Wake County Human Services
Public Health Report

Injuries
2018

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WAKE COUNTY NORTH CAROLINA

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Overview

Information about the many types of injuries is complex and is gathered from several data sources such as death certificates, medical examiner reports, law enforcement reports, hospital admissions and emergency department visits. This report describes injuries and their impact on the health of those who live, work, play and learn in Wake County. Deaths are the most severe outcome from injuries but are the "tip of the iceberg" (Figure 1) when evaluating the burden of injuries. Many injuries are either treated by medical providers during outpatient visits and not reported or no medical treatment is sought for the injury. Thus, the total societal burden of injuries from all causes is unknown.

Figure 1

Source: Injury and Violence Prevention Branch, NC DHHS, 8/24/15.

The term "intentional" is used to refer to injuries resulting from purposeful human action, whether directed at oneself or others. Intentional injuries include self-inflicted and interpersonal acts of violence intended to cause harm.

"Unintentional" is used to refer to injuries that were unplanned and can be defined as events in which:

- the injury occurs in a short period of time (seconds or minutes)
- a harmful outcome was not sought
- the outcome was the result of one of the forms of physical energy in the environment or normal body functions being blocked by external means. (1)

Also described in the report are measures taken by Wake County Human Services, Wake County and community partners to prevent and limit the impacts of injury.

As mentioned in Wake County's 2017 injury report, the October 2015 transition in the International Classification of Diseases (ICD) from ICD-9 to ICD-10 has limited the ability to do analysis of injury trends. Therefore, 2015 data is currently not being analyzed. Pre-transition data (2014 and before) is not comparable to post-transition data (2016 and after). As a result, only the leading causes of injury hospitalizations and ED visits in 2016 and 2017 are discussed in this report. (The ICD-9 to ICD-10 transition for deaths occurred in 1998, so death trend analysis is done in this report.)

This report analyzes, in significant detail, the three leading causes of injury death in Wake County (motor vehicle traffic (MVT), falls and poisonings). Since poisonings surpassed falls and MVT as the number one cause of injury death in 2016 and remained so in 2017, this report focuses extensively on the opioid epidemic at the national, state and local levels.

Beginning in FY 2017-2018, Wake County began implementation of an initiative to respond to the opioid crisis; its components and activities are described in detail. This report also provides a follow-up to last year's analysis on pedestrian and bicycle injuries and closes with evaluation of a topic that made news headlines in 2018, traumatic brain injuries.

Leading Causes of Hospitalization and ED Visits by Injury, 2016 and 2017

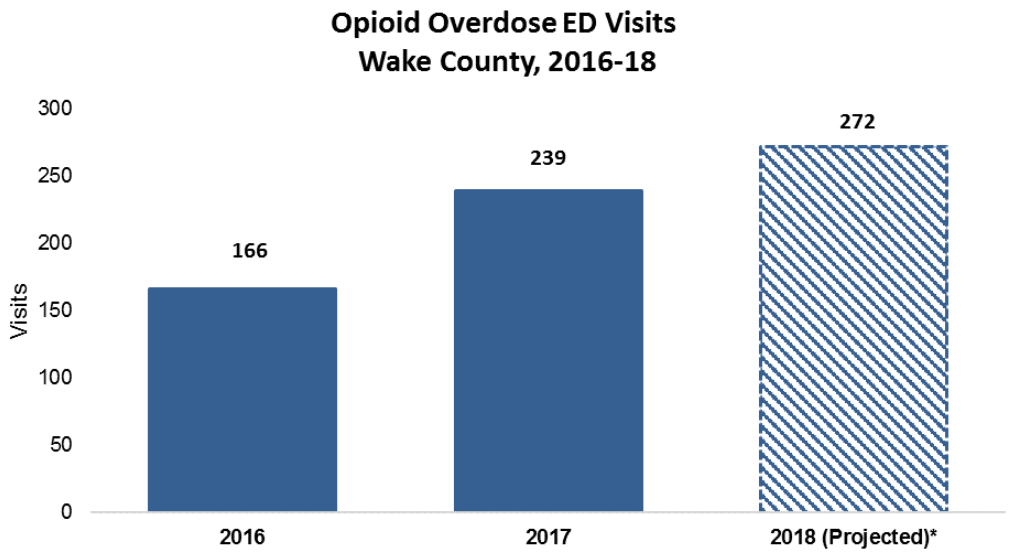
Table 1 shows *MVT-Unspecified-Unintentional* as the top cause of injury-related ED (emergency department) visits again in 2017. The ED visit rate for unintentional falls increased dramatically (23.5%) from 2016 to 2017. It is worth noting that opioid overdose ED visits are increasing in Wake County (Figure 2) although it is not one of the top five causes of injury ED visits. . If the current trend holds through the remainder of 2018, opioid overdose visits will have increased 63.9% from 2016 to 2018. (Opioid overdoses are discussed in more detail later in this report.)

Table 1

Cause of Injury	Top Five Causes of Emergency Department Visits by Injury (All Ages), Wake County, 2016-2017					
	2016			2017		
	Cases	Rate[1]	Rank	Cases	Rate[1]	Rank
MVT[2] *- Unspecified – Unintentional*	10,111	965.9	1	10,329	963.3	1
Fall - Unintentional	7,796	744.8	2	9,862	919.8	2
Bite and Stings-Nonvenomous - Unintentional	2,082	198.9	3	2,289	213.5	3
Other Specified Foreign Body[3] *- Unintentional*	1,524	145.6	4	1,725	160.9	4
Unspecified[4] *- Assault*	1,004	95.9	5	1,111	103.6	5

Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.
[1]Rate is per 100,000 population.
[2]In the ICD-10-CM data, Motor Vehicle Transport is more specific and has separate categories for MVT- Pedestrian, MVT Pedal Cyclist, MVT-Occupant, MVT-Unspecified, and MVT-Other.
[3] *Other specified foreign body* is an injury resulting from entrance of a foreign body into or through the eye or other natural body opening that does not block an airway or cause suffocation (asphyxia). Examples include pebble or dirt in eye, BB in ear, or small children's toys in esophagus.
[4]Intent established, but mechanism is unclear or not documented.

Figure 2



* 2018 projection is based on the monthly average of opioid ED visits from January-July 2018. There were 159 visits in that seven-month period.
Source: https://www.injuryfreenc.ncdhhs.gov/DataSurveillance/Poisoning.htm, 8/23/18

Table 2 shows *Falls-Unintentional* continued to lead injury hospitalizations by a large margin in 2017. Hospitalizations from unintentional falls increased from 2016 (1,833) to 2017(1,906), but the rate for hospitalizations from unintentional falls increased only slightly. MVT and poisoning (both unintentional and self-harm) hospitalization cases and rates fell from 2016 to 2017.

Table 2

Cause of Injury	Top Five Causes of Injury Hospitalization (All Ages), Wake County, 2016-17					
	2016			2017		
	Cases	Rate[1]	Rank	Cases	Rate[1]	Rank
Fall - Unintentional	1,833	175.1	1	1,906	177.8	1
MVT[2]-Occupant - Unintentional	319	30.5	2	294	27.4	2
Poisoning: Drug - Unintentional	276	26.4	3	250	23.3	3
Poisoning: Drug - Self-Harm	234	22.4	4	216	20.1	4
Unspecified[3] - Unintentional	118	11.3	5			
Hot Object/Substance - Unintentional				108	10.1	5

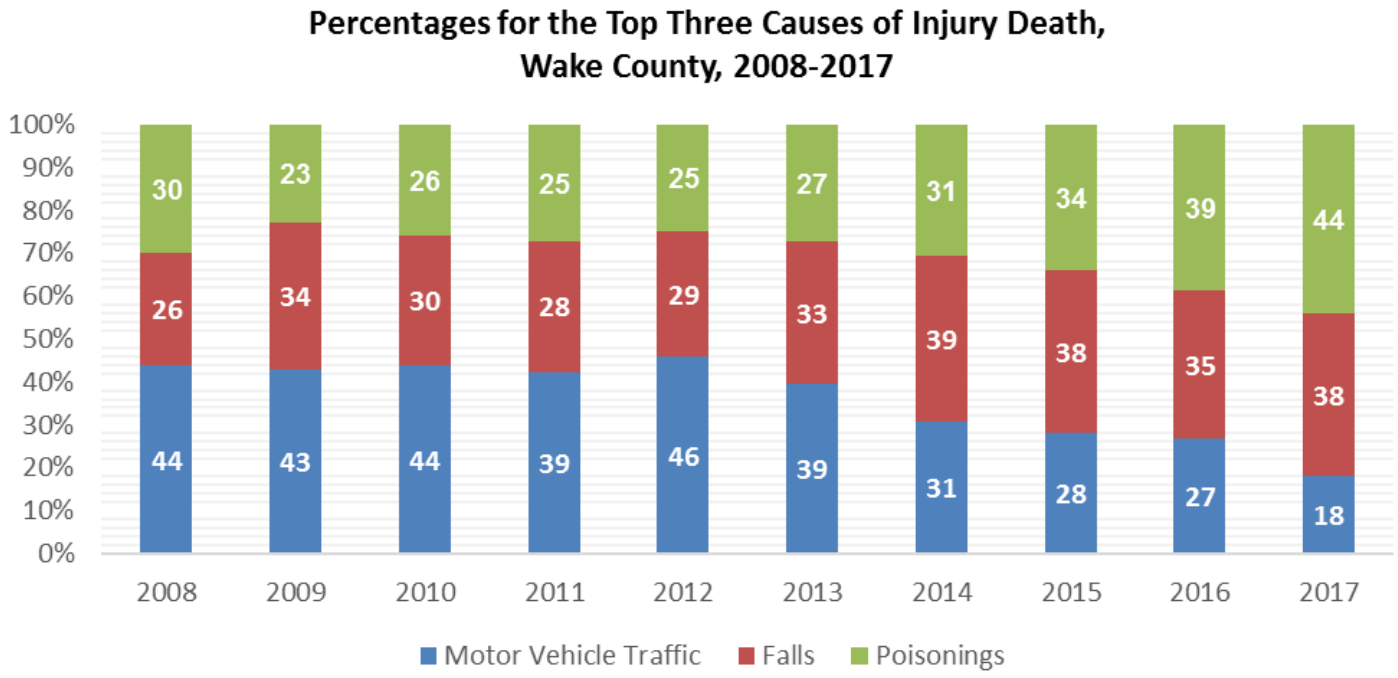
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.
[1]Rate is per 100,000 population.
[2]In the ICD-10-CM data, Motor Vehicle Transport is more specific and has separate categories for MVT- Pedestrian, MVT Pedal Cyclist, MVT-Occupant, MVT-Unspecified, and MVT-Other.
[3]Intent established, but mechanism is unclear or not documented.

Leading Causes of Death

The top three causes of injury death in Wake County have not changed in the previous eight years, but the proportion of deaths due to poisonings and falls compared to MVT has changed. MVT has not led injury deaths in Wake County since 2013. Over the last 8 years, Wake County has seen the following trends in the top 3 causes of injury death:

- Motor vehicle traffic injury deaths have decreased
- Fall injury deaths have increased
- Poisoning injury deaths have increased (Figure 3)

Figure 3

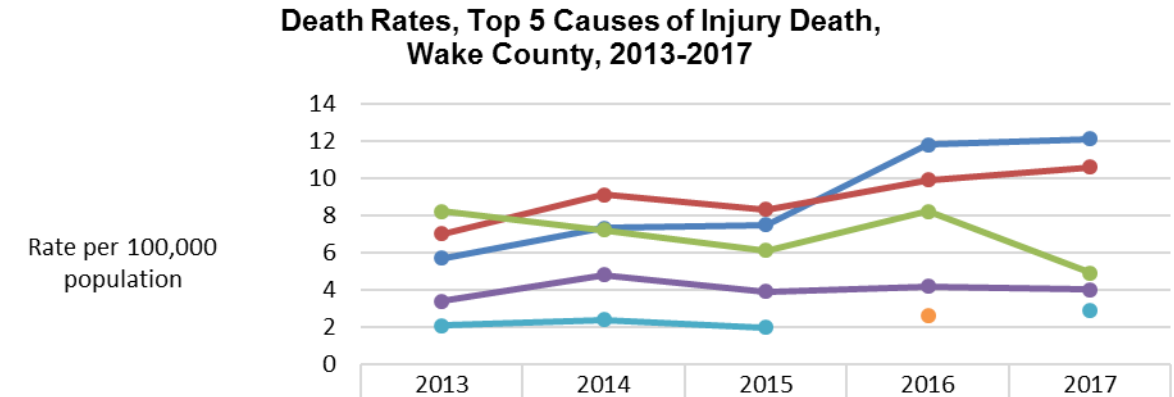


Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

Figure 4 shows that unintentional poisonings had the highest death rate in Wake County in 2017. The unintentional poisoning death rate increased from 2016 to 2017, but much less dramatically than from the previous year (2.6% compared to 57.3%). A more detailed analysis of Wake County's opioid epidemic (a major driver of increased poisoning deaths) can be found later in this report.

The fall death rate (second-highest in 2017) continued to rise; since 2013, the fall death rate has increased 51.4%. The MVT death rate (third-highest in 2017) experienced a huge one-year drop of 40.2% from 2016 to 2017. Firearm (self-inflicted) and suffocation (self-inflicted) death rates ranked fourth and fifth in 2017.

Figure 4



	2013	2014	2015	2016	2017
Poisoning-Unintentional	5.7	7.3	7.5	11.8	12.1
Falls-Unintentional	7	9.1	8.3	9.9	10.6
MVT-Unintentional	8.2	7.2	6.1	8.2	4.9
Firearm-Self-inflicted	3.4	4.8	3.9	4.2	4
Suffocation-Self-Inflicted*	2.1	2.4	2		2.9
Firearm-Assault**				2.6	

*In 2016, "Suffocation-Self-inflicted " was not among the top 5 causes of injury death so no data is shown for that year.
**"Firearm-Assault" was only among the top 5 causes of injury death in 2016, so no data is shown for other years.
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

Motor Vehicle Traffic (MVT) Deaths

There were 353 MVT deaths in Wake County from 2013-2017, 4.9% lower than from 2012-2016. The demographic groups experiencing the highest MVT death rates in Wake County are the same as in previous years, males, black/African-Americans and 15-24 year olds. Men died at more than 2.5 times the rate of women (10.1 and 3.8 per 100,000 population, respectively). Whites and Hispanics represented 64.6% of MVT deaths in 2013-2017, yet black/African-Americans died at higher rates than whites and Hispanics (10.6, 6.4 and 6.0 per 100,000 population, respectively). The 15-24 year old age group died at significantly higher rates than all other age groups (12.8 per 100,000 population; the next highest age group was 65+ at 9.6 per 100,000 population). (Table 3)

Table 3

Motor Vehicle Traffic (MVT) Deaths, Wake County, 2013 - 2017			
	Number	**Percent (%)**	**Rate (per 100,000 population)**
Sex			
Female	101	28.6	3.8
Male	252	71.4	10.1
Race/Ethnicity			
White (non-Hispanic)	198	56.1	6.4
Black (non-Hispanic)	112	31.7	10.6
American Indian (non-Hispanic)	0	0.0	0.0
Asian (non-Hispanic)	8	2.3	*
Hispanic	30	8.5	6.0
Other/Unknown	5	1.4	*

*The number of deaths for Asians and Other/Unknown was too small to calculate a rate.
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

Table 3 continued

Motor Vehicle Traffic (MVT) Deaths, Wake County, 2013 - 2017			
	Number	Percent (%)	Rate (per 100,000 population)
Age Group			
0-14	20	5.7	1.9
15-24	88	24.9	12.8
25-34	63	17.8	8.4
35-44	40	11.3	5.1
45-54	49	13.9	6.6
55-64	42	11.9	7.5
65+	51	14.4	9.6
Total	**353**	**100.0**	**6.9**

Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

Fall Deaths

There were 462 fall deaths in Wake County from 2013-2017, an 18.2% increase from 2012-2016. The rise in fall death rates has occurred across key demographics, as Table 4 shows. The 65+ death rate is disproportionately higher when compared to all other age groups, and 14 times higher than the next highest group (55-64 year-olds at 5.3 per 100,000 population).

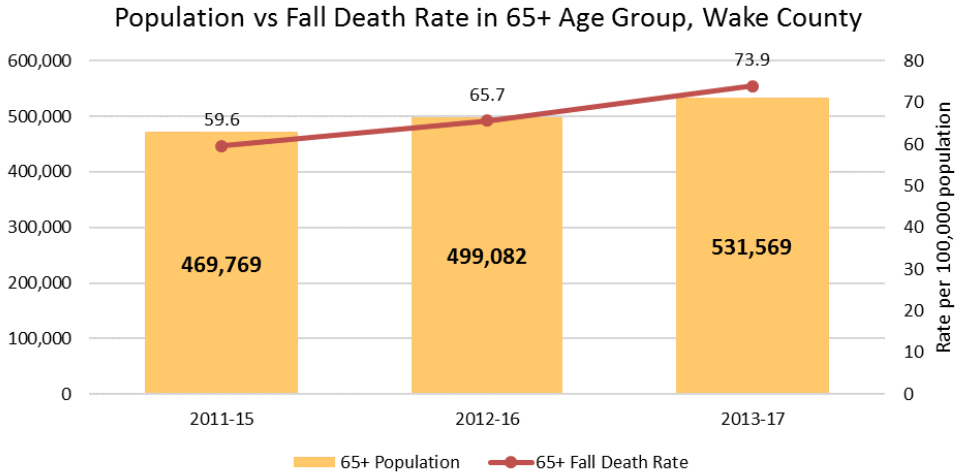
Table 4

Fall Death Rates by Key Demographic, Wake County			
Demographic	2011-15	2012-16	2013-17
Age 65+	59.6	65.7	73.9
Ages 55-64	4.8	4.5	5.3
White non-Hispanic	8.6	10.8	12.6
Black non-Hispanic	3.1	4.4	5.1
Hispanic	*	**	2.6
Male	6.9	7.9	9.1
Female	6.8	7.8	8.9

*data not available
**numbers too small to calculate a rate
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

Figure 5 shows that as Wake County's senior population has increased, so has the fall death rate in the senior age group.

Figure 5

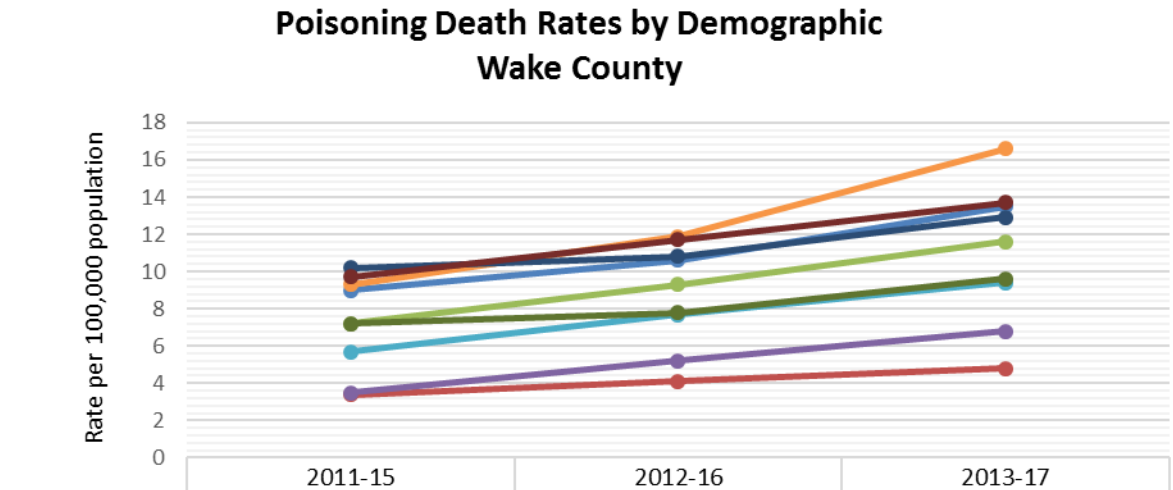


Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/4/16, 9/19/17 and 8/17/18.

Poisoning Deaths

Poisoning deaths remain a major public health issue in Wake County. In the span of just two years, poisoning deaths have increased 54.7%, 298 in 2011-2015 to 461 in 2013-2017. Males, white non-Hispanics and people ages 25-54 continue to have the highest percentages of poisoning deaths (72.7%, 77.9% and 71.1% respectively). Figure 6 shows poisoning death rates continue to rise across all demographic groups.

Figure 6



	2011-15	2012-16	2013-17
Male	9	10.6	13.5
Female	3.4	4.1	4.8
White NH*	7.2	9.3	11.6
Black NH	3.5	5.2	6.8
Age 15-24	5.7	7.7	9.4
Age 25-34	9.3	11.9	16.6
Age 35-44	10.2	10.8	12.9
Age 45-54	9.7	11.7	13.7
Age 55-64	7.2	7.8	9.6

*non-Hispanic
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

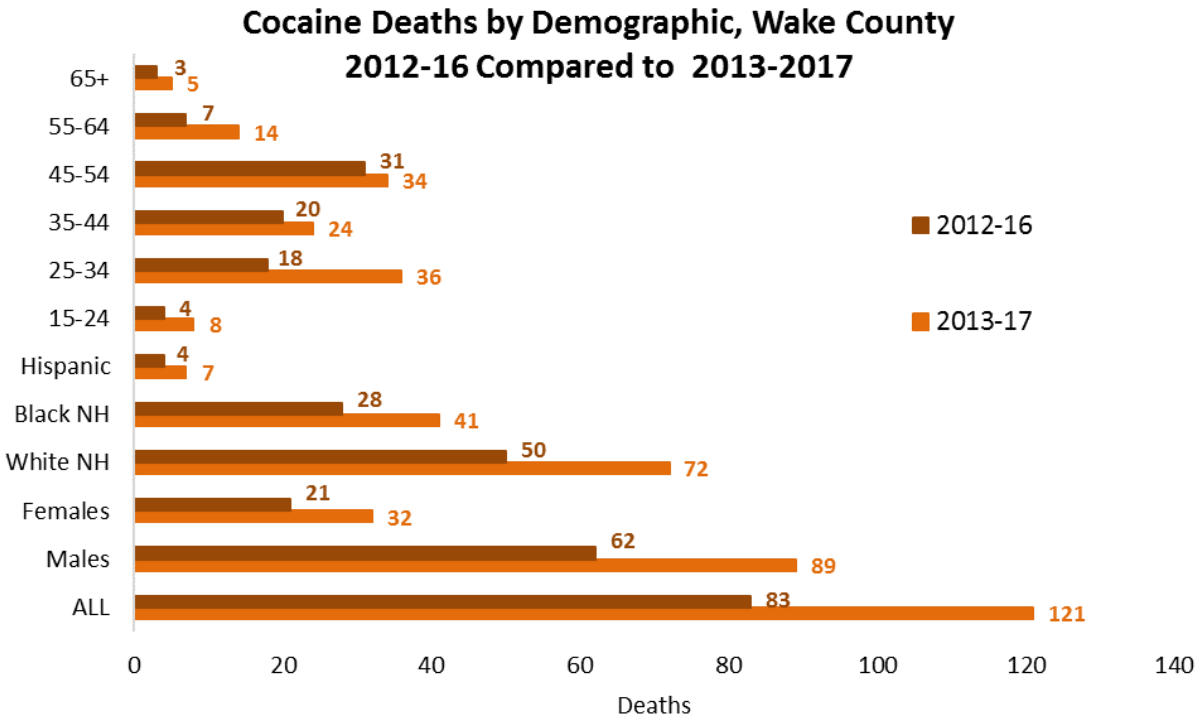
Deaths from Psychostimulants and Cocaine

Over the decade from 2004-2014, there were only six deaths in Wake County caused by *psychostimulants with potential for abuse,* the category under which methamphetamines fall. Yet in the three-year span from 2015-2017, there were 11 such deaths in Wake County (data provided via email by NC DHHS Division of Public Health, Injury and Violence Prevention Branch, 7/13/18). Psychostimulant deaths are less numerous than other drug categories, but they are also rising statewide and nationally. These death numbers are small, but their rise is a cause for concern. (Figure 9)

Cocaine deaths rose significantly in Wake County from 2012-2016 to 2013-2017 as Figure 7 shows. Across the board, cocaine deaths increased 45.8%. In demographic groups who had at least 10 deaths in 2013-2017, there were significant increases among:

- Males (43.5%)
- Females (52.4%)
- White non-Hispanics (NH) (44%)
- Black non-Hispanics (46.4%)
- 25-34 year-olds (100%)
- 55-64 year-olds (100%)

Figure 7



Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

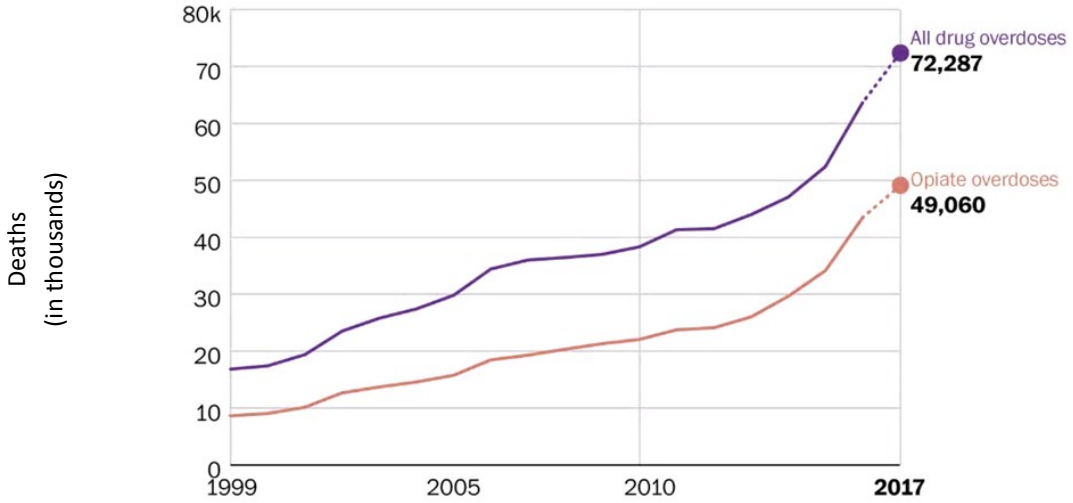
The Opioid Crisis—National, State and Local

In an August 15, 2018 article on drug overdose deaths in the US, the *New York Times* painted a stark picture. "Drug overdoses killed about 72,000 Americans last year [2017], a record number that reflects a rise of around 10 percent, according to new preliminary estimates from the Centers for Disease Control. The death toll is higher than the peak yearly death totals from H.I.V., car crashes or gun deaths. Analysts pointed to two major reasons for the increase: A growing number of Americans are using opioids, and drugs are becoming more deadly. It is the second factor that most likely explains the bulk of the increased number of overdoses last year." (2)

In a *Washington Post* article referencing the same Centers for Disease Control and Prevention (CDC) data, synthetic opioids are the prime culprit in the increase in national overdose deaths; with the numbers essentially quadrupling in less than three years. (3) Figure 8 shows a significant increase in deaths from all drug overdoses and opioid overdoses over the last 20 years. Figure 9 shows that while synthetic opioid deaths rose significantly at the national level, heroin and other opioid deaths have stalled. North Carolina and Wake County are reflecting the same trend.

Figure 8

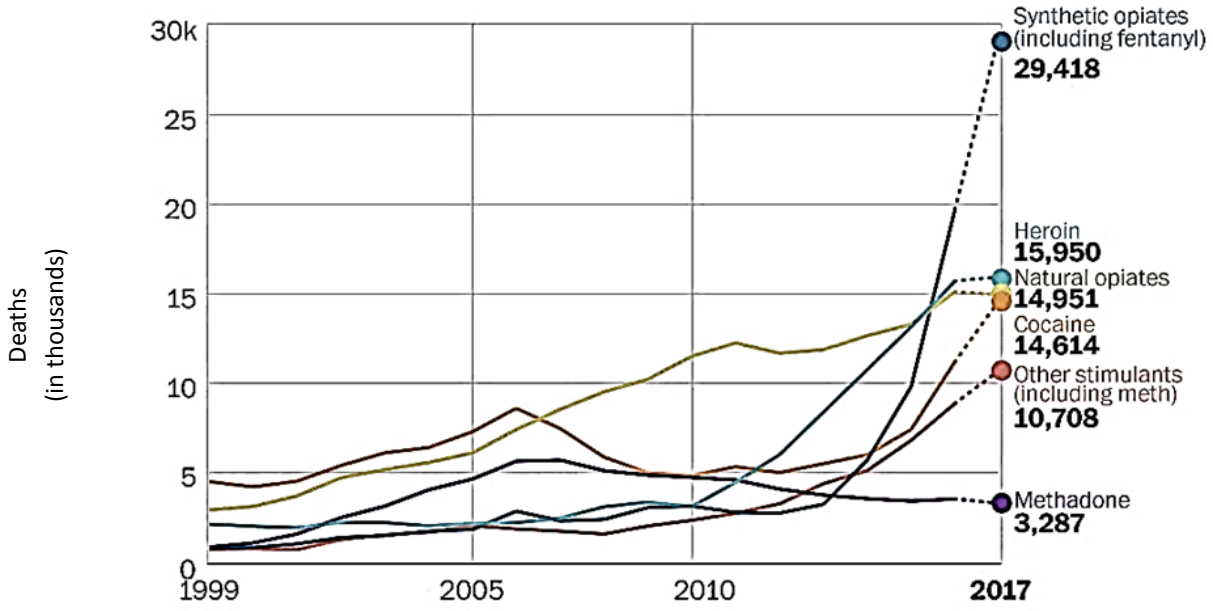
Annual Drug Overdose and Opiate Overdose Deaths in US, 1999-2017*



*2017 figures are provisional.
Source: *The Washington Post*. 8-15-18.

Figure 9

Annual Overdose Deaths by Selected Drug in US, 1999-2017*

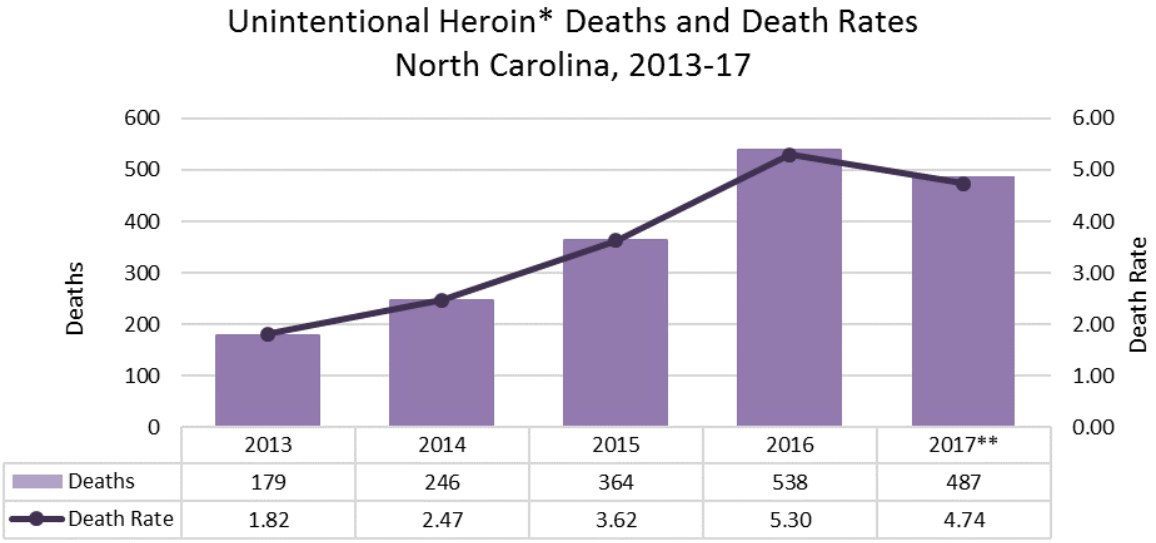


*2017 figures are provisional.
Source: *The Washington Post*. 8-15-18.

According to recent CDC stats, North Carolina experienced the third highest percentage increase in the nation for overdose deaths from January 2017 to January 2018. (4) For the 12-month period ending in January 2017, there were 1,974 reported drug overdose deaths; for the 12-month period ending in January 2018, there were 2,323 deaths, an increase of 17.7%.

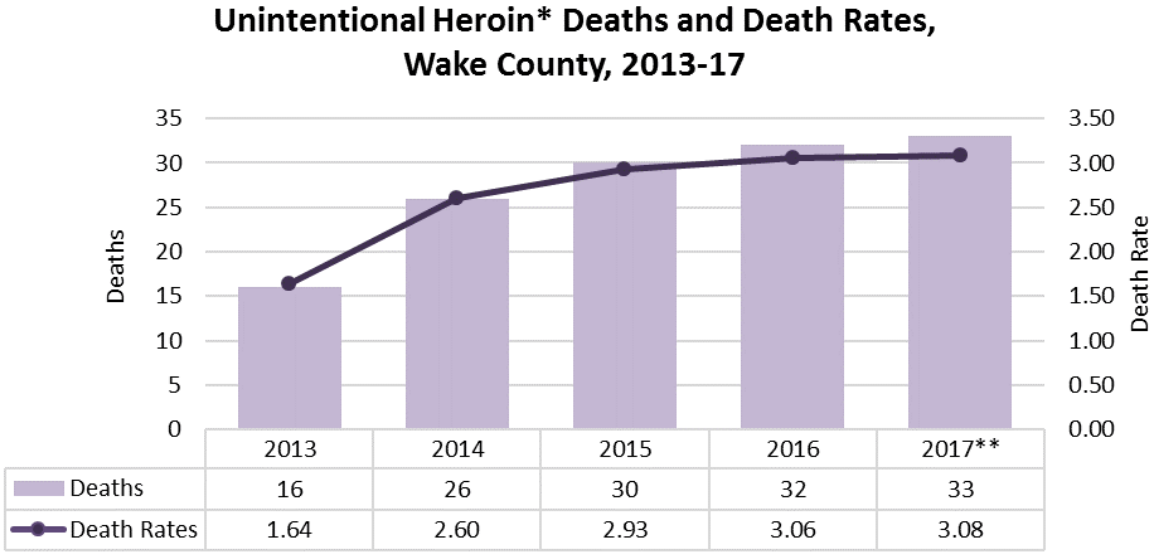
Figures 10-15 show similar trends for both North Carolina and Wake County; heroin and commonly prescribed opioid deaths fell statewide and slowed in Wake County, while other synthetic opioid deaths skyrocketed for both.

Figure 10



*Includes cod1-cod20 (ICD-10) any mention of T40.1 and unintentional intent (X40-X44) in cod1.
**2017 data is provisional.
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

Figure 11



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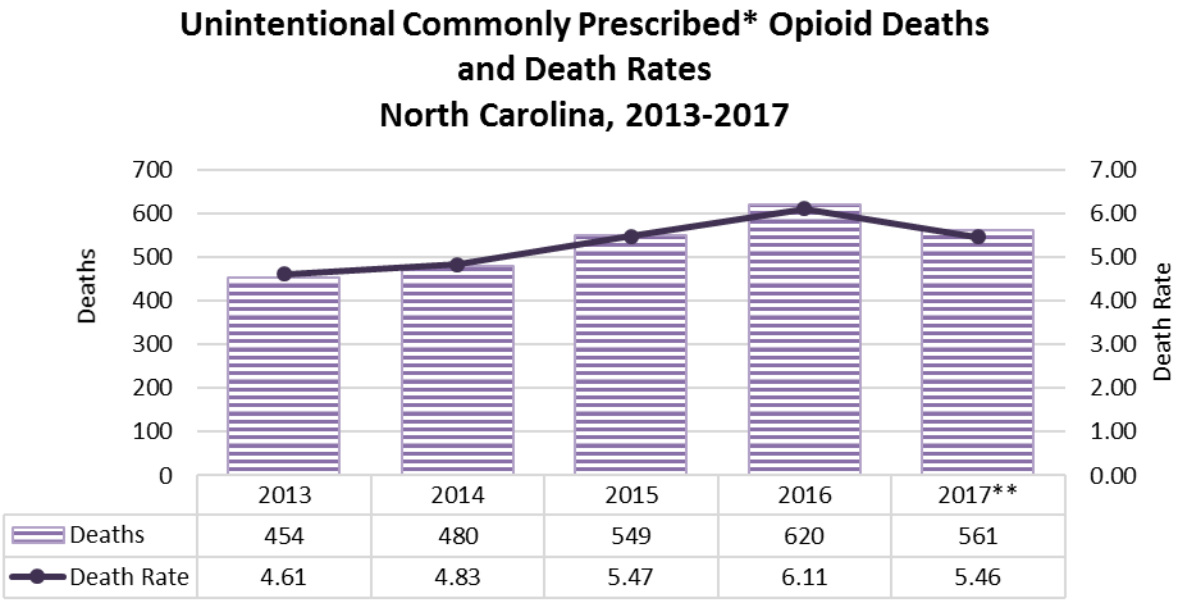
**2017 data is provisional.
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

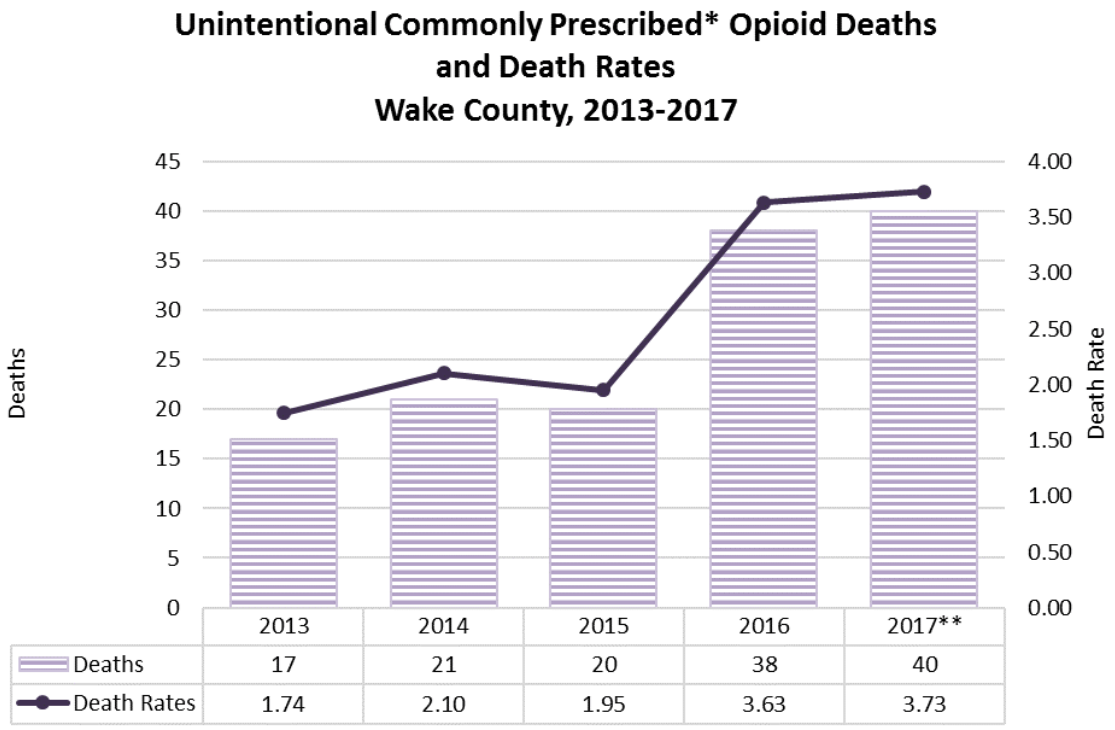
Figure 12



	2013	2014	2015	2016	2017**
Deaths	454	480	549	620	561
Death Rate	4.61	4.83	5.47	6.11	5.46

*Includes cod1-cod20 (ICD-10) any mention of T40.4 and unintentional intent (X40-X44) in cod1.
**2017 data is provisional.
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

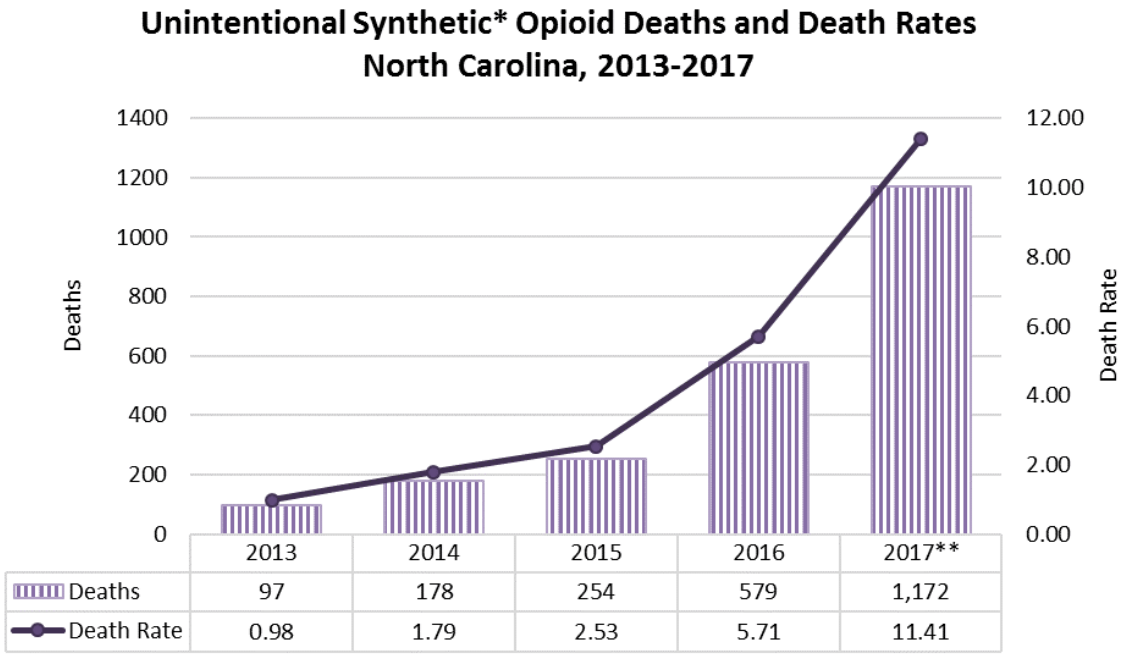
Figure 13



	2013	2014	2015	2016	2017**
Deaths	17	21	20	38	40
Death Rates	1.74	2.10	1.95	3.63	3.73

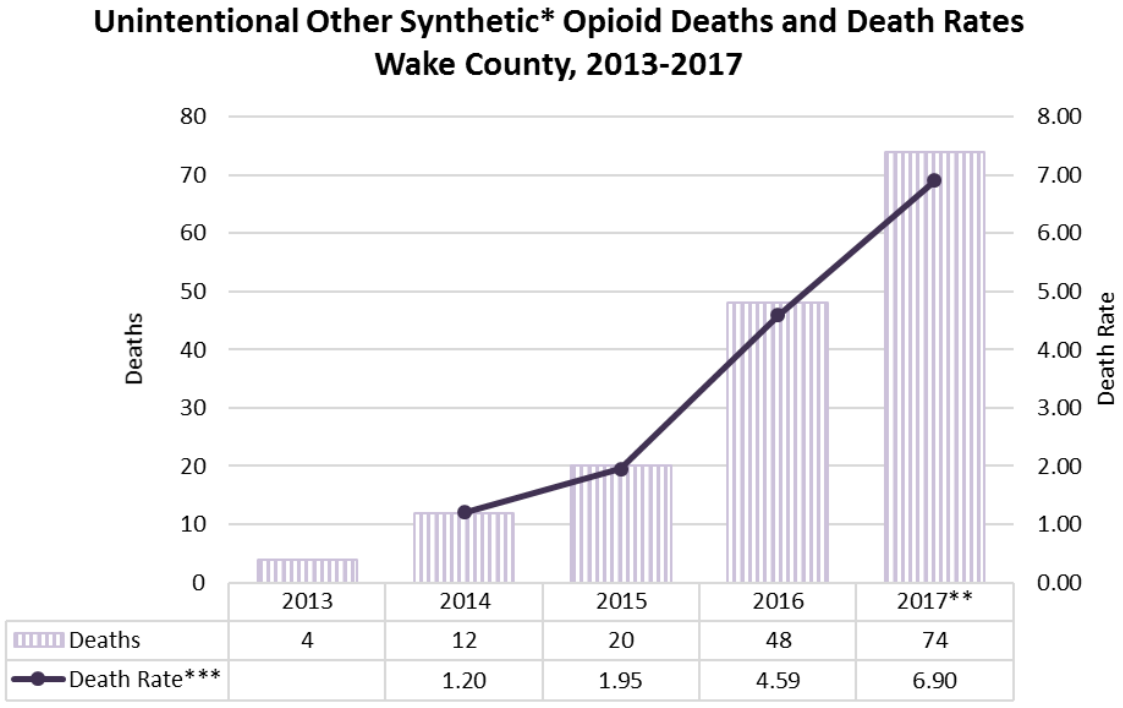
*Includes cod1-cod20 (ICD-10) any mention of T40.4 and unintentional intent (X40-X44) in cod1.
**2017 data is provisional.
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

Figure 14



*Includes cod1-cod20 (ICD-10) any mention of T40.2 or T40.3 and unintentional intent (X40-X44) in cod1.
**2017 data is provisional.
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

Figure 15



*Includes cod1-cod20 (ICD-10) any mention of T40.2 or T40.3 and unintentional intent (X40-X44) in cod1.
**2017 data is provisional.
***Number of deaths too small to calculate a rate.
Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

On a local level, Table 5 shows that while the same demographic groups (white non-Hispanics, males, ages 25-34) have the highest opioid overdose deaths and death rates in Wake County, both deaths and death rates increased across the board from 2012-16 to 2013-17. Significant increases for other synthetic opioid death rates followed the North Carolina pattern.

Table 5

Unintentional Opioid Overdose Deaths and Death Rates by Type and Demographic Wake County, 2012-2016 Compared to 2013-2017

		Heroin			Other Synthetic Opioids			Commonly Prescribed Opioids		
		Deaths Rate		Death Rate ↑	Deaths Rate		Death Rate ↑	Deaths Rate		Death Rate ↑
		2012-16	2013-17		2012-16	2013-17		2012-16	2013-17	
Gender	Male	86 3.5	105 4.2	20%	57 2.3	112 4.5	**95.6%**	68 2.8	89 3.6	28.6%
	Female	26 1.0	32 1.2	20%	28 1.1	46 1.8	**64.3%**	41 1.6	47 1.8	12.5%
Race/ Ethnicity	White non-Hispanic	97 3.1	117 3.8	22.6%	72 2.3	131 4.2	**82.6%**	95 3.1	115 3.7	19.4%
	Black non-Hispanic	9 *	12 1.1	N/A	9 *	20 1.9	N/A	11 1.0	15 1.4	40%
	American Indian non-Hispanic	0 0	0 0	N/A	0 0	0 0	N/A	1 *	1 *	N/A
	Asian non-Hispanic	0 0	0 0	N/A	1 *	1 *	N/A	0 0	1 *	N/A
	Hispanic	4 *	5 *	N/A	1 *	4 *	N/A	1 *	3 *	N/A
	Other/ Unknown	1 *	3 *	N/A	2 *	2 *	N/A	1 *	1 *	N/A
Age	0-14	0 0	0 0	N/A	0 0	0 0	N/A	0 0	0 0	N/A
	15-24	19 2.8	22 3.2	14.3%	19 2.8	30 4.4	**57.1%**	14 2.1	16 2.3	9.5%
	25-34	38 5.2	44 5.8	11.5%	29 3.9	58 7.7	**97.4%**	25 3.4	40 5.3	**55.9%**
	35-44	32 4.1	40 5.1	24.4%	18 2.3	31 3.9	**69.6%**	28 3.6	29 3.7	2.8%
	45-54	17 2.3	22 3.0	30.4%	12 1.7	26 3.5	**105.9%**	28 3.9	33 4.4	12.8%
	55-64	4 *	7 *	N/A	6 *	12 2.1	N/A	13 2.4	17 3.0	25%
	65+	2 *	2 *	N/A	1 *	1 *	N/A	1 *	0 0	N/A
All		112 2.2	137 2.7	22.7%	85 1.7	158 3.1	**82.4%**	109 2.2	136 2.7	22.7%

*Number of deaths was too small to calculate a rate for these demographic groups.

Source: NC DHHS DPH, Injury and Violence Prevention Branch, 8/17/18.

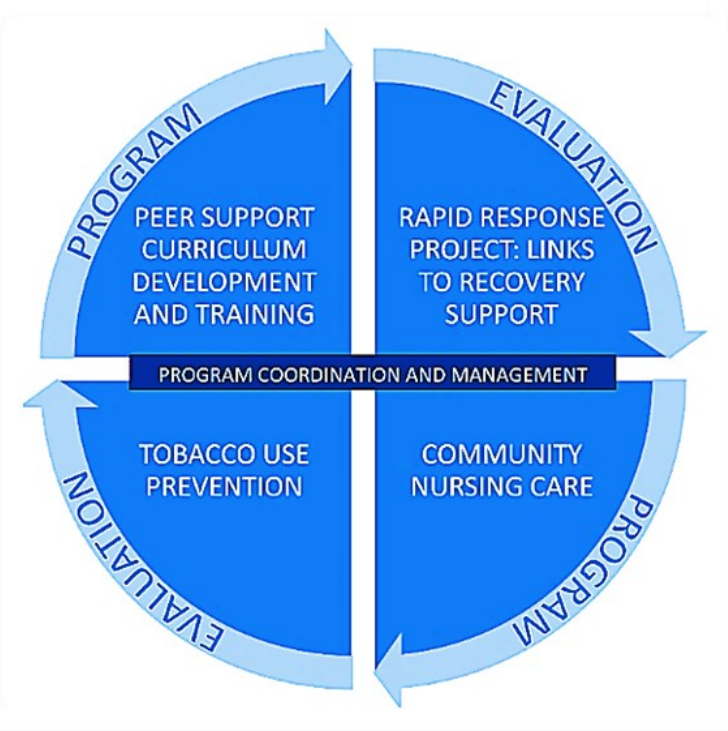
Wake County's Response to the Opioid Crisis

From 2010 to 2014, injury surveillance data showed a large increase in heroin overdose deaths in Wake County. In late 2015, Wake County Human Services (WCHS) and the Wake County Sheriff's Office proactively convened a community coalition in response to the opioid overdose problem. The Wake County Drug Overdose Prevention Coalition represents the cornerstone for the county's strategic thinking and long-range planning on the opioid issue that took place in 2016 and 2017. The work led to a three-year, $950,000 allocation of ABC funds from the Wake County Board of Commissioners to create the Wake County Drug Overdose Prevention and Tobacco Use Initiative (Initiative).

The Initiative is both multi-agency and interdisciplinary by design, and leverages resources found in the larger Wake County community. Figure 16 illustrates the programmatic components of the Initiative. At the center lies overall coordination and program management for the Initiative. Program evaluation touches and cycles through all areas to ensure adherence to program standards. The purpose of evaluation is to gain insight into this program's effectiveness by determining if the activities and objectives were achieved and by assessing the impact on participants' lives. The four quadrants represent the areas where the key capacity-building, prevention and treatment activities occur. They are:

- Peer Support Recovery-Focused Curriculum Development and Training
- Rapid Response Project linking individuals to recovery support services
- Injury and Drug Prevention Community Nursing Care
- Tobacco Use Prevention and Support

Figure 16



Program implementation for the Initiative began in September 2017, and Figure 17 details the implementation timeline.

Figure 17

Wake County Drug Overdose Prevention and Tobacco Use Initiative Implementation Timeline

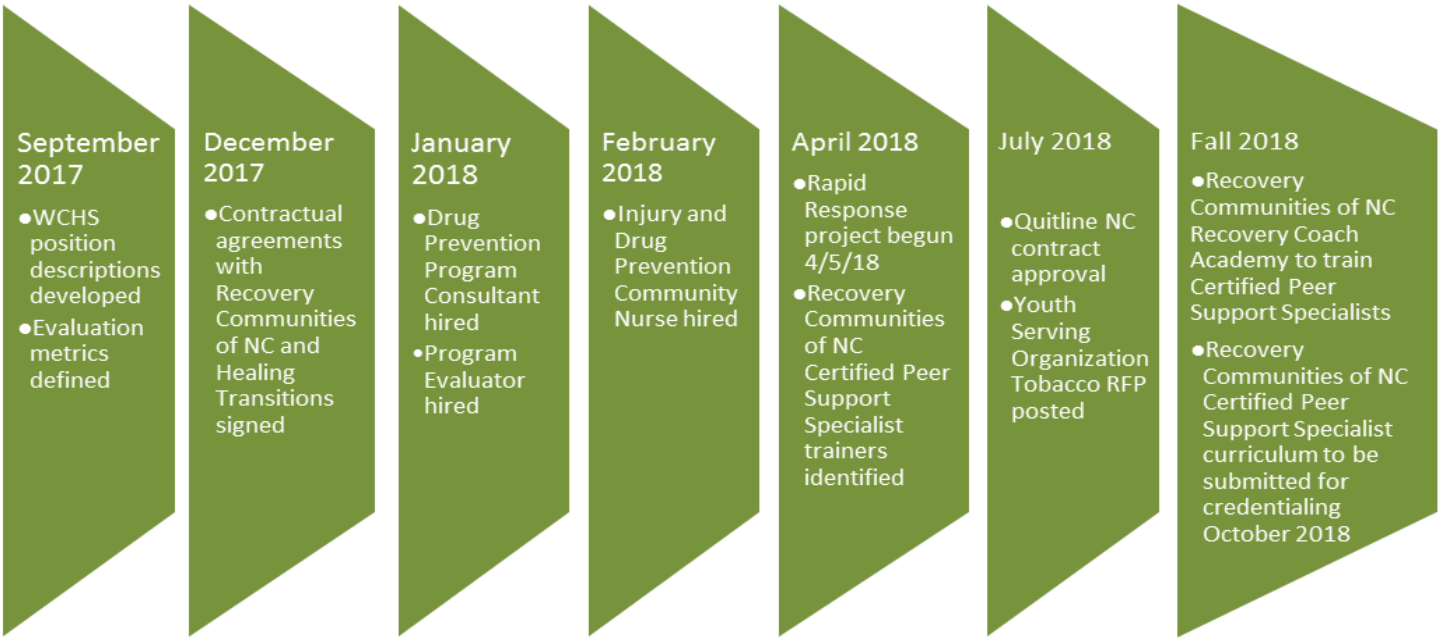


Table 6 describes the Initiative's key activities by program area.

Table 6

Initiative Activities by Program Area			
Program Area	**Staff Responsible/ Agency**	**Key Activities**	**Key Partnerships**
Coordination and Management	Injury and Drug Prevention Consultant Wake County Human Services (WCHS)	• Management of the implementation and coordination of the Wake County Drug Overdose Prevention and Tobacco Use Initiative • Facilitation of the Wake County Drug Overdose Prevention Coalition • Oversight for contractual agreements with Initiative partners	Initiative staff from WCHS, Healing Transitions (HT), Recovery Communities of North Carolina (RCNC), NC Harm Reduction Coalition (HRC), Wake County EMS, tobacco use prevention partners
Training	Executive Director (RCNC)	• Development of a peer support recovery focused curriculum • Identifying/training/registering with UNC Behavioral Healthcare Resource Program at least 4 individuals to provide the curriculum • Providing training to a minimum of 24 individuals within 3 years	UNC Behavioral Healthcare Resource Program

Table 6 continued

Initiative Activities by Program Area			
Program Area	**Staff Responsible/ Agency**	**Key Activities**	**Key Partnerships**
Rapid Response System—Link to Recovery Support	Recovery Engagement Coordinator, Certified Peer Support Specialists (Healing Transitions) Advanced Practice Paramedics (Wake County EMS)	• Peer navigator assistance to individuals who come to the attention of law enforcement, EMS, the NC Harm Reduction Syringe Exchange Program and the WCHS health clinics due to their opioid use and its consequences • Linkage to recovery support resources	Initiative staff from WCHS, Healing Transitions, RCNC, NC Harm Reduction Coalition and Wake County EMS
Community Nursing Care	Injury and Drug Prevention Community Nurse (WCHS)	• Nursing assessments and referral process for linkages to behavioral health and wrap around services • Wound treatment • Coordination of resources for naloxone distribution	WCHS Hepatitis C Bridge Counselors, Love Wins, Healing Transitions, NC Harm Reduction Coalition
Tobacco Use Prevention	Smoking Cessation and Nicotine Replacement Therapy Counselors (Quitline Staff)	• Providing counseling and nicotine replacement therapy for registered/ eligible Quitline NC callers	Region 7 Tobacco Prevention Control Manager (based at WCHS) with NC Public Health Foundation and Quitline NC
	To be determined	• Training a minimum of 20 Wake County youth on substance use and tobacco use prevention	Initiative staff from WCHS, Tobacco Contracted Partners
Program Evaluation	Program Evaluator (Contract)	• Develops a written evaluation plan for each component of the Initiative • Provides monitoring of program objectives with quarterly reports, annual written summary reports and a project final report	Initiative staff from WCHS, Healing Transitions, RCNC, NC Harm Reduction Coalition and Wake County EMS

Table 7 provides a snapshot of key Initiative indicators from 1/1/18-6/30/18.

Table 7

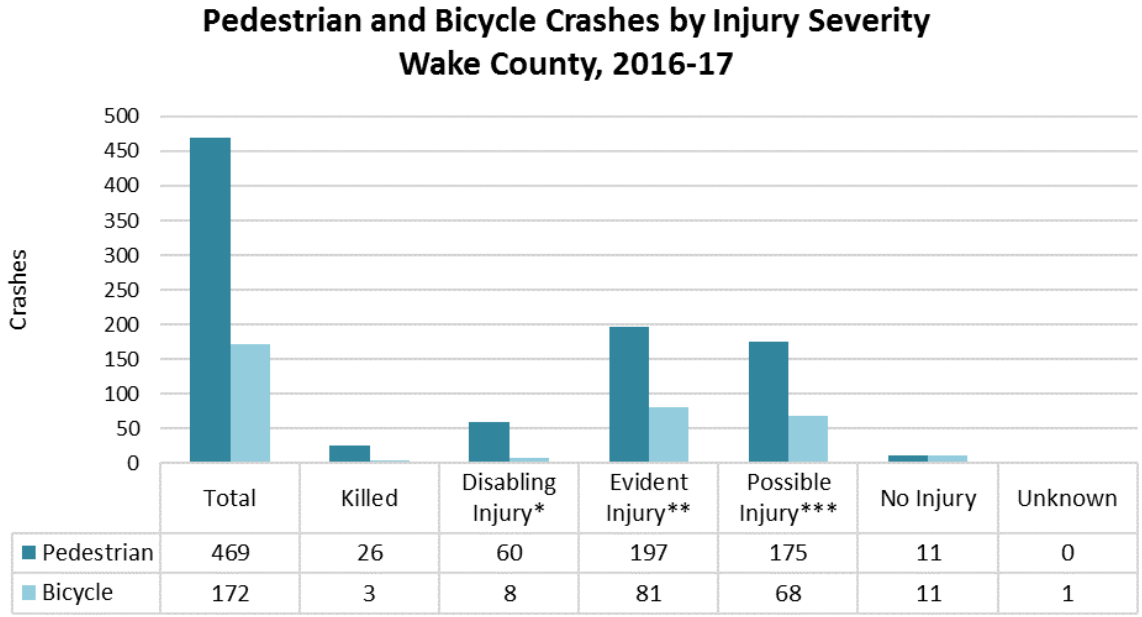
Wake County Drug Overdose Prevention and Tobacco Use Initiative Key Indicators 1/1/18 - 6/30/18	
Indicator	**Number of Clients Reached**
Links to Certified Peer Support Specialists (CPSS)	132
Clients referred by CPSS to community providers	89
Clients linked to Injury/Drug Prevention Nurse	6
Clients linked by Injury/Drug Prevention Nurse to community providers	4
Quitline NC (Tobacco Cessation) callers	457
Trained in recovery-focused curriculum	4

Source: Wake County Drug Overdose and Tobacco Use Prevention Initiative data 10/11/18.

Pedestrian and Bicycle Injuries

With Wake County's ever-growing population (1,072,203 in 2017) and population density (1,284 persons per square mile), pedestrian and bicycle crashes (crashes with motor vehicles that are reported to police) remain a safety concern. Figure 18 shows pedestrian and bicycle crashes by severity in 2016-2017.

Figure 18



*Disabling injuries are those serious enough to prevent normal activity for at least one day, such as massive loss of blood, broken bones, etc.
**Evident injuries are non-fatal or non-disabling injuries that are evident at the scene, such as bruises, swelling, limping, etc.
***Possible injuries are those for which there is no visible injury but there are complaints of pain or momentary unconsciousness. Definitions found at https://connect.ncdot.gov/resources/safety/Documents/TEAAS/Chapter%2014%20Severity.pdf
Source: NC Department of Transportation, Traffic Safety Unit, 8/30/18. 9/10/18.

Tables 8 and 9 show the demographic characteristics of pedestrian and bicycle injuries and fatalities in Wake County from January 1, 2016 through December 31, 2017.

Table 8

Pedestrian* Injuries and Fatalities, Wake County 1/1/16—12/31/17		
Year	**Total Fatalities**	**Total Injuries**
2016	15	248
2017	12	226
Total	**27**	**474**
Age		
0-5	1	12
6-10	1	15
11-15	0	34
16-19	1	44
20-24	7	58
25-29	1	63
30-39	1	61
40-49	4	60
50-59	7	64
60-69	2	49
70+	2	14
Ethnicity		
White	9	174
Black	8	208
American Indian	0	0
Hispanic	8	52
Asian	1	10
Other	0	19
Unknown	1	11
Gender		
Male	21	280
Female	5	186
Unknown	1	8

*Injuries and fatalities that resulted from motor vehicle crashes with pedestrians that were reported to police.
Source: Special report prepared by NC Department of Transportation, Traffic Safety Unit, 8/27/18.

Table 9

Bicycle* Injuries and Fatalities, Wake County 1/1/16—12/31/17		
Year	**Total Fatalities**	**Total Injuries**
2016	1	78
2017	2	83
Total	**3**	**161**
Age		
0-5	0	2
6-10	0	6
11-15	0	19
16-19	1	14
20-24	0	29
25-29	0	20
30-39	0	19
40-49	0	13
50-59	2	26
60-69	0	10
70+	0	3
Ethnicity		
White	2	93
Black	0	42
American Indian	0	2
Hispanic	1	13
Asian	0	3
Other	0	7
Unknown	0	1
Gender		
Male	3	131
Female	0	29
Unknown	0	1

*Injuries and fatalities that resulted from motor vehicle crashes with bicyclists that were reported to police.
Source: Special report prepared by NC Department of Transportation, Traffic Safety Unit, 8/27/18.

Frequency of Pedestrian Crashes by Socioeconomic and Demographic Vulnerabilities

Wake County is divided into 455 census block groups. These groups are used as a proxy for "Community." In a geographic analysis of 2011-15 pedestrian crash data in Wake County, crashes were found to correlate with block groups that have higher socioeconomic vulnerabilities.

Indicators are used to help understand the socio-economic conditions within communities across Wake County. Each block group was analyzed by specific indicators, then given a score based on the total number of block groups, 1-455. The higher the score, the more vulnerable the population in that block group. Table 10 presents the frequency of pedestrian crashes by selected indicators as well as total score based on a combination of indicators. The indicators in Table 10 are found in the *Community Vulnerabilities Index* (http://www.wakegov.com/planning/maps/socialequity/Pages/Community-Vulnerability.aspx, 9/10/18) and the *Economic Health Index* (http://www.wakegov.com/planning/maps/socialequity/Pages/Economic-Health.aspx, 9/10/18.

Population density was also considered as a factor contributing to crashes. When adjusting for population, the average crash rate is almost 4 times higher in the 20 most vulnerable block groups (5.039 per 1000 people) compared to the least vulnerable groups (1.6375 per 1000 people).

Other factors such as speed, roads with unpaved shoulders, alcohol and drugs may also contribute to pedestrian crashes. Further analysis is needed to have a comprehensive understanding of all the factors that can contribute to pedestrian crashes.

Table 10

Frequency of Pedestrian Crashes in the 20 Most and 20 Least Vulnerable Block Groups by Indicator Wake County, 2011-2015

Indicator	Number of Crashes	
	20 Most Vulnerable Block Groups	20 Least Vulnerable Block Groups
Receiving food stamps[1]	151	54
Income 100-200% poverty level[2]	73	48
% in poverty[3]	148	38
% with no high school diploma[4]	133	43
Lowest median household income[5]	128	21
Highest housing vacancy rate[6]	102	38
Highest unemployment rate[7]	119	72
Total combined equity score[8]	139	39

[1]Percentage of persons receiving food stamps in each block group. Most vulnerable had highest percentage, least vulnerable had lowest.
[2]Persons living between 100-200% of federal poverty level ($22,000-44,000 per year). Ratio of income to poverty level for whom poverty status is determined between 100-200%. Most vulnerable had lowest ratio, least vulnerable had highest.
Continued on page 23

Table 10 continued

[3]Percentage of persons living below the federal poverty threshold. Most vulnerable had highest percentage, least vulnerable had lowest.

[4]The population of ages 25 and over who have less than a high school diploma. Most vulnerable had highest percentage, least vulnerable had lowest.

[5]Median household income in the past 12 months. Most vulnerable had lowest incomes, least vulnerable had highest.

[6]Percentage of vacant or unoccupied housing units. Most vulnerable had highest percentage, least vulnerable had lowest.

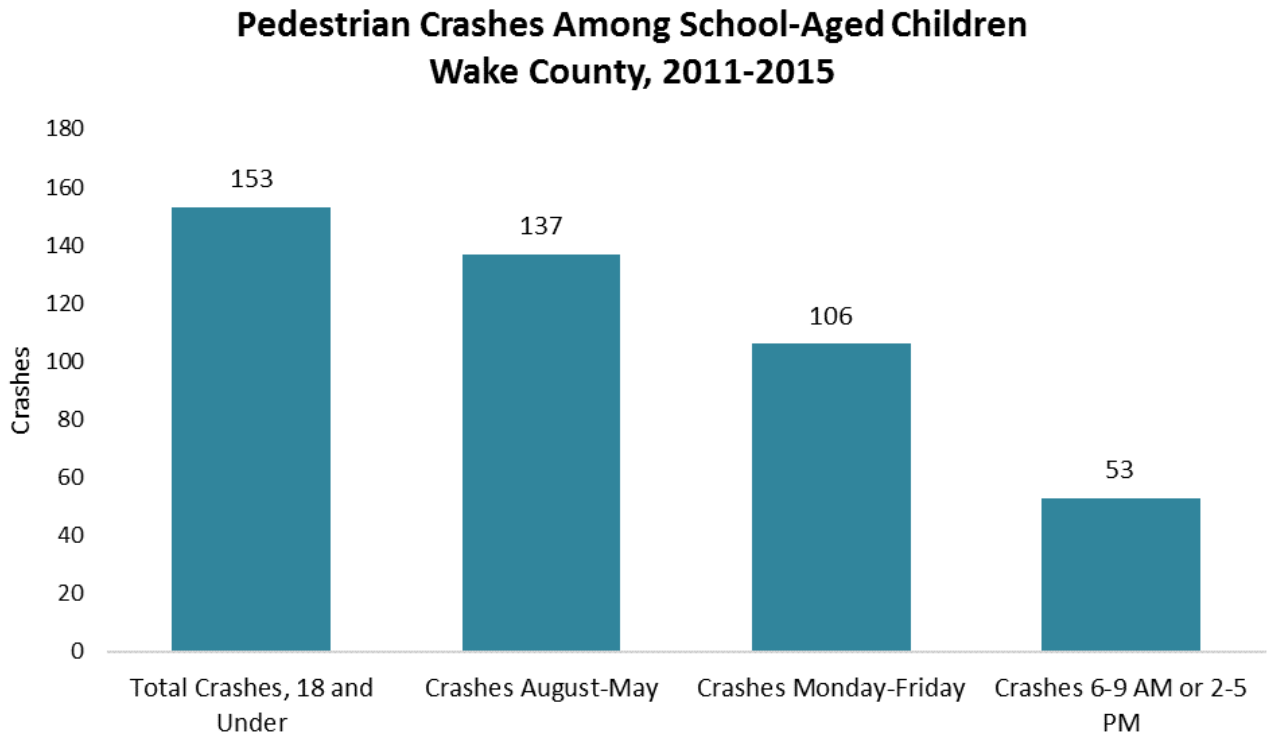
[7]Percentage of population ages 16 and over who are unemployed in the civilian labor force. Most vulnerable had highest percentage, least vulnerable had lowest.

[8]The combined equity score takes into account the contribution of multiple indicators (unemployment, age dependency, low educational attainment, housing vacancy, below poverty level, median household income, food stamps, rent as greater than 30% income, home mortgage as greater than 30% income, persons living between 100% and 200% of poverty income) at one time. The 20 least vulnerable groups had total combined equity scores of 1-20. The 20 most vulnerable groups had total combined equity scores of 436-455.

Source: NC Department of Transportation, with additional block group analysis by Wake County Community Services GIS Program, 7/25/18. Block group data taken from the US Census Bureau's American Community Survey (ACS 2012-16).

Additional analysis of pedestrian crash data from 2011-15 shows 153 pedestrian crashes involving school-age children that occurred within ½ mile of a school. Figure 19 shows that slightly more than one-third of these crashes occurred in students likely walking to or from school (i.e., crash occurred between August and May, during the school week and in the hours before or after school).

Figure 19



Source: NC Department of Transportation, 7/25/18.

SUCCESS STORY: SCOTTS RIDGE ELEMENTARY SCHOOL, APEX

Figure 19 illustrates the need for children to have safe ways to walk or bike to school in Wake County. On the first day of the 2018-2019 school year, there were 162,000 students in the Wake County Public School System (WCPSS). The exact number of how many students walk and bike to school is not known, but a district with that many children attending one of 183 schools includes many walkers and bike riders (whether by personal choice or necessity). Some school locations are better equipped to offer safe ways to walk and bike to school than others. Addressing factors such as location of new schools, school site design and the built environment around schools are ways to enhance children's safety and thereby reduce the number of motor vehicle and pedestrian/bicycle crashes.

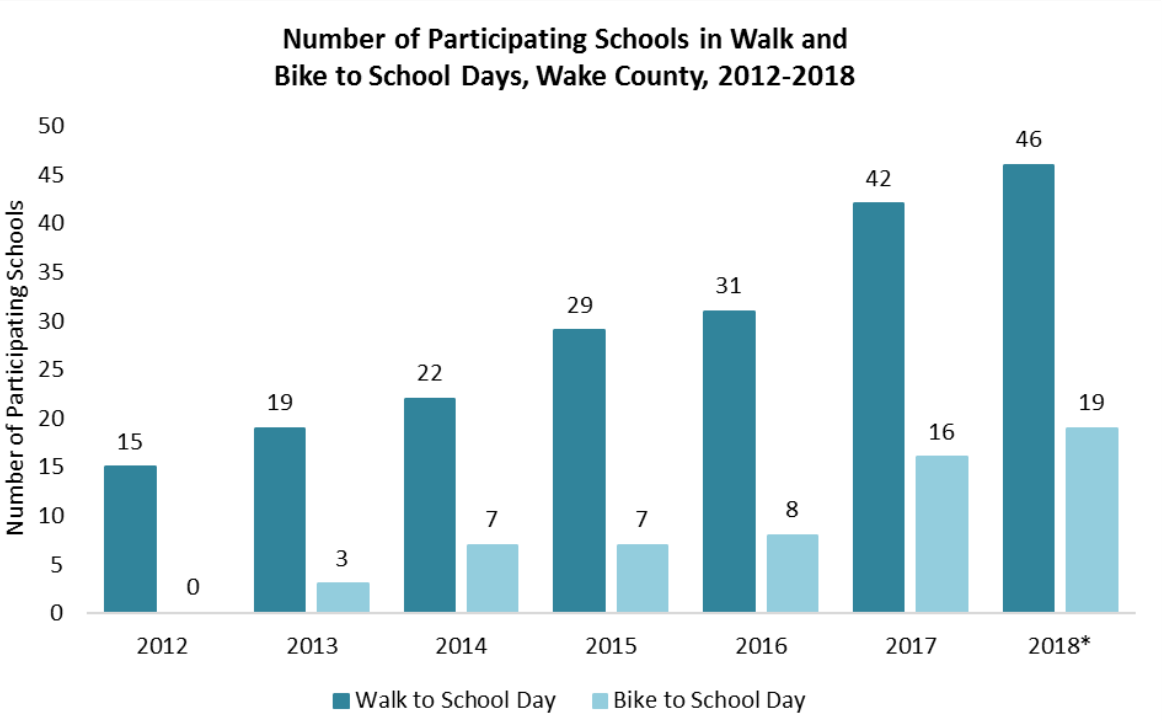
In the summer of 2015, the Active Routes to School (ARTS) Region 5 Coordinator facilitated a planning process with Wake County Public School System transportation staff, the Town of Apex planning and engineering staff, and incoming administrative staff for the new Scotts Ridge Elementary School to discuss school transportation issues. The ARTS Coordinator advocated making walking to school easy and safe for students and families. Parents in Scotts Mill (the large neighborhood directly across the street from the school) had already expressed a strong desire for their children to be able to walk and bike to school. The Scotts Mill homeowners' association was included in planning conversations from the outset, so parents knew what to expect leading up to the opening of the new school.

As a result of this ARTS-led planning process, the Town of Apex approved a new school crossing guard position in their budget. The new guard was trained by the Apex Police Department and was in place by the first day of school. The town also striped a crosswalk in front of the school at the intersection of the school driveway as well as on one of the main roads into the neighborhood. This sidewalk is where the crossing guard safely shepherds hundreds of children across the street every day.

This multi-stakeholder planning process also allowed school administrators to create walk and bike to school guidelines before the start of the school year, so that parents knew from day one exactly what to do and where to go if their children would be primarily walking or biking to and from school. These guidelines served as a template for at least two other WCPSS elementary schools.

Other benefits of this proactive planning process included changes in response to students' needs, even after school had started. For example, administrators requested additional bike racks when it became clear that there were not enough.

Figure 20



*As of 10/2/18, 46 schools in Wake County have registered to participate in the next Walk to School Day on October 10, 2018.
Source: Active Routes to School Region 5 Coordinator, 10/2/18.

Traumatic Brain Injuries

The CDC defines a traumatic brain injury (TBI) as "a disruption in the normal function of the brain that can be caused by a bump, blow, or jolt to the head, or penetrating head injury." The severity of a TBI may range from *mild* (i.e., a brief change in mental status or consciousness) to *severe* (i.e., an extended period of unconsciousness or memory loss after the injury). Most TBIs are mild and known as *concussions*. (5)

According to the latest national data available from the CDC, there were approximately 2.5 million ED visits, 282,000 hospitalizations and 56,000 deaths from TBI in 2013. (6) Combined together, TBI-related ED visits, hospitalizations and deaths (TBI-EDHDs) represented 1.9% of all EDHDs in the US in 2013.

At the national level, TBI-EDHD rates differed by age group, gender and cause of injury (Table 11). People with the highest TBI injury rates in 2013 were those aged 0-4, 15-24 and 75+. Males had higher TBI injury rates and fall rates exceeded those of being struck by/against and object and motor vehicle traffic.

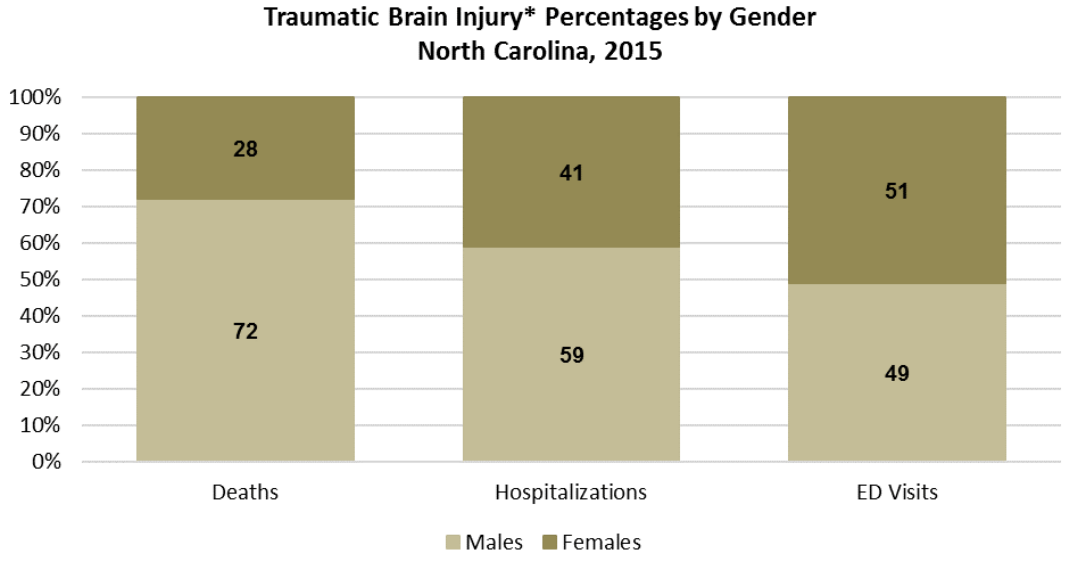
Table 11

Traumatic Brain Injury* Rates by Demographic Group United States, 2013		
Category	Group	Rate per 100,000 population
Age Group	0-4	1,591.5
	5-14	837.6
	15-24	1,080.7
	25-34	727.7
	35-44	574.4
	45-54	587.9
	55-64	578
	65-74	777
	75+	2,232.2
Gender	Males	959
	Females	810.8
Cause of Injury	Falls	413.2
	Being struck by/against object	142.1
	Motor vehicle crashes	121.7

*Rates include traumatic brain injury-related ED visits, hospitalizations and deaths.
Source: https://www.cdc.gov/mmwr/volumes/66/ss/ss6609a1.htm?s_cid=ss6609a1_e, 8/29/18.

The epidemiology of TBI-EDHD in North Carolina mirrors national trends; groups most affected are people ages 65+ and men. The most common reason for TBI ED visits and hospitalizations in NC in 2015 was unintentional falls. Suicide was the leading cause of TBI deaths in NC in 2015. (Figures 21-23)

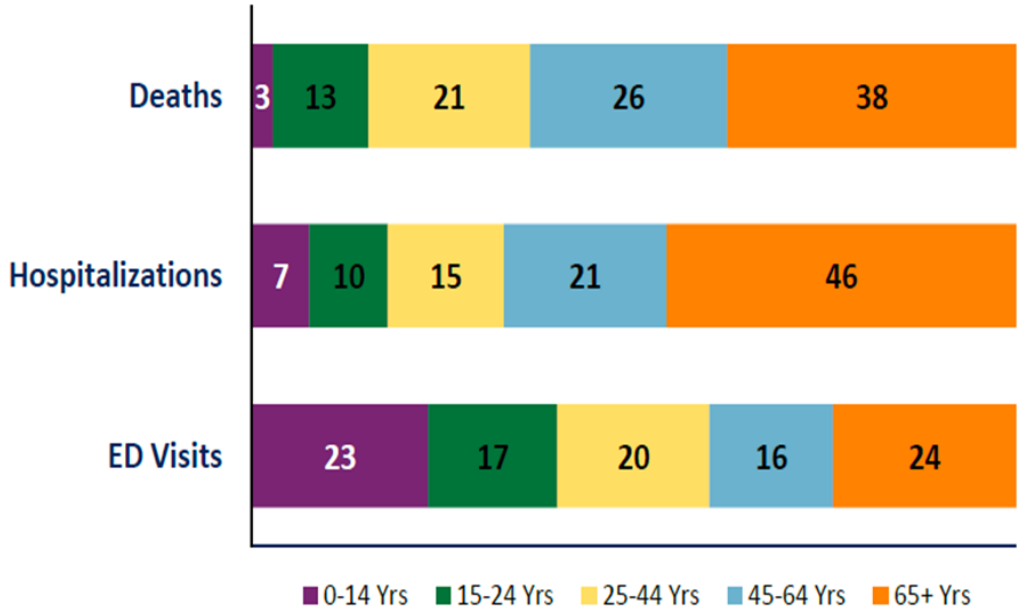
Figure 21



*Percentages include traumatic brain injury-related ED visits, hospitalizations and deaths.
Source: 2015 Special Emphasis Report https://www.injuryfreenc.ncdhhs.gov/DataSurveillance/TBI-SpecialEmphasisReport-NC2015.pdf, 8/29/18.

Figure 22

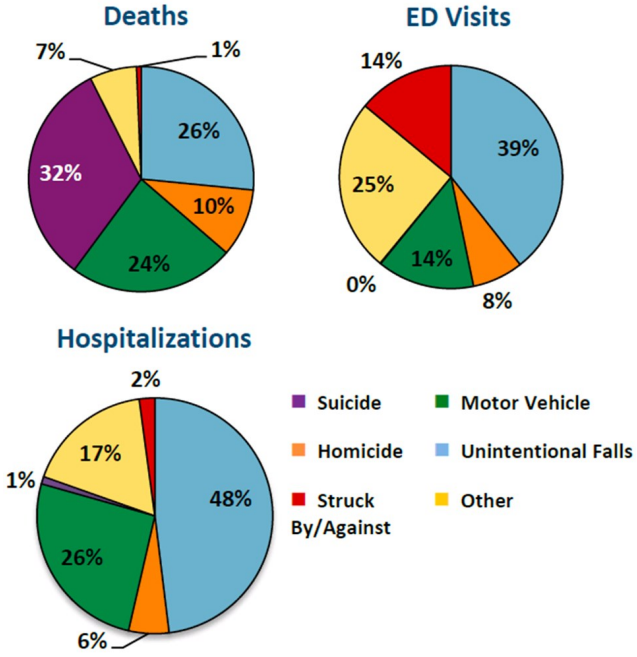
Traumatic Brain Injury* Percentages by Age Group, North Carolina, 2015



*Percentages include traumatic brain injury-related ED visits, hospitalizations and deaths.
Source: 2015 Special Emphasis Report https://www.injuryfreenc.ncdhhs.gov/DataSurveillance/TBI-SpecialEmphasisReport-NC2015.pdf, 8/29/18.

Figure 23

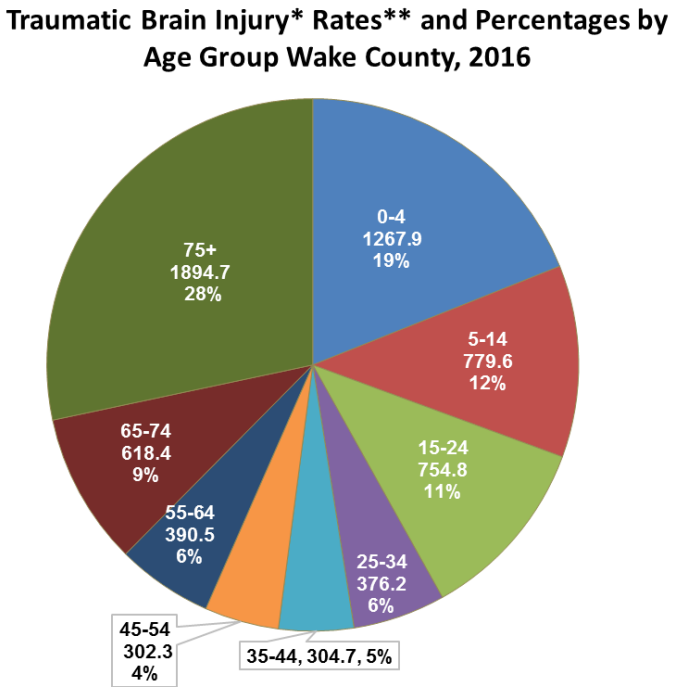
Traumatic Brain Injury* Percentages by External Cause
North Carolina, 2015



*Percentages include traumatic brain injury-related ED visits, hospitalizations and deaths.
Source: 2015 Special Emphasis Report https://www.injuryfreenc.ncdhhs.gov/DataSurveillance/TBI-SpecialEmphasisReport-NC2015.pdf, 8/29/18.

TBI data for Wake County residents shows the age groups most affected by TBIs are the same locally as they are statewide and nationally (very young children and the elderly), which Figure 24 illustrates.

Figure 24



*Case defined as having one or more ICD-10-CM codes for "traumatic brain injury."
**Rate per 100,000 population
Source: NC DETECT, Custom Event Line List, 8/29/18. Rates calculated using population estimates found at https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_DP05&src=pt, 8/30/18.

One area in which TBI prevention activities are having an impact in Wake County is sports-related concussions. According to Deran Coe, Athletic Director for the school system, in 2013 WCPSS became the first district in the state to adopt the USA Football *Heads Up* program, an initiative supported by the National Football League (NFL) that aims to make the game of football better and safer (phone conversation with Deran Coe, 8/17/18). The *Heads Up* program consists of teaching safety components, including concussion recognition and response. Prior to the 2014 season, coaches and athletic trainers trained on the signs and symptoms of concussions, how to handle a suspected concussion, and the correct protocols for returning an athlete to play. WCPSS has certified athletic trainers present at all high school football practices and games, which exceeds the state requirement that only requires first responders to be present.

In the spring and summer of 2018, the WCPSS School Board approved a policy that will require district-wide tracking of head injuries and concussions that happen in sports. Data collection for Wake County Public Schools will begin in the 2018 fall athletic season. Data by school and types of head injuries will be collected for the entire school year and the first report issued in the fall of 2019.

Summary

This report analyzed in detail motor vehicle traffic, falls and poisoning deaths in Wake County. It illuminated the opioid epidemic at the national , state and local levels as poisonings surpassed falls and motor vehicle traffic as the number one cause of injury death in Wake County both in 2016 and 2017. The report also described the creation and work of the Wake County Drug Overdose Prevention and Tobacco Use Initiative to address the opioid epidemic in Wake County.

Traumatic brain injuries (TBI) made headlines in 2018. Data illustrating those impacted by TBI in Wake County and North Carolina was described along with a prevention program being adopted by Wake County Public School System to prevent sports related head injuries.

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