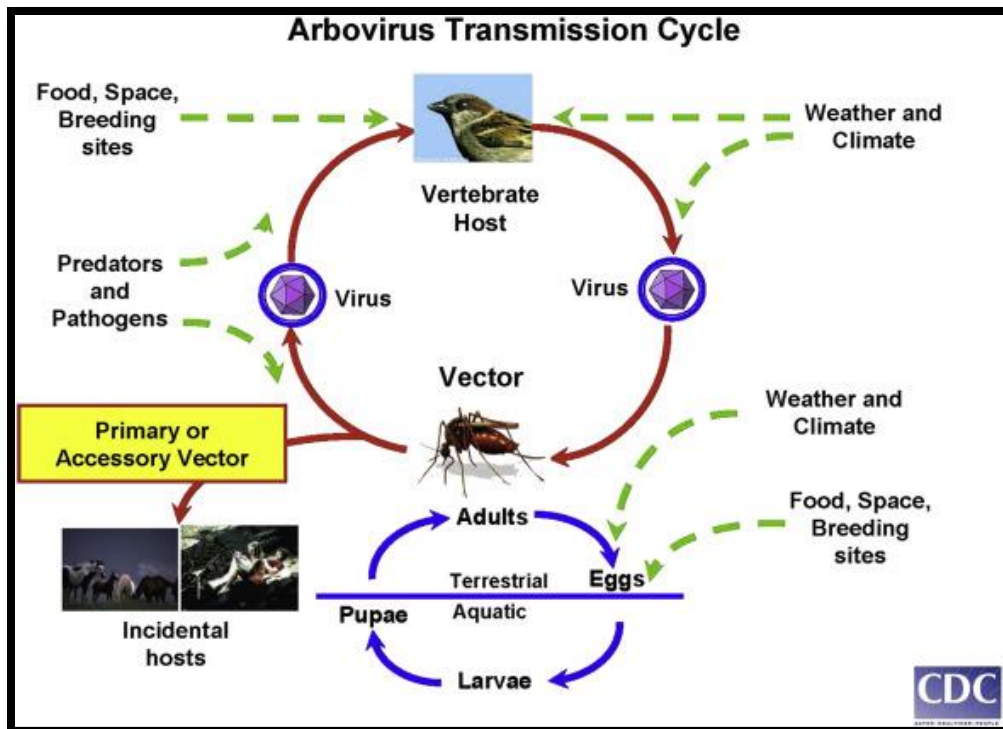


Arboviral Disease Summary Report 2019 - 2022

Background

Arthropod-borne viruses (arboviruses) are transmitted to humans primarily through the bites of infected mosquitoes and ticks. These viruses are maintained in transmission cycles between mosquitoes and vertebrate hosts such as birds and small mammals¹. Examples of arboviruses include West Nile Virus (WNV), LaCrosse virus (LACV), Jamestown Canyon virus (JCV), Powassan virus (POW), eastern equine encephalitis virus (EEE), St. Louis encephalitis virus (SLE), dengue virus (DENV), Zika virus (ZV), and Chikungunya virus (CHIKV). Surveillance of known and emerging arboviruses is an important tool to help identify outbreaks and promote prevention strategies.



Centers for Disease Control Division of Vector-Borne Infectious Diseases, Fort Collins, Colorado.

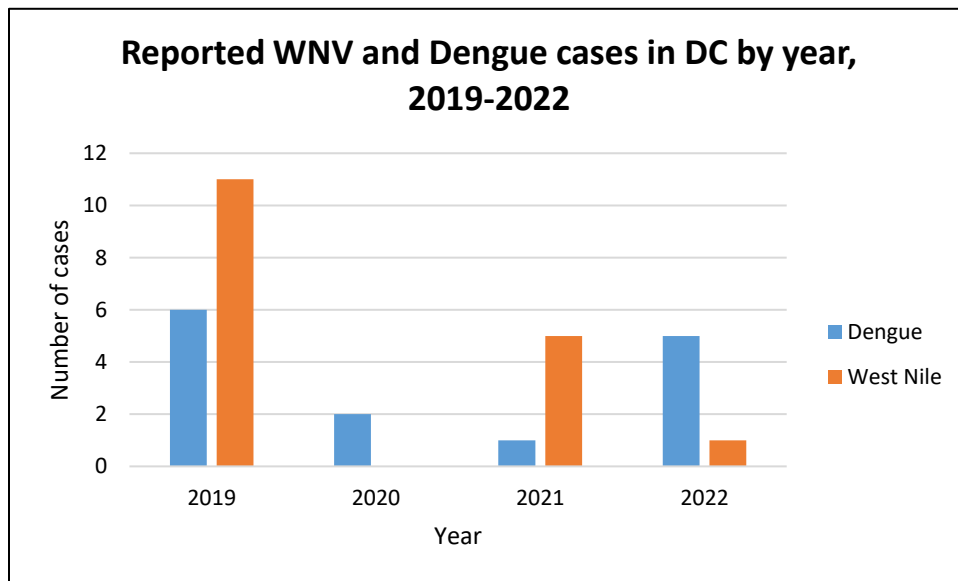
Most infected people are asymptomatic, however approximately 20% of infected people develop symptoms. Symptoms range from commonly occurring systemic febrile illness (non-neuroinvasive disease) to less common neuroinvasive disease which is characterized by a combination of symptoms relating to meningitis, encephalitis, or acute flaccid paralysis. Arboviral infections may also spread by blood transfusion, organ transplantation, sexual contact, and from mother to child during birth depending on the specific virus involved. Zika infection during pregnancy has been linked to certain birth defects, including microcephaly².

Arboviruses in the US

WNV is the leading cause of domestically acquired neuroinvasive arboviral disease in the continental US¹. Other arboviruses including EEE, JCV, POW, and SLE cause sporadic cases of disease. Zika, chikungunya, and dengue are largely acquired through non-domestic travel². More than 88% of arboviral disease cases are reported to occur between the months of April and September. However, reported numbers of arboviral disease cases vary from year to year, as factors such as weather (e.g., temperature, precipitation), zoonotic host and vector abundance, and human behavior (e.g., repellent use, outdoor activities, and use of air conditioning) affect yearly incidence^{1,2}. Recently, consequences of the COVID-19 pandemic, such as changes in health care seeking–behavior, prioritization of diagnostic testing for SARS-CoV-2, and challenges in reporting of arboviral disease cases concurrent with COVID-19, likely affected reporting of arboviral disease cases¹.

Arboviruses in DC

WNV is currently the only cause of domestically acquired arboviral disease, and thus the only cause of arboviral neuroinvasive disease, in the District of Columbia. This report summarizes the 2019 - 2022 surveillance data for WNV and dengue cases, which were the only arboviruses reported in the District. Reports of WNV have fluctuated since 2019. No cases of WNV were reported in 2020, compared to 11 in 2019 and five in 2021, which may be attributed to effects of the COVID-19 pandemic. Reported cases of dengue have remained comparatively stable since 2019, but similarly saw decreases in 2020 and 2021.

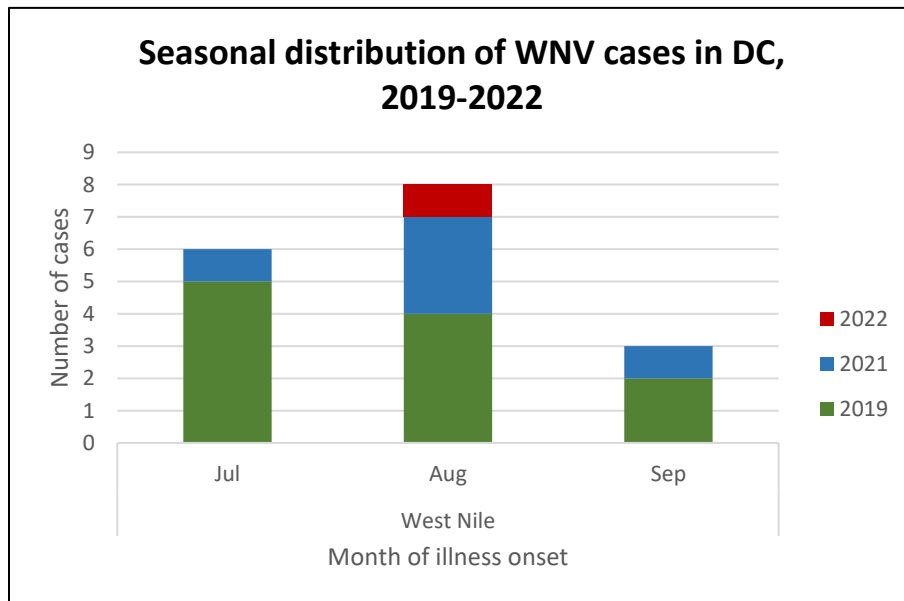


*Graph 1. Distribution of WNV and dengue cases in DC by year.
Data source: "Zoonotic and Vector-borne Disease Program," Research Evaluation and Measurement Division, Center for Policy, Planning and Evaluation, DC Department of Health.*

West Nile Virus

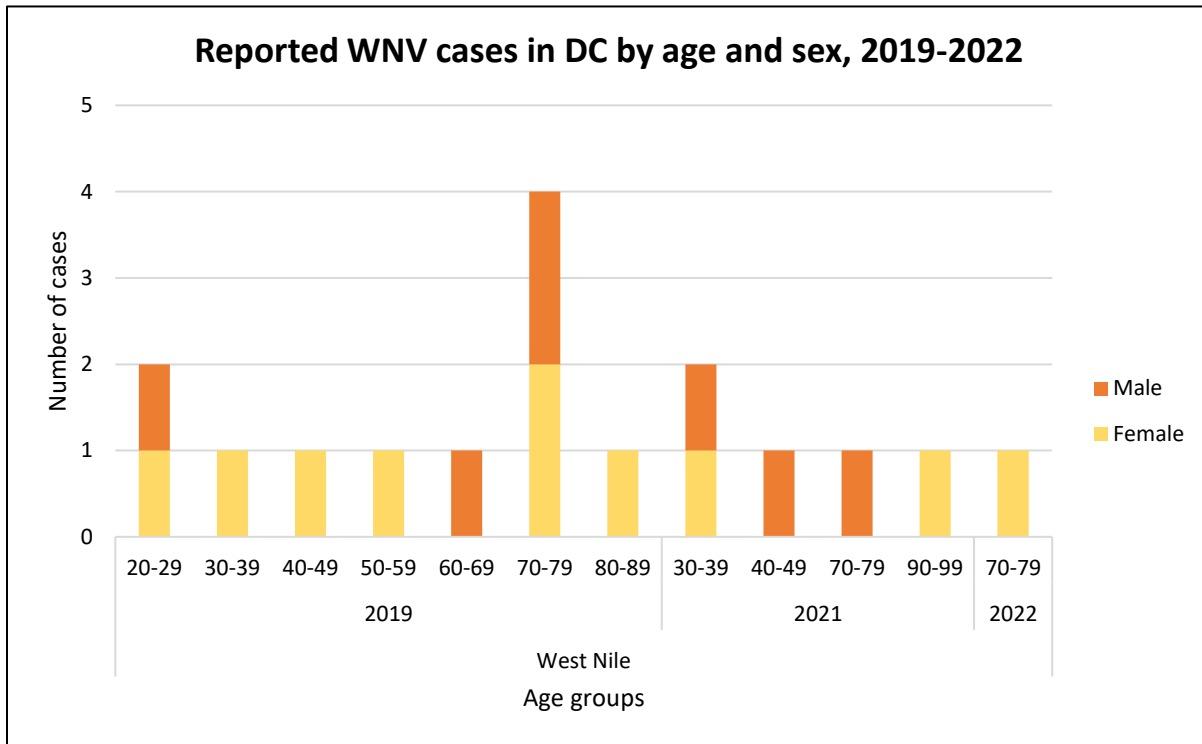
The District reported 17 cases of WNV disease from 2019 to 2022. All WNV cases were locally acquired. While several species of mosquitoes have been known to carry the virus, the main vector species for WNV in DC are *Culex pipiens* (common house mosquito).

Overall, peak reports of WNV disease cases occurred in August, and all 17 cases had illness onset during July–September. The mean age of patients with WNV was 56 years (range = 25–96 years). Ten of the 17 WNV cases (58.8%) were female. 13 out of 17 WNV cases (76.5%) were classified as WNV neuroinvasive disease, the same 13 patients were hospitalized, and there was one fatality. Of the 13 WNV neuroinvasive disease patients, 4 (30.7%) had encephalitis, 6 (46.2%) had meningitis, and none had acute flaccid paralysis. Graph 2 shows the seasonal distribution of WNV cases, and Graph 3 summarizes the distribution of WNV cases by age and sex.



Graph 2. Seasonal distribution of WNV cases in DC from 2019 to 2022. There were no cases of WNV reported in 2020.

Data source: "Zoonotic and Vector-borne Disease Program," Research Evaluation and Measurement Division, Center for Policy, Planning and Evaluation, DC Department of Health.



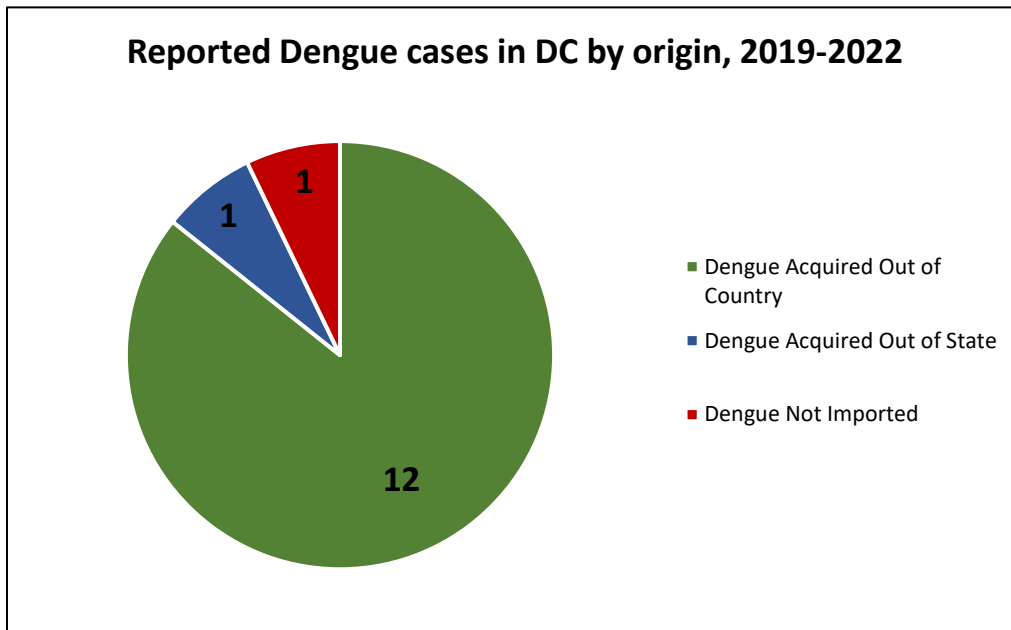
Graph 3. Distribution of WNV cases in DC in 2019, 2021, and 2022 by age and sex. There were no cases of WNV reported in 2020.

Data source: "Zoonotic and Vector-borne Disease Program," Research Evaluation and Measurement Division, Center for Policy, Planning and Evaluation, DC Department of Health.

Dengue

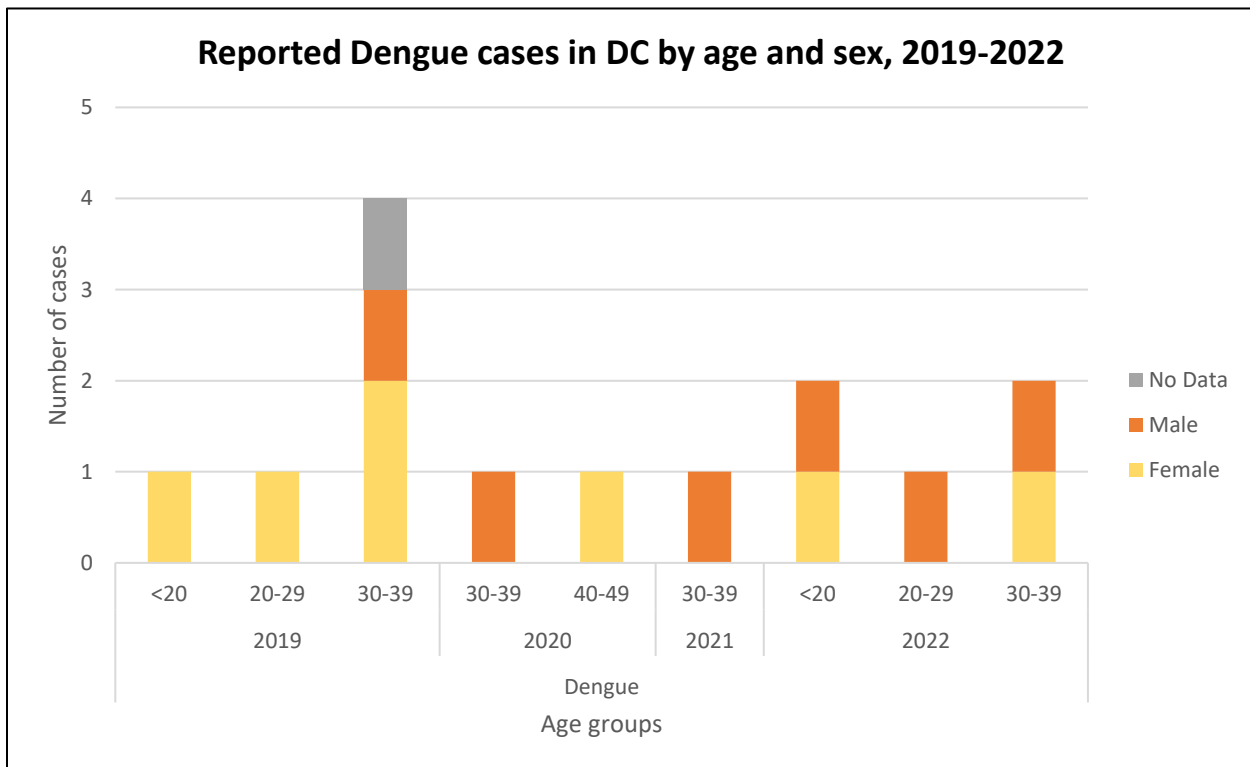
The District reported 14 cases of dengue from 2019 to 2022. Of the 14 cases, 12 were acquired out of the country, one was acquired in Puerto Rico where dengue is common⁵, and one is considered locally acquired, but may be a result of an infection that occurred during travel to a dengue-endemic country months prior to illness onset (Graph 4). Dengue is most often transmitted by *Aedes aegypti* (yellow fever mosquito) and *Aedes albopictus* (Asian tiger mosquito) species.

The mean age of patients with dengue was 29 years (range = 11—42 years). Seven of the 14 dengue cases (50%) were female; data was not available for one case. Graph 5 shows the distribution of dengue cases by age and sex. Seasonal trends were not analyzed due to the fact that clinical manifestation of dengue is not temporally correlated with infection with DENV in many cases. Additionally, given that most dengue cases are travel-associated, they may be reported year-round rather than during particular seasons.



Graph 4. Distribution of dengue cases in DC from 2019 - 2022 by origin.

Data source: "Zoonotic and Vector-borne Disease Program," Research Evaluation and Measurement Division, Center for Policy, Planning and Evaluation, DC Department of Health.



Graph 5. Distribution of dengue cases in DC from 2019 - 2022 by age and sex.

Data source: "Zoonotic and Vector-borne Disease Program," Research Evaluation and Measurement Division, Center for Policy, Planning and Evaluation, DC Department of Health.

Healthcare providers should include arboviral infections in the differential diagnosis of cases of aseptic meningitis and encephalitis, obtain appropriate specimens for laboratory testing, and promptly report cases to DC Health.

Human vaccines against domestic arboviruses are not available. Prevention of arboviral disease depends on community and household efforts to reduce vector populations and taking personal protective measures to decrease exposure to mosquitoes and ticks²:

- Eliminate places where mosquitoes might breed in and near homes and other buildings. Examples of standing water sources include garbage cans, house gutters, old tires, buckets, pool covers, pets' water bowls, bird baths, and flowerpots.
- Apply EPA-approved mosquito repellants such as diethyltoluamide (DEET) to the skin or permethrin on clothing.
- Wear long sleeves and pants.
- Use secured window and door screens without holes or punctures.
- Sleep under a mosquito nets, if necessary.

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4. (2019, May 9). For Pregnant Women | Zika virus | CDC. Retrieved from <https://www.cdc.gov/zika/pregnancy/index.html>
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