Plus	Club CHOICE Plus is a weight management series for adult women. The series includes eight sessions, each session consisting of nutrition education (in English and Spanish) and group fitness. The children of the participants also take part in activities promoting healthy eating and fitness facilitated by Wake County 4-H Cooperative Extension. **Information: 919-250-4677**	•58 women and children participants •68% of women lost weight with an average weight loss of 2 pounds •100% of women made healthy behavior changes
	Cooking Matters at the Store	An on-site grocery store tour which provides participants with hands-on education as they shop for food. Participants learn how to budget and plan for a healthy, affordable and delicious meals for their families through a curriculum sponsored by the Inter-Faith Food Shuttle. **Information: 919-212-9663**	•86 participants learned techniques to shop for healthy food on a budget that they will continue to use
	Diabetes Management and Prevention	Diabetes Management Education series at Shepherd's Care Medical Clinic in Fall 2017 Health Promotion will be facilitating the Minority Diabetes Prevention Program (MDPP) in early 2018 **Information: 919-212-9663**	•Outcome data will be available in the next Public Health Report on Chronic Disease
	Middle Class Express (MCE)	MCE is a program to help individuals advance toward self-sufficiency to achieve a middle class lifestyle. Health Promotion provides a nutrition education session to each MCE cohort. Additionally, the Health Promotion RD provides health coaching to MCE participants who select health as one of their goals. **Information: 919-250-4746**	•5 education sessions reaching 56 participants •5 individuals participated in health coaching showing increased healthy behaviors
	STEPS	STEPS is a component of the Work First Program in which participants learn skills to thrive on their own. Health Promotion provides a series of three nutrition education sessions to each STEPS cohort. **Information: 919-212-9663**	•55 participants •Results: Individuals reported making healthy behavior changes for them-selves and their children

Community Physical Activity Programs	Movin' and Groovin'	A 6-8 week series of free physical activity sessions for Wake County Families to encourage healthier lifestyles and reduce the burden of overweight/obesity in children and adults. Families engage in mini physical activity sessions as well as organized walking, facilitated by Health Promotion and 4-H Youth Development staff. **Information: 919-250-4731**	•4 series with a total of 231 participants •Results: Over 80% of participants reported increased physical activity and healthy eating behaviors as a result of participating in the series
Food Security and Local Food Systems	Farmer's Markets	Health Promotion provides technical support to Farmer's Markets to increase access to fresh, local food among low resource individuals. This includes encouraging and supporting markets who accept EBT, WIC payments and participate in Farmer Foodshare (a program in which produce from the market is donated to local food pantries). HP promotes the use of EBT at Farmer's Markets throughout the community. HP also provides interactive educational displays at farmer's markets providing information on nutrition and local food. **Information: 919-250-4734**	• 19 Farmer's Markets in Wake County • 9 accept EBT payment • 5 accept WIC vouchers • 8 participate in Farmer FoodShare • 3 are Summer Meal Sites
	Mobile Markets	Health Promotion partners with *Grocers on Wheels* mobile market to bring fresh fruits and vegetables to *Movin' & Groovin'* participants during the finale of the walking series in an effort to improve access to fresh produce within the community. **Information: 919-250-4734**	•Over 840 pounds worth of fresh produce distributed to 86 *Movin' & Groovin'* participants
	Summer Food Service Program	Health Promotion works in partnership with the NC Department of Public Instruction as well as Human Services' Board, Social and Economic Vitality Program, other staff and multiple community partners to increase the number of summer meal sites and the number of meals served. Sunnybrook became a meal site during Summer 2017 which demonstrated great success. **Information: 919-250-4734**	•Wake County: 146 sites which is a 11% increase from 2016; 235,575 meals served •Sunnybrook served 1298 meals over 8 weeks
Regional Center Service Integrations		Health Promotion is formally integrated into all Wake County regional centers (ERC, NRC, SRC and Millbrook) to provide population health services for vulnerable groups. Health Promotion brings added value to the clients as well as the staff through wellness initiatives and leveraging resources with community partners. **Information: 919-212-8376**	• Staff Wellness: • 69 education sessions reaching 133 staff • 7 Wellness challenges reaching 78 staff • Community Wellness • Men's Health Fair • 5 wellness sessions reaching 30 participants

Community Partnerships		Health Promotion partners with numerous community based organizations, including faith partners, non-profits, municipalities, and medical providers along with other Wake County departments to build capacity and share resources regarding health promotion and disease prevention interventions. **Information: 919-250-4553**	•Partner with over 120 community organizations •Provide interventions with 7 community and faith based organizations
Public Health Education Campaigns		Health Promotion provides monthly public health education campaigns corresponding to national health observances (i.e. Breast Cancer Awareness Month and Heart Health Month) to build awareness and connect people to disease prevention and management resources. Campaign components include presentations, education outreach and fundraisers to corresponding non-profits. **Information: 919-212-8376**	
Active Routes to School (ARTS)		This regional project is a partnership between NC Division of Public Health and NC Department of Transportation. The goal of the project is to increase the number of elementary and middle school students who safely walk and bike to and at school. The Active Routes to School coordinator works with community, county and state partners to support schools in starting ongoing education programs and foster policy changes at all levels to support safer routes to school. **Information: 919-610-5760**	•Helped create Safe Routes to School Action plans for 5 schools •Walking and biking to school included in WCPSS Wellness Policy •Increased Walk and Bike to School Day participation: 16 schools in May and 42 schools in October
Tobacco Prevention and Control (TPC)		This regional project provides technical support in the form of preparation, implementation and enforcement of tobacco free policies. TPC also provides tobacco cessation resources and professional training. Starting in 2018, at least 20 youth will be trained as smoking cessation community ambassadors, as part of Wake County's integrated program for prevention of drug abuse and tobacco use. Once trained, each youth ambassador will conduct a community smoking cessation project and present findings to 15 community members by FY 2019-20. **Information: 919-250-1171**	•Policies Passed: Tobacco Free Parks Town of Morrisville impacting over 23,000 people •NC Quitline: 1631 registered callers and 521 fax referrals in Wake County

Tobacco Prevention and Control (TPC) continued			•145 participants (including 52 WCHS providers) participated in 5As training regarding tobacco cessation counseling and resources •Developed and implemented a standing order for nurses to bill for tobacco cessation counseling provided in WCHS clinics

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7.0 Acknowledgements

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