



Communicable Disease Report 2022

Wake County Health and Human Services Public Health Report



Nannette M. Bowler, JD Health and Human Services Director
Rebecca A. Kaufman, MS Public Health Division Director
Content Editor: Morgan Poole, MPH Field Epidemiology Program Manager



Table of Contents

Cover image: Keep pets up to date on rabies and other vaccines to help keep both people and animals healthy.

1.0 Introduction.	3
2.0 Surveillance.	4
3.0 Special Focus: Preventing Rabies.	5
4.0 COVID-19.	7
5.0 Other Vaccine Preventable Diseases.	9
5.1 Pertussis, Hepatitis B, and <i>Haemophilus influenzae</i> type b.	9
5.2 Influenza.	9
6.0 Foodborne Diseases.	11
6.1 Foodborne Outbreaks.	11
7.0 Vectorborne Diseases.	11
8.0 Sexually Transmitted Diseases.	13
9.0 Tuberculosis.	15
10.0 Summary.	15
11.0 References.	16
12.0 Acknowledgements.	16
13.0 URLs.	17

1.0 Introduction

Wake County Health and Human Services (WCHHS), 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) and
- provision of reports on the health of the community to the local board of health (Benchmark activity 38.1).

Figure 1: Ten Essential Public Health Services

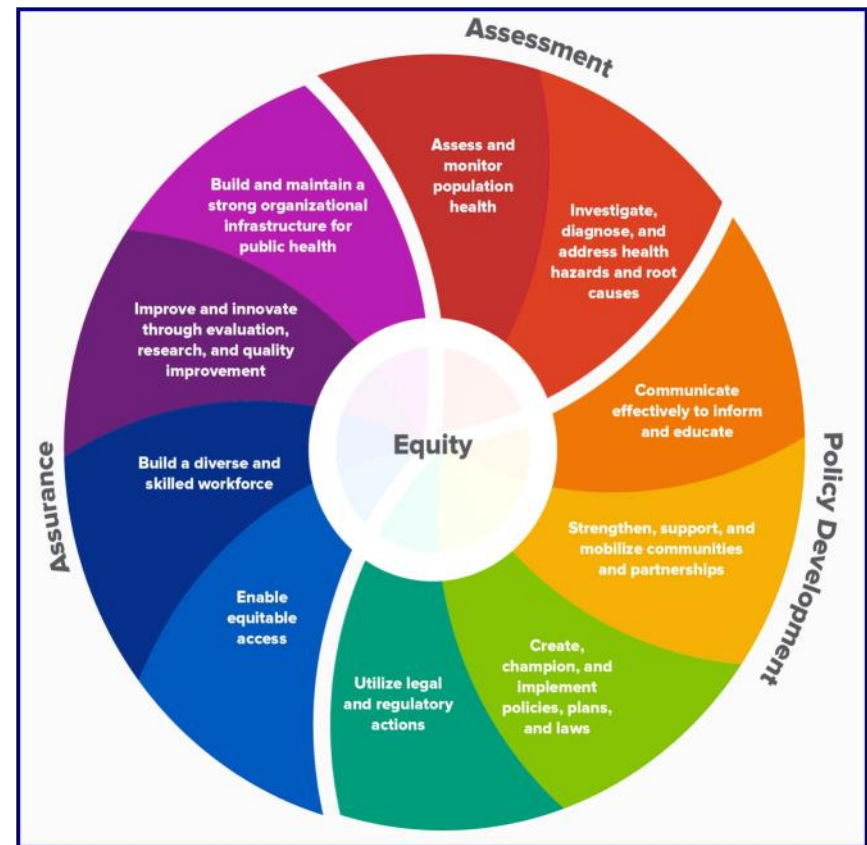


Image source: [Centers for Disease Control and Prevention](https://www.cdc.gov/10essentialpublichealthservices/).
(CDC - 10 Essential Public Health Services - CSTLTS essentialhealthservices.html)

Public health quarterly reports covering a five year period can be found on [WakeGOV.com](https://www.wakegov.com/). [Requirements for public health accreditation](#) can be found on the North Carolina Local Health Department Accreditation Board [website](#).

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-140](#)).

There are over 80 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 WCHHS 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.)

With the exception of COVID-19 and animal exposures, data in this report is shown for the five year period 2017-2021. Five year data is not available for:

- COVID-19 as the virus was first identified in 2019 and
- animal exposures as the data collection methodology changed in 2018.

State and county case counts and incidence rates for all reportable infectious diseases are available on North Carolina Department of Health and Human Services [Facts and Figures NC Communicable Disease Reports](#) webpage.

3.0 Special Focus: Preventing Rabies

Rabies is a viral disease of mammals. The rabies virus infects the central nervous system resulting in disease of the brain. Survival is rare once symptoms begin; rabies almost always progresses to coma or death within 10 days after the first symptom (1).

Rabies is spread primarily through the bite of infected animals. It is also spread when a rabid animal's infectious saliva comes into contact with the mucous membranes or a fresh open wound of another mammal (1). There is no test that can determine if a living person or animal has been infected with rabies. There is no treatment to stop the course of the disease once symptoms start.

Rabies illness can be prevented in exposed humans by prompt medical treatment. Prevention measures following exposure include:

- thorough washing of the wound site for 15 minutes,
- administration of human rabies immune globulin (HRIG. This must take place in a hospital emergency room.), and
- a series of injections with rabies vaccine (1). In Wake County, rabies vaccine is provided primarily by Wake County Health and Human Services and area hospital emergency rooms.

North Carolina law ([GS 130A-196](#)) requires reporting bites from animals who are required to be vaccinated against rabies by

- the person bitten (parent/guardian when applicable),
- the owner/person in possession of the biting animal, and
- Physicians attending people bitten by an animal known to be a potential carrier of rabies (24 hours).

WCHHS Communicable Disease (CD) Program is responsible for investigating animal bites reported in Wake County. The CD Surveillance Team contacts the person who was bitten (or parent/guardian when applicable) to assess the risk of rabies exposure and assure treatment. Needed treatment includes wound care, antibiotics and tetanus vaccine as needed, and HRIG and rabies vaccine when it is determined that there is an exposure to rabies (2).

The CD Surveillance team also works jointly with Animal Control. Six animal control programs serve Wake County and its municipalities. Animal Control follows up with the animal's owner and tries to find animals that are stray/feral.

Additionally, Animal Control assures confinement (quarantine) of biting animals (regardless of vaccination status) to observe for signs and symptoms of rabies and testing the animal for rabies when indicated by NC Division of Public Health animal management protocols (3).

North Carolina public health law ([GS 130A-187](#)) mandates that local health directors assure at least one countywide rabies vaccination clinic annually to provide rabies vaccine for animals required ([GS 130A-185](#)) to be vaccinated. Wake County Animal Center provides rabies vaccine clinics throughout the year. Clinics sponsored by Wake County as well as other organizations can be found on [Animal Services](#) web page. All owners of dogs, cats, and ferrets in NC must have those animals over 4 months of age vaccinated against rabies ([GS 130A-185](#)). Typically another rabies vaccine is given one year after the first dose then every year or three years depending on the vaccine used.

Eight animals tested positive for rabies in Wake County in 2018 and 2019. No animals tested positive in 2020 or 2021 (data not shown).

An animal exposure is “any bite, scratch or other situation in which saliva or nervous tissue from a potentially rabid animal

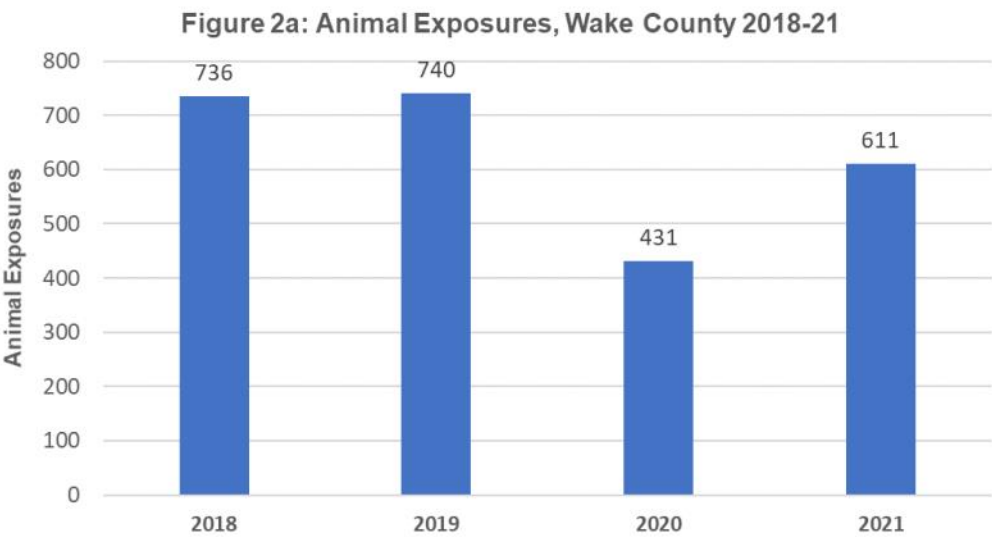
- enters an open or fresh wound, abrasion or break in the skin, or
- comes into contact with a mucus membrane by entering the eye, nose or mouth”(2).

Bat exposures occur

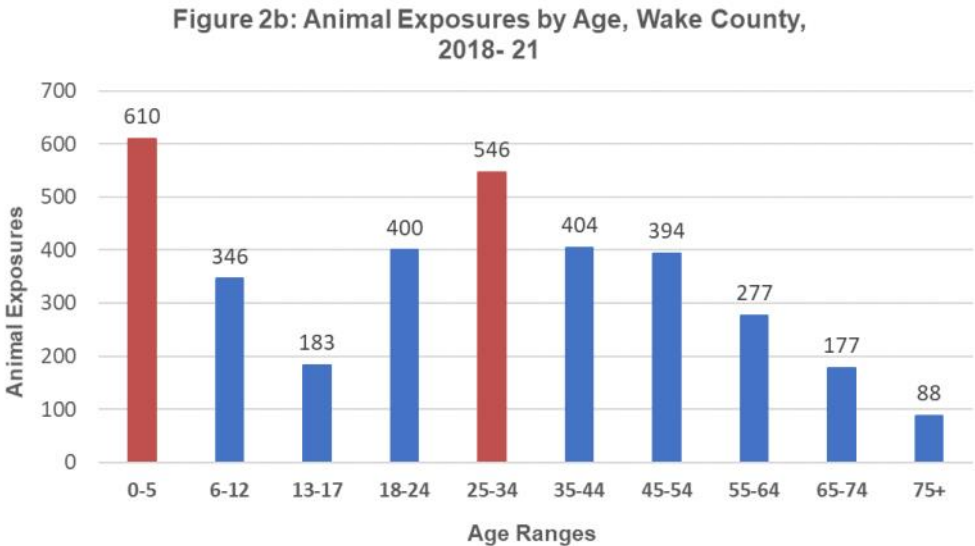
- when people have direct contact with a bat and
- when a bat is found in the same room as a person who might not know that a bite or direct contact occurred (e.g. a person in deep sleep, an unattended child, mentally disabled person or intoxicated person)(2).

Figure 2a shows the total number of animal exposures in Wake County by year from 2018-2021. Animal exposures increased between 2020 and 2021 by 41.8%.

Figure 2b shows the total number of animal exposures by age. People in the 0-5 and 25-34 had more animal exposures than people in other age groups.



Source: CD Surveillance Team, 6/9/2022



Source: CD Surveillance Team, 6/9/2022

Figure 2c shows the total number of animal exposures by animal type from 2018-2021. Dogs accounted for the majority of animal exposure reports, followed by cats and bats.

In accordance with NC law, ([GS 130A-196](#)) dogs, cats, and ferrets that bite people are confined for 10 days in a place determined by the local health director. The biting animal is isolated from people and other animals during the confinement period and observed for signs of rabies. Animals that are ill at the beginning of confinement or become ill during confinement are evaluated immediately by a veterinarian. Animals that die during confinement are tested for rabies by the State Laboratory of Public Health (4).

Figure 2d shows the total number of animals that were quarantined (confined) by year from 2018-2021.

4.0 COVID-19

Throughout the COVID-19 pandemic, Wake County Public Health has relied heavily on data to guide its pandemic response. Wake County Public Health continues to use a combination of metrics such as wastewater surveillance, hospitalizations, case trends, vaccinations, and the prevalence of variants to inform decision making, guidance, and the provision of services.

Wake County can anticipate additional surges of COVID-19 infections as the pandemic evolves. The most effective and appropriate public health prevention tools continue to be applied to each phase of the pandemic.

Figure 2c: Animal Exposures by Animal Type, Wake County, 2018-21

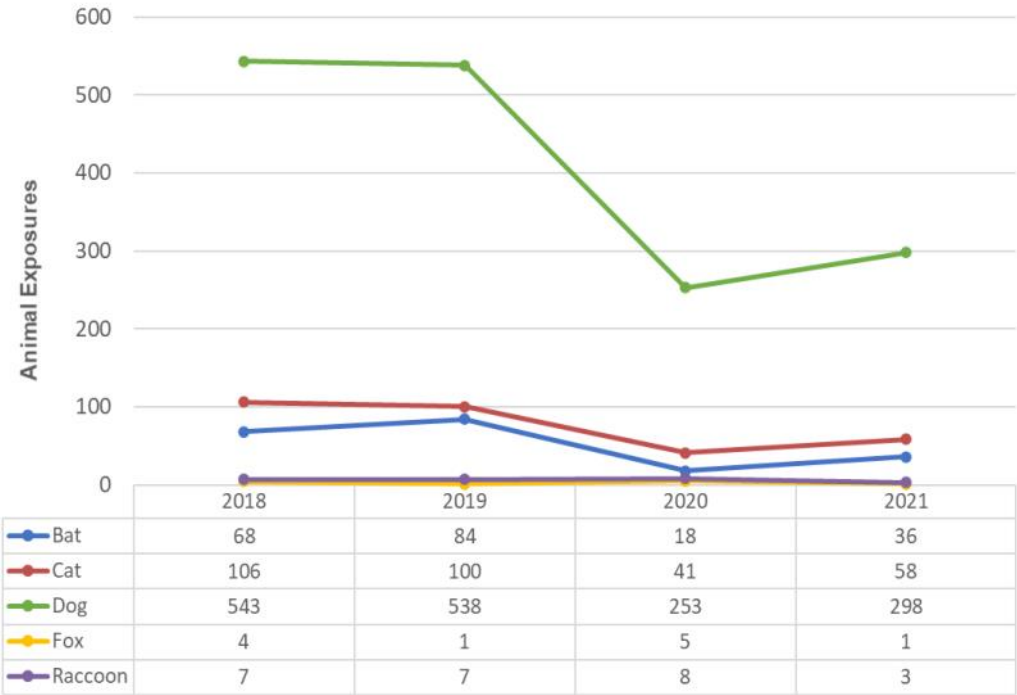
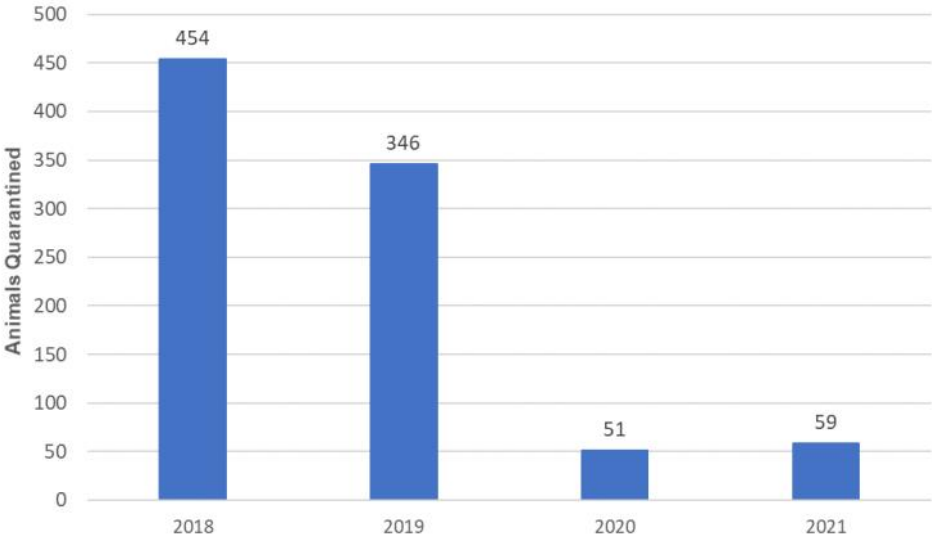


Figure 2d: Animals Quarantined, Wake County, 2018-21



Source Figures 2c and 2d , CD Surveillance Team, 6/9/2022

These tools include:

- vaccination. Vaccines are now available for those 6 months-4 years old. Additionally, boosters are now available for people age 5 years and older. COVID vaccines can protect against severe illness, hospitalizations and death. Boosters can further enhance or restore protection that may have decreased over time since the primary vaccine series was given.
- use of face coverings/masks,
- testing, and
- treatment.

Figures 3a through 3c show

- the total number of Wake County COVID-19 cases from 3/7/2020 through 7/9/2022,
- the total number of COVID-19 deaths by date of death from 3/7/2020 through 7/9/2022, and
- the percentage of Wake County's total population that has completed the primary COVID-19 vaccination series.

Suppressed data in the graphs means that the number of people in a population is so small, information is not shown in order to protect patient privacy. Missing data in 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 tested from 3/7/2020 through 7/9/2022. The number of positive cases peaked in January 2021 and January 2022 due to highly contagious variants of the COVID-19 virus.

Figure 3b shows the total number of COVID-19 deaths by date of death in Wake County from 3/7/2020 through

Figure 3a

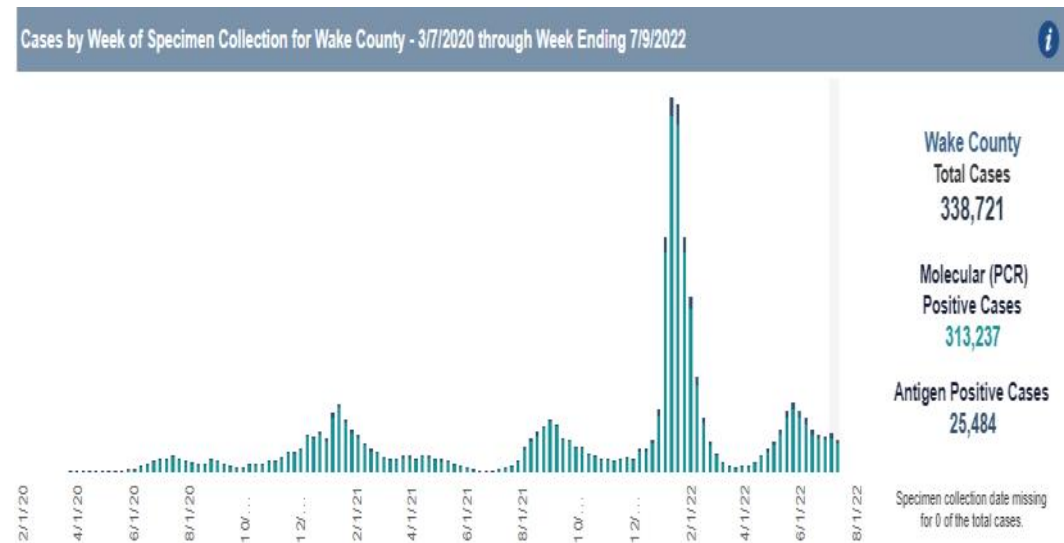
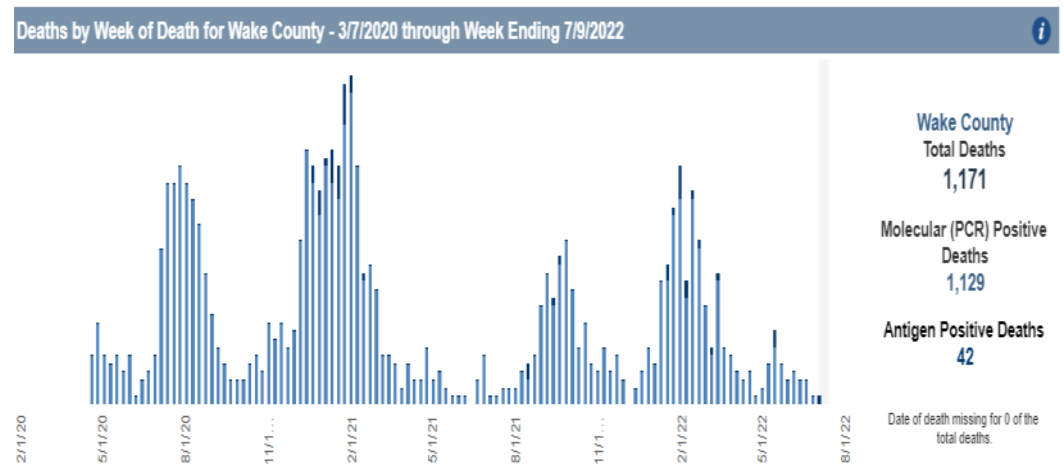


Figure 3b



Source: Figures 3a and 3b: NC Department of Health and Human Services. <https://covid19.ncdhhs.gov/dashboard/cases-and-deaths>, 7/20/22

7/9/2022. A significant number of deaths occurred in July 2020, January 2021, and January 2022, periods that also were marked by an increase in cases. Figure 3c shows the percentage of Wake County's total population that completed the COVID-19 primary vaccination series. Wake County has some of the highest COVID-19 vaccination rates in North Carolina.

5.0 Other Vaccine Preventable Diseases

5.1 Pertussis, hepatitis B and *Haemophilus influenzae* type b

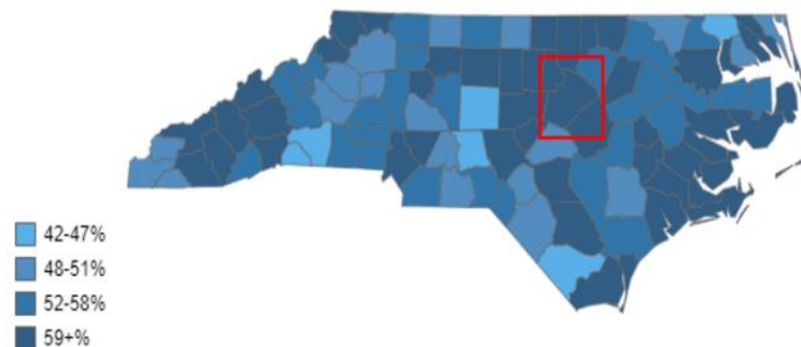
There were surges of COVID-19 in 2020 and 2021 that likely contributed to decreased testing and diagnostic services at times for many medical conditions. There were far fewer cases of vaccine preventable diseases in Wake County in 2021 in comparison to previous years (2018 and 2019) (Figure 4). Given the significant decrease in cases in 2021, no further demographic analysis was performed here. The 2021 case counts for pertussis and *Haemophilus influenzae* type B were not displayed to protect patient privacy.

5.2 Influenza

As during the 2020-21 influenza season, the course of the 2021-22 influenza season was influenced by the COVID-19 pandemic. As highly contagious variants of COVID-19 emerged and statewide executive orders and local public health mandates intended to control the spread of COVID-19 were lifted, both flu and COVID-19 cases increased.

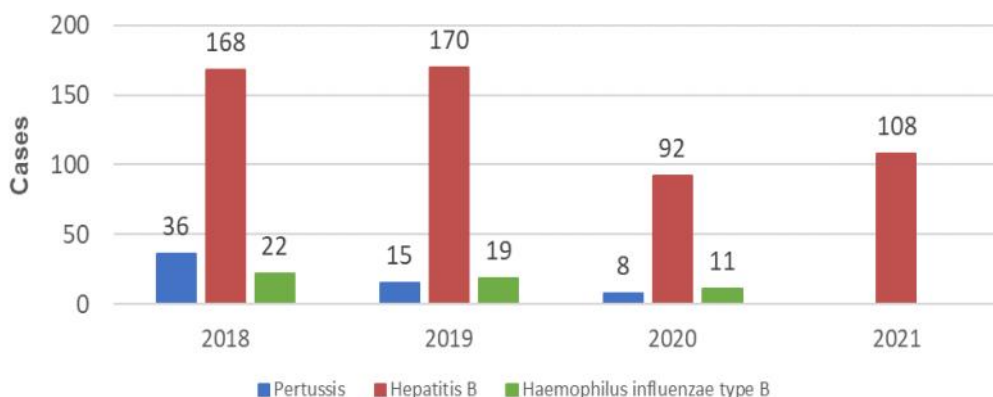
Figure 3c

74% Percent of Population Vaccinated with Initial Series Complete
Wake County



Source: NC Department of Health and Human Services
<https://covid19.ncdhhs.gov/dashboard/vaccinations>, 7/20/22

Figure 4: Pertussis, Hepatitis B, and *Haemophilus influenzae* type B Cases, Wake County, 2018-21

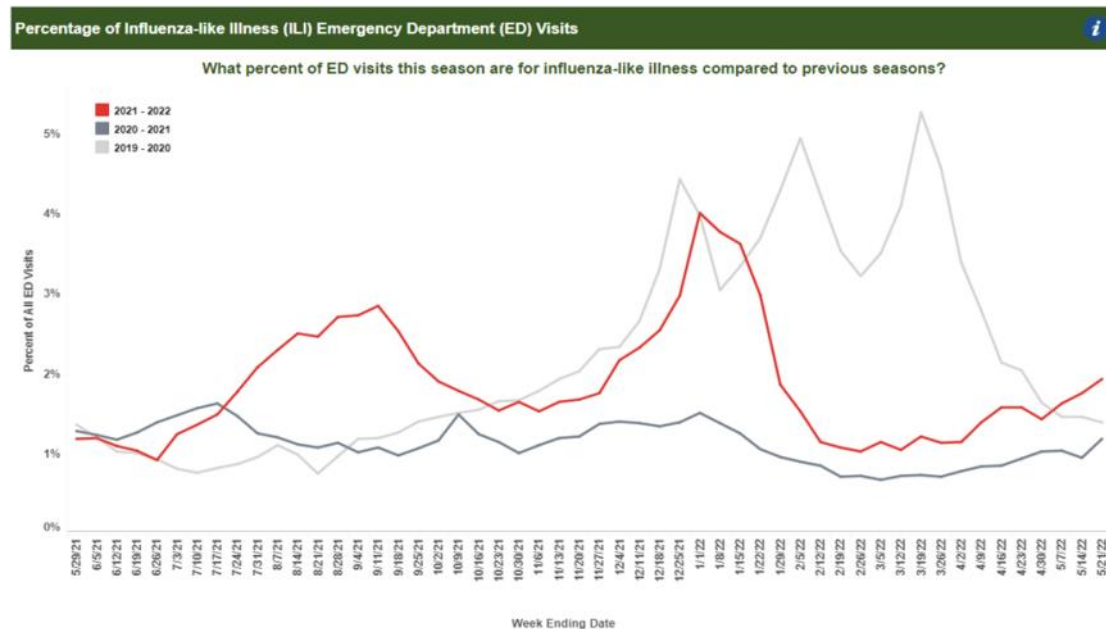


Source: NC EDSS, 6/2/22

From October 3, 2021 to May 21, 2022, there were 17 flu deaths in North Carolina, and no flu deaths in Wake County. Figure 5 shows the percentage of total emergency department (ED) visits with ILI (influenza-like illness) in North Carolina over the last three flu seasons. Figure 6 shows Wake County's ILI percentages compared to CLI (COVID-like illness) over the 2021-22 flu season.

While continuing to respond to the COVID-19 pandemic, WCHHS administered a total of **5,320** flu vaccine doses from September 15, 2021 to May 15, 2022. Four thousand six hundred and twenty-three (4,623) doses were administered to the community and an additional 697 doses to Wake County employees.(5)

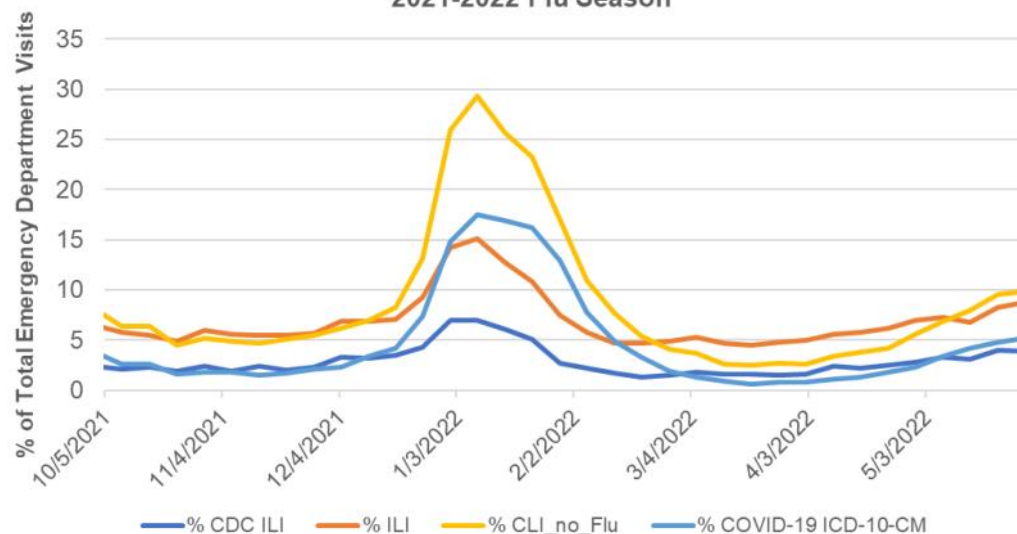
Figure 5



Source: NC Department of Health and Human Services. <https://covid19.ncdhhs.gov/dashboard/respiratory-virus-surveillance>, 5/31/22

Figure 6

Figure 6: ILI and CLI by Week, Wake County 2021-2022 Flu Season



Source Figure 6: NC DETECT, 6/1/22

6.0 Foodborne Diseases

Figure 7 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 2021 (over 90%). While *Salmonella* remained the most frequently reported foodborne disease 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 2021. No further analysis was performed on these potentially artificially decreased numbers.

6.1 Foodborne Outbreaks

All foodborne outbreaks must be reported to the local health department and NC Division of Public Health. There were no foodborne outbreaks in Wake County in 2021.

Figure 7: 5-Year Trend Most Frequently Reported Foodborne Diseases, Wake County 2017-2021



Source: NC EDSS, 6/3/22

7.0 Vectorborne Diseases

Vectorborne diseases are caused by microbes that are 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, dengue, malaria, West Nile virus, and Zika virus) disease 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.

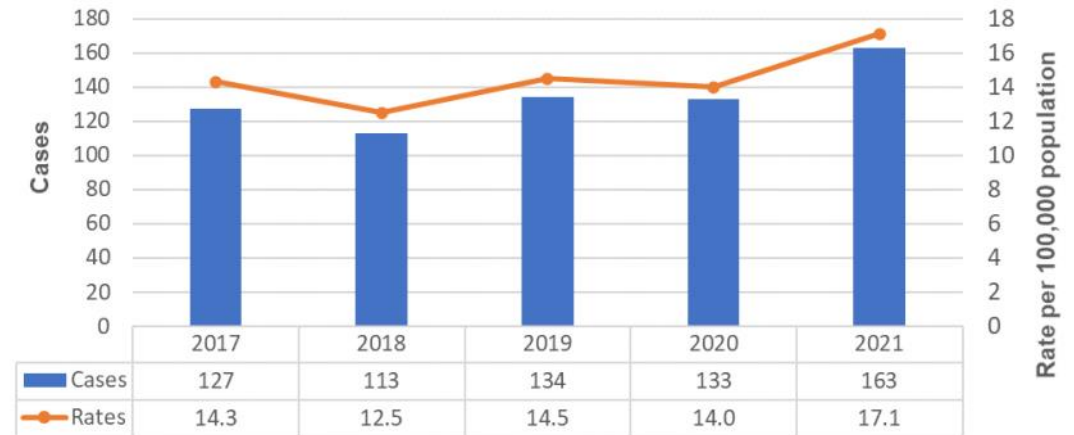
Table 1: Vectorborne Diseases in Wake County, 5-Year Trend, 2017- 21											
		2017		2018		2019		2020		2021	
		Confirmed	Confirmed/ Suspect/ Probable	Confirmed	Confirmed/ Suspect/ Probable	Confirmed	Confirmed/ Suspect/ Probable	Confirmed	Confirmed/ Suspect/ Probable	Confirmed	Confirmed/ Suspect/ Probable
Tickborne	Ehrlichiosis, HGE	0	2	0	0	1	2	1	2	0	1
	Ehrlichiosis, HME	0	10	0	11	1	15	0	24	2	30
	Rocky Mountain Spotted Fever	0	31	1	48	2	63	0	28	0	35
	Lyme Disease	4	46	1	29	7	37	0	20	4	47
Mosquito-borne	Chikungunya	0	2	0	2	2	3	1	2	0	1
	Dengue	0	1	2	3	5	6	0	0	0	2
	Malaria	9	9	6	6	12	12	1	1	6	6
	West Nile Virus	0	0	0	1	0	0	0	0	0	1
	Zika Virus	1	1	0	2	0	1	0	0	0	0

Source: NC EDSS, 6/6/22

8.0 Sexually Transmitted Diseases (STDs)

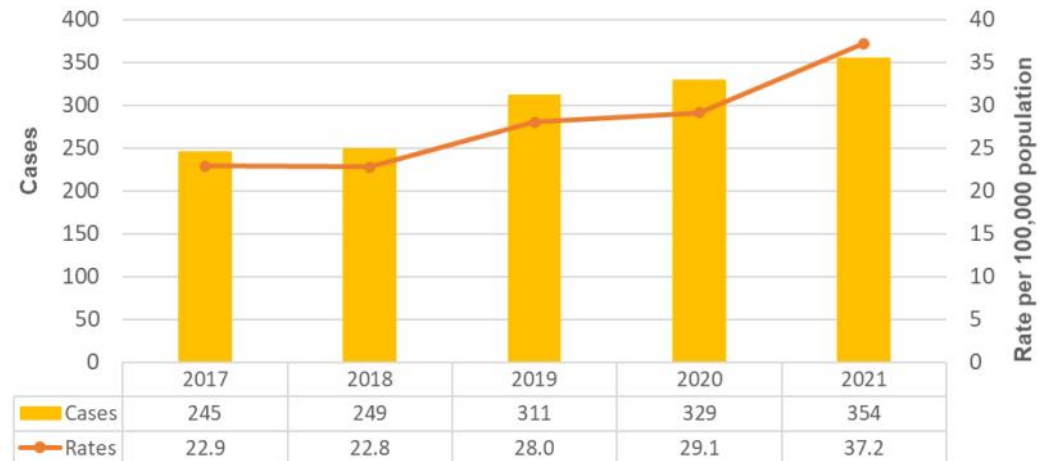
Figures 8-11 show cases and rates for the four most frequently reported STDs in Wake County: HIV/AIDS, early syphilis, gonorrhea, and chlamydia. Figure 8 shows that HIV/AIDS cases and rates increased from 2020-2021. Figure 9 shows that early syphilis cases and rates, which were already high in Wake County from 2017-2019, continued to increase; since 2019, cases increased 13.9% and rates increased 32.9%. Additionally, both gonorrhea (6.9%, 27.2% respectively) and chlamydia (2.6%, 22% respectively) cases and rates increased from 2020-2021. Despite the COVID-19 pandemic and associated lockdowns, STDs continue to rise nationally as well. Cases may be undetected therefore under reported because WCHHS testing and diagnostic services were reduced between 2020-2021 due to the pandemic.

Figure 8: HIV/AIDS Cases and Rates, Wake County, 2017-21



Source: 2019 and 2020 North Carolina HIV Surveillance Report, https://epi.dph.ncdhhs.gov/cd/stds/figures/hiv19rpt_11302020.pdf, <https://epi.dph.ncdhhs.gov/cd/stds/figures/2020-HIV-AnnualReport-Final.pdf>, 6/7/22. For 2021 data, NC EDSS. 2021 rate calculated by Wake County Geographic Information System (GIS) Department using the American Community Survey-5-year Estimates for those aged 10 and older (2016-2020) and NC EDSS, 6/8/22

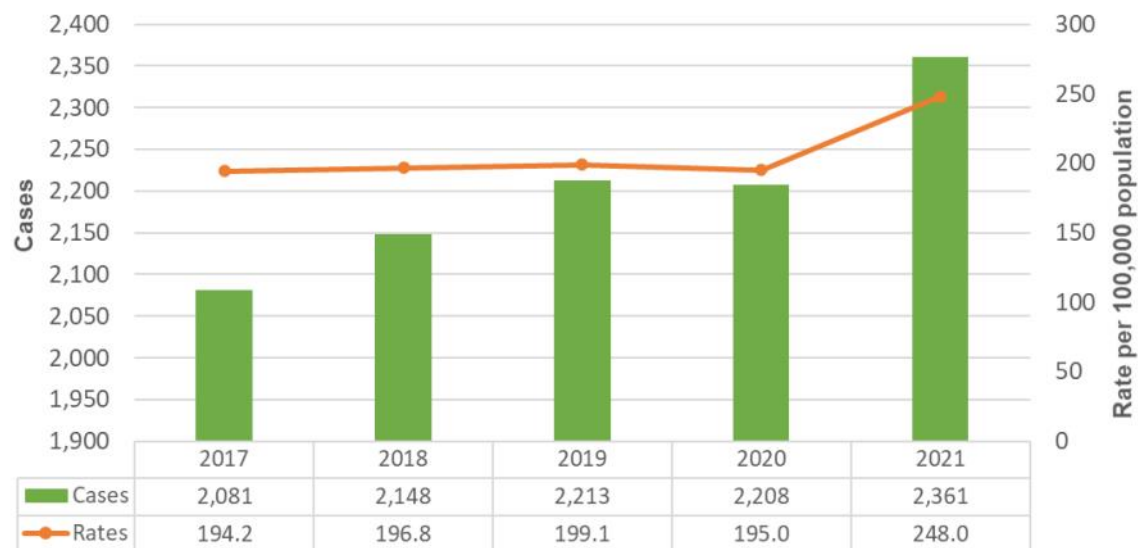
Figure 9: Early Syphilis Cases and Rates, Wake County 2017-21



Source Figure 9: 2019 and 2020 North Carolina STD Surveillance Report, <https://epi.dph.ncdhhs.gov/cd/stds/figures/std19rpt.pdf>, <https://epi.dph.ncdhhs.gov/cd/stds/figures/2020-STD-AnnualReport-Final-v2.pdf>, 6/8/22. For 2021 data, NC EDSS. 2021 rate calculated by Wake County Geographic Information System (GIS) Department using the American Community Survey-5-year Estimates for those aged 10 and older (2016-2020) and NC EDSS, 6/8/22

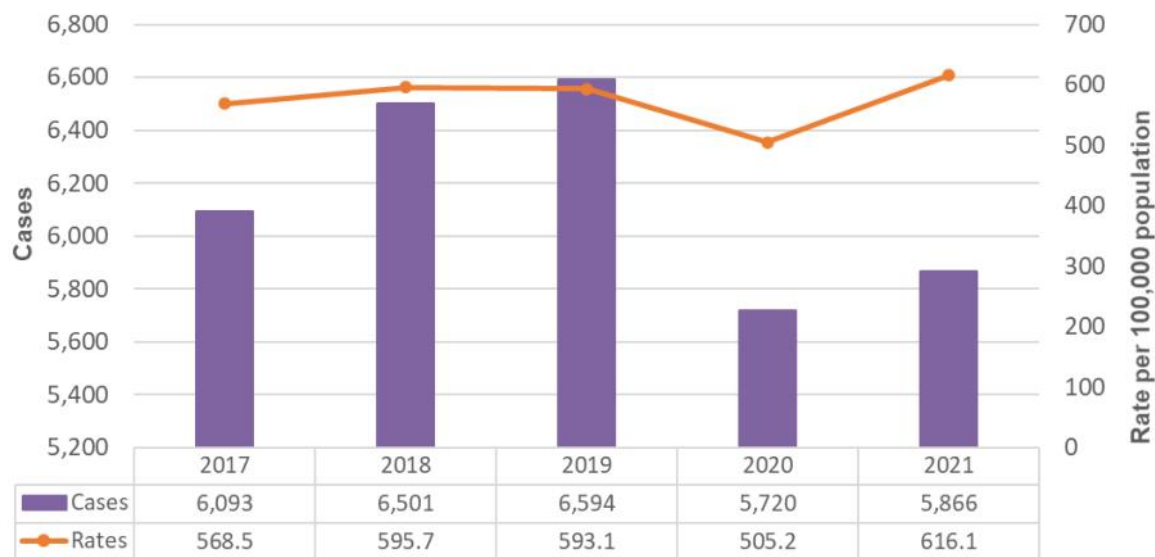
Source: 2019 and 2020 North Carolina STD Surveillance Report, <https://epi.dph.ncdhhs.gov/cd/stds/figures/std19rpt.pdf>, <https://epi.dph.ncdhhs.gov/cd/stds/figures/2020-STD-AnnualReport-Final-v2.pdf>, 6/8/22. For 2021 data, NC EDSS. 2021 rate calculated by Wake County Geographic Information System (GIS) Department using the American Community Survey-5-year Estimates for those aged 10 and older (2016-2020) and NC EDSS, 6/8/22

Figure 10: Gonorrhea Cases and Rates, Wake County, 2017-21



Source: 2019 and 2020 North Carolina STD Surveillance Report, <https://epi.dph.ncdhhs.gov/cd/stds/figures/std19rpt.pdf>, <https://epi.dph.ncdhhs.gov/cd/stds/figures/2020-STD-AnnualReport-Final-v2.pdf>, 6/8/22. For 2021 data, NC EDSS. 2021 rate calculated by Wake County Geographic Information System (GIS) Department using the American Community Survey-5-year Estimates for those aged 10 and older (2016-2020) and NC EDSS, 6/8/22

Figure 11: Chlamydia Cases and Rates, Wake County, 2017-21



9.0 Tuberculosis

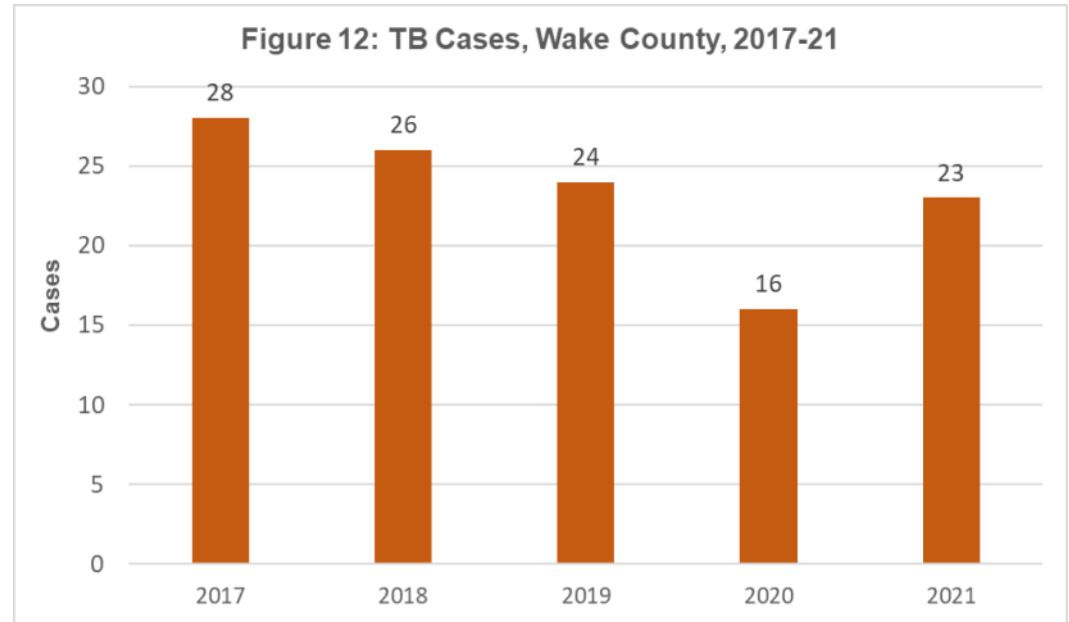
When comparing TB case numbers from 2017-2021, TB cases remained stable overall. Since 2020, the number of TB cases increased by 43.8%.

10.0 Summary

In summary, the COVID-19 pandemic continued to have an impact on communicable disease morbidity as well as service provision in Wake County in 2021. Program updates were not included in this report as WCHHS Public Health resources were (and at the time of this report continued to be) redirected to the County's COVID-19 response.

While Wake County had no reports of rabies cases in animals in 2020 and 2021, the risk of rabies still exists. To reduce this risk, residents should be vigilant about keeping their animals up to date on rabies vaccines, avoid interacting with stray and wild animals and keep their homes from attracting wild animals ([WakeGOV.com/StopRabies](https://www.wakegov.com/stoprabies)).

As COVID-19 control measures prescribed in public health mandates were lifted, case increases were seen not only in COVID-19 but in influenza, which has similar control measures. HIV/AIDS and other STDs, especially syphilis, continue to be a major concern in Wake County. TB cases increased in 2021, but over the 5-year trend, case numbers remain stable.



Source: WCHHS TB Program, 6/8/22.

11.0 References

1. *What is Rabies?* NC Rabies Control Manual. NC Division of Public Health, NC Department of Health and Human Services. February 2013. https://epi.dph.ncdhhs.gov/cd/lhds/manuals/rabies/docs/what_is_rabies.pdf. Accessed 6/9/2022.
2. *Prevention of Rabies in Humans: Rabies Risk Assessment and Treatment Steps*. NC Rabies Control Manual. NC Division of Public Health, NC Department of Health and Human Services. May 2021. https://epi.dph.ncdhhs.gov/cd/lhds/manuals/rabies/docs/steps_for_HCP.pdf. Accessed 6/10/2022.
3. *Animal Management: Dog, Cat or Ferret that Bites a Human*. NC Division of Public Health, NC Department of Health and Human Services. February 2013. https://epi.dph.ncdhhs.gov/cd/lhds/manuals/rabies/docs/domestic_mgmt.pdf. Accessed 6/10/2022.
4. *Animal Management: 10-Day Confinement Q&A and Recommendations*. NC Rabies Control Manual. NC Division of Public Health, NC Department of Health and Human Services. February 2013. https://epi.dph.ncdhhs.gov/cd/lhds/manuals/rabies/docs/10day_domestic.pdf. Accessed 6/13/2022.
5. Source: WCHHS Immunization Tracking Program, 5/31/22).

12.0 Acknowledgements

For contributions to this report:

Crystal Lormejuste, Health Informatics Analyst, WCHHS

Nancy Phillips, Public Health Nurse Supervisor, WCHHS

Dr. Nicole Mushonga, Associate Physician Director and Epidemiology Program Director

Michelle Ricci, Public Health Educator, WCHHS

Michelle Winings, Interim Director of Nursing, Immunization Compliance Coordinator, WCHHS

13.0 URLs

URLs for web links used In this report are provided below in the event of (unexpected) broken links and for those using print copies.

Page 3	WakeGov.com <i>Data and Reports</i>	www.wakegov.com/departments-government/health-human-services/data-and-reports
	NC Local health Department Accreditation Board <i>Health Department Self-Assessment Instrument Interpretation Document 2022</i>	https://nclhdaccreditation.unc.edu/wp-content/uploads/sites/733/2021/12/HDSAI-Interpretation-Document-Version-7_1-1-22.pdf
	NC Local Health Department Accreditation Board	https://nclhdaccreditation.unc.edu
Page 4	NC General Statutes Chapter 130A– Public Health	https://www.ncleg.gov/Laws/GeneralStatuteSections/Chapter130A
	North Carolina Administrative Code <i>Reportable Diseases and Conditions</i>	http://reports.oah.state.nc.us/ncac/title%2010a%20-%20health%20and%20human%20services/chapter%2041%20-%20epidemiology%20health/subchapter%20a/10a%20ncac%2041a%20.0101.html
	NC DHHS <i>Facts and Figures NC Communicable Disease Reports</i>	https://epi.dph.ncdhhs.gov/cd/figures.html#cds
Page 5	NC General Statutes 130A-196 <i>Notice and confinement of biting animals</i>	https://ncleg.net/EnactedLegislation/Statutes/HTML/BySection/Chapter_130A/GS_130A-196.html G.S. 130A-196
	NC General Statutes 130A-187 <i>County rabies vaccination clinics</i>	https://www.ncleg.gov/EnactedLegislation/Statutes/PDF/BySection/Chapter_130A/GS_130A-187.pdf
	Wake Gov.com <i>Events</i>	https://www.wakegov.com/departments-government/animal-services/events
	NC General Statutes 130A-185 <i>Vaccination Required</i>	https://ncleg.net/EnactedLegislation/Statutes/PDF/BySection/Chapter_130A/GS_130A-185.pdf
Page 15	WakeGov.com <i>Stop Rabies</i>	https://www.wakegov.com/departments-government/health-human-services/public-health-and-medical-services/communicable-diseases-and-pests/stop-rabies