

North Carolina Vaccine-Preventable Diseases Annual Report, 2024

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NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**
Division of Public Health

Vaccine-Preventable Diseases Reported in North Carolina, 2024

Controlling vaccine-preventable diseases (VPDs) requires consistent, concerted and coordinated efforts of public health agencies and health care providers to rapidly identify and report suspected cases and swiftly implement control measures. Although many VPDs remain at or near record low levels, maintaining high immunization rates is critical to prevent reemergence. Vaccine effectiveness varies by vaccine. For some vaccines, effectiveness can wane over time. Because no vaccine is 100% effective, breakthrough cases in vaccinated individuals are expected. These breakthrough cases generally lead to milder illness. This annual surveillance report summarizes 14 VPDs, ten of which were reported in North Carolina during 2024. Additional details on the surveillance data for those reported diseases are presented on subsequent pages. An appendix summarizing acute flaccid myelitis is also included.

2024 Surveillance Highlights

- Pertussis (whooping cough) cases increased significantly in North Carolina, to a level not seen in decades
- One case of measles was reported, the first case in North Carolina since 2018
- Cases of invasive meningococcal disease decreased to half the number of cases seen during the previous year
- Mpox cases increased in 2024 but remained much lower than the level seen during the 2022 outbreak
- No cases of diphtheria, polio, rubella, or congenital rubella syndrome were reported

Vaccination Summary

Vaccination rates in North Carolina are generally at or above the national average among children, but vaccine hesitancy and nonmedical vaccine exemptions in school-aged children are increasing. For example, during the 2023-2024 influenza season, vaccination coverage among people age ≥ 6 months in North Carolina decreased to 48.8% compared to 50.8% in the 2022-2023 season and 55.7% in the pre-COVID, 2019-2020 season. National Immunization Survey (NIS) coverage estimates are updated annually and are typically published in the fall. Influenza immunization data from 2017 to 2024 are available on the [CDC's VaxView dashboards](#).

According to the [North Carolina Kindergarten Immunization Dashboard](#), the percentage of kindergartners who had received all required immunizations by day 30 of enrollment increased from 92.5% in 2023-2024 to 92.8% in 2024-2025. Despite this increase, religious exemptions grew from 2.7% to 3.0%. Private schools had the lowest percentage of kindergartners who received all required immunizations (87.2%), followed by charter schools (93%), and public schools (93.4%). Data by county varied widely. The lowest percentage of kindergartners who had received all the required immunizations for a county was as low as 83.9% and as high as 100%.

Please note that exemption data relies on school reporting and should be interpreted with this in mind. Vaccine-hesitant individuals often cluster geographically, and those communities are at significant risk of VPD outbreaks. In recent years, under-vaccination in specific communities has contributed to outbreaks of measles, mumps, varicella (chickenpox) and pertussis (whooping cough).

Number of Cases of VPDs Reported in North Carolina, 2019-2024								
Disease	2019	2020	2021	2022	2023	Previous five-year average	2024	Significant Change*
Diphtheria	0	0	0	0	0	0	0	--
<i>Haemophilus influenzae</i> , invasive disease	242	129	110	218	269	194	302	--
Hepatitis A	162	521	945	106	28	352	48	--
Measles	0	0	0	0	0	0	1	↑
Meningococcal invasive disease	9	7	9	18	26	14	13	--
Mpox	0	0	0	703	12	143	79	--
Mumps	89	21	2	2	4	24	7	--
Pertussis (whooping cough)	496	191	52	46	106	178	829	↑
Pneumococcal meningitis	54	23	25	62	89	51	82	--
Polio	0	0	0	0	0	0	0	--
Rubella	0	0	0	0	0	0	0	--
Congenital rubella syndrome	0	0	0	0	0	0	0	--
Tetanus	0	0	0	1	0	<1	1	--
Varicella (chickenpox)	n/a	13	32	98	173	79	155	--

↑ =significant increase (≥ 2 standard deviations above average) ↓ =significant decrease (≥ 2 standard deviations below average) -- = no significant change

Report Specifications. Notable information about this report includes:

- Cases include those classified as confirmed or probable and are only among North Carolina residents.
- Cases are counted using the earliest date of illness identification, which is most frequently the symptom onset date. Therefore, case counts in this report may differ slightly from those published in national summaries or state dashboards, which can be based on other dates such as date of initial report to public health, or the date when case surveillance records were closed and reported to the Centers for Disease Control and Prevention (CDC).
- Ages are based on the date the case was entered in the North Carolina Electronic Disease Surveillance System (NCEDSS).
- Incidence rates are based on data obtained from the U.S. census population estimates project. Note that estimates of rates based on a small number of cases are unstable and can fluctuate widely. Therefore, these estimates should be interpreted with caution. Ninety-five percent confidence intervals are shown for demographic-specific rates.
- Fourteen VPDs are shown in the table above. Data for other VPDs in North Carolina, such as influenza, are summarized in separate reports.
- Please note that case classification criteria are subject to change and case counts may fluctuate based on these changes.

Haemophilus influenzae, invasive disease

302

cases reported in 2024

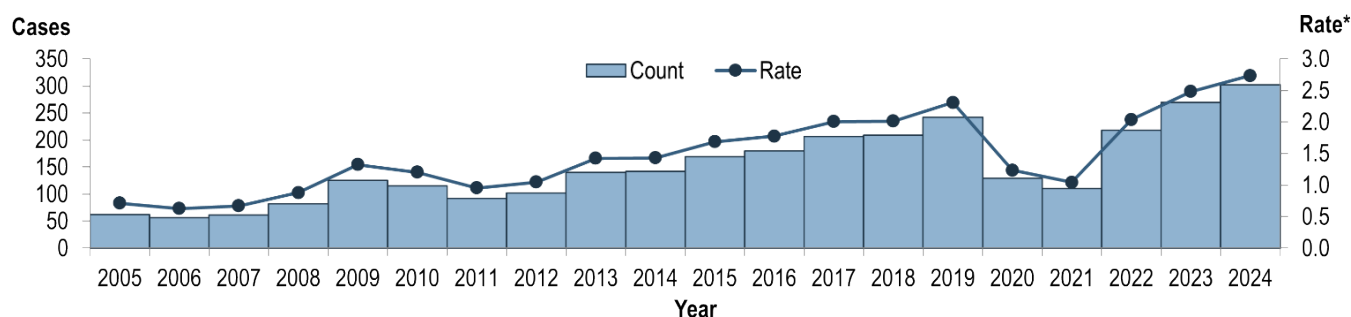
- 302 cases is the greatest number reported in a year since at least 1991 (see [CDC National Surveillance and Trends](#))
- Cases and rates of invasive *H. influenzae* have consistently risen since 2014, excluding the COVID-19 pandemic years

Haemophilus influenzae can cause a variety of clinical syndromes, including bacteremia, pneumonia, meningitis, and epiglottitis. *H. influenzae* organisms are divided into serotypes based on proteins found in the capsule that surrounds the organism. Serotypes without a capsule are called non-typeable. Invasive disease caused by any serotype, including non-typeable serotypes, is reportable in North Carolina. *H. influenzae* serotype b (Hib) is the most virulent and is the only serotype for which there is a vaccine. Hib was the leading cause of bacterial meningitis in children under five years of age before a vaccine was available.

[CDC recommends Hib vaccination](#) for all children younger than five years old in the United States. In North Carolina, Hib vaccination is required for all children under the age of five. According to the 2023 National Immunization Survey (NIS), it is estimated that 79.6% of North Carolina children born in 2021 had completed the full *H. influenzae* vaccine series by 24 months of age.

H. influenzae reached the highest count and rate North Carolina has seen in the last 20 years.

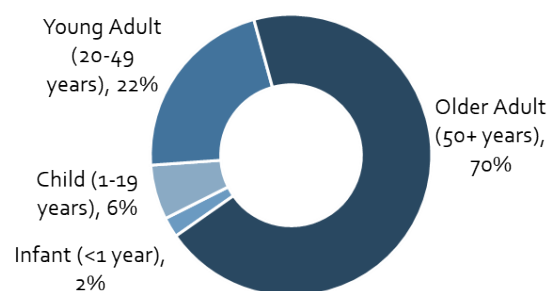
NC 2005-2024 *Haemophilus influenzae* case count and rate by year



The majority of *H. influenzae* cases were older adults.

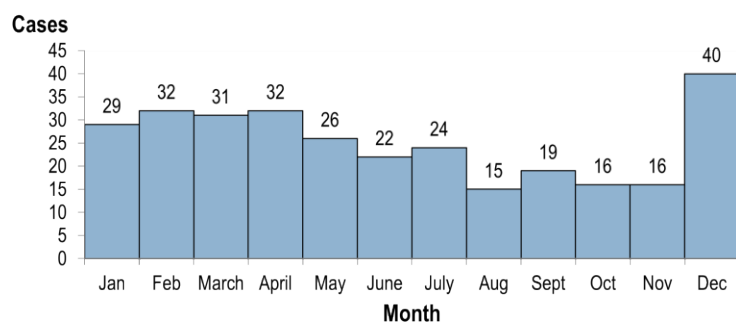
NC 2024 *Haemophilus influenzae* cases by age group status

In 2024, *H. influenzae* cases occurred mostly in older adults. Almost three-quarters of cases were in adults 50 years and older.



H. influenzae occurred consistently throughout the year.

NC 2024 *Haemophilus influenzae* invasive cases by month

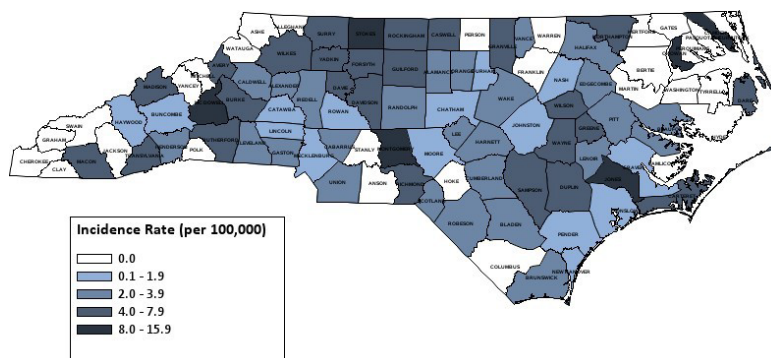


H. influenzae cases occurred throughout the entirety of 2024. Notably, December had the largest number of cases by a significant margin.

Haemophilus influenzae, invasive disease

H. influenzae cases did not concentrate in any specific region of North Carolina in 2024. Cases were observed in most counties (78%).

H. influenzae cases occurred all throughout NC.
NC 2024 *Haemophilus influenzae* cases by county



Annual Summary Key Points

- As noted above, 302 cases in a single year is a high point for North Carolina. The cause of the consistent increase in cases over the past decade is unknown.
- Invasive *H. influenzae* can cause very serious disease. It often affects older adults who have other underlying or immunocompromising health conditions. The severity of illness is demonstrated by the high number of hospitalizations and deaths among reported cases.
- Non-typeable cases are by far the most common, representing two-thirds of all reported cases. Non-typeable does not mean that the serotype is unknown; rather, non-typeable bacteria do not produce a capsule.
- H. influenzae* type b is now rare since the vaccine is available. Only one case of invasive Hib was reported in 2024.

Annual Summary					
	2020	2021	2022	2023	2024
Cases	129	110	218	269	302
Rate*	2.3	1.2	1.0	2.0	2.5
Case Statistics, 2024					
Sex	Cases	%	Rate*	95% CI	
Male	138	46%	2.6	2.1, 3.0	
Female	164	54%	2.9	2.5, 3.4	
Unknown	0	0%	--	--	
Age Group					
Infant	7	2%	5.8	2.3, 11.9	
1-4 yrs	7	2%	1.4	0.6, 2.9	
5-9 yrs	6	2%	0.9	0.3, 2.0	
10-19 yrs	6	2%	0.4	0.2, 0.9	
20-49 yrs	66	22%	1.5	1.2, 1.9	
50-74 yrs	114	38%	3.5	2.9, 4.2	
75+ yrs	96	32%	11.8	9.5, 14.4	
Unknown	0	0%	--	--	
Race					
White	194	64%	2.5	2.2, 2.9	
Black or African American	78	26%	3.2	2.5, 4.0	
American Indian / Alaskan Native	8	3%	4.4	1.9, 8.7	
Asian or Pacific Islander	3	1%	0.7	0.1, 1.9	
Multiple Races	2	1%	0.7	0.1, 2.4	
Other or Unknown	17	6%	--	--	
Hispanic Ethnicity					
Yes	17	6%	1.3	0.7, 2.1	
No	283	94%	2.9	2.6, 3.3	
Unknown	2	1%	--	--	
Disease Severity					
Hospitalized	269	89%			
Died	30	10%			
Serotypes					
Type b	1	0%			
Non-b, typeable	67	22%			
Nontypeable	198	66%			
Unknown	36	12%			

Hepatitis A

48

cases reported in 2024

- Cases increased compared to 2023, but were much lower than during the outbreak years of 2018-2022

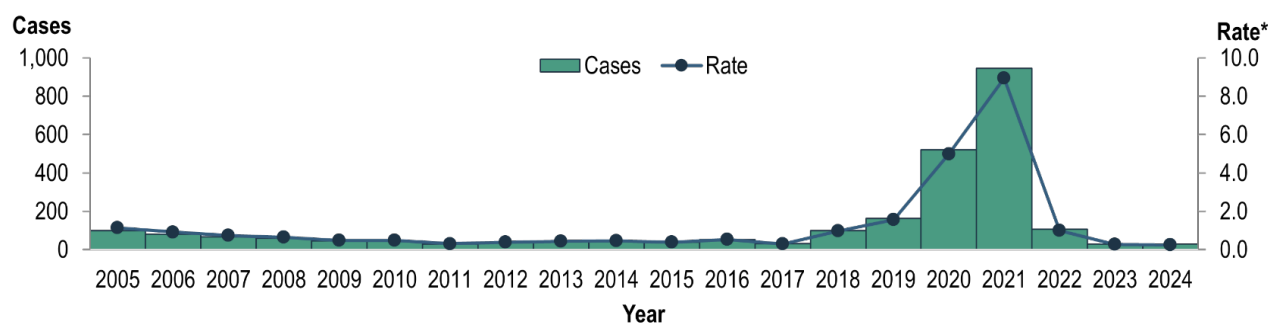
- No outbreaks of hepatitis A were reported in 2024

Hepatitis A virus (HAV) is a cause of acute liver disease transmitted by the fecal-oral route. HAV spreads person-to-person or by eating contaminated food or drink. Common signs and symptoms include nausea, vomiting, abdominal pain, fatigue, and jaundice; however, infection is often asymptomatic in children under 6 years of age. [Learn more about hepatitis A.](#)

According to the 2023 National Immunization Survey results, it is estimated that 88.1% of North Carolina children born in 2021 had received at least one dose of the hepatitis A vaccine by 24 months of age, compared to 86.2% nationally. A slight decline was observed for the recommended second dose; an estimated 76.2% of children born in 2021 received at least two doses of vaccine by 35 months of age, compared to 78.1% nationally. Coverage improved among older age groups: 89.9% of adolescents aged 13-17 years had received at least two doses of the hepatitis A vaccine, compared to 89.6% nationally. Currently, [North Carolina immunization law](#) does not require that individuals be immunized against hepatitis A.

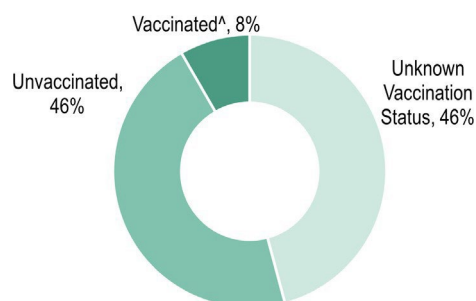
A low number of hepatitis A cases was reported for the second consecutive year.

NC 2005-2024 hepatitis A case count and rate by year



Only half of vaccinated cases (4% of all cases) had received the full, two-dose series. This is expected as Hepatitis A vaccines have been found to be very effective in preventing disease¹.

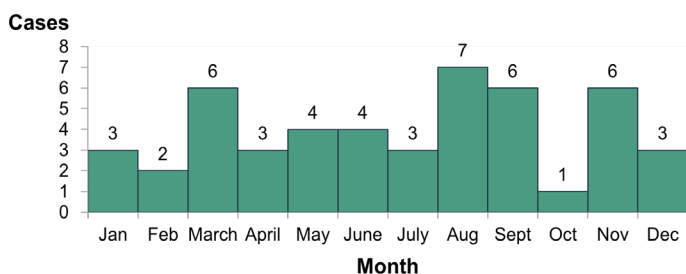
Only 8% of hepatitis A cases had a recorded vaccination. NC 2024 hepatitis A cases by vaccination status



[^]Received at least one hepatitis A vaccine

Hepatitis A cases were highest in summer

NC 2024 hepatitis A cases by month



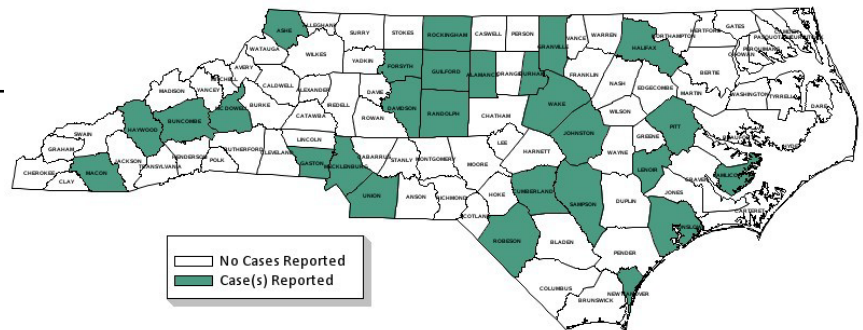
Hepatitis A cases occurred throughout the 2024 year. Hepatitis A does not usually follow a seasonality pattern.

¹World Health Organization. 2022. Hepatitis A vaccines: WHO position paper, October 2022. *Weekly Epidemiological Record*, 97(40), pp. 492-512.

Hepatitis A

Hepatitis A cases were reported in 18 counties in 2024.

Hepatitis A cases occurred throughout the state.
NC 2024 hepatitis A cases by county



Annual Summary Key Points

- The 48 reported cases of hepatitis A in 2024 are a slight increase compared to 2023, but much lower than the five-year average of 366 cases that was seen during the outbreak years of 2018-2022.
- The number of cases in 2024 is close to the baseline level of cases that was seen during the pre-outbreak period of 2008-2017, when an average of 42 annual cases were reported.
- Almost all cases were in adults 20 years of age or older. Cases in children are now rare in North Carolina since the hepatitis A vaccine was added to the routine childhood immunization schedule in 2006.
- Hepatitis A can be a severe disease. Over half of cases in 2024 had to be hospitalized.

Annual Summary					
	2020	2021	2022	2023	2024
Cases	521	945	106	28	48
Rate*	5.0	8.9	1.0	0.3	0.4
Case Statistics, 2024					
Sex	Cases	%	Rate*	95% CI	
Male	29	60%	0.5	0.4, 0.8	
Female	19	40%	0.3	0.2, 0.5	
Unknown	0	0%	--	--	
Age Group					
Infant	0	0%	0.0	0.0, 3.0	
1-4 yrs	0	0%	0.0	0.0, 0.7	
5-9 yrs	2	4%	0.3	0.0, 1.1	
10-19 yrs	1	2%	0.1	0.0, 0.4	
20-49 yrs	28	58%	0.6	0.4, 0.9	
50-74 yrs	11	23%	0.3	0.2, 0.6	
75+ yrs	6	13%	0.7	0.3, 1.6	
Unknown	0	0%	--	--	
Race					
White	23	48%	0.3	0.2, 0.4	
Black or African American	5	10%	0.2	0.1, 0.5	
American Indian / Alaskan Native	0	0%	0.0	0.0, 2.0	
Asian or Pacific Islander	7	15%	1.5	0.6, 3.1	
Multiple Races	3	6%	1.0	0.2, 2.9	
Other or Unknown	10	21%	--	--	
Hispanic Ethnicity					
Yes	6	13%	0.5	0.2, 1.0	
No	37	77%	0.4	0.3, 0.5	
Unknown	5	10%	--	--	
Disease Severity					
Hospitalized	26	54%			
Died	0	0%			

Measles

1

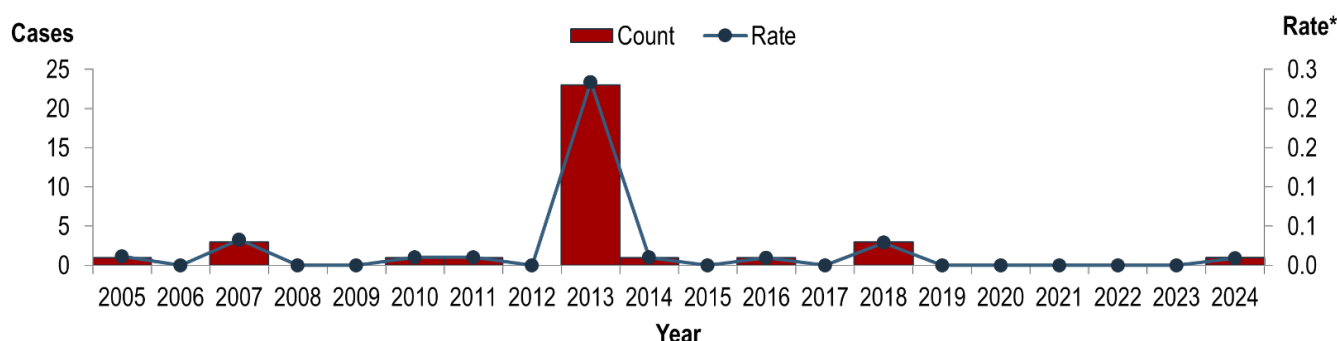
case reported in
2024

- One case was reported in 2024, the first case in North Carolina since 2018
- Measles is uncommon in North Carolina. Most cases occur after international travel by people who are not vaccinated.

Measles is an acute viral illness that is transmitted through airborne droplets or by direct contact with respiratory or throat secretions from an infected person. Measles is characterized by fever, runny nose, red eyes, and a maculopapular rash that first begins on the head and face and gradually moves down to the torso and the extremities. Complications such as pneumonia, encephalitis, and death can occur. Measles is one of the most contagious diseases. Any person that shares the same space (e.g. being in the same room) as a measles case is considered exposed to measles. [Learn more about measles.](#)

North Carolina historically has maintained low measles numbers.

NC 2005-2024 measles case count and rate by year



Vaccination is the best way to prevent measles. In North Carolina, one dose of MMR vaccine is required for children on or after 12 months and before 16 months of age, and a second dose is required for students entering school, college, or university for the first time. Results from the 2023 NIS estimate that 96.1% of North Carolina children born in 2021 had received at least one dose of MMR vaccine by 24 months of age, compared to 90.1% nationally. Additionally, 96.1% of teens 13-17 years of age in North Carolina were estimated to have received at least two doses of MMR vaccine compared to 91.3% nationally.

A person is considered immune to measles if they were born before 1957, or if they have:

- Written documentation of vaccines for measles,
- Laboratory evidence of immunity (such as a positive antibody test), or
- Laboratory confirmation of measles.

Many people get vaccinated as a child to go to child care or school. North Carolina requires measles vaccination for these settings. [More about NC school requirements and exemptions.](#)

Although rare, it is possible for someone to get measles even if they are vaccinated. If this happens, symptoms are usually milder and they are less likely to transmit the disease to others. One dose of MMR vaccine is about 93% effective at preventing measles¹. Two doses are about 97% effective¹.

2024 Case

Just one case of measles was reported during 2024. The case occurred in a North Carolina resident who had recently returned from international travel. The person's exposure to measles occurred overseas.

Due to the low number of cases in 2024, demographic and geographic data is not included in this report to protect patient privacy.

¹Centers for Disease Control and Prevention. 2025. Measles vaccination. <https://www.cdc.gov/measles/vaccines/index.html>

Meningococcal Invasive Disease

13

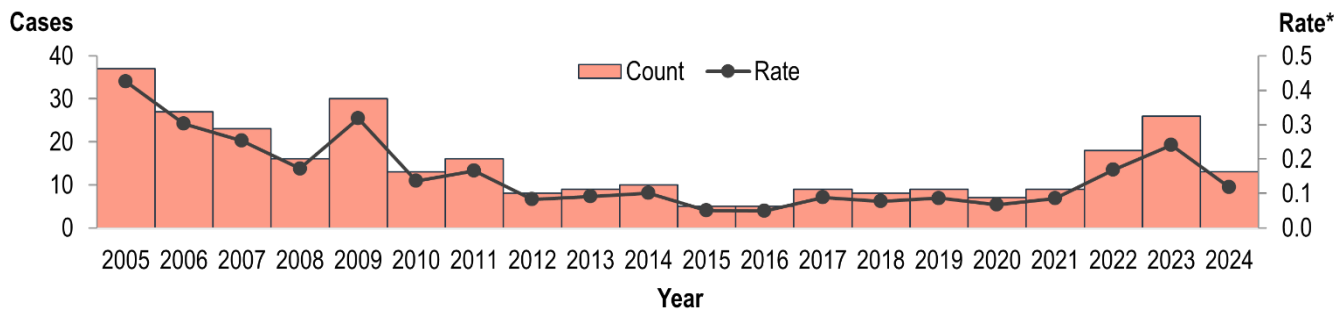
cases reported in 2024

- Reported cases decreased to half the level seen in 2023
- No outbreaks of meningococcal disease were reported in 2024

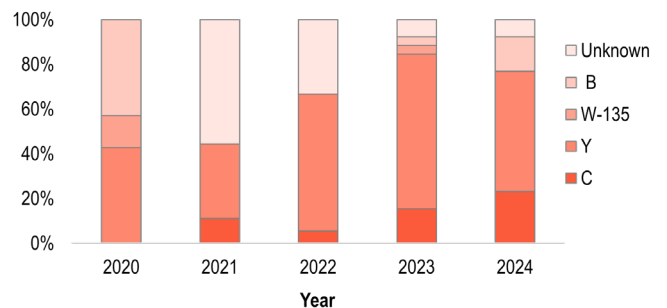
Invasive meningococcal disease caused by *Neisseria meningitidis* is an acute, serious illness that can cause several syndromes including meningitis, bacteremia, and sepsis. Learn more about [meningococcal disease](#).

The quadrivalent meningococcal conjugate vaccine contains four serogroups (A, C, Y, and W). Two doses are recommended for children as part of the routine immunization schedule: the first at 11-12 years, and the second at 16 years. Vaccination with the serogroup B vaccine is recommended for various populations considered to be at increased risk for disease. In North Carolina, one dose of meningococcal conjugate vaccine is required for 7th grade entry (or by 12 years of age), and a second dose is required for 12th grade entry (or by 17 years of age). According to the 2023 NIS, it is estimated that 91.7% of North Carolinians aged 13-17 had received at least one dose of the meningococcal conjugate vaccine, which is higher than the estimated 88.4% of teenagers nationally.

Meningococcal cases decreased in 2024 after a stepwise increase the last few years.
NC 2005-2024 meningococcal case count and rate by year

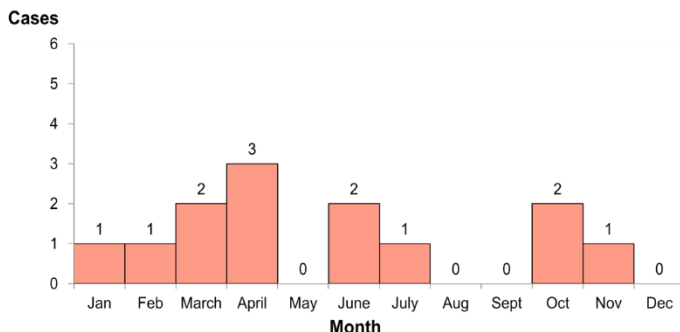


NC 2020-2024 meningococcal cases by serogroup



Meningococcal cases were mostly group Y. Serogroups B and C were also reported in 2024.

NC 2024 meningococcal cases by month

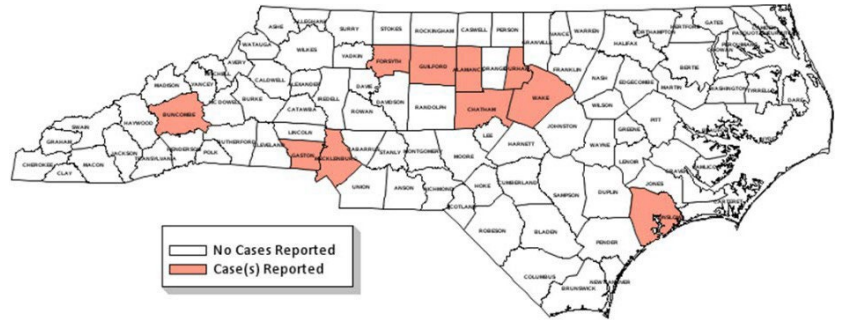


Meningococcal cases were reported sporadically during 2024. No cases were reported during four months of the year.

Meningococcal Invasive Disease

Meningococcal cases occurred in ten (10%) counties in 2024, mostly in the central part of the state.

NC 2024 meningococcal cases by county



Annual Summary Key Points

- After a peak year in 2023, cases in 2024 decreased by 50%, although 13 cases is still above the recent baseline number of annual cases that was seen from 2012 to 2021.
- Cases were spread among several different age groups. Cases occurred in people age 20-49 more than any other age group.
- All cases were hospitalized, demonstrating the severity of invasive meningococcal disease and the need for urgent medical care.
- A majority of cases were serogroup Y. This is consistent with the trend in recent years, when Y has been the predominant serogroup.
- Some recent cases of serogroup Y were found to be resistant to ciprofloxacin and penicillin. [NC DHHS recommends](#) discontinuing the use of ciprofloxacin for prophylaxis of close contacts in certain North Carolina and South Carolina counties.

Annual Summary					
	2020	2021	2022	2023	2024
Cases	7	9	18	26	13
Rate*	0.07	0.09	0.17	0.24	0.12
Case Statistics, 2024					
Sex	Cases	%	Rate*	95% CI	
Male	8	62%	0.1	0.1, 0.3	
Female	5	38%	0.1	0.0, 0.2	
Age Group					
Infant	0	0%	0.0	0.0, 3.0	
1-4 yrs	1	8%	0.2	0.0, 1.1	
5-9 yrs	0	0%	0.0	0.0, 0.6	
10-19 yrs	2	15%	0.1	0.0, 0.5	
20-49 yrs	6	46%	0.1	0.1, 0.3	
50-74 yrs	2	15%	0.1	0.0, 0.2	
75+ yrs	2	15%	0.2	0.0, 0.9	
Race					
White	6	46%	0.1	0.0, 0.2	
Black or African American	5	38%	0.2	0.1, 0.5	
American Indian / Alaskan Native	0	0%	0.0	0.0, 2.0	
Asian or Pacific Islander	0	0%	0.0	0.0, 0.8	
Multiple Races	1	8%	0.3	0.0, 1.8	
Other or Unknown	1	8%	--	--	
Hispanic Ethnicity					
Yes	3	23%	0.2	0.0, 0.7	
No	10	77%	0.1	0.0, 0.2	
Unknown	0	0%	--	--	
Disease Severity					
Hospitalized	13	100%			
Died	1	8%			
Serotypes					
A	0	0%			
B	2	15%			
C	3	23%			
Y	7	54%			
W-135	0	0%			
Unknown	1	8%			

Mpox

79

cases reported in 2024

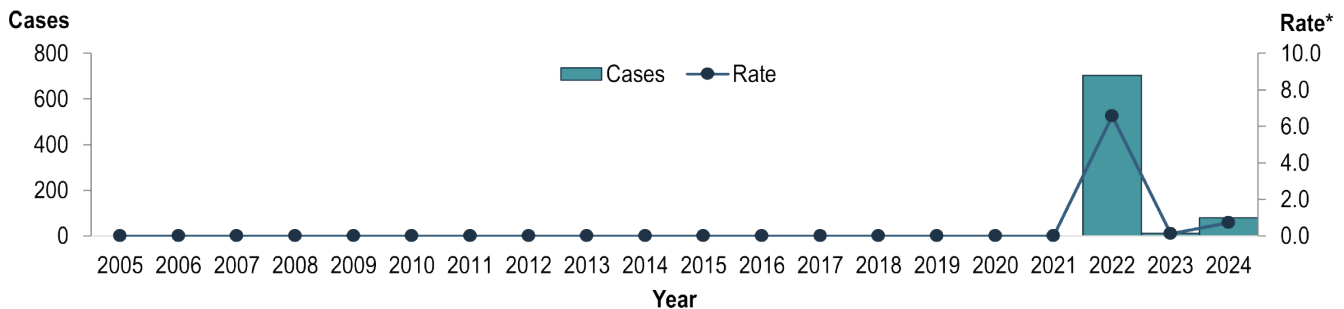
- Mpox cases increased in 2024 but remained much lower than the level seen during the 2022 outbreak
- No cases of Clade I mpox have been reported in North Carolina

Mpox (formerly known as monkeypox) is a viral disease that can be spread person-to-person through contact with body fluids or lesions, items that have been in contact with fluids or lesions, and respiratory droplets. People with mpox often get a rash, along with other symptoms. There are two types of mpox: clade I and clade II. Both types spread the same way and can be prevented using the same methods. A subclade of clade II (clade IIb) has been associated with the 2022-23 mpox outbreak that has predominantly affected gay, bisexual, or other men who have sex with men (MSM) in the United States and globally. In November 2024, the first U.S. case of clade I mpox was reported in California after a traveler returned from an affected area. As of the date of publication, no cases of clade I mpox have been reported in North Carolina. [Learn more about mpox here.](#)

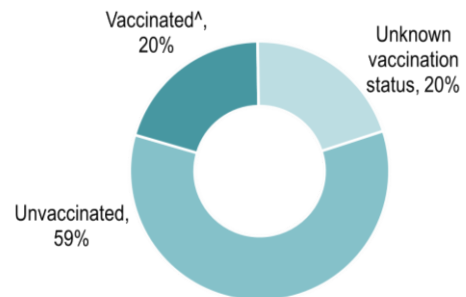
Vaccination is the best way to reduce the risk of mpox infection. People who have known or presumed exposure to mpox virus should receive the mpox vaccine as post-exposure prophylaxis. Mpox vaccination should also be offered before exposure to people with high potential for exposure or who anticipate potential exposure. Two doses of the JYNNEOS vaccine are recommended for those who meet the vaccine eligibility criteria. The second dose should occur at least 28 days after the initial vaccine to ensure suitable immunity to mpox. Information on vaccine eligibility criteria and uptake can be found on the [NC DHHS mpox webpage.](#)

Mpox cases increased in 2024 compared to 2023 but are still not comparable to the large counts seen in 2022.

NC 2005-2024 mpox case count and rate by year



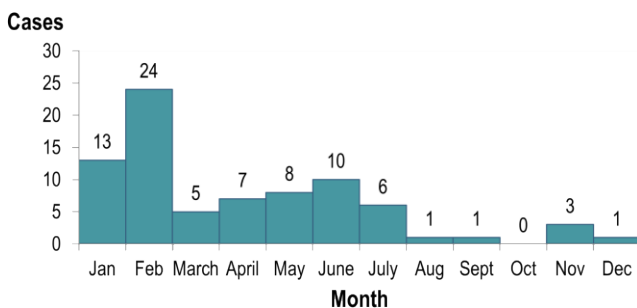
NC 2024 mpox cases by vaccination status



^AReceived at least one dose of mpox (JYNNEOS) vaccine

The majority of mpox cases were unvaccinated. Only 20% were vaccinated. Eleven cases (14%) had the full two-dose series.

NC 2024 mpox cases by month

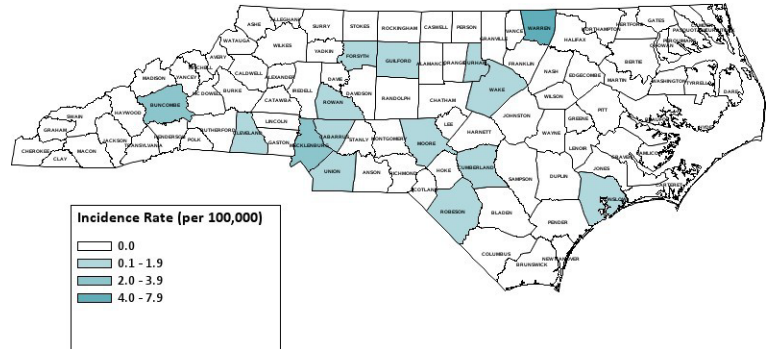


Most 2024 mpox cases occurred in the first half of the year.

Mpox

Fifteen North Carolina counties had mpox cases during 2024.

NC 2024 mpox cases by county



Annual Summary Key Points

- Most cases occurred among males between the ages of 20 and 49.
- Since 2022, cases have occurred primarily among gay, bisexual, or other men who have sex with men (MSM). Two doses of the JYNNEOS vaccine are recommended for those who meet the vaccine eligibility criteria.
- The rate of mpox was highest among Black or African American men. This is consistent with the trend seen during the 2022 outbreak.
- Five people were hospitalized in 2024 due to mpox. No deaths were reported.

Annual Summary					
	2020	2021	2022	2023	2024
Cases	0	0	703	12	79
Rate*	0.0	0.0	6.6	0.1	0.7
Case Statistics, 2024					
Sex	Cases	%	Rate*	95% CI	
Male	75	95%	1.4	1.1, 1.7	
Female	4	5%	0.1	0.0, 0.2	
Age Group					
Infant	0	0%	0.0	0.0, 3.0	
1-4 yrs	0	0%	0.0	0.0, 0.7	
5-9 yrs	0	0%	0.0	0.0, 0.6	
10-19 yrs	3	4%	0.2	0.0, 0.6	
20-49 yrs	68	86%	1.6	1.2, 2.0	
50-74 yrs	8	10%	0.2	0.1, 0.5	
75+ yrs	0	0%	0.0	0.0, 0.5	
Race					
White	27	34%	0.4	0.2, 0.5	
Black or African American	45	57%	1.9	1.4, 2.5	
American Indian / Alaskan Native	0	0%	0.0	0.0, 2.0	
Asian or Pacific Islander	1	1%	0.2	0.0, 1.2	
Multiple Races	3	4%	1.0	0.2, 2.9	
Other or Unknown	3	4%	--	--	
Hispanic Ethnicity					
Yes	12	15%	0.9	0.5, 1.6	
No	65	82%	0.7	0.5, 0.9	
Unknown	2	3%	--	--	
Disease Severity					
Hospitalized	5	6%			
Died	0	0%			

Mumps

7

cases reported in
2024

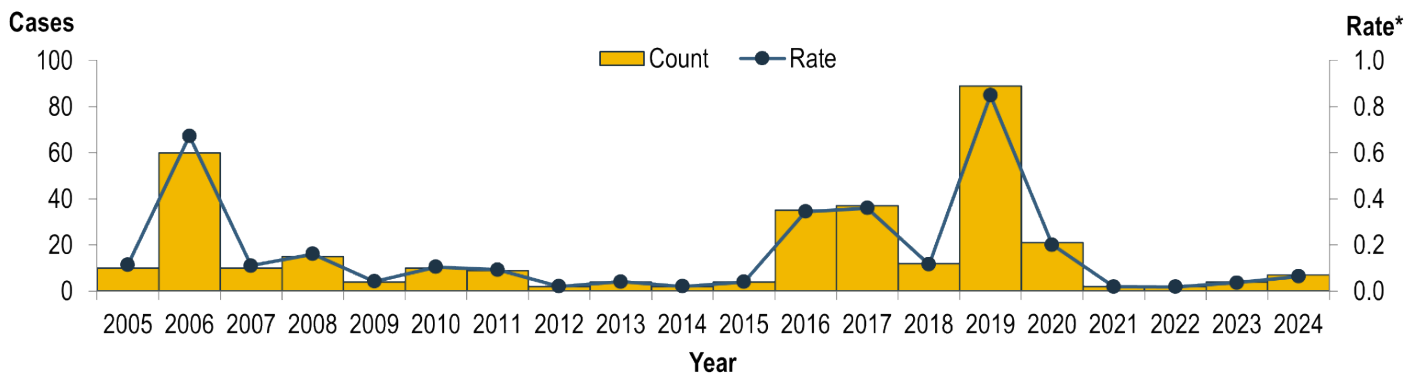
- Mumps cases in North Carolina remain at a very low level
- No outbreaks of mumps were reported in 2024

Mumps is a viral illness best known for causing swelling of the salivary glands below the ears and above the jaw, called parotitis. Mumps can sometimes cause complications such as orchitis (inflammation of the testicles) in males, oophoritis (inflammation of the ovaries) in females, deafness, and meningitis. Before the U.S. mumps vaccination program began in 1967, about 200,000 cases of mumps were reported each year. Since that time, there has been more than a 99% decrease in mumps cases in the United States. [Learn more about mumps.](#)

[Vaccination](#) is the best way to prevent mumps. In North Carolina, one dose of MMR vaccine is required for children on or after 12 months and before 16 months of age, and a second dose is required for students entering school, college, or university for the first time. Results from the 2023 NIS estimate that 96.1% of North Carolina children born in 2021 had received at least one dose of MMR vaccine by 24 months of age, compared to 90.1% nationally. Additionally, 96.1% of teens 13-17 years of age in North Carolina were estimated to have received at least two doses of MMR vaccine compared to 91.3% nationally.

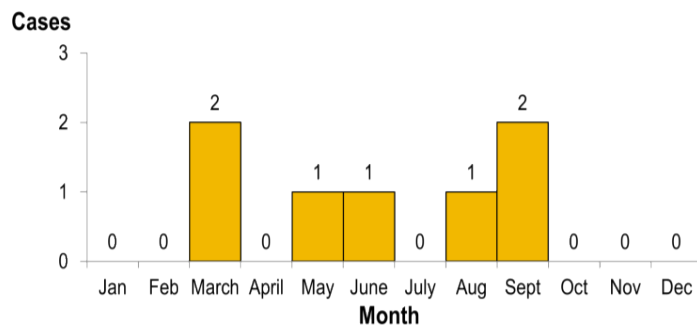
Fewer than ten mumps cases were reported for the fourth consecutive year.

NC 2005-2024 mumps case count and rate by year



Mumps occurred sporadically throughout the year.

NC 2024 mumps cases by month

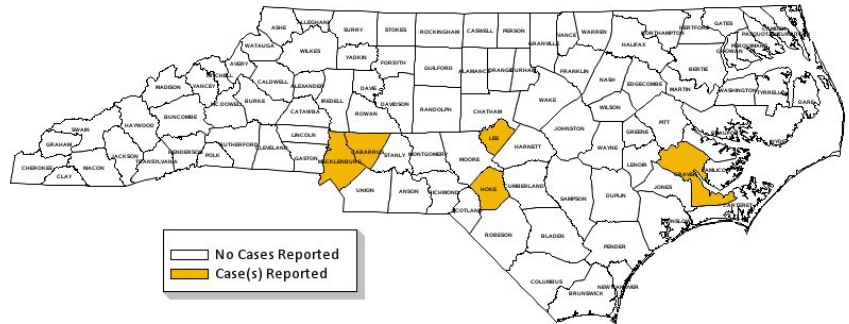


Historically, mumps is most common during the spring months in North Carolina. In 2024, cases occurred between March and September.

Mumps

Mumps did not have any geographic patterns.
NC 2024 mumps cases by county

Mumps cases occurred in just five counties in 2024



Annual Summary

	2020	2021	2022	2023	2024
Cases	21	2	2	4	7
Rate*	0.20	0.02	0.02	0.04	0.06

Case Statistics, 2024

Sex	Cases	%	Rate*	95% CI
Male	3	43%	0.06	0.0, 0.16
Female	4	57%	0.07	0.0, 0.18
Age Group				
Infant	0	0%	0.0	0.0, 3.04
1-4 yrs	1	14%	0.20	0.0, 1.12
5-9 yrs	1	14%	0.15	0.0, 0.86
10-19 yrs	0	0%	0.0	0.0, 0.26
20-49 yrs	4	57%	0.09	0.0, 0.24
50-74 yrs	1	14%	0.03	0.0, 0.17
75+ yrs	0	0%	0.0	0.0, 0.45
Race				
White	2	29%	0.0	0.0, 0.09
Black or African American	1	14%	0.04	0.0, 0.23
American Indian / Alaskan Native	0	0%	0.0	0.0, 2.04
Asian or Pacific Islander	3	43%	0.65	0.13, 1.91
Multiple Races	0	0%	0.00	0.0, 1.21
Other or Unknown	1	14%	--	--
Hispanic Ethnicity				
Yes	1	14%	0.08	0.0, 0.42
No	5	71%	0.05	0.0, 0.12
Unknown	1	14%	--	--
Disease Severity				
Hospitalized	1	14%		
Died	0	0%		

Annual Summary Key Points

- North Carolina continues to see very few mumps cases. 2020 was the last year an outbreak of mumps was reported.
- Within the past decade, large outbreaks have occurred in congregate or close-contact settings in North Carolina, so it is important to maintain high vaccination rates.
- In 2024, most cases were adults (71%).
- Most individuals recover from mumps infection. In 2024, there was only one hospitalization associated with mumps infection.
- In 2024, fewer than half of cases (N=3, 43%) were known to have ever received a mumps vaccination.

Pertussis (Whooping Cough)

831

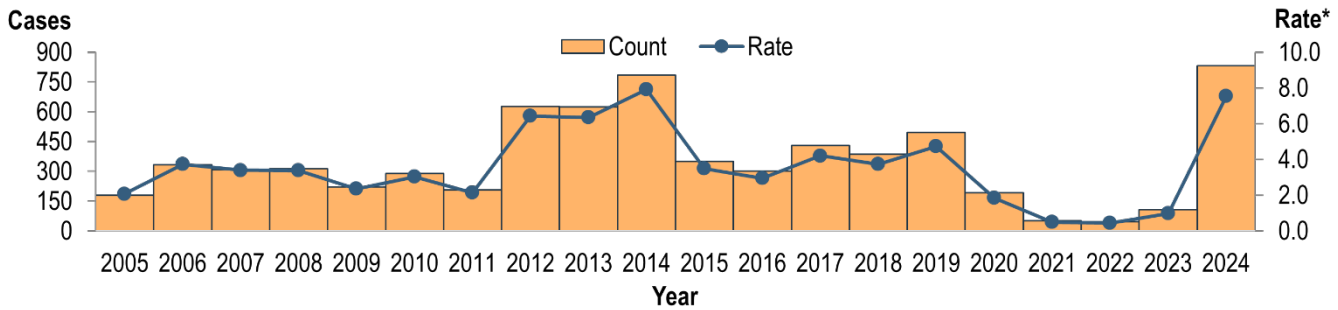
cases reported in
2024

- The number of cases reported in 2024 is the highest since 1955
- Seventeen outbreaks of pertussis were reported in 2024. Most outbreaks occurred in elementary, middle, and high schools.

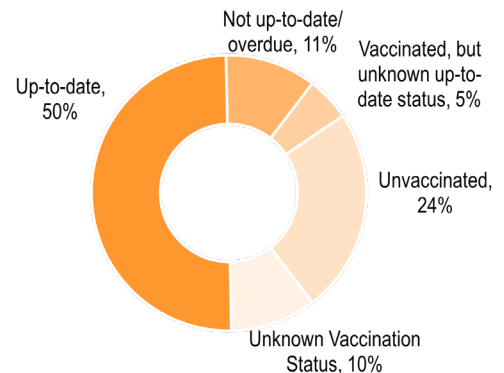
Pertussis (commonly known as “whooping cough”) is a highly contagious respiratory infection spread from person to person through respiratory droplets from a cough or sneeze, or by direct contact with respiratory secretions. People with pertussis can experience paroxysms, or uncontrollable fits of coughing. The paroxysms can cause a need to gasp for air, which can sometimes result in a “whooping” sound. [Learn more about pertussis.](#)

Vaccination is the best way to protect against pertussis. In North Carolina, five doses of the childhood pertussis vaccine (called DTaP) are required. The first three doses are required by age 7 months, and two booster doses are also required: the first by age 19 months and the second booster on or after the fourth birthday, before entering school for the first time. Another booster dose of the adolescent/adult pertussis vaccine (called Tdap) is required for 7th grade entry or by 12 years of age, whichever comes first.

Pertussis cases reached the highest count and rate in 2024 that North Carolina has seen in 70 years.
NC 2005-2024 pertussis case count and rate by year

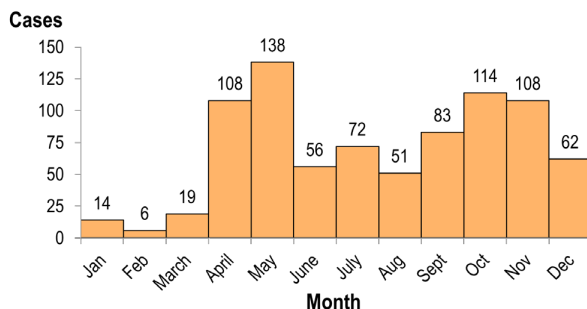


NC 2024 pertussis cases by vaccination status



Half (50%) of 2024 pertussis cases were up-to-date on pertussis vaccination. Almost a quarter (24%) of cases had never received a dose of pertussis vaccine.

NC 2024 pertussis cases by month

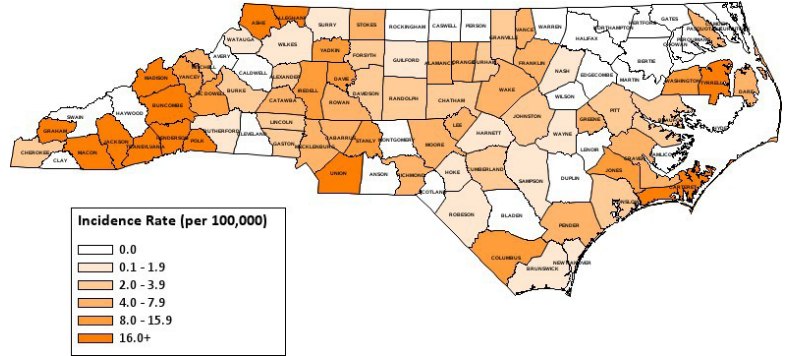


Few cases occurred during the first quarter of 2024. In April, large outbreaks began in the western part of the state. A high level of cases continued to occur during the remainder of the year.

Pertussis (Whooping Cough)

NC 2024 pertussis cases by county

The highest rates of pertussis were primarily seen in the far western counties. Seventy (70%) counties had at least one case.



Annual Summary

	2020	2021	2022	2023	2024
Cases	191	52	46	106	831
Rate	1.8	0.5	0.4	1.0	7.5

Case Statistics, 2024

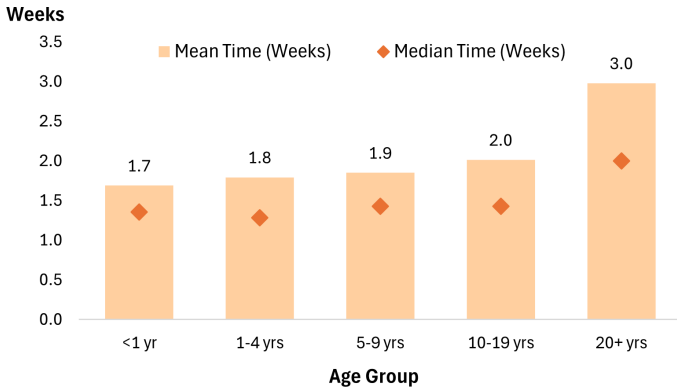
Sex	Cases	%	Rate*	95% CI
Male	421	51%	7.8	7.1, 8.6
Female	409	49%	7.2	6.6, 8.0
Unknown	1	0%	--	--
Age Group				
Infant	81	10%	66.8	53.0, 83.0
1-4 yrs	136	16%	27.4	23.0, 32.4
5-9 yrs	146	18%	22.6	19.1, 26.6
10-19 yrs	307	37%	21.9	19.5, 24.5
20-49 yrs	70	8%	1.6	1.3, 2.0
50-74 yrs	66	8%	2.0	1.6, 2.6
75+ yrs	25	3%	3.1	2.0, 4.5
Race				
White	705	85%	9.2	8.5, 9.9
Black or African American	44	5%	1.8	1.3, 2.4
American Indian / Alaskan Native	2	0%	1.1	0.1, 4.0
Asian or Pacific Islander	12	1%	2.6	1.4, 4.6
Multiple Races	6	1%	2.0	0.7, 4.3
Other or Unknown	62	7%	--	--
Hispanic Ethnicity				
Yes	89	11%	6.7	5.4, 8.3
No	682	82%	7.0	6.5, 7.6
Unknown	60	7%	--	--
Disease Severity				
Hospitalized	33	4%		
Died	0	0%		

Annual Summary Key Points

- 831 cases in 2024 is the highest number reported since 1955, when 1,366 cases were reported.
- The increase in cases is likely due to multiple factors, including natural transmission cycles and decreasing vaccination rates among certain populations. It is possible that the COVID-19 pandemic affected typical pertussis transmission patterns.
- Infants had the highest rate among the age groups, almost 2.5 times higher than the next highest rate. Pertussis can be severe in infants. Maternal Tdap vaccine during pregnancy can help prevent pertussis infection in young infants. However, maternal Tdap coverage in NC remains low.
- Pre-school and school-aged children also had high rates of pertussis. Most of the pertussis outbreaks occurred in school settings.

Pertussis (Whooping Cough)

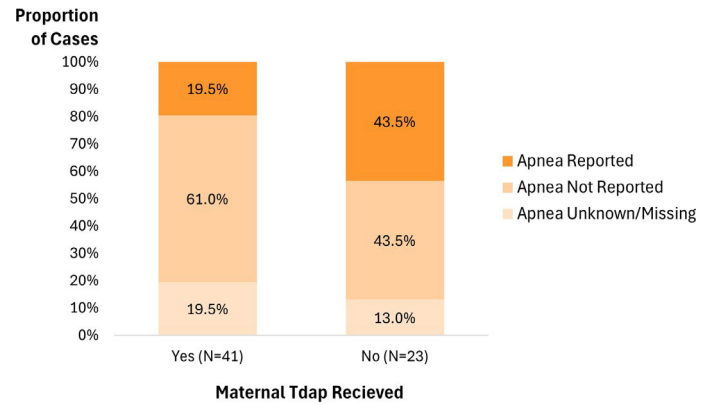
NC 2024 pertussis cases by time from onset date to antibiotic treatment



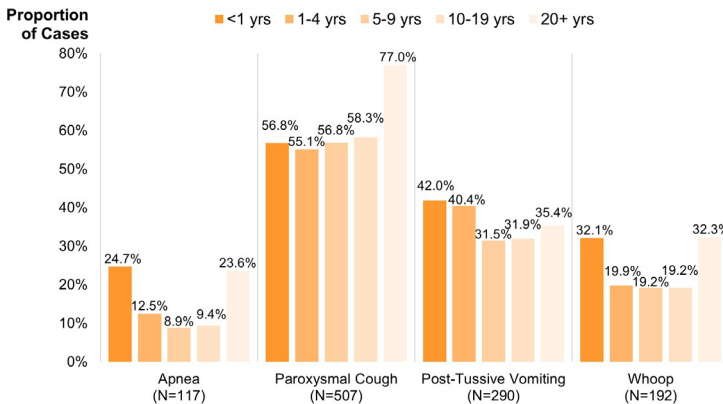
Antibiotics are recommended to treat pertussis. Azithromycin is the most common antibiotic prescribed for treatment. On average, adults received antibiotic treatment almost twice as long after symptom onset as infants and young children. This is unsurprising, as parents and guardians often seek care for young children sooner than they would for themselves.

Tdap, which passes on protective antibodies to the baby during the first months after birth, is recommended for pregnant women during the third trimester of each pregnancy. Apnea rates were twice as high in infants whose mothers did not receive a dose of maternal Tdap than those whose mothers did receive maternal Tdap.

NC 2024 infant pertussis cases by maternal Tdap and apnea



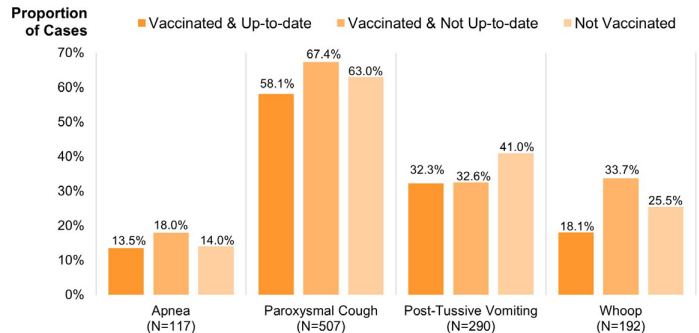
NC 2024 pertussis case cough symptoms by age group



Most 2024 pertussis cases experienced paroxysmal cough, followed by post-tussive vomiting, whoop and apnea. Infants had the highest rate of apnea and post-tussive vomiting, which suggests the increased severity infants experience when infected with pertussis.

Individuals that were known to be vaccinated and up to date on their pertussis-containing vaccines were less likely to experience all cough symptoms. This suggests that up-to-date vaccination lowers the severity of pertussis infection.

NC 2024 pertussis case cough symptoms by vaccine status



Pneumococcal Meningitis

82

cases reported in 2024

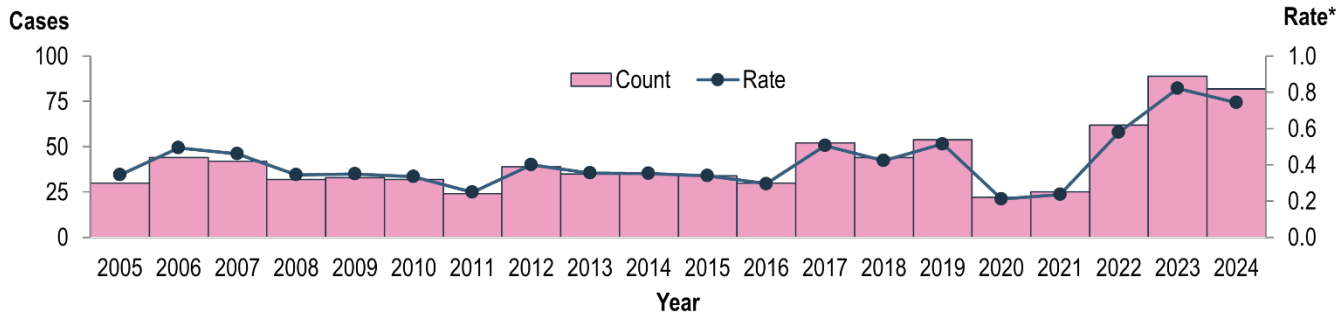
- Cases decreased slightly from a peak in 2023 but were still elevated compared to the five-year average
- No outbreaks of pneumococcal meningitis were reported in 2024

Streptococcus pneumoniae (pneumococcus) is a gram-positive bacterium that can cause many clinical syndromes including pneumonia, bacteremia, and meningitis. Pneumococcal meningitis is the only form of disease that is reportable in North Carolina. [Learn more about pneumococcal disease.](#)

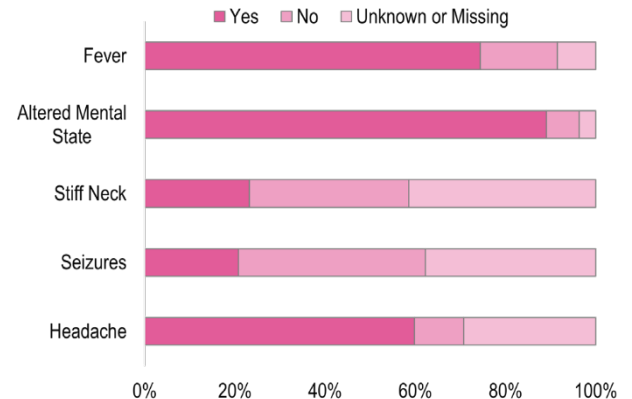
CDC recommends [pneumococcal vaccination](#) for people based on their age or if they have certain risk conditions. In North Carolina, four doses of PCV vaccine are required for children before 15 months of age. According to the 2023 NIS, an estimated 88.6% of North Carolina children born in 2021 had received at least four doses of PCV by 24 months of age, compared to 80.8% nationally. Results from the 2023 Behavioral Risk Factor Surveillance System (BRFSS) survey found that 74.1% of North Carolina adults 65 years of age and older had received at least one dose of pneumococcal vaccine, compared to 70.2% nationally.

Pneumococcal meningitis cases remained high in 2024.

NC 2005-2024 pneumococcal meningitis case count and rate by year

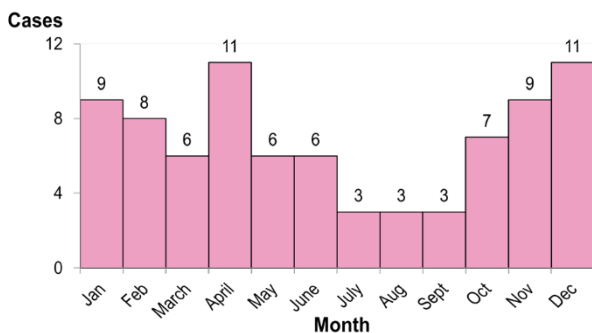


NC 2024 pneumococcal meningitis cases by symptoms



A majority of cases experienced fever, altered mental status, and headache. Stiff neck and seizures were less common, but up to 40% of cases had unknown or missing data.

NC 2024 pneumococcal meningitis cases by month

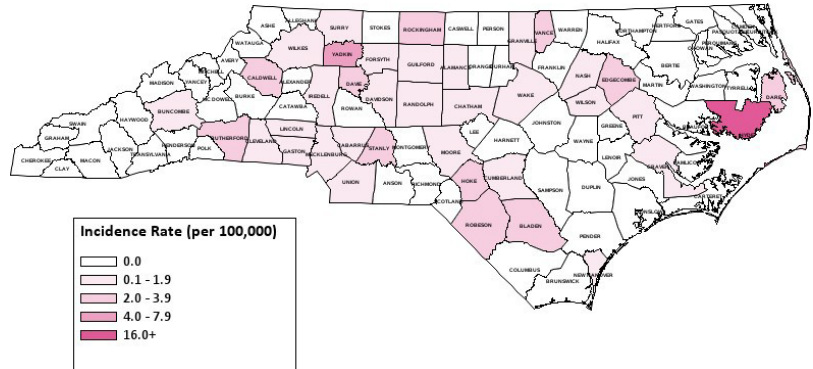


Pneumococcal meningitis is more common during months with cooler weather. In 2024, cases were highest during the fall and winter months, and lowest during late spring and summer.

Pneumococcal Meningitis

Pneumococcal meningitis cases occurred throughout North Carolina.

NC 2024 pneumococcal meningitis cases by county



Annual Summary						
	2020	2021	2022	2023	2024	
Cases	22	25	62	89	82	
Rate	0.2	0.2	0.6	0.8	0.7	
Case Statistics, 2024						
Sex	Cases	%	Rate*	95% CI		
Male	44	54%	0.8	0.6, 1.1		
Female	38	46%	0.7	0.5, 0.9		
Age Group						
Infant	3	4%	2.5	0.5, 7.2		
1-4 yrs	1	1%	0.2	0.0, 1.1		
5-9 yrs	4	5%	0.6	0.2, 1.6		
10-19 yrs	3	4%	0.2	0.0, 0.6		
20-49 yrs	18	22%	0.4	0.2, 0.7		
50-74 yrs	46	56%	1.4	1.0, 1.9		
75+ yrs	7	9%	0.9	0.3, 1.8		
Race						
White	45	55%	0.6	0.4, 0.8		
Black or African American	30	37%	1.2	0.8, 1.8		
American Indian / Alaskan Native	1	1%	0.6	0.0, 3.1		
Asian or Pacific Islander	2	2%	0.4	0.1, 1.6		
Multiple Races	1	1%	0.3	0.0, 1.8		
Other or Unknown	3	4%	--	--		
Hispanic Ethnicity						
Yes	4	5%	0.3	0.1, 0.8		
No	78	95%	0.8	0.6, 1.0		
Unknown	0	0%	--	--		
Disease Severity						
Hospitalized	82	100%				
Died	5	6%				

Annual Summary Key Points

- Cases in 2023-2024 were elevated compared to recent years. The cause of this increase is unknown.
- Cases were similar among males and females in 2024.
- Infants less than one year of age had the highest rate, followed by adults ages 50 to 74 years old (2.5 and 1.4 per 100,000 North Carolina residents, respectively).
- Although White North Carolinians had the highest case count (N=45), the rate of cases in Black or African American North Carolinians was twice as high (1.2 versus 0.6 per 100,000, respectively).
- Most pneumococcal cases in 2024 were non-Hispanic North Carolina residents (95% of cases).
- Five (6%) cases in 2024 died from their illness.

Tetanus

1

case reported in
2024

- Tetanus is rare in North Carolina
- Adults are recommended to get a tetanus booster every 10 years

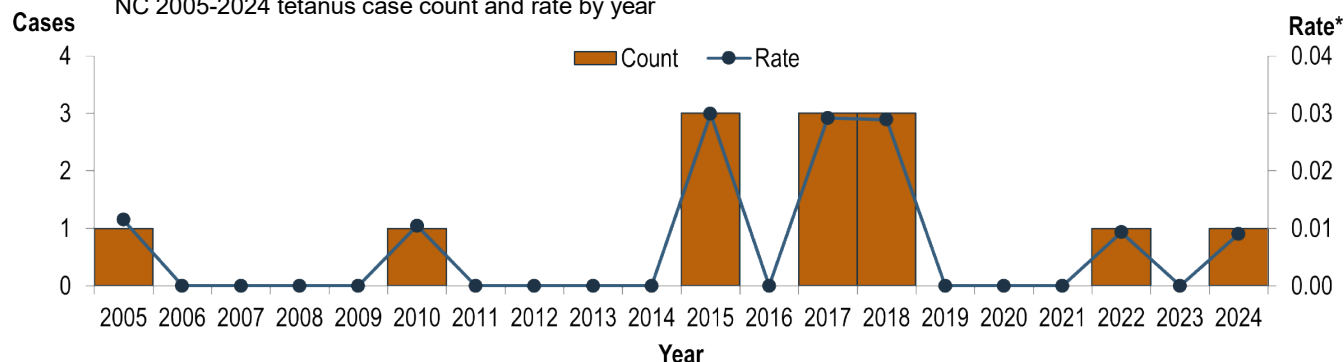
Tetanus infections are caused by spores of the bacterium *Clostridium tetani*, which are present naturally in the environment and are widespread in dust, soil, and manure. Spores thrive in anaerobic conditions, meaning that they can grow in environments without oxygen. When spores are introduced into dead tissue or deep wounds, they germinate into full-grown bacteria and secrete tetanus toxin, which causes disease. Tetanus is not transmitted person to person.

Certain types of wounds are more likely to become infected with tetanus bacteria because of anaerobic conditions. Deep puncture wounds (e.g. stepping on a nail), burn wounds, or crush injuries that are contaminated with dust or dirt are at higher risk of becoming infected than shallow wounds. Symptoms of tetanus include jaw cramping (lockjaw), painful muscle spasms and stiffness, headache, and fever. Serious complications can occur, including seizures, broken bones, difficulty breathing, and death.

Cases of tetanus have declined by 95% since the disease began to be reported in 1947, and deaths have been reduced by 99%. Sporadic cases of tetanus still occur in individuals who are not up-to-date on their tetanus vaccination. The low numbers of tetanus attest to proper wound management and proper vaccine recommendation and uptake.

Cases and rates of tetanus continue to be at a low level in North Carolina.

NC 2005-2024 tetanus case count and rate by year



Tetanus vaccines are combined with vaccines for diphtheria and pertussis (DTaP, Td, and Tdap). Five doses of DTaP are recommended for children at 2, 4, 6, and 15-18 months and 4-6 years. One dose of Tdap is recommended for adolescents, preferably at 11-12 years, and should be followed by a dose of Td vaccine (excludes the pertussis component) or Tdap every ten years. Although tetanus is rare in North Carolina, any infection emphasizes the need for strong vaccination recommendations for people who are not up-to-date or who are unsure of their vaccination status.

Tetanus is not passed person-to-person, but outbreaks have been documented during natural disasters when the risk for contamination of severe wounds greatly increases.

2024 Case

Just one case of tetanus was reported during 2024, which was similar to the previous five-year average. The 2024 tetanus case occurred in a person who stepped on a nail in their backyard, and who was not up-to-date on tetanus vaccine. The patient survived the illness.

Due to the low number of cases in 2024, demographic and geographic data is not included in this report to protect patient privacy.

Varicella (Chickenpox)

155
cases reported in
2024

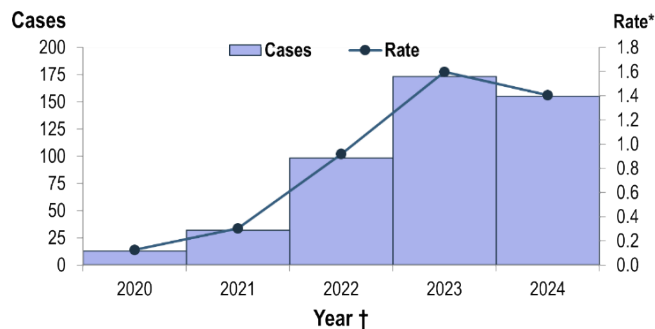
- Varicella cases decreased slightly compared to 2023. This was the first decrease in annual cases since varicella became reportable in 2020.
- One outbreak of varicella was reported in 2024

Varicella (chickenpox) is a viral illness best known for causing an itchy, blister-like rash that can spread over the entire body. Varicella is caused by the varicella-zoster virus (VZV). In addition to the rash, symptoms may include fever and headache. Although rare, severe complications like skin infections, pneumonia, and encephalitis can occur. [Learn more about varicella.](#)

Vaccination is the best way to prevent varicella. In North Carolina, children are required to have two doses of varicella vaccine, one on or after 12 months and before 19 months of age and a second before entering school for the first time. Results from the 2023 NIS estimate that 95.1% of North Carolina children born in 2021 had received at least one dose of varicella vaccine by 24 months of age, compared to 90.1% nationally.

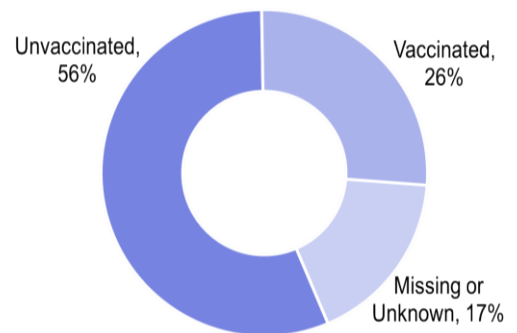
VZV is the same virus that causes shingles, which is an illness that occurs primarily in older adults. Shingles occurs when VZV is reactivated in the body, usually years after infection with primary varicella or vaccination. Shingles is not a reportable disease, and data on the number of cases is not available. [Shingles vaccine is recommended for certain adults.](#)

NC 2020-2024 varicella case count and rate by year



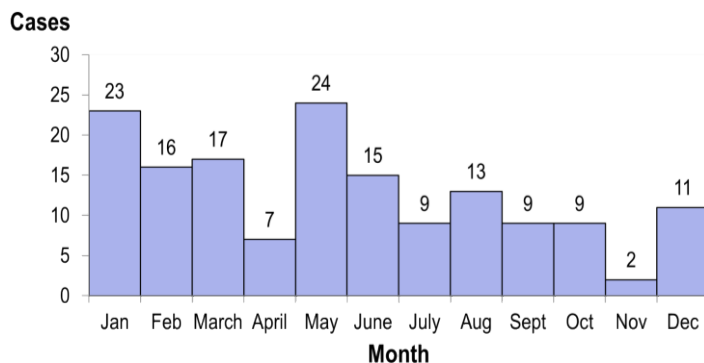
Varicella cases increased for three consecutive years before declining slightly in 2024. The increase in cases was likely due to health care providers and laboratories adapting to the new reporting rule that was adopted in 2020.

NC 2024 varicella cases by vaccination status



Just 26% of varicella cases had received at least one dose of varicella vaccine, and 16% had received the full two-dose vaccine series.

NC 2024 varicella cases by month

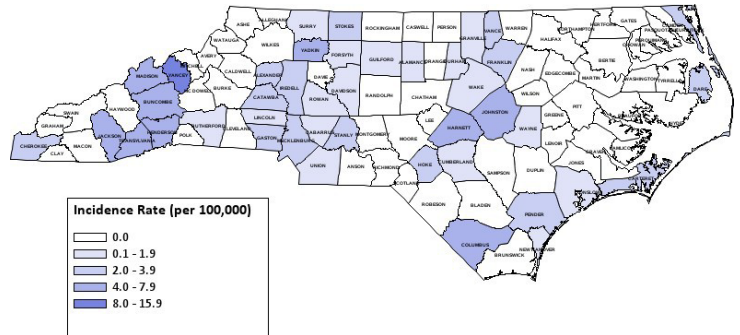


Although varicella cases occurred throughout the entirety of 2024, cases were more common during the winter and spring months.

Varicella (Chickenpox)

NC 2024 varicella cases by county

Just under half (42)% of all NC counties had a case of varicella. The highest rates of varicella were in the western part of the state.



Annual Summary Key Points

- Cases of varicella occurred more often in males than in females.
- 61% of cases occurred in children less than 10 years of age. Infants less than one year of age had a rate 49 times higher than adults 20 years and older (22.3 versus 0.5 per 100,000 North Carolinians).
- Asian or Pacific Islander North Carolinians had the highest rate (1.5 per 100,000), followed by White (1.4), American Indian or Alaskan Native (1.1), and Black or African American (0.7) North Carolinians.
- North Carolinians of Hispanic ethnicity had a rate 2 times higher than non-Hispanic North Carolinians (2.6 versus 1.2 per 100,000).
- Ten individuals (6%) were hospitalized from varicella in 2024. No deaths were reported.

Annual Summary						
	2020	2021	2022	2023	2024	
Cases	13	32	98	173	155	
Rate*	0.1	0.3	0.9	1.6	1.4	
Case Statistics, 2024						
Sex	Cases	%	Rate*	95% CI		
Male	87	56%	1.6	1.3, 2.0		
Female	68	44%	1.2	0.9, 1.5		
Age Group						
Infant	27	17%	22.3	14.7, 32.4		
1-4 yrs	29	19%	5.8	3.9, 8.4		
5-9 yrs	38	25%	5.9	4.2, 8.1		
10-19 yrs	23	15%	1.6	1.0, 2.5		
20-49 yrs	31	20%	0.7	0.5, 1.0		
50-74 yrs	7	5%	0.2	0.1, 0.4		
75+ yrs	0	0%	0.0	0.0, 0.5		
Race						
White	106	68%	1.4	1.1, 1.7		
Black or African American	18	12%	0.7	0.4, 1.2		
American Indian / Alaskan Native	2	1%	1.1	0.1, 4.0		
Asian or Pacific Islander	7	5%	1.5	0.6, 3.1		
Multiple Races	0	0%	0.0	0.0, 1.2		
Other or Unknown	22	14%	--	--		
Hispanic Ethnicity						
Yes	34	22%	2.6	1.8, 3.6		
No	118	76%	1.2	1.0, 1.5		
Unknown	3	2%	--	--		
Disease Severity						
Hospitalized	10	6%				
Died	0	0%				

*Incidence rate, calculated per 100,000 North Carolina residents

†Varicella became a reportable condition in 2020; therefore, historical case data is unavailable

Appendix: Acute Flaccid Myelitis (AFM)

2

cases reported in
2024

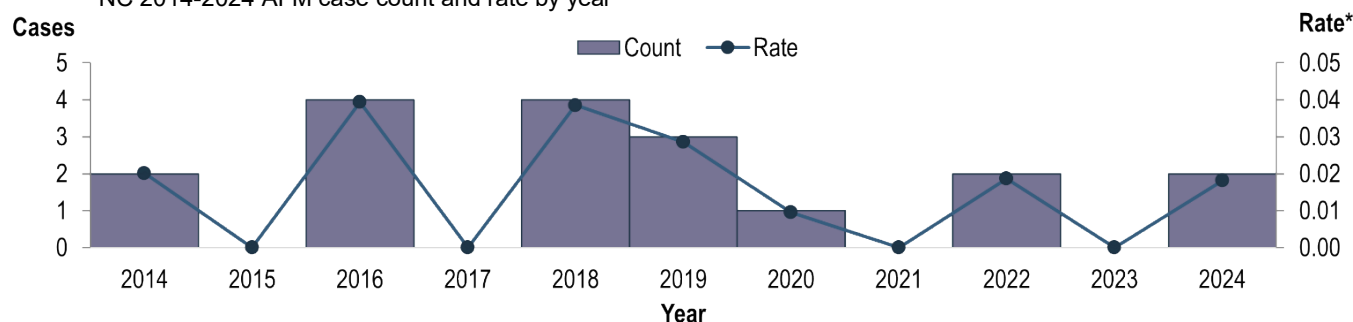
- AFM is rare in North Carolina, with only one or two cases reported per year on average
- AFM was made reportable in North Carolina in mid-2020

Acute flaccid myelitis (AFM) is a rare but serious neurologic condition that affects the spinal cord. AFM is usually characterized by the sudden onset of weakness and loss of muscle tone or reflexes in the arms and/or legs. Some patients also experience facial droop or weakness, difficulty moving the eyes, difficulty swallowing, or slurred speech. [Learn more about AFM.](#)

Although AFM it is not vaccine-preventable, it has many similar symptoms to polio, including weakness in the arms and/or legs. Wild-type poliovirus was eliminated from local transmission in the United States in 1979, but people who are unvaccinated or incompletely vaccinated continue to be at risk for polio when traveling to places with circulation of vaccine- derived poliovirus or wild-type poliovirus. Polio is typically ruled out as a cause of illness during the AFM case investigation.

Surveillance for AFM began in 2014

NC 2014-2024 AFM case count and rate by year



Most (90%) cases of AFM occur in young children. It is most common in the fall, when common respiratory viruses begin to circulate.

AFM has been tracked since 2014 and became reportable in North Carolina in 2020. No single cause of AFM has been identified; however, it has been associated with several viruses, including enterovirus D68 (EV-D68). Other viruses including flaviviruses (the cause of West Nile encephalitis), herpesviruses, and adenoviruses can cause AFM.

2024 Cases

Two cases of AFM were reported in 2024, both in November. One case occurred in a child less than five years of age, and one in a child of adolescent age. Further information on demographic and geographic data is not included in this report to protect patient privacy.