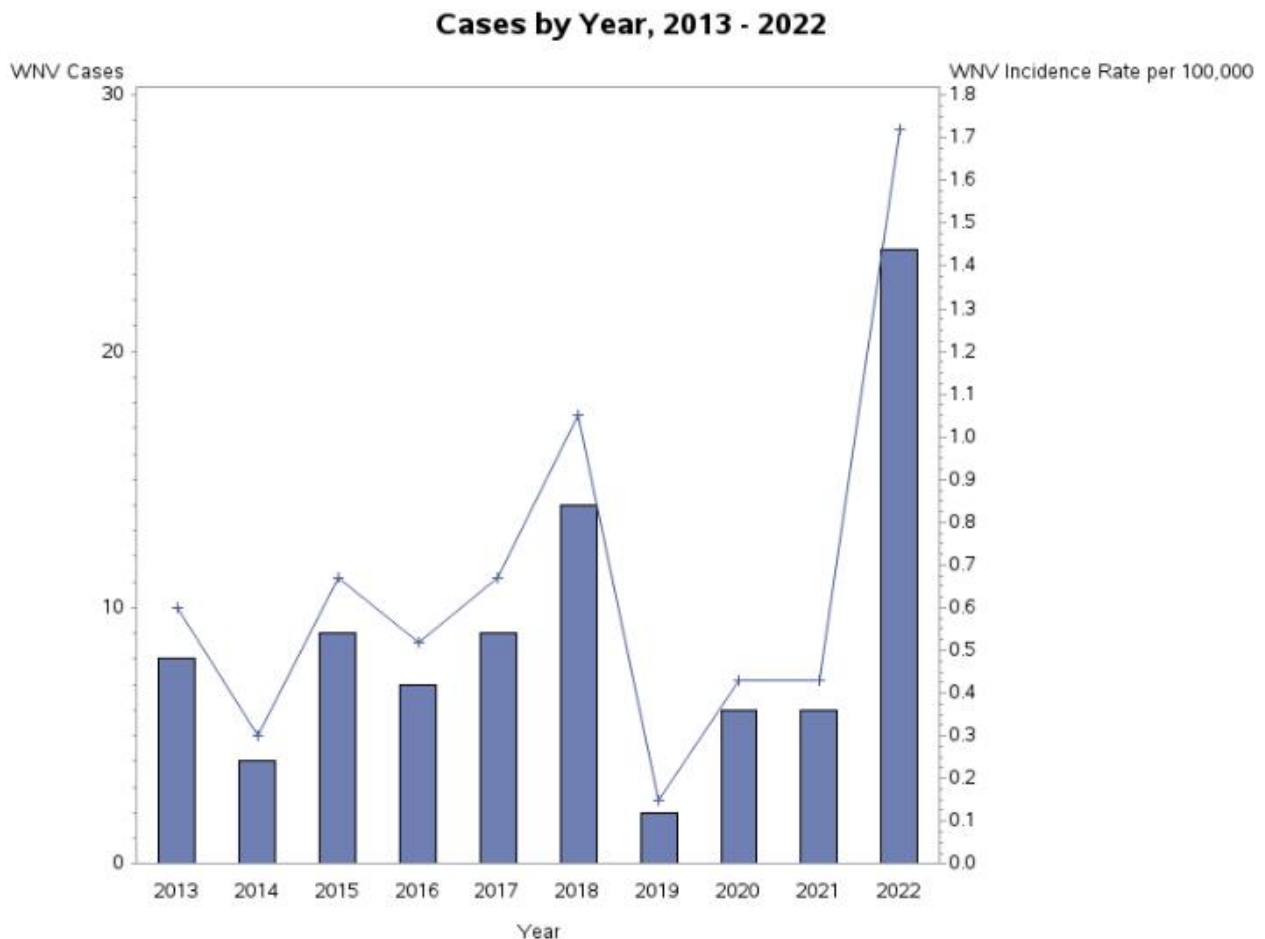


## WEST NILE VIRUS IN NASSAU COUNTY, 2013 – 2022

West Nile Virus (WNV) is an infectious disease transmitted to people through the bite of an infected mosquito. WNV can also infect birds, horses, and some other mammals. Less often, the virus can spread in transfused blood, a transplanted organ or by transplacental transmission (mother-to-child) (WHO, 2017). WNV is seasonal, occurring mostly from the beginning of Summer through Fall. About 1 in 5 people who are infected develop a fever or other symptoms, while 1 in 150 infected people develop a serious, sometimes fatal, illness such as meningitis or encephalitis. WNV can occur in people of any age but people who are 60 years and above, and those with pre-existing medical conditions such as cancer, diabetes, hypertension, and kidney disease are more at risk of the disease (CDC, 2023; NYSDOH, 2017).

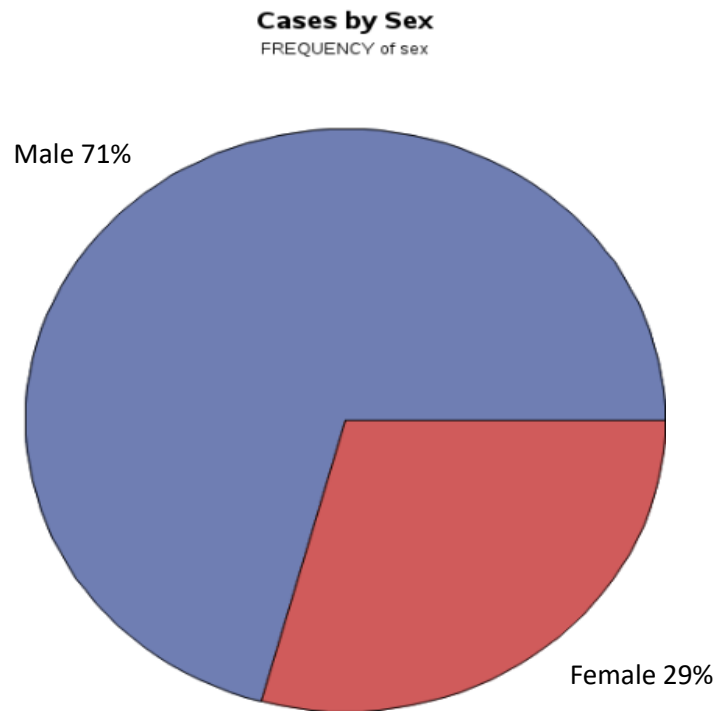
However, the risk of WNV can be reduced by using the CDC recommended insect repellent, avoiding mosquito bites by wearing long sleeves and pants, and displacing mosquito breeding sites.

Data from Nassau County, NY revealed that there were 24 cases of WNV in 2022 as shown in [Figure 1](#), making it the highest recorded incidence in a single year since 2013 in the county of Nassau, New York.

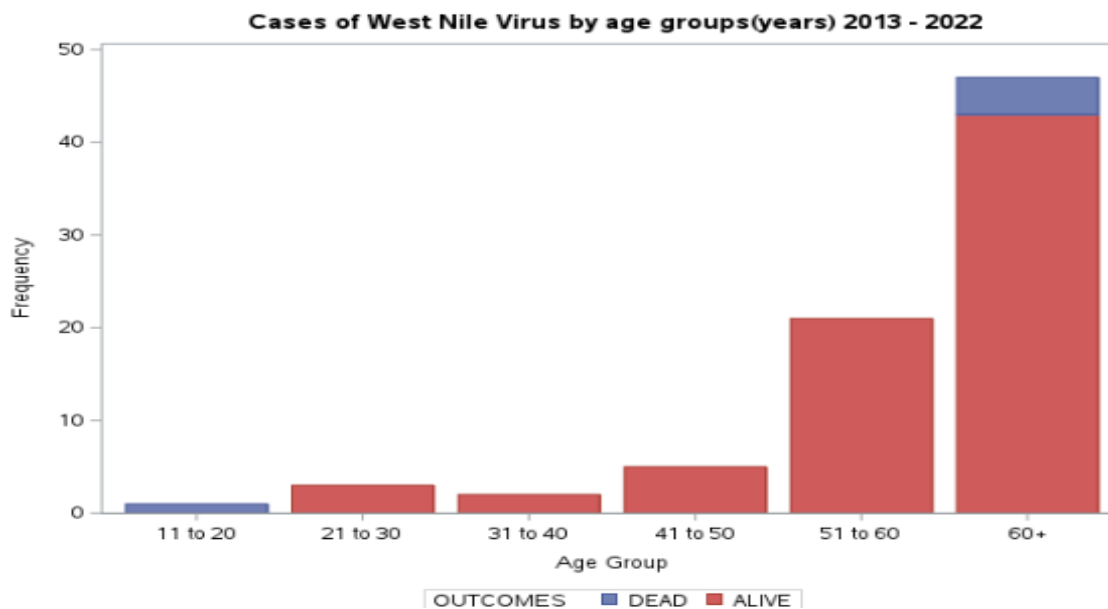


**Figure 1: WNV Cases by Year, Nassau County, 2013 – 2022.** This graph shows an irregular trend across the years but uptrend in 2022 with 24 cases and an incidence rate of 1.72 per 100,00 population.

## DEMOGRAPHICS

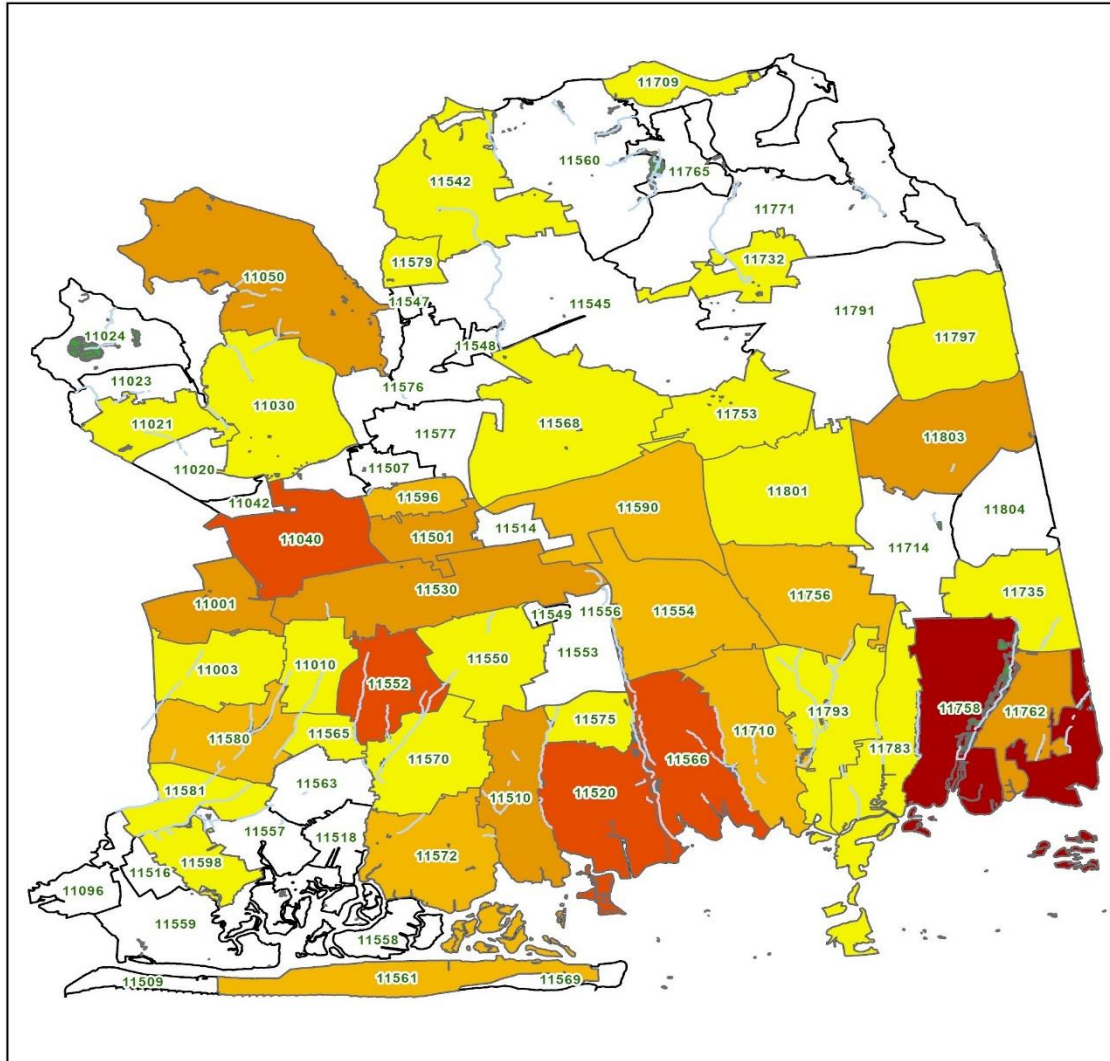


**Figure 2: Cases by Sex, Nassau County, 2013 – 2022.** Eight-nine cumulative cases of WNV from 2013 to 2022, comprised of 26 females (29%), and 63 males (71%).



**Figure 3: Cases by Age Group, Nassau County, 2013 – 2022.** Most WNV cases during this period in Nassau County were seen in people of age 60 years and above, constituting about 64% of all cases. Older adults were more at risk of the disease compared with the lower age groups. Nonetheless, a fatality was recorded for a single WNV diseased individual in the age group of 11-20 years.

# West Nile Virus Cases From 2013 to 2022



## Legend

— Stream Corridors

■ Wetlands

### Frequency

■ 1

■ 2

■ 3 - 4

■ 5 - 6

■ 7 - 8

0 1.75 3.5 7 Miles

N



**Figure 4: WNV Cases by Zip Code on GIS, Nassau County, 2013 - 2022.** Most cases were seen in zip codes 11758 (Massapequa), 11566 (Merrick), 11040 (New Hyde Park), 11520 (Freeport), 11552 (West Hempstead), and 11510 (Baldwin).

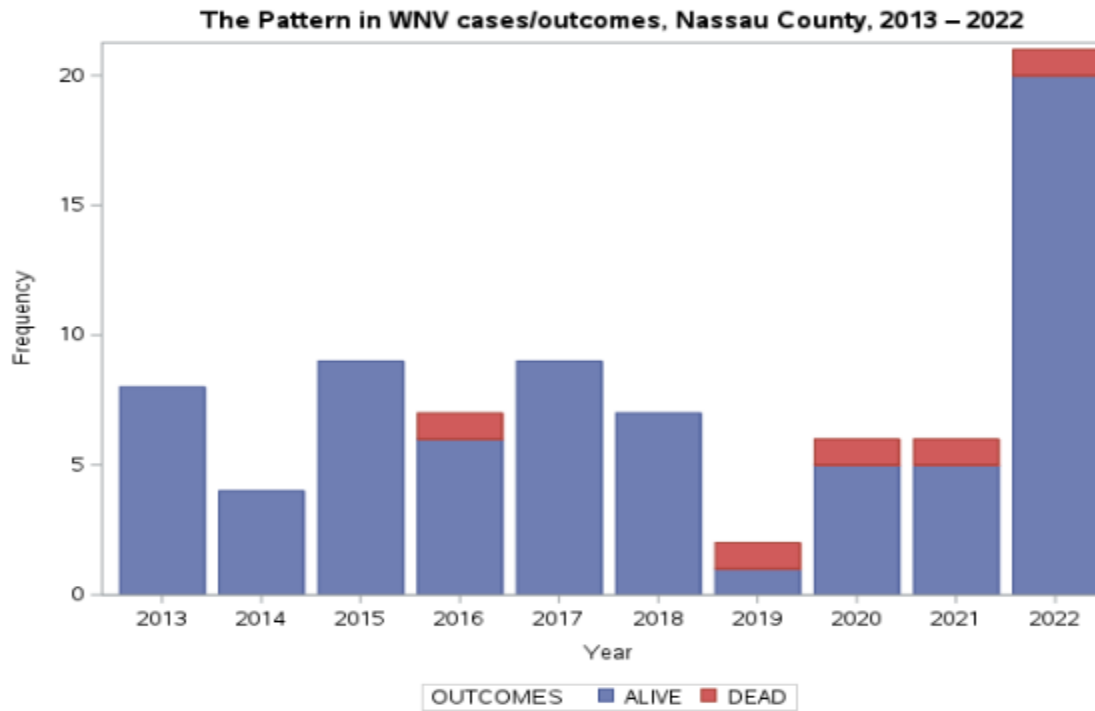


Figure 5: WNV By Year and Outcome, Nassau County, 2013- 2022. This graph shows 5 deaths occurring over the course of 10 years.

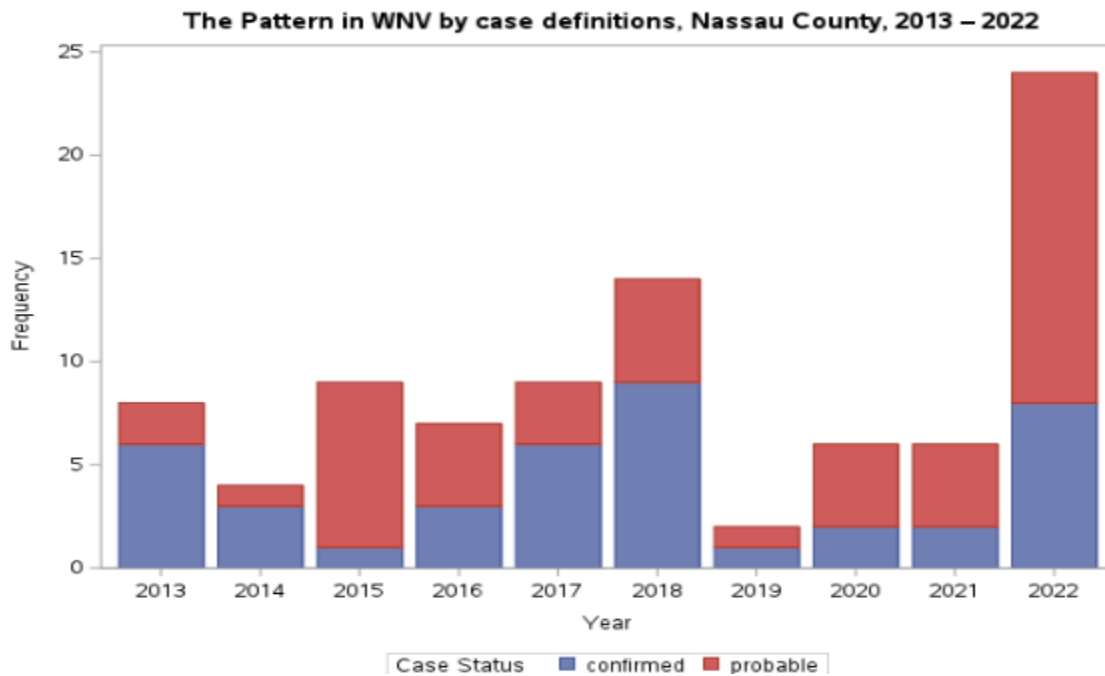
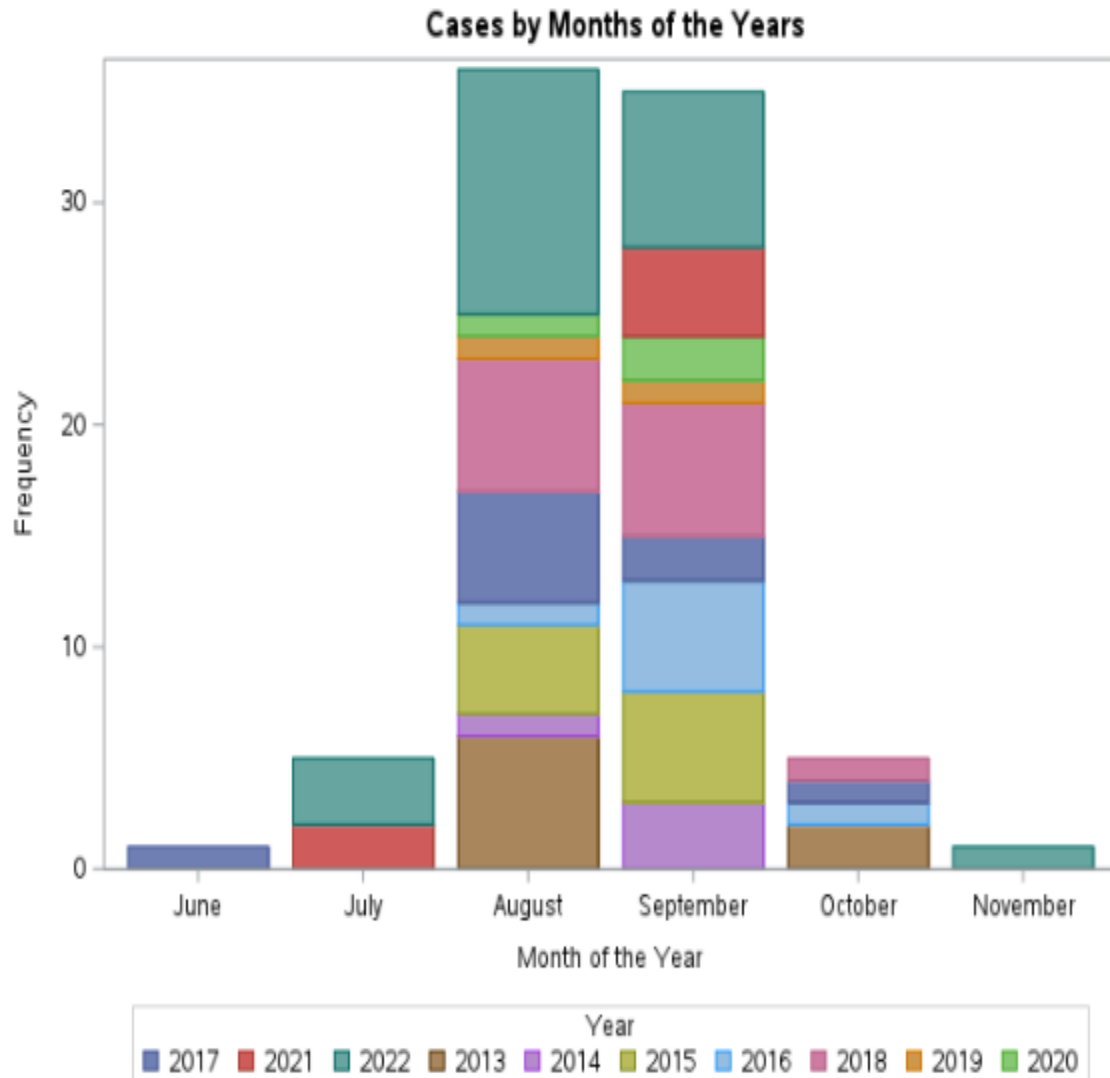


Figure 6: WNV by Case Definition, Nassau County, 2013-2022. This graph shows the frequency of the confirmed and probable cases by year.



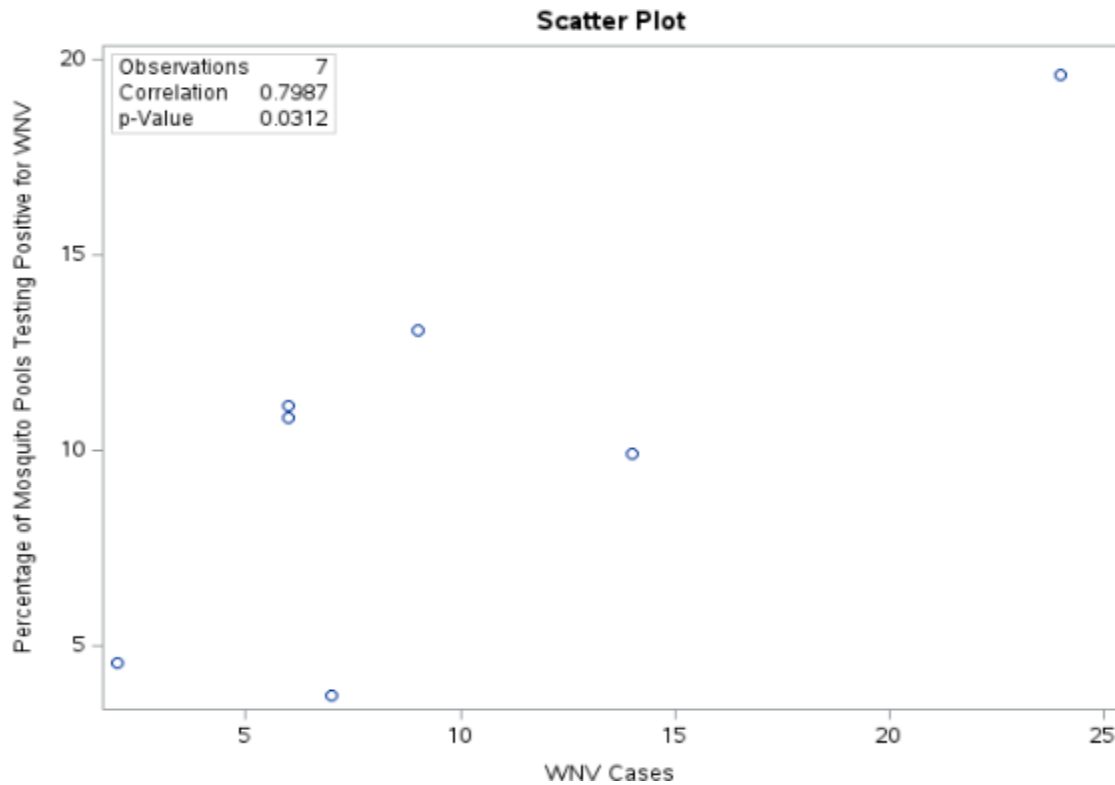
**Figure 7: The Frequency of WNV by Month of the Year, Nassau County, 2013 – 2022.** The bar chart shows that the peak of the disease incidence occurred between the beginning of August (8<sup>th</sup> Month) and the end of September (9<sup>th</sup> Month) across the years. However, there were isolated cases that occurred early in June and late in November of 2017 and 2022 respectively.

**Human WNV Cases, Percentage of Mosquito Pools Testing Positive for WNV, and Minimum Infection Rate/1000 of Mosquitoes Testing Positive for WNV, per Year 2016-2022 in Nassau County**

Obs	Year	Human WNV Cases	% Mosquito Pools Testing Positive for WNV	Minimum Infection rate/1000 Mosquitoes Testing Positive for WNV
1	2016	7	3.70	1.37
2	2017	9	13.05	4.68
3	2018	14	9.88	3.35
4	2019	2	4.54	1.50
5	2020	6	11.11	3.53
6	2021	6	10.81	3.36
7	2022	24	19.60	6.01

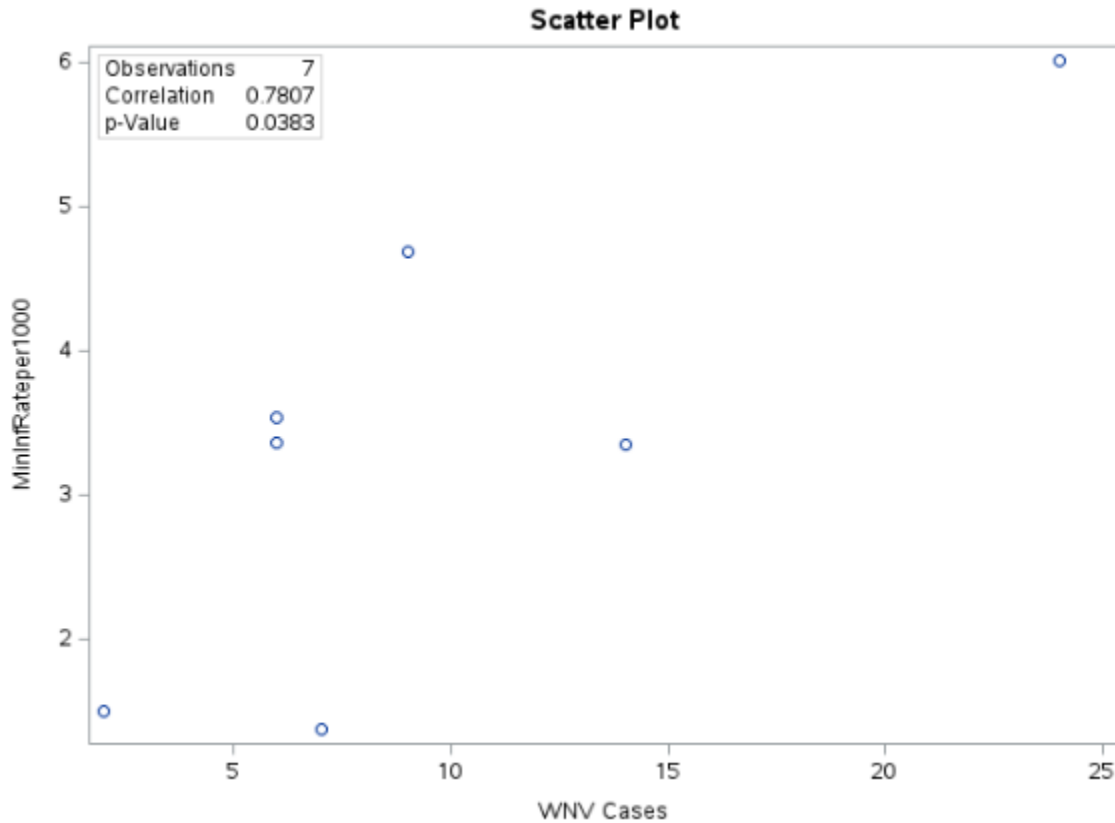
**Table 1. Human WNV Cases, Percentage of Mosquito Pools Testing Positive for WNV, Minimum Infection Rate/1000 of Mosquitoes Testing positive for WNV per Year, 2016 – 2022.** This table shows the observed years matched with their numbers of human WNV cases, corresponding values of percentage of mosquito pools testing positive for WNV, and the minimum infection rate/1000 of mosquitoes testing positive for WNV per year.

**Correlation between WNV Cases and Percentage of Mosquito Pools Testing Positive for WNV/Year, 2016 - 2022**



**Figure 8: Scatter Plot of the Correlation between WNV Cases and Percentage of Mosquito Pools Testing Positive for WNV/Year in Nassau County, 2016-2022.** The scatter plot shows the correlation between human WNV Cases and the percentage of mosquito pools testing positive for WNV/year in Nassau County from 2016 - 2022. A strong correlation exists between human WNV cases and the percentage of mosquito pools testing positive for WNV/year with a statistically significant correlation coefficient of 0.799 at p value < 0.05.

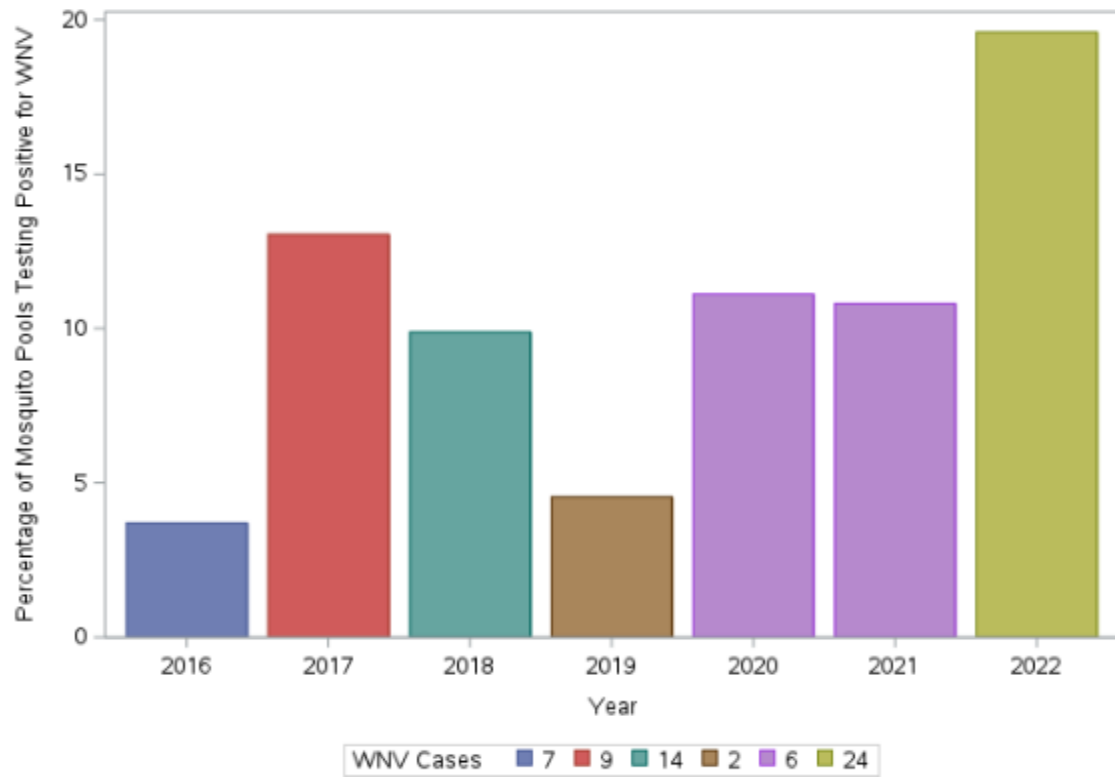
**Correlation between WNV Cases and Minimum Infection Rate/1000 of Mosquitoes Testing Positive for WNV per Year, 2016 -2022**



**Figure 9. Scatter Plot of the Correlation between WNV Cases and the Minimum Infection rate/1000 of Mosquitoes testing positive for WNV per year in Nassau County from 2013 to 2022.** Similar to [Figure 8](#), the scatter plot shows a strong correlation between human WNV cases and the minimum infection rate/1000 of mosquitoes testing positive for WNV per year with a statistically significant correlation coefficient of 0.781 at p value <0 .05.

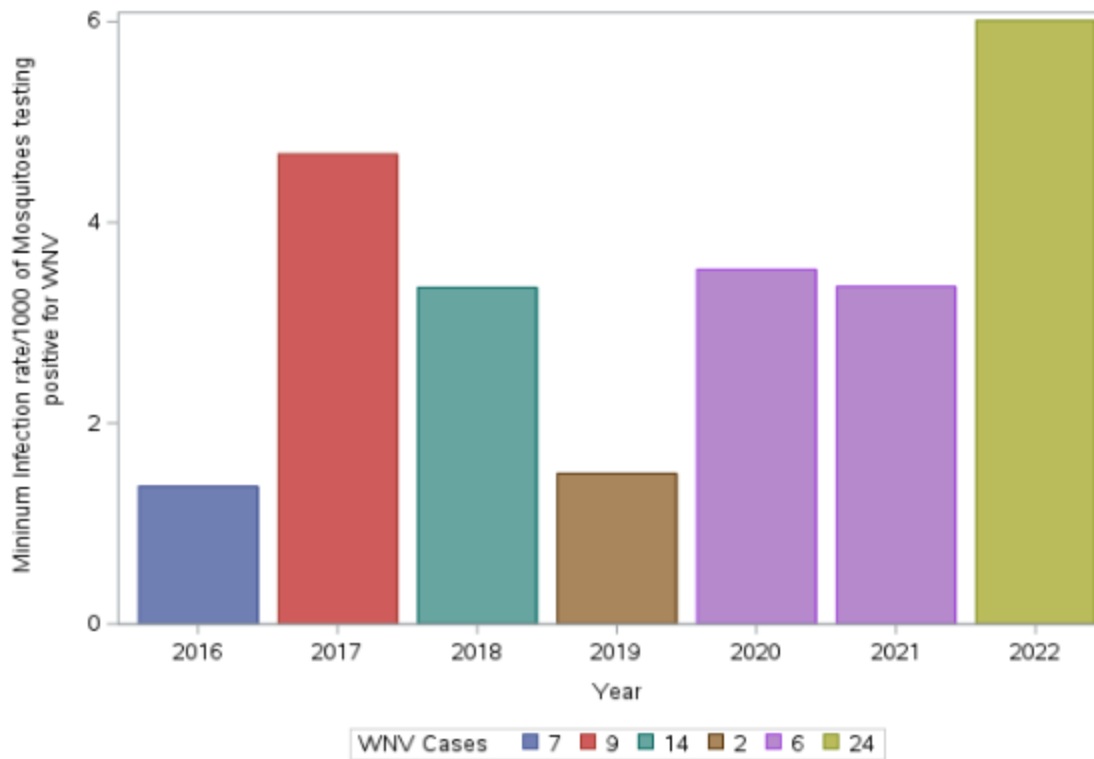


**Relationship between Percentage of Mosquito Pools Testing Positive for WNV and Human WNV Cases per Year, 2016 -2022**

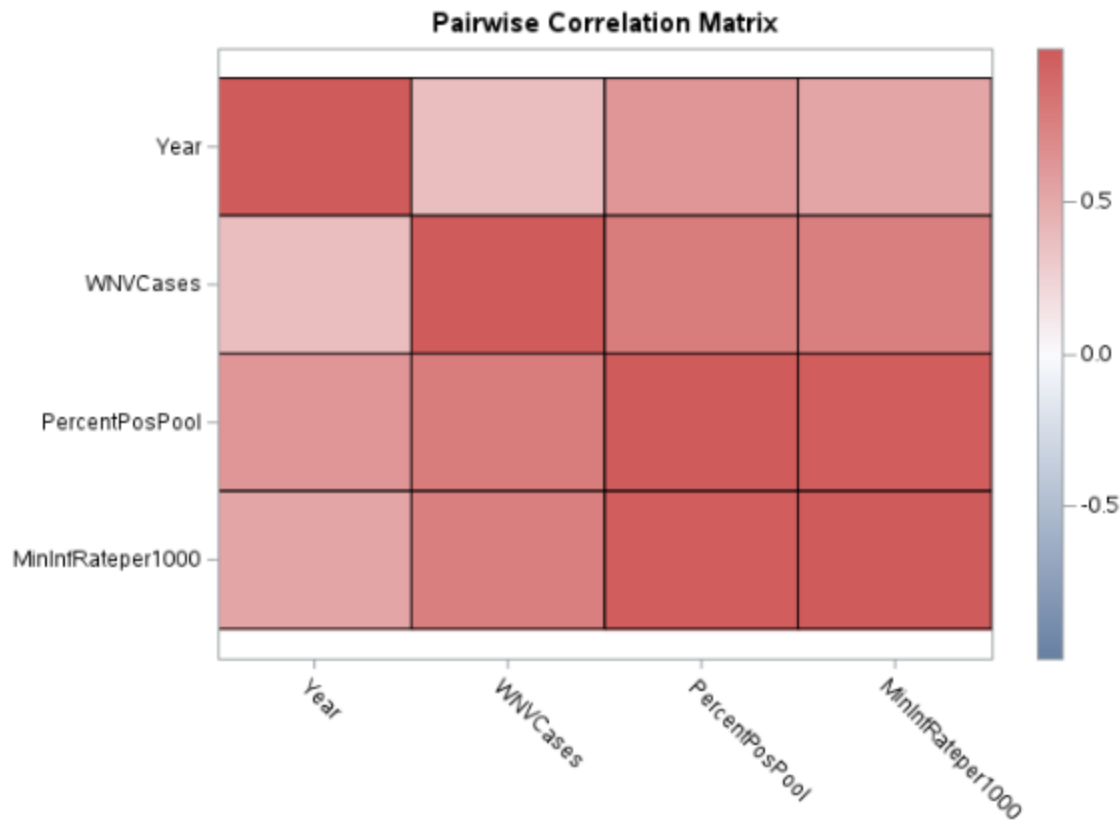


**Figure 10. Relationship between Percentage of Mosquito Pools Testing Positive for WNV and Human WNV Cases/Year, Nassau County 2016-2022.** The heights of the bars in the chart represent the percentage of mosquito pools testing positive for WNV in each year. WNV cases (counts) are differentiated by color. For example, in 2020 and 2021 the count was the same.

**Relationship between Minimum Infection rate/1000 of Mosquitoes testing positive for WNV and Human WNV Cases per Year, 2016 -2022**



**Figure 11. Relationship between the Minimum Infection Rate per 1000 of Mosquitoes Testing Positive for WNV and Human WNV Cases/Year, Nassau County 2016-2022.** The heights of the bars in the chart represent the minimum infection rate/1000 of mosquitoes testing positive for WNV in each year. WNV cases (counts) are differentiated by color. For example, in 2020 and 2021 the count was the same.



**Figure 12. Pairwise Correlation Matrix, WNV Cases and Variables, Nassau County, 2016-2022.** This matrix shows the correlation between each pair of observed values (Year, Human WNV Cases, Percentage of Mosquito Pools Testing Positive for WNV, and the Minimum Infection Rate per 1000 Mosquitoes Testing Positive for WNV).

**References**

1. CDC (2023). West Nile Virus. <https://www.cdc.gov/westnile/healthcareproviders/healthCareProviders-ClinLabEval.html>
2. World Health Organization (Oct.,2017). <https://www.who.int/news-room/fact-sheets/detail/west-nile-virus>.
3. New York State Department of Health (NYSDOH, 2017) West Nile Virus Fact Sheet. [https://www.health.ny.gov/diseases/west\\_nile\\_virus/fact\\_sheet](https://www.health.ny.gov/diseases/west_nile_virus/fact_sheet)
4. Communicable Disease Electronic Surveillance System (CDESS). Vector Surveillance Report Lab Test Result by County, Nassau County.

**Notes**

- The data analysis included probable and confirmed cases of WNV unless where specified.
- 2010 and 2020 Census data for Nassau County were used to compute incidence rates.
- WNV infection rates in mosquitos were not assessed prior to 2016, data was not available.
- Percentage of mosquitoes pools testing positive= (# positive pools testing positive for WNV/# pools tested)\*100.
- Minimum infection rate= (# positive pools with at least one mosquito testing positive for WNV/total number of mosquitoes tested) \*1000.