

Harris County

HCPHES

Public Health & Environmental Services

www.hcphe.org
www.pcbpge.org

Responding to Zika: A Local Texas Public Health Perspective

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Executive Director

Harris County Public Health & Environmental Services (HCPHES)

Governor's Infectious Disease Taskforce Meeting

Austin, TX

May 6, 2016



What is Public Health?

“What we as a society do
collectively
to assure the conditions in which people
can be healthy.”

-The Future of the Public's Health in the 21st Century, Institute of Medicine, 2003



Chronic
Disease



Food
Safety



Emergency
Preparedness



Environmental
Health



Infectious
Disease



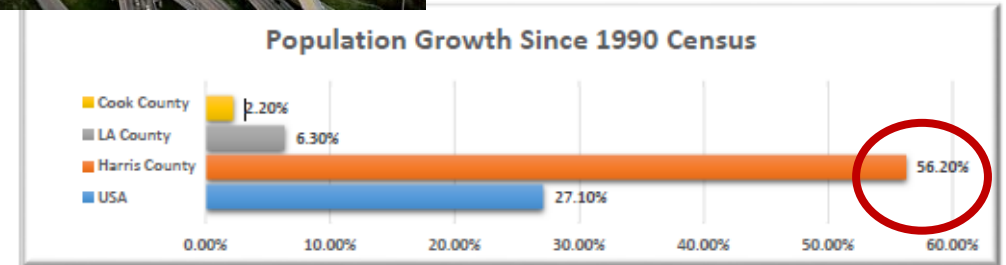
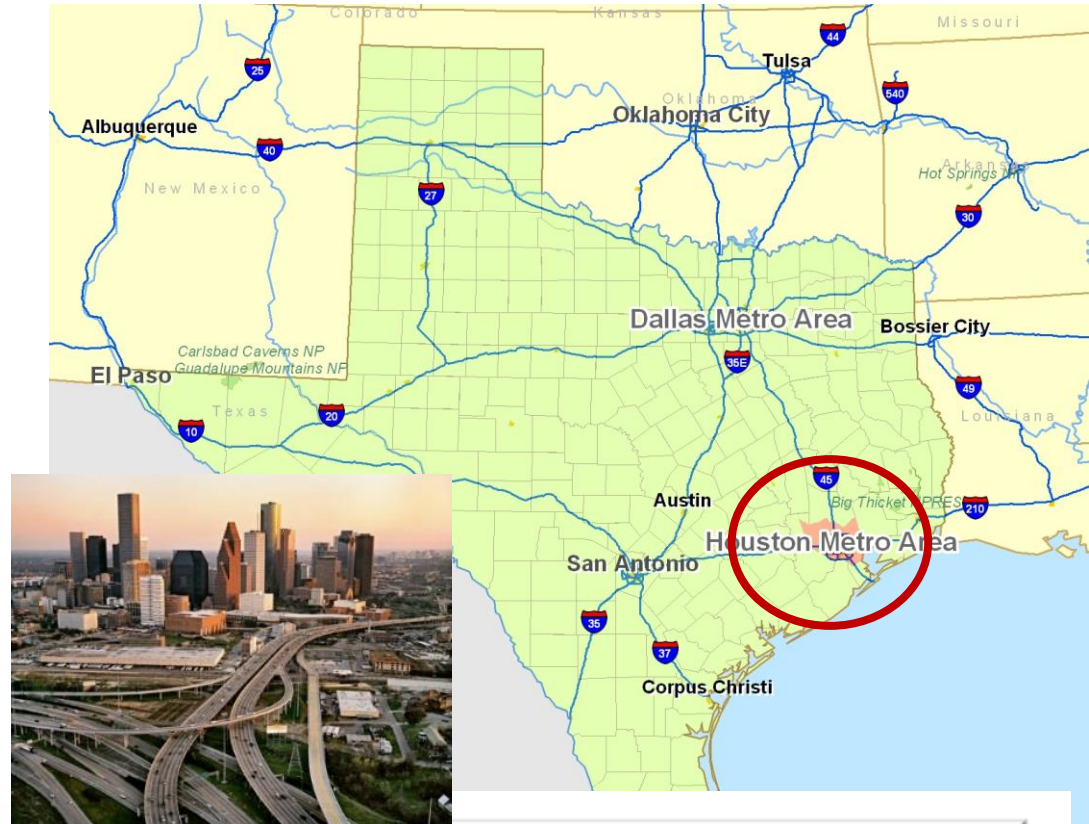
Injury



Social, Mental,
and Emotional
Wellbeing

HCPHES & Harris County

- HCPHES serves as the county health department for Harris County (TX) with **over 700** public health professionals
- Third most populous county in nation with estimated population of **4.34 million**
- Spread over **1,778 square miles** (*larger than the state of Rhode Island*)
- Geographically, politically, and socio-demographically **diverse** and growing
- Home to **world's largest** medical center



Chronic Disease



Food Safety



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Infectious Disease



Injury



Social, Mental, and Emotional Wellbeing

Celebrating 50 Years of Mosquito Control in Harris County

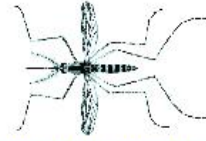
1964

Vote to establish the Harris County Mosquito Control District.



1979

First occurrence of *Aedes grossbecki* found in Texas and identified in Harris County.



1980

Placement of CDC light traps into storm sewer system.

1985

First discovery and identification of Asian Tiger (*Aedes albopictus*) mosquito in the continental United States.



&

First mosquito control agency in the United States to establish an in-house Virology Lab.

Detection and Isolation of West Nile virus in birds and mosquitoes.

2002

Expansion of weekly Mosquito Surveillance to ensure comprehensive mosquito surveillance for all of 268 operational areas.

2005

Establishment of a continually supported Mosquito Resistance Monitoring and Management Program.

268

2001



Comprehensive response to rise in mosquito population due to tropical storm Allison.

1995

Mosquito Control becomes a division of Harris County Public Health & Environmental Services.



Establishment of Education and Outreach team to do community based prevention education and establishment of the Mosquito Control Regional Workshop to educate professionals on mosquito control techniques and methods.



1990s

2008

Comprehensive emergency response in the aftermath of Hurricane Ike, including aerial application of Dibrom to more than 1,000,000 acres.



2013

Incorporation of Dengue and Chikungunya Surveillance Program via BG traps.

2014

Use of VectorTests for Chikungunya virus.

2015

50 Year Celebration and broadening of other vectors to the Division's mission.



1965-2015

Zika Virus - Setting Context

- **Mosquito-borne** disease of concern due to: 1) rapid geographic spread; and, 2) association with birth defects
- 1 in 5 people infected become ill so **80% are asymptomatic**
- **Usually** not cause of severe disease or hospitalizations – that said, worry for microcephaly, Guillen-Barre Syndrome, and rarely even death
- Symptoms **generally mild**, lasting 3-7 days:
 - fever, rash, joint/muscle pain, conjunctivitis (red eyes)
- Now we know Zika can be **spread sexually** – especially important for pregnant women
- **All age** groups can be affected
- Currently **no vaccine** to prevent Zika infection



How is HCPHES Preparing to Respond to Zika?



Chronic Disease



Food Safety



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Social, Mental, and Emotional Wellbeing

January 11, 2016 - HCPHES Confirms First Texas Zika Case

THE WALL STREET JOURNAL.

Texas Woman Diagnosed With Mosquito-Borne Zika Virus

Development raises concern that health crisis in Brazil is spreading



WIRED

SARAH ZHANG SCIENCE 02/06/16 7:00 AM

RIDE WITH THE MOSQUITO HUNTERS PROTECTING THE US AGAINST ZIKA



Harris County **HCPHES** Public Health & Environmental Services

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FOR IMMEDIATE RELEASE
January 11, 2016

Contact: Sandy Kachur
713.439.6292

Travel-Related Zika Virus Infection Has Been Identified in the Harris County Area

Harris County, Texas - Harris County Public Health & Environmental Services (HCPHES) has received confirmation from the [Centers for Disease Control and Prevention \(CDC\)](#) that the Zika virus has been confirmed in a traveler who recently returned from Latin America. The individual developed symptoms that are often associated with the Zika virus which include: fever, rash, and joint pain.

Zika virus is spread through the bite of the *Aedes* species mosquito. "Prevention is key to reducing the risk of Zika virus infection", stated Umair A. Shah, MD, MPH, Executive Director of HCPHES. "Zika virus infections occur throughout the world. We encourage individuals [traveling to areas where the virus](#) has been identified to protect themselves against mosquito bites, and to contact their healthcare provider immediately if they develop Zika virus-like symptoms."

According to CDC, illness from Zika is usually mild with symptoms lasting several days to a week. Severe disease requiring hospitalization is uncommon and deaths are rare. There is no vaccine to prevent or medicine to treat Zika virus infection. The CDC recommends that all people, especially pregnant women, who are traveling to areas where Zika virus is found, should take precautions to avoid mosquito bites to reduce their risk of infection of Zika virus as well as other mosquito-borne viruses such as dengue and chikungunya.

HCPHES recommends before traveling abroad, individuals contact their healthcare provider who may recommend vaccines or important preventive medication for [travel-related diseases](#).

To learn more about the Zika virus, please visit: www.hcphe.org and www.cdc.gov.

HCPHES is the local public health agency for the Harris County, Texas jurisdiction. It provides a wide variety of activities and services aimed at improving the health and well-being of the Harris County community. For more information please visit HCPHES at www.hcphe.org.

Follow HCPHES on Twitter [@HCPHES](#) and like us on [Facebook](#).

www.hcphe.org

CBS NEWS

Zika virus confirmed in U.S. patient



A female *Aedes aegypti* mosquito / JAMES GATHANY. PROVIDED BY CDC/PAUL I. HOWELL, MPH; PROF. FRANK HADLEY COLLINS

theguardian

First case of tropical Zika virus linked to serious birth defect found in Texas

HCPHES Planned Zika Response Levels

- **Level 4** - *Normal Conditions*: No cases of locally acquired Zika in Harris County
- **Level 3** - *Increased Readiness*: One case of locally acquired Zika in Harris County
- **Level 2** - *High Readiness*: A few or cluster of cases of locally acquired Zika within Harris County
- **Level 1** - *Maximum Readiness*: Widespread cases of locally acquired Zika throughout Harris County



HCPHES Zika Response Team — formed January 7, 2016



HCPHES Approach to Fighting *Aedes*

- *Understand Aedes* vector predominance in Texas and Harris County
- *Recognize* need to shift from primarily *Culex*-based program to incorporation of *Aedes* mosquito as a targeted vector
- *Appreciate* importance of public education, personal protection, and source reduction as major tenets in fight against *Aedes*
- *Assure* “One Health” and health equity lens are applied to evolving multidisciplinary response



Aedes albopictus



Aedes aegypti

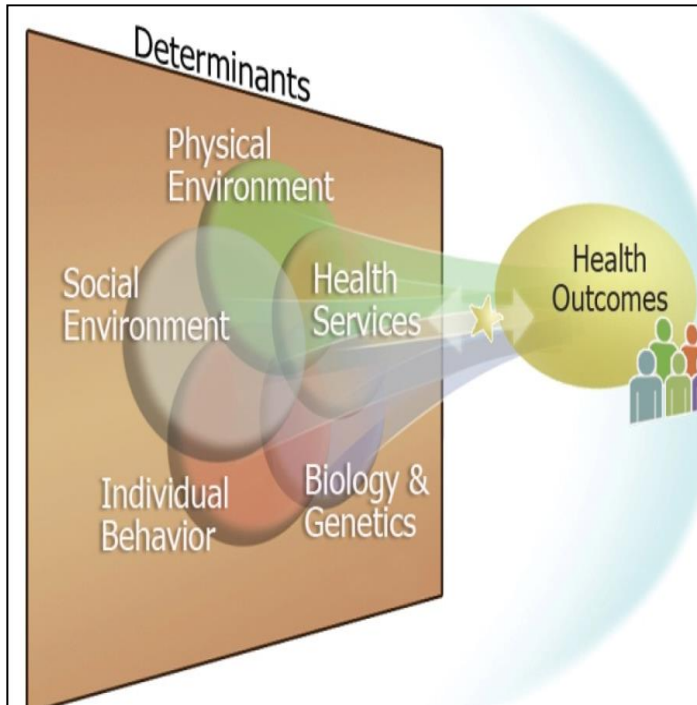


Role of Health Equity, One Health, & MDT

Multi-Disciplinary Teams (MDT)

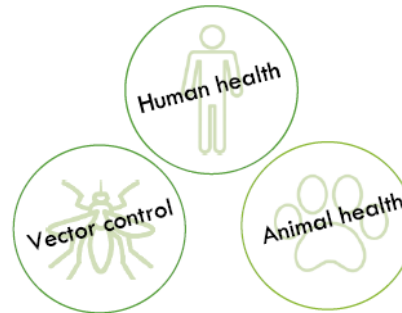
An internal team whose purpose is to conduct targeted mosquito, epidemiological, environmental assessments of household perimeters & proximate areas to determine need for interventions

Health Equity



One Health

Traditional view:



One Health view:



MDT



Chronic Disease



Food Safety



Emergency Preparedness



Environmental Health



Infectious Disease



Injury



Social, Mental, and Emotional Wellbeing

HCPHES Planned Zika Response Focus Areas

- Emergency Preparedness and Response
- **Vector Surveillance and Control**
- Legal Review and Authority
- **Epidemiology Surveillance & Testing**
- Environmental Public Health
- **Health Care Provider/Clinical Outreach**
- Veterinary Public Health
- **Communications and Community Engagement**



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HCPHES Human Surveillance & Outreach

Epidemiology Surveillance & Testing

- Evaluate and monitor surveillance data for **travel-related** cases of Zika and identify emergence of **locally-acquired** Zika cases and alternate modes of transmission through regular surveillance
- Monitor **clinical outcomes** of any women infected during pregnancy, congenital virus diseases, other atypical transmission routes (e.g. sexual transmission), and severe disease cases, including Guillain-Barre syndrome

Health Care Provider/Clinical Outreach

- **Disseminate information** through the locally-operated Health Alert Network (HAN) regarding Zika national and local surveillance data with suspected modes of transmission and any new information when available
- Work with local clinicians, hospitals, clinics, and other healthcare partners (e.g., blood bank, etc.) on **clinical situations** including in context of updates to clinical guidance for activities such as handling and testing of specimens, updating Zika testing sites, etc.



HCPHES Planned Zika Response Activities

Environmental Public Health

- Identify geographic areas in Harris County with a high prevalence of vector breeding sites through **neighborhood nuisance abatement** and vector-borne disease transmission
- Utilization of GIS data collection application by **field inspectors** to report any neighborhood nuisance issues which may provide a breeding ground for mosquitos

Veterinary Public Health

- Send out a **veterinary health alert** network emails when new information is available.
- Provide **consultation** to veterinary professionals and the general public regarding Zika virus and pets, wild animals, or livestock, as applicable



HCPHES Planned Zika Response Activities



Legal Review and Authority

- Review legal issues relating to the specific vector borne disease to include evaluation of **legal powers**, insecticide spraying issues, authority to go onto private property, privacy issues, nuisance abatement, and emergency procurement
- Work with Harris County Attorney's Office to **enforce codes** or initiate warrants if needed



Emergency Preparedness and Response

- Coordinate and **communicate** with Harris County partners regarding HCPHES activities relating to Zika virus
- **Coordinate and train** a multi-disciplinary team (MDT) to conduct epidemiological, environmental, and mosquito assessments when a symptomatic confirmed Zika case is reported within Harris County



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HCPHES Communications and Engagement

- Conduct disease prevention education, personal protection, and source reduction **campaigns**
- Utilize **media** and other community partners to provide credible information to the public
- Distribute insect repellent and other **prevention modalities** when feasible and appropriate
- Create **messaging** in languages appropriate for affected communities, working with area consulates, etc.
- Conduct door to door education and **outreach** in targeted communities
- Engage federal, state, and local **stakeholders/partners** to coordinate efforts



HCPHES @HCPHES - 6h
 Reduce your risk of mosquito bites by checking out these tips:
bit.ly/1AyJNHF. #fightthebite #hcpbes ow.ly/i/b93NJ



Harris County

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www.hcphe.org

Vector Surveillance and Control Activities

Mustapha Debboun, Ph.D, BCE

Director of Mosquito Control Division

Harris County Public Health & Environmental Services (HCPHES)



50 Years of "Fighting the Bite" - Primarily Against the *Culex* Mosquito



**Avian
Surveillance**



**Mosquito
Surveillance**



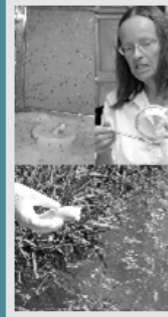
**Field
Mosquito Control
Operations**



**Education
& Training**




**Mosquito
Inspections**



**Testing &
Evaluation**

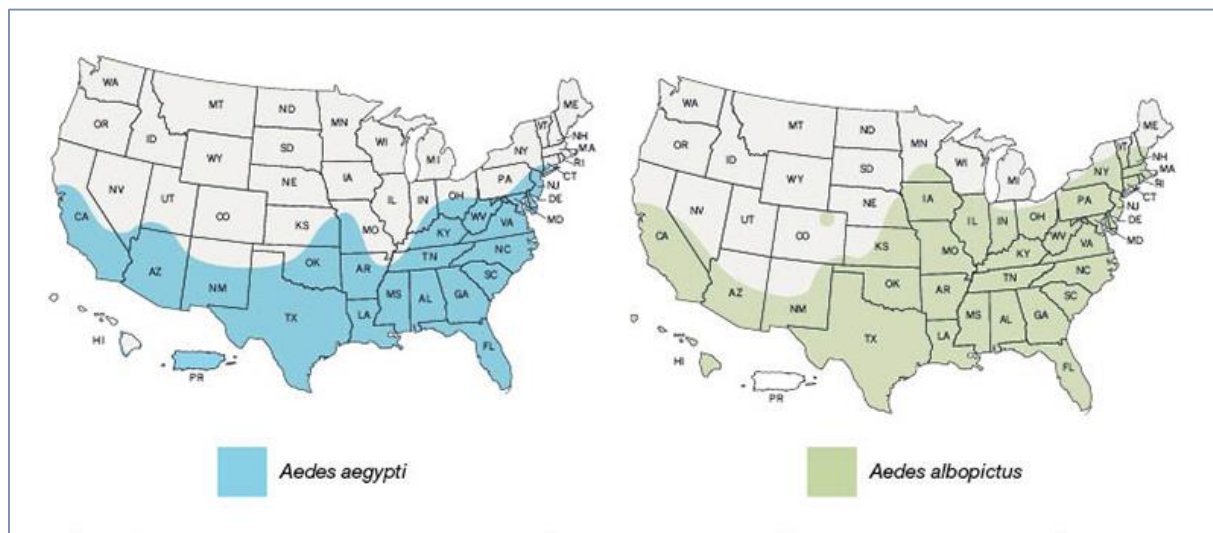


**Virology
Laboratory**

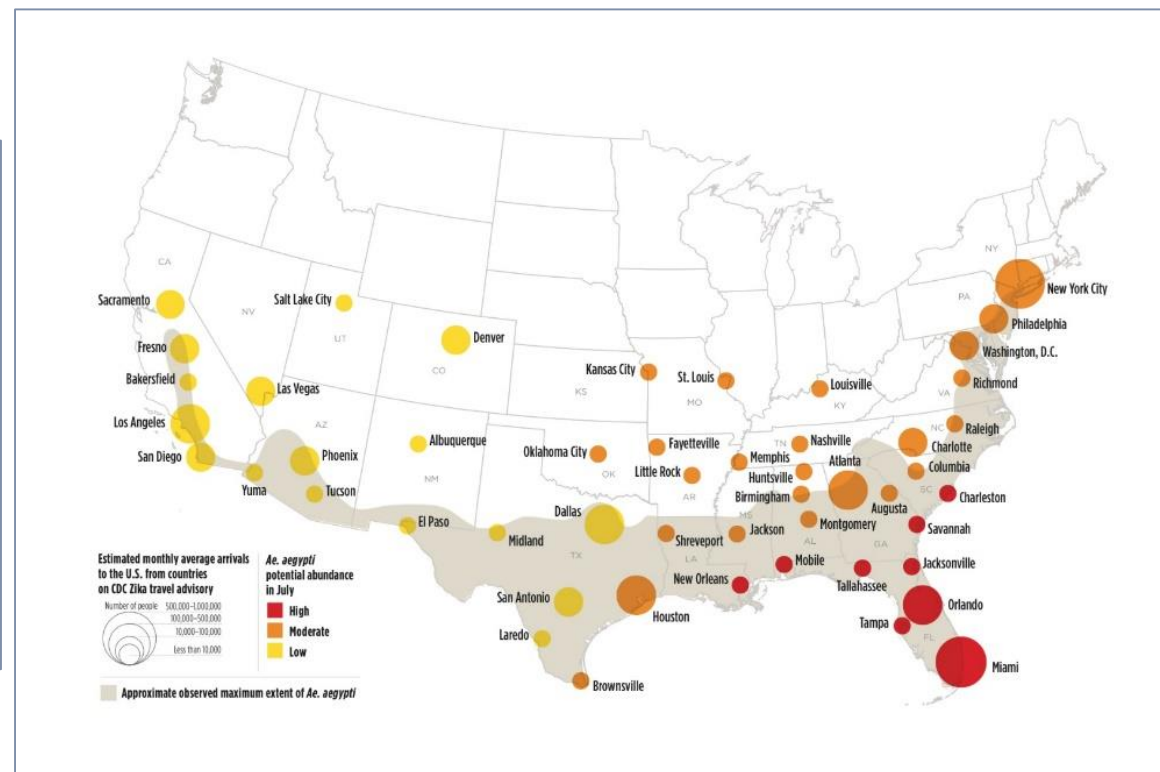


**Geographic
Information
System (GIS)**

Two Maps: The Presence of the *Aedes* Mosquito Equates to Increased Risk



Source: CDC, presented at ZAP Summit, April 1, 2016



Source: https://www.nsf.gov/news/news_summ.jsp?cntn_id=137907



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HCPHES Vector Surveillance and Control

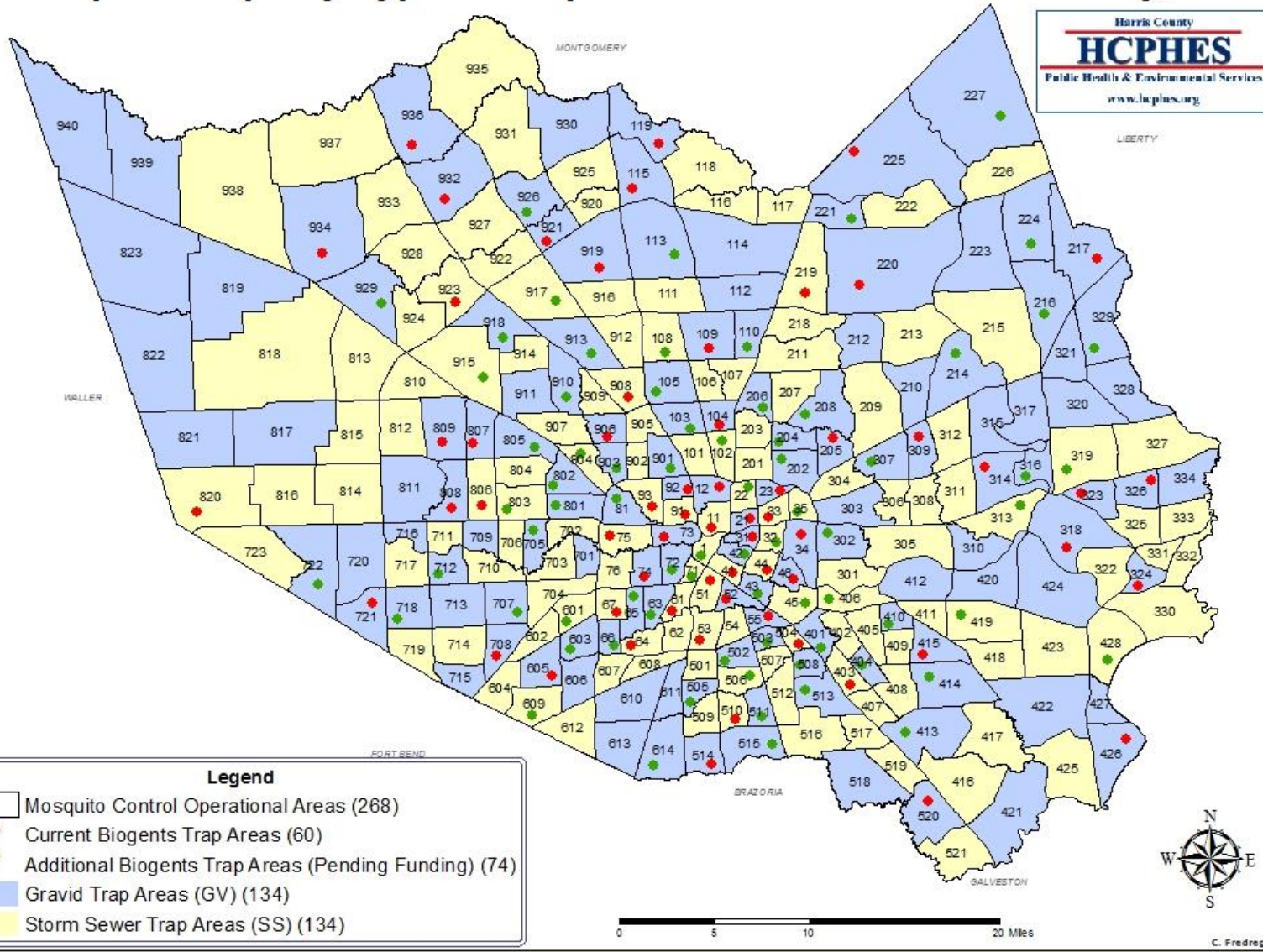
- Utilize **mosquito surveillance** using (limited) historical data on *Aedes* combined with (expanded) surveillance including incorporation of predictive modeling within the 268 operational areas
- Generate **GIS maps** indicating key metrics such as mosquito population density levels of *Aedes*, Zika confirmed mosquito samples, local cases of human infections, and sources of breeding, etc.
- Conduct necessary **staff training** for inspectors, larvicide applicators, and other MC support personnel
- Acquire testing materials and laboratory **equipment** for mosquito virology laboratory for Zika
- Work with **partners** and community members on key issues around reducing mosquito habitats



SEVEN CASES OF ZIKA VIRUS CONFIRMED IN HOUSTON AREA



Mosquito Traps by Type and Operational Area in Harris County, TX



**Biogents
(BG) Sentinel
Trap (*Aedes*)**



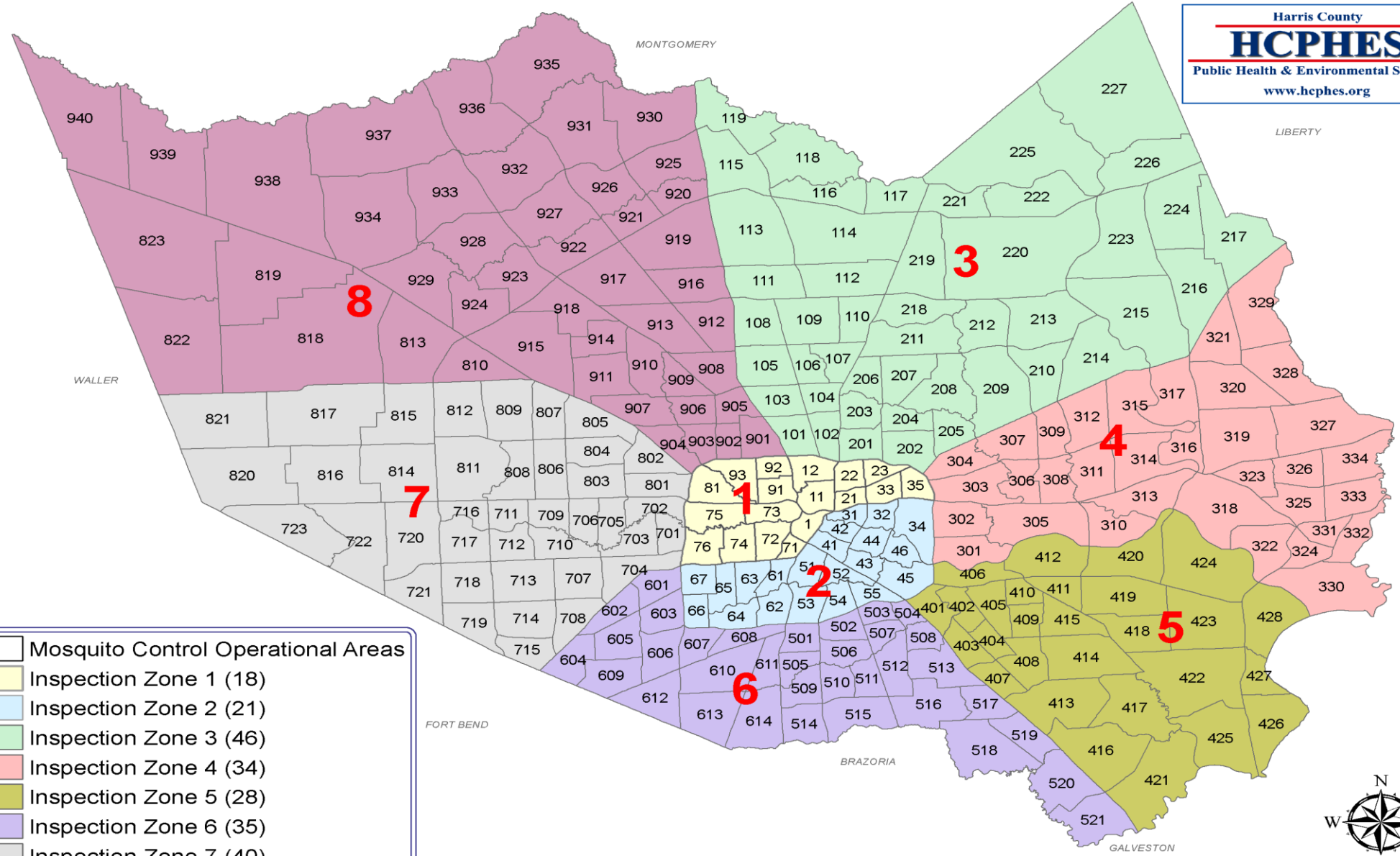
**Gravid Trap
(*Culex* &
Aedes)**



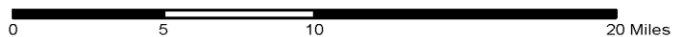
**CDC Storm
Sewer Trap
(*Culex*)**



Inspection Zones in Harris County, TX



- Mosquito Control Operational Areas
- Inspection Zone 1 (18)
- Inspection Zone 2 (21)
- Inspection Zone 3 (46)
- Inspection Zone 4 (34)
- Inspection Zone 5 (28)
- Inspection Zone 6 (35)
- Inspection Zone 7 (40)
- Inspection Zone 8 (46)



Environments Where *Aedes* Mosquitoes Thrive

- Stored water and discarded containers accumulate rain water and create abundant mosquito development sites



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Social, Mental,
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Wellbeing



HCPHES
Mosquito Control Division
Vector Surveillance Report



Week 13 ending 2 April, 2016

<u>Epi-Week</u>	7	8	9	10	11	12	13	YTD ^b
<u>Week ending</u>	02/19	02/26	03/05	03/12	03/19	03/25	04/2	
Total Traps Collected	164	158	163	158	260	163	153	2,170
Total Mosquitoes	6,846	4,967	6,382	4,878	10,849	9,003	14,390	88,670
Mean Mosquitoes/Trap ^a	41.74	31.44	39.15	30.87	41.73	55.23	120.49	48.58
Total Mosquitoes Pooled	3,680	2,692	3,594	3,028	4,886	4,400	4,619	42,538
Mosquito Pools Tested	133	109	140	130	230	146	142	1,727
SLE Confirmed Pools	0	0	0	0	0	0	0	0
WNV Confirmed Pools	0	0	0	0	0	0	0	0
DEN/CHIK Confirmed Pools	0	0	0	0	0	0	0	0
ZIKA Confirmed Pools	0	0	0	0	0	0	0	0
<i>Culex quinquefasciatus</i>	6,196	4,447	5,942	4,671	10,155	8,431	12,828	81,421
<i>Aedes albopictus</i>	5	0	5	5	66	50	95	239
<i>Aedes aegypti</i>	4	2	8	3	30	11	27	125



Schools, Libraries, Museums and Community Forums

Prevent the Bite...Day & Night

- Remove/empty containers that can hold water such as tires, flower pots, birdbaths, and toys; Keep rain gutters free of debris
- Install or repair screens on windows and doors
- Sweep up lawn clippings and leaves; Don't feed the storm drain
- Eliminate mosquito breeding sources inside your home, too
- Wear insect repellent when outdoors
- Wear long-sleeve shirts, long pants and socks



Adult Mosquito Control Methods

Adulticiding using Handheld sprayers



Maintaining Window Screens on Homes



CDC Autocidal Gravid Ovitrap (AGO) Trap

- Population reduction
- Field trials in Puerto Rico detected sustained reduction in *Aedes aegypti*



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Social, Mental, and Emotional Wellbeing

Zika Response: A Crossroads

- Emergency Preparedness and Response
- **Vector Surveillance and Control**
- Legal Review and Authority
- **Epidemiology Surveillance & Testing**
- Environmental Public Health
- **Health Care Provider/Clinical Outreach**
- Veterinary Public Health
- **Communications and Community Engagement**



Select Zika Response Challenges

- The situation related to Zika is one that continues to evolve
- “We cannot spray our way out of this situation”
- Additive Arbovirus Response: *Culex*-based activities plus *Aedes*-based activities
- Addressing Zika in the context of other ongoing departmental activities
- Funding and resource needs must be addressed
[98% of HCPHES mosquito control activities are locally funded]



Texas Floods - Harris County (April 2016)

Storm caused the worst flooding Houston has seen in 15 years



More than a foot of rain has deluged the Houston area, inundating homes, shutting down major highways and leaving at least five people dead. The National Weather Service had the area under a flash flood watch through Wednesday morning.

EXTREME WEATHER

Houston flooding: 5 dead, 1,200 rescued -- and more rain to come

By Holly Yan and Melissa Gray, CNN
Updated 19:17 GMT (02:17 HKT) April 19, 2016



Death toll rising after Houston flooding 02:35

Story highlights

(CNN) — Sunita Singh was determined to get to work, even if that meant taking more than a week to reach her office.

Top stories

- Chris Brown 'suicidal' after boating Rihanna
- Florida search on for priest, missing a week

Dell

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TWEETS 6,789 FOLLOWING 634 FOLLOWERS 805 LIKES 2,668 LISTS 2



HCPHES @HCPHES · 4h
Your yard could be full of #mosquito breeding sites! Be sure to #DUMPandDRAIN standing water
hcphe.org/mc

ARE YOU RAISING MOSQUITOES IN YOUR YARD?

Help prevent mosquito-borne diseases such as West Nile Virus, St. Louis Encephalitis, Zika, Dengue and Chikungunya.

HCPHES @HCPHES · 6h
Got #sewage after the storm? Hire a professional to help if you can. COVER/PROTECT yourself if you're

By Molly Hennessy-Fiske · Contact Reporter

APRIL 19, 2016, 11:34 AM | REPORTING FROM HOUSTON

A storm that hit Houston this week caused the city's worst flooding in 15 years and left five people dead, officials said.

More than a thousand residents of apartment complexes in the northern

UNITED CLUB™ MEMBERSHIP AND MORE

MileagePlus Club VISA

\$100 statement credit

PREVENT THE BITE

The Role of Local Public Health Just Makes “Common Sense”



Umair A. Shah, MD, MPH
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