Malaria Surveillance in North Carolina, 2023

Malaria is a severe disease caused by a *Plasmodium* parasite. The parasite is transmitted by infected *Anopheles* mosquitoes to humans. Mosquitoes can become infectious after biting an infected human and spread the disease to others. Malaria does not spread from person to person. However, transfusion transmission and transmission through organ transplantation have been documented.

Malaria infections can range from a mild, flu-like illness with fever, headache, chills, muscle aches, and gastrointestinal symptoms to life-threatening symptoms such as kidney failure, seizures, confusion, and coma.

Nationally, malaria risk is low as it is not endemic in the United States. However, there has been locally transmitted disease[1] in recent years, stemming from individuals with recent international travel where malaria is circulating.

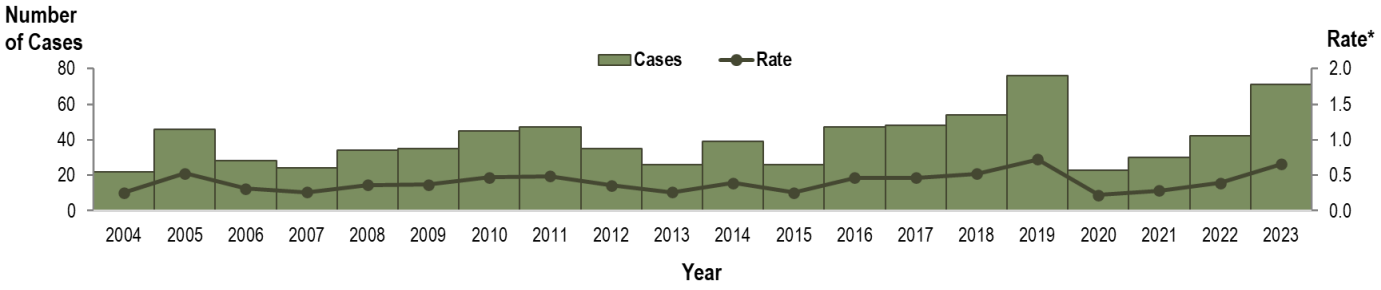
When traveling internationally to countries with endemic malaria transmission, malaria prophylaxis is recommended. Take other precautions to avoid mosquitoes and mosquito bites.

Malaria Epidemiology

Malaria cases in North Carolina (NC) have remained low over the past 20-years, averaging 40 cases annually. Malaria cases and rates have been steadily increasing over the last four years.

North Carolina malaria cases and rates spiked in 2023, following a yearly increase since 2020.

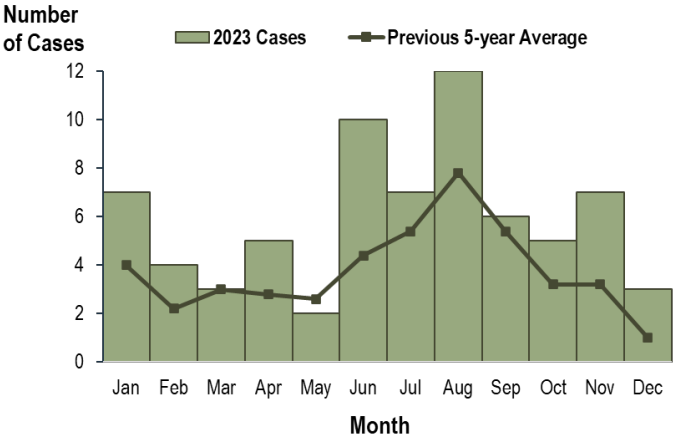
NC 2004-2023 malaria case count and rate by year



There were 71 cases of malaria among North Carolinians in 2023, a rate of 0.66 per 100,000 NC residents. This is 7.6 times higher than the five-year average rate (2018 to 2022; 0.66 versus 0.09 per 100,000 North Carolinians, respectively). Forty-one percent (41%) of 2023 cases occurred during the summer months (June – August).

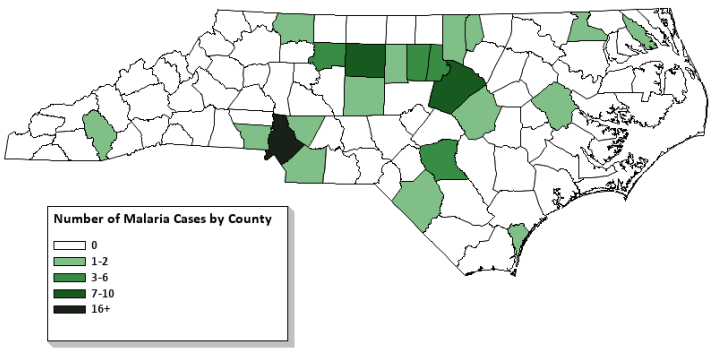
Malaria cases spiked during the summer in 2023.

NC 2023 malaria cases by month with previous 5-year average** comparison



Mecklenburg County had the most malaria cases in 2023.

NC 2023 malaria cases by county



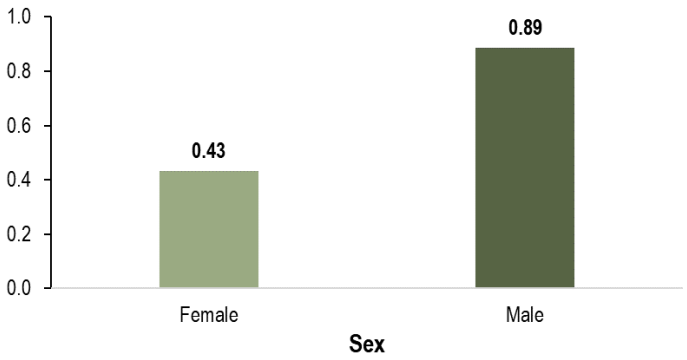
Cases occurred in 22 counties (22% of 100 counties) across NC in 2023. Notably, 20 cases (28%) were residents of Mecklenburg County.

Malaria Case Demographics

In 2023, males had an infection rate 2.1 times higher than females (0.89 versus 0.43 per 100,000 North Carolinians, respectively).

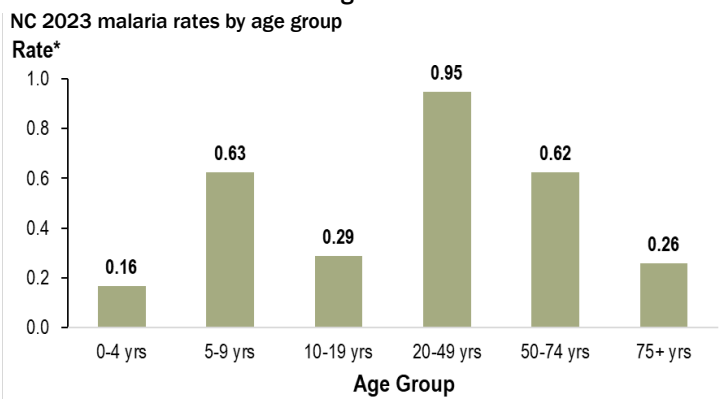
Males were more likely to be infected with malaria than females.

NC 2023 malaria rates by sex



Most malaria cases were among adults.

NC 2023 malaria rates by age group

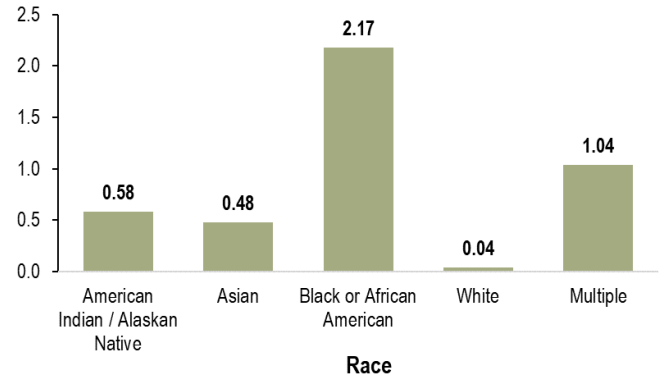


Most 2023 malaria cases were adults ages 20 to 74 years (85%). North Carolina adults 20 years of age or older had a malaria infection rate 2.2 times higher than those ages less than 20 years old (0.76 versus 0.34 per 100,000 North Carolinians, respectively).

Seventy-three percent (73%; N = 52) of 2023 malaria cases were among Black or African American North Carolinians. Infection rate among Black or African American NC residents was 54.8 times higher than white NC residents (2.17 versus 0.04 per 100,000, respectively).

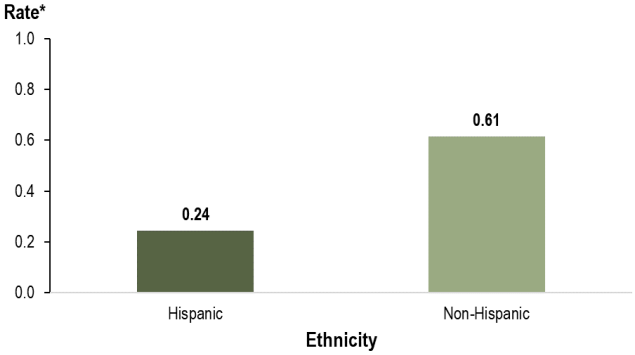
Black or African American North Carolinians had the highest rate.

NC 2023 malaria rates by race



Malaria rates were 2.6x higher in non-Hispanic North Carolinians.

NC 2023 malaria rates by ethnicity

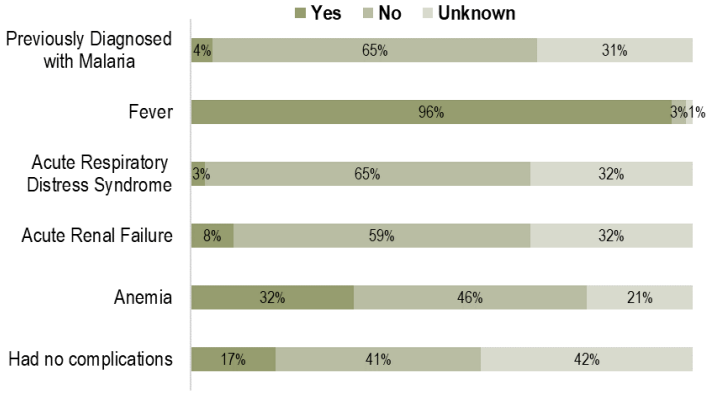


In 2023, non-Hispanic NC residents were 2.6 times more likely to be infected with malaria than Hispanic North Carolinians (0.62 versus 0.24 per 100,000 NC residents).

Fever was the only consistent symptom among NC malaria cases in 2023 (96% of cases affected). Additionally, 32% of cases experienced anemia. Forty-one percent (41%; N=29) of cases experienced complications related to the malaria infection, many of which sought hospitalization.

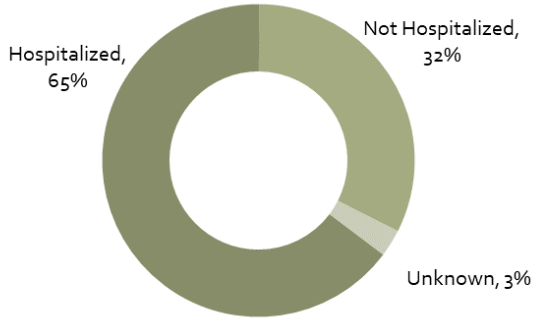
Almost all malaria cases were febrile.

NC 2023 malaria cases clinical manifestation



Many malaria cases needed to be hospitalized (N=46).

NC 2023 malaria cases by clinical severity



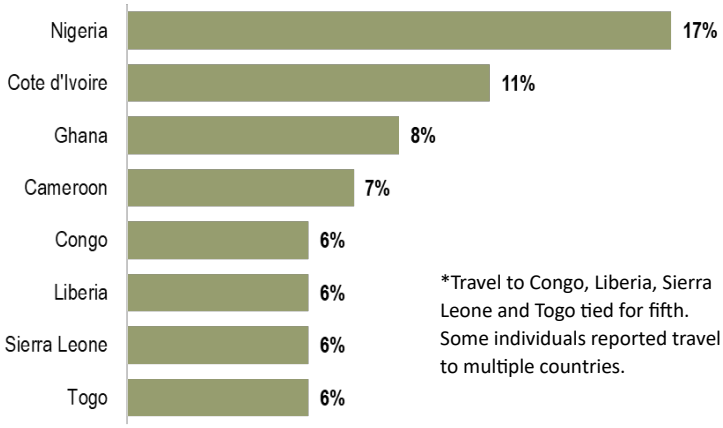
Sixty-five percent (65%; N=46) of NC 2023 malaria cases were hospitalized during their infection. The hospitalization rate for 2023 was 1.8 times higher than the 5-year average (0.42 versus 0.23 per 100,000 NC residents).

All (100%) of 2023 NC malaria cases reported international travel during their exposure period. Travel to Nigeria (17% of cases), Cote d'Ivoire (11%), and Ghana (8%) were the most frequent.

From 2018 to 2023, NC malaria cases most frequently reported travel to Nigeria (18%), Ghana (7%), Liberia (7%), Sierra Leone (7%) and Afghanistan (6%).

Malaria cases most often reported travel to Nigeria.

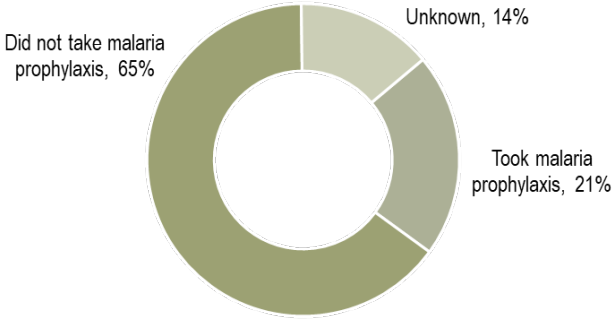
NC 2023 malaria cases top five countries of travel*



*Travel to Congo, Liberia, Sierra Leone and Togo tied for fifth. Some individuals reported travel to multiple countries.

Most cases did not take malaria prophylaxis before travel.

NC 2023 malaria cases by whether prophylaxis was taken before travel



Despite all 2023 malaria cases having a travel history, only 21% (N=15) reported taking malaria prophylaxis prior to travel.

NC Malaria Statistics	Count	Percent (%)	Rate*	Previous 5-year Average** Count	Previous 5-year Average** Percent (%)	Previous 5-year Average** Rate*
Total Cases	71	100	0.66	45	100	0.43
Sex						
Male	47	66	0.89	30	67	0.59
Female	24	34	0.43	15	33	0.27
Race						
White	3	4	0.04	6	14	0.08
Black / African American	52	73	2.17	30	64	1.27
Asian / Pacific Islander	2	3	0.48	<1	<1	**
American Indian / Alaskan Native	1	1	0.58	0	0	0.0
Multiple	3	4	1.04	1	1	0.23
Other	7	10	--	3	6	--
Unknown	3	4	--	6	14	--
Ethnicity						
Hispanic	3	4	0.24	1	2	0.08
Non-Hispanic	59	83	0.62	31	65	0.33
Unknown	9	13	--	13	32	--
Age Group						
0-4 years	1	1	0.13	2	4	0.33
5-9 years	4	6	0.63	2	3	0.26
10-19 years	4	6	0.29	5	9	0.35
20-49 years	40	56	0.95	25	61	0.61
50-74 years	20	28	0.62	11	22	0.35
75+ years	2	3	0.26	<1	<1	0.06
Additional Detail						
Malaria prophylaxis	15	23	0.14	8	17	0.01
Travel – associated[1]	39	55	0.36	45[2]	100	0.43
Hospitalizations	46	65	0.42	24	54	0.23
Deaths	0	0	0.0	<1	<1	**

*Rate per 100,000 North Carolina residents; rates supported by counts <5 should be interpreted with caution

** Previous 5-year average refers to years 2018 to 2022. Counts and percents are rounded to the nearest whole number; average counts less than one corresponding rate suppressed

[1] Travel – associated cases are instances when NC residents travel to areas outside of NC, where malaria is known to occur, and become infected

[2] One case included in the 5-year average only had domestic travel and was determined to have been infected at an airport.

Note: Cases are counted using earliest date of illness identification against the Council for State and Territorial (CSTE) malaria case definition. Data are entered and downloaded from the North Carolina Electronic Disease Surveillance System (NCEDSS). These data reflect reported cases and may be missing asymptomatic cases.

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES
Division of Public Health