

ARBOVIRUS SURVEILLANCE, 2006

RHODE ISLAND

HIGHLIGHTS

In Rhode Island, West Nile Virus (WNV) was first detected in tested dead birds during the summer of 2000. Since then, ten human cases (one death), 26 mosquito pools, 548 birds and five horses were identified. In 2006, WNV was detected in 10 additional mosquito pools. Eastern Equine Encephalitis (EEE) was found in three mosquito pools. The following report summarizes in detail the 2006 season in Rhode Island.

Human surveillance

The Rhode Island Department of Health is the lead agency responsible for conducting human case surveillance for arboviral encephalitis, meningitis, and meningoencephalitis. Starting June 1 and at least until October 31 (ending date to be determined based on ongoing epidemiological findings), RI HEALTH requests health care providers, emergency rooms and hospitals to report cases of encephalitis, aseptic or suspect viral meningitis over the age of 17 years, or Guillain-Barre syndrome. The RI Department of Health Laboratory's normal viral testing menu for arboviruses includes human serology and cerebrospinal fluid assays for WNV, EEE, SLE (St. Louis Encephalitis) and LE (LaCrosse Encephalitis). Communicable Disease nurses screen reports to determine if the clinical presentation meets the case criteria for arboviral neurological illness. If the case meets surveillance criteria, the hospital laboratory will be contacted and requested to submit the appropriate diagnostic specimens for testing. HEALTH nursing staff coordinate the collection of convalescent sera on all suspected case-patients with encephalitis of unknown etiology.

In 2006, specimens from 120 patients were submitted for arboviral testing. Samples were submitted from all 10 acute-care hospitals in addition to the Veterans Administration Hospital.

From June 6 to November 11, 2006, the HEALTH Lab tested 104 acute serum specimens, 13 convalescent specimens and 96 cerebrospinal fluid specimens from 120 persons with suspect WNV infection. Of those tested, all patients were reported as aseptic meningitis (age > 17 years); no patients were reported with encephalitis. All patients tested negative for arboviruses.

Veterinary surveillance

Veterinarians are required to report any suspected animal cases with neurological illnesses to DEM, Office of Agriculture. The State Veterinarian assists community veterinarians to arrange testing for WNV or EEE in horses that have severe neurological disease.

During the 2006 surveillance season, no horses were identified with any arboviral infection.

Mosquito surveillance

From the beginning of June to early October, an average of 32 trap sites were set weekly with CO₂-baited CDC light traps and/or gravid traps. Overnight mosquito collections

were done and females were sorted by species into groups of 50 or less. Trapping was expanded where positive mosquito pools were found, or if human cases were detected. Mosquito pools were assayed (via RT-PCR and cell culture, with IFA confirmation) weekly for WNV, EEE, and other selected viruses at the HEALTH Laboratory. Mosquito surveillance ended on October 8, 2006.

A total of 1382 mosquito pools (18,439 mosquitoes) were submitted for arboviral testing in 2006. Approximately 42.5% of all pools were collected in Washington County, 24.9 % in Providence County, 14.0 % in Newport County, and 13.4 % and 5.2 % in Kent County and Bristol County, respectively. See Table 1 for the distribution of all collected mosquito pools by county.

County	# pools collected (# mosquitoes)	# WNV Positive pools (Mosquito species)	# EEE Positive pools (Mosquito species)
Bristol	72 (1390)	4 (<i>Cx. pipiens</i>)	0
Kent	185 (1684)	0	0
Newport	194 (2928)	1 (<i>Cx. pipiens</i>)	0
Providence	344 (4496)	1 (<i>Cx. pipiens</i>)	0
Washington	587 (7941)	4 (3 <i>Cx. pipiens</i> , 1 <i>Cq. Perturbans</i>)	3 (1 <i>Ochlerotatus canadensis</i> , 2 <i>Cx. pipiens</i>)

In 2006, ten pools tested positive for West Nile Virus. The first positive findings were announced on August 21, by the Department of Environmental Management. Two mosquito pools, one from central Middletown and one from the Carolina Management Area of Richmond tested positive for West Nile Virus. The positive results came from *Culex pipiens* mosquitoes trapped by DEM staff during the week of August 8. Additional WNV positive findings include: three pools of *Culex pipiens* in Barrington on August 15, one pool of *Culex pipiens* in Barrington on August 21, and on September 3, four pools (*Culex pipiens* in Richmond, *Coquilletidia perturbans* and *Culex pipiens* in New Shoreham, and *Culex pipiens* in Cranston).

In 2006, three pools were confirmed positive for EEE. On September 25, DEM announced that EEE was found in a pool of *Culex pipiens* in Westerly. The positive finding came from mosquitoes trapped by DEM staff on September 19 and tested at the RI Department of Health (HEALTH) laboratory. The second positive finding was from mosquitoes trapped on October 3 from the same site. *Culex pipiens* and *Aedes canadensis* were the two species that tested positive for EEE.

Due to cooler evening temperatures and significant reductions in mosquito populations, mosquito trapping for the 2006 season ended after the October 9 trap week.

The distribution of mosquito species collected for testing can be found in Table 2.

Table 2: Mosquito surveillance by species, 2006, Rhode Island				
Scientific Name	Number Pools Collected	Number of Mosquitoes	Number of positive WNV pools (Number in pools)	Number of positive EEE pools (Number in pools)
<i>Aedes cinereus</i>	1	9		
<i>Aedes vexans</i>	236	4143		
<i>Anopheles barberi</i>	1	1		
<i>Anopheles punctipennis</i>	84	316		
<i>Anopheles quadrimaculatus</i>	32	120		
<i>Anopheles walkeri</i>	4	5		
<i>Coquillettidia perturbans</i>	138	1978	1 (3 in pool)	
<i>Culex erraticus</i>	8	21		
<i>Culex pipiens</i>	320	6583	9 (325)	2 (97)
<i>Culex restuans</i>	22	252		
<i>Culex salinarius</i>	14	143		
<i>Culex territans</i>	3	11		
<i>Culiseta impatiens</i>	5	7		
<i>Culiseta inornata</i>	4	9		
<i>Culiseta melanura</i>	20	77		
<i>Culiseta minnesotae</i>	2	2		
<i>Culiseta morsitans</i>	3	4		
<i>Ochlerotatus abserratus</i>	20	85		
<i>Ochlerotatus aurifer</i>	2	13		
<i>Ochlerotatus canadensis</i>	137	1889		1 (11 in pool)
<i>Ochlerotatus cantator</i>	42	305		
<i>Ochlerotatus communis</i>	4	18		
<i>Ochlerotatus diantaeus</i>	1	1		
<i>Ochlerotatus dorsalis</i>	1	7		
<i>Ochlerotatus excrucians</i>	13	67		
<i>Ochlerotatus fitchii</i>	4	4		
<i>Ochlerotatus hendersoni</i>	7	12		
<i>Ochlerotatus intrudens</i>	5	28		
<i>Ochlerotatus j. japonicus</i>	60	130		
<i>Ochlerotatus provocans</i>	2	2		
<i>Ochlerotatus punctor</i>	3	19		
<i>Ochlerotatus sollicitans</i>	34	445		
<i>Ochlerotatus stimulans</i>	16	496		
<i>Ochlerotatus taeniorhynchus</i>	52	643		
<i>Ochlerotatus thibaulti</i>	1	6		
<i>Ochlerotatus triseriatus</i>	18	160		
<i>Ochlerotatus trivittatus</i>	49	356		
<i>Psorophora ferox</i>	26	155		

Avian surveillance

Because West Nile Virus and Eastern Equine Encephalitis are both firmly established throughout the state, a decision was made not to discontinue testing birds for those viruses as an "early warning." The Department of Environmental Management deactivated its WNV/EEE bird hotline prior to the 2006 season.

Comparison of National and Rhode Island WNV Surveillance

1999 28 counties in 4 states reported any WNV activity
 2000 136 counties in 12 states & DC reported any WNV activity
 2001 358 counties in 27 states & DC reported any WNV activity
 2002 2,480 counties in 44 states & DC reported any WNV activity
 2003 1,890 counties in 46 states & DC reported any WNV activity
 2004 47 states, DC, NYC and PR reported any WNV activity
 2005 48 states, DC, NYC and PR reported any WNV activity
 2006 48 states, DC and NYC reported any WNV activity

Reported Human WNV Disease Cases, United States, 1999-2006 YTD*					
Year	Cases	Deaths	States	Counties	Onset Dates
1999	62	7	1	6	August 2-September 24
2000	21	2	3	10	July 20-September 27
2001	66	9	10	40	July 13-December 7
2002	4156	284	39 & DC	708	May 19-December 14
2003	9862	264	46 & DC	1079	April 14 – December 5
2004	2539	100	40, & DC & NYC	505	April 23 – November 16
2005	3000	119	42, & DC & NYC	632	January 2 – December 16
2006	4256	165	43 & DC	730	January 6 – December 18

* 2006 YTD totals are as of 3/06/2007

Reported Human WNV Disease Cases, Rhode Island, 1999-2006		
Year	Number of persons tested	Number of persons positive for WNV
1999	0	0
2000	42	0
2001	43	0
2002	82	2
2003	120	7
2004	134	0
2005	156	1
2006	121	0

WNV Surveillance, US, 1999-2006*, Summary of Mosquito Data					
Year	# of positive pools	# of species	Earliest + pool	States	Counties
1999	18	6	9/12/99	3	8
2000	515	17	7/7/00	5	38
2001	919	27	5/31/01	16 & D.C.	70
2002	6033	29	5/22/02	33 & D.C.	---
2003	8384	51	1/18/03	41 & D.C.	944
2004	8759	49	2/10/04	38 & D.C.	420
2005	11816	43	1/21/05	42 & D.C.	427
2006	11898	39	1/26/06	39 & D.C.	762
* 2006 YTD totals are as of 3/06/2007					

WNV Surveillance, Rhode Island, 1999-2006, Summary of Mosquito Data					
Year	# of collected pools	# positive pools	Number of species	Earliest + pool	Counties
1999	0	0	0	0	0
2000	1113	0	0	0	0
2001	1856	14	8	7/16/01	3
2002	1417	4	3	8/28/02	2
2003	2383	7	2	8/21/03	3
2004	3062	0	0	---	---
2005	1466	1	1	9/19/05	1
2006	1382	10	2	8/08/06	4

WNV Surveillance, US, 1999-2006 YTD*, Summary of Dead Bird Data			
Year	# of positive birds	States	Counties
1999	249	4	28
2000	4305	12 and D.C.	136
2001	7332	26 and D.C.	328
2002	15,745	42 and D.C.	1888
2003	12,066	44 and D.C.	1689
2004	7396	47 and NYC	983
2005	5344	45	592
2006	4105	43 and NYC	700
* 2006 YTD totals are as of 3/06/2007			

WNV Surveillance, Rhode Island, 1999-2006, Summary of Dead Bird Data					
Year	Number of birds reported	Number of birds tested	Number of birds positive	Earliest + reported	Counties
1999	0	0	0	0	0
2000	1466	365	88	8/14/00	4
2001	1324	390	245	5/30/01	5
2002	1441	249	167	6/17/02	5
2003	651	75	47	8/14/03	5
2004	257	58	5	8/12/04	2
2005	108	28	2	9/21/05	2
2006	Dead-bird hotline deactivated. No avian surveillance conducted.				

WNV Surveillance, US, 1999-2006* YTD, Summary of Equine Data			
Year	# of equine cases	States	Counties
1999	25	1	2
2000	63	6	26
2001	731	19	125
2002	12038	39	1678
2003	5145	40	1271
2004	1441	38	421
2005	1139	37	382
2006	1069	35	408
* 2006 YTD totals are as of 3/06/2007			

WNV Surveillance, Rhode Island, 1999-2006, Summary of Equine Data			
Year	# of equine cases	County	Month of onset
1999	0	---	---
2000	1	Washington	August
2001	0	---	---
2002	1	Kent County	October
2003	3	Providence (1), Washington (2)	September
2004	0*	---	---
2005	0*	---	---
2006	0	---	---

* WNV was not detected, however EEE was detected in one horse in both 2004 and 2005.