# Welcome

**Office for State, Tribal, Local and Territorial Support**
presents

## CDC *Vital Signs* Town Hall
## Vector-Borne Diseases: The Growing Threat

May 8, 2018
2:00–3:00 PM (EDT)

# Agenda

| Time | Agenda Item | Speaker(s) |
|---|---|---|
| 2:00 pm | Welcome & Introduction | **José T. Montero, MD, MHCDS**<br>Director, Office for State, Tribal, Local and Territorial Support |
| 2:05 pm | Vital Signs Overview | **Lyle R. Petersen, MD, MPH**<br>Director, Division of Vector-Borne Diseases (DVBD), National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention |
| 2:10 pm | Presentations | **David Neitzel, MS**<br>Epidemiologist, Supervisor, Vectorborne Diseases Unit, Foodborne, Waterborne, Vectorborne and Zoonotic Diseases Section, Minnesota Department of Health<br><br>**Claudia Riegel, PhD**<br>Director, New Orleans Mosquito, Termite, and Rodent Control Board |
| 2:35 pm | Q&A and Discussion | **José T. Montero, MD, MHCDS** |
| 2:55 pm | Wrap-up | |
| 3:00 pm | End of Call | |

CDC Vitalsigns™

TOWN HALL TELECONFERENCE

to support STLT efforts and build momentum around the monthly release of CDC *Vital Signs*

# *Vital Signs*: Illnesses on the rise from mosquito, tick, and flea bites

**Lyle Petersen, MD, MPH**

Director, Division of Vector-Borne Diseases

National Center for Emerging and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention

# More cases in the US (2004-2016)

- The number of reported cases of disease from mosquito, tick, and flea bites has more than tripled.
- More than 640,000 cases of these diseases were reported from 2004 to 2016.
- Disease cases from ticks have doubled.
- Mosquito-borne disease epidemics happen more frequently.

## More germs (2004-2016)

- Chikungunya and Zika viruses caused outbreaks in the US for the first time.
- Seven new tickborne germs can infect people in the US.

## More people at risk

- Commerce moves mosquitoes, ticks, and fleas around the world.
- Infected travelers can introduce and spread germs across the world.
- Mosquitoes and ticks move germs into new areas of the US, causing more people to be at risk.

# Vector-borne diseases reported by states to CDC

**Mosquito-borne diseases:**

- California serogroup viruses
- Chikungunya virus
- Dengue viruses
- Eastern equine encephalitis virus
- Malaria plasmodium
- St. Louis encephalitis virus
- West Nile virus
- Yellow fever virus
- Zika virus

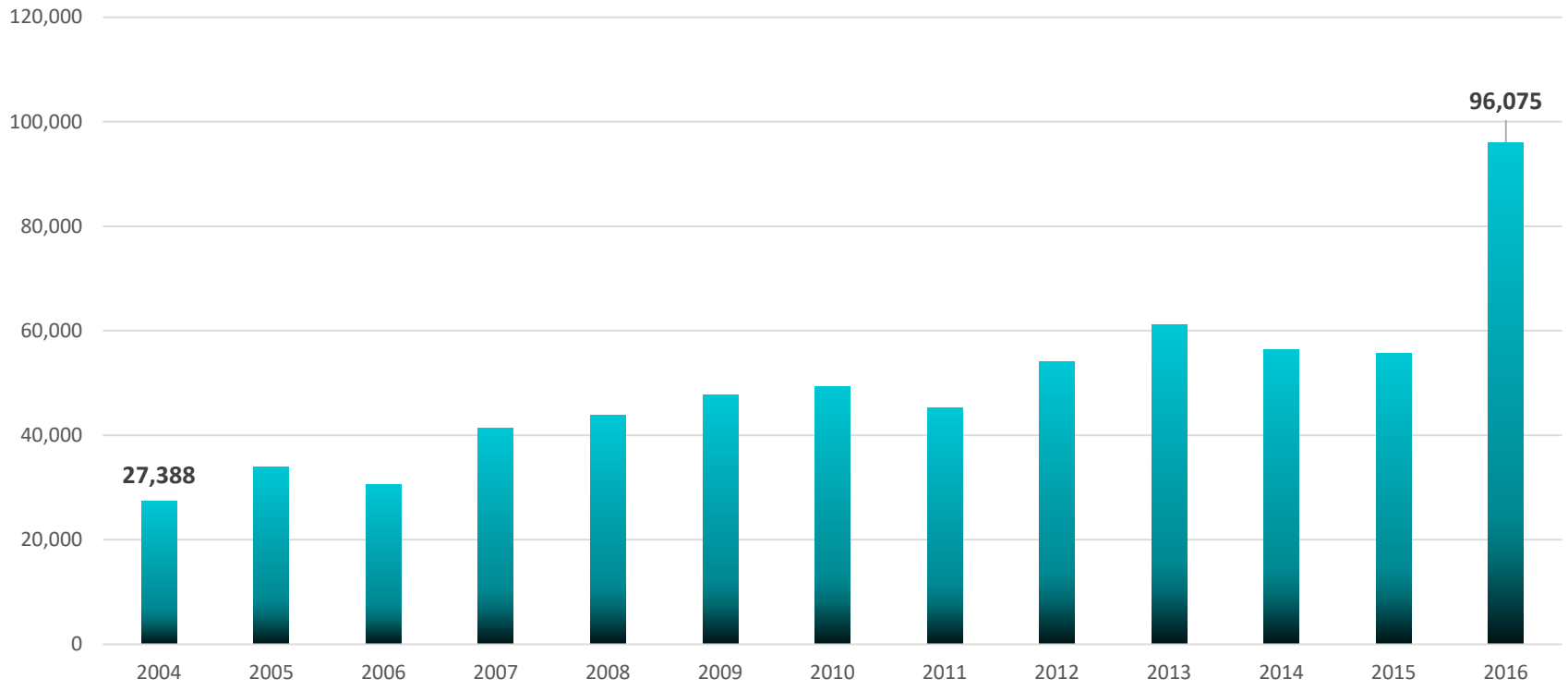
**Tickborne diseases:**

- Anaplasmosis/ehrlichiosis
- Babesiosis
- Lyme disease
- Powassan virus
- Spotted fever rickettsiosis
- Tularemia

**Fleaborne disease:**

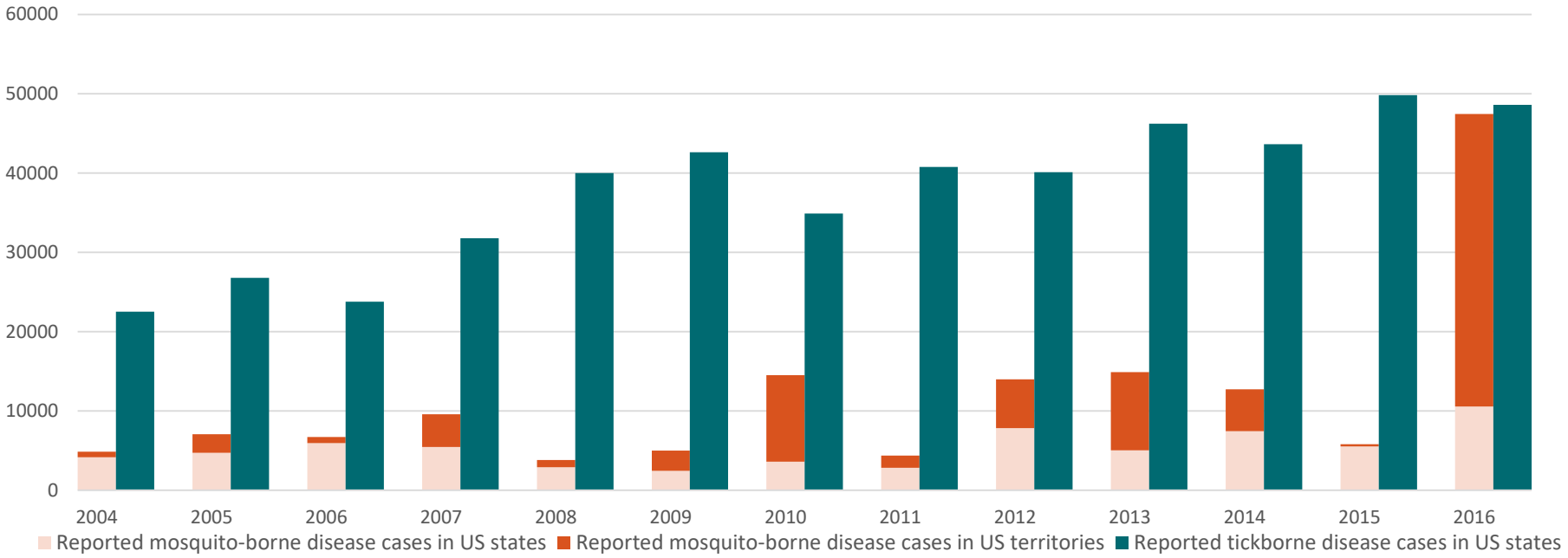
- Plague

# Disease cases from infected mosquitoes, ticks, and fleas have tripled in 13 years




Source: Rosenberg R, et al. Trends in Reported Vector-Borne Diseases Cases – United States and U.S. Territories, 2004-2016. MMWR Morb Mortal Wkly Rep. Vol. 67 , 2018.

# Reported nationally notifiable mosquito-borne*, tickborne+, and fleaborne disease cases – US states and territories, 2004-2016

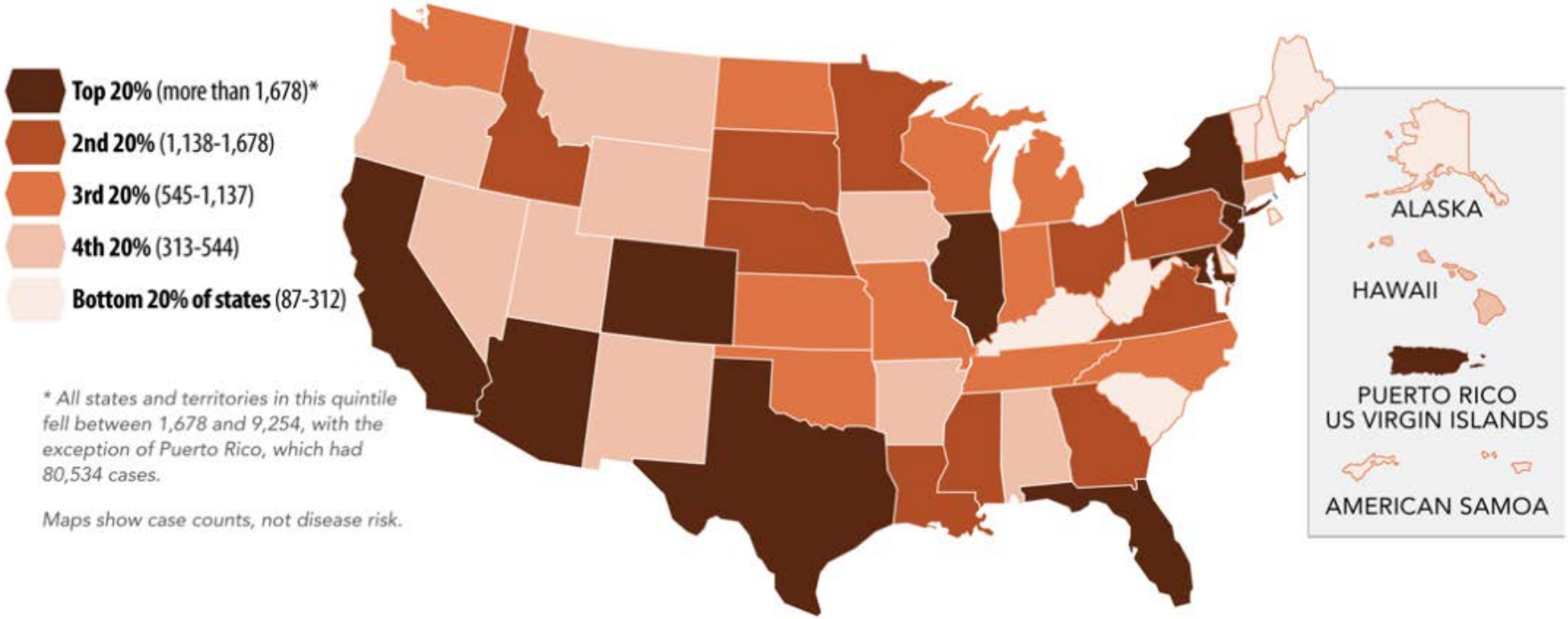



* Mosquito-borne case counts include both locally transmitted and travel-associated cases.

+ A total of 89 fleaborne disease cases (plague) were reported during 2004-2016, ranging from two cases in 2010 to 16 cases in 2015. The cases are not depicted on the figure.

Source: Rosenberg R, et al. Trends in Reported Vector-Borne Diseases Cases – United States and U.S. Territories, 2004-2016. MMWR Morb Mortal Wkly Rep. Vol. 67 , 2018.

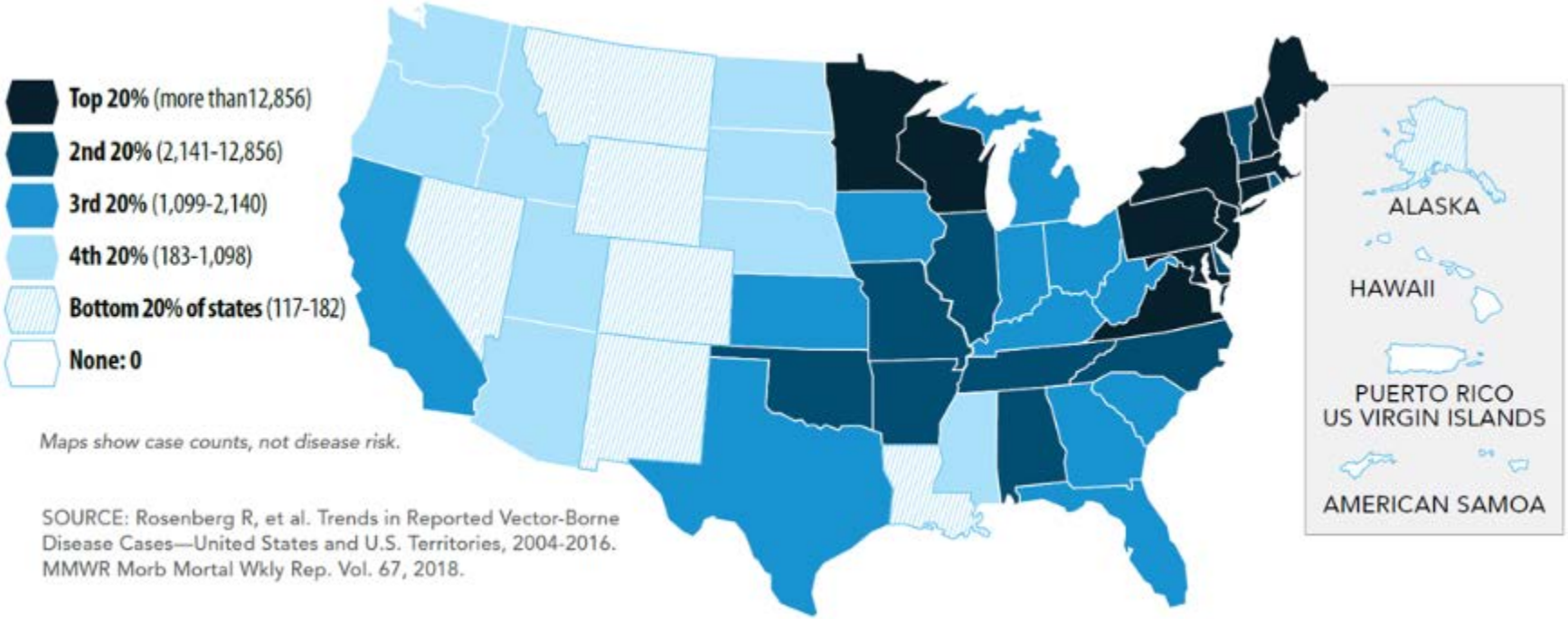
# Disease cases from mosquitoes (2004-2016, reported)




*Disease counts include both locally transmitted and travel-associated cases.*

Source: Rosenberg R, et al. Trends in Reported Vector-Borne Diseases Cases – United States and U.S. Territories, 2004-2016. MMWR Morb Mortal Wkly Rep. Vol. 67 , 2018.

# Disease cases from ticks (2004-2016, reported)




SOURCE: Rosenberg R, et al. Trends in Reported Vector-Borne Disease Cases—United States and U.S. Territories, 2004-2016. MMWR Morb Mortal Wkly Rep. Vol. 67, 2018.

# The US is not fully prepared

- Local and state health departments and vector control organizations face increasing demands to respond to these threats.
- More than 80% of vector control organizations report needing improvement in 1 or more of 5 core competencies, such as testing for pesticide resistance.[1]
- More proven and publicly accepted mosquito and tick control methods are needed to prevent and control these diseases.

[1] National Association of County and City Health Officials. NACCHO Report: Vector Control Assessment in Zika Virus Priority Jurisdictions. 2017 [cited 2018 March 19, 2018]; Available from: https://www.naccho.org/uploads/downloadable-resources/Mosquito-control-in-the-U.S.-Report.pdf.

# Controlling diseases from mosquitoes and ticks requires 5 core competencies.

Local health departments and vector control organizations must be able to:

1. Monitor and track mosquitoes and ticks locally.
2. Use data to drive local decisions about vector control.
3. Have an action plan to kill mosquitoes and ticks at every life stage.
4. Control vectors using multiple types of methods
5. Conduct pesticide-resistance testing.

# State and local health departments can:

- Build and sustain public health programs that test and track germs and the mosquitoes and ticks that spread them.
- Train vector control staff on 5 core competencies for conducting prevention and control activities
- Educate the public about how to prevent bites and control germs spread by mosquitoes, ticks, and fleas in their communities.

# Thank you!

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

# Minnesota Department of Health Vectorborne Diseases Unit

**David Neitzel, MS**
**Minnesota Department of Health**
**Infectious Disease Epidemiology, Prevention and Control Division**

**Vital Signs Town Hall Meeting**
**May 8, 2018**

DEPARTMENT OF HEALTH

# MDH Vectorborne Diseases Unit

**Agency Organization**

- Health Protection Bureau
  - Infectious Disease Epidemiology, Prevention, & Control Division

**Responsibilities and Activities**

- Conduct surveillance for vectorborne diseases in Minnesota
  - Diseases transmitted primarily by ticks and mosquitoes
  - Human cases
  - Vector monitoring
- Research
  - TickNET
  - Midwest Center of Excellence for Vectorborne Disease
  - Emerging pathogens and diseases
- Disease Prevention
  - MDH Website, media contacts, social media
  - Presentations to medical providers and public
  - Case site investigations

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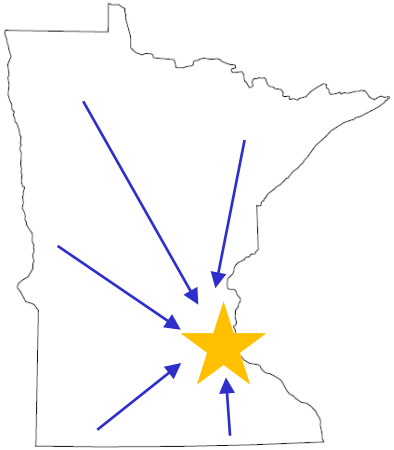
# Centralized Vectorborne Disease Surveillance

- Minnesota (MN) vectorborne disease surveillance is centralized
  - Consistent data collection and analysis over time
  - Enhanced data collection including vector exposure interviews with cases

- Ability to train permanent staff and graduate student workers to become subject matter experts in vectorborne diseases



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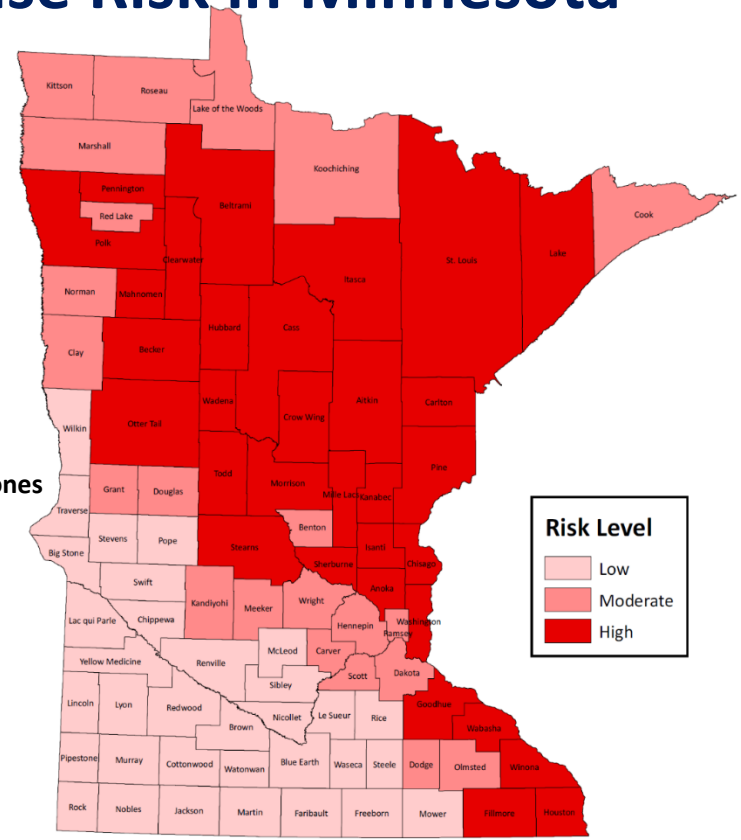
# Tickborne Disease Risk in Minnesota

**Tickborne disease risk is highest in forested areas within the shaded zones**

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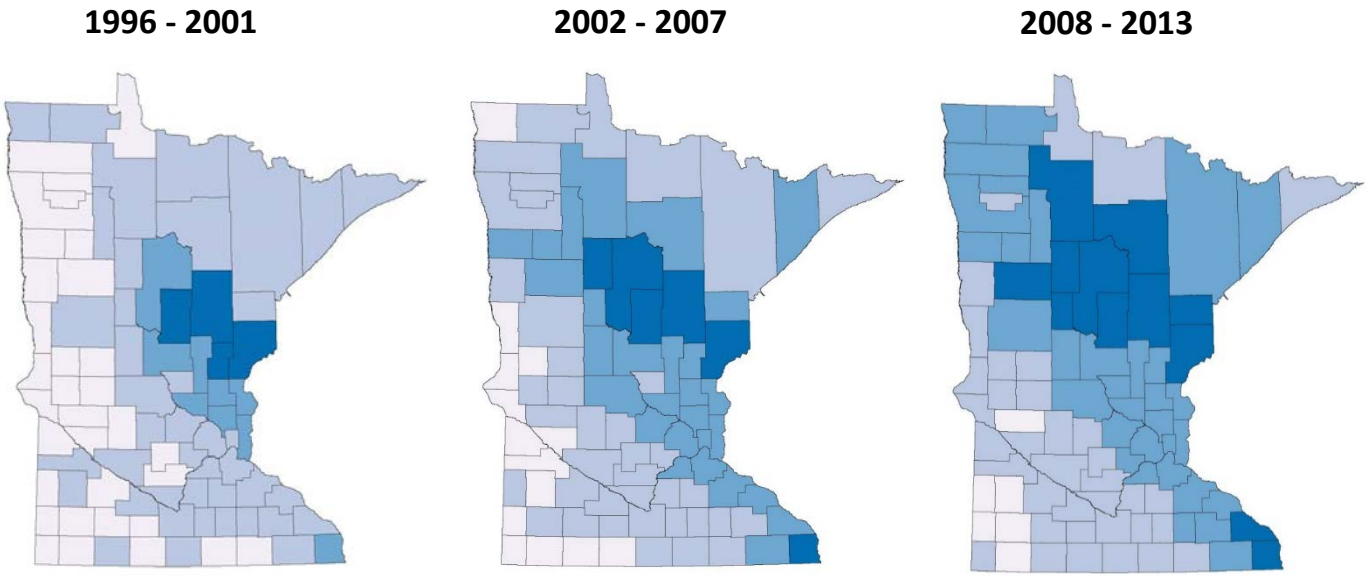
Risk is based on average incidence (cases/100,000 population) of Lyme disease, anaplasmosis, and babesiosis in Minnesota, 2007-2015.

# Distribution of MN Lyme Disease Cases by County of Residence, 1996-2013

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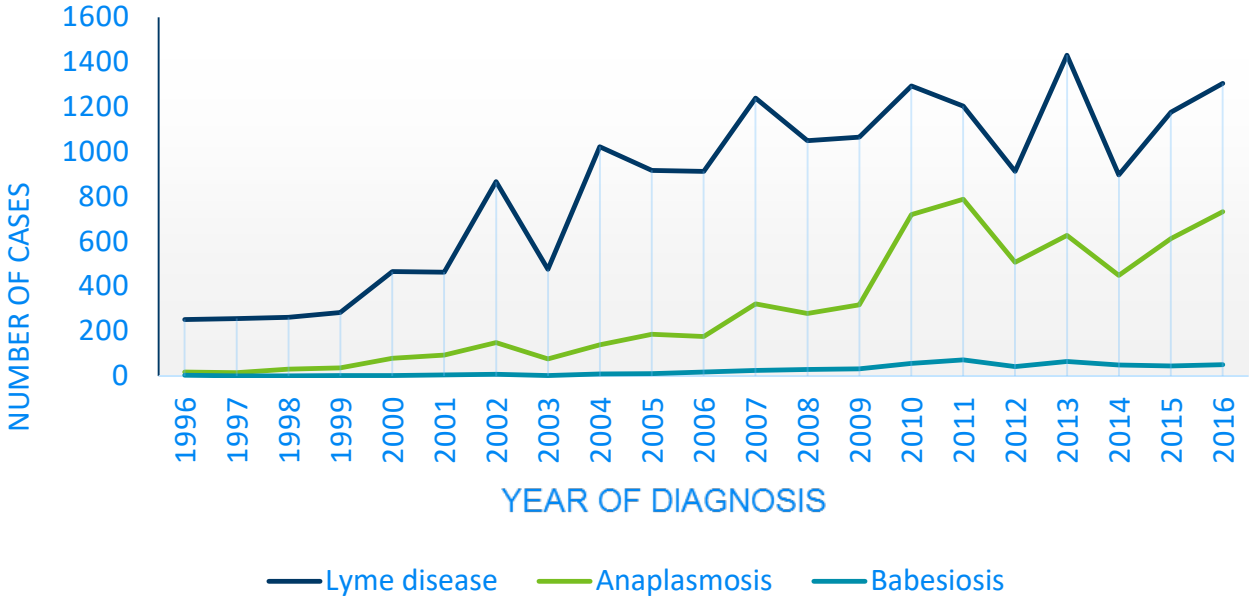
# Reported Tickborne Disease Cases in Minnesota, 1996-2016

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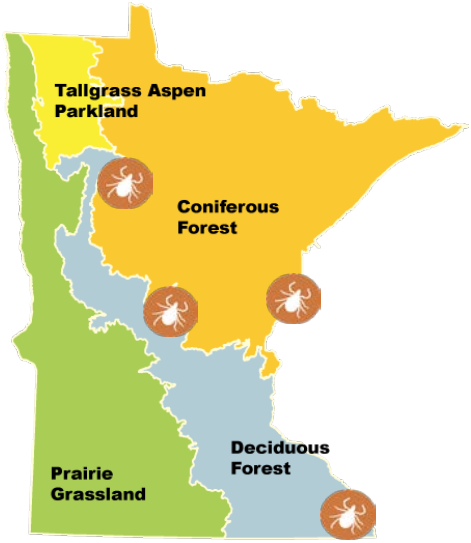
# Blacklegged Tick Infection Prevalence Monitoring

- Goal: to collect at least 100 adults and 100 nymphs annually for PCR testing
  - *Borrelia burgdorferi*
  - *Anaplasma phagocytophilum*
  - *Babesia microti*
  - *Ehrlichia muris eauclairensis*
  - *Borrelia miyamotoi*
  - *Borrelia mayonii*

- Powassan virus testing done separately at these and other sites

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# TickNET

- Established in 2007
  - Partnership between CDC and 4 states (NY, CT, MD, and MN)
  - To foster coordination among public health officials on surveillance, research, education, and prevention of tickborne diseases
- Research & Special Studies
  - Underreporting and Surveillance
  - Laboratory Burden
  - Economic Burden
  - Entomologic Risk Factors
  - Pathogen Detection and Discovery
  - Prevention Studies

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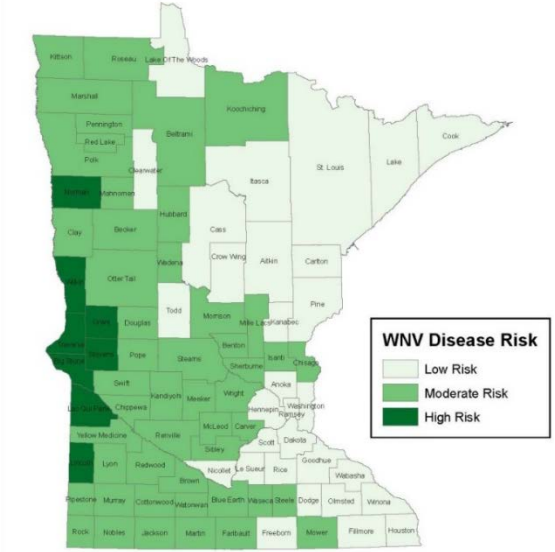
TickNET

# West Nile virus Surveillance

- **Primary vector: *Culex tarsalis***
- **Risk highest in rural agricultural regions**
- **Human case surveillance collected since 2002**
- **Decreased utility of avian and equine surveillance**

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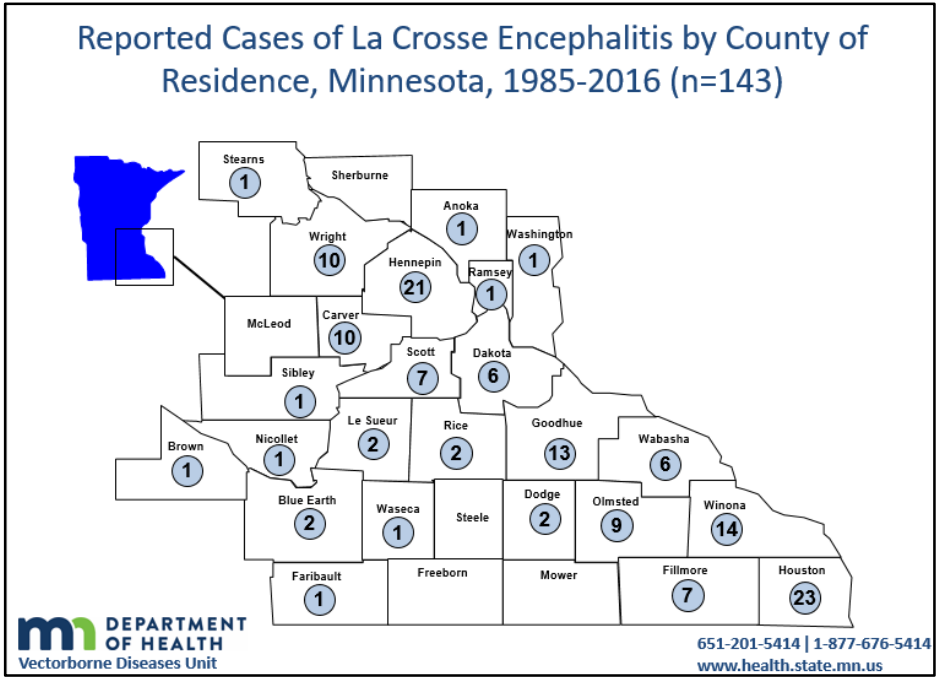
# La Crosse Encephalitis Prevention

- **Case site investigation**
  - **mosquito breeding site removal**
- **Educational Outreach**



# For More Information

**Minnesota Department of Health**

**Dave Neitzel: 651-201-5414**

**David.Neitzel@state.mn.us**

**www.health.state.mn.us**

DEPARTMENT OF HEALTH

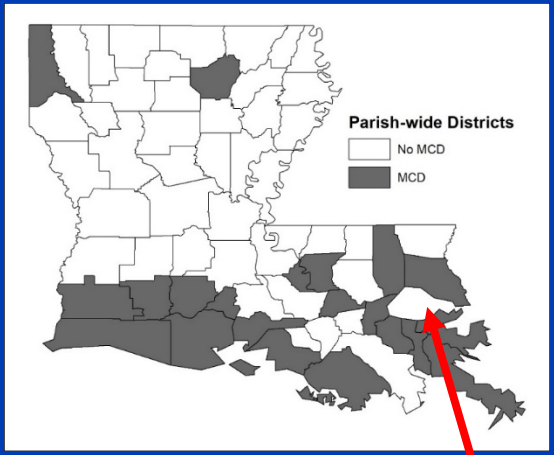
# Mosquito Control Program in New Orleans, LA

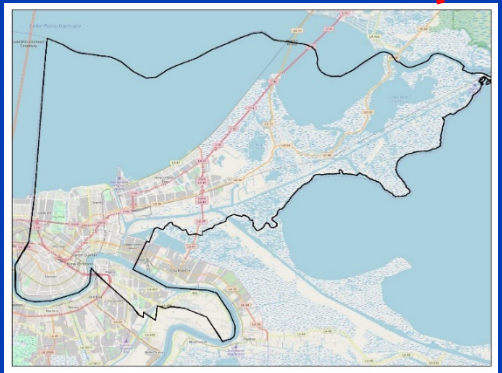
Claudia Riegel[1] and Christine Scott-Waldron[2]

[1]City of New Orleans Mosquito & Termite Control Board, [2]Louisiana Department of Health, Office of Public Health, Infectious Disease Epidemiology Section

# Mosquito Abatement Districts

- Out of 64 parishes in LA, we are one of 23 parish-wide mosquito abatement programs in Louisiana.
- Districts are managed independently and make resource allocation decisions to manage nuisance and mosquito disease vectors within their parish jurisdictions.
- Resource allocation and depth of program varies



# Department Mission & Vision

## Mission Statement

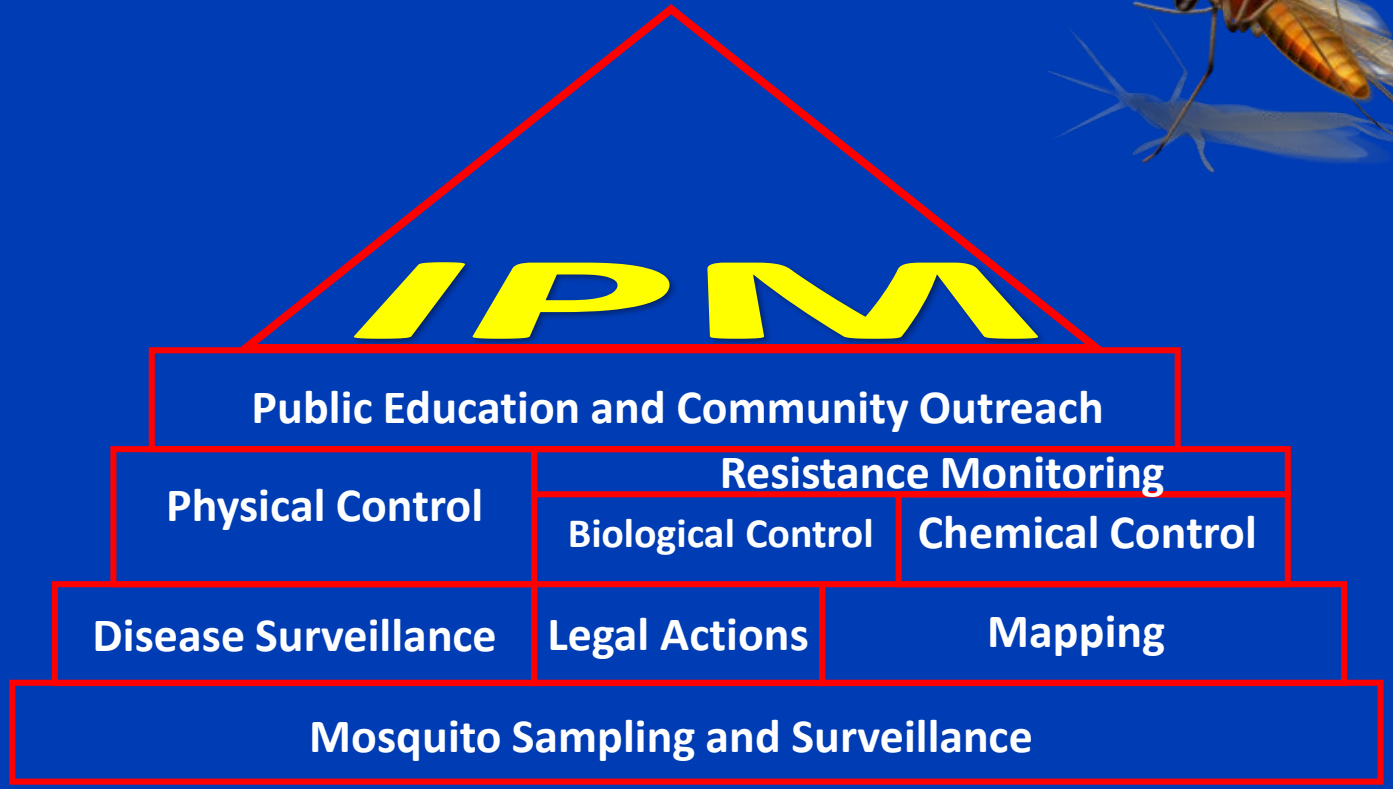
The mission of the Mosquito, Termite and Rodent Control Board is to:

•Administer and evaluate mosquito control activities
•Monitor the populations of disease and virus transmitting mosquitoes and consult with appropriate authorities.
•The Board has adopted the duties of rodent, termite and structural insect control under additional programs.

# Vision Statement

- The City of New Orleans Mosquito, Termite and Rodent Control Board provides the citizens of New Orleans high quality, safe & effective mosquito and rodent control services. Our department practices integrated pest management and places an emphasis on reducing the conducive conditions that lead to mosquito and rodent infestations. Our department will continue to expand services we offer to the City of New Orleans and to the general public. Our trained and licensed staff inspects, treats and maintains the pest control services at City facilities.

# Integrated Pest Management



# Mosquito Control and Preparedness

- Partner with government and private industry to maximize resources and increase infrastructure and capacity.
  - Try novel methods of mosquito control
  - Validate field and laboratory methodology
  - Expand services
  - Bring research and innovation to New Orleans
  - Generate revenue
- Multiple city and state agency cooperation
  - Sanitation Department, NO Health, Code Enforcement, LA Dept. Health
- Interface between pest control and mosquito control
- International training and cooperation
  - Abu Dhabi, UAE
  - Operation Blessing International, Honduras

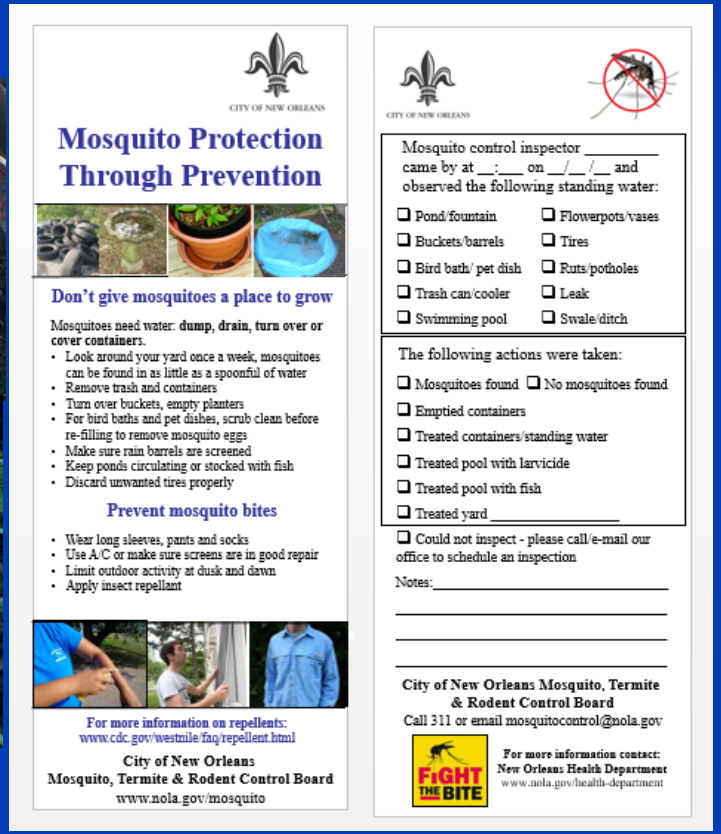
# Successful Partnerships for Vector Control

- Regular meetings with officials at local universities and collaborate on prevention at schools and daycares
- Coordinate activities between mosquito control entities and IDEpi
  - State Medical Entomologist purchased traps and supplies
  - Dropvision fluorescent microscope
  - LMCA workshops

- LDH, LMCA, Tulane and LSU Universities *Aedes* surveillance and insecticide resistance statewide project
- IDEpi and City of New Orleans
- IDEpi has robust relationship with local government and mosquito abatement for routine vector management practices for endemic arboviral transmission (WNV, SLE, EEE)

# Strategies Implemented in NOLA

# New Orleans Door-To-Door Vector Assessments and Source Reduction



CITY OF NEW ORLEANS

## Mosquito Protection Through Prevention

### Don't give mosquitoes a place to grow

Mosquitoes need water: **dump, drain, turn over or cover containers.**

- Look around your yard once a week, mosquitoes can be found in as little as a spoonful of water
- Remove trash and containers
- Turn over buckets, empty planters
- For bird baths and pet dishes, scrub clean before re-filling to remove mosquito eggs
- Make sure rain barrels are screened
- Keep ponds circulating or stocked with fish
- Discard unwanted tires properly

### Prevent mosquito bites

- Wear long sleeves, pants and socks
- Use A/C or make sure screens are in good repair
- Limit outdoor activity at dusk and dawn
- Apply insect repellant

For more information on repellents:
www.cdc.gov/westnile/faq/repellent.html

**City of New Orleans**
**Mosquito, Termite & Rodent Control Board**
www.nola.gov/mosquito

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Mosquito control inspector _____ came by at __:___ on __/__/__ and observed the following standing water:

- ❑ Pond/fountain
- ❑ Buckets/barrels
- ❑ Bird bath/ pet dish
- ❑ Trash can/cooler
- ❑ Swimming pool
- ❑ Flowerpots/vases
- ❑ Tires
- ❑ Ruts/potholes
- ❑ Leak
- ❑ Swale/ditch

The following actions were taken:

- ❑ Mosquitoes found ❑ No mosquitoes found
- ❑ Emptied containers
- ❑ Treated containers/standing water
- ❑ Treated pool with larvicide
- ❑ Treated pool with fish
- ❑ Treated yard _____

❑ Could not inspect - please call/e-mail our office to schedule an inspection

Notes:_____

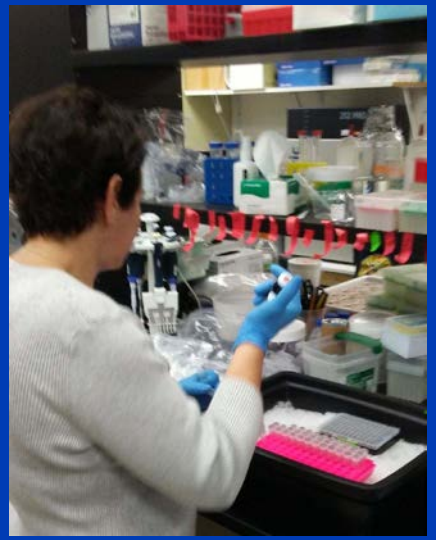
**City of New Orleans Mosquito, Termite & Rodent Control Board**
Call 311 or email mosquitocontrol@nola.gov

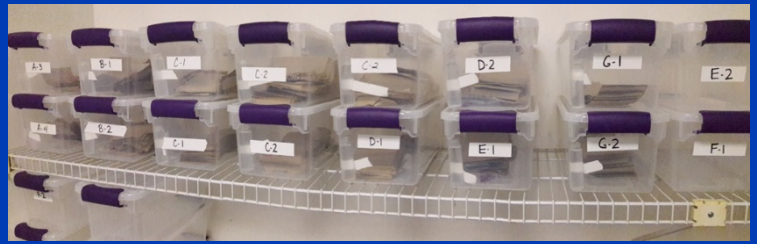
FIGHT THE BITE

**For more information contact:**
**New Orleans Health Department**
www.nola.gov/health-department

Photos courtesy of
New Orleans Mosquito and Termite Control Board

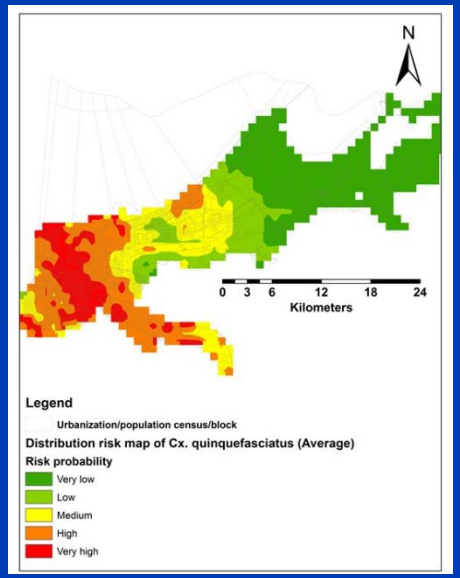
# Photos of Laboratorians at Work

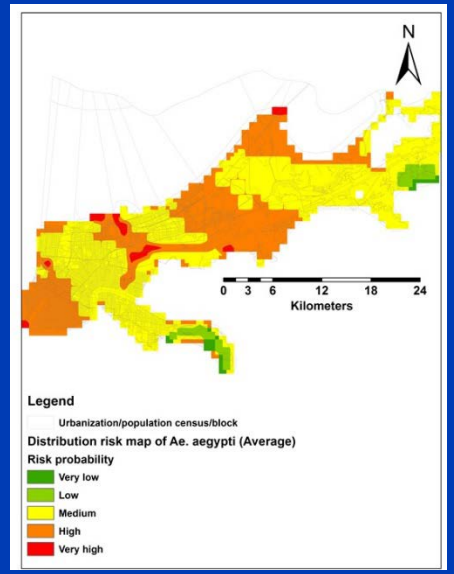




# GIS: Data Output

## (Mapping and Prediction of Vector/Disease Distribution)




- 2015, *Culex quinquefasciatus* and *Aedes aegypti* mosquito surveillance data
- Model the area with increased risk of bites-increased transmission
- Most models rely on only on presence/absence of mosquitoes
- This model takes into account human population density

Sallam, M.F., et al., 2017. IJERS

# A Robust Mosquito Control Program = Preparedness

- A response plan
- Robust surveillance program
  - Mosquito collections
  - Virus testing
  - Understanding of local mosquito resistance/tolerance to insecticides
  - Data management
- Infrastructure
  - Equipment (for larviciding and adulticiding)
  - Supplies and insecticides (validated in the field)
  - Trained personnel
  - Contingency contracts
- Interagency cooperation
- Education
  - Government officials, medical professionals, port and airport officials, public

# CDC Vital Signs Electronic Media Resources

- Become a fan on Facebook
  www.facebook.com/cdc
- Follow us on Twitter
  www.twitter.com/CDCgov
- Syndicate Vital Signs on your website
  https://tools.cdc.gov/medialibrary/index.aspx#/media/id/305883
- Vital Signs interactive buttons and banners
  https://www.cdc.gov/socialmedia/tools/buttons/vitalsigns

# Thank You

Provide feedback on this teleconference: OSTLTSFeedback@cdc.gov

Please mark your calendars for the next

*Vital Signs* Town Hall Teleconference

**June 12, 2018**

**2:00–3:00 PM (EDT)**

For more information, please contact Centers for Disease Control and Prevention.

1600 Clifton Rd, NE, Atlanta, GA 30333
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
Email: cdcinfo@cdc.gov
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