

Zika viruses by PCR. These results were confirmed by the Shanghai Center for Disease Control and Prevention and the China Center for Disease Control and Prevention. Yellow fever virus RNA remained detectable 9 days after symptom onset in serum and for an additional 3 days in urine and feces.

A person from China traveling to a yellow fever–endemic area would usually receive vaccination against yellow fever (4). Persons such as our patient, who cannot or should not receive vaccination for yellow fever, should be monitored closely. As of April 2, 2016, a total of 9 imported cases of yellow fever were reported in China: 4 cases in Fujian Province, 4 cases in Beijing, and 1 case in Shanghai. All 9 cases occurred in travelers returning to China from Angola; no local cases have been reported.

The mosquito density is low in Shanghai, and the temperature typically is low in March, suggesting that the imported case we describe will probably not result in mosquito-borne transmission. However, in the upcoming summer, the risk for onward transmission of travel-associated yellow fever in China will warrant increased vigilance. To help prevent the importation and potential spread of yellow fever in China, the Chinese government now requests proof of vaccination for yellow fever from persons traveling to China from Angola.

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Clinical Manifestations of Zika Virus Infection, Rio de Janeiro, Brazil, 2015

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To the Editor: Zika virus infection, which has been associated with microcephaly and other neurologic disorders, has reached the level of public health emergency of international concern (1). Zika virus (family *Flaviviridae*, genus *Flavivirus*) is transmitted by mosquitos of the genus *Aedes* (2). The virus was first isolated from a serum specimen from a rhesus monkey in the Zika Forest of Uganda in 1947 (3). After 2007, a rapid geographic expansion of the virus was observed, including outbreaks in the Pacific region (4) and, more recently, in South America. Brazil reported the first autochthonous case of Zika virus disease in April 2015 (5), and subsequently, increasing numbers of cases have been reported, especially in northeastern Brazil (6).

Studies on the natural history of Zika virus infection are scarce. Previous research defined Zika virus infection as a dengue-like illness, typically characterized by fever, maculopapular rash, arthralgia, and conjunctivitis (4). Although some patients have all of these symptoms during early onset, fever is not an early symptom for all. Here we describe the frequency of signs and symptoms from a sample of clinic patients in Rio de Janeiro, Brazil, who were later confirmed to have Zika virus disease by using real-time reverse transcription PCR (rRT-PCR).

We retrospectively collected clinical data on a convenience sample of 57 patients found to be Zika virus–positive by rRT-PCR who had medical attention at the 24-hour acute care clinic of Manguinhos in Rio de Janeiro during April 28–June 8, 2015. Data were collected from electronic medical records and surveillance reports. Data were anonymized and included age, sex, and signs and symptoms documented on the first clinic visit of patients who reported acute rash, dengue-like illness, or both. Fever

was documented either through direct measurement in the clinic or by patient self-report. Pregnancy status was not assessed. We collected blood samples for serum sample testing during each patient's initial visit to the clinic and tested for Zika virus using rRT-PCR as described by Lanciotti et al. (7); all samples were collected within 7 days of illness onset. Patients were not tested for dengue or chikungunya viruses. We did not measure the duration of any sign or symptom.

Of the 57 Zika virus disease case-patients, median age was 34 years; 63% were women (Table). The most common sign or symptom was exanthema (98%), followed by headache (67%), fever (67%), arthralgias (58%), myalgias (49%), and joint swelling (23%) (Table). Conjunctivitis was observed in 39% case-patients and retro-orbital eye pain was reported by 40%. Among 30 patients who had fever assessed by clinic staff, median temperature was 38°C (range 37.5°C–38.5°C). One patient had no rash or joint swelling but did have all other symptoms. One patient's sole symptom was rash. No patients were referred for hospitalization.

Our clinic-based study of 57 rRT-PCR–confirmed cases of Zika virus disease found rash to be the most common symptom for which patients sought care (98%); fever, generally low-grade, was reported or observed in 67%. Because our study design was retrospective in nature, wherein we reviewed records for selected patients in whom Zika was subsequently found to be laboratory-confirmed by using rRT-PCR, we may have introduced selection bias to our sample, limiting the generalizability and comparability of our results. For example, clinic staff may have seen patients with mild symptoms but decided not to test for the virus, leading to a bias toward testing patients with more severe rash. It is also possible, considering the retrospective nature of our data collection, that some data points were not accurately recorded and could not be validated. Despite these limitations, our data suggest the term “Zika fever” is not a

helpful substitute term for Zika virus disease. Furthermore, referring to the illness caused by this virus as “Zika fever” (8) may be misleading and should probably be avoided until further more systematic studies clarify the frequency of fever as a symptom.

Although patient sampling and laboratory testing methods are not directly comparable to our study, a 2015–2016 assessment in Puerto Rico detected Zika virus in 30 of 155 case-patients in whom Zika virus disease was suspected. In that study, laboratory-confirmed disease was defined as detection of Zika virus RNA by using rRT-PCR or IgM by using ELISA. Among the 30 confirmed cases, the most frequently reported signs and symptoms were rash (77%), myalgia (77%), arthralgia (73%), and fever (73%) (9). The February 12, 2015, interim case definition published by the World Health Organization describes a suspected case-patient as a person with rash, fever, or both, in addition to 1 of 3 other listed symptoms (10). Like the Puerto Rico report, our report supports the established World Health Organization case definition indicating that the presence of rash, fever, or both should be emphasized as primary characteristics of Zika virus disease.

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Table. Characteristics of Zika virus disease patients seeking care in an acute care clinic, Rio de Janeiro, Brazil, April 28–June 8, 2015

Characteristic	Value*
Cohort, no. patients	57
Age, y	34 (25–40)
Female sex	36 (63)
Symptoms	
Exanthema	56 (98)
Fever†	38 (67)
Days from symptom onset to exanthema	1 (0–2)
Arthralgia	33 (58)
Itching	32 (56)
Headache	38 (67)
Myalgia	28 (49)
Retro-orbital pain	23 (40)
Conjunctivitis	22 (39)
Joint swelling	13 (23)

*Median (interquartile range) or no. (%) case-patients.

†Measured in medical office (n = 30) or self-reported (n = 8).

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Zika Virus–Related News Coverage and Online Behavior, United States, Guatemala, and Brazil

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To the Editor: News coverage of emerging infectious diseases tends to be episodic and ephemeral rather than thematic, comprehensive, and consistent over time, in part because of newsroom constraints (1–3). Public health authority announcements may help drive peaks in coverage and warrant attention, in particular given the importance

of trust and credibility for information acceptance (4,5). Moreover, online search behavior and social media interaction tend to respond to news coverage, especially for novel health issues (6,7).

The nature of Zika virus transmission as a novel phenomenon not completely understood by researchers could encourage anxiety and fear among the public (8,9). Patterns of social interaction and search behavior regarding Zika virus can point to opportunities and constraints for education efforts.

To assess relationships between news coverage, social media mentions, and online search behavior regarding Zika virus, we studied data available for January 1–February 29, 2016. Although news outlets occasionally covered Zika virus before 2016, our selected period included prominent announcements. For example, on January 28, the World Health Organization declared that Zika virus was “spreading explosively” (10), and the Centers for Disease Control and Prevention issued a travel alert. On February 3, authorities reported the first case that appeared in the United States.

Across 3 data sources, we searched for mentions of “Zika” or “El Zika.” We used Google Trends (Google Inc., Mountain View, CA, USA) to assess the number of total searches that originated in the United States, Guatemala, or Brazil for these terms, relative to total Google searches for any topic for the same period. We used a scale of 0–100 (as an indicator of relative volume), with 50 representing half the volume as 100 but not a specific absolute number. Zika virus has been detected in >25 countries since 2015; the countries selected were places where transmission has been relatively widespread or where Zika virus had not yet been but was anticipated to be. We used a monitoring tool, Crimson Hexagon (<http://www.crimsonhexagon.com/>), to capture the total number of daily Twitter posts (tweets) and focused on tweets geotagged as originating from the United

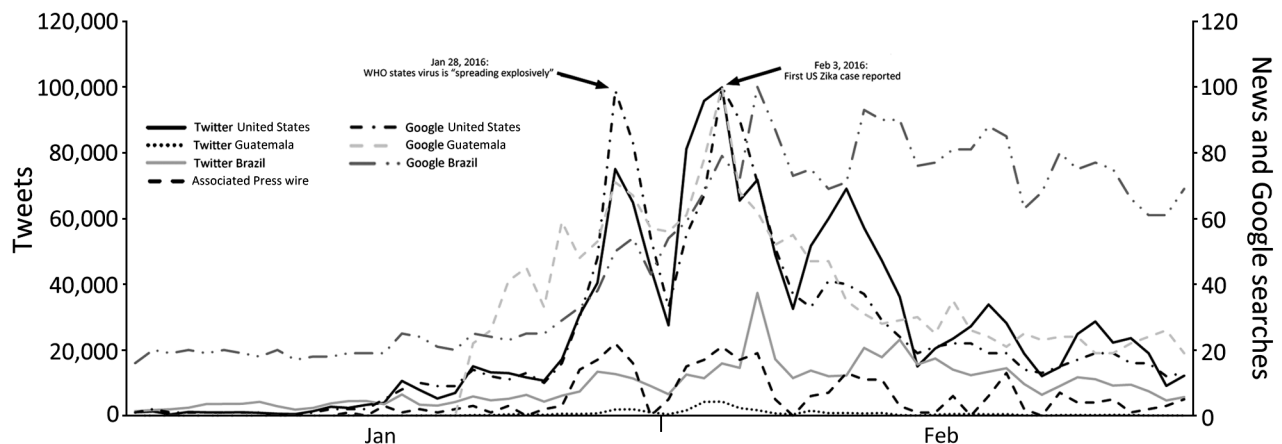


Figure. Comparison of number of tweets by individual persons, Google searches by individual persons, and Associated Press news stories about Zika virus in the United States, Guatemala, and Brazil, January 1–February 29, 2016.