



# Westchester County Department of Health

2017.02



@whealthdept  
#keephealthy

## Community Health Assessment Data Update

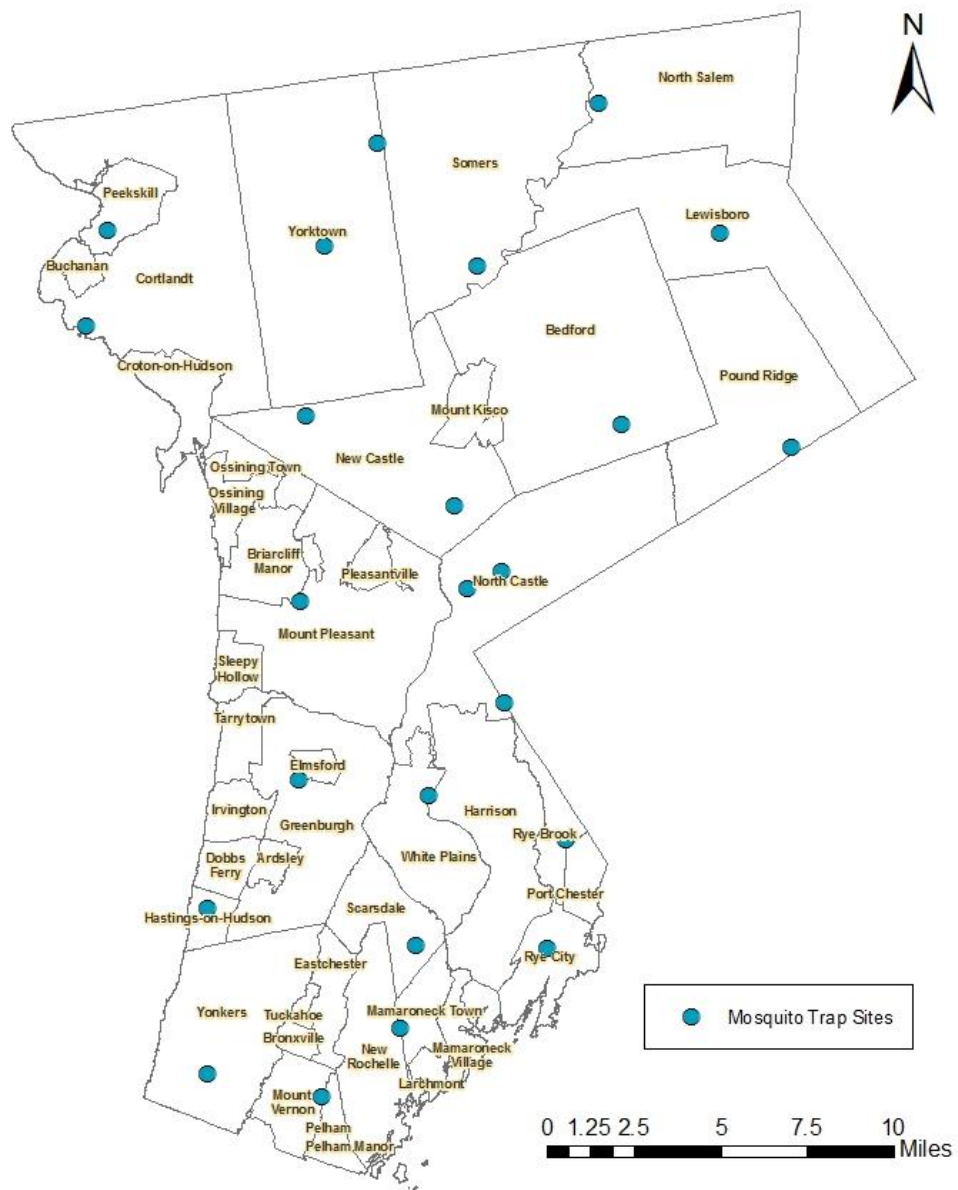
KEEP  
HEALTHY  
AND  
GET  
THE STATS

### Arbovirus/Mosquito Control and Surveillance, 1999-2016

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Mosquito Surveillance Trap Sites, 2016



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# West Nile Virus

West Nile Virus (WNV) can be a serious illness.

Approximately 3 out of 4 people who are infected do not show any symptoms, but about 1 in 4 will develop mild symptoms 3-14 days after being bitten by an infected mosquito.

Even though the chance of serious disease is less than 1%, there is no treatment or vaccine. Serious symptoms may last for several weeks and can be life-threatening among people with a vulnerable immune system. The neurological effects of a WNV infection may be permanent.

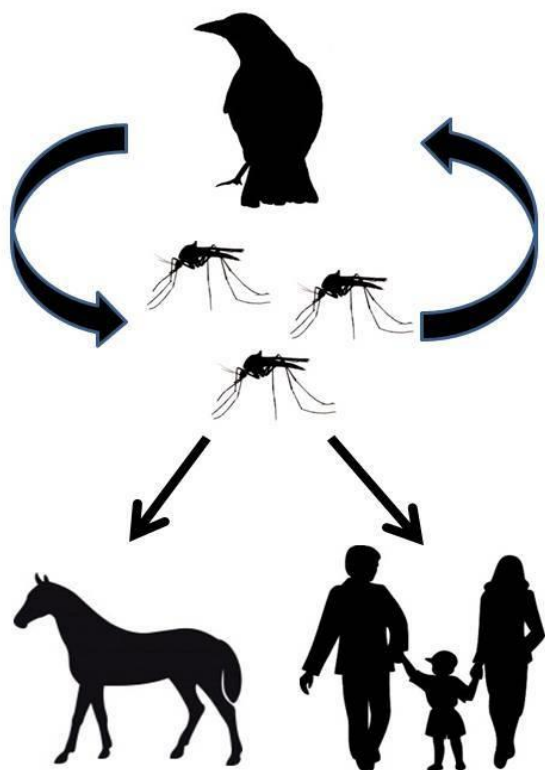
## Symptoms of West Nile Virus

### Mild symptoms:

- Body aches
- Fever
- Fatigue
- Headache
- Mild rash
- Swollen lymph glands

### Serious disease symptoms:

- High fever with rapid onset
- Headache and neck stiffness
- Disorientation
- Convulsions
- Encephalitis
- Paralysis
- Coma
- Death



## The West Nile Virus Life Cycle

West Nile virus is reproduced by a cycle of transmission between adult blood-feeding mosquitoes and birds, which are the main reservoir hosts for the virus.

Certain species of mosquitoes feed on both birds and mammals, and are the bridge vector for WNV transmission to humans.

In Westchester County, the *Culex*, *Ochlerotatus*, and *Aedes* genera are the most common mosquito types. The species *Culex pipiens-restuans* is the major mosquito vector for WNV transmission between animal reservoirs and humans in New York State.

# Zika Virus

Zika virus disease is caused by the Zika virus, which is spread to people primarily through the bite of an infected mosquito.

Many people infected with Zika virus won't have symptoms or will only have mild symptoms, which can last several days to a week.

However, a pregnant woman can pass Zika to her fetus during pregnancy or around the time of birth. Zika infection during pregnancy can cause a serious birth defect called microcephaly and other severe fetal brain defects. A person with Zika can also pass it to his or her sex partners.

## Symptoms and Effects of Zika Virus

### Mild symptoms:

- Fever
- Rash
- Joint pain
- Conjunctivitis (red eyes)
- Muscle Pain
- Headache

### Potential serious effects around pregnancy:

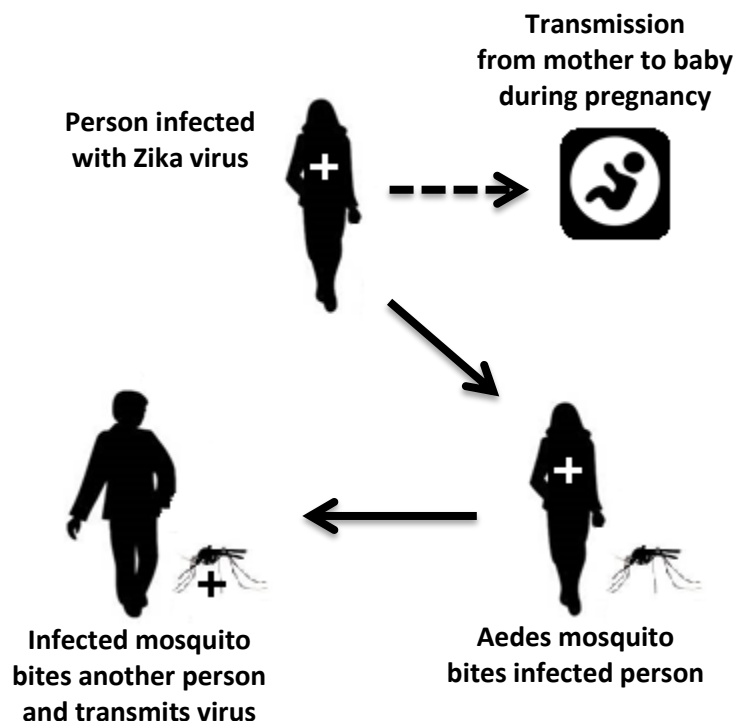
- Microcephaly - where a baby's head is much smaller than expected, due to improper development
- Other severe fetal brain defects

## The Zika Virus Transmission Cycle

Infected *Aedes* species mosquitoes (*Aedes aegypti* and *Aedes albopictus*) are the primary spreaders of Zika in the United States. Fortunately, Westchester County is not a known habitat for the *Aedes aegypti* mosquito at this time.

Pregnant women should not travel to any area with Zika. People who have traveled to or live in places with Zika are encouraged to protect themselves by preventing mosquito bites, and sexual transmission of Zika through barrier methods.

More information about Zika can found at: [health.westchestergov.com/zika-virus-facts](http://health.westchestergov.com/zika-virus-facts)



# Mosquito Control and Surveillance

The Westchester County Department of Health (WCDH) has worked since 1999 to prevent the spread of arboviruses which cause mosquito-borne disease. This is done through controlling mosquito populations during their breeding season, trapping and monitoring adult mosquitoes to locate possible clusters/habitat, and educating medical providers and the public.

## **Mosquito Control**

### **Eliminating Breeding Sites**

Each spring, and throughout the mosquito breeding season, WCDH collaborates with municipalities, community stakeholders, and the public to identify and eliminate standing water in places such as empty lots and backyards. These intensive efforts reduce potential mosquito breeding sites. The health department also investigates any complaints of standing water from residents.

### **Minnow Distribution**

Fathead minnows help provide control by eating mosquito larvae and pupae before they emerge into adult mosquitoes. Since 2013, WCDH has distributed minnows to County residents and municipalities; approximately 410 pounds were distributed in 2016.

### **Larvicide**

Catch basins are municipal drainage systems designed to move excess rainwater from streets and other urban surfaces into the storm drain system. Since catch basins can hold standing water for long periods of time, they are ideal mosquito breeding sites. Each May, WCDH evaluates thousands of catch basins throughout the county, and applies larvicide to those that hold standing water. The least toxic, most effective agents are used to prevent mosquito larvae from developing into adult disease vectors.

### **Adulticide**

If disease-bearing mosquitoes ever become a serious threat to public health, the county will consider applying pesticides. To date, this has only occurred in 2000.

## **Mosquito Surveillance**

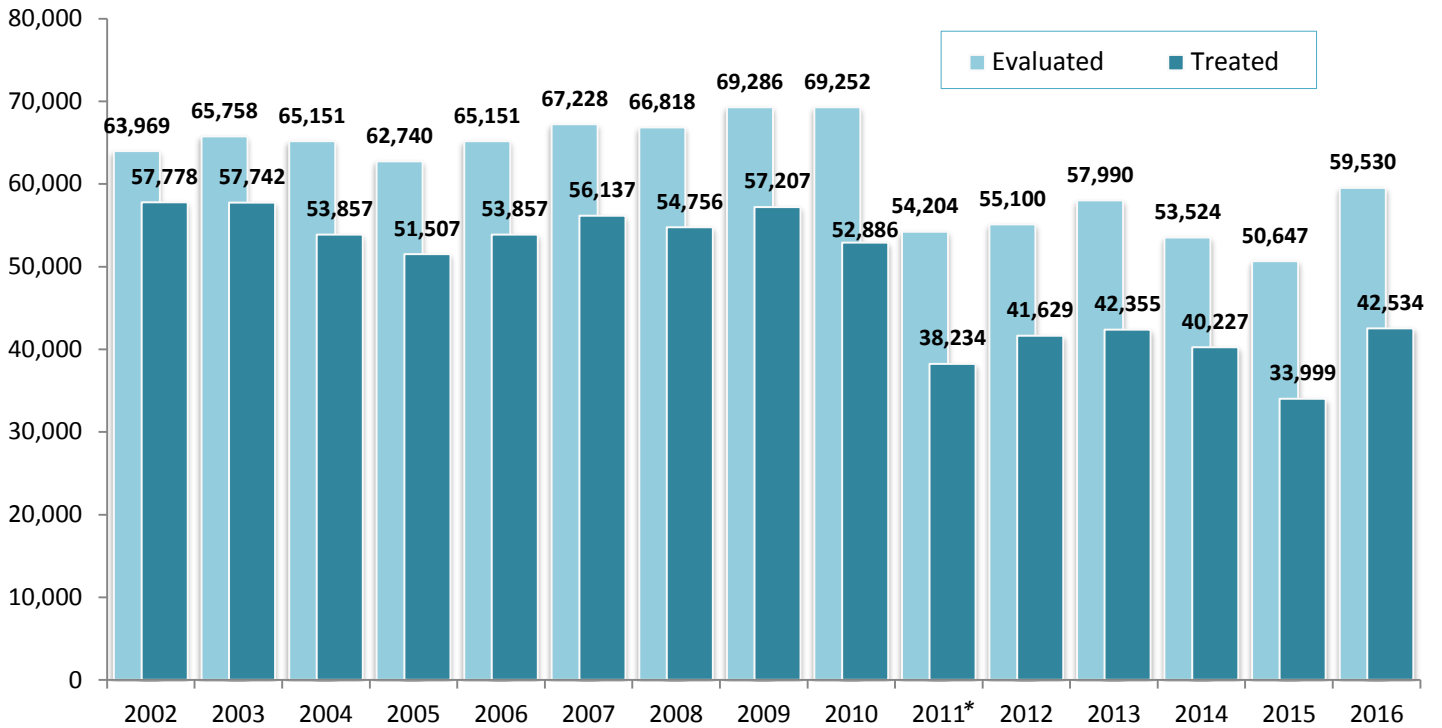
The health department initiated annual mosquito surveillance in 1999. Each year, WCDH sets up multiple trap sites at various locations throughout Westchester County from May to October. The trapping of mosquitoes allows for surveillance and testing for the presence mosquito-borne diseases.

Trap sites are selected based on population density, where positive mosquitoes have been identified in the past, and locations of past human WNV cases, as well as site availability or the need for additional surveillance in response to heavy mosquito infestation.

Health department staff collects the trapped mosquitoes during the May to October breeding season three times a week; they are then sorted by species and submitted in batches for WNV, Zika (testing began in 2016), and other arbovirus testing at the NYS Wadsworth Laboratory by NYSDOH guidelines.

# Catch Basin Evaluation and Treatment

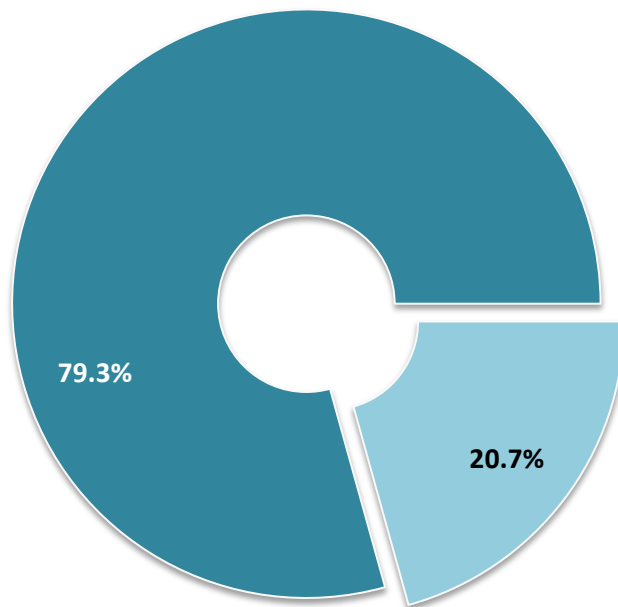
Number of Catch Basins Evaluated and Treated with Larvicide, 2002-2016



\*From 2011 on, WCDH no longer carried out larvicide activities on NYSDOT roads.

Average Percentage of Evaluated Catch Basins Treated with Larvicide, 2002-2016

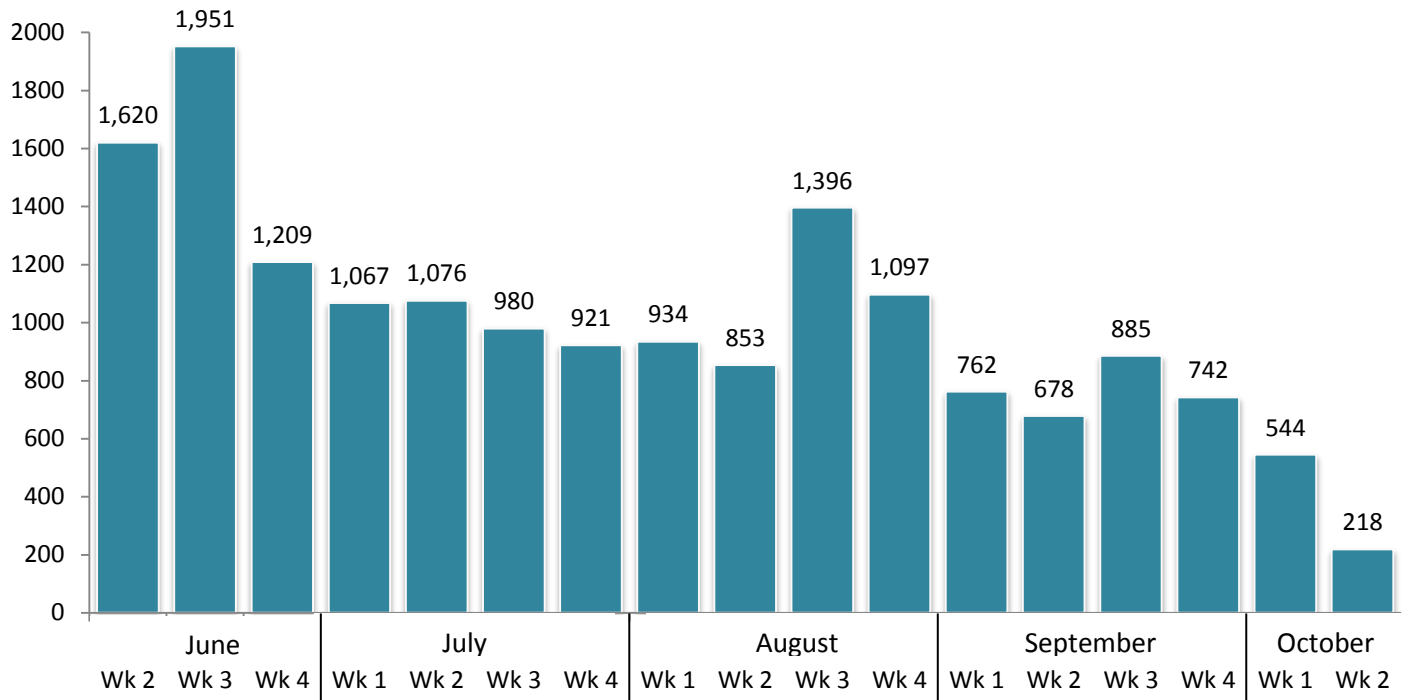
On average, approximately 4 out of 5 catch basins evaluated in Westchester County were treated with larvicide between 2002 and 2016.



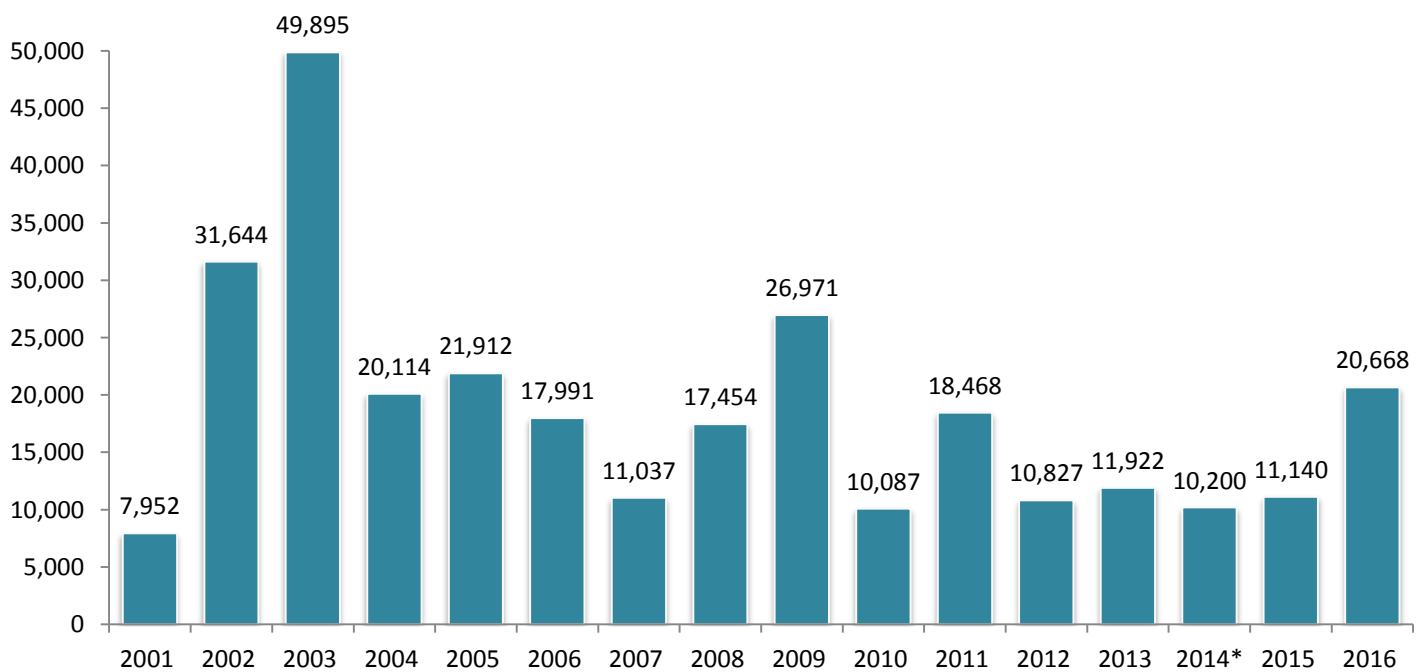
Some catch basins were not treated either due to the absence of standing-water or inaccessibility.

# Mosquito Surveillance

Average Number of Mosquitoes Trapped per Week, 2001-2016



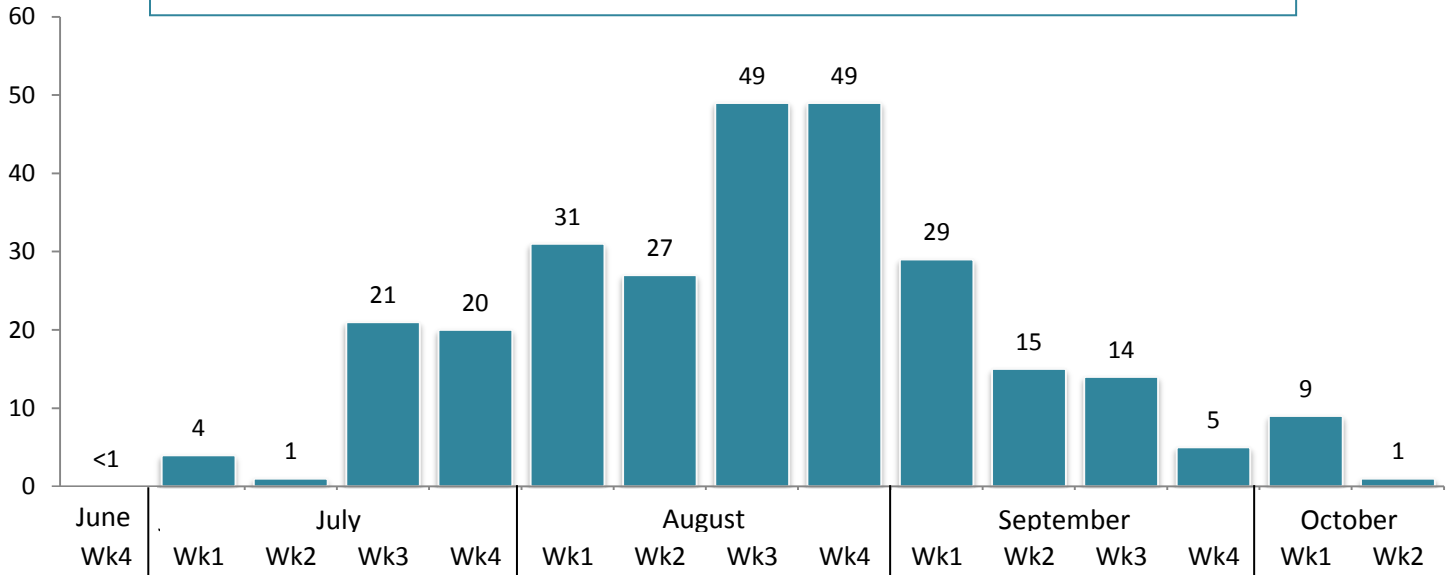
Total Number of Mosquitoes Trapped, 2001-2016



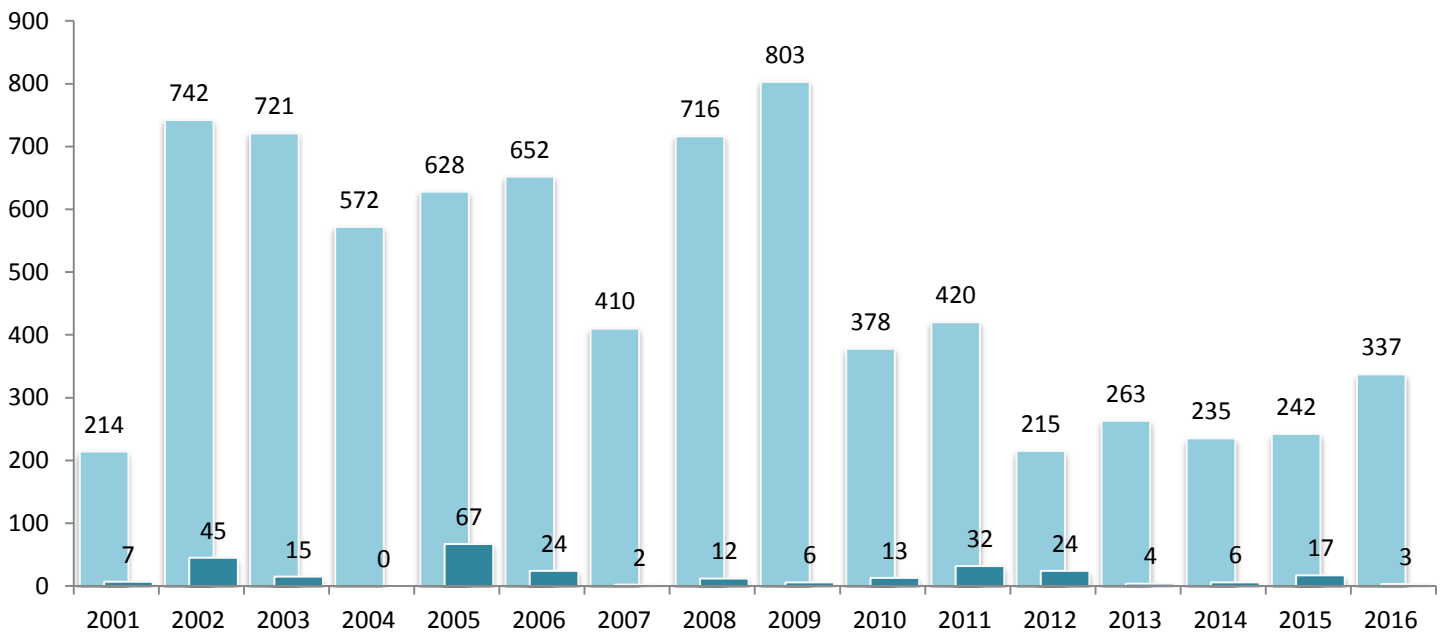
\*2014 data for number of mosquitoes trapped is an estimate

# Mosquito Batches Submitted for Testing and Results

Average Mosquito Batches Submitted for Testing per Week, 2001-2016



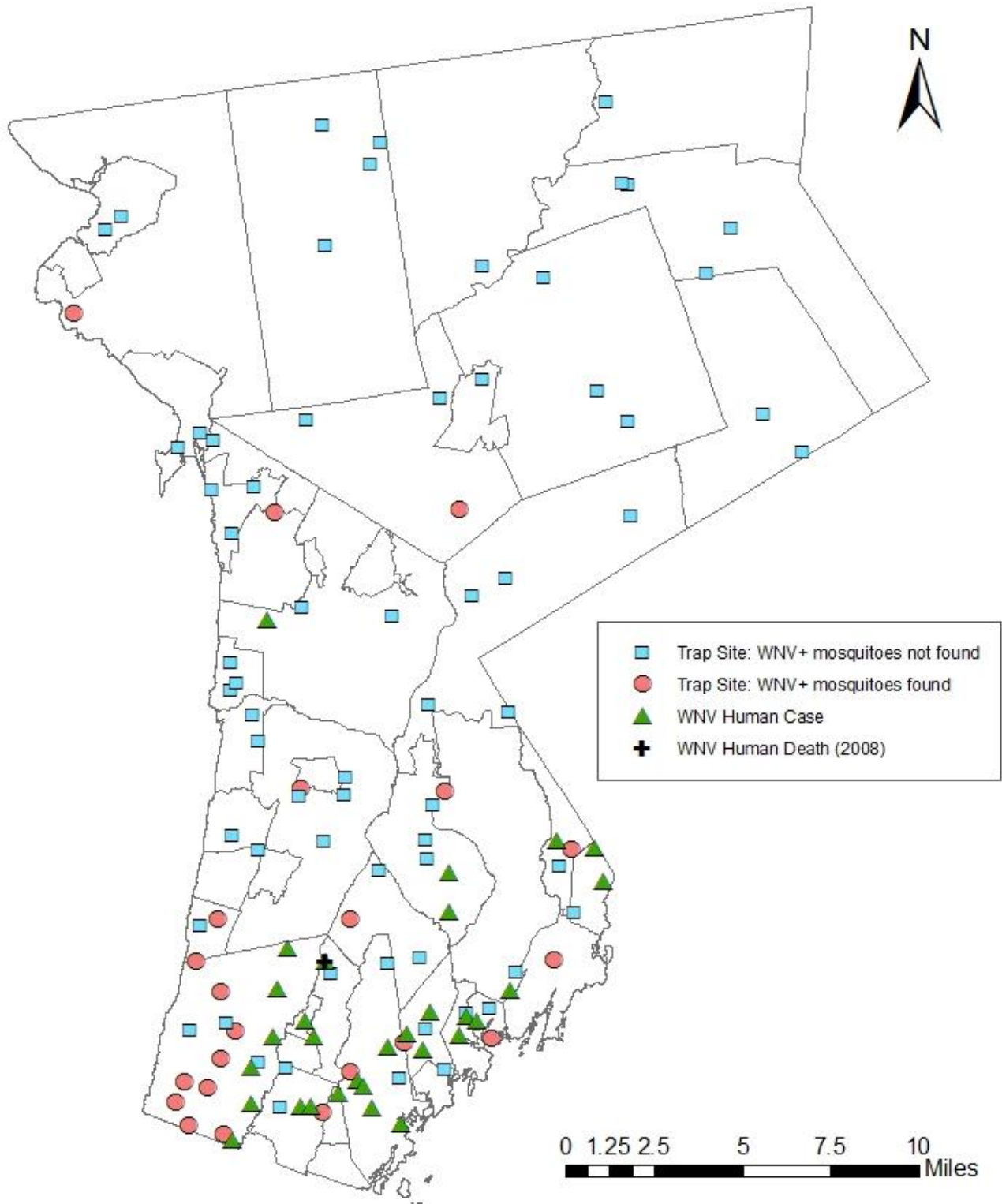
Total Mosquito Batches Submitted for Testing and Positive WNV Test Results, 2001-2016



Since 2001, a total of 7,548 mosquito batches have been submitted to NYS for testing. Each batch contained a minimum of 10 mosquitoes. Zika Virus testing began in 2016 and was not identified in any mosquito batches. Overall, 277 batches have tested positive for WNV. The overall positive rate is 3.7%. During the past sixteen years of mosquito surveillance, the peak of WNV-positive mosquitoes occurred in the last two weeks of August.

# Trap Site Locations and WNV Human Cases Over Time

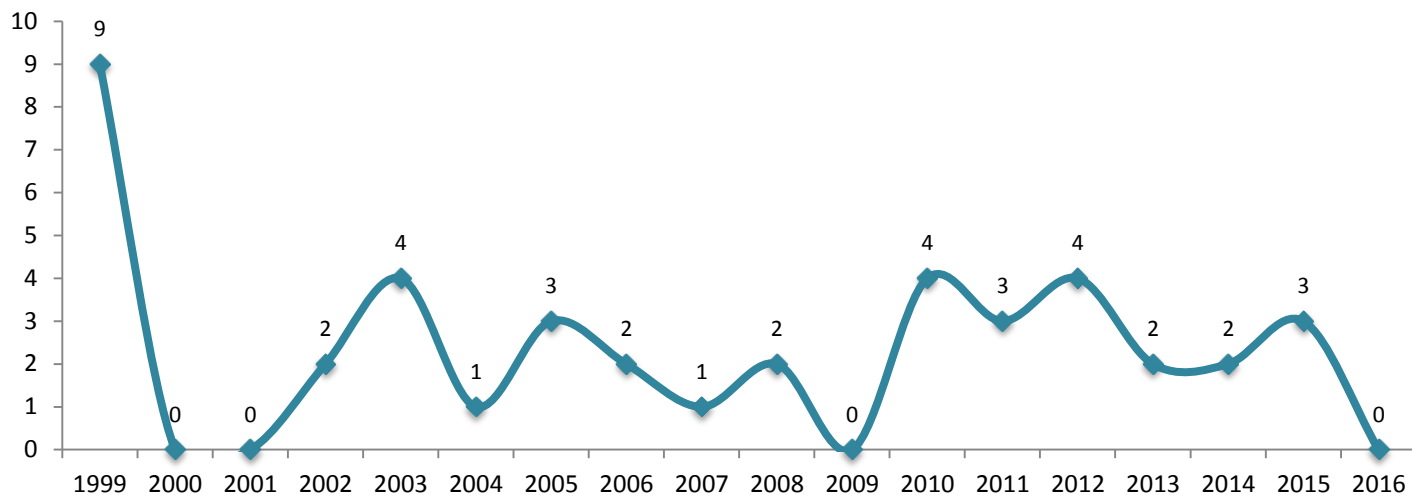
Cumulative Distribution of Mosquito Trap Sites and WNV Human Cases, 1999-2016





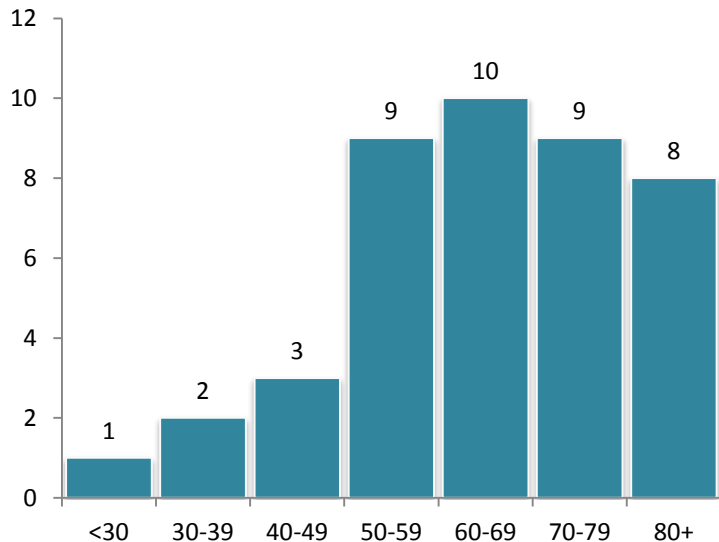
# WNV Human Cases

Total Number of WNV Human Cases, 1999-2016



The health department monitors West Nile Virus encephalitis among other mosquito-borne diseases. From May to October, the health department provides all county hospitals and infectious disease specialists with educational materials, reminders on criteria for case reporting and submission of laboratory specimens, and updates on arbovirus activity. Health department staff visit the homes and surrounding neighborhood of every person who is confirmed to have West Nile Virus to identify and eliminate any mosquito breeding areas. When appropriate, the health department provides targeted mosquito control measures in these areas, such as additional larvicide and mosquito traps, to prevent further transmission.

Age Distribution of Human WNV Cases, 1999-2016



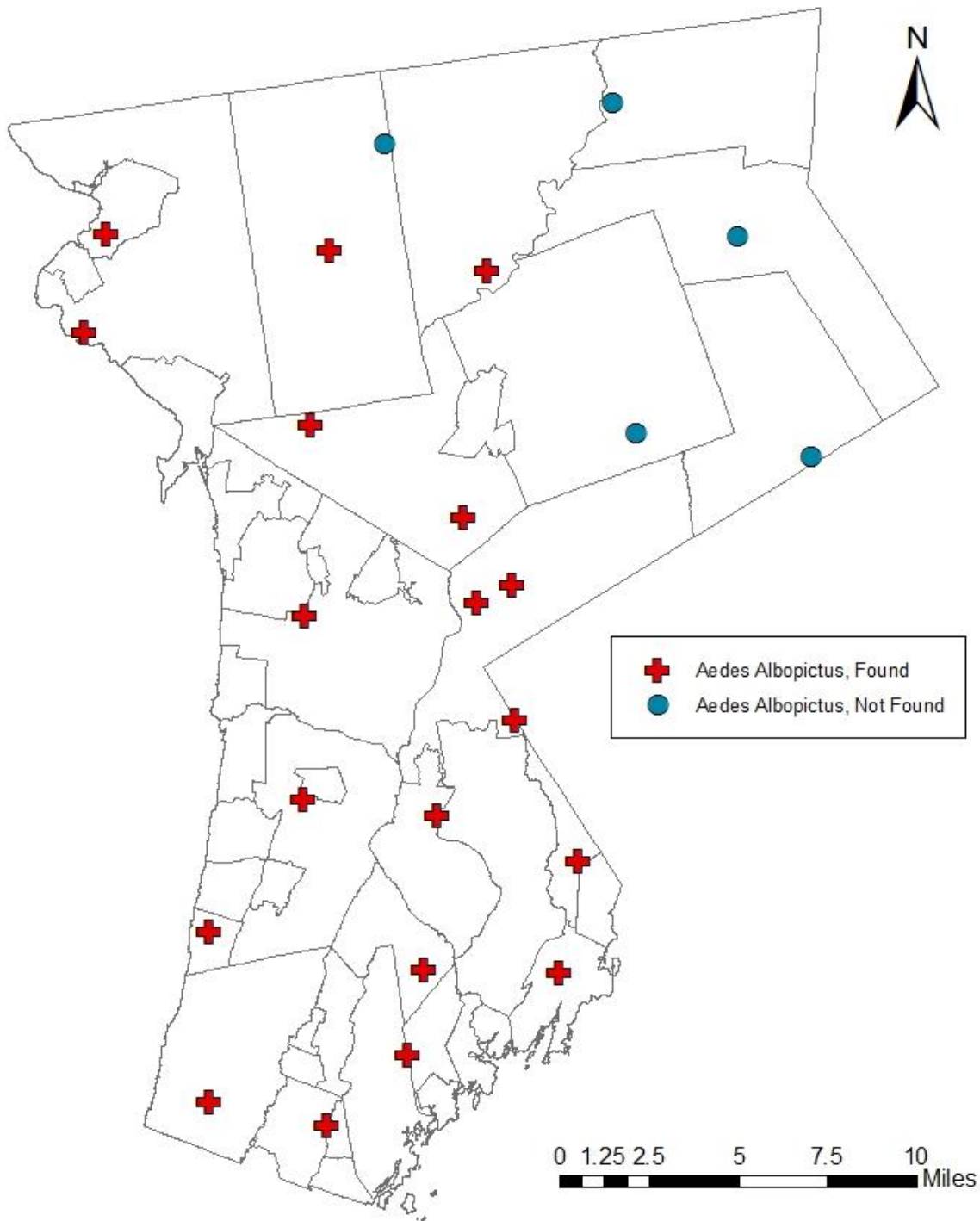
Since 1999, 42 Westchester residents had West Nile Virus and one death was reported in Westchester County.

Of the 42, 19 were women and 23 were men. Almost two-thirds (64.3%) were among people aged ages 60 and older.

With the exception of three, all Westchester residents to have West Nile Virus resided in the southern half of the county.

# Trap Site Locations and *Aedes Albopictus* Habitat

Mosquito Trap Sites and Identified *Aedes Albopictus* Habitat, 2016



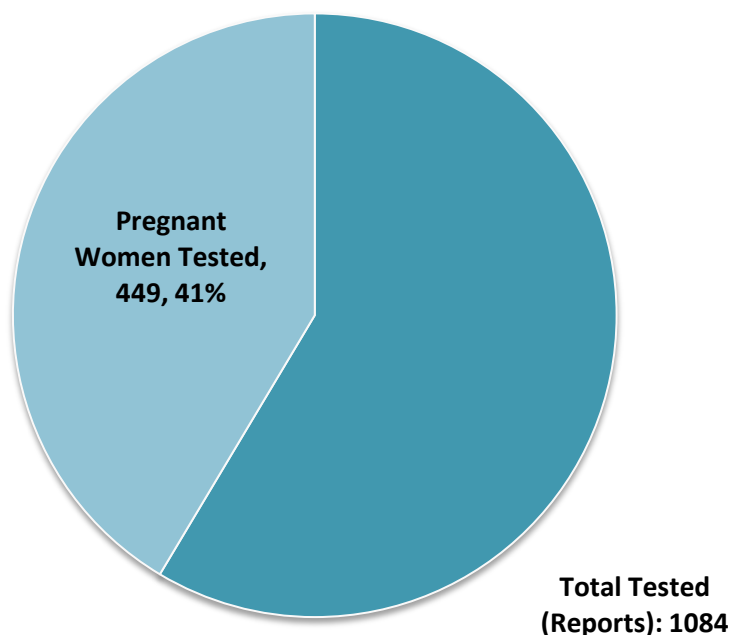
The number of trap sites increased in 2016 in response to Zika.

*Aedes Albopictus*, also known as the Asian Tiger Mosquito, is one of the two mosquito species (*Aedes aegypti* and *Aedes albopictus*) capable of transmitting the Zika virus; it is the only one found in Westchester County.

# Mosquito-borne Disease Prevention Tips

All 37 cases of Zika Virus in 2016 for Westchester County residents have been associated with travel to a Zika-affected country abroad. Of the 37 cases, 33 had mild symptoms and 4 did not experience symptoms. There have been no reports to date of Zika-related effects in any newborns.

To identify cases and monitor disease spread, the health department processed a large volume of reports for Zika in 2016. Over one calendar year of reports (Feb 2016-Feb 2017), 1084 individuals were either tested or authorized for testing in Westchester County. Approximately 41% (449) of the total tested were pregnant women – a prioritized group due to the possible negative effects of Zika to an unborn baby. Of those whose lab results were positive, 5 were pregnant women; the early identification allowed the women to be closely monitored by their health provider.



## Summary of Mosquito Control and Surveillance Activities 1999-2016

Program	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	*2014	2015	2016
<b>Mosquito Control</b>																		
Number of Catch Basins Evaluated	--	--	--	63,969	65,758	65,151	62,740	65,151	67,228	66,818	69,286	69,252	54,204	55,100	57,990	53,524	50,647	59,530
Number of Catch Basins Treated	--	--	--	57,778	57,742	53,857	51,507	53,857	56,137	54,756	57,207	52,886	38,234	41,629	42,355	40,227	33,999	42,534
<b>Mosquito Vector Surveillance</b>																		
Number of Nights Out for Trapping	--	--	51	71	78	60	67	55	52	62	63	56	52	46	37	51	48	58
Number of Trap Sites	--	--	37	31	11	11	15	12	10	13	11	12	10	10	10	10	10	24
Number of Trap Nights	--	--	1,075	2,545	1,299	1,061	1,426	1,147	802	1,200	1,121	1,134	622	329	557	550	582	1,474
Number of Mosquitoes Trapped	--	--	7,952	31,644	49,895	20,114	21,912	17,991	11,037	17,454	26,971	10,087	18,468	10,827	11,922	10,200	11,140	20,668
Number of Mosquitoes Submitted	--	--	4,070	16,406	24,664	13,258	14,949	12,237	7,584	12,904	19,400	6,898	12,046	6,628	6,724	5,933	6,043	9,211
Number of Batches Submitted	--	--	214	742	721	572	628	652	410	716	803	378	420	215	263	235	242	337
Number of WNV+ Mosquito Batches	--	--	7	45	15	0	67	24	2	12	6	13	32	24	4	6	17	3
Number of Zika+ Mosquito Batches	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
<b>WNV Human Surveillance</b>																		
Number of Human Cases**	9	0	0	2	4	1	3	2	1	2	0	4	3	4	2	2	3	0
Number of Human Deaths	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

\* 2014 data entry was incomplete; Trap Nights and Number of Mosquitoes Trapped is estimated

\*\* Including confirmed and probable cases.

Data sources: WCDH internal database and NYSDOH Communicable Disease Surveillance System (CDESS)

# Mosquito-borne Disease Prevention Tips

## How to Minimize Your Risk for Mosquito-borne Diseases

The best way to avoid infection with WNV is to prevent mosquito bites:

- ✓ **Protect yourself and your family**
  - **Use insect repellent** and insect-repellent clothing when outdoors. Mosquitoes are most active at dusk and dawn; consider wearing long sleeves and loose pants during these times. When outdoors, cover your baby stroller or playpen with netting.
  - Use an Environmental Protection Agency (EPA)-registered insect repellent with one of the following active ingredients. When used as directed, EPA-registered insect repellents are proven safe and effective, even for pregnant and breastfeeding women.
    - DEET
    - Picaridin, also known as KBR 3023, Bayrepel, and icaridin
    - Oil of lemon eucalyptus (OLE) or para-menthane-diol (PMD)
    - IR3535
- ✓ **Protect your home**
  - **Screens on windows and doors** should be kept in good repair to keep mosquitoes out.
- ✓ **Protect your yard**
  - **Get rid of standing water** around your home where mosquitoes can breed. Empty standing water from flower pots, buckets, rain barrels, child wading pools, old tires, tree holes, clogged gutters, or even something as small as a bottle cap.

**To report sources of standing water, call the Westchester County  
Department of Health Complaint Bureau at (914) 813-5000.**

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## Travel Considerations

- ✓ **Remember to pack insect repellent** and use it to prevent mosquito bites
- ✓ **Pregnant women should not travel to any area where Zika virus is spreading**
  - Women trying to become pregnant, and their male partners, should consult with their doctor before traveling to these areas and strictly follow steps to prevent mosquito bites during the trip.
- ✓ **After your trip**
  - Visit your healthcare provider right away if you develop a fever, headache, rash, muscle or joint pain. Be sure to tell your doctor about any recent international travel.

For more tips, click to view the department's [Keep Healthy and Bug Off](#) brochure.