

Dengue, Chikungunya & Zika Virus in VA Caribbean HCS, Nov. 2015-Aug. 2016

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Objective

We describe surveillance for Dengue virus (DENV), Chikungunya virus (CHIKV) and Zika virus (ZIKV) in VA Caribbean Healthcare System (VACHS) from the start of ZIKV transmission in Puerto Rico.

Introduction

DENV, CHIKV and ZIKV are all transmitted by mosquitoes and have occurred in outbreaks in the Caribbean. Common symptoms (which can be severe and disabling) are similar among the 3 viruses and include fever, joint pain/swelling, headache, muscle pain and rash. In December 2015, the first endemic case of ZIKV infection was reported by VACHS. Since that time, an increasing number of ZIKV infections have been reported in Puerto Rico. Due to the growing ZIKV outbreak, we performed ongoing testing and surveillance.

Methods

DENV, CHIKV and ZIKV infection surveillance from November 2015 - August 2016 at VACHS was performed from 2 primary data sources: (1) VA Praedico™ Public Health Surveillance System for laboratory results documented within the electronic medical record (EMR) and (2) communications with facility clinicians for laboratory results not entered into the EMR. Laboratory tests were considered unique tests if they were performed >30 days apart. A positive test was defined as a positive IgM or RT-PCR test result. Serial infection was defined as infection with CHIKV and ZIKV or CHIKV and DENV. Potential cross-reaction of assays was defined as positive DENV and ZIKV IgM results within 30 days. Demographic and clinical data was obtained on all positive ZIKV cases including cases with serial infection.

Results

For the time period evaluated, 2,218 unique tests were performed for DENV (744), CHIKV (741), and ZIKV (744). Five hundred thirty three positive tests were identified for: DENV (34), CHIKV (55) and ZIKV (444) (Figure 1). Demographic and virus breakdown of testing is shown in Table 1. Percent positive range for DENV testing was 0-23%, for CHIKV was 0-14%, and for ZIKV 0-73%. Temporal timing of positive tests for each virus by percent positive is depicted in Figure 2. Serial infections were identified in 39 patients (1 CHIKV IgM/ZIKV IgM/PCR+, 7 CHIKV IgM/ZIKV IgM+, 26 CHIKV IgM/ZIKV PCR+, 2 CHIKV IgM/ZIKV PCR/DENV IgM+, 2 DENV IgM/CHIKV IgM+, 1 DENV IgM/CHIKV IgM/ZIKV IgM+). The average age of patients with serial infection was 63.5 years (range 33-85) and occurred in 4 females and 35 males. 21 patients were identified with positive DENV and ZIKV IgM tests, which could represent cross-reactivity between the assays or co-infection. Confirmatory testing of these specimens is pending.

Conclusions

Laboratory surveillance demonstrated co-circulation of all 3 viruses, although ZIKV was the dominant infection identified during this time period. In addition, laboratory data suggests serial infection with CHIKV and ZIKV while also identifying patients with probable cross-reaction between DENV and ZIKV tests. Additional investigation is needed to determine whether patients with serial infection have increased severity of symptoms or different clinical

outcomes. Since number of ZIKV infections continues to increase and all 3 viruses continue to circulate, continued public health messaging remains important.

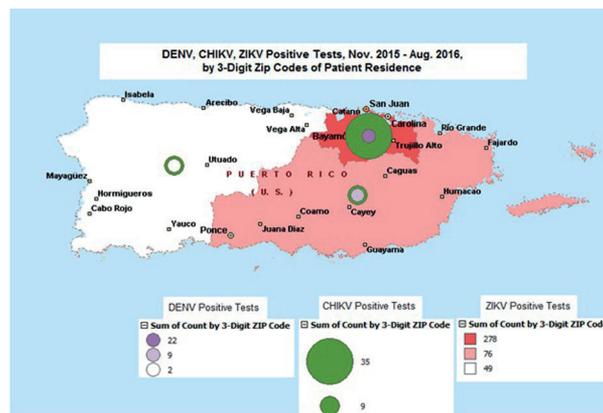


Figure 1

	DENV	CHIKV	ZIKV
# Unique Tests*	744	741	733
# Unique Patients	735	734	726
# Unique Positive ^A Tests*	34	55	444
# Unique Positive ^A Patients	34	55	443
Positive ^A Patients (F:M)	8:26	5:50	44:399
Positive ^A Patient Average Age (Range)	63.3 (27-94)	64.3 (33-85)	58.9 (21-98)

*Considered a unique test if performed >30 days apart
^APositive result is either a positive IgM or RT-PCR result

Table 1: VA Caribbean Healthcare System Dengue Virus (DENV), Chikungunya Virus (CHIKV) and Zika Virus (ZIKV) Demographics and Testing, Nov. 2015-Aug. 2016

Percent Positive of DENV, CHIKV and ZIKV in Puerto Rico from Nov. 2015 to Aug. 2016

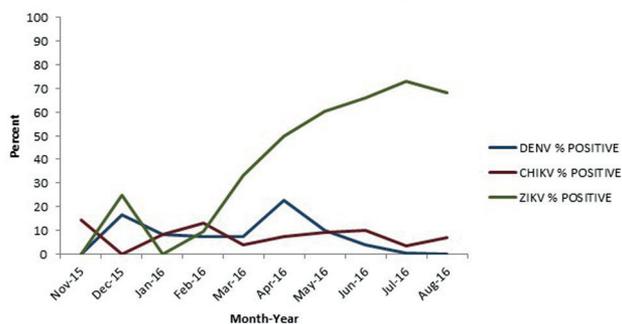


Figure 2

Keywords

Department of Veterans Affairs; Dengue; Chikungunya; Zika; Electronic Laboratory Data

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