



Final Report:
Zika Virus Community
Assessment for Public
Health Emergency
Response (CASPER)

Williamson County and Cities
Health District

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1 INTRODUCTION

1.1 BACKGROUND

Zika virus (ZIKV) is a mosquito-borne arbovirus of the *Flaviviridae* family, genus *Flavivirus* that is primarily transmitted to humans through the bite of an infected *Aedes* species mosquito (*Ae. aegypti* and *Ae. albopictus*). These mosquitoes also spread dengue (DENV) and chikungunya (CHIKV) viruses, are aggressive daytime-biters that prefer to bite people, may live indoors and outdoors, and lay eggs in and near standing water in objects around the home (e.g. buckets, bowls, flower pots, etc.). Other identified routes of ZIKV transmission include: mother to fetus, sexual transmission, and blood transfusion¹. Approximately 80% of people infected with ZIKV are asymptomatic. If symptoms are present, they are typically mild and non-specific, like those of other arboviral infections, especially those transmitted by *Aedes* mosquitoes (e.g. DENV and CHIKV). The most common ZIKV symptoms include: fever, rash, arthralgia, and conjunctivitis. ZIKV viremia ranges from several days to one week². During the viremic period, a person may infect *Aedes spp.* mosquitoes during a blood meal and anthroponotic (human-to-vector-to-human) transmission, called local transmission, may occur¹. To date, it is unknown how long ZIKV remains in semen and vaginal fluids and how long it can be passed through sexual transmission³. ZIKV disease requiring hospitalization is uncommon and case fatality is low². However, in April 2016, the United States (U.S.) Centers for Disease Control and Prevention (CDC) concluded ZIKV infection during pregnancy is a cause of congenital malformations, including microcephaly and other severe fetal brain defects⁴. In addition, ZIKV infection during pregnancy has been linked to adverse outcomes including pregnancy loss, eye defects, hearing loss, and impaired growth in infants^{4,5}. Furthermore, health officials in Colombia reported Guillain-Barré syndrome (GBS) in patients following ZIKV infection⁶. There is currently no treatment or vaccine available for ZIKV; therefore, the CDC recommends public health responses and community actions focus on primary prevention methods to prevent ZIKV infection, particularly in pregnant women. Primary prevention methods include: mosquito bite avoidance, elimination of mosquito breeding habitats, travel restrictions to areas with active local ZIKV transmission, and abstaining from or using condoms during sexual contact after ZIKV exposure or travel to an area with active local ZIKV transmission^{7,8}.

Prior to 2015, human ZIKV infection was primarily reported in Asia and Africa, with sporadic outbreaks documented in Micronesia in 2007 and French Polynesia in 2013⁹. In May 2015, the Pan American Health Organization (PAHO) issued an alert regarding the first locally acquired mosquito-borne ZIKV case in Brazil. The emergence of ZIKV outside of its previously known geographic range prompted increased awareness among world-wide health agencies of the potential for ZIKV to spread throughout the Americas. In addition, the Brazilian Ministry of Health reported a high incidence of the birth defect, microcephaly, in infants born to ZIKV-infected mothers in Brazil. As ZIKV cases continued to expand geographically and microcephaly reports increased, the World Health Organization (WHO) declared ZIKV a public health emergency of international concern in February 2016^{10,11}. Furthermore, the CDC issued travel



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warnings which urged pregnant women to limit or avoid travel to areas with active local ZIKV transmission¹².

In April 2016, the CDC hosted a Zika Action Plan (ZAP) Summit, to increase knowledge of the latest ZIKV science, discuss risk communication strategies, and address possible ZIKV planning and response gaps among federal, state, and local health departments. The CDC urged public health officials to develop ZIKV preparedness and response plans within respective states and jurisdictions and to prepare for potential local ZIKV transmission in the United States¹³.

As part of a local public health and preparedness planning effort, on June 17 and 18, 2016, the Williamson County and Cities Health District (WCCHD) conducted a Community Assessment for Public Health Emergency Response (CASPER) to evaluate ZIKV health communication, mosquito prevention behaviors, and emergency preparedness readiness among households in Williamson County, Texas. The objectives of the ZIKV CASPER were:

1. To quantify knowledge and understanding of ZIKV health messages;
2. To evaluate mosquito prevention behaviors (e.g. drain standing water, wear repellent, wear long sleeve shirts and pants);
3. To quantify known emergency preparedness planning principles (e.g. emergency plans, evacuation plans);
4. To describe the types of preparedness equipment and supplies households have access (e.g. emergency supply kits, first aid kits); and
5. To describe sources of trusted ZIKV and emergency preparedness messages among households in Williamson County, Texas.

WCCHD will distribute analyzed ZIKV CASPER data to various WCCHD divisions (i.e. Disease Control and Prevention, Emergency Response and Preparedness, Environmental Health Services, Marketing and Community Engagement, Administration), local emergency management, and community stakeholders to be used to develop evidence-based ZIKV health education strategies and inform preparedness and response plans in Williamson County.

To complete this CASPER, WCCHD collaborated with a neighboring local health department, Austin/Travis County Health and Human Services Department (A/TCHHSD), now known as Austin Public Health (APH), to leverage resources amongst agencies and conduct simultaneous Zika CASPERs on the same date. These simultaneous WCCHD and APH CASPERs were some of the first CASPERs in the nation to evaluate ZIKV knowledge and mosquito prevention in a community. APH Zika CASPER information can be found on their website at:

<http://www.austintexas.gov/resident/public-health>.



1.2 CURRENT ZIKV STATUS

As of January 2017, active local mosquito-borne ZIKV transmission has been identified in parts of the Americas (including the U.S.), Pacific Islands, and Africa. In the U.S., local ZIKV transmission has occurred in the Miami-Dade area of Florida and Cameron County, Texas¹⁴.

According to the CDC, *Aedes* species mosquitoes (*Ae. aegypti* and *Ae. albopictus*) are present in many areas in the U.S., including Texas (and Williamson County). Per the Texas Department of State Health Services (DSHS), local mosquito-borne ZIKV transmission in Texas remains likely. However, public health officials do not expect widespread local transmission of ZIKV across large geographic areas of the state. Instead, small pockets of cases in limited clusters are more likely. This assessment is based on the state's experience with DENV, a similar virus, also spread by *Ae. aegypti* and *Ae. albopictus* mosquitoes¹⁵.

ZIKV Case Counts in the United States and Texas:

- In the U.S., ZIKV disease and ZIKV congenital infection are nationally notifiable conditions. From January 2015 to February 2016, there have been 4,973 ZIKV cases reported in the U.S. since 2015. Most of these cases (approximately 95%; 4,752) were travel-associated and 220 (approximately 4%) were locally acquired mosquito-borne cases (Miami-Dade, Florida – 220, Cameron County, Texas – 6). There has been one laboratory-acquired case reported. Of the 4,973 reported cases, 41 were sexually transmitted and 13 had GBS¹⁶.
- To understand more about Zika virus infection, the CDC established the U.S. Zika Pregnancy Registry and is collaborating with state, tribal, local, and territorial health departments to collect information about pregnancy and infant outcomes following laboratory evidence of ZIKV infection during pregnancy¹⁷. As of January 24, 2017, there have been 999 completed pregnancies in the U.S. enrolled in the registry. Of these, 38 pregnancies with birth defects and five pregnancy losses with birth defects were reported¹⁷.
- In Texas, from December 2015 through December 2016, there were 300 reported ZIKV cases, including six cases of ZIKV disease likely transmitted locally by mosquitoes in Cameron County. All other cases (294) were related to travel to areas with ongoing ZIKV transmission, including two cases acquired by sexual contact with travelers. There have been three reported ZIKV cases where the virus was passed from mother to child during pregnancy¹⁵.
- In Williamson County, Texas there were five confirmed ZIKV cases reported to WCCHD in 2016, all of which were travel-associated¹⁵.

Pregnant women remain a high-risk ZIKV group due to the potential for birth defects in babies born to mothers infected with ZIKV during pregnancy. Primary prevention methods to prevent mosquito bites, mosquito breeding habitats, and sexual transmission of ZIKV remain crucial to prevent ZIKV infection in pregnant women and to reduce the spread of the disease in the community.



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Note:

In addition to ZIKV, DENV and CHIKV also spread by the *Aedes spp.* mosquito, tend to circulate in the same geographic areas as ZIKV, and pose risk to travelers who visit locations where these diseases are spread locally. Furthermore, West Nile virus (WNV), an arbovirus endemic to Texas (including Williamson County), which is spread by the *Culex spp.* mosquito, remains a threat to the community each year. WNV has the potential to cause neuroinvasive disease and long-term neurologic effects in people of all ages. Therefore, primary prevention methods against all mosquito-borne diseases continue to be essential and include mosquito bite avoidance and elimination of mosquito breeding habitats, regardless of ZIKV incidence in Williamson County.



2 METHODS AND MATERIALS

2.1 CASPER OVERVIEW

CASPER is an epidemiologic technique designed to provide quickly and at low-cost household-based information about a community's knowledge, behaviors, and needs in both disaster and non-disaster settings¹⁸. CASPER is designed to sample a representative cross-section of a community through a two-stage sampling methodology. In the first stage, stakeholders pre-select a sampling-frame, or geographic area of interest, for the assessment. Next, thirty U.S. Census Blocks, called clusters, are randomly selected within the sampling-frame. In the second stage, designated teams are deployed to the thirty clusters to attempt to conduct seven household interviews in each cluster. The goal is to complete 210 total household interviews during the assessment. Once analyzed with a weighted cluster analysis, the data collected from the surveys may be generalized to the entire sampling frame¹⁹.

2.2 WCCHD ZIKV CASPER SAMPLING METHODOLOGY

To accomplish the Zika CASPER objectives, WCCHD utilized a modified version of the CASPER two-stage sampling methodology.

Stage 1: WCCHD Defined the Sampling Frame and Identified Thirty Clusters

1. WCCHD worked with APH and local officials to define the project sampling frame, or geographic location where potential samples (household interviews) would occur during the assessment.
 - The final approved sampling frame included all 2010 U.S. Census Blocks within the cities and county jurisdiction of Williamson County, excluding the City of Round Rock, which opted out of participation in the Zika CASPER project.
 - The sampling frame contained 77% of housing units (per 2010 U.S. Census data) in the cities and county jurisdiction of Williamson County.
 - WCCHD and APH used ESRI ArcGIS software to create a map of the final sampling frame (Appendix A).
2. Next, WCCHD, with assistance from APH staff, used ESRI ArcGIS CASPER Toolbox software to randomly select thirty 2010 U.S. Census blocks in the Williamson County sampling frame.
 - WCCHD used 2010 U.S. Census Data (most current available).
 - The U.S. Census Blocks were selected by their probability of selection proportional to the estimated number of housing units in each U.S. Census block.



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3. WCCHD used ESRI ArcGIS to map the thirty clusters (U.S. Census Blocks where household interviews would be attempted), which were in the following cities and county limits of Williamson County: Austin, Bartlett, Cedar Park, Florence, Georgetown, Hutto, Leander, Liberty Hill, Taylor, and Thrall (Appendix B).

Stage Two: Sampling (Conduct Household Interviews)

1. WCCHD used ESRI ArcGIS software to identify a random address within each of the thirty clusters.
 - WCCHD used this address as a geographic point for teams to identify the assigned cluster.
 - WCCHD conducted “ground truthing,” a method to ensure clusters were accessible, safe, and contained at least seven housing units. WCCHD staff drove to cluster locations in the two weeks prior to the Zika CASPER. Six cluster locations did not meet the safety and accessibility requirements. Therefore, WCCHD used ESRI ArcGIS to replace them with new, randomly selected cluster locations.
2. On Friday, June 17 and Saturday, June 18, 2016, WCCHD deployed fifteen, pre-trained interview teams (of two to three volunteers) to conduct household interviews at seven occupied housing units in each of the thirty clusters between the hours of 8:00 a.m. and 5:00 p.m.
 - WCCHD provided each team with a pre-selected starting address and detailed maps of each cluster, created by WCCHD with ESRI ArcGIS and Google Earth.
 - WCCHD instructed teams to attempt the first interview at the house directly to the left of the provided starting address, then to move sequentially to the left, until seven interviews were completed in the cluster.
 - Interview teams requested consent from one adult (≥ 18 years of age) in the household to participate in the interview. If the household refused to participate or an interview could not be conducted (i.e. due to age, safety, vacant property, not home, etc.), the interview teams moved, sequentially, to the next household.
 - Interview teams tracked interview attempts and details on a standardized tracking form (Appendix C).
 - WCCHD’s goal was to complete a combined total of 210 interviews (minimum 168 for statistical significance) for the entire sampling frame.
 - Interview teams distributed ZIKV, mosquito prevention, and emergency preparedness information to participating households (Appendix D).



2.3 SURVEY TOOL AND ANALYSIS

Survey Tool

WCCHD, in collaboration with APH, created a two-page survey instrument for this CASPER. The survey instrument included thirty-two, non-personally identifying questions regarding ZIKV health communication, knowledge of Zika virus disease, mosquito prevention behaviors, and household emergency preparedness (Appendix E).

WCCHD created a hard-copy and electronic version of the survey, each containing the same questions. The electronic version was created in SurveyMonkey, with the intent of WCCHD piloting this survey platform and the efficacy of electronic survey data entry during a CASPER. WCCHD provided teams the option of collecting household responses on the hard-copy or electronic version of the survey. Six of 15 teams elected to collect electronic survey responses on mobile devices (for example, with phones or tablets) while in the field. Upon completion of the field portion of the project, WCCHD staff ensured electronic form entries were complete and entered hard-copy responses into the SurveyMonkey form, which compiled all responses (hard-copy and electronic) into one SurveyMonkey database. WCCHD staff exported the SurveyMonkey database into a MS-Excel file for data cleaning and analysis.

Analysis

WCCHD used Epi Info 7.2.0.1 and MS-Excel to conduct a weighted cluster analysis. WCCHD weighted data based on the total number of housing units in the sampling frame, the number of housing units interviewed in each cluster, and the number of clusters selected. The estimated percent and projected number of households with a particular response in the assessment area were reported. WCCHD calculated the unweighted and weighted frequencies, unweighted and weighted percentages, projected number of households, and the 95% confidence intervals of the weighted percentages.

2.4 INTERVIEW TEAMS AND TRAINING

Prior to the CASPER, WCCHD recruited internal volunteers from WCCHD and external volunteers from neighboring health departments, emergency response teams, and schools of public health to staff interview teams (Appendix F).

WCCHD staffed interview teams with volunteers from:

- Bell County Health District
- Cedar Park CERT
- DSHS Region 7
- Texas State University
- WCCHD



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WCCHD created 15 teams of two to three volunteers to conduct household interviews in each cluster. Each team was assigned two clusters. If a team completed its assigned clusters early, WCCHD assigned it additional clusters.

On June 17, 2016, WCCHD provided a three-hour “just-in-time” training to teams on topics including: the purpose of CASPER, household selection and interview, safety and logistics, radio communication, and Zika virus, mosquito prevention, and emergency preparedness 101.

2.5 NOTIFICATION TO THE PUBLIC

On June 13, 2016, WCCHD and APH published a joint press release to inform Williamson County and Travis County citizens of the June 17th and 18th CASPER project (Appendix G). In addition, WCCHD used Facebook to inform Williamson County citizens of the project and to encourage survey participation (Appendix H). Throughout the field-work portion of the CASPER, WCCHD encouraged interview teams to share their progress on Twitter, Facebook, and Instagram while in the field, by posting photos with #ZikaCASPER.

2.6 LIMITATIONS

The results of this study are subject to limitations.

- WCCHD Zika CASPER field teams conducted interviews at accessible houses only. Therefore, the study results may underestimate the actual responses of the community (e.g. households that appeared unsafe or vacant were not approached).
- WCCHD estimated the number of households in the Williamson County sampling frame with the most current available U.S. Census Data, which is from 2010. The weighted analysis does not account for changes in the number of housing units from 2010-2016.
- WCCHD used a modified version of the two-stage sampling methodology. Although WCCHD used standard CASPER methodology to select a random starting point in each cluster, WCCHD introduced sequential sampling into the methodology, potentially biasing samples to one selection of households in each of the clusters. WCCHD introduced the sequential sampling component due to weather (heat), time constraints (8 a.m. – 5 p.m.), limited numbers of volunteers, and to maximize sampling efforts (for example, some clusters contained fewer than ten households).
- The City of Round Rock opted out of participation in the CASPER, and was the only city within Williamson County excluded from the sampling frame. Therefore, the analyzed data may be generalized to all households in Williamson County, excluding those in the City of Round Rock. This leaves a potential ZIKV and mosquito prevention planning gap in this part of Williamson County.



3 RESULTS

Unless otherwise stated, the percentages used in the text are weighted percentages.

3.1 GENERAL SURVEY OVERVIEW

On June 17 and June 18, 2016, WCCHD Zika CASPER interview teams approached a total of 727 households in Williamson County, representing 24.1% of the 3,016 housing units in the selected 30 clusters. Of the 727 households approached, the teams completed 188 out of the targeted 210 household interviews, for a completion rate of 89.5% and a contact rate of 25.9%. Of the 316 (43.5%) households with an eligible participant answering the door (adult ≥ 18 years of age), 188 completed an interview, for a cooperation rate of 61.0% (Table 1).

Table 1. WCCHD Zika CASPER 2016: Completion, Contact, and Cooperation Rates

Questionnaire Response	Rate	Percent (%)
Completion*	188/210	89.5
Contact‡	188/727	25.9
Cooperation†	188/316	61.0

*Percent of surveys completed in relation to the standard CASPER goal of 210

‡ Percent of randomly selected households that completed an interview

† Percent of contacted households that were eligible and willing to participate in the survey

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

3.2 HOUSEHOLD CHARACTERISTICS AND DEMOGRAPHICS

The WCCHD Zika CASPER interview teams recorded information on the types of housing structures approached and asked interviewees to self-report race and ethnicity.

Household Characteristics

Most households were single family dwellings (91.4%), followed by mobile homes (5.2%), then multiple unit dwellings (3.3%) (Table 2).

Table 2. WCCHD Zika CASPER 2016: Household Characteristics

Housing Structure	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
Single family home	170	90.4	114,839	91.4 (83.9 – 98.9)
Mobile home	11	5.9	6,579	5.2 (-1.8 – 12.3)
Multiple unit	7	3.7	4,187	3.3 (0.3 – 6.4)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



Demographics

Of households that self-reported race and ethnicity, the following races and ethnicities were reported: White (75.8%), Mixed-race (6.4), Other (6.1%), Black or African American (4.0%), Asian/Pacific Islander (2.4%), and American Indian/Alaskan Native (1.5%). Interviewees reported ethnicity as: non-Hispanic (56.6%) and Hispanic (24.2%) (Table 3).

Table 3. WCCHD Zika CASPER 2016: Household Demographics

Race	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
American Indian/Alaska Native	3	1.6	1,894	1.5 (-0.7 – 3.7)
Asian/Pacific Islander	5	2.6	2,991	2.4 (-0.5 – 5.2)
Black or African American	8	4.3	5,024	4.0 (1.1 – 6.9)
Mixed Race	13	6.9	8,014	6.4 (2.4 – 10.3)
Other	10	5.3	7,716	6.1 (1.6 – 10.6)
White	141	75.0	95,181	75.8 (68.3 – 83.3)
No answer	8	4.3	4,785	3.8 (0.7 – 6.9)
Ethnicity				
Hispanic	45	23.9	30,335	24.2 (17.5 – 30.8)
Non-Hispanic	107	56.9	71,076	56.6 (44.0 – 69.1)
No answer	36	19.2	24,194	19.3 (8.6 – 29.9)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Pregnant Women

The CDC recommends a top priority for public health response to ZIKV should be to protect pregnant women because of the risks associated with ZIKV infection during pregnancy^{1,3,6}. As previously stated, ZIKV infection during pregnancy is the cause of congenital malformations, including microcephaly and other severe fetal brain defects, and poor pregnancy outcomes. Scientists continue to study the full range of potential health problems that ZIKV infection during pregnancy may cause³. To gain perspective on the number of pregnant women in Williamson County households, Zika CASPER interview teams asked, “How many pregnant women are living in your household?”

Most respondents (93.6%) reported zero pregnant women in the household, followed by one pregnant woman (2.4%), and then two pregnant women (0.5%). No households reported more than two pregnant women living in the home at the time of the survey. Based on 2010 U.S. Census Data, pregnant women are in a projected 3,588 households in the WCCHD Zika CASPER sampling frame (Table 4).



Table 4. WCCHD Zika CASPER 2016: Reported Number of Pregnant Women in Households

# of Pregnant Women*	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
0	175	93.0	117,590	93.6 (89.9 – 97.3)
1	5	2.7	2,990	2.4 (0.4 – 4.4)
2	1	0.5	598	0.5 (-0.4 – 1.5)
No answer	7	3.7	4,426	3.5 (0.1 – 7.0)

*No interviewee reported >2 pregnant women in a household

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

3.3 ZIKV HEALTH COMMUNICATION

Zika CASPER survey teams asked participating households three questions related to ZIKV health communication. The purpose of WCCHD gathering this information was to determine how Williamson County households acquire ZIKV-related information, the trusted sources of ZIKV information, and additional ZIKV information needs. These data may be utilized WCCHD and others stakeholders for future ZIKV communication and outreach efforts.

Sources of ZIKV Information

Interview teams asked survey participants, “From which sources have you heard information about Zika?”

- The top five reported sources of ZIKV-related information were: radio/television (81.6 %), internet (37.0%), newspapers (25.1%), social media (16.8 %), and family (16.2 %) (Table 5).

Table 5. WCCHD Zika CASPER 2016: Top Five Reported Sources of Zika Virus Information

Information Source	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Radio/Television	151	80.3	102,478	81.6 (75.3 – 87.9)
Internet	70	37.4	46,284	37.0 (26.6 – 47.4)
Newspapers	45	23.9	31,480	25.1 (16.9 – 33.2)
Social Media	32	17.0	21,073	16.8 (10.3 – 23.2)
Family	30	16.0	20,336	16.2 (8.7 – 23.7)

*Interviewees were permitted to provide >1 response

Additional Responses: Friends/neighbors (10.7%); Government (5.6%); Private doctor (5.6%); Local health department (4.6%); Church (3.1%); Community meeting (3.1%); Pharmacy (3.1%); Job/work (1.5%); Magazine/Professional journal (1.0%); Blood bank (0.5%); No answer (2.9%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



Trusted Sources of ZIKV Information

Zika CASPER interview teams asked households which sources they *most trust* to provide accurate ZIKV-related information.

- The top five leading sources for *trusted* ZIKV information were: radio/television (48.1%), private doctor (27.2%), local health department (23.1%), internet (22.2%), and newspapers (17.6%).

Table 6. WCCHD Zika CASPER 2016: Top Five *Trusted* Sources of Zika Virus Information

Information Source	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Radio/Television	86	45.7	60,400	48.1 (40.3 – 55.8)
Private Doctor	49	26.1	34,172	27.2 (19.3 – 35.1)
Local Health Department	42	22.3	29,049	23.1 (14.0 – 32.2)
Internet	41	21.8	27,852	22.2 (13.1 – 31.2)
Newspapers	33	17.6	22,130	17.6 (11.2 – 24.0)

*Interviewees were permitted to provide >1 response

Additional Responses: Government (10.0%); Family (9.5%); Social media (8.9%); Pharmacy (7.9%); Friends/neighbors (7.8%); Church (7.5%); Community meeting (6.2%); CDC/Health Organizations (4.0%); No trusted source (2.4%); Job/work (1.0%); Magazine/professional journal (0.9%); Blood bank (0.5%); Sheriff (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

ZIKV Information Needs

Zika CASPER interview teams asked survey participants, “What additional information would you like to know or receive about Zika?”

- The top five information requests among households were for: ZIKV signs/symptoms (40.2%) and prevention (38.1%), followed by treatment options (26.5%), cause (21.7%), and then the “no additional information needed” category (19.9%) (Table 7).



Table 7. WCCHD Zika CASPER: Additional Information Needed or Requested by Households

Additional Information Needed	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Signs and Symptoms	76	40.4	50,521	40.2 (31.1 – 49.3)
Prevention	74	39.4	47,909	38.1 (28.6 – 47.7)
Treatment Options	52	27.7	33,275	26.5 (18.2 – 34.7)
Cause	39	20.7	27,204	21.7 (15.9 – 27.4)
No Information Needed	36	19.2	24,962	19.9 (12.6 – 27.2)
Consequences of Zika	34	18.1	21,014	16.7 (11.5 – 22.0)
Other**	24	12.8	16,398	13.1 (7.6 – 18.5)
No Answer	7	3.7	4,187	3.3 (1.0 – 5.6)
Don't Know	5	2.7	3,888	3.1 (-0.6 – 6.8)

*Interviewees were permitted to provide >1 response

**Other: Case counts/location (6.8%); Long-term health effects associated with Zika infection (1.4%); Mosquito identification/prevention/control (1.4%); City/county response (0.5%); Environmental assessment (0.6%); Health consequences of spraying (0.5 %); Human laboratory testing (0.5%); Transmission (0.5%); Where to find information (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

3.4 ZIKV KNOWLEDGE AND MOSQUITO PREVENTION BEHAVIORS

Per the CDC, it remains essential for public health responses and community actions to focus on primary prevention methods to prevent ZIKV infection in a population, especially in pregnant women^{6,7}. Therefore, Zika CASPER teams asked households a series of questions regarding ZIKV knowledge and mosquito prevention behaviors, with question structure rooted in constructs of the Health Belief Model (HBM) such as: perceived seriousness, perceived susceptibility, perceived barriers, and self-efficacy among households. The underlying concept of the HBM is that health behavior is determined by personal beliefs or perceptions about a disease and the strategies available to decrease its occurrence²⁰. These Zika CASPER data describe the community’s health-related perceptions and behaviors pertaining to ZIKV knowledge and prevention, which may be used by WCCHD and stakeholders to develop strategies or campaigns to increase the potential uptake of ZIKV and mosquito prevention behaviors.

ZIKV Importance

To understand perceived seriousness of ZIKV among Williamson County residents, Zika CASPER interview teams asked households, “Do you think Zika is an important issue in your community.”

- 70.4% of households reported ZIKV is an important issue in their community, followed by “no” (17.6%), “don’t know” (10.6%), then “no answer” (1.4%) (Table 8).



Table 8. WCCHD Zika CASPER 2016: Do you think Zika is an important issue in your community?

Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
Yes	133	70.7	88,462	70.4 (61.9 – 79.0)
No	34	18.1	22,051	17.6 (10.6 – 24.5)
Don't Know	18	9.6	13,298	10.6 (4.7 – 16.7)
No Answer	3	1.6	1,794	1.4 (-0.2 – 3.1)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

ZIKV Transmission, Symptoms, Risks

To understand perceived severity and susceptibility to ZIKV among households in the sampling frame, Zika CASPER interview teams asked respondents a series of questions regarding ZIKV transmission, vaccine availability, ZIKV symptoms, and ZIKV risk to an infected mother and fetus. These questions included: “What are common ways people can get infected with Zika,” “Is there a vaccine for Zika,” “What are the symptoms of Zika,” and “If a pregnant woman has Zika, what are the risks for her fetus/baby?”

- 87.7% of households correctly reported mosquito bites as a route of ZIKV transmission. In addition, 33.4% of households reported sexual transmission as a way for people to become infected with ZIKV. However, only 2.9% of households reported ZIKV can be passed from mother to fetus (Table 9).
- 65.5% of households reported there is no vaccine for ZIKV and 29.4% reported they “don’t know” if there is a ZIKV vaccine (Table 10).
- When asked to describe ZIKV symptoms, 40.1% of households reported “don’t know,” followed by fever (33.2%). In addition, 27.3% of households reported “other” symptoms, some which were incorrect, for example, AIDS (0.5%). A low frequency of households responded with other common ZIKV symptoms such as: joint pain (8.3%), rash (6.1%), and conjunctivitis (1.0%). Only 2.9% of households reported a person infected with ZIKV may be asymptomatic, or have no symptoms (Table 11).
- Over half (57.6%) of households correctly identified that microcephaly may occur in a baby born to a mother infected with ZIKV during pregnancy. Furthermore, 35.4% of households reported abnormal growth or “other” possible complications if a mother is infected with ZIKV during pregnancy (Table 12).



Table 9. WCCHD Zika CASPER 2016: What are common ways people can get infected with Zika?

Response	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Mosquito bites	163	86.7	110,114	87.7 (82.7 – 92.6)
Sexual Transmission	62	33.0	41,789	33.4 (26.8 – 39.7)
Other**	16	8.6	10,347	8.3 (3.7 – 13.0)
Passed from Mother to Child	6	3.2	3,589	2.9 (0.7 – 5.0)
Don't Know	13	7.0	7,776	6.2 (1.4 – 11.0)
No Answer	1	0.5	698	0.6 (-0.6 – 1.7)

*Interviewees were permitted to provide >1 response

**Other: Kissing (0.5%); Being outdoors (1.6%), Needles/Blood (1.1%), Other people (0.5%); Travel (1.6%); (Water 0.5%); Blood transfusion (1.6%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Table 10. WCCHD Zika CASPER 2016: Is there a vaccine for Zika?

Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
No	124	66.0	82,321	65.5 (57.3 – 73.7)
Don't Know	54	28.7	36,964	29.4 (22.1 – 36.8)
Yes	8	4.26	5,124	4.1 (1.5 – 6.7)
No Answer	2	1.0	1,196	1.0 (-0.4 – 2.3)

*Interviewees were permitted to provide >1 response

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Table 11. WCCHD Zika CASPER 2016: What are the symptoms of Zika?

Response	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Don't Know	74	39.4	50,322	40.1 (30.6 – 50.0)
Fever	62	33.0	41,679	33.2 (25.8 – 40.5)
Other**	53	28.2	34,232	27.3 (17.6 – 36.9)
Headache	29	15.4	19,080	15.2 (8.5 – 21.9)

**Other: Influenza-Like Illness (ILI) (12.8%); Birth defects (4.1%); Cold Symptoms (2.4%); Nausea/vomiting (2.6%); Cold (1.4%); Weakness/fatigue/lethargic (1.4%); Acquired immune deficiency syndrome (AIDS) (0.5%); Death (0.5%); Diarrhea (0.5%); Guillain-Barre syndrome (GBS) (0.6%); Microcephaly (0.6%)

Additional responses: Joint pain (8.3%); Rash (6.1%); No symptoms (2.9%); No answer (2.5%); Conjunctivitis/Red eyes (1.0%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



Table 12. WCCHD ZIKV CASPER 2016: If a pregnant woman has Zika, what are the risks for her fetus/baby?

Response	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Microcephaly	106	56.4	72,352	57.6 (47.4 – 67.9)
Not growing or developing normally in the womb	35	18.6	22,628	18.0 (10.2 – 25.9)
Other**	32	17.1	21,881	17.4 (9.9 – 24.9)
Don't know	28	14.9	19,269	15.3 (8.9 – 21.7)

*Interviewees were permitted to provide >1 response

**Other: Birth defects (8.3%); High risk (4.9%); Brain damage (1.7%); Death (1.4%); Zika infection (1.0%)

Additional responses: Miscarriage (3.5%); Disability (2.9%); Born prematurely (1.9%); No answer (1.4%); Stillborn (0.5%); None (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Prevention Methods and Barriers

The CDC recommends people should avoid mosquito bites as a first-line defense to ZIKV. The following prevention methods should be used to prevent mosquito bites:

- Use Environmental Protection Agency (EPA)-registered insect repellent;
- Wear long-sleeved shirts and long pants; and
- Take steps to control mosquitoes inside and outside the home (use/repair screens on windows and doors; use air conditioning when available; and once a week, empty and scrub, turn over, cover, or throw out items that hold water, such as tires, buckets, planters, toys, pools, birdbaths, flowerpots, or trash containers, etc.).

To understand perceived barriers and self-efficacy pertaining to mosquito bite prevention, Zika CASPER interview teams asked households two questions pertaining to current methods to prevent ZIKV and what barriers might prevent a household from acting to protect themselves from ZIKV. More specifically, interview teams asked, “What actions can you take to protect you or your household from getting ZIKV” and “What would stop you from protecting yourself from Zika?”

- The most frequent actions taken to protect households from ZIKV were: to use mosquito repellent (72.9%), turn over/cover, clean items that hold water (32.4%), use mosquito control products to treat large containers of water (22.7%), wear long sleeved shirts/pants (20.2%), and spray fumigate home (16.4%) (Table 13).



- Over 75% of households reported “nothing” would stop them from protecting themselves from ZIKV. Of households that reported barriers, 6.3% reported the “other” category (Inconvenient (3.3%); Allergies (1.0%); Vaccine (1.0%); Age (0.5%); Immunity (0.6%)), followed by “preventing ZIKV is not a priority” (5.4%), don’t know (5.0%), and “don’t have the time/resources/knowledge” (3.9%) (Table 14).

Table 13. WCCHD Zika CASPER 2016: What actions can you take to protect you or your household from getting Zika?

Response	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Use mosquito repellant	137	72.9	91,532	72.9 (66.3 – 79.4)
Turn-over/cover/clean items that hold water	58	30.9	40,752	32.4 (22.2 – 42.7)
Use mosquito control products to treat large containers of water	41	21.8	28,510	22.7 (14.6 – 30.8)
Wear long sleeved shirts/pants	34	18.1	25,261	20.2 (14.2 – 26.2)
Spray or fumigate home	29	15.4	20,635	16.4 (10.4 – 22.5)

*Interviewees were permitted to provide >1 response

Additional responses: Avoid/cancel travel to ZIKV affected area (8.0%); Use a condom/abstain from sex (5.0%); Don’t know (4.8%); Install/repair/use screens (2.9%); None of the above (1.9%); No answer (1.9%); Stay indoors/Limit time outdoors during certain hours (8.5%); No standing water (3.3%); Candles (0.9%); Get tested/contact physician (1.1%); Mow/cut grass (0.9%); Sanitization/hygiene (0.9%); Avoid infected people (0.5%); Birds (0.8%); Contact the city (0.5%); Sulfur (0.5%); Bug nets (0.5%); Vitamin B1 (0.5%); Wear dark clothing (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



Table 14. WCCHD Zika CASPER 2016: What would stop you from protecting yourself from Zika?

Response	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Nothing, I would protect myself	138	73.4	94,473	75.2 (67.5 – 82.9)
Other**	13	6.9	7,875	6.3 (1.7 – 10.9)
Preventing Zika is not a priority for me	11	5.9	6,779	5.4 (2.3 – 8.6)
Don't know	10	5.3	6,220	5.0 (1.1 – 8.8)
I don't have the time/resources/knowledge	7	3.7	4,875	3.9 (1.1 – 6.6)

*Interviewees were permitted to provide >1 response

**Other: Inconvenient (3.3%); Allergies (1.0%); Vaccine (1.0%); Age (0.5%); Immunity (0.6%)

Additional responses: No answer (2.9%); I don't think preventative measures are effective (1.9%); You can't prevent getting ZIKV (1.0%); I do not think my household or community is at risk (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Mosquito Control, Diseases, and Community Impact

To understand the household perceived severity and susceptibility pertaining to mosquito control, mosquito-borne disease, and community impact, Zika CASPER interview teams asked households as series of three questions: “Is mosquito control an important issue to you,” followed by, “Are you concerned with the diseases mosquitoes may carry,” and then “Are you aware of other diseases spread by mosquitoes that may impact Williamson County residents?”

- Most households (94.1%) in the sampling frame reported mosquito control is an important issue (Table 15).
- A high frequency of households (81.2%) responded, “yes” to being concerned about mosquito-borne diseases (Table 16).
- Over half (58.9%) of households stated, they are aware of the diseases mosquitoes may carry. In addition, respondents correctly reported mosquito-borne illnesses such as West Nile virus (39.3%), dengue (7.6%), and chikungunya (6.9%) as disease spread by mosquitoes. However, a portion of households freely responded to the mosquito-borne disease identification question with an “other” response (17.7%). The respondents appropriately identified malaria and yellow fever as mosquito-borne diseases. However, some answers such as influenza, AIDS, hepatitis, and Rocky Mountain fever were not properly identified as mosquito-borne disease and are not transmitted by mosquitoes (Table 17).



Table 15. WCCHD Zika CASPER 2016: Is mosquito control an important issue to you?

Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
Yes	176	93.6	118,188	94.1 (91.0 – 97.2)
No	12	6.4	7417	5.9 (2.8 – 9.0)
Don't Know	0	0.0	0	0.0
No Answer	0	0.0	0	0

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Table 16. WCCHD Zika CASPER 2016: Are you concerned with the diseases mosquitoes may carry?

Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
Yes	154	81.9	101,939	81.2 (74.0 – 88.3)
No	33	17.6	23,067	18.4 (11.3 – 25.5)
No Answer	1	0.5	598	0.5 (0.5 – 1.5)
Don't Know	0	0.0	0	0.0

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Table 17. WCCHD Zika CASPER 2016: Are you aware of other diseases spread by mosquitoes that may impact Williamson County residents?

Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
Yes	111	59.0	73,928	58.9 (49.0 – 68.8)
No	70	37.2	47,491	37.8 (28.1 – 47.5)
No answer	6	3.2	3,688	2.9 (0.3 – 5.6)
Don't know	0	0.0	0	0.0
If yes, which other diseases? (n=111)*				
West Nile Virus	72	38.3	49,375	39.3 (29.9 – 48.8)
Dengue	16	8.5	9,570	7.6 (3.2 – 12.0)
Chikungunya	12	6.4	8,672	6.9 (2.2 – 11.6)
Other**	34	18.1	21,562	17.7 (10.7 – 23.6)
No answer	1	0.5	598	0.5 (-0.5 – 1.5)

*Interviewees were permitted to provide >1 response

**Other: Malaria (13.6%); Yellow Fever (1.9%); Encephalitis (1.0%); Influenza (1.0%); Heartworms (1.2%); AIDS (0.5%); Hepatitis (0.5%); Rocky Mountain Fever (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



Mosquito Prevention Behaviors and Risks

Per the CDC, two mosquito prevention methods include: use EPA-registered mosquito repellent and reduce or remove mosquito breeding sites from the environment.

To understand household self-efficacy and susceptibility pertaining to mosquito bite and mosquito breeding site prevention behaviors, WCCHD ZIKV CASPER teams asked households three questions pertaining to mosquito repellent use and mosquito breeding habitats around households. The questions were: “In the last 30 days, have you or member of your household used mosquito repellent,” “What are you currently doing to reduce or remove mosquitoes from your house or yard,” and “Do you have any of the following potential mosquito breeding sites in your yard?”

- Many households (68.3%) reported using mosquito repellent in the thirty days prior to the Zika CASPER survey. Conversely, approximately one-quarter (24.1%) of households had not used repellent in the thirty days prior to the survey (Table 18).
- Most households reported the following actions to reduce or remove mosquitoes from the house or yard: removal of standing/stagnant water (42.7%), spray/fumigation (41.6%), cover/clean/scrub water containers (34.7%), and keep the yard and shrubs clean (15.3%) (Table 19).
- Respondents also reported “other” actions taken (20.3%) to reduce or remove mosquitoes from the property. Some of these free-response “other” actions, for example, mosquito repellent and pest control, which are proven methods to reduce mosquito exposure and breeding sites. However, other reported actions are unconventional (or not scientifically proven) methods for mosquito prevention on the property, such as, the use of old beer, lye, diesel lube, and incense candles (Table 19).
- The top five potential mosquito breeding sites identified among households were: flower pots (54%), bird baths (32.3%), pet water dishes (28.8%), yard ornaments (17.4%) and buckets (13%). A reported 18.7% household were noted as having no potential mosquito breeding sites around their household (Table 20).

Table 18. WCCHD Zika CASPER 2016: In the last 30 days, have you or member of your household used mosquito repellent?

Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
Yes	132	70.2	85,790	68.3 (58.1 – 78.5)
No	45	23.9	30,245	24.1 (15.4 – 32.7)
Don't Know	1	0.5	2,093	1.7 (-1.7 – 5.1)
No Answer	10	5.3	7,476	6.0 (1.1 – 10.8)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



Table 19. WCCHD Zika CASPER 2016: Behaviors to reduce or remove mosquitoes from house or yard

Response	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Remove standing/stagnant water	83	44.2	53,641	42.7 (32.4 – 53.0)
Spray/fumigate	77	41.0	52,206	41.6 (32.7 – 50.4)
Keep water source/water containers covered, cleaned, scrubbed	63	33.5	43,613	34.7 (24.6 – 44.8)
Other**	40	21.2	25,490	20.3 (12.5 – 28.1)
Keep yard and shrubs clean	26	13.83	19,220	15.3 (7.9 – 22.7)

*Interviewees were permitted to provide >1 response

**Other: Nothing (5.6%); Use repellent (4.2%); Incense/candles (2.9%); Pest control company (1.4%); Stay indoors (1.6%); Bug zapper (0.6%); Diesel lube (0.7%); Fly swatter (0.5%); Lye (0.5%); Old beer (0.5%); Plants (0.5%); Rain barrier (0.5%); Sulfur (0.5%)

Additional responses: Use screens on open windows (8.8%); Keep the environment clean and remove garbage (7.6%); Clean clogged roof gutters (6.6%); Use larvicides (4.1%); No answer (3.8%); Use air conditioning (3.3%); Burn mosquito coils (2.9%); Don't know (1.4%); It is impossible to reduce mosquitoes (1.3%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Table 20. WCCHD Zika CASPER 2016: Potential breeding sites in yards

Response	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Flower pots	98	52.1	67,876	54.0 (46.3 – 61.7)
Bird bath	55	29.3	40,513	32.3 (23.5 – 41.0)
Pet water dish	50	26.6	36,196	28.8 (20.0 – 37.5)
None	38	20.2	23,526	18.7 (11.5 – 26.0)
Yard ornament	29	15.4	21,831	17.4 (7.8 – 27.0)

*Interviewees were permitted to provide >1 response

Additional responses: Buckets (13%); Pool (12.0%); Rain barrel (9.3%); Fountain (7.4%); Tires (6.1%); Other** (3.8%); No answer (2.2%); Water tank/trough (1.4%); Pond (1.0%); Bird feeder (0.5%); Rain collection system (0.5%); Wheelbarrow (0.5%); No yard (0%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



3.5 ACCESS TO LOCAL HEALTH DEPARTMENT (LHD) RESOURCES

The WCCHD Environmental Health Services (EHS) and Marketing and Community Engagement programs have developed a robust mosquito management campaign, “Fight the Bite,” to be utilized by citizens and stakeholders to prevent mosquito bites and minimize mosquito breeding habitats in Williamson County. Fight the Bite information is available to the community through the WCCHD website, brochures, and social media sites. In addition, the WCCHD website contains mosquito surveillance and mosquito-borne illness information.

To measure household use of LHD (WCCHD) mosquito prevention resources and the community’s expectations of the action(s) the LHD should take to prevent mosquito-borne diseases, Zika CASPER interview teams asked respondents the following two questions: “Have you accessed resources from your LHD regarding Zika virus or mosquito prevention” and “What actions would you like the health department to take to prevent mosquito diseases?”

- A high frequency of households (93.1%) reported they have *never* accessed resources from the LHD regarding ZIKV or mosquito prevention. For those that reported access to LHD resources (4.8%), the website, social media, and brochures/flyers were most often used (Table 21).
- Almost half of households (45.2%) reported they would like the LHD to spray/fumigate to prevent mosquito diseases. Furthermore, approximately one-quarter of households (24.5%) prefers the LHD provides education and awareness (24.5%) to prevent mosquito diseases. A combined 16% of households reported “I don’t know / no answer” and “nothing” to the actions the LHD could take to prevent mosquito-borne diseases (Table 22).

Table 21. WCCHD Zika CASPER 2016: Have you accessed resources from your LHD regarding Zika virus or mosquito prevention?

Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
No	175	93.1	117,829	93.8 (88.6 – 99.0)
Yes	10	5.32	5,981	4.8 (0.5 – 9.0)
No Answer	3	1.6	1,794	1.4 (-0.2 – 3.1)
If yes, which resources?	n=10*			
Website	4	2.1	2392	1.9 (-0.4 – 4.2)
Social media	4	2.1	2392	1.9 (-0.4 – 4.2)
Brochures/flyers	3	1.6	1794	1.4 (-0.7 – 3.6)
Phone call	0	0.0	0	0.0
Other	0	0.0	0	0.0

*Interviewees were permitted to provide >1 response

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



Table 22. WCCHD Zika CASPER 2016: What actions would you like the health department to take to prevent mosquito diseases?

Response category	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
Spray/fumigate	87	46.3	56,761	45.2 (37.1 – 53.3)
Education / awareness	53	28.2	34,571	27.5 (20.7 – 34.3)
I don't know / no answer	17	9.0	10,607	8.4 (4.9 – 12.0)
Nothing / Nothing can be done	12	6.4	9,709	7.7 (3.3 – 12.1)
Address standing water	8	4.3	4,984	3.9 (0.7 – 7.3)

Additional responses: Reduce mosquitoes (1.8%); Vaccine development (1.8%); Maintenance of public land (1.0%); Do not spray (1.7%); Health screening (0.5%); Preventative measures (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

3.6 HOUSEHOLD EMERGENCY PREPAREDNESS LEVELS

In addition to ZIKV and mosquito prevention and disease information, WCCHD collected data pertaining to household emergency preparedness levels, emergency readiness, emergency concerns, evacuation barriers, and emergency communication methods among households in the Zika CASPER sampling frame. Questions were derived from the CDC's CASPER Toolkit 2.0 question bank and were based on the CDC's "Get a kit, Make a plan, Be informed" emergency preparedness concepts, which provide step-by-step actions households can take to prepare for an emergency event^{21,22}. The purpose of collecting these data were to develop a baseline assessment of emergency preparedness and readiness levels in the community. These data may be used by the WCCHD Emergency Response and Preparedness Division and emergency response partners to inform future plans and identify evidence-based successes and gaps in community preparedness levels and emergency communications in Williamson County. When utilized by WCCHD and emergency response partners, well-developed plans serve to protect the community during a public health emergency such as a natural disaster, act of terrorism, or disease outbreak.

WCCHD Zika CASPER interview teams asked households a series of questions pertaining to levels of household preparedness and response plans, which are summarized in Table 23 and 24.

- Households reported the highest preparedness levels (at 75% or higher) in: storing multiple copies of important documents (77.2%), multiple routes of evacuation away from the home (76.0%), three-day food supply of non-perishable foods (87.4%), an alternate way to cook food without utilities (89.5%), first aid kit (85.2%), and seven-day supply of medication for all those who take medications (76.5%).



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- Households reported lower levels of preparedness levels (below 65%) in: emergency communication plan (58.5%), designated meeting place outside of the home and neighborhood (42.5% and 41.0%), adequate three-day water supply (64.6%), emergency supply kit (58.4%), and three-day food and water supply for pets (59.0%).

WCCHD Zika CASPER interview teams asked households the top emergencies they felt were likely to impact their household.

- The top five reported emergencies of concern were: tornado (68.1%), rain/thunderstorm (45.8%), high winds (39.2%), flood (35.5%) and wildland fire (32.0%) (Table 25).

WCCHD Zika CASPER interview teams asked households, “What would be the main reason that might prevent you from evacuating if asked to do so” and “If your household had to evacuate due to a large-scale disaster or emergency, where would you go?”

- Most households (67.6%) reported nothing would stop them from evacuating, followed by concern about leaving pets (7.0%), then concern about leaving property (5.8%) (Table 26).
- A high frequency of respondents (72.3%) reported they would evacuate to a friend/family/second home in the event of a large-scale disaster or emergency. No households (0.0%) reported they “would not evacuate.” (Table 27).

Lastly, WCCHD Zika CASPER interview teams asked households, “Which sources does your household use to receive up-to-date information about disaster or emergency events?”

- The top five sources households use to receive information about a disaster or emergency were reported as: television (67.6%), internet/social media (54.1%), mobile emergency alerts (40.6%), radio (35.5%), and text message (30.1%) (Table 28).



Table 23. WCCHD Zika CASPER 2016: Level of Household Preparedness/Response Plans

Emergency Plan / Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
<i>Emergency communication plan (i.e. list of numbers and contacts)</i>				
Yes	76	58.0	73,519	58.5 (50.3 – 66.7)
No	109	40.4	50,292	40.0 (31.7 – 48.3)
Don't know	0	0	0	0
No answer	3	1.6	1.4	1.4 (-0.2 – 3.1)
<i>Copies of important documents in a safe location (e.g. water proof container)</i>				
Yes	145	77.1	96,905	77.2 (69.8 – 84.5)
No	38	20.2	25,709	20.4 (13.7 – 27.3)
Don't know	2	1.1	1,196	1.0 (-0.1 – 2.9)
No answer	3	1.6	1,794	1.4 (-0.2 – 3.1)
<i>Multiple routes away from your home in case evacuation is necessary</i>				
Yes	142	75.5	95,440	76.0 (67.2 – 84.8)
No	38	20.2	25,380	20.2 (11.6 – 28.8)
Don't know	4	2.1	2,392	1.9 (0.1 - 3.7)
No answer	4	2.1	2,392	1.9 (0.1 – 3.7)
<i>Designated meeting place immediately outside your home or close by in your neighborhood</i>				
Yes	78	41.5	53,392	42.5 (34.5 – 50.5)
No	105	55.9	69,222	55.1 (47.1 – 63.1)
Don't know	1	0.5	598	0.5 (-0.5 – 1.5)
No answer	4	2.1	2,392	1.9 (0.1 – 3.7)
<i>Designated meeting place outside of your neighborhood in case you cannot return home</i>				
Yes	74	39.4	51,418	41.0 (33.7 – 48.2)
No	107	56.7	69,999	55.7 (48.2 – 63.2)
Don't know	2	1.1	1,196	1.0 (-0.4 – 2.3)
No answer	5	2.7	2,991	2.4 (0.4 – 4.4)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



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Table 24. WCCHD Zika CASPER 2016: Resident emergencies preparedness levels as reported by Williamson County, Texas households

Emergency Supplies / Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
Adequate drinking water (besides tap for the next 3 days? (1gal/person/day)				
Yes	123	65.4	81,095	64.6 (59.7 – 69.5)
No	62	33.0	42,716	34.0 (29.1 – 38.9)
Don't know	1	0.5	598	0.5 (-0.5 – 1.5)
No answer	2	1.1	1,196	1.0 (-0.4 – 2.3)
Adequate non-perishable food (e.g. canned, protein bars) for the next 3 days				
Yes	162	86.2	109,715	87.4 (82.5 – 92.3)
No	24	12.8	14,694	11.7 (6.7 – 16.6)
Don't know	0	0	0	0
No answer	2	1.1	1,196	1.0 (-0.4 – 2.3)
A way to cook food if you had no utilities				
Yes	166	88.3	112,446	89.5 (84.6 – 94.4)
No	20	10.6	11,962	9.5 (4.6 – 14.4)
Don't know	0	0	0	0
No answer	2	1.1	1,196	1.0 (-0.4 – 2.3)
A first aid kit with medical supplies that is kept in a designated place in your home				
Yes	157	83.5	106,964	85.2 (80.3 – 91.7)
No	28	14.9	16,847	13.4 (8.5 – 18.3)
Don't know	0	0	0	0
No answer	3	1.6	1,794	1.4 (-0.1 – 2.7)
An emergency supply kit with supplies (water, food, flashlight, radio, batteries)				
Yes	108	57.5	73,349	58.4 (53.5 – 63.3)
No	78	41.5	51,059	40.7 (35.8 – 45.6)
Don't know	0	0	0	0
No answer	2	1.1	1,196	1.0 (-0.4 – 2.3)
A 7-day supply of medication for each person who take prescribed meds				
Yes	142	75.5	96,068	76.5 (71.6 – 81.4)
No	20	10.6	13,508	10.8 (5.9 – 15.7)
Don't know	1	0.5	598	0.5 (-0.5 – 1.5)
No answer	2	1.1	1,196	1.0 (-0.4 – 2.3)
Doesn't apply	23	12.23	14,235	11.3 (6.4 – 16.2)
Adequate food and water for your pet(s) for the next 3 days				
Yes	112	59.6	74,137	59.0 (54.1 – 63.9)
No	22	11.7	14,953	11.9 (7.0 – 16.8)
Don't know	2	1.1	1,196	1.0 (-0.4 – 2.3)
No answer	3	1.6	1,794	1.4 (-0.1 – 2.3)
Doesn't apply	49	26.1	33,524	26.7 (21.8 – 30.8)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



Table 25. WCCHD Zika CASPER 2016: Top 5 emergencies of concern as reported by Williamson County, Texas households

Emergency	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Tornado	128	68.1	85,591	68.1 (60.9 – 75.4)
Rain/thunderstorm	89	47.3	57,579	45.8 (38.8 – 52.9)
High winds	71	37.8	49,225	39.2 (29.1 – 49.3)
Flood	66	35.1	44,620	35.5 (27.5 – 43.6)
Wildland fire	64	34.0	40,204	32.0 (24.3 – 39.8)

*Interviewees were permitted to provide >1 response (i.e. list top 3 emergencies)

Additional responses: Act of terrorism (10%); Ice/snow storm (5.3%); Other** (4.6%); Chemical spill (2.2%); Don't know (3.7%); None (1.4%); None (1.4%); Earthquake (1.0%); No answer (1.0%); Bomb/explosion (1.0%); Hail (1.0%); Power outage (1.0 %); Heat (0.5%); Water shortage (0.5%); Weather (0.7%); Zika virus (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Table 26. WCCHD Zika CASPER 2016: Top 3 barriers to emergency evacuation as reported by Williamson County, Texas households

Response	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Nothing, would evacuate	123	66.9	83,427	67.7 (60.2 – 75.2)
Concern about leaving pets	13	7.0	8,772	7.0 (2.8 – 11.2)
Concern about leaving property	11	5.9	7,297	5.8 (2.0 – 9.6)

*2 interviewees selected >1 response

Additional responses: Lack of trust in government officials (5.2%); Inconvenient/expensive (5.5%); Concern about traffic jams (4.7%); Don't know (3.9%); Health problems (2.9%); Concern about personal safety (1.9%); Lack of transportation (1.6%); Nowhere to go (1.0%); No answer (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census

Table 27. WCCHD Zika CASPER 2016: Reported emergency evacuation destinations by Williamson County, Texas households

Response	Frequency (n=188)*	% of Households	Projected # of Households	Weighted % (95% CI)
Friends/family/2 nd home outside of area	136	71.6	91,532	72.3 (65.8 – 80.0)
Church or community shelter	19	10.0	11,554	9.2 (4.1 – 14.3)
Hotel or motel	18	9.5	11,663	9.3 (4.3 – 14.3)
Don't know	8	4.2	5,024	4.0 (1.5 – 6.5)
Other**	7	3.7	4,635	3.7 (0.4 – 7.0)
No answer	2	1.1	1,196	1.0 (-0.5 – 2.3)
Would not evacuate	0	0	0	0

*Some Interviewees selected >1 response

**Other: Another city/county/location (3.2%); Office/Workplace (0.5%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



Table 28. WCCHD Zika CASPER 2016: Main sources to receive up-to-date information about disaster or emergency events as reported by Williamson County, Texas households

Response	Frequency (n=188)	% of Households	Projected # of Households	Weighted % (95% CI)
TV	126	67.0	84963	67.6 (61.3 - 74.0)
Internet/Social media	104	55.3	67817	54.1 (47.1 – 63.1)
Mobile emergency alerts	79	42.0	50970	40.6 (30.6 – 50.6)
Radio	69	36.7	44550	35.5 (29.0 – 41.9)
Text message	61	32.5	37841	30.1 (21.9 – 38.4)

*Interviewees were permitted to provide >1 response

Additional responses: Automated call (ex: reverse 911) (21.1%); Neighbor/friend/family/word of mouth (17.1%); Local newspaper (10.0%); Regional notification system (5.2%); Church/other groups (4.6%); Poster/flyer (2.9%); Other (2.0%); No answer (1.0%); Don't know (0%)

Data Source: WCCHD Zika CASPER data, 2016; 2010 U.S. Census



4 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

- The Williamson County citizens were gracious and accepting of the Zika CASPER project, and eager to participate. WCCHD is proud to serve the citizens of Williamson County and was impressed by the community's efforts and responses.
- Williamson County households receive ZIKV information from an array of sources, with the top five sources reported as: radio/television, internet, newspapers, social media, and family. However, when asked which sources of ZIKV information Williamson County households *trust* to provide accurate ZIKV information, additional references such as the local health department and private doctor were reported in the study. Yet, a high frequency of Williamson County households reported *never* accessing local health department ZIKV resources and did not report private doctor as a utilized source of ZIKV information.
- Williamson County households consider ZIKV to be an important issue in the community and had moderate knowledge of ZIKV transmission. Households appropriately understand ZIKV is primarily transmitted through mosquito bites and were aware ZIKV has the potential to cause birth defects, including microcephaly, in infants born to mothers infected with ZIKV during pregnancy. However, a low number of households reported ZIKV may be sexually transmitted. Furthermore, interview responses indicated households are mostly unaware of ZIKV signs/symptoms. Households requested additional information about ZIKV signs/symptoms, prevention, and treatment.
- Williamson County households consider mosquito control an important issue and are concerned with mosquito-borne diseases. Additionally, a high frequency of Williamson County households reported using mosquito repellent as a mosquito bite prevention method. However, fewer Williamson County households took actions to reduce potential mosquito breeding habitats on their properties and several households were unaware of mosquito-borne diseases, other than ZIKV, that may affect Williamson County. Also, Williamson County households reported an expectation that WCCHD should spray/fumigate to prevent mosquito-borne diseases, which is not effective at reducing *Aedes* spp. mosquitoes.
- Williamson County households reported moderate to high preparedness levels regarding evacuation, storage of important documents, food rations, first aid kits, and prescription medication supplies. However, household response plans were lacking in emergency communications, supply kits, water storage, and provisions for pets.



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- Households relevantly reported tornados as the number one disaster of concern for Williamson County. Households are generally prepared and willing to evacuate and mostly reported no barriers to evacuation, with many having an alternate location to go in the event of an emergency. The main sources Williamson County households receive emergency information is from the television, internet/social media, and mobile emergency alerts. However, it is unclear which emergency communication method is most effective.

4.2 RECOMMENDATIONS

- WCCHD, as the local health department, should identify solutions to make WCCHD's presence and resources (disease prevention and control, environmental health, emergency preparedness and response, "Fight the Bite," social media, internet resources, other media) more visible and known to the Williamson County public, medical communities, and stakeholders so that WCCHD may become a utilized source of *trusted* ZIKV (and other mosquito-borne disease) health information and communications. In addition, community and medical provider access to WCCHD resources would enable consistent and current ZIKV information to be provided to the community from WCCHD.
- Williamson County citizens requested and need information pertaining to accurate ZIKV information including: signs and symptoms, prevention, and transmission. WCCHD should incorporate this information request into current ZIKV messaging and identify a consistent method for dissemination of health education on personal, mosquito-related, and household actions that can be taken by citizens to prevent ZIKV and other mosquito-borne disease exposure.
- WCCHD should identify strategies to ensure Williamson County citizens and stakeholders receive and utilize accurate mosquito bite prevention and mosquito management information (i.e. WCCHD Fight the Bite Campaign, effective and non-effective uses of spraying as a means for ZIKV, and mosquito-borne disease prevention).
- WCCHD should communicate and collaborate with emergency preparedness stakeholders on strategies to ensure Williamson County households receive routine and current information pertaining to personal preparedness plans and supplies, types of emergencies that may affect Williamson County, and effective ways to receive up-to-date information about disasters and emergencies.



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- WCCHD and emergency management partners should identify the most reliable and effective method(s) to communicate with Williamson County citizens in the event of a disaster or emergency.



5 ACRONYMS

APH	Austin Public Health
CASPER	Community Assessment for Public Health Emergency Response
CDC	Centers for Disease Control and Prevention
CHIKV	Chikungunya virus
DENV	Dengue virus
DCP	Disease Control and Prevention (WCCHD Division)
EPA	Environmental Protection Agency
EHS	Environmental Health Services (WCCHD Division)
EPR	Emergency Preparedness and Response (WCCHD Division)
HBM	Health Belief Model
PAHO	Pan American Health Organization
WCCHD	Williamson County and Cities Health District
WHO	World Health Organization
WNV	West Nile virus
ZAP	Zika Action Plan (CDC Summit)
ZIKV	Zika virus



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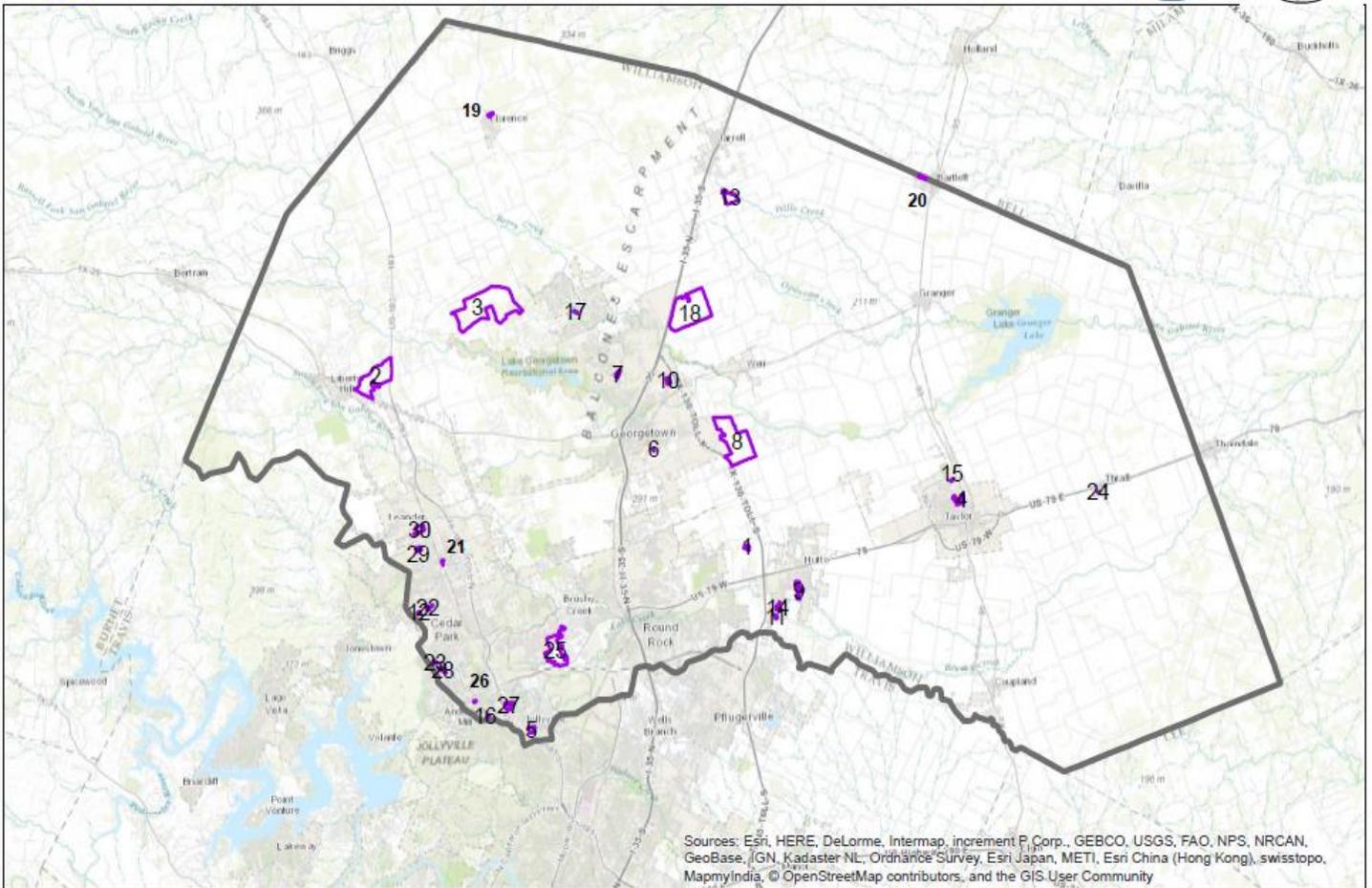
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APPENDIX B: WCCHD ZIKA CASPER 2016: 30 CLUSTERS

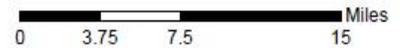


Zika C.A.S.P.E.R.

Community Assessment for Public Health Emergency Response



Source: WCCHD; ATCHHSD; May 2016. ehuebner/thaywood.





APPENDIX C: WCCHD ZIKA CASPER 2016: INTERVIEW TRACKING FORM

CASPER Tracking Form

County: Cluster # (i.e., 1-30): # of Households in Cluster: Interviewer:

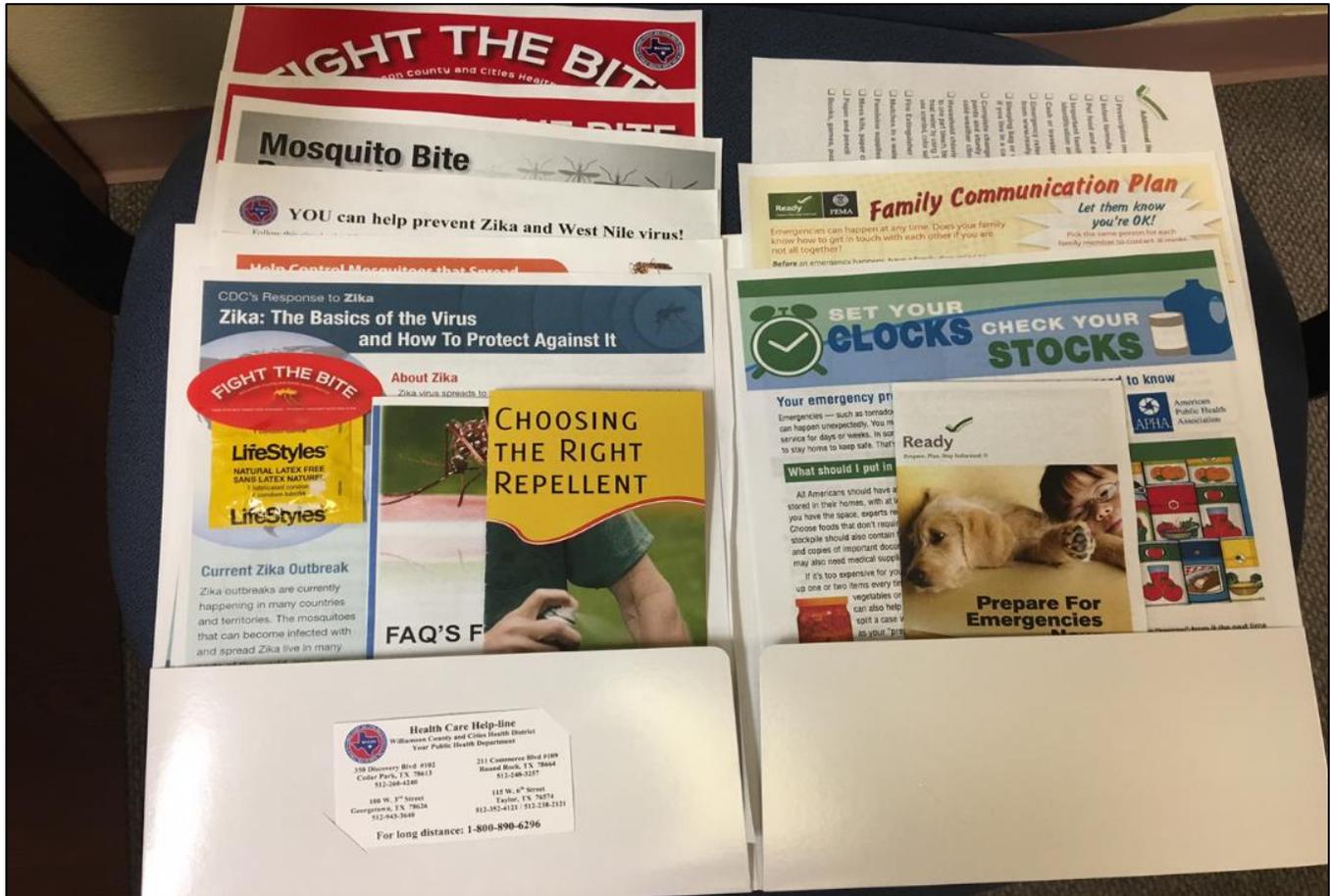
Date of Interview:/...../.....

Instructions: Use one tracking form per cluster. Check where appropriate, but try to choose only one best option for each of the four categories. Go as far down the list as possible for each site you visit. Use neighbors to find information if no resident is available. Each sampled housing unit represents one housing structure (if you visit a structure more than once to attempt an interview, do not count it as a new sampled housing unit, but record the number of attempted visits under the "No Answer" category).

Sampled Housing Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1) TYPE OF DWELLING																		
No housing structure	<input type="checkbox"/>																	
Mobile Home	<input type="checkbox"/>																	
Single Family Home	<input type="checkbox"/>																	
Duplex	<input type="checkbox"/>																	
Apartment	<input type="checkbox"/>																	
Other	<input type="checkbox"/>																	
2) ACCESS																		
House is Accessible	<input type="checkbox"/>																	
House Inaccessible (unsafe structure)	<input type="checkbox"/>																	
House inaccessible (locked gate)	<input type="checkbox"/>																	
House Inaccessible (stray dogs/other animals)	<input type="checkbox"/>																	
House Inaccessible (no trespassing sign)	<input type="checkbox"/>																	
House inaccessible (safety issues)	<input type="checkbox"/>																	
3) NO ANSWER																		
Vacant (no sign of anyone possibly living there)	<input type="checkbox"/>																	
No answer (no one opens the door.)	<input type="checkbox"/>																	
Number of attempted visits																		
4) INTERVIEW																		
Language Barrier	<input type="checkbox"/>																	
Refused to Participate	<input type="checkbox"/>																	
No adult over 18 years old	<input type="checkbox"/>																	
Interview begun, not finished	<input type="checkbox"/>																	
Interview Completed	<input type="checkbox"/>																	
Survey # (i.e., 1-7) from Completed Questionnaire:																		



APPENDIX D: WCCHD ZIKA CASPER 2016: HEALTH EDUCATION MATERIALS



LIST OF RESOURCES	
Fight the Bite Flyer	FEMA Prepared for Emergencies Now - Pets
Repellant Brochure	APHA Set Your Clocks Check Your Stocks
Homeowner Checklist – Mosquito Prevention	Ready.gov Family Communication Plan
FAQs for Pregnant Women Brochure	Ready.gov Emergency Supply List
Mosquito Habitat - coloring sheet	1 Free Sports Physical at WCCHD
CDC Mosquito Bite Prevention	“Know your Numbers” Flier
CDC Help Control Mosquitoes	General WCCHD Services Brochure
ZIKV: The Basics of the Virus and Prevention	Fight the Bite Magnets
DEET and hand sanitizer wipes	Free condom vouchers



APPENDIX E: WCCHD ZIKA CASPER 2016: ZIKA QUESTIONNAIRE

Williamson County and Cities Health District – Zika CASPER Questionnaire – June 2016

To be completed by team BEFORE the interview		
Q1. Date (MM/DD/YY):	Q2. Cluster Number:	Q3. Survey Number:
Q4. Team Number:	Q5. Interviewer Initials:	
Answer to the following question should be completed by observation		
Q6. Type of structure <input type="checkbox"/> Single family <input type="checkbox"/> Multiple unit <input type="checkbox"/> Mobile home <input type="checkbox"/> Other _____		
First we are going to ask about basic household information		
Q7. Which category best describes your race (<i>interviewee only</i>)? <input type="checkbox"/> American Indian/Alaska Native <input type="checkbox"/> Asian/Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Mixed race <input type="checkbox"/> Black or African American <input type="checkbox"/> Other: _____ <input type="checkbox"/> No Answer		
Q7a. Which category best describes your ethnicity? <input type="checkbox"/> Hispanic <input type="checkbox"/> Non-Hispanic <input type="checkbox"/> No Answer		
Q8. How many pregnant women are living in your household? _____ <input type="checkbox"/> No Answer		
We would now like to ask you about Zika virus health communication		
Q9. From which sources have you heard information about Zika? (<i>Check all that apply</i>) <input type="checkbox"/> Family <input type="checkbox"/> Friends/neighbors <input type="checkbox"/> Community meeting <input type="checkbox"/> Church <input type="checkbox"/> local health department <input type="checkbox"/> Private doctor <input type="checkbox"/> Government <input type="checkbox"/> Pharmacy <input type="checkbox"/> Radio/Television <input type="checkbox"/> Newspapers <input type="checkbox"/> Internet <input type="checkbox"/> Social media <input type="checkbox"/> Other: _____ <input type="checkbox"/> No Answer		
Q10. Which sources do you most trust to give you accurate information about Zika? (<i>Check all that apply</i>) <input type="checkbox"/> Family <input type="checkbox"/> Friends/neighbors <input type="checkbox"/> Community meeting <input type="checkbox"/> Church <input type="checkbox"/> Local health department <input type="checkbox"/> Private doctor <input type="checkbox"/> Government <input type="checkbox"/> Pharmacy <input type="checkbox"/> Radio/Television <input type="checkbox"/> Newspapers <input type="checkbox"/> Internet <input type="checkbox"/> Social media <input type="checkbox"/> Other: _____ <input type="checkbox"/> No Answer		
Q11. What additional information would you like to know or receive about Zika? (<i>Check all that apply</i>) <input type="checkbox"/> Cause <input type="checkbox"/> Signs and symptoms <input type="checkbox"/> Prevention <input type="checkbox"/> Treatment options <input type="checkbox"/> Consequences of having Zika, e.g. during pregnancy <input type="checkbox"/> Other: _____ <input type="checkbox"/> I do not need additional information <input type="checkbox"/> Don't Know <input type="checkbox"/> No Answer		
We would now like to ask you about knowledge regarding Zika Virus Disease		
Q12. Do you think Zika is an important issue in your community? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know <input type="checkbox"/> No Answer		
Q13. What are common ways people can get infected with Zika? (<i>Don't read choices - check all answers as they respond</i>) <input type="checkbox"/> Mosquito bites <input type="checkbox"/> Sexual transmission <input type="checkbox"/> Passed from mother to child <input type="checkbox"/> Other: _____ <input type="checkbox"/> Don't Know <input type="checkbox"/> No Answer		
Q14. Is there a vaccine for Zika? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know <input type="checkbox"/> No Answer		
Q15. What are the symptoms of Zika? (<i>Don't read choices - check all answers as they respond</i>) <input type="checkbox"/> Fever <input type="checkbox"/> Headache <input type="checkbox"/> Rash <input type="checkbox"/> Joint pain <input type="checkbox"/> Conjunctivitis/red eyes <input type="checkbox"/> Other: _____ <input type="checkbox"/> No symptoms <input type="checkbox"/> Don't Know <input type="checkbox"/> No Answer		
Q16. If a pregnant woman has Zika, what are the risks for her fetus / baby? (<i>Don't read choices - check all answers as they respond</i>) <input type="checkbox"/> Not growing or developing normally in the womb <input type="checkbox"/> Miscarriage <input type="checkbox"/> Born Prematurely <input type="checkbox"/> Stillborn <input type="checkbox"/> Microcephaly (small head) <input type="checkbox"/> Disability <input type="checkbox"/> Other: _____ <input type="checkbox"/> None <input type="checkbox"/> Don't Know <input type="checkbox"/> No answer		
Q17. What actions can you take to protect you or your household from getting Zika? (<i>Don't read choices - check all answers as they respond</i>) <input type="checkbox"/> Wear long sleeved shirts and pants <input type="checkbox"/> Use mosquito repellent <input type="checkbox"/> Avoid/cancel travel to Zika-affected areas <input type="checkbox"/> Use a condom or abstain from sex <input type="checkbox"/> Turn over/cover/clean items that hold water <input type="checkbox"/> Install/repair/use screens <input type="checkbox"/> Use mosquito control products to treat large containers of water <input type="checkbox"/> Spray or fumigate my home <input type="checkbox"/> Other _____ <input type="checkbox"/> None of the above <input type="checkbox"/> Don't Know <input type="checkbox"/> No answer		
Q18. What would stop you from protecting yourself from Zika? (<i>Don't read choices - check all answers as they respond</i>) <input type="checkbox"/> I do not think my household or community is at risk <input type="checkbox"/> Preventing Zika is not a priority for me <input type="checkbox"/> I don't have the time/ resources / knowledge to take prevention measures <input type="checkbox"/> I don't think preventative measures are effective <input type="checkbox"/> You can't prevent getting Zika <input type="checkbox"/> Nothing, I would protect myself <input type="checkbox"/> Other _____ <input type="checkbox"/> Don't Know <input type="checkbox"/> No Answer		
We would now like to ask you about knowledge regarding mosquito prevention behaviors		
Q19. Is mosquito control an important issue to you? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know <input type="checkbox"/> No Answer		
Q20. Are you concerned with the diseases mosquitoes may carry? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know <input type="checkbox"/> No Answer		
Q21. Are you aware of other diseases spread by mosquitoes that may impact Williamson County residents? <input type="checkbox"/> Yes <input type="checkbox"/> No (→Q22)		
Q21a. If yes, which other mosquito diseases? <input type="checkbox"/> West Nile Virus <input type="checkbox"/> Dengue <input type="checkbox"/> Chikungunya <input type="checkbox"/> Other: _____		
Q22. In the last 30 days, have you or members of your household used mosquito repellent? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know <input type="checkbox"/> No answer		
Q23. What are you currently doing to reduce or remove mosquitoes from your house or yard? (<i>Don't read choices - check all answers as they respond</i>) <input type="checkbox"/> Clean clogged roof gutters <input type="checkbox"/> Keep yards and shrubs clean <input type="checkbox"/> Remove standing/stagnant water <input type="checkbox"/> Use air conditioning <input type="checkbox"/> Use screens on open windows <input type="checkbox"/> Spray/fumigation <input type="checkbox"/> Use larvicides <input type="checkbox"/> Burn mosquito coils <input type="checkbox"/> Keep water source/water container(s) covered, cleaned, and scrubbed <input type="checkbox"/> Keep the environment clean and remove garbage <input type="checkbox"/> It is impossible to reduce mosquitoes <input type="checkbox"/> Other: _____ <input type="checkbox"/> No Answer <input type="checkbox"/> Don't Know		



Williamson County and Cities Health District – Zika CASPER Questionnaire – June 2016

Q24. Do you have any of the following in your yard? (Check all that apply)
 Bird bath Tires Pet water dish Flower pots Fountain Yard ornament Buckets Rain barrel
 Pool Other: _____ None I don't have a yard

Q25. Have you accessed resources from your local health department regarding Zika virus or mosquito prevention?
 Yes(→Q25a) No(→Q26) DK(→Q26)
Q25a. If Yes, what health department resources have you accessed? Website Phone call Brochures / Flyers
 Social media (FB, Twitter, YouTube) Other: _____

Q26. What actions would you like the health department to take to prevent mosquito diseases? _____

Now we would like to ask you about your households emergency, preparedness and evacuation plans

Q27. Does your household (HH) have any of the following emergency plans?
 Emergency communication plan such as a list of numbers and designated out-of-town contacts Yes No DK NA
 Copies of important documents in a safe location (e.g., water proof container) Yes No DK NA
 Multiple routes away from your home in case evacuation is necessary Yes No DK NA
 Designated meeting place immediately outside your home or close by in your neighborhood Yes No DK NA
 Designated meeting place outside of your neighborhood in case you cannot return home Yes No DK NA

Q28. Does your household currently have?
 Adequate drinking water (besides tap) for the next 3 days? (1 gallon/person/day) Yes No DK NA
 Adequate non-perishable food (e.g., canned food, protein bars) for the next 3 days Yes No DK NA
 A way to cook food (e.g., gas or charcoal grill) if you had no utilities Yes No DK NA
 A First Aid Kit w/medical supplies that is kept in a designated place in your home Yes No DK NA
 An Emergency Supply Kit with supplies like water, food, flashlights, radio & extra batteries Yes No DK NA
 A 7-day supply of medication for each person who takes prescribed meds Yes No DK NA Doesn't apply
 Adequate food and water for your pet(s) for the next 3 days Yes No DK NA Doesn't apply

Q29. What are the top three emergencies you feel are most likely to affect your household? (Check only three)
 Flood High winds Chemical Spill Earthquake Ice/snow storm Wildland fire
 Act of terrorism Rain/thunderstorm Tornado Other _____ None Don't Know

Q30. What would be the main reason that might prevent you from evacuating if asked to do so? (Check only one)
 Lack of transportation Nowhere to go Lack of trust in government officials Concern about leaving pets
 Inconvenient/expensive Concern about traffic jams Concern about personal safety Nothing, would evacuate
 Concern about leaving property Health problems (e.g., could not be moved) Don't Know

Q31. If your household had to evacuate due to a large-scale disaster or emergency, where would you go?
 Friends/family/2nd home outside your area Hotel or motel Church or community shelter Would not evacuate
 Other _____ Don't Know No Answer

Q32. Which sources does your household use to receive up-to-date information about disaster or emergency events? (Check all that apply)
 TV Radio Text message Automated call (e.g., reverse 911) Local newspaper Poster/flyer
 Church/other groups Internet (Other than social media websites) Regional Notification System Social Media (Twitter, FB, etc.)
 Neighbor/friend/family/word of mouth Mobile emergency alerts Other: _____ Don't Know No Answer

Thank you for taking the time to complete this survey. Your answers will allow us to better serve you in the future.

DK: Don't know NA: No Answer



Williamson County and Cities Health District

APPENDIX F: WCCHD ZIKA CASPER VOLUNTEER RECRUITMENT FLIER

WILLIAMSON COUNTY ZIKA & EMERGENCY PREPAREDNESS CASPER



FRIDAY & SATURDAY
JUNE 17 & 18
8 AM - 5 PM

COMMUNITY ASSESSMENT FOR PUBLIC HEALTH EMERGENCY RESPONSE

WE NEED YOUR HELP!

PURPOSE OF CASPER

To learn more about:
1. Zika virus health communication,
2. Mosquito prevention behaviors, and
3. Emergency preparedness readiness among residents in Travis and Williamson County.

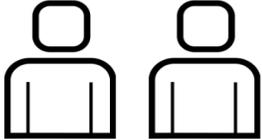
SIGN UP AT:
TINYURL.COM/ZIKACASPER

QUESTIONS? CONTACT:
LESLIE PLATZ
.....
512-943-3657
LPLATZ@WCCHD.ORG

HOW YOU CAN HELP

You can help by volunteering to participate on a field team.
As part of a two-person field team, volunteers can expect to:

1. Participate June 17 (Friday) & June 18 (Saturday) - 8:00 a.m. - 5:00 p.m. on both days,
2. Conduct household interviews using a short, two-page survey,
3. Complete forms to track interviews and answers (handwritten or electronically),
4. Distribute health education materials,
5. Maintain contact with support staff,
6. Be safety conscious, and
7. Practice true "boots on the ground" public health!





Williamson County and Cities Health District

APPENDIX G: WCCHD ZIKA CASPER 2016: WCCHD AND APH (A/TCHHSD) JOINT PRESS RELEASE

**Austin/Travis County
Health & Human Services**



CONTACT: Carole Barasch
Carole.barasch@austintexas.gov
512-972-6115/512-845-3041

**Williamson County and Cities
Health District**



CONTACT: Deb Strahler
media@wcchd.org
512-248-7629 / 512-630-0778

June 13, 2016

City of Austin and Williamson County Public Health Officials to Conduct CASPER Survey

Austin/Travis County Health and Human Services Department (A/TCHHSD) and Williamson County and Cities Health District (WCCHD) are collaborating on a first-of-its-kind, simultaneous public health project to learn more about the public's understanding of the Zika virus and how best to communicate information that helps protect residents of both communities. Zika is a generally mild illness primarily transmitted through the bite of an infected mosquito. Zika is currently widespread in Central and South America and the Caribbean, and is linked to serious birth defects. There have been two travel-related cases of Zika in Travis County, and one travel-related case in Williamson County to date.

This project, called a Community Assessment for Public Health Emergency Response, or CASPER, is a Centers for Disease Control and Prevention (CDC) survey tool. Its purpose is to gather public health and emergency preparedness feedback from members of a community through interviewing randomly selected households.

On Friday, June 17 and Saturday, June 18, A/TCHHSD and WCCHD public health teams will travel to neighborhoods across Travis County and Williamson County to conduct door-to-door surveys to ask residents about their knowledge of mosquito-borne diseases, mosquito prevention, and household emergency preparedness. The information from the surveys will be used for future public health, emergency communications and planning efforts for the Central Texas region.

CASPER survey team members will include: epidemiologists, public health and emergency response personnel, and public health students. The survey will not be used to collect any personal health information, and will only be conducted during daylight hours. Participation in the survey is voluntary and residents may decline to participate if approached by interviewers. All CASPER volunteers will be wearing clearly marked vests and will have identification cards.

By conducting surveys in two counties, A/TCHHSD and WCCHD hope to gain a real-time regional perspective on the public health needs of each community. Information on Zika can be found at www.austintexas.gov/zika and at www.@wcchd.org

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APPENDIX H: WCCHD ZIKA CASPER 2016: SOCIAL MEDIA POSTS - #ZIKACASPER

Williamson County & Cities Health District
June 15 · 🌐

Public Health in Your Neighborhood - WCCHD public health teams will travel across Williamson County Fri. Jun. 17 and Sat. Jun. 18 conducting door-to-door surveys to ask randomly selected households about their knowledge of Zika virus, mosquito prevention practices, and household emergency preparedness. This information will be used for future public health and emergency planning efforts. Thank you for your support! www.wcchd.org #ZikaCASPER CDC



Like Comment Share

Williamson County & Cities Health District added 3 new photos.
June 17 · 🌐

It's #ZikaCASPER training day! Teams will be going into the community this afternoon - you may be lucky and get a visit from these friendly folks! Thank you for your support! www.wcchd.org CDC



Like Comment Share

Williamson County & Cities Health District added 4 new photos.
June 18 · 🌐

#zikaCASPER Day 2 is happening! Teams are heading back into the field to talk to our wonderful residents - thank you for your support! www.wcchd.org CDC



Like Comment Share