

Travel-Associated Zika Virus Disease Cases Among U.S. Residents — United States, January 2015–February 2016

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Zika virus is an emerging mosquito-borne flavivirus. Recent outbreaks of Zika virus disease in the Pacific Islands and the Region of the Americas have identified new modes of transmission and clinical manifestations, including adverse pregnancy outcomes. However, data on the epidemiology and clinical findings of laboratory-confirmed Zika virus disease remain limited. During January 1, 2015–February 26, 2016, a total of 116 residents of 33 U.S. states and the District of Columbia had laboratory evidence of recent Zika virus infection based on testing performed at CDC. Cases included one congenital infection and 115 persons who reported recent travel to areas with active Zika virus transmission ($n = 110$) or sexual contact with such a traveler ($n = 5$). All 115 patients had clinical illness, with the most common signs and symptoms being rash (98%; $n = 113$), fever (82%; 94), and arthralgia (66%; 76). Health care providers should educate patients, particularly pregnant women, about the risks for, and measures to prevent, infection with Zika virus and other mosquito-borne viruses. Zika virus disease should be considered in patients with acute onset of fever, rash, arthralgia, or conjunctivitis, who traveled to areas with ongoing Zika virus transmission (<http://www.cdc.gov/zika/geo/index.html>) or who had unprotected sex with a person who traveled to one of those areas and developed compatible symptoms within 2 weeks of returning.

Zika virus is primarily transmitted to humans by *Aedes aegypti* mosquitoes (1). Most infections are asymptomatic (2). When occurring, clinical illness is generally mild and characterized by acute onset of fever, maculopapular rash, arthralgia, or nonpurulent conjunctivitis. Symptoms usually last from several days to a week. Severe disease requiring hospitalization is uncommon, and deaths are rare.

In addition to mosquito-borne transmission, Zika virus infections have been reported through intrauterine transmission

resulting in congenital infection, intrapartum transmission from a viremic mother to her newborn, sexual transmission, and laboratory exposure (3,4). Increasing evidence suggests that Zika virus infection during pregnancy can result in microcephaly, other congenital anomalies, and fetal losses (5). Guillain-Barré syndrome also has been associated with recent Zika virus disease (6). However, the frequency of these outcomes is not known. To characterize Zika virus disease among U.S. residents, CDC reviewed demographics, exposures, and reported symptoms of patients with laboratory-evidence of recent Zika virus infection in the United States.

Zika virus disease cases among residents of U.S. states with specimens tested at CDC's Arboviral Diseases Branch during January 1, 2015–February 26, 2016 were identified. The cases included in this report had laboratory evidence of Zika virus infection based on the following findings in serum: 1) Zika virus RNA detected by reverse transcription-polymerase chain reaction (RT-PCR); 2) anti-Zika virus immunoglobulin M (IgM) antibodies detected by enzyme-linked immunosorbent assay (ELISA) with ≥ 4 -fold higher neutralizing antibody titers against Zika virus compared with neutralizing antibody titers against dengue virus; or 3) anti-Zika virus IgM antibodies with <4 -fold difference in neutralizing antibody titers between Zika and dengue viruses and a direct epidemiologic link to a person with laboratory evidence of recent Zika virus infection (i.e., vertical transmission from mother to baby or sexual contact). State and local health departments collected information on patient demographics, dates of travel, and clinical signs and symptoms.

During January 1, 2015–February 26, 2016, a total of 116 residents of 33 states and the District of Columbia with laboratory evidence of recent Zika virus infection were identified on the basis of testing at CDC. One case occurred



in a full-term infant born with severe congenital microcephaly, whose mother had Zika virus disease in Brazil during the first trimester of pregnancy (5). Among the remaining 115 patients (including the infant's mother), 24 (21%) had illness onset in 2015 and 91 (79%) in 2016. Seventy-five (65%) cases occurred in females (Table 1). The median age of patients was 38 years (range = 3–81 years); 11 (10%) cases occurred in children and adolescents aged <18 years. Of the 115 patients, 110 (96%) reported recent travel to areas of active Zika virus transmission and five (4%) did not travel but reported sexual contact with a traveler who had symptomatic illness. The most frequently reported countries with active Zika virus transmission visited by patients were Haiti (n = 27), El Salvador (16), Colombia (11), Honduras (11), and Guatemala (10).

All 115 patients reported a clinical illness with onset during March 2015–February 2016 (Figure). The most commonly reported signs and symptoms were rash (98%), fever (82%), arthralgia (66%), headache (57%), myalgia (55%), and conjunctivitis (37%) (Table 2). Among all 115 patients, 110 (96%) reported two or more of the following symptoms: rash, fever, arthralgia, and conjunctivitis; 75 (65%) reported three or more of these signs or symptoms. Four (3%) patients were hospitalized; no deaths occurred. Among the 109 travelers who had known travel dates, patients reported becoming ill a median of 1 day after returning home (range = 37 days before return to 11 days after return).

Laboratory evidence of Zika virus infection included positive RT-PCR test results in 28 (24%) cases and positive serologic test results in 87 (76%) cases; two (2%) cases had serologic evidence of a recent unspecified flavivirus infection and were classified as Zika virus disease cases based on their epidemiologic link to a confirmed case (one vertical transmission and one sexual contact).

Discussion

Before 2015, Zika virus disease among U.S. travelers was uncommon. This likely was because of low levels of Zika virus transmission in travel destinations and limited disease recognition in the United States. Local mosquito-borne transmission of Zika virus has not been documented in U.S. states. With the recent outbreaks in the Americas, the number of Zika virus disease cases among travelers visiting or returning to the United States has increased and will likely continue to increase. These imported cases might result in local human-to-mosquito-to-human transmission of the virus in U.S. states that have the appropriate mosquito vectors.

This report increases the number of laboratory-confirmed sexually transmitted Zika virus disease cases reported in the United States; two cases included here were previously reported as probable cases and were confirmed through additional testing (4).

TABLE 1. Characteristics of 115 residents of U.S. states and the District of Columbia with laboratory evidence of Zika virus disease — January 1, 2015–February 26, 2016*,†

Characteristic	No. (%)
Female	75 (65)
Age group (yrs)	
<10	4 (3)
10–19	10 (9)
20–29	23 (20)
30–39	22 (19)
40–49	19 (17)
50–59	23 (20)
60–69	13 (11)
≥70	1 (1)
Region visited	
Central America	42 (37)
Caribbean	38 (33)
South America	21 (18)
Southeast Asia and Pacific Islands	7 (6)
North America (Mexico)	2 (2)
No travel§	5 (4)
Hospitalized	4 (3)
Died	0 (0)

* Testing performed at CDC's Arboviral Diseases Branch laboratory.

† Excludes one infant born with severe congenital microcephaly after maternal infection in Brazil during the first trimester of pregnancy.

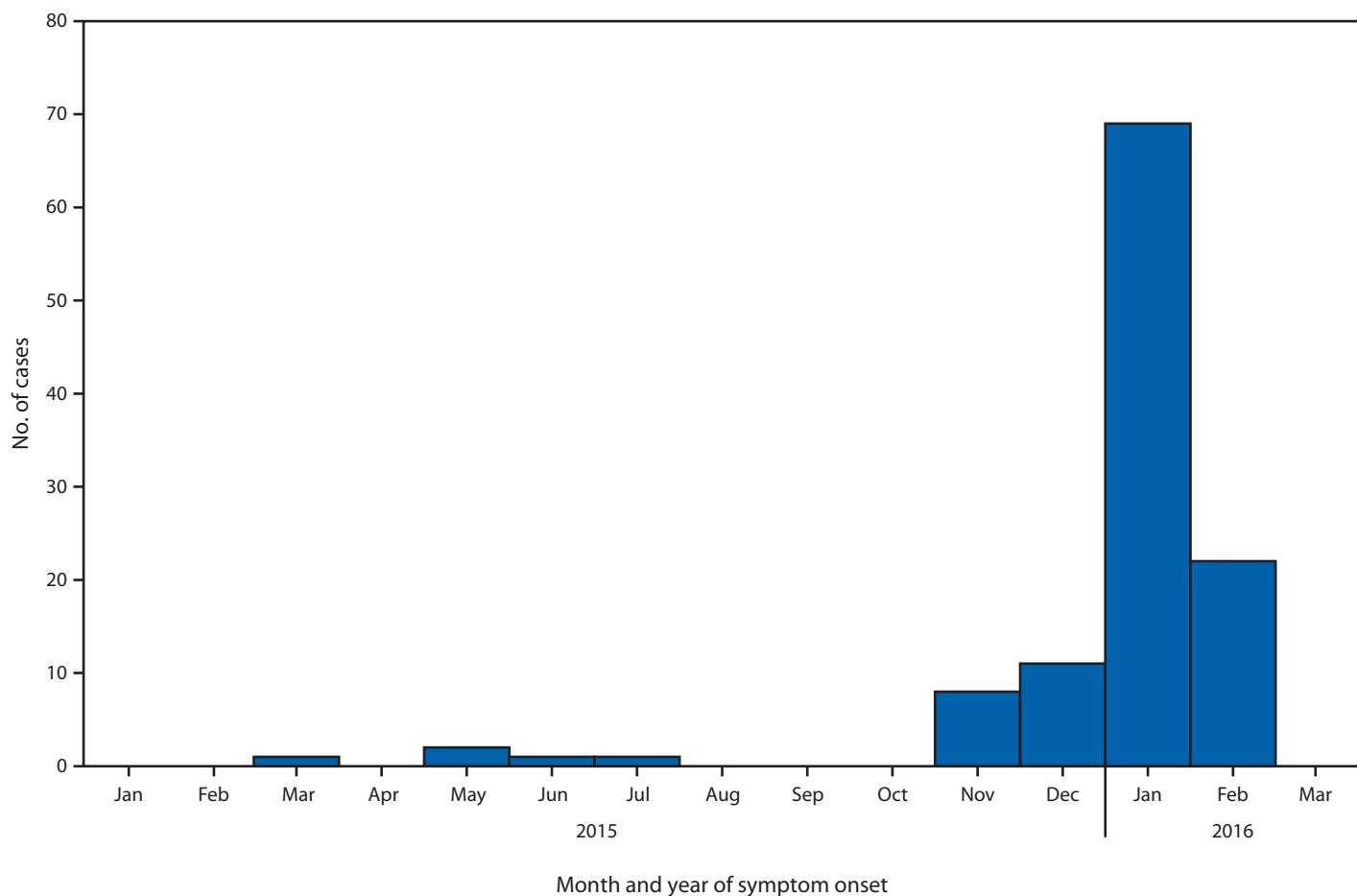
§ Sexual contacts of travelers.

Sexually transmitted cases will be increasingly recognized among contacts of returning travelers and there is risk for congenital, perinatal, or transfusion-associated transmission. CDC has issued guidelines to reduce the risk for travel-associated infections, especially among pregnant women and sexual contacts of travelers (4,7). Temporary deferral of blood donors with recent travel to Zika-affected areas also has been recommended to reduce the risk for transfusion-associated transmission (8).

The cases presented in this report have clinical findings similar to those of Zika virus disease cases previously reported from other countries. Most had fever and rash; however, rates of conjunctivitis are lower than those seen in previous outbreaks (2). The majority (95%) of cases occurred in travelers to areas with ongoing mosquito-borne Zika virus transmission.

This evaluation was limited to cases with testing performed at CDC through February 26, 2016. Zika virus RT-PCR and anti-Zika IgM antibody testing is now available at an increasing number of state, territorial, and local health departments, and additional cases have been diagnosed and reported from state and territorial health departments beyond those included in this report (<http://www.cdc.gov/zika/geo/united-states.html>). On February 26, 2016, the Council of State and Territorial Epidemiologists (CSTE) approved interim case definitions for Zika virus disease and Zika virus congenital infection and added them to the list of nationally notifiable conditions (9). Subsequent reports of Zika virus disease cases will include

FIGURE. Month of illness onset for 115 patients with laboratory evidence of Zika virus infection among residents of U.S. states and the District of Columbia — January 1, 2015–February 26, 2016*



* Testing performed at CDC's Arboviral Diseases Branch laboratory.

TABLE 2. Clinical signs and symptoms reported by 115 residents of U.S. states and the District of Columbia with laboratory evidence of Zika virus disease — January 1, 2015–February 26, 2016*

Sign/symptom	Yes†	No	Unknown
	No. (%)	No. (%)	No. (%)
Rash	113 (98)	1 (1)	1 (1)
Fever	94 (82)	20 (17)	1 (1)
Arthralgia	76 (66)	33 (29)	6 (5)
Headache	65 (57)	37 (32)	13 (11)
Myalgia	63 (55)	38 (33)	14 (12)
Conjunctivitis	43 (37)	53 (46)	19 (17)
Diarrhea	22 (19)	63 (55)	30 (26)
Vomiting	6 (5)	79 (69)	30 (26)

* Testing performed at CDC's Arboviral Diseases Branch laboratory.

† Some patients had more than one sign and/or symptom.

cases reported to ArboNET, the national arboviral surveillance system, using the interim CSTE case definitions.

Health care providers should educate patients about the risks for Zika virus disease and measures to prevent Zika virus

infection and other mosquito-borne infections. Zika virus disease should be considered in patients with acute onset of fever, rash, arthralgia, or conjunctivitis who traveled to areas with ongoing transmission or had unprotected sex with someone who traveled to those areas and developed compatible symptoms within 2 weeks of returning. Until more is known about the effects of Zika virus infection on the developing fetus, pregnant women should postpone travel to areas where Zika virus transmission is ongoing. Pregnant women who do travel to one of these areas should talk to their health care provider before traveling and strictly follow steps to avoid mosquito bites (<http://www.cdc.gov/features/stopmosquitoes/>) during travel. Pregnant women who develop a clinically compatible illness during or within 2 weeks of returning from an area with Zika virus transmission should be tested for Zika virus infection; testing may also be offered to asymptomatic pregnant women 2–12 weeks after travel to an area with active Zika transmission (7). Fetuses and infants of women infected with

Zika virus during pregnancy should be evaluated for possible congenital infection (10). CDC has established a registry to collect information on Zika virus infection during pregnancy and congenital infection.*

Health care providers are encouraged to report suspected Zika virus disease cases to their state or local health departments to facilitate diagnosis and mitigate the risk for local transmission in areas where *Aedes aegypti* or *Aedes albopictus* mosquitoes are currently active. State health departments should report laboratory-confirmed cases of Zika virus disease to CDC (8).

*Please send inquiries about the pregnancy registry to ZikaPregnancy@cdc.gov.

Acknowledgments

State and local health departments.

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Summary

What is already known about this topic?

Zika virus is an emerging mosquito-borne flavivirus. Recent outbreaks of Zika virus disease in the Pacific Islands and the Region of the Americas have identified new modes of transmission and clinical manifestations, including adverse pregnancy outcomes.

What is added by this report?

During January 1, 2015–February 26, 2016, a total of 116 residents of U.S. states and the District of Columbia had laboratory evidence of recent Zika virus infection based on testing performed at CDC, including one congenital infection and 115 persons who reported recent travel to areas with active Zika virus transmission (n = 110) or sexual contact with such a traveler (n = 5).

What are the implications for public health practice?

Health care providers should educate patients about the risks for Zika virus disease and measures to prevent Zika virus infection and other mosquito-borne infections. Zika virus disease should be considered in patients with acute onset of fever, rash, arthralgia, or conjunctivitis who traveled to areas with ongoing transmission or had unprotected sex with someone who traveled to those areas and developed compatible symptoms within 2 weeks of returning.

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