



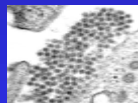
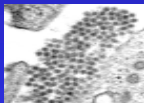
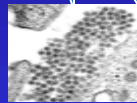
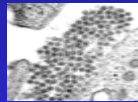
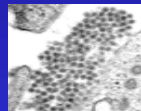
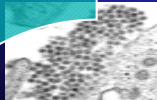
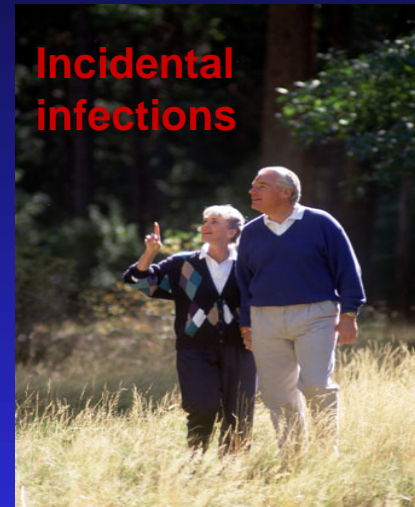
Epidemiology of WNV and EEE

Massachusetts Department of Public Health
Division of Epidemiology and Immunization

Arbovirus

- A group of viruses that are transmitted to humans by arthropods
- An arthropod is a phylum of the animal kingdom which includes arachnids, crustaceans, and insects
- West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE) virus are the two most common arboviruses spread by mosquitoes in MA

WNV/EEE virus Transmission Cycle



The Role of Epidemiologists

- Surveillance (can be active or passive) for human cases of arboviral infection
 - ◆ Investigate human cases
 - ◆ Monitor for clusters and outbreaks
- Public health and prevention education
- Communicate with LBOH; results, etc.
 - ◆ Serve as resource
- Work with lab and other experts to assess risk to humans at a given point in time

West Nile Virus (WNV)

- WNV is a single-stranded RNA virus, of the family Flaviviridae, genus flavivirus
- WNV was first documented in the US in NY in 1999 and in MA in 2000
- In addition to mosquitoes, WNV also has been shown to be spread through blood transfusions, organ transplants, breastfeeding, occupational exposure and transplacentally

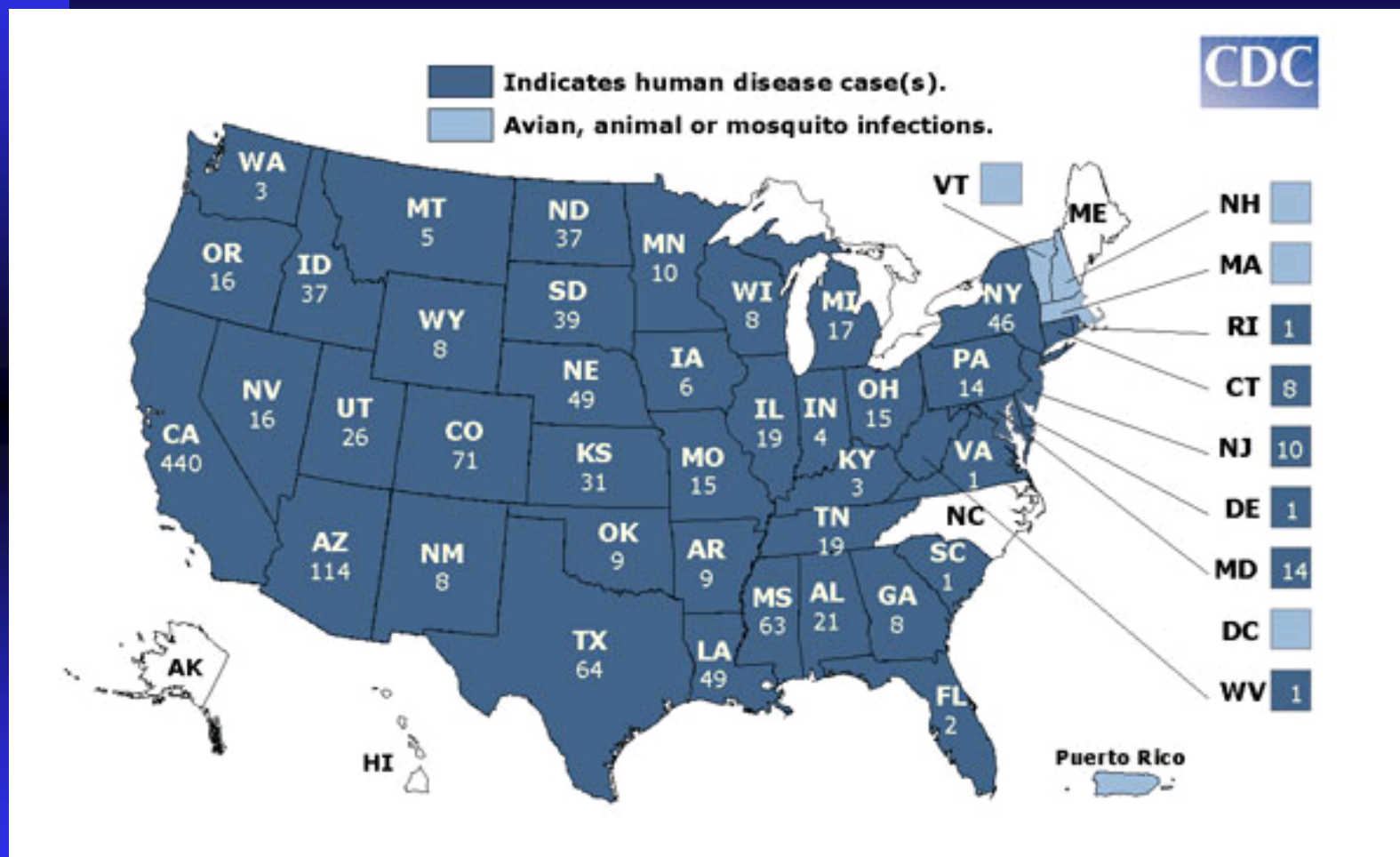
WNV Symptoms

- Incubation period of 3-15 days
- Infection but no symptoms (~80%)
- West Nile “fever”: generally mild symptoms such as fever, headache, body aches, rash, swollen lymph glands (~20%)
- More serious infections like meningitis, encephalitis, meningo-encephalitis (~ < 1%)

WNV Symptoms

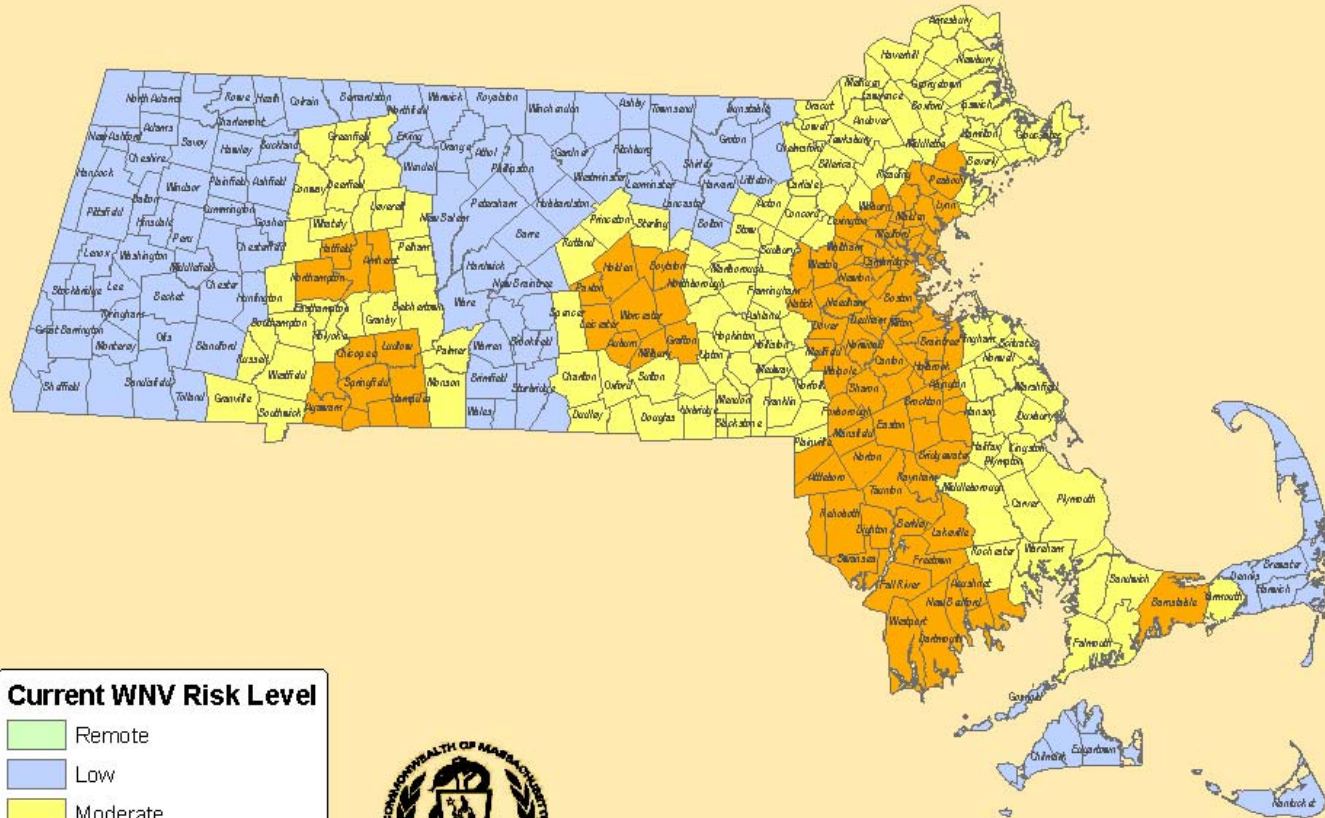
- Severe complications include acute aseptic meningitis or encephalitis, or acute flaccid paralysis
 - ◆ Death rate among those with encephalitis/meningitis: 7%-10%
- Elderly appear to be at higher risk for more severe complications
- Most fatal cases >50 years old {MA—6 fatalities—70 years and older}

2008 West Nile Virus Activity in the United States



Final 2008 Risk Categories

Massachusetts WNV Risk Categories



Current WNV Risk Level

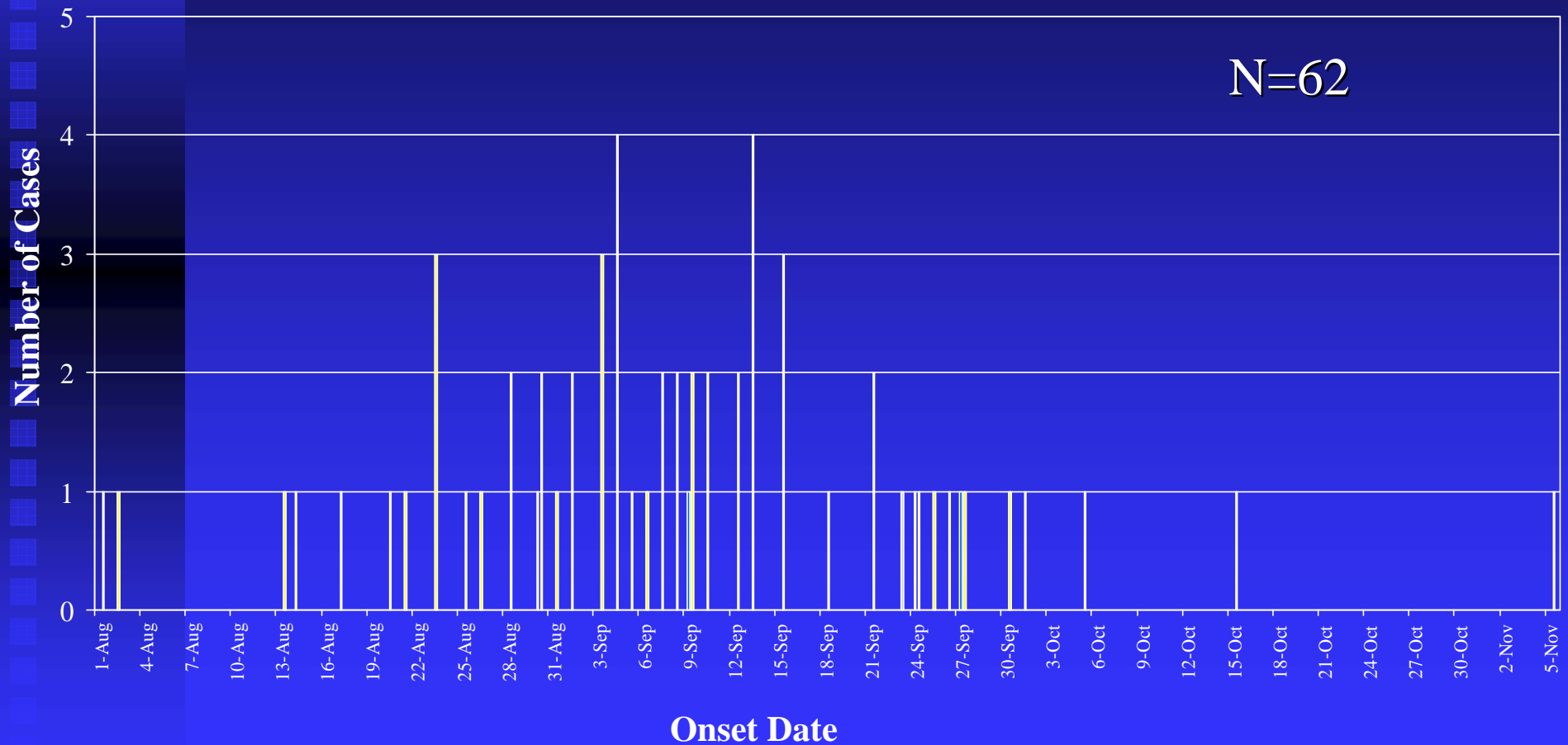
- Remote
- Low
- Moderate
- High
- Critical



State Laboratory Institute
Arbovirus Surveillance Program

Human West Nile Virus Cases Identified in Massachusetts by Date of Onset, 2001-2008

Note: There were no WNV cases reported in MA in 2004



Specimens Tested and WNV Positive in Massachusetts by Type, 2004-2008

Specimens Tested and WNV Positive by Year, 2004-2008*

Species	2004		2005		2006		2007		2008	
	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive
Birds	86	8	303	57	313	57	223	43	139	63
Mosquito Pools	7200	15	8136	99	9344	43	7271	65	4575	136
Horses	19	0	12	0	16	0	8	0	14	0
Humans	440	0	544	6	649	3	392	6*	385	1

* One MA case exposed out-of-state. Two out-of-state cases exposed in their home states are not included.

† Avian testing criteria varied year to year.

Eastern Equine Encephalitis (EEE)

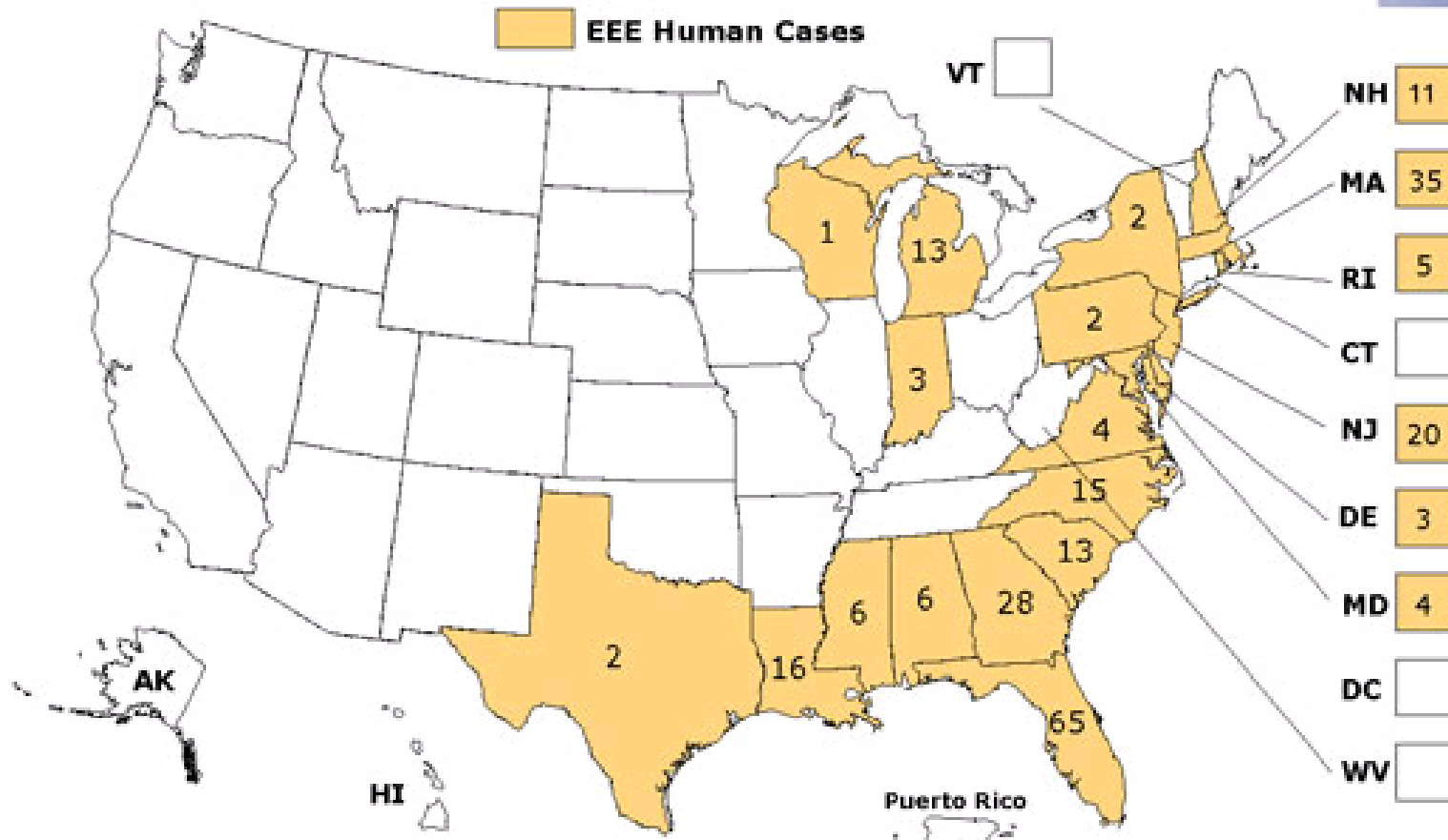
- Member of the family *Togaviridae*, genus *Alphavirus*
- First documented in the US in a horse with encephalitis in New Jersey in 1933. First human case occurred in MA in 1938.
- Most pathogenic arbovirus in the US

EEE Symptoms

- Incubation period of 2-10 days
 - ◆ Headache
 - ◆ High fever (103-106 degrees)
 - ◆ Nausea, vomiting, diarrhea
 - ◆ Lack of energy
 - ◆ Seizures
 - ◆ Coma
- 2 out of 3 people infected will either not survive or suffer severe neurological complications

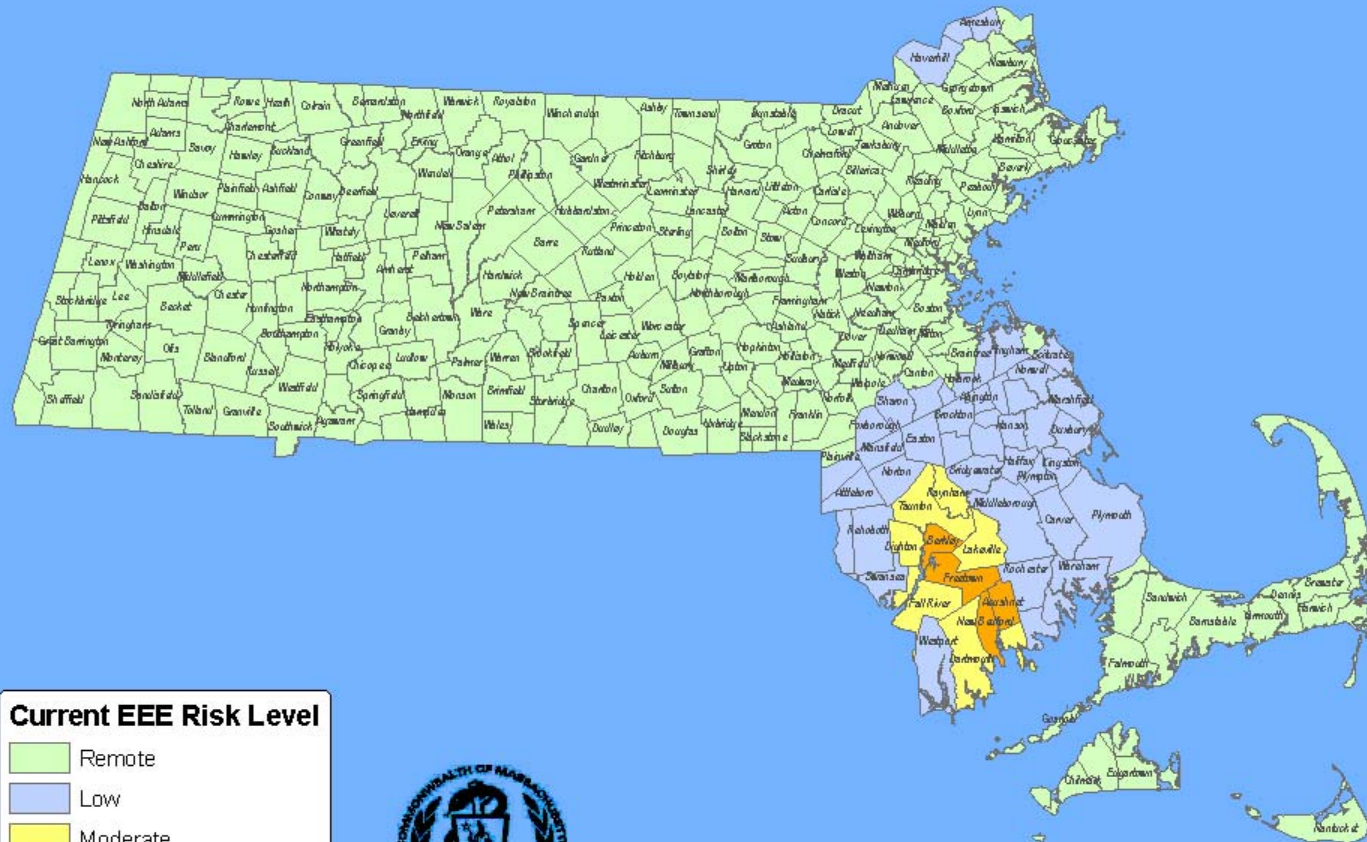
2008 EEE Virus Activity in the United States

Human Eastern Equine Encephalitis Cases by State, 1964-2007



Final 2008 EEEV Risk Categories

Massachusetts EEE Risk Categories



Current EEE Risk Level

- Remote
- Low
- Moderate
- High
- Critical



State Laboratory Institute
Arbovirus Surveillance Program

Specimens Tested and EEE Virus Positive in Massachusetts by Type, 2004-2008

	Number Tested and EEE Virus Positive by Year				
Specimen Type	2004 + / Tested	2005 + / Tested	2006 + / Tested	2007 + / Tested	2008 + / Tested
Mosquito Samples	39/7730	45/8136	157/9344	31/7271	13/4575
Humans	4/389	4/540	5/649	0/392	1/385*
Horses	7/34	4/12	6/16	0/8	1/14

** EEE virus positive results were also recorded in one emu in 2003; one emu and one alpaca in 2004, and one emu in 2005