



# Neighborhood Mosquito Survey Report - Gilbert, AZ

April 7, 2018

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## Definitions

**Exercise:** *A planned event designed to test plans and identify procedural and/or training gaps*

**Mosquito-borne disease:** *A disease spread by a mosquito*

**Outbreak:** *An unexpected increase of a disease in a specific location and time*

**Protocol:** *A step-by-step plan to carry out a procedure or process*

**Response plan:** *A method of approaching and managing an emergency situation*

**Response rate:** *The number of people who answered a survey divided by the total number of people who were asked to answer a survey*

# Background

The Maricopa County Department of Public Health (MCDPH), the 3<sup>rd</sup> largest public health jurisdiction in the United States<sup>1</sup>, promotes and protects the health of over 4 million residents. Part of its mandate (legal responsibility) is to be prepared for a variety of public health emergencies, including local spread of a disease carried by mosquitoes. While a general plan to respond to such a local, community-based outbreak had been outlined, a protocol detailing the response did not exist, and a response had never been practiced.

To address this gap, MCDPH, together with Maricopa County Environmental Services Department Vector Control Division (VC), drafted a document (the Response Protocol). This draft outlined a coordinated response to the spread of a mosquito-borne disease in a Maricopa County community. It was reviewed and discussed by 52 stakeholders [Appendix] on December 7<sup>th</sup>, 2017, during a workshop hosted by MCDPH.

The workshop successfully gave participants an opportunity to explore their individual response plans, roles, and responsibilities in the event that a mosquito-borne disease outbreak occurs within the county. Throughout the workshop, several improvements were incorporated into the Response Protocol, including recommendations to develop appropriate trainings for staff and partners and to identify staffing, supplies, and resource needs.

During the workshop, participants were asked if they had interest in hosting an exercise to practice the Response Protocol. The Town of Gilbert was one of three communities that expressed interest.

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<sup>1</sup> Maricopa County, AZ, *About Maricopa County*. Retrieved from <https://www.maricopa.gov/3598/About-Maricopa-County> 5/22/18.

# Response Protocol in Action:

## The Neighborhood Survey

### Introduction

The Town of Gilbert offered to host a coordinated response exercise to a mosquito-borne disease outbreak. To assist Gilbert's town management in selecting the neighborhood, VC provided historical data on locations that had increased mosquito activity and citizen complaints. Also considering the need to exercise in a community with approximately 150 closely-spaced homes with backyards (for easier door-to-door canvassing), the "Lindsay Meadows" neighborhood was identified as an ideal community. Town management sought and received approval through their executive team, as well as the Lindsay Meadows Home Owners' Association (HOA).

### Materials

A variety of materials were developed and tested in this exercise, including:

- Questionnaires, consent forms, leave behind flyers (in English and Spanish)
- Volunteer coordination documents (e.g., sign-in sheets)
- Volunteer training materials (e.g., Response Protocol, "Just-in-Time" training)
- Messaging for the community about the survey (developed by MCDPH Public Information Officers (PIOs) and pushed out by the HOA to residents)
- A custom Geographic Information System (GIS) mapping application (to track which homes had been approached)
- Leave-behind bags with mosquito repellent, bite prevention information, tips to reduce mosquito breeding (both in English and Spanish), and a fly-swatter

### Neighborhood Survey Logistics

The survey was carried out by MCDPH staff and community volunteers on Saturday, April 7, 2018. The Exercise Control Center was set up at Gilbert's Public Works office 2 miles away from the selected neighborhood to easily allow for resupply and provide field relief. The neighborhood was divided into groups of 20-30 homes. The custom GIS application tracked interview status in real-time and allowed the Exercise Control Center to respond to any issues that came up in the field. The 1<sup>st</sup> shift of 12 volunteers participated in a Just-in-Time training from 9:00-10:00am and they were in the field from 10:00am until 2:00pm. The 2<sup>nd</sup> shift completed training at 2:00pm and they were in the field until 6:00pm. Teams surveyed residents after obtaining consent and confirming they were adult (at least 18 years of age) members of the household. Respondents were told they could skip any questions they preferred not to answer. Residents were asked about their knowledge of mosquito-borne diseases, their feelings of how likely it was for them to catch one, their awareness of relevant resources, their preferences on how to get information during an emergency, and their demographic information.

# Neighborhood Survey Results

A total of 142 homes were approached. All contacted individuals were offered a free backyard assessment by VC, regardless of their participation in the interview.

Table 1: Survey Response Rate

Status	Neighborhood Interview	VC Backyard Assessment
Completed	56 (39%)	29 (20%)
Refused	52 (37%)	80 (56%)
No Answer	34 (24%)	

## Knowledge of Mosquitoes

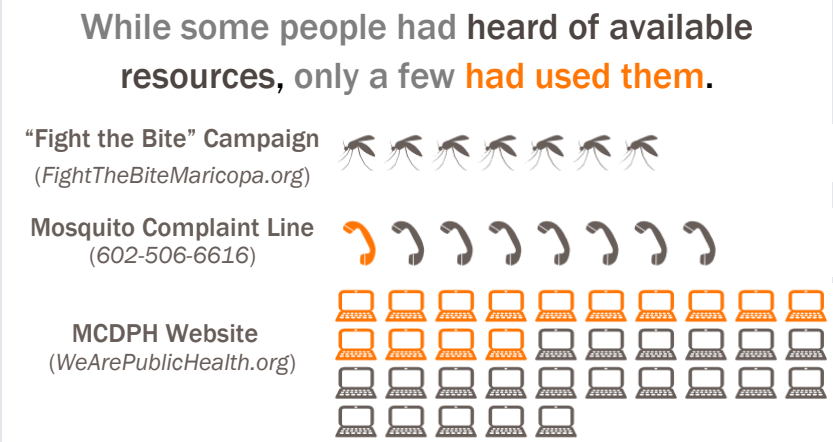
The 1<sup>st</sup> section of the questionnaire focused on respondents' general knowledge of mosquitoes and mosquito bite prevention. Almost 90% of households believed mosquito control to be important and 89% felt that mosquitoes were a problem to some degree in their area. Still, only 16% of households reported contacting any mosquito control service in 2017.

**Prevention Tip:** Dump out any standing water in your yard (potted plants, vases, pet dishes) at least twice weekly.

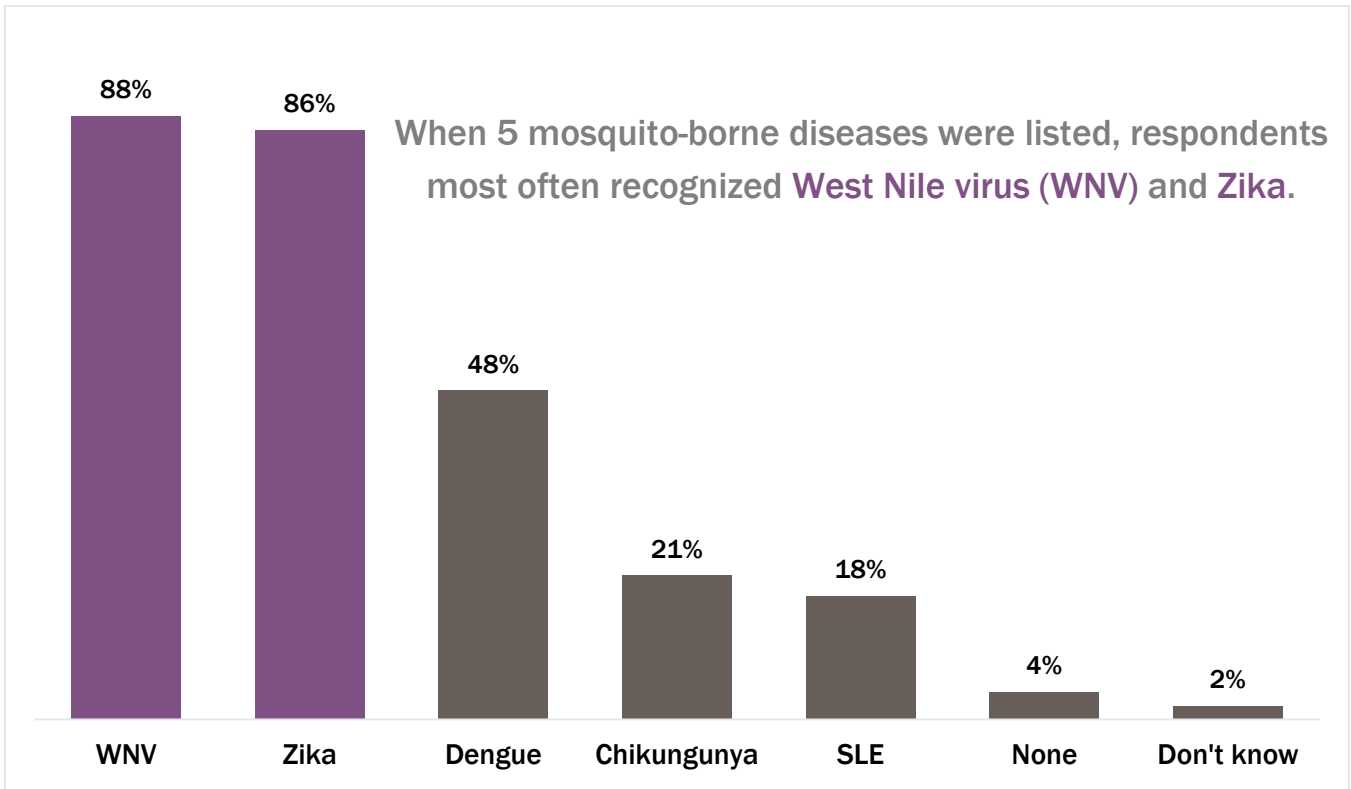
Respondents were also asked if they had items outside their home where mosquitoes could breed (e.g., vases with water or fountains), and they self-identified 122 potential mosquito breeding sites. In the 29 backyard assessments completed by Vector

Control, over 350 potential breeding sites were identified. This demonstrates a gap in knowledge of what potential mosquito breeding sites are, as VC staff identified 10-15 breeding sites per home compared with only 2 when respondents identified sites themselves.

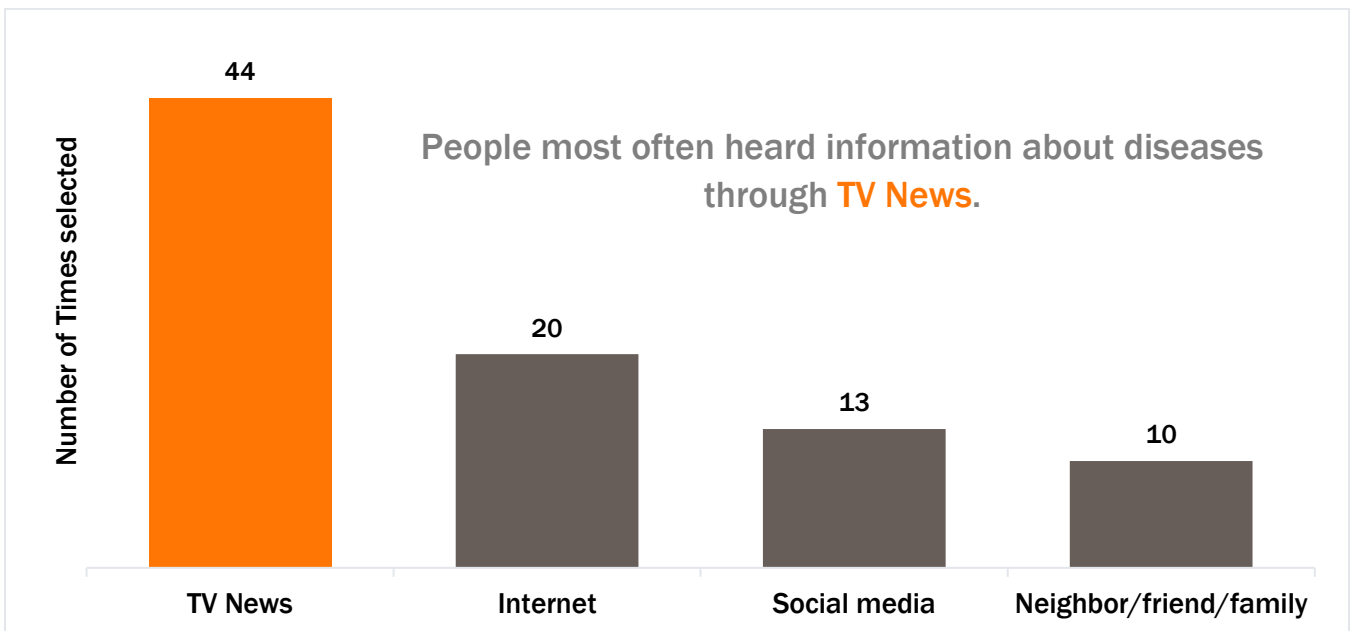
Many neighborhoods in Maricopa County, including Lindsay Meadows, are affected by mosquitoes. In response, the Arizona Department of Health Services (ADHS) and MCDPH developed multiple resources on mosquito bite prevention and control. Survey respondents were asked if they heard of the “Fight the Bite” campaign, the Maricopa



County Mosquito Complaint Line, and the MCDPH website. Seven (13%) of respondents had heard of ADHS’s “Fight the Bite” campaign; 8 (14%) had heard of the Maricopa County Mosquito Complaint Line, however only 1 of the 8 (13%) reported using it; and 35 (63%) were aware of the MCDPH website, but only 14 of the 35 (40%) had ever visited it.



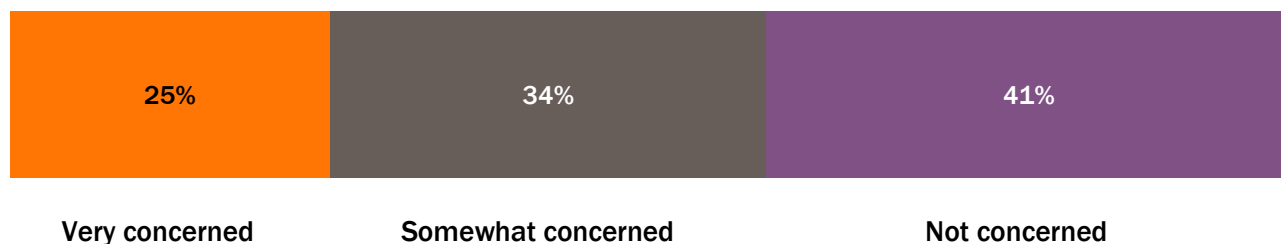
Respondents reported having heard about these diseases through a variety of sources; most often cited were TV News (44 times), and internet (20 times).





Despite interviewing only 56 households, 5 people (9%) were diagnosed with or knew someone diagnosed with a mosquito-borne disease. Respondents reported they were either very concerned about catching a mosquito-borne disease themselves (25%), or were somewhat concerned (34%).

Over half of the respondents were either **very concerned** or **somewhat concerned** about catching a mosquito-borne disease.



Knowing that over half the respondents were concerned about catching a mosquito-borne disease, it was encouraging to hear that almost all residents took actions to prevent them. Mosquito bite prevention is vital to limit the spread of disease, and when they were asked about what their family does to prevent mosquito bites, 95% of respondents said they do something:

- use screens on windows and doors,
- wear mosquito repellent,
- burn citronella candles, and/or
- empty or replace water in pet bowls, bird baths, etc. at least weekly.

Only 3 respondents (5%) replied that they do nothing to prevent mosquito bites, mostly because of health/safety concerns with repellents – despite repellents containing DEET being EPA approved for everyone, including babies and pregnant women.

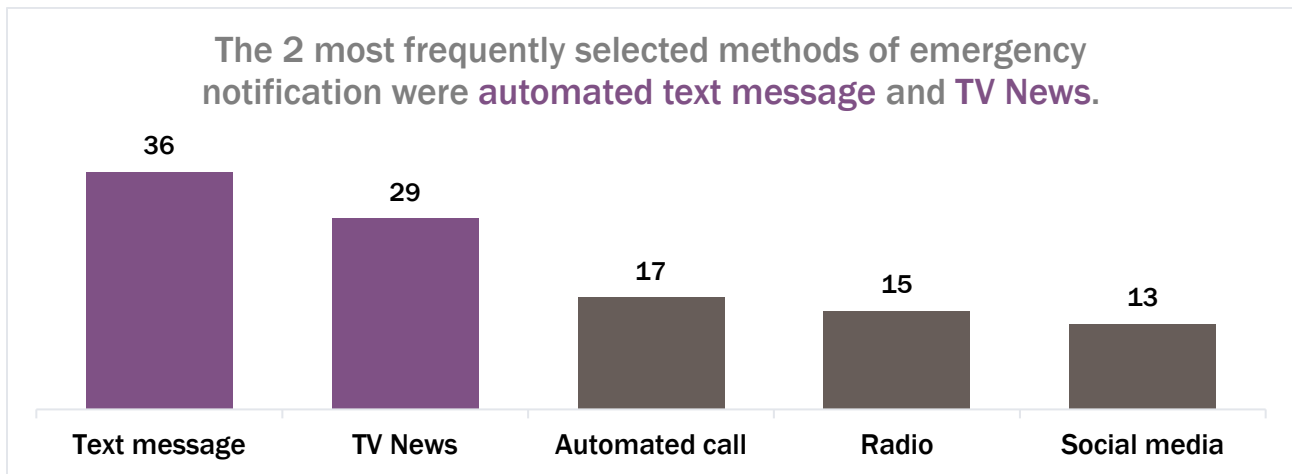
Almost all households **do something** to prevent mosquito bites.



## Response Information

It is possible to be infected with some illnesses without showing symptoms. Respondents were asked if they would provide samples to be tested for possible infection if there were a local outbreak in their neighborhood. Almost everyone (93%) stated they would be willing to give a urine sample and 71% stated they would be willing to have their blood drawn. Additionally, VC would need to access yards for prevention and control activities. Respondents said they would allow VC to: access their yard (93%), set mosquito traps (91%), treat breeding sites (87%), look for mosquito breeding (86%), and spray for mosquitoes (86%).

Households were also asked about how they would like to receive notifications during a public health emergency.



### Demographic Information

The survey ended with questions on the respondents' household, and if any household members had barriers to effective emergency communication. The average household consisted of 3 people. The majority of respondents (84%) owned their home and were permanent residents of Arizona (95%). Eighty-four percent did not have any barriers to effective communication during an emergency. The households that did indicate potential barriers stated those to be: difficulty understanding English or written material, a developmental or cognitive disability, or impaired hearing. In the event of an emergency, MCDPH has resources available and processes in place to address a variety of communication needs.



# Discussion / Conclusion

While a survey of 56 households cannot possibly be representative of the knowledge, perception of risk, and behaviors of the over 4 million residents of Maricopa County, this survey offers a neighborhood snapshot to guide further information gathering efforts. This exercise also provided a unique and vital opportunity for MCDPH and VC to practice responding to a mosquito-borne outbreak and identify potential gaps in our plans. Additionally, the coordination of the neighborhood survey was an opportunity for MCDPH to partner with a local community and to conduct educational outreach with Maricopa County residents. In preparation for the exercise, Public Health staff created the Response Protocol and multiple training and tracking documents; having these in place will be vital to conducting an organized and rapid response in the future. The custom-developed GIS mapping application played a key role in enabling successful communication through real-time information sharing between interviewers, Vector Control, and the Exercise Control Center.

In the weeks before April 7, neighborhood residents were informed about the upcoming exercise. Multiple notifications were sent using an online platform (Nextdoor) and flyers were posted on mailboxes around the community. However, most households were still unaware that the exercise was occurring. Recommendations for informing the public in the future would be to use the United States Postal Services' Every Door Direct Mail, a targeted, affordable advertising technique, as well as potentially using multiple social media applications.

MCDPH extends its sincere appreciation to all of the participants; from the active participation of numerous stakeholders in the December 2017 workshop, which helped to shape the Response Protocol, to the staff who crafted logistics, volunteers who administered the questionnaire, and to Gilbert for welcoming us into their community. All of the input and responses will help shape future methods of sharing disease information and communicating public health emergency notifications.

## Resources

Maricopa County Disease Information Line: (602) 506-6767  
Maricopa County Vector Control Main Number: (602) 506-0700  
Maricopa County Mosquito Complaint Line: (602) 506-6616  
WeArePublicHealth.org  
FightTheBiteMaricopa.org  
facebook.com/MCDPH



# Appendix

<b>12/07/17 Workshop Participants</b>
<b>State</b>
Arizona Department of Health Services (ADHS)
Arizona State Public Health Laboratory (ASPHL)
Public Safety Answering Point (PSAP)
<b>Maricopa County</b>
Disease Reporting Line (DRL)
Homeland Defense Bureau, Phoenix Fire Department
Maricopa County Attorney's Office
Maricopa County Department of Emergency Management (MCDEM)
Maricopa County Environmental Services Department Vector Control Division (MCESD VC)
Maricopa County Sheriff's Office (MCSO)
Office of Epidemiology (OE)
Office of Preparedness and Response (OPR)
Public Information Officers (PIO)
<b>Tribal Partners</b>
Fort McDowell Yavapai Nation
Gila River Indian Community
Salt River Indian Community
Tohono O'Odham Nation
<b>Municipalities</b>
City of Goodyear
City of Peoria
City of Scottsdale
City of Tempe
Town of Cave Creek
Town of Gilbert