Communicable Disease 2021

Wake County Human Services Public Health Report

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NORTH CAROLINA Accredited Health Department 2019-2024 Local Health Department Accreditation Board

WAKE COUNTY NORTH CAROLINA

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Cover image: PNC Arena closing day; COVID-19 vaccine staff and total doses given during the site's operation from February 11 to May 12, 2021. Image source: Wake County Communications Office.

1.0 Introduction

Wake County Human Services (WCHS), an accredited health department, strives to perform the three core public health functions of assessment, policy development and assurance to deliver the 10 essential public health services (Figure 1). Reports are provided on a quarterly basis about health and safety trends for Wake County residents, providers, policy makers and the community to better inform decision making. These reports help fulfill public health essential services:

- Number 1: Assess and monitor population health status, factors that influence health, and community health needs and assets
- Number 3: Communicate effectively to inform and educate people about health, factors that influence it, and how to improve it

This report also fulfills, in part, North Carolina Public Health Accreditation requirements including:

- Analysis and tracking of reportable events occurring in the community and reporting unusual occurrences to the NC Division of Public Health and local board of health (Benchmark activity 2.4)

- Provision of reports on the health of the community to the local board of health (Benchmark activity 38.1)

Figure 1: 10 Essential Public Health Services

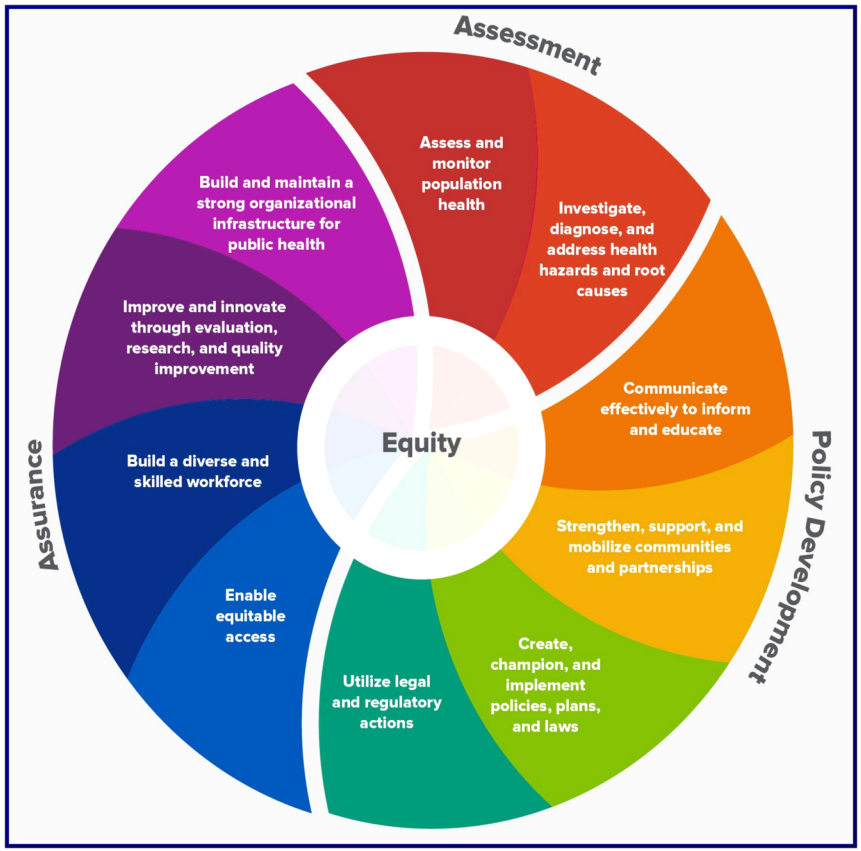

Image source: Centers for Disease Control and Prevention.
(CDC - 10 Essential Public Health Services - CSTLTS essentialhealthservices.html)

2.0 Surveillance

Communicable diseases are illnesses caused by infectious agents (bacteria, viruses, parasites, fungi and prions) or their toxins that are transmitted from an infected person, animal, plant or from the environment. Because communicable diseases can have so much impact on populations, they are tracked and the information analyzed (called surveillance) so that measures can be put in place for protecting the public's health. Certain communicable diseases are required by law to be reported to local health departments by:

- physicians
- school administrators
- child care center operators
- medical facilities
- operators of restaurants and other food or drink establishments and
- persons in charge of laboratories (G.S. § 130A-135 through 130A-139)

There are over 70 reportable diseases and conditions specified in the N.C. Administrative Code rule 10A NCAC 41A .0101.

After initial notification about a case or cases of a communicable disease, an investigation begins to collect details such as demographic, clinical, and epidemiological information. A case, meeting the reporting requirements in the standardized case definitions, is reported electronically to the N.C. Division of Public Health (NC DPH) via the North Carolina Electronic Disease Surveillance System (NC EDSS) and then to the Centers for Disease Control and Prevention's (CDC) National Notifiable Diseases Surveillance System.

This report focuses on selected communicable diseases of public health significance. To achieve consistency with the state's counts and rates, as well as to be able to monitor significant trends appropriately, the WCHS Epidemiology Program counts probable and suspect cases as appropriate, in addition to confirmed cases, for all figures and tables in this report. (It is also worth noting that surveillance, investigation, and control measures are applied to all reported cases, regardless of classification.)

State and county case counts and incidence rates for all reportable infectious diseases dating back to 2005 are available on the North Carolina Disease Data Dashboard NCD3: North Carolina Disease Data Dashboard - NCD3: North Carolina Disease Data Dashboard | Tableau Public.

3.0 Special Focus: COVID-19

Wake County's initial awareness of what would become the global pandemic of coronavirus disease 2019 (COVID-19) came in an email from the WCHS Epidemiologist on January 7, 2020: an outbreak of pneumonia, of unknown cause, was circulating in Wuhan, China. Chinese authorities reported 59 cases (seven cases classified as severe, but no deaths) and 150 close contacts exposed at a wholesale seafood market in Wuhan, sometime between December 12 and December 19, 2019. Symptoms included fever and shortness of breath, and there was concern this was a virus: *"Local authorities have reported negative lab results for seasonal influenza, avian influenza, adenovirus, and the coronaviruses known to cause SARS (severe acute respiratory syndrome) and MERS (Middle East respiratory syndrome)"* [1].

Throughout January and February 2020, WCHS (in conjunction with NC Division of Public Health (NC DPH) and the Centers for Disease Control and Prevention (CDC) implemented a 14-day quarantine for travelers returning from mainland China. WCHS staff contacted quarantined individuals twice a day to monitor symptoms. By March 2, 2020, Wake County (and North Carolina) had its first reported COVID-19 case.

In response to the unprecedented nature of the COVID -19 pandemic, Wake County had to develop both new processes and outcomes starting in March 2020, to track COVID-19 effectively and thereby mitigate its impact. On March 13, 2020, the Wake County Board of Commissioners (BOC) declared a state of emergency in the county.

Cooperation was mandated at the highest level, according to a provision in the "Proclamation of a State of Emergency" signed by BOC Chairman Greg Ford:

> *"I further proclaim that the ordinances set forth below, which are contained in Chapter 70 of the Wake County Ordinance, are necessary in order to maintain an acceptable level of public order, services, and protection of lives, safety and property during this emergency, and that the same shall be in effect within the County of Wake and by request of the chief elected officials of the above-referenced municipalities within the corporate limits of those municipalities, until this Proclamation is rescinded. I hereby order all county employees and all other emergency management personnel subject to my control to cooperate in the enforcement and implementation of the emergency management ordinances set forth below"* [2].

In December 2020, the COVID-19 case epidemiological curve increased sharply (cases peaked in early January 2021). At that time, the North Carolina Department of Health and Human Services (NC DHHS) issued recommendations for prioritizing individuals and populations at highest risk for transmission of COVID-19. Priority populations included cases known to be:

- linked to an outbreak/cluster
- living in a congregate or healthcare setting
- and/or working or exposed in a high density setting (i.e., long-term care facilities, nursing homes, correctional facilities, homeless shelters, educational institutions/ schools, child care facilities, manufacturing plants, religious events, and mass gatherings).

Wake County Public Health's COVID-19 operations' processes followed suit, and specific individuals were designated on the case investigation and contact tracing teams to interview cases and contacts linked to educational institutions/schools as well as childcare facilities. The CD Nursing team conducted intensive site visits and provided additional consultation for long-term care facilities in Wake County to prevent outbreaks in those very vulnerable populations. Additionally, a team of epidemiology program managers was formed to further investigate cases in those settings to identify epidemiological linkages that constitute a cluster (5 or more cases that have had considerably close contact in the span of 14 days). The epidemiology program managers implemented a process for reporting COVID-19 cases, and continue to work closely with leadership in educational institutions/schools to develop and implement effective COVID-19 prevention and control measures.

The WCHS Public Health Division partnered with other Wake County departments to reach vulnerable populations. Operational data dashboards indicated gaps in testing and vaccine distribution that allowed for re-deployment of resources in real time.

Figure 2a shows the number of COVID-19 cases and the seven day average for Wake County from March 2, 2020 to June 13, 2021. Figure 2b shows significant milestones during the COVID-19 pandemic. Each milestone represents an event that necessitated a policy response at either the state or county level [3].

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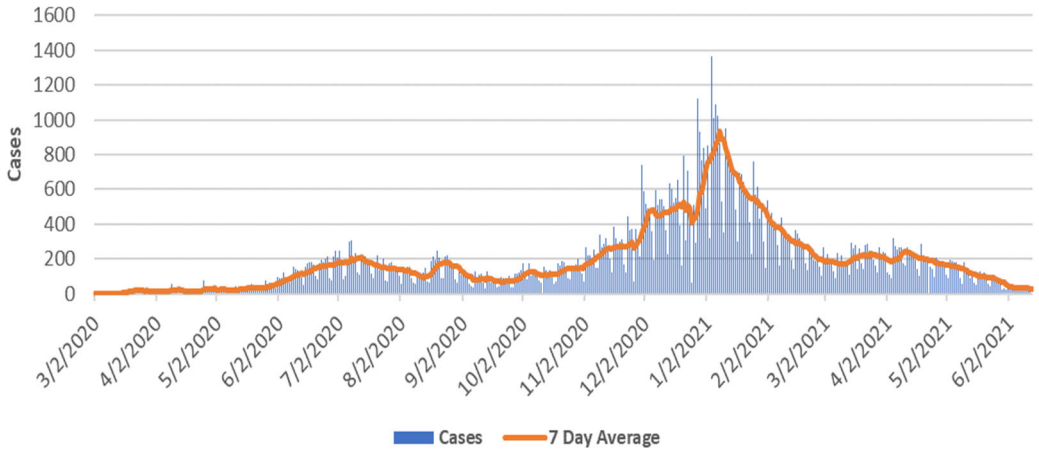
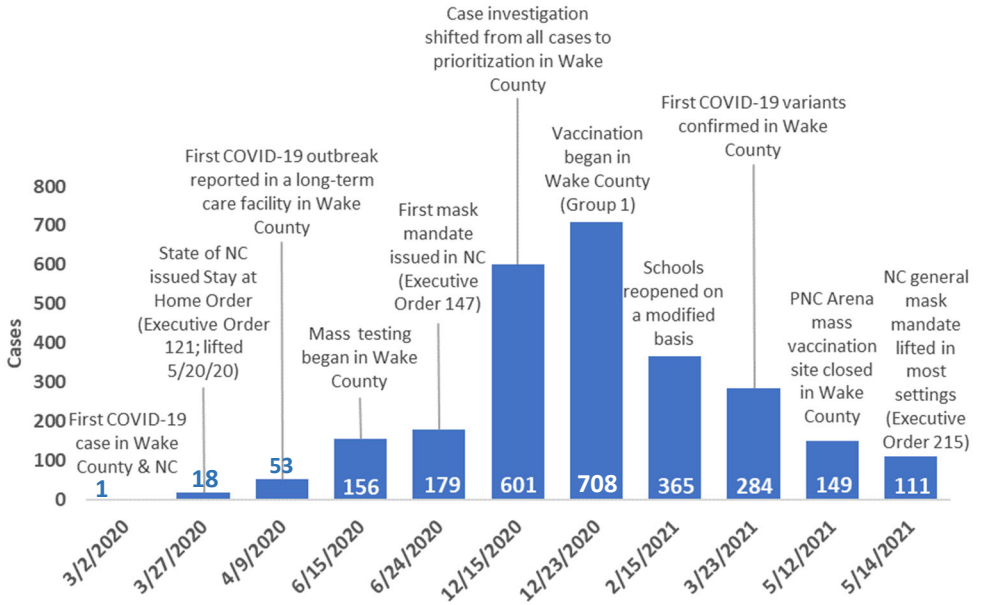
Figure 2a: COVID-19 Cases and 7-Day Average, Wake County



Source: NC Electronic Disease Surveillance System 6/14/21

Figure 2b: Number of COVID-19 Cases on Significant Milestone Dates, Wake County, March 2, 2020 - May 14, 2021



3.1 COVID-19 Cases

Figures 3a through 3e show the number of Wake County COVID19 cases from 3/1/20 through 5/16/21 by date, age, gender, and race/ethnicity. Suppressed data in the graphs means that the number of people in a population is so small, information is "suppressed" to protect patient privacy. Missing data in the graphs indicates the number of cases and deaths that are missing demographic information from the laboratory report.

Figure 3a shows molecular (PCR) positive and antigen positive cases by the date the person was tested. The number of positive COVID-19 cases peaked in January 2021.

Figure 3b shows the total number of COVID-19 cases by age in Wake County. People-ages 25-64 represented 60% of COVID-19 cases in that time period.

Figure 3c shows the total number of COVID-19 cases by gender in Wake County. COVID-19 cases, for the most part, were equally distributed between men and women in that time period.

Figure 3a

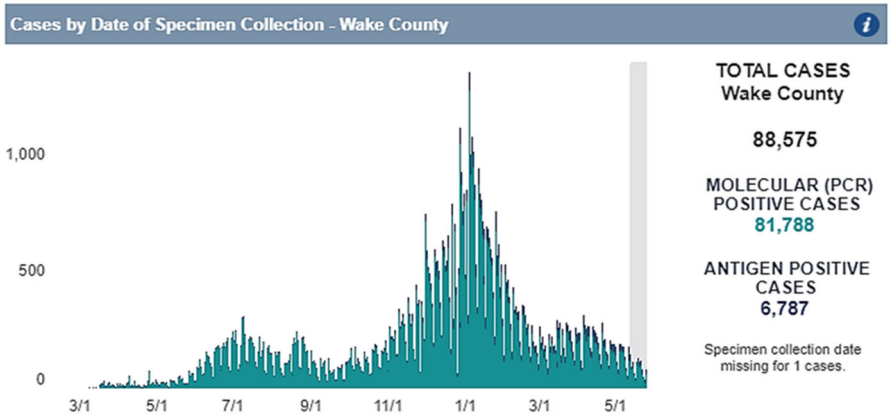


Figure 3b

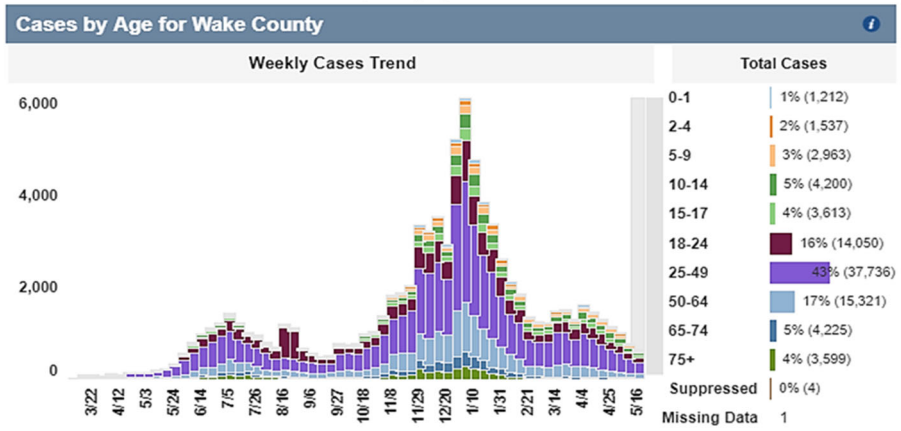
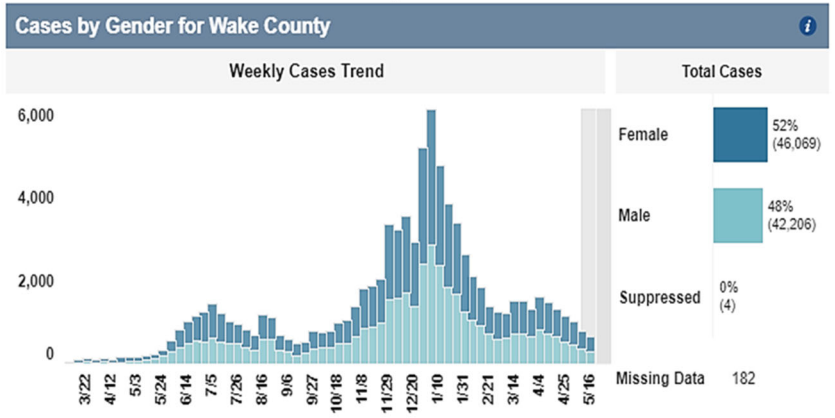


Figure 3c



Source: Figures 3a, 3b and 3c, Cases Demographics | NC DHHS COVID-19, 5/27/21.

Figure 3d shows the total number of COVID-19 cases by race in Wake County. For cases when race is known, there remains a significant and persistent disparity in the number of cases between African-Americans and all other racial groups; African-Americans are over-represented among COVID-19 cases, relative to their share of the county's population.

Figure 3e shows the total number of COVID-19 cases by ethnicity in Wake County. For cases when ethnicity was known, more than 1 in 5 cases was among Hispanics during that time period.

3.2 COVID-19 Deaths

Figures 3f-j show the number of COVID-19 deaths from 3/22/20 through 5/16/21 by date of death, age, gender, and race/ethnicity.

Figure 3f shows the total number of COVID-19 deaths by date of death in Wake County. A significant number of deaths occurred in July 2020 and January 2021, periods that also were marked by an increase in cases.

Figure 3d

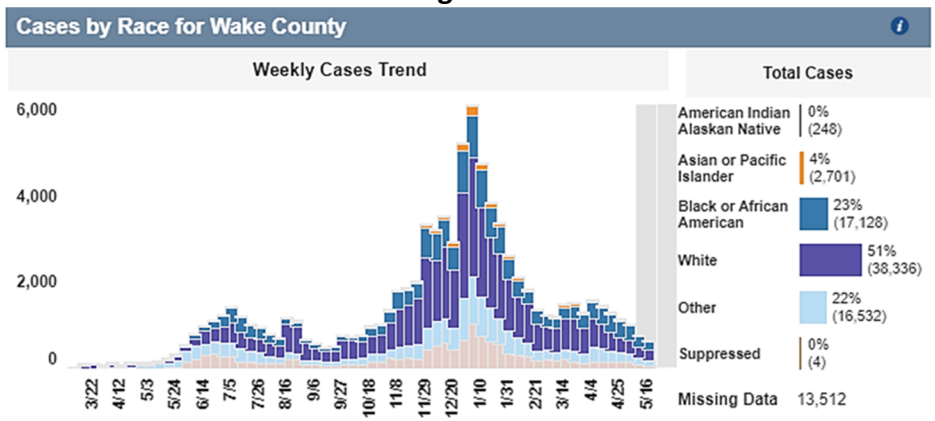


Figure 3e

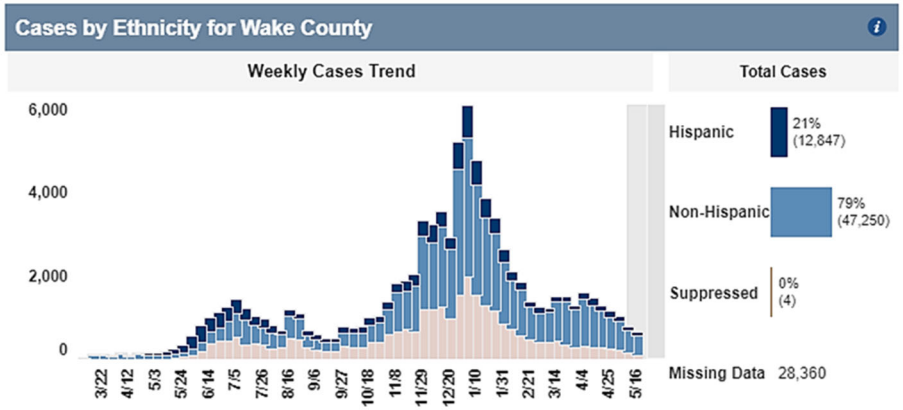
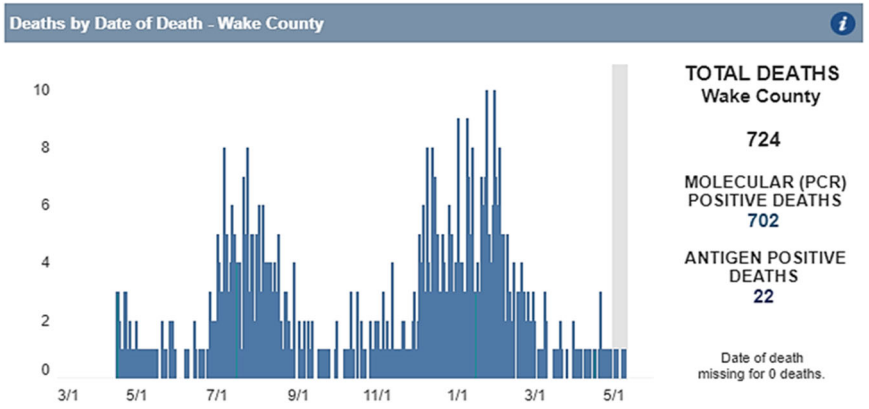


Figure 3f



Sources:
Figures 3d and 3e, Cases Demographics | NC DHHS COVID-19, 5/27/21.
Figure 3f, Cases | NC COVID-19 (ncdhhs.gov) 5/27/21.

Figure 3g shows the total number of COVID-19 deaths by age in Wake County. Persons aged 65 and up represented 84% of COVID-19 related deaths in Wake County during that time period.

Figure 3h shows the total number of COVID-19 deaths by gender in Wake County. Females (50%) represented slightly more COVID-19 deaths than males (47%) during that time period.

Figure 3i shows the total number of COVID-19 deaths by race (if known) in Wake County. African-Americans represent 21% of Wake County's total population, yet represented more than 30% of COVID-19 deaths during that time period.

Figure 3j (page 10) shows the total number of COVID-19 deaths by ethnicity (if known) in Wake County. Overall, the non-Hispanic population represented 87% of COVID-19 related deaths during this time period.

Source: 3g,3h,and 3i [Cases Demographics | NC DHHS COVID-19](), 5/27/21.

Figure 3g

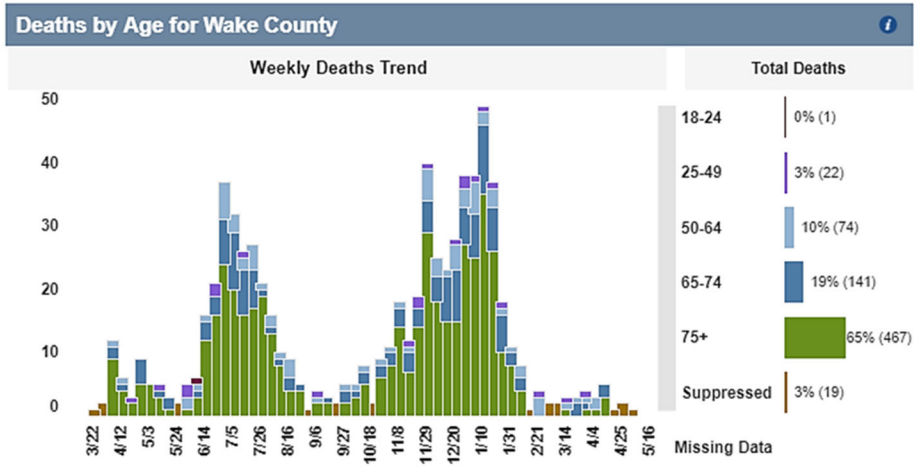


Figure 3h

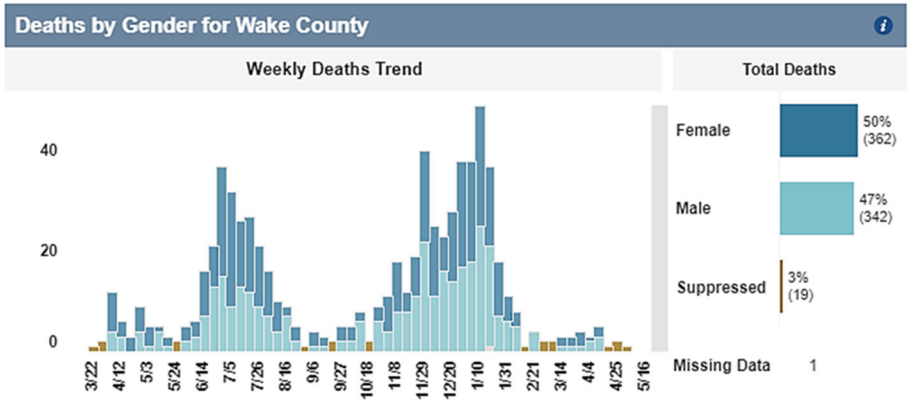
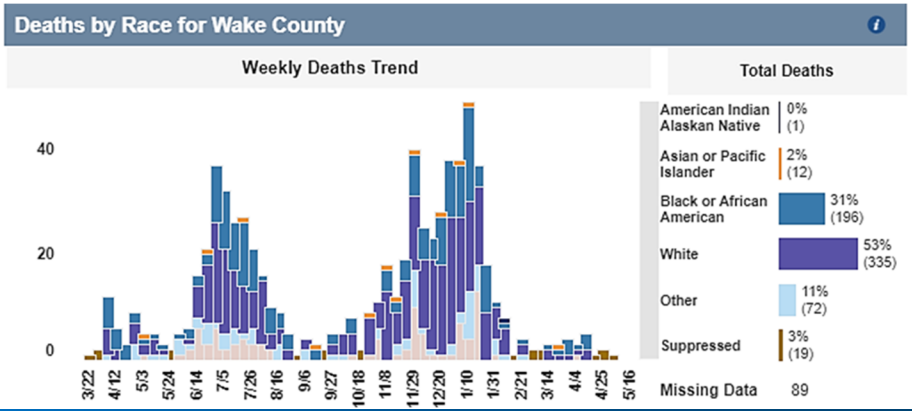


Figure 3i

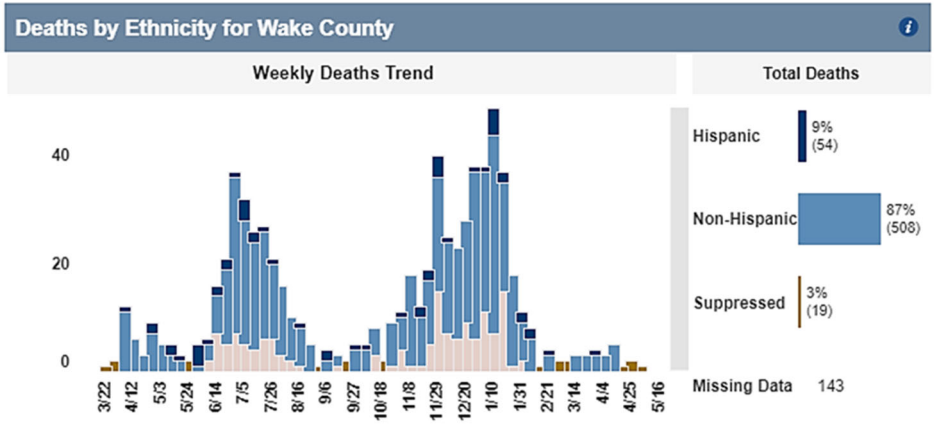


3.3 COVID-19 Key Indicators

At the onset of the COVID-19 pandemic, NC DHHS established four key indicators to be tracked in 14-day increments. Increases in any of the indicators generally led to more restrictive public health measures, while decreases meant less restrictive measures. Wake County followed suit in tracking the 14-day trajectory of these four key indicators:

- COVID-like illness (CLI). This includes the mention of COVID or fever/chills, cough, or shortness of breath/difficulty breathing. NC Department of Health and Human Services (NC DHHS) began tracking this indicator due to the illness presenting symptoms similar to influenza-like illness. Historically, surveillance systems that have been used during influenza seasons are now being used to track trends of mild COVID-like illness. This allows comparison with prior influenza seasons.
- Laboratory-confirmed cases. The number of new cases confirmed by a positive COVID-19 test in 14 days per 100,000 people.
- Percent of tests returning positive. The percentage of tests that are positive out of all COVID-19 tests administered over 14 days
- Hospitalizations. The number of hospitalizations of COVID-19 positive patients in Wake County over 14 days

Figure 3j



3.4 COVID-19 Vaccines

The availability of vaccines was a very significant step in Wake County's ability to lessen the impact of COVID-19. Figure 4 displays how the dissemination of the COVID-19 vaccine correlates with significantly reduced case numbers.

4.0 Other Vaccine Preventable Diseases

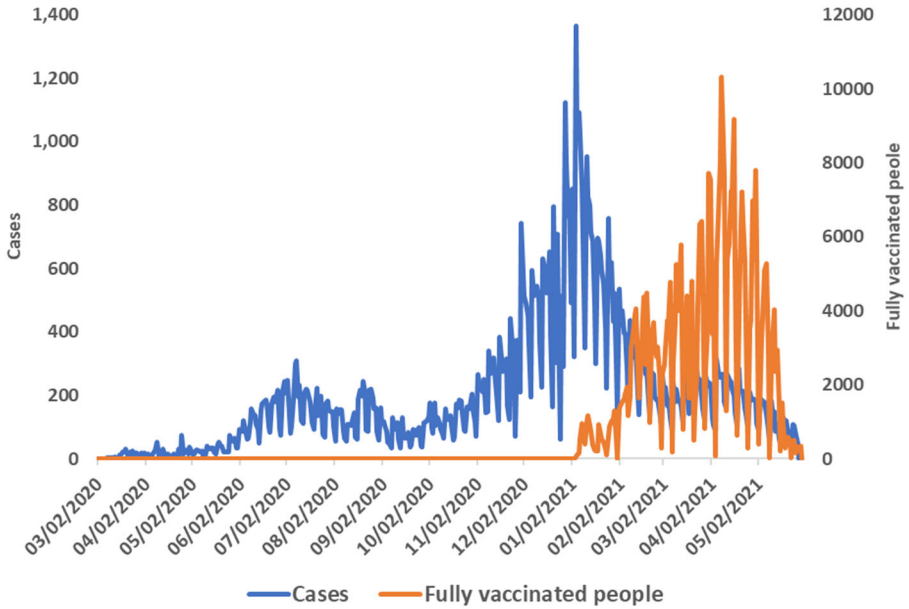
4.1 Pertussis, hepatitis B and *Haemophilus influenzae* type B

Since the COVID-19 pandemic likely decreased testing and diagnostic services for many medical conditions, there were far fewer cases of vaccine preventable diseases in Wake County in 2020 in comparison to previous years (Figure 5). Given the potentially artificial decrease in cases in 2020, no further demographic analysis was performed here.

4.2 Influenza

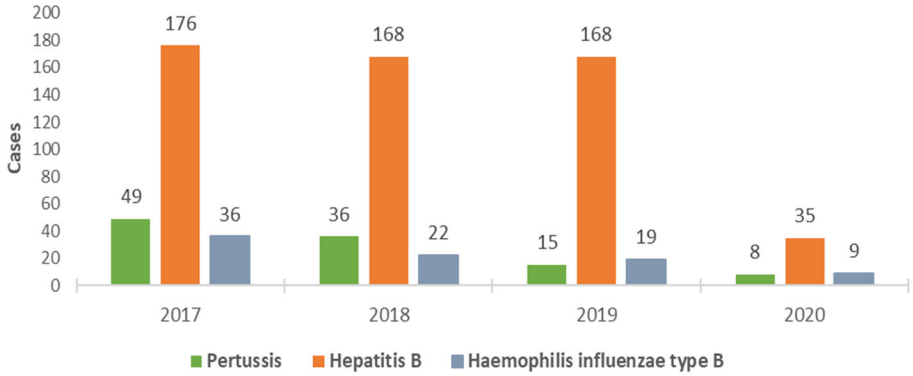
The 2020-21 influenza season was impacted by the COVID-19 pandemic in many important ways. From September 27, 2020 to May 8, 2021, there were only 7 flu deaths in North Carolina, and 0 deaths in Wake County.

Figure 4: COVID-19 Cases and Fully Vaccinated People, Wake County, March 2020-May 2021



Source: Wake County internal COVID-19 dashboard, 6/1/21.

Figure 5: Pertussis, Hepatitis B and *Haemophilus influenzae* type B Cases, Wake County, 2017-2020



Source: North Carolina Electronic Disease Surveillance System (NC EDSS) 5/5/21

NC DHHS's "Know your 3 Ws" campaign :

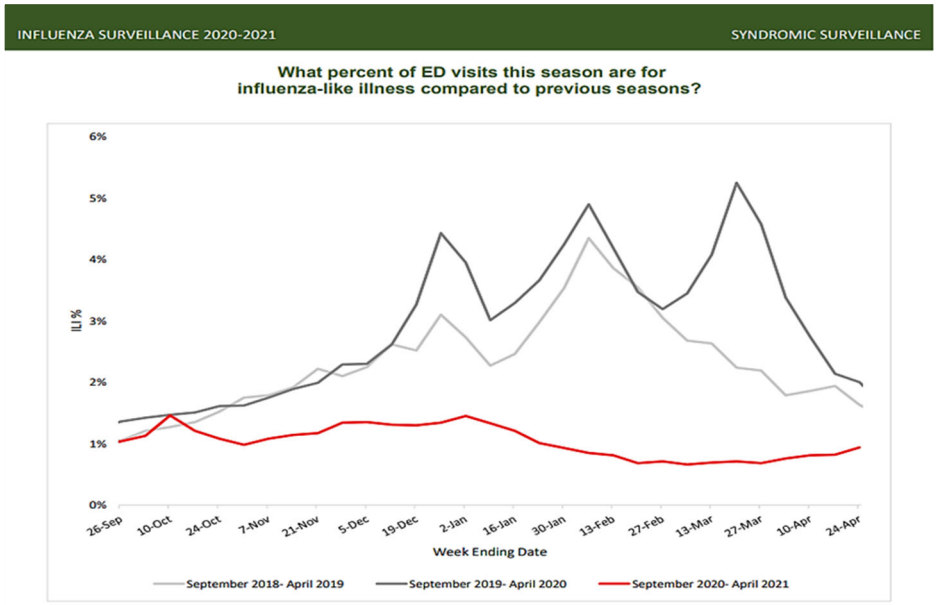
- **WEAR** a cloth mask over your nose and mouth
- **WAIT** 6 feet apart/avoid close contact and
- **WASH** your hands or use hand sanitizer

in conjunction with the combination of statewide executive orders and local public health ordinances implemented during 2020 and 2021, likely had the effect of decreasing both flu cases as well as COVID-19 cases.

Figure 6 shows the percentage of total emergency department (ED) visits with ILI (influenza-like illness) in North Carolina over the last three flu seasons, and Figure 7 shows Wake County's ILI percentages compared to CLI (COVID-like illness) over the 2020-21 flu season.

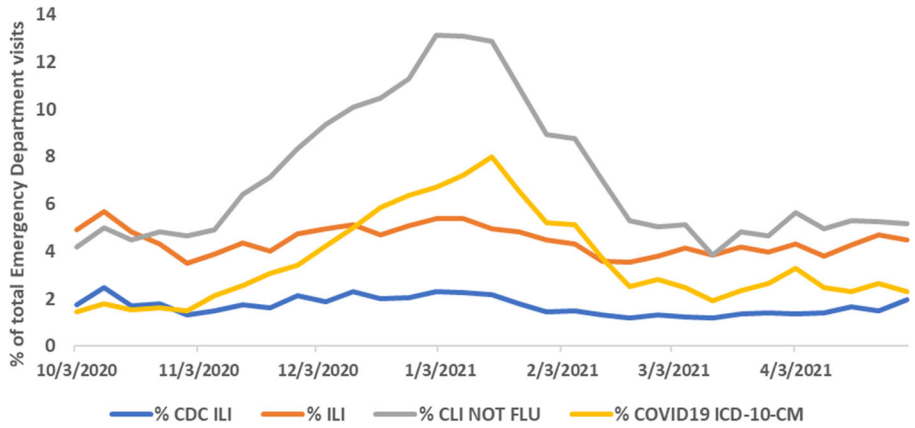
While responding to the COVID-19 pandemic, WCHS administered a total of 6,606 flu vaccine doses from September 15, 2020 to May 15, 2021. Five thousand three hundred and fifty nine (5,359) doses were administered to the community and an additional 1,247 doses to Wake County employees [4].

Figure 6



Source: https://flu.ncdhhs.gov/data/documents/Weekly-COVID19-Surveillance.pdf?ver=1.4, obtained 5/5/21

Figure 7: ILI and CLI by Week, Wake County, 2020-21 Flu Season



Source: NC DETECT, 5/5/21

5.0 Foodborne Diseases

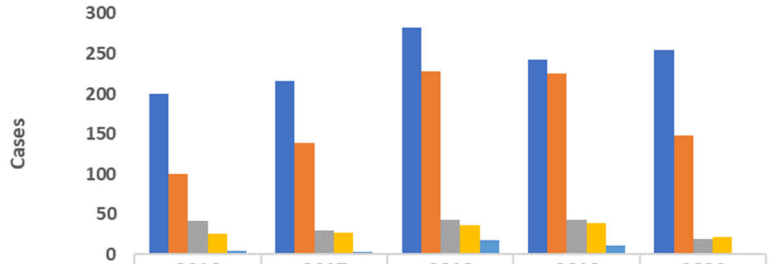
Figure 8 shows the five-year trend for the most frequently reported foodborne diseases in Wake County. As in previous years, *Salmonella* and *Campylobacter* accounted for the vast majority of foodborne illness cases in Wake County in 2020 (over 90%). While *Salmonella* remained the most frequently reported foodborne illness in Wake County, with case numbers consistent with previous years, the COVID-19 pandemic may have contributed to an undercount of *Campylobacter*, *E. coli*, *Shigella* and hepatitis A cases in 2020. No further analysis was performed on these potentially artificially decreased numbers.

5.1 Foodborne Outbreaks

All foodborne outbreaks must be reported to the local health department and NC Division of Public Health. There were no foodborne outbreaks, and only one norovirus outbreak (with 21 sick individuals), in Wake County in 2020. COVID-19 may have contributed to the small number of outbreaks since in 2020:

- restaurants were closed to indoor dining for an extended period, and
- long-term care facilities restricted families and guests as well as conducted more frequent cleanings. The CD Nursing Team investigated three flu outbreaks with eight sick individuals in 2020[5].

Figure 8: 5-Year Trend, Most Frequently Reported Foodborne Diseases, Wake County, 2016-2020



	2016	2017	2018	2019	2020
Salmonellosis (38)	200	216	283	242	254
Campylobacter infection (50)	100	139	228	225	148
E. coli - shiga toxin producing (53)	42	30	43	43	19
Shigellosis (39)	25	27	36	39	21
Hepatitis A (14)	4	3	17	11	0

Source: NCEDSS, 5/5/21.

6.0 Vectorborne Diseases

Vectorborne diseases are caused by microbes spread to people by arthropods like ticks and mosquitoes that feed on human blood. The vectorborne diseases that occur most often in Wake County are transmitted by ticks, but there are instances of diseases transmitted by mosquitoes as well. Table 1 shows confirmed, suspect, and probable cases of tickborne (ehrlichiosis, Lyme disease and Rocky Mountain spotted fever) and mosquito-borne (chikungunya, malaria, West Nile virus, and Zika virus) diseases over the last five years. For tickborne diseases in particular, many more cases are suspected and investigated than can be confirmed. This is due to the difficulty in getting clinical and/or laboratory information needed to meet the confirmed case definition.

Table 1: Vectorborne Diseases in Wake County, 5-Year Trend, 2016-2020

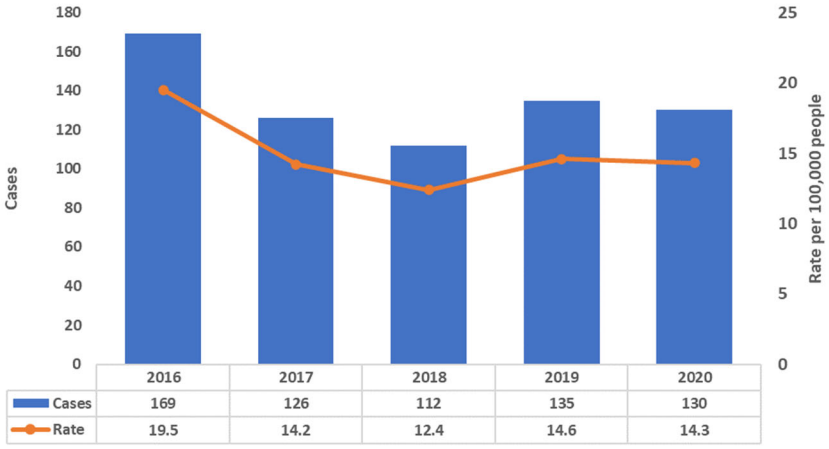
		2016		2017		2018		2019		2020	
		Confirmed	Confirmed/ Suspect/ Probable	Confirmed	Confirmed/ Suspect/ Probable	Confirmed	Confirmed/ Suspect/ Probable	Confirmed	Confirmed/ Suspect/ Probable	Confirmed	Confirmed/ Suspect/ Probable
Tickborne	Ehrlichiosis, HGE	0	1	0	2	0	0	1	2	1	2
	Ehrlichiosis, HME	1	10	0	10	0	11	1	15	0	24
	Rocky Mountain Spotted Fever	2	36	0	31	1	48	2	63	0	28
	Lyme Disease	3	30	4	46	1	29	7	37	0	20
Mosquito-borne	Chikungunya	0	1	0	2	0	2	2	3	1	2
	Dengue	1	2	0	1	2	3	5	6	0	0
	Malaria	7	7	9	9	6	6	12	12	1	1
	West Nile Virus	0	0	0	0	0	1	0	0	0	0
	Zika	14	14	1	1	0	2	0	1	0	0

Source: NCEDSS, 5/5/21

7.0 Sexually Transmitted Diseases (STDs)

Figures 9-12 show cases and rates for the four most commonly reported STDs in Wake County: HIV/AIDS, early syphilis, gonorrhea, and chlamydia. Figure 9 shows that HIV/AIDS cases and rates remained stable between 2019 and 2020. Figure 10 shows that early syphilis cases and rates, which were already high in Wake County from 2016-18, continued to increase. Since 2018, cases increased 28.1% and rates increased 25.3%. The risk of congenital syphilis remains a concern; 78% of Wake County's female syphilis cases in 2020 were among women of childbearing age (data not shown). While gonorrhea cases and rates decreased slightly, chlamydia cases decreased 14.6% and chlamydia rates decreased 16.1% from 2019 to 2020 (Figures 11-12). The decreases for gonorrhea and chlamydia may be attributed to decreased testing and diagnostic services at WCHS due to the COVID-19 pandemic in 2020.

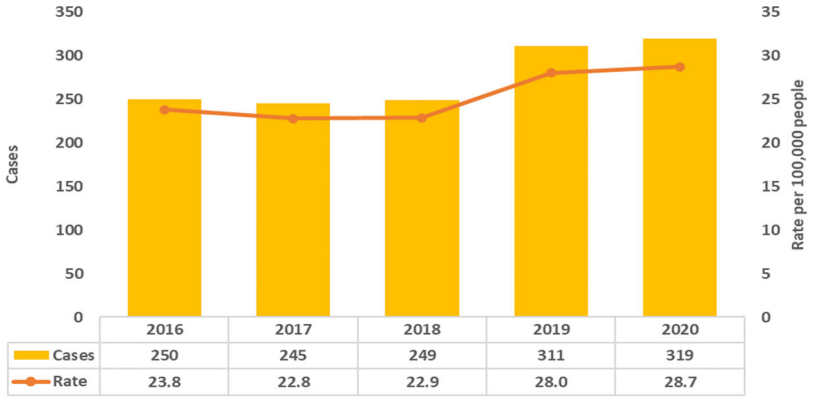
Figure 9: HIV/AIDS Cases and Rates, Wake County, 2016-20



	2016	2017	2018	2019	2020
Cases	169	126	112	135	130
Rate	19.5	14.2	12.4	14.6	14.3

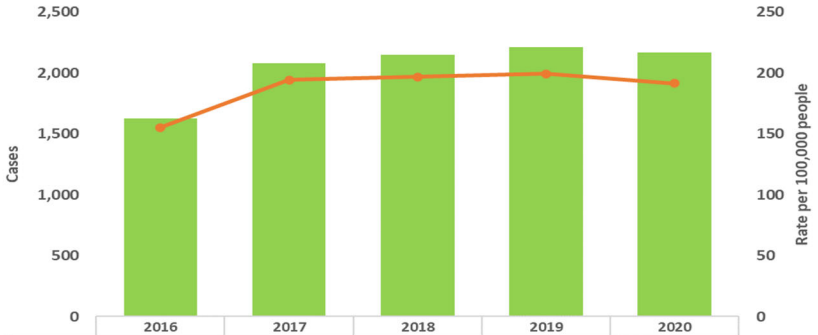
Source: for 2016-19 data, hiv19rpt_11302020.pdf (ncdhhs.gov), 5/6/21. For 2020 data, NCEDSS. 2020 rate calculated by state DPH using age 13 and older population estimate for Wake County, 5/7/21.

Figure 10: Early Syphilis Cases and Rates, Wake County, 2016-20



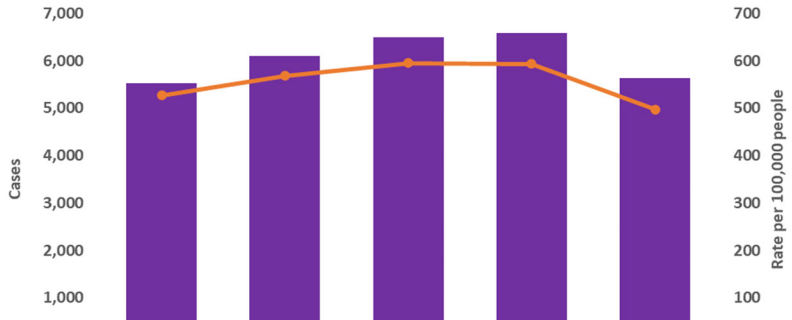
	2016	2017	2018	2019	2020
Cases	250	245	249	311	319
Rate	23.8	22.8	22.9	28.0	28.7

Figure 11: Gonorrhea Cases and Rates, Wake County, 2016-20



	2016	2017	2018	2019	2020
Cases	1,626	2,081	2,148	2,213	2,166
Rate	155.1	194.2	196.8	199.1	191.3

Figure 12: Chlamydia Cases and Rates, Wake County, 2016-20



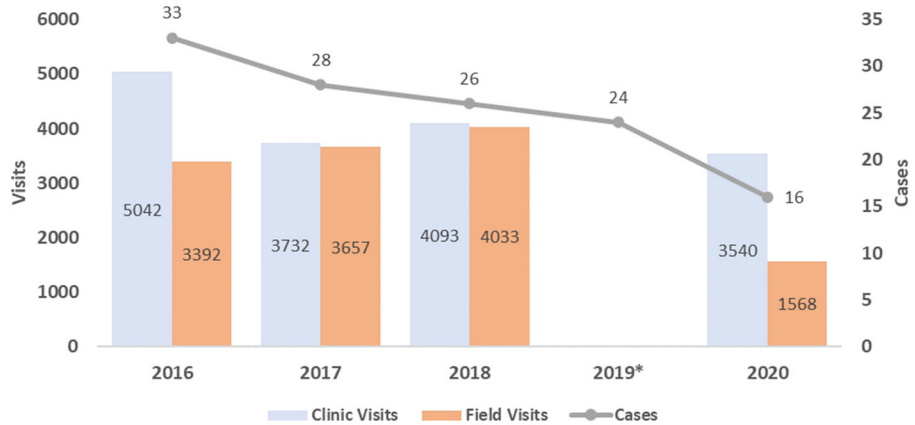
	2016	2017	2018	2019	2020
Cases	5,523	6,093	6,501	6,594	5,632
Rate	526.8	568.5	595.7	593.1	497.4

Source: Figures 10,11,12 For 2016-19 data, std19rpt.pdf (ncdhhs.gov), 5/6/21. For 2020 data, NCEDSS. 2020 rate calculated using population estimate found at Census: Population highlights in North Carolina, Biggest county | Charlotte Observer, 5/7/21.

8.0 Tuberculosis

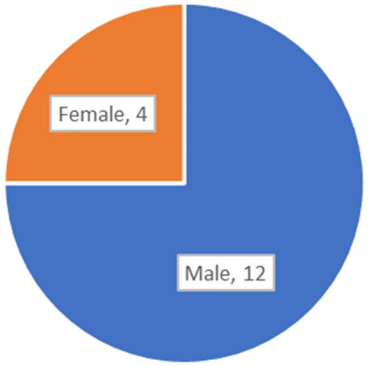
When comparing TB case numbers from 2016 to 2020, TB cases overall have declined (Figure 13). The decrease in cases in 2020 corresponded with a decrease in field visits. In 2020, TB cases occurred predominantly in men and Hispanics, while being somewhat evenly distributed across age groups (Figures 14-16). The majority of TB cases were pulmonary (Figure 17).

Figure 13: TB Cases Compared to Clinic and Field Visits, Wake County, 2016-20



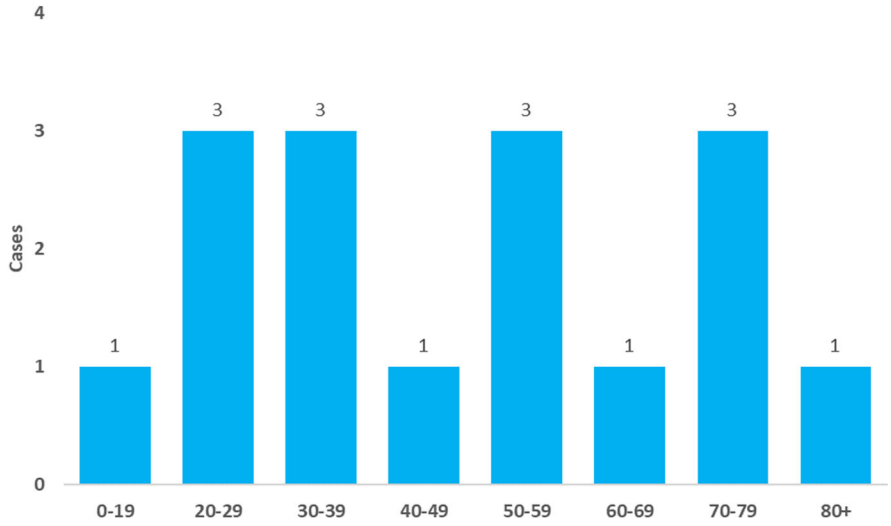
Source: WCHS TB Program, 5/5/21. * Due to a change in coding methodology, visit information is not available for 2019.

Figure 14: TB Cases by Gender, 2020 (N=16)



Source: WCHS TB Program, 5/22/20

Figure 15: TB Cases by Age Group, 2020 (N=16)



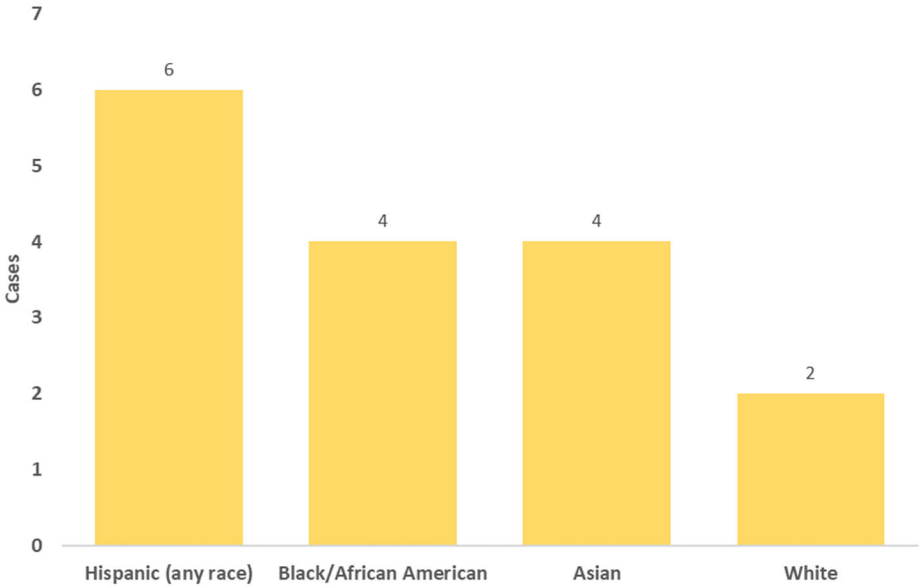
Source: WCHS TB Program, 5/22/20

9.0 Summary

In summary, the COVID-19 pandemic had an extraordinary impact on communicable disease morbidity in Wake County as well as service provision by WCHS. The program updates section found in previous communicable disease reports was not included in this report since so many WCHS Public Health staff were (and at the time of this report continued to be) redirected to the county's COVID-19 response.

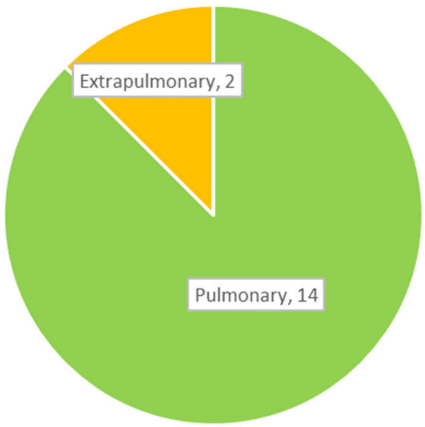
The first reported case of COVID-19 occurred in Wake County in March 2020 and remains a significant public health issue at the time of this report (15 months later). The development and subsequent availability of a preventive vaccine was a significant tool used to reduce the spread of disease as well as the number of cases and deaths. Given the similar control measures for influenza and COVID-19, flu was almost non-existent in Wake County during the 2020-21 flu season. HIV and STDs continued to be a concern in Wake County, particularly syphilis. The highest number of early syphilis cases ever reported in a single year was reported in 2020. TB cases decreased in 2020, yet a high percentage of those cases were Hispanic men.

Figure 16: TB Cases by Race/Ethnicity, 2020 (N=16)



Source: WCHS TB Program, 5/22/20.

Figure 17: TB Cases by Site, 2020 (N=16)



Source: WCHS TB Program, 5/22/20.

10.0 References

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5. WCHS Communicable Disease team, 5/7/21.

11.0 Acknowledgements

For contributions to this report:

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