



Martin County Dengue Outbreak and Serosurvey Martin County, Florida

Summary

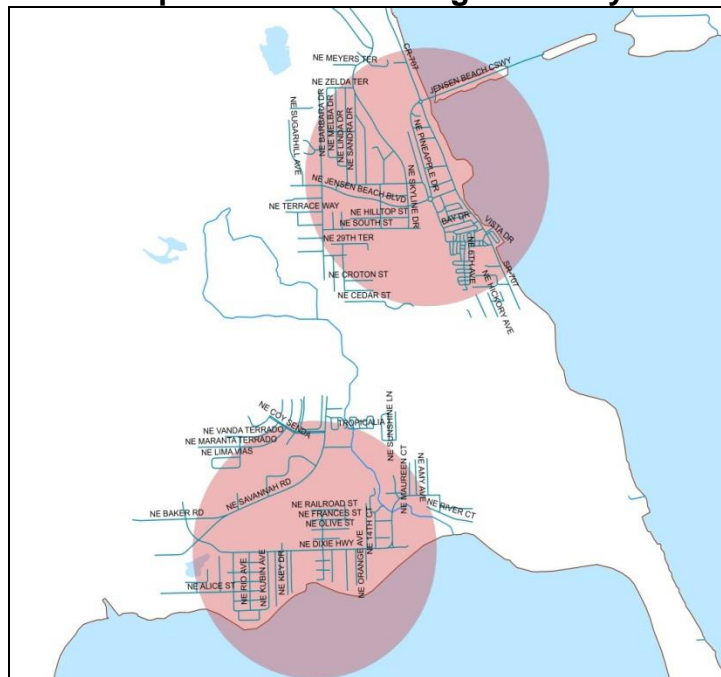
- Florida Department of Health investigated a dengue outbreak in Rio and Jensen Beach, Martin county in August-September, 2013.
- Mosquito control efforts were kept at high levels throughout the outbreak and included community outreach, and home-to-home inspections and treatments.
- Consistent and ongoing public information efforts by the Martin County Health Department raised community awareness about dengue fever, prevention and the community serosurvey.
- The Martin County Health Department epidemiology team provided immediate response to the outbreak by initiating field work in the Rio area to determine the scope of the outbreak as well as providing information to community health care providers.
- A serosurvey was also done to get a better understanding of the extent of the outbreak and to identify risk factors that increased risk of dengue infection. Blood samples were collected and tested from randomly selected, consenting residents who also agreed to provide responses to a questionnaire concerning dengue risk factors.
- A total of 28 individuals were identified as being infected with dengue virus.
 - 24 symptomatic persons (aged 4-70 years) meeting the national case definition for dengue
 - 21 identified during the outbreak investigation
 - 3 identified during the serosurvey
 - 4 asymptomatic individuals were identified during the serosurvey (laboratory tests showed recent dengue infection but no illness was reported).
 - Six of the 24 ill persons were hospitalized.
- 82% of the survey participants had heard of dengue. TV and newspapers were the most common sources of knowledge for 59% and 39% of participants, respectively.
 - Individuals that used DEET-containing repellants were less likely to be infected with dengue. Only 13% of survey participants said that they always use mosquito repellent when outdoors.
- Inspections by Martin County Mosquito Control District revealed the following:
 - In August, 33% of inspected locations in the Rio area and 100% of the inspected sites in downtown Jensen Beach had *Aedes aegypti* mosquito breeding activity.
 - In September, after intensive mosquito control efforts, 18% of inspected locations in Rio and few to none of the inspected sites in downtown Jensen Beach had signs of *Aedes aegypti* mosquito breeding activity.

- This is the second introduction of dengue in Martin County in two years.
 - Continuing to maintain a well-organized and effective mosquito control program to respond to future introductions is recommended.
 - Public health officials and mosquito control should continue to remind the public of ways to reduce risk of mosquito-borne illness and introduction within the community, and alert the public when mosquito-borne disease risk increases.
 - Public health officials should continue to provide health care providers up-to-date information about mosquito-borne illnesses.
 - Community members should be highly commended for their important contributions to the successful control of dengue fever in Martin County.

Background

In August 2013, a cluster of three locally-acquired cases of dengue fever was confirmed by the Florida Department of Health. All three people had been bitten by dengue-infected mosquitoes while in the Rio neighborhood of Martin County. A mosquito-borne illness advisory was then issued jointly by the Martin and St. Lucie County Health Departments. Mosquito control efforts by Martin County Mosquito Control District were intensified as soon as dengue was suspected. When dengue illnesses linked to mosquito exposure in a second area of Martin county (Map 1) was detected (downtown Jensen Beach), a mosquito-borne illness alert was issued in Martin County and a local emergency was declared.

Map 1. Areas with dengue activity



Response

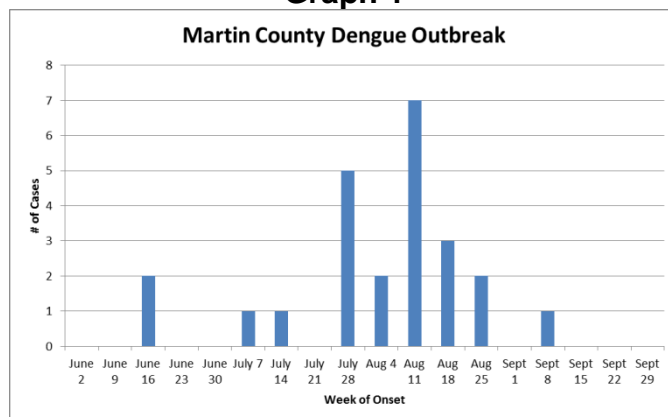
- Information on how to prevent infection with dengue was provided to the public through face-to-face, print media, radio, and television outreach by Martin County Health Department and Martin County Mosquito Control District.
- Mosquito control efforts were kept at high levels throughout the outbreak and included home-to-home inspections and treatments.
- The county health department reminded local physicians and medical facilities to report suspect cases of dengue fever and also provided support for collection of blood from residents who reported dengue-like illness.
- Blood samples from persons suspected to have dengue fever were sent to the state public health laboratories for testing.
- Training developed by the Centers for Disease Control and Prevention (CDC) for physicians was provided in two area hospitals. The training provided information about diagnosing and treating dengue and was provided by a University of Miami, Miller Medical School infectious disease physician.
- As a precaution, blood banks temporarily suspended blood donations from Martin and St. Lucie Counties during the outbreak.
- During the 10 day survey (9/13-9/22), 1,715 households in the downtown Jensen Beach and Rio areas were visited and 364 individuals from 256 of the randomly selected households participated.

Major Findings

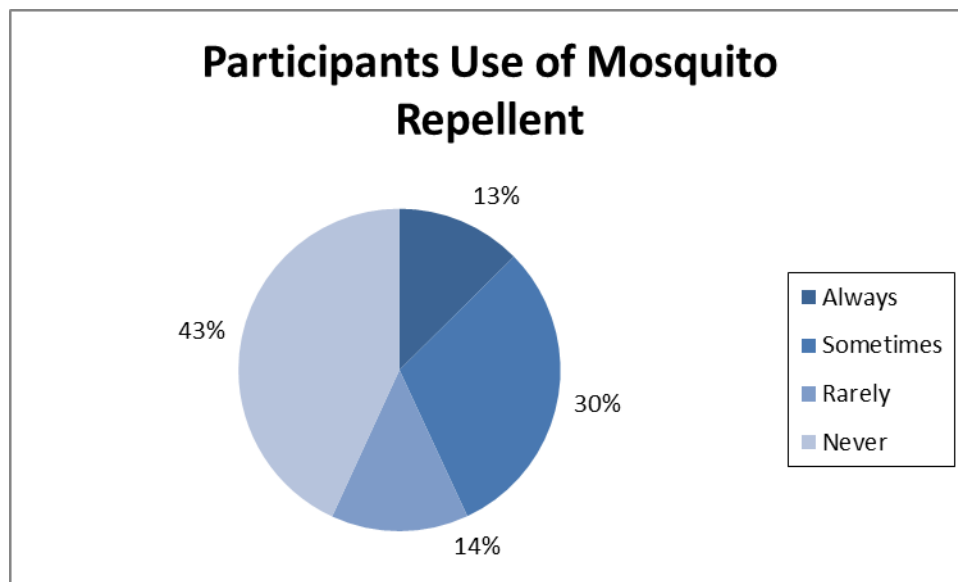
A total of 28 individuals were identified as being recently infected with dengue virus:

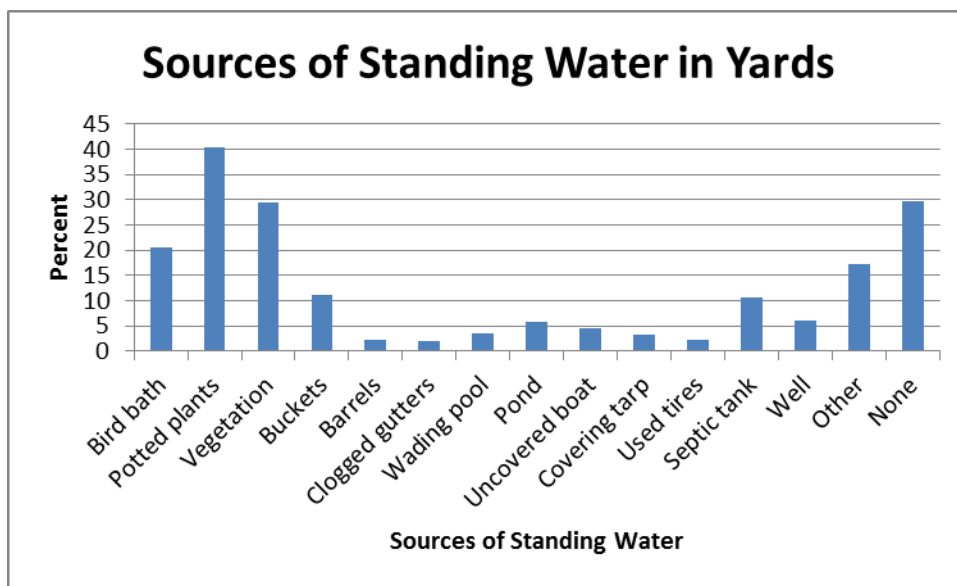
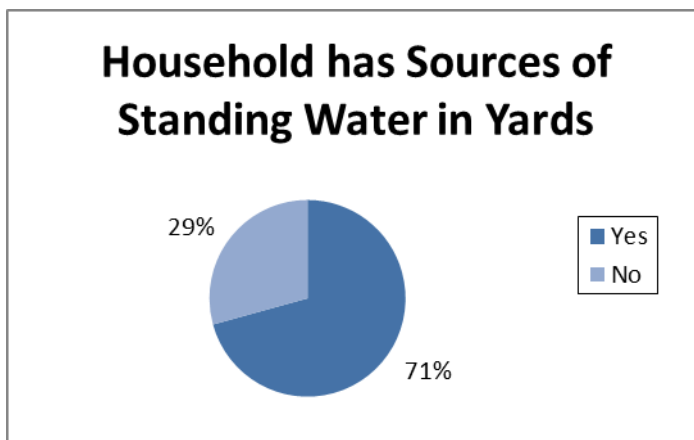
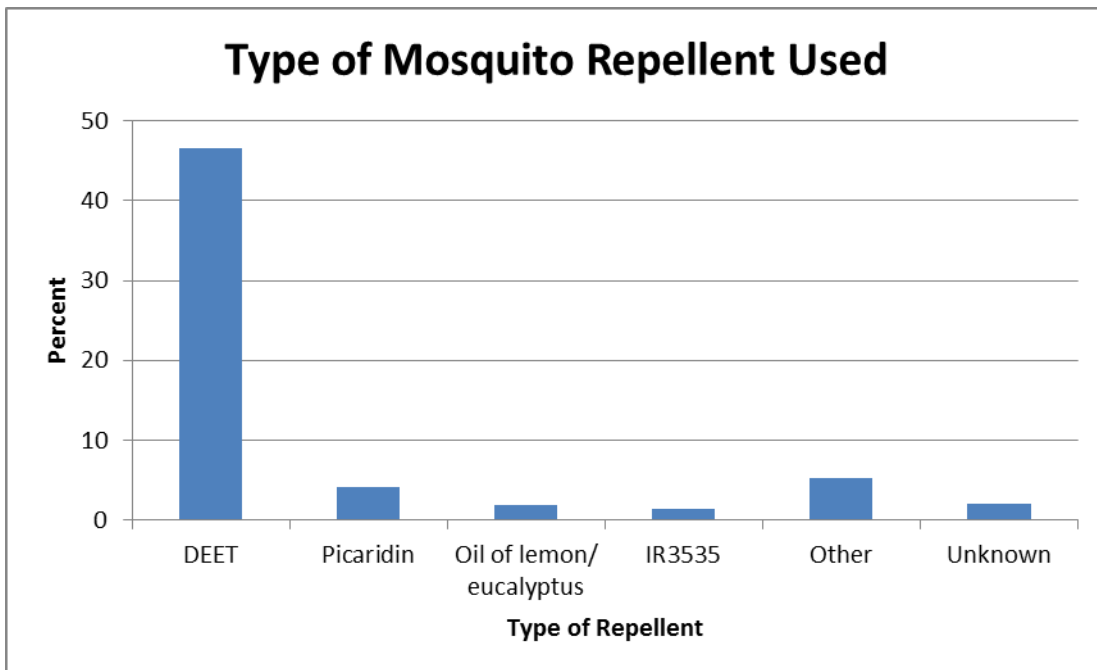
- 24 symptomatic persons meeting the national case definition for dengue (aged 4-70)
 - 21 identified during the outbreak investigation by the Martin and St. Lucie County's EPI teams
 - 3 identified during the serosurvey
- 4 asymptomatic individuals were identified during the serosurvey
- All 24 sick persons reported beginning to feel ill sometime between June 16 and September 12, 2013. Graph 1 depicts the week illness started for each ill person.
- Six of the 24 ill persons were hospitalized.

Graph 1

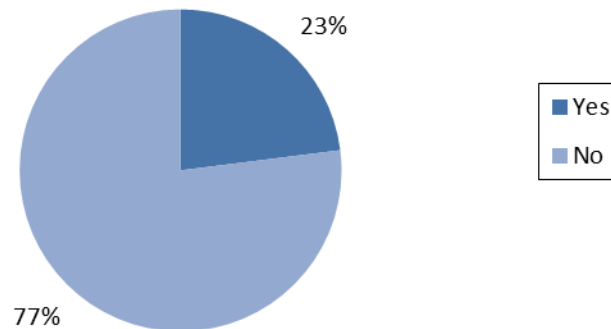


- All 28 ill and asymptomatic persons had possible mosquito exposure in either the downtown Jensen Beach or Rio areas and had not traveled out of the area recently.
- All cases were found to have been infected with dengue virus 1 (DENV-1). Worldwide there are four known serotypes of dengue virus; dengue viruses 1, 2, 3 and 4. Dengue virus 1 is most common.
- 82% of the survey participants had heard of dengue. TV and newspapers were the most common sources of knowledge for 59% and 39% of participants, respectively.
- *Aedes aegypti*, a container breeding mosquito, is one of two mosquitoes that can spread dengue. Inspections by Martin County Mosquito Control District revealed the following:
 - In August, 33% of inspected locations in the Rio area and 100% of the inspected sites in downtown Jensen Beach had signs of *Aedes aegypti* mosquito breeding activity.
 - In September, after intensive mosquito control efforts, 18% of inspected locations in Rio and few to none of the inspected sites in downtown Jensen Beach had signs of *Aedes aegypti* mosquito breeding activity.
- Individuals that used DEET-containing repellants were less likely to be infected with dengue. Overall, only 13% of survey participants said that they always use mosquito repellent when outdoors.
- 71% of the households participating in the serosurvey had sources of standing water in their yards. Individuals in households with buckets and potted plants in their yard were more likely to be infected with dengue. These common household items serve as a standing water source and potential breeding site for *Aedes aegypti* mosquitoes.
- 77% of households indicated that these containers were emptied weekly. Individuals in households that emptied containers of standing water at least once a week were less likely to be infected with dengue.





Household Empty Standing Sources of Water at Least Once Weekly



Recommendations

- The major findings from the serosurvey and outbreak investigation reinforce “Drain and Cover” practices as the best personal prevention practices against dengue and other mosquito-borne infections.
 - Drain standing water to stop mosquitoes from multiplying.
 - Cover your skin with clothing and use mosquito repellent.
 - Cover doors and windows with screens to keep mosquitoes out.
- This is the second introduction of dengue in Martin County in two years. Worldwide, dengue activity continues to increase; there is a continued risk for future dengue introductions and outbreaks in Martin County. In addition, another mosquito-borne disease, chikungunya, recently arrived in the nearby Caribbean Islands and continues to spread. Chikungunya is spread by the same mosquitoes that can carry dengue and which are present in Martin County.
 - Continuing to maintain a well-organized and effective mosquito control program to respond to future introductions is recommended.
 - Public health officials and mosquito control should continue to remind the public of ways to reduce risk of mosquito-borne illness and introduction within the community, and alert the public when mosquito-borne disease risk increases.
 - Public health officials should continue to provide health care providers up-to-date information about mosquito-borne illnesses circulating in Florida and emerging regionally.
 - The Florida Department of Health in Martin County provided a swift and efficient response to the dengue outbreak, which garnered strong community support for the serosurvey. Community members should be highly commended for their individual efforts, which helped contribute to the successful control of dengue fever in Martin County.