Dallas County Health and Human Services
Arbovirus Surveillance Report

Summary of 2017 WNV Season

- During 2017, a total of 7,498 gravid mosquito traps were placed in Dallas County, with 382 traps testing positive for WNV. The peak county-wide vector index was 0.24 in week 29.
- Twenty six human WNV cases, including two deaths were confirmed in Dallas County during the 2017 season.
- In 2017, three travel-associated confirmed human Zika cases were identified in Dallas County.
- Thirteen pregnant women with laboratory criteria for possible Zika infection were reported to CDC for inclusion in the US Zika Pregnancy Registry, one of whom was a symptomatic disease case.[m]
- Two imported chikungunya and ten imported dengue cases were reported in Dallas County in 2017.

Table 1. Mosquito Laboratory and Human Case Surveillance Data for WNV, Dallas County

Week Ending	11/18	11/25	12/02	12/09	12/16	12/23	12/30	YTD
MMWR Week	46	47	48	49	50	51	52	
Total Traps Placed in Dallas County [a]	62	47	69	58	72	60	0	7,498
Number of Positive Mosquito Traps (PHL; IL) [c]	0; 0	0; 0	0; 0	0; 0	0; 0	0; 0	0; 0	355; 27
Number of Pools Tested (PHL; IL) [b,c]	56; 0	38; 0	66; 0	51; 0	67; 0	55; 0	0; 0	6,557; 1,035
Number of Trap Results Currently Pending	0	0	0	0	0	0	0	
Average Number of *Cx. quinquefasciatus* per Trap [d]	22.5	8.7	33.2	55.7	26.4	12.9	0	43.4
Total Number of *Cx. quinquefasciatus* Trapped and Tested	1,118	344	1,622	1,629	1,404	723	0	206,145
Number of Positive Mosquito Pools (PHL; IL) [c]	0; 0	0; 0	0; 0	0; 0	0; 0	0; 0	0; 0	358; 28
WNV Infection Rate per 1,000 *Cx. quinquefasciatus* [e]	0	0	0	0	0	0	0	
Weekly Vector Index (VI) [f]	0	0	0	0	0	0	0	
Presumptive WNV Viremic Blood Donors	0	0	0	0	0	0	0	0
WNV Human Cases (WNND; WNF) [g]	0; 0	0; 0	0; 0	0; 0	0; 0	0; 0	0; 0	15; 11

Table 2. Mosquito Laboratory and Human Case Surveillance Data for Chikungunya, Dengue and Zika Virus, Dallas County

Week Ending	11/18	11/25	12/02	12/09	12/16	12/23	12/30	YTD
MMWR Week	46	47	48	49	50	51	52	
Total Biogents Sentinel-Traps Placed in Dallas County [h]	0	0	0	0	0	0	0	872
Average Number of *Aedes per* Trap [i]	0	0	0	0	0	0	0	16.7
Chikungunya Human Cases (Confirmed & Probable) [j]	0	0	0	1	0	0	0	2
Dengue Human Cases (Confirmed & Probable) [k]	0	0	0	0	0	0	0	10
Zika Human Cases (Confirmed & Probable) [l]	0	0	0	0	0	0	0	2
Pregnant Women with Possible Zika Infection [m]	0	0	0	0	0	0	0	13

a. All traps deployed in municipalities submitting data to DCHHS since January 1st, 2017. Includes traps without mosquitoes, malfunctioning traps and traps with pending results
b. Excludes traps without female *Culex quinquefasciatus* identified. Maximum of 50 female *Culex quinquefasciatus* per pool; more than 1 pool may be tested per trap
c. PHL = Public health laboratory (DSHS, DCHHS) testing performed by viral culture or CDC RT-PCR protocol; IL = Testing from independent labs by alternate methods
d. Average abundance of female *Culex quinquefasciatus* mosquitoes per trap night/week (excludes non-working traps)
e. WNV Infection rates calculated using a Maximum Likelihood Estimation (MLE). *Biggerstaff BJ. PooledInfRate, version 4.0; Microsoft Excel Add-In; CDC 2007*
f. The Vector Index (VI) reflects the MLE adjusted for *Culex quinquefasciatus* abundance. VI= $\sum_{i=species} \bar{N}i\hat{P}i$, where *N* is the average number of *Culex quinquefasciatus* mosquitoes collected per trap night and $\hat{P}$ is the estimated infection rate
g. Human cases by week of report to health department. WNND = West Nile Neuroinvasive Disease; WNF = West Nile Fever
h. All Biogents (BG) Sentinel traps deployed in municipalities submitting data to DCHHS since Week 13.
i. Average abundance of *Aedes albopictus* and A*edes aegypti* mosquitoes per night/trap in BG-Traps (excludes non-working traps)
j. Human CHKV cases by week of report to health department (AT : Autochthonous case; I : imported)
k. Human Dengue cases by week of report to the health department
l. Confirmed and probable human Zika cases by week of specimen collection date
m. Possible Zika Virus Infection Among Pregnant Women — United States and Territories, May 2016, http://www.cdc.gov/mmwr/volumes/65/wr/mm6520e1.htm/

Table 3. WNV Positive Gravid Mosquito Traps and Human WNV Cases by City, Dallas County, 2017

City	Number of Human WNV Cases	Range Total Number of Traps/Week[1]	Number of WNV Positive Traps
Addison	0	2	7
Balch Springs	0	1 – 4	3
Carrollton	0	7 – 8	30
Cedar Hill	0	1 – 5	1
Cockrell Hill	0	1 – 2	0
Coppell	1	6	30
Dallas	16	2 – 90	106
DeSoto	0	2 – 6	7
Duncanville	0	1 – 6	7
Farmers Branch	0	4	7
Garland	2	3 – 27	36
Glenn Heights	0	1 – 7	2
Grand Prairie	0	24 – 33	21
Highland Park	1	1 – 10	9
Hutchins	0	1 – 2	1
Irving	4	7 – 15	40
Lancaster	0	1 – 4	1
Mesquite	0	10 – 23	17
Richardson	2	12 – 13	28
Rowlett	0	2 – 7	15
Sachse	0	1 – 4	6
Seagoville	0	1 – 3	1
Sunnyvale	0	1 – 2	0
Unincorporated County	0	1 – 2	3
University Park	0	3 – 7	4
Wilmer	0	1 – 2	0
Total	26		382

[1]Range of numbers of traps placed weekly, in weeks 25-43

Figure 1: All WNV Negative and Positive Mosquito Traps Collected During 2017: Weeks 1-52 (N=7,498)

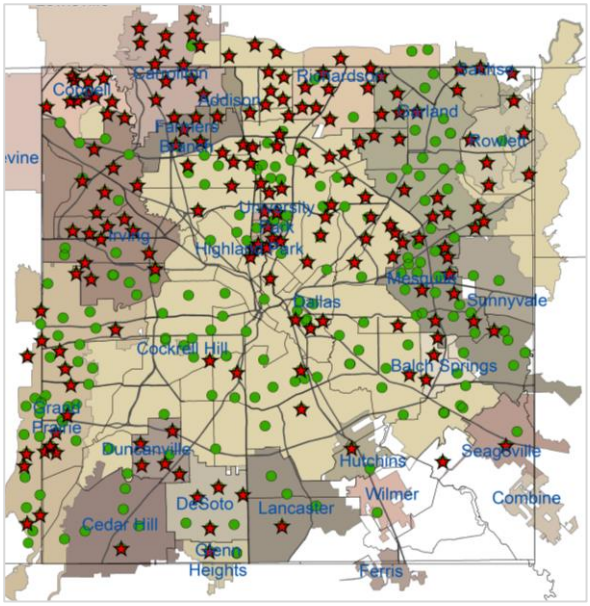
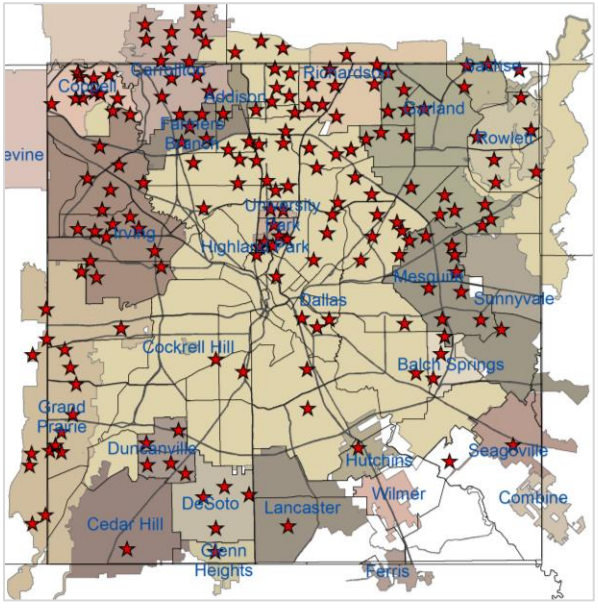


Figure 2: Cumulative WNV Positive Mosquito Traps Collected: Weeks 1-52 (N=382)



Positive Traps Negative Traps

Figure 3: Trap Counts of Female *Cx. quinquefasciatus* from 2017 Season: Weeks 1-52*

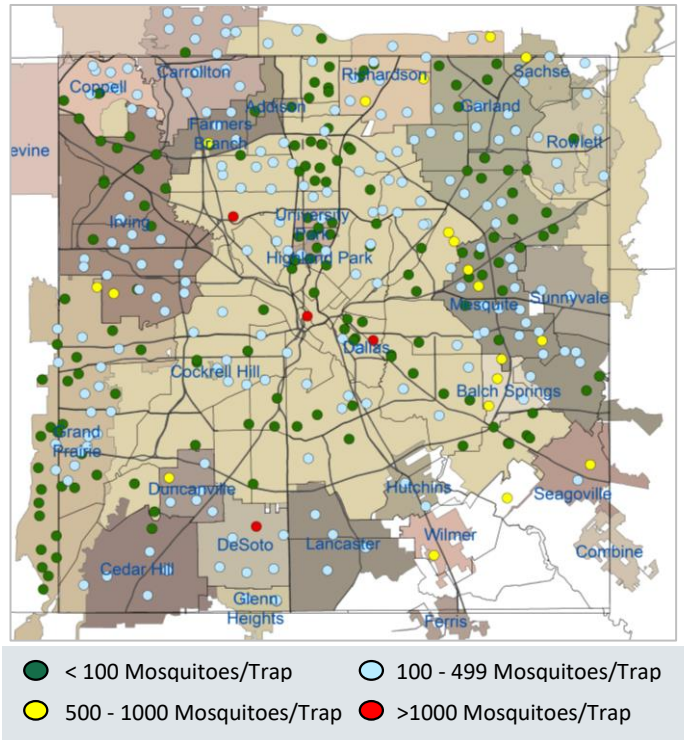
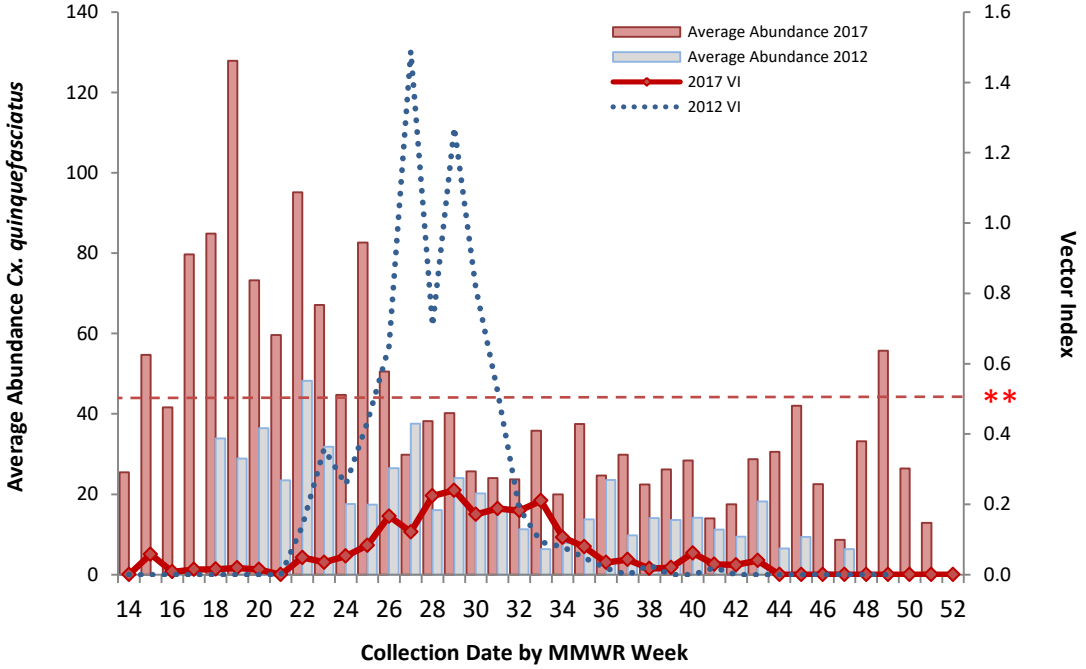


*Figure 3 only shows traps for which results were available; malfunctioning traps were excluded. Almost all traps are at fixed sites.

Figure 4: Average Numbers of Female *Cx. quinquefasciatus* per Trap-night and WNV Vector Index by Week: 2012 Season and 2017 Season



** Vector Index of 0.50 is the historical threshold associated with larger local epidemics of WNV illnesses in humans.

Figure 5: WNV Vector Index by Week: 2012 - 2017 Seasons

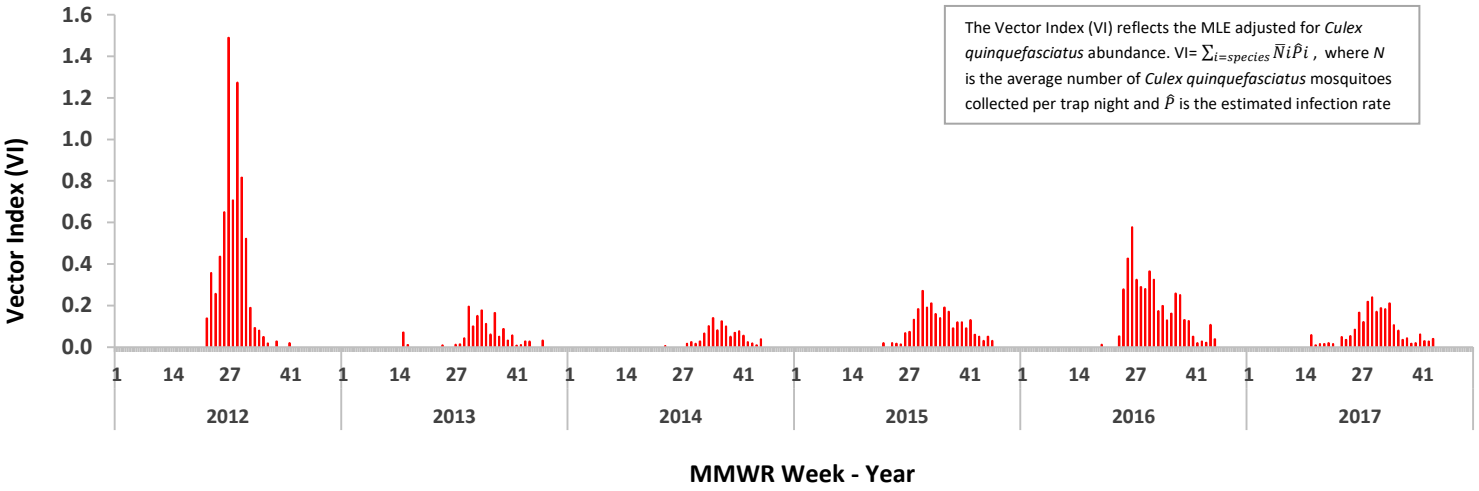


Figure 6: Average Numbers of Female *Cx. quinquefasciatus* per Trap-night by Week: 2012 - 2017 Seasons

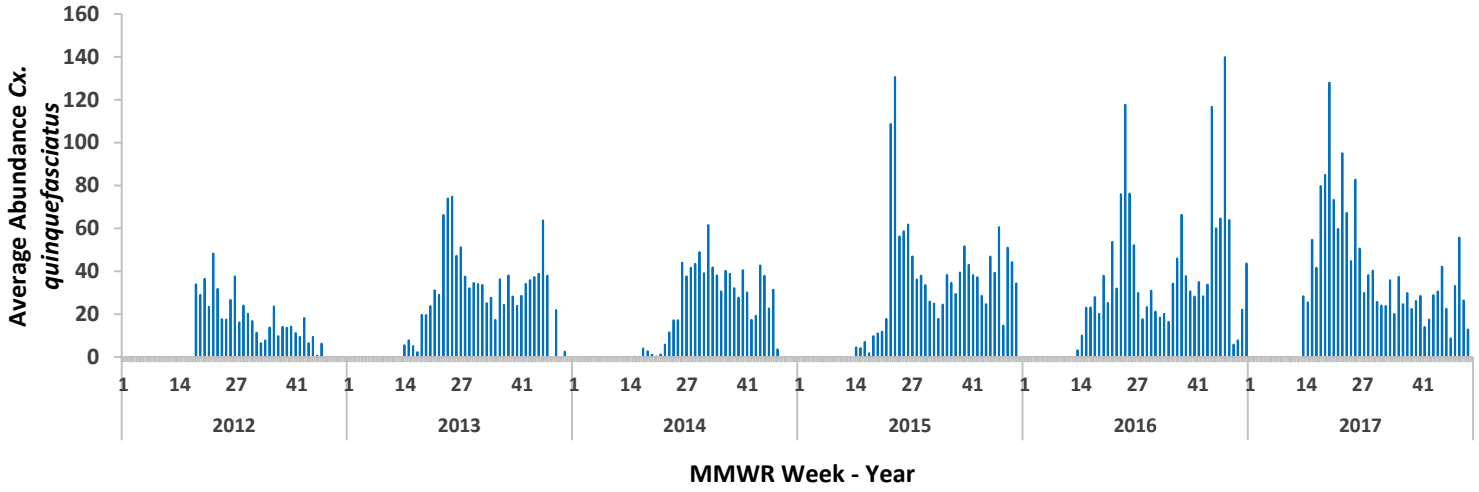


Figure 7: MLE (WNV Infection Rate per 1,000 *Cx. quinquefasciatus*) by Week: 2012 - 2017 Seasons

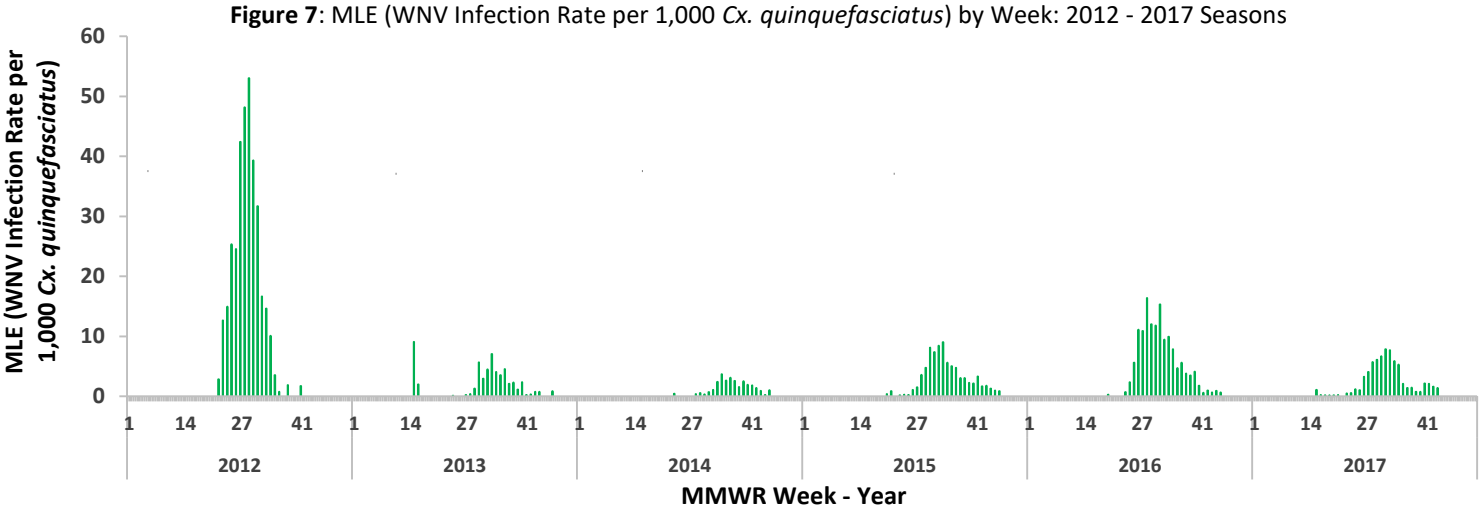


Figure 8: WNV Vector Index, Viremic Blood Donors, and Human WNV Cases by Week of Report: 2017 Season

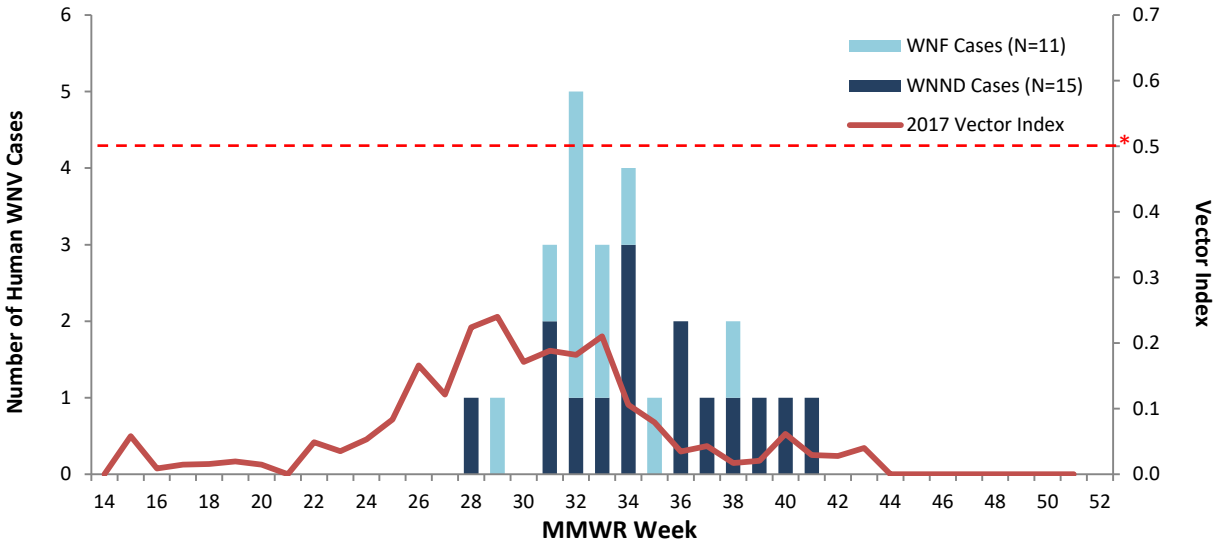


Table 4: Characteristics of West Nile Virus Human Cases: Dallas County, 2017

	Hospitalized	Deaths	Average Age (Range)	Female (%)
WNND (N=15)	15	2	61.4 (38 - 77)	6 (40.0)
WNF (N=11)	0	0	51.6 (15 - 73)	3 (27.3)
Total (N=26)	15	2	57.3 (15 - 77)	9 (34.6)

Figure 9: Arboviral Human Cases During 2017 Season (WNND = 15; WNF = 11; CHIKV = 2; Dengue = 10)

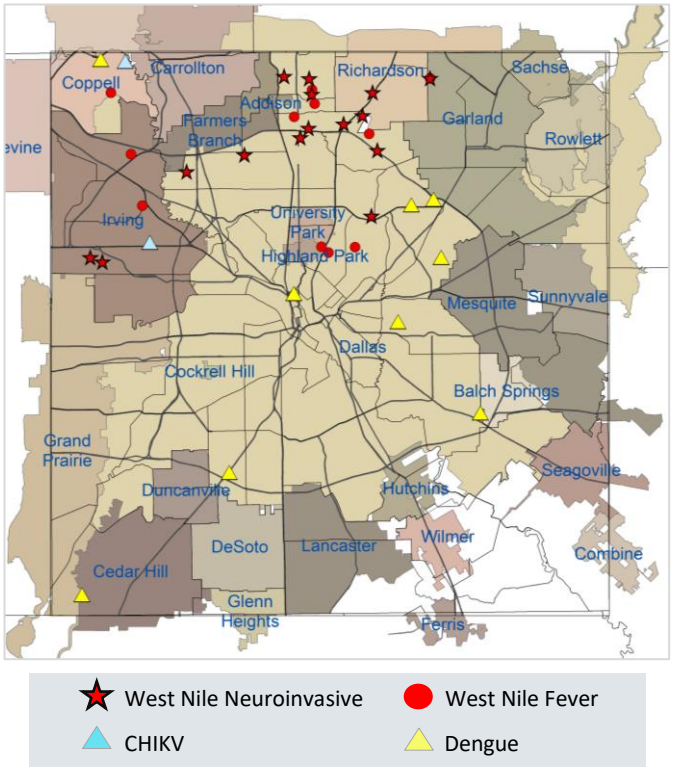


Table 5. Travel-Associated Zika Disease Cases* by Country/Territories: Dallas County, 2016-2017

	Country/Territories	# Human Zika Cases (%)	
		2016	2017
North America	Mexico	12 (26.7)	2 (66.7)
Central America	Guatemala	5 (11.1)	0 (0.0)
	El Salvador	4 (8.9)	0 (0.0)
	Honduras	2 (4.4)	0 (0.0)
	Nicaragua	2 (4.4)	0 (0.0)
	Belize	1 (2.2)	0 (0.0)
Carribean	Puerto Rico	5 (11.1)	0 (0.0)
	Jamaica	4 (8.9)	0 (0.0)
	Virgin Islands	3 (6.7)	0 (0.0)
	Dominican Republic	1 (2.2)	0 (0.0)
	Barbados	1 (2.2)	0 (0.0)
	Saint Barthélemy	0 (0.0)	1 (33.3)
	Saint Martin	1 (2.2)	0 (0.0)
	Trinidad	1 (2.2)	0 (0.0)
South America	Venezuela	2 (4.4)	0 (0.0)
	Colombia	1 (2.2)	0 (0.0)
	Total	**45**	**3**

*Confirmed and probable Zika case definitions: https://wwwn.cdc.gov/nndss/conditions/zika-virus-disease-congenital/case-definition/2016/06/

Table 6. Zika infections reported to US Zika Pregnancy Registry (USZPR)[†]: Dallas County, 2016-2017

	# Pregnant Women	
	2016	2017
USZPR-eligible pregnant women with any laboratory evidence of possible Zika virus infection	39	13
USZPR-eligible pregnant women who also meet CSTE definition as confirmed or probable Zika disease cases	3	1

[†] https://www.cdc.gov/zika/geo/pregwomen-uscases.html

Figure 10: Confirmed and Probable Human Zika Cases by Week of Specimen Collection Date: 2016 and 2017 Seasons

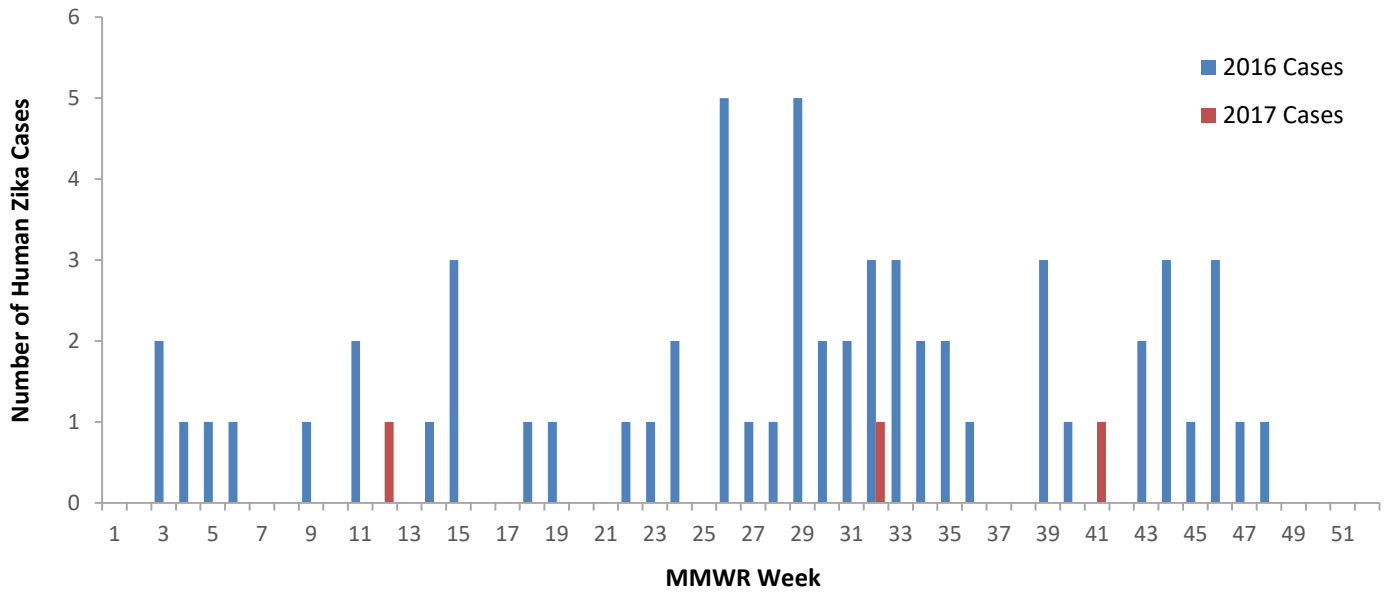


Figure 11: BG-Sentinel Trap Counts of Female *Aedes aegypti* and *Aedes albopictus* During 2017: Weeks 13 through 52

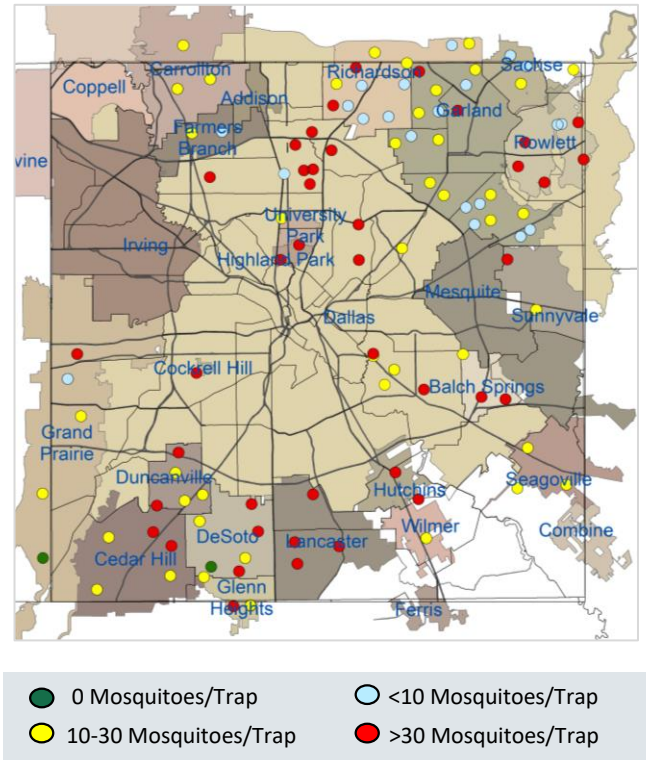


Figure 12: Average Numbers of *Aedes aegypti* per Trap-night: 2016 and 2017 Seasons*

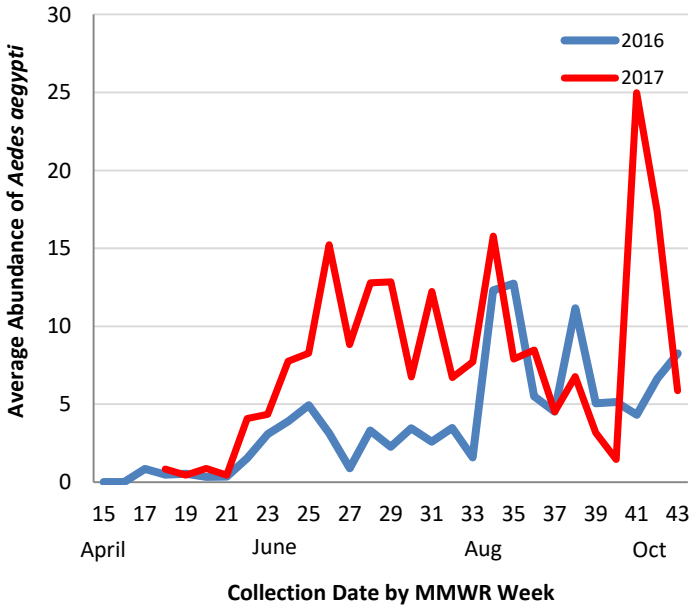
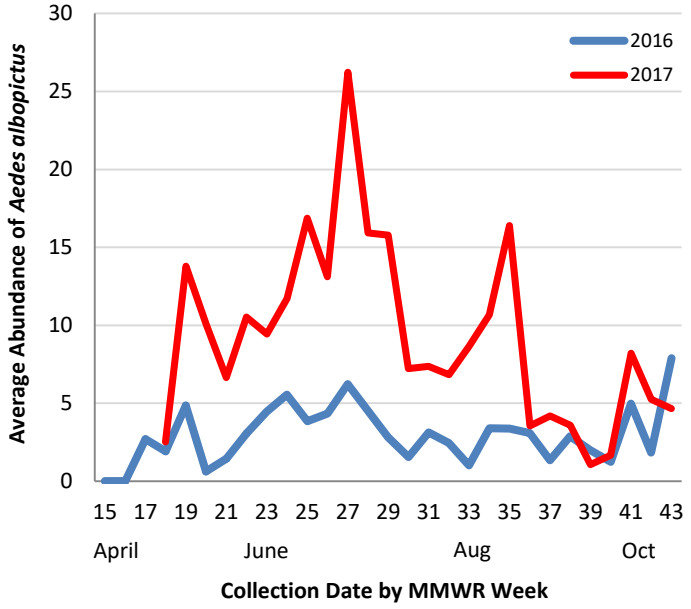
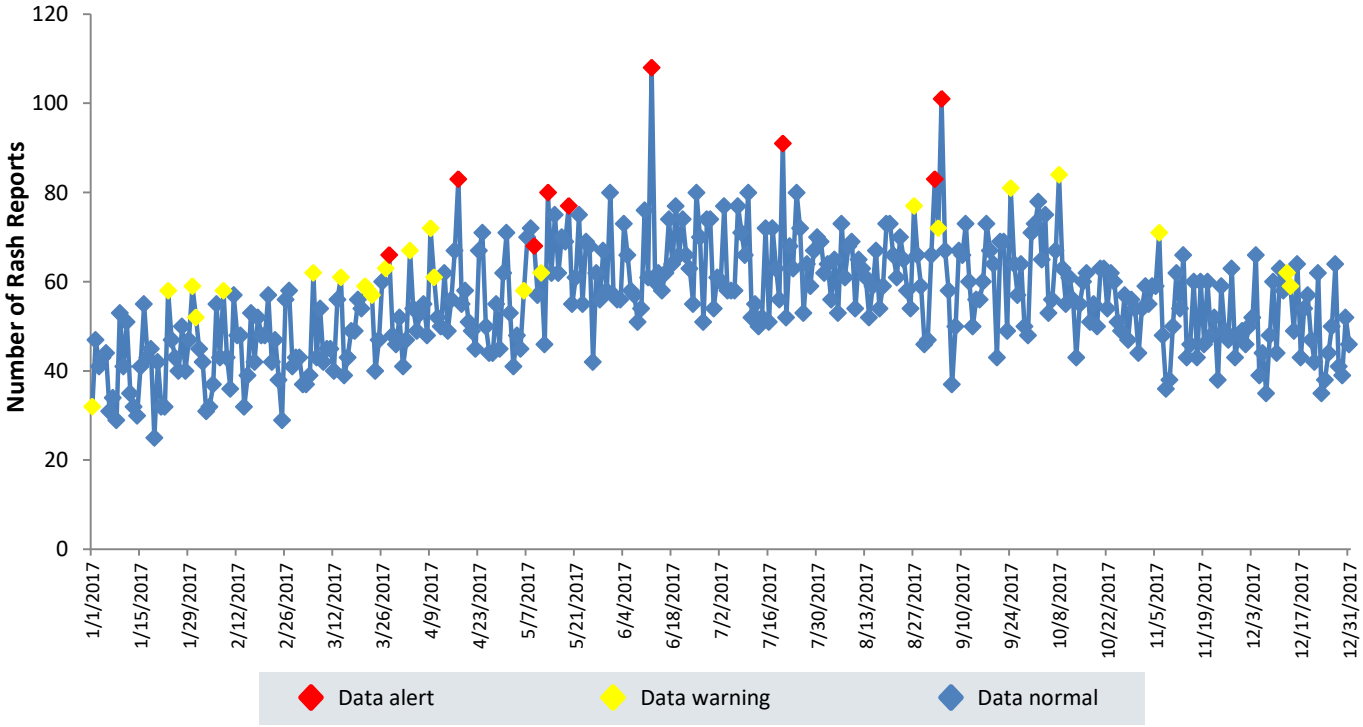


Figure 13: Average Numbers of *Aedes albopictus* per Trap-night: 2016 and 2017 Seasons*



*Routine *Aedes* BG-Sentinel trapping was conducted during week 15 - 43 in 2016 and 2017

Figure 14: Syndromic Surveillance of Emergency Department Visits for Chief Complaints of Rash, Dallas County: January 1, 2017 – December 31, 2017



Data source: 18 emergency departments in Dallas County hospitals participating in the Electronic Surveillance System for the Early Notification Of Community-based Epidemics (ESSENCE) voluntarily reporting the numbers of persons presenting with self-reported chief complaints of rash.

Acknowledgements:

We are grateful for the partnership of the following contributors to our county-wide Arboviral Surveillance Report:

Mosquito Trapping and Data from Environmental Health Services Divisions of the Following Cities:

Addison
Balch Springs
Carrollton
Cedar Hill
Cockrell Hill
Coppell
Dallas
DeSoto
Duncanville
Farmers Branch
Garland
Glenn Heights
Grand Prairie
Highland Park
Hutchins
Irving
Lancaster
Mesquite
Richardson
Rowlett
Sachse
Seagoville
Sunnyvale
University Park
Wilmer

Mosquito Trapping and Data From:

DCHHS Environmental Health Services: Vector Control Division
Municipal Mosquito
Vector Disease Control International

Mosquito Speciation and Laboratory Testing:

DCHHS Environmental Health Services: Mosquito Lab
DCHHS LRN Laboratory
DSHS Laboratory Services, Arbovirus-Entomology Team
Municipal Mosquito

Human Case Reports and Investigations:

Area Acute Care Hospitals and Healthcare Providers
Dallas County Medical Examiner's Office
City of Dallas Vital Statistics Unit
Carter Blood Care
American Red Cross
DCHHS Acute Communicable Disease Epidemiology Division
Zika Pregnancy Registry Team
Arboviral Case Investigation and Clinical Inquiries Team

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