



2018 VECTORBORNE DISEASE UPDATE



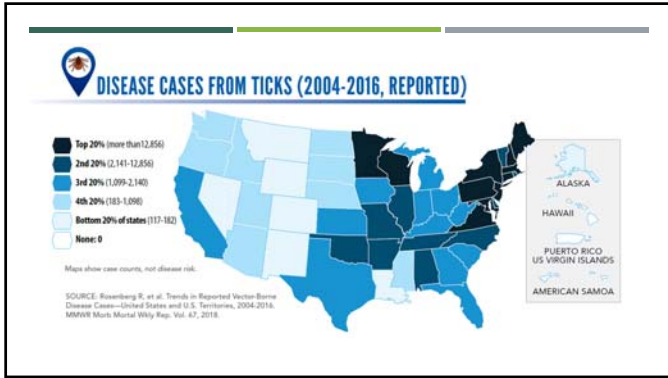
KAREN WORTHINGTON, MS, RN
VECTOR-BORNE DISEASE PROGRAM

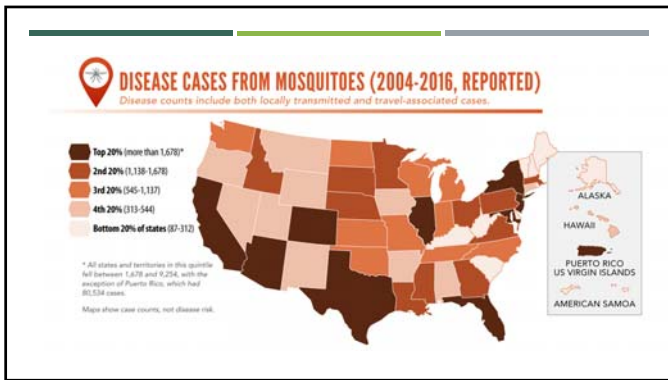
OVERVIEW

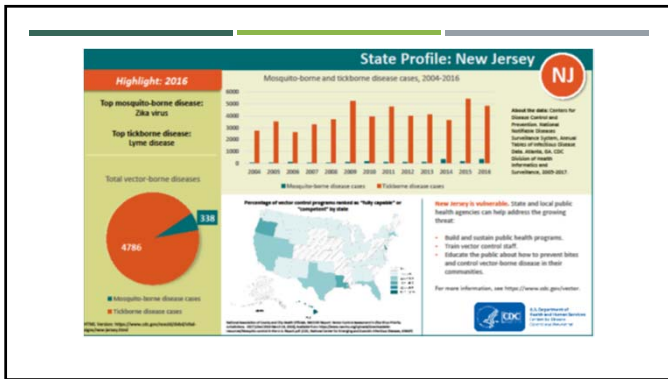
- Vectorborne disease overview
- NJ surveillance trends and updates
- Arboviral disease presentations and testing

- Disease cases from mosquito, tick and flea bites tripled in the US from 2004 to 2016
- 9 new germs spread by mosquitoes and ticks discovered or introduced since 2004
- 80% of vector control agencies lack critical prevention and control capacities







VB DISEASE BASICS









- Vector – mosquito, tick, flea that transmits the pathogen
- Animal hosts – birds, small or large mammals that vectors must feed upon to grow to adulthood
 - Some enable the pathogen to replicate and be passed to uninfected vectors
 - Others are dead-end hosts – pathogen level doesn't get high enough to transmit
- Pathogen – parasite, bacteria or virus causing infection and sometimes disease.
 - Parasite: Plasmodium, Babesia
 - Bacteria: Borrelia burgdorferi, Ehrlichia, Anaplasma, Rickettsia rickettsia,
 - Arbovirus: WNV, EEE, Zika, Dengue, Chikungunya, Powassan

PREVENTION OF VECTORBORNE DISEASE


Individual

- Vaccination – only 2 licensed in US
- Immune globulin – some lab exposures
- Reduce ticks / mosquitoes / animal hosts at home
- Use tick or mosquito repellent
- Showers / tick checks after possible tick exposure
- After return from travel, avoid getting mosquito bites for 3 weeks to prevent introduction of new diseases to NJ mosquitoes.


Public Health

- 1920 - NJ State Mosquito Control Commission
- Mosquito control agencies in all NJ counties
 - Mosquito trapping / testing at PHEL
 - Targeted mosquito control activities in community
 - Visits to homes of positive cases to reduce mosquito habitat
- No equivalent tick control activities – yet.
- NJ interagency Vectorborne Disease Working Group


VECTORBORNE DISEASE PREVENTION RESOURCES




<https://nj.gov/health/cd/statistics/arbviralsz/index.shtml>





Under revision



<https://nj.gov/health/cd/topics/vectorborne.shtml>



MOST RELEVANT VECTORBORNE DISEASES IN NEW JERSEY - 2017


<p style="text-align: center;">TICK</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Locally acquired</p> <p>Lyme (5107) Babesiosis (193) Anaplasmosis (154) Spotted Fever Group Rickettsiosis (137) Ehrlichiosis (102) Powassan (4)</p> </div> 	<p style="text-align: center;">MOSQUITO</p> <table border="0" style="width: 100%;"> <tr> <td style="border: 1px solid black; padding: 5px; width: 50%;"> <p>Locally acquired</p> <p>West Nile Virus (8) Eastern Equine Encephalitis (0)</p> </td> <td style="border: 1px solid black; padding: 5px; width: 50%;"> <p>Travel-related</p> <p>Malaria (125) Zika (37) Dengue (25) Chikungunya (12)</p> </td> </tr> </table> 	<p>Locally acquired</p> <p>West Nile Virus (8) Eastern Equine Encephalitis (0)</p>	<p>Travel-related</p> <p>Malaria (125) Zika (37) Dengue (25) Chikungunya (12)</p>
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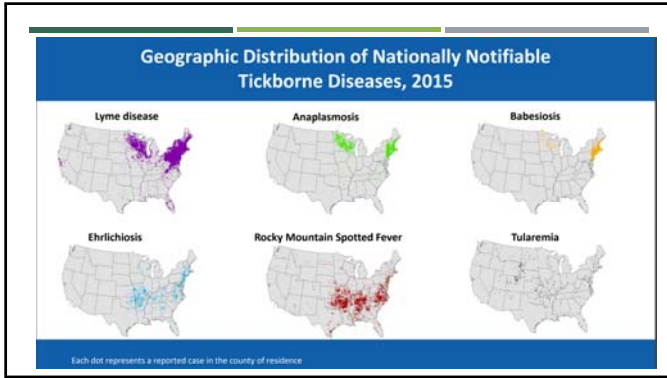
UNCOMMON AND EMERGING VECTORBORNE DISEASES OF POSSIBLE CONCERN

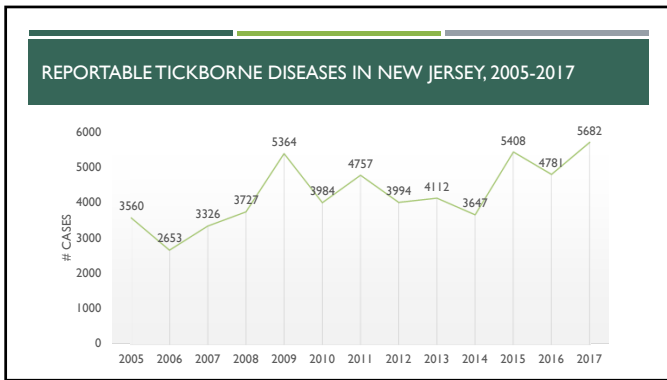
<p style="text-align: center;">Could be acquired within the U.S.</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Tick</p> <p>Heartland Virus – Midwest, South Bourbon Virus – Midwest, South Powassan – Northeast, Great Lakes</p> <p>Mosquito</p> <p>Eastern Equine Encephalitis – East coast, Great Lakes, Mississippi LaCrosse Virus – Upper Midwest, mid-Atlantic, SE states Jamestown Canyon Virus – New York, Connecticut</p> </div>	<p style="text-align: center;">International travel-related</p> <div style="border: 1px solid black; padding: 5px;"> <p>Mosquito</p> <p>Usutu virus – Austria, Europe Yellow fever – Africa, S.America</p> </div>
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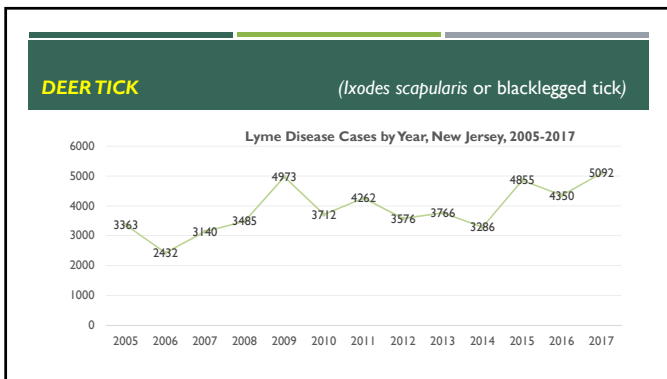
All are arboviruses, many of which can be neuroinvasive.

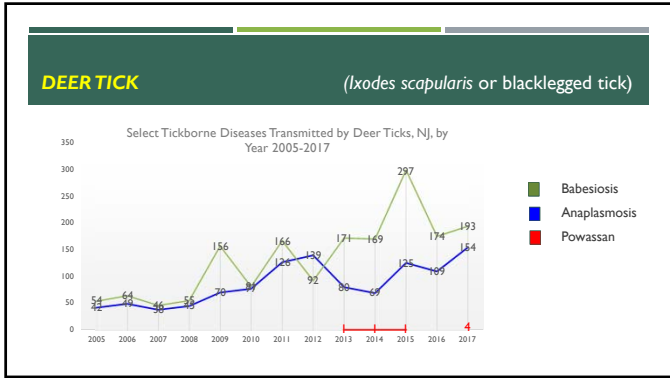
NEW TICK OF POSSIBLE CONCERN – “ASIAN LONGHORNED TICK” (Haemaphysalis longicornis)

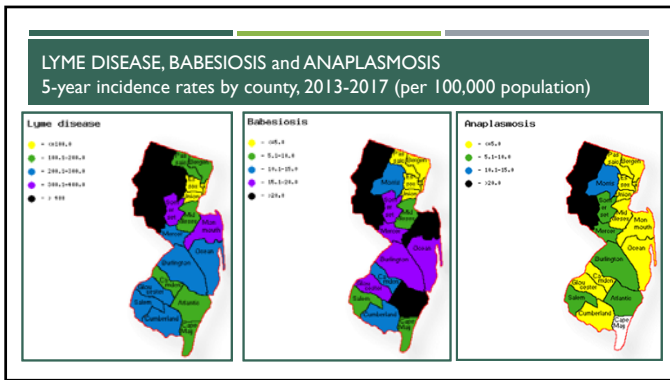
<ul style="list-style-type: none"> • First U.S. identification - Hunterdon County, 2017 • Now in Hunterdon, Union, Bergen, Middlesex, Mercer • Other states: NC, WV, VA, AR, NY, PA, MD • Collected from: sheep, deer, cow, raccoon, opossum, horse, goat, dog, cat 	
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>NJ Department of Agriculture Information Line: 833-NEW TICK or 833-639-8425</p> </div> <ul style="list-style-type: none"> • Impact on human health unknown • Testing of the tick for human pathogens so far negative • In Asia, Australia – associated with Powassan, a viral hemorrhagic fever and Japanese Spotted Fever. • Surveillance is ongoing 	











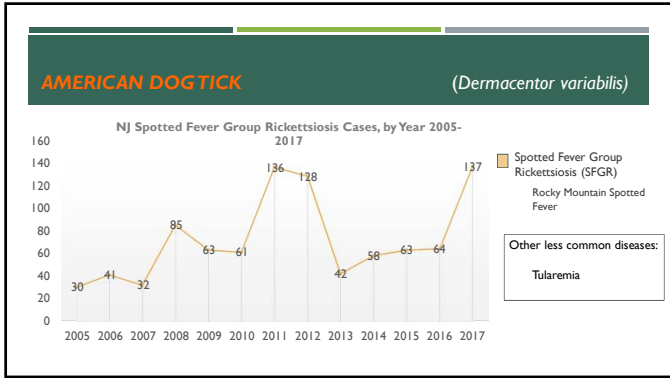
DEERTICK - UPDATES

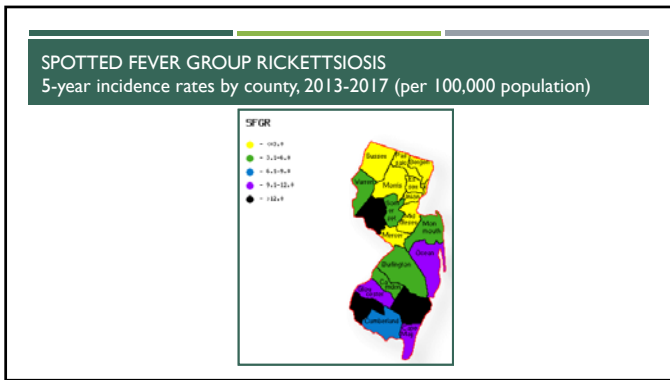
FIRST REPORTED B. Miyamotoi infections

- 1995- *Borelia miyamotoi* identified in ticks in Japan
- 2011 - found to be a pathogen in humans in Russia
- 2013 - first cases in U.S., including Hunterdon Co.
- Not a reportable disease; reporting encouraged
- September 2018 - 2 cases identified in Cape May and Warren Counties
- Symptoms range from flu-like illness to meningencephalitis

TRANSFUSION-TRANSMITTED BABESIOSIS

- Most common transfusion-transmitted pathogen
- Leading cause of mortality in transfusion recipients
- Timely investigations needed to identify h/o blood transfusion/donation or organ transplant
- Expect more LHD inquiries re: transfusion dates, blood products and sources
- New NJDOH Babesiosis Investigation Worksheet includes questions about transfusion/donation



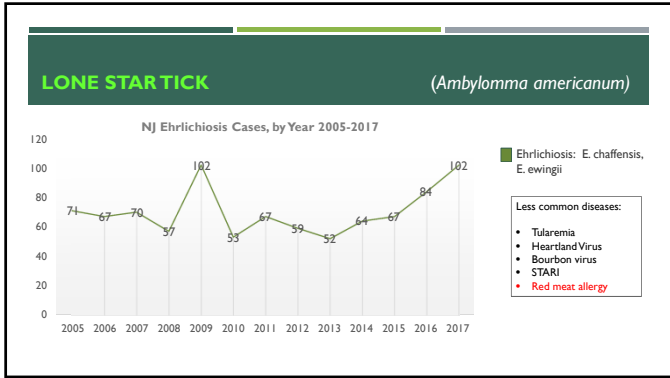


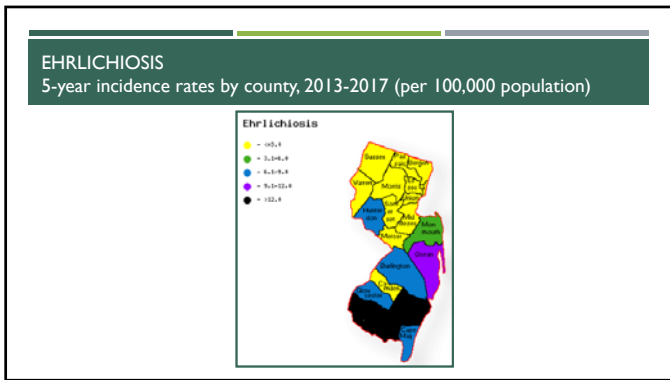
AMERICAN DOGTICK - UPDATE **NEW!**

SPOTTED FEVER GROUP RICKETTSIOSIS

- PCR testing on whole blood, rash/eschar biopsies now available at NJ PHEU/CDC
- Indications: 3 to 8 days after symptom onset or in severely ill patients
- Specimen: Before or within 24 hours of antibiotics
 - 3 ml of whole blood in a lavender top tube
 - Biopsy tissue or eschar swab specimens in dry, sterile container
- Forms: Complete SFGR Investigation worksheet
- Approval: E-mail to NJDOH Vectorborne Disease Team: CDSVectorTeam@doh.nj.gov
- Send acute and convalescent serology specimens to commercial lab

Don't delay initiation of antibiotic therapy!





GULF COASTTICK – HAS IT ARRIVED IN NJ?

NEW!






Rickettsia parkeri

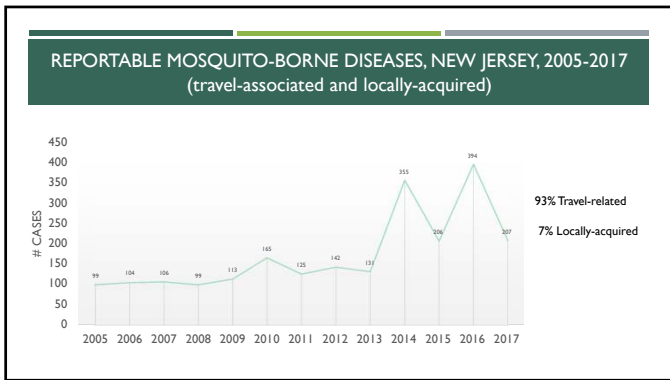
- Less severe illness than Rocky Mountain Spotted Fever – so probably not hospitalized
- Almost always associated with an inoculation eschar at site of tick attachment
- PCR testing and convalescent serologies can help to differentiate from the more serious Rocky Mountain Spotted Fever
 - PCR specimens before or within 24 hours of antibiotics (PHEU/CDC)
 - 3 ml of whole blood in a lavender top tube
 - Swab of eschar in dry, sterile container
 - Convalescent specimens 2-4 weeks after acute (commercial lab)

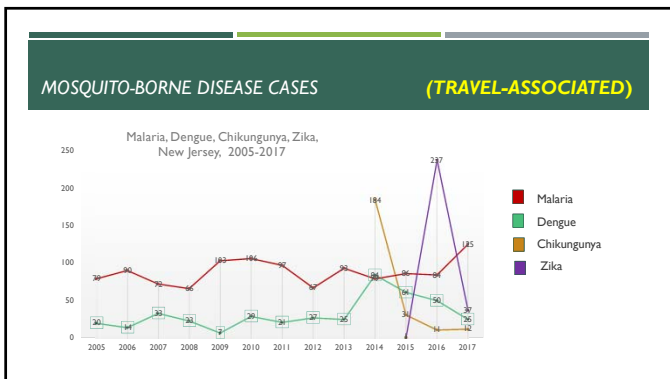


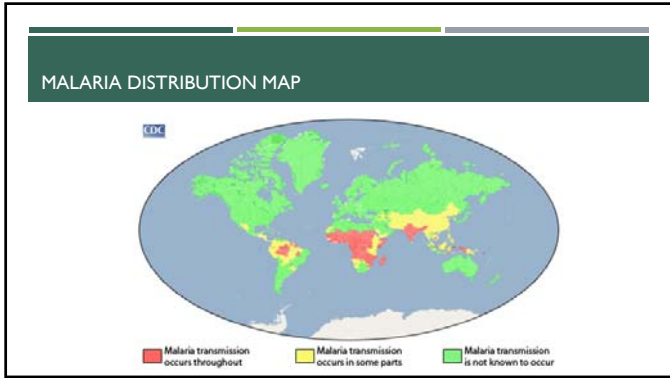

MOSQUITO-BORNE DISEASE IN NJ RESIDENTS

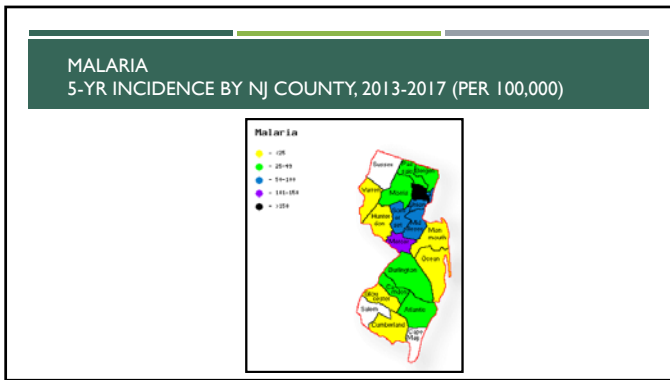
Travel-related	Locally acquired
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Chikungunya(12)	

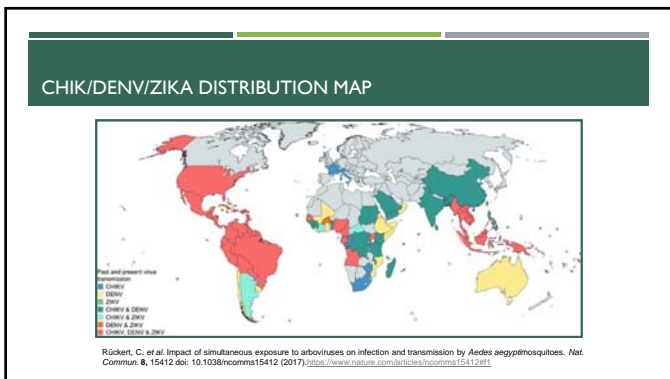
















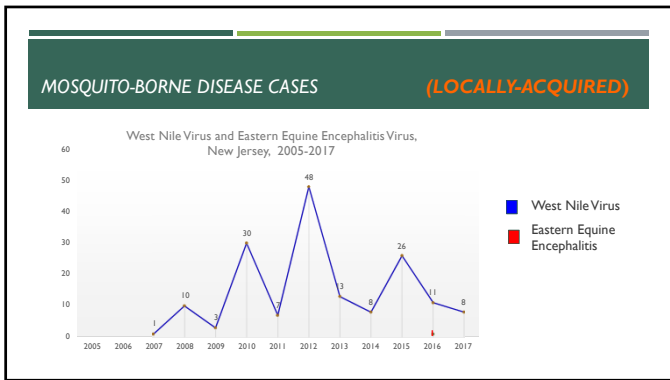
ZIKA - KEY UPDATES AT YEAR 3 **NEW!**

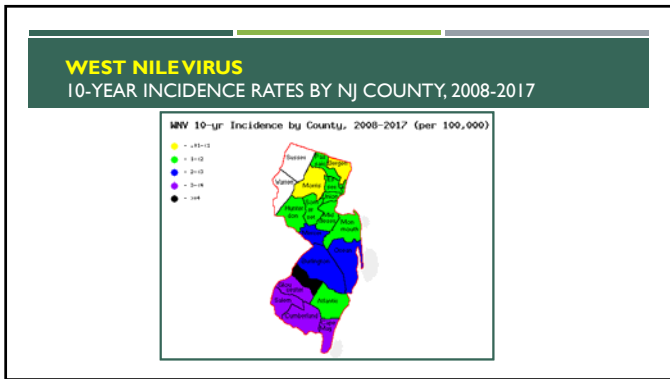
- 1 in 7 infants evaluated in U.S. territories with local Zika transmission had a Zika-related condition.
- Careful monitoring of infants born to infected mothers is essential for early detection of developmental abnormalities.
- Continue to screen pregnant women for travel Zika exposure.
- Men with possible Zika exposure should wait 3 months before unprotected sex.

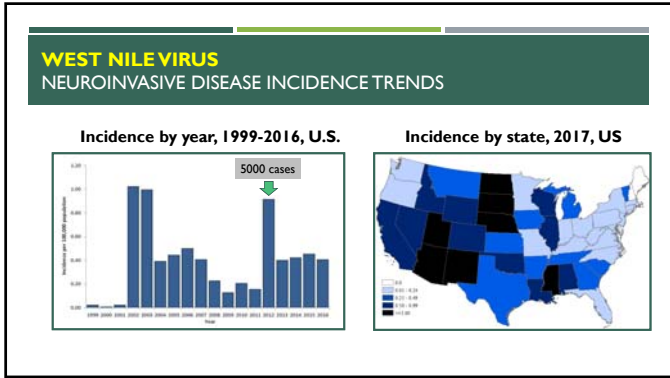
We must continue to monitor babies who were infected with Zika virus before birth.

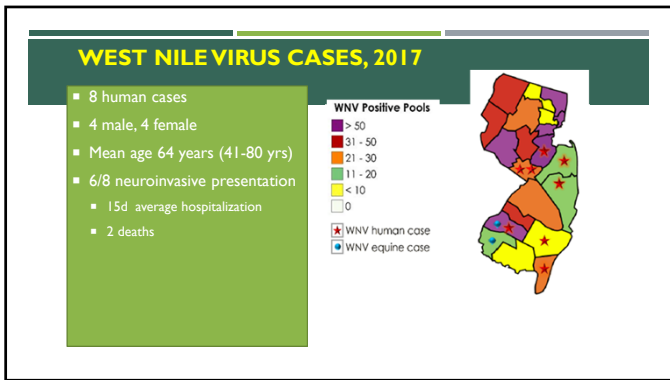


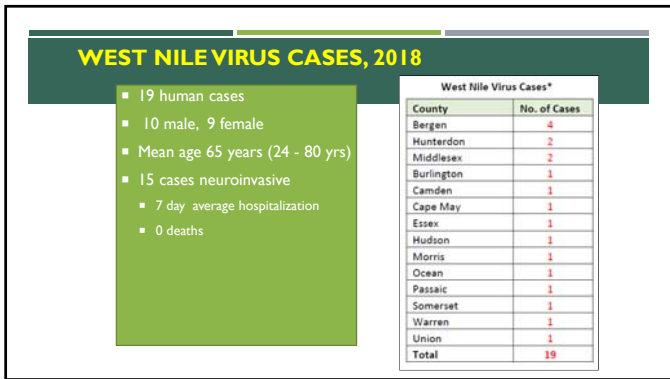
#PREVENT2PROTECT

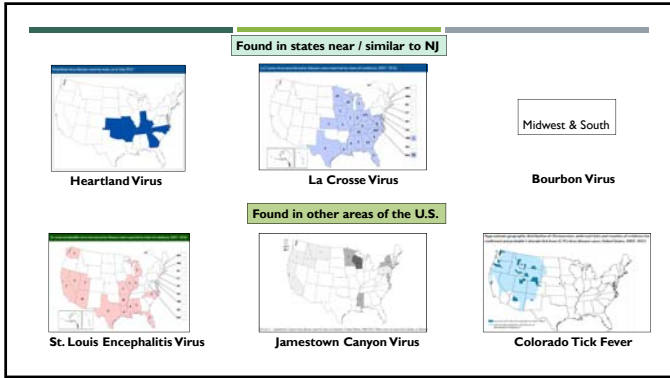












ARBOVIRAL SYSTEMIC ILLNESS VS NEUROINVASIVE DISEASE

<p><u>Systemic Illness</u></p> <ul style="list-style-type: none"> ■ Febrile illness ■ Fever/rash/arthralgias, myalgias ■ Flu-like illness ■ Flu-like illness with arthralgias, conjunctivitis ■ Flu-like illness with N&V ■ Flu-like illness with N&V, hepatitis, rash, hemorrhagic fever 	<p><u>Neuroinvasive Diseases</u></p> <ul style="list-style-type: none"> ■ Meningitis ■ Encephalitis ■ Myelitis ■ Encephalomyelitis ■ Neuritis ■ Myositis
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■ Frequent forerunners of neuroinvasive disease: altered mental status, muscle weakness/paralysis


ARBOVIRAL TESTING

<p>Testing options</p> <ul style="list-style-type: none"> ■ Commercial <ul style="list-style-type: none"> ■ Available for many arboviruses: WNV, Zika, Dengue, Chikungunya ■ Public health or specialty laboratories: <ul style="list-style-type: none"> ■ Rare or emerging diseases: EEE, Jamestown Canyon, Powassan, Yellow Fever ■ NOTE: Currently limited at NJ PHEL 	<p>Testing at NJ PHEL or CDC</p> <ul style="list-style-type: none"> ■ Case-by-case consultation ■ Focus <ul style="list-style-type: none"> ■ Hospitalized patients ■ Clinically compatible illness ■ Neuroinvasive presentation ■ Suspected arboviral disease ■ Risk factors – e.g., known outdoor exposures / travel history ■ Absence of another known etiology
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REQUESTING ARBOVIRAL TESTING FOR HOSPITALIZED PATIENTS WITH NEUROINVASIVE DISEASE

1. Complete the NJDOH Arboviral Testing Request Worksheet
2. E-mail to NJDOH at: CDSVectorTeam@doh.nj.gov (preferred) or fax to 609-826-4874.
3. If approved, CDSVector Team sends SRD-1 form for completion along with specimen collection and shipping instructions.
4. When specimen collection date/time and submitting laboratory information is completed, e-mail or fax the completed form to the CDSVector Team as above.
5. Testing can take up to 3 weeks from time specimen is received at CDC (via PHEL). Results will be faxed to HCP and hospital listed on SRD-1 form.

NJDOH Arboviral Testing Request Worksheet



<https://www.nj.gov/health/cd/topics/vectorborne.shtml>

INFORMATION TO GATHER ARBOVIRAL WORKSHEET

<p>Signs & Symptoms</p> <ul style="list-style-type: none"> ■ Fever ■ Headache ■ Myalgia ■ Rash ■ Altered mental status ■ Stiff neck / meningeal signs ■ Seizures 	<p>Lab Information / Test Results</p> <ul style="list-style-type: none"> ■ CBC - WBC ■ CSF – glu, prot, WBC ■ Brain imaging 	<p>Testing to R/O other causes:</p> <ul style="list-style-type: none"> ■ Cytomegalovirus ■ Enteroviruses ■ Epstein Barr virus ■ Herpes Simplex virus ■ La Crosse virus ■ St. Louis Encephalitis ■ Varicella Zoster ■ West Nile virus 	<p>Current Diagnosis:</p> <ul style="list-style-type: none"> ■ Encephalitis ■ Meningitis ■ Other
<p>Travel / exposure risk factors</p>	<p>Vaccination history</p> <ul style="list-style-type: none"> ■ Japanese Enceph., Yellow Fever, Dengue 	<p>Transfusion / transplants</p>	

IN CONCLUSION

- Tick and mosquito-borne disease cases in NJ are increasing
- Travelers and ticks are on the move
- Human AND vector surveillance are needed to identify new pathogens and monitor ones we know about
- Diagnosis of rare or emerging diseases (*B. miyamotoi*, Powassan, Bourbon virus, Heartland virus) rely on clinician awareness and specialized testing

Thank You!

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