

Zika virus: A summary

What is Zika?

Zika virus is a flavivirus from the same family as dengue virus and West Nile virus. Infection in humans was rare and isolated to Africa and Asia until 2007.¹⁻³ Since the first human case of Zika infection in the western hemisphere was reported in 2015,³ the virus has caused widespread outbreaks across Central and South America, Mexico, and the Caribbean.

How and where it is acquired

Transmission of Zika virus is via the *Aedes* mosquito, which is found in tropical, subtropical, and some temperate regions.^{4,5} There have also been

rare accounts of transmission by sexual contact and through blood transfusion in countries outside of Canada.⁶⁻⁸

There has been no transmission of Zika within Canada to date, and none is expected due to the absence of an appropriate vector.^{4,5} An updated list of countries with known Zika virus circulation (**Figure 1**) can be found on the Centers for Disease Control and Prevention website (www.cdc.gov/zika/geo/index.html).

Signs and symptoms of infection

Only 20% to 25% of those infected with Zika virus develop symptoms.^{3,9,10} These include fever, macu-

lopapular rash, arthralgias, nonpurulent conjunctivitis, headaches, and myalgia.^{3,9} The incubation period is between 3 and 12 days, and the illness lasts between 2 and 7 days.^{3,10,11} Most patients recover fully without complications, although there are some worrisome associations under investigation.^{2,10}

Associations with GBS and microcephaly

A relationship between Zika infection and Guillain-Barré syndrome (GBS) has been suggested due to higher-than-usual rates of GBS observed in French Polynesia, Brazil, and El Salvador during recent outbreaks.¹¹⁻¹⁴ Research into this association is ongoing.

Zika virus infection has also been linked to congenital abnormalities, specifically microcephaly. Brazilian states with known Zika transmission have reported a greater than twenty-fold increase in rates of children born with microcephaly since the outbreak began.^{3,15} A recent case report of vertical Zika transmission identified viral RNA in the brain tissue of a fetus with severe microcephaly.¹⁶ Other case reports have identified Zika RNA and antibodies in the amniotic fluid of microcephalic fetuses from affected areas in Brazil.^{17,18} Although these findings do not prove causality between Zika virus infection and microcephaly, the link is now strongly supported by mounting epidemiologic and clinical data.

Preventive measures

Given the potential impact of Zika virus, pregnant women and women



Figure 1. Map of countries and territories in the Americas with active Zika virus transmission as of 29 February 2016.

Source: Centers for Disease Control and Prevention, <http://www.cdc.gov/zika/geo/americas.html>. For a list of all countries and territories with active Zika virus transmission visit www.cdc.gov/zika/geo/index.html.

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trying to become pregnant should discuss all travel plans with their health care provider to assess their risk for Zika exposure and should consider postponing travel to areas of known Zika circulation.¹⁹

Based on the current understanding of the Zika incubation period, duration of viremia, and unclear duration of persistence in tissues, the Public Health Agency of Canada recommends that women returning from areas of known Zika circulation should avoid becoming pregnant for at least 2 months following their last potential exposure.¹⁹

Of concern to male travelers, there is evidence that Zika virus can persist in semen for more than 2 weeks.¹⁹ Total duration of viral shedding in male and female genital secretions is currently unknown, although experience with similar viral infec-

tions suggests that viral shedding can be very prolonged.¹⁹ As a precaution, men with partners who are pregnant or who could become pregnant should abstain from sexual activity or consistently and correctly use condoms for at least 2 months following return from areas of known Zika circulation.¹⁹ It is reasonable to consider condom use for the duration of the pregnancy until more is known about sexual transmission of the virus.¹⁹

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All travelers should take strict steps to avoid mosquito bites at all times of the day and night. This includes covering up, using insect repellent on exposed skin, and protecting living and sleeping areas from mosquito entry.^{19,20} More information can be found on the Public Health Agency of Canada website (www.publichealth.gc.ca).²⁰

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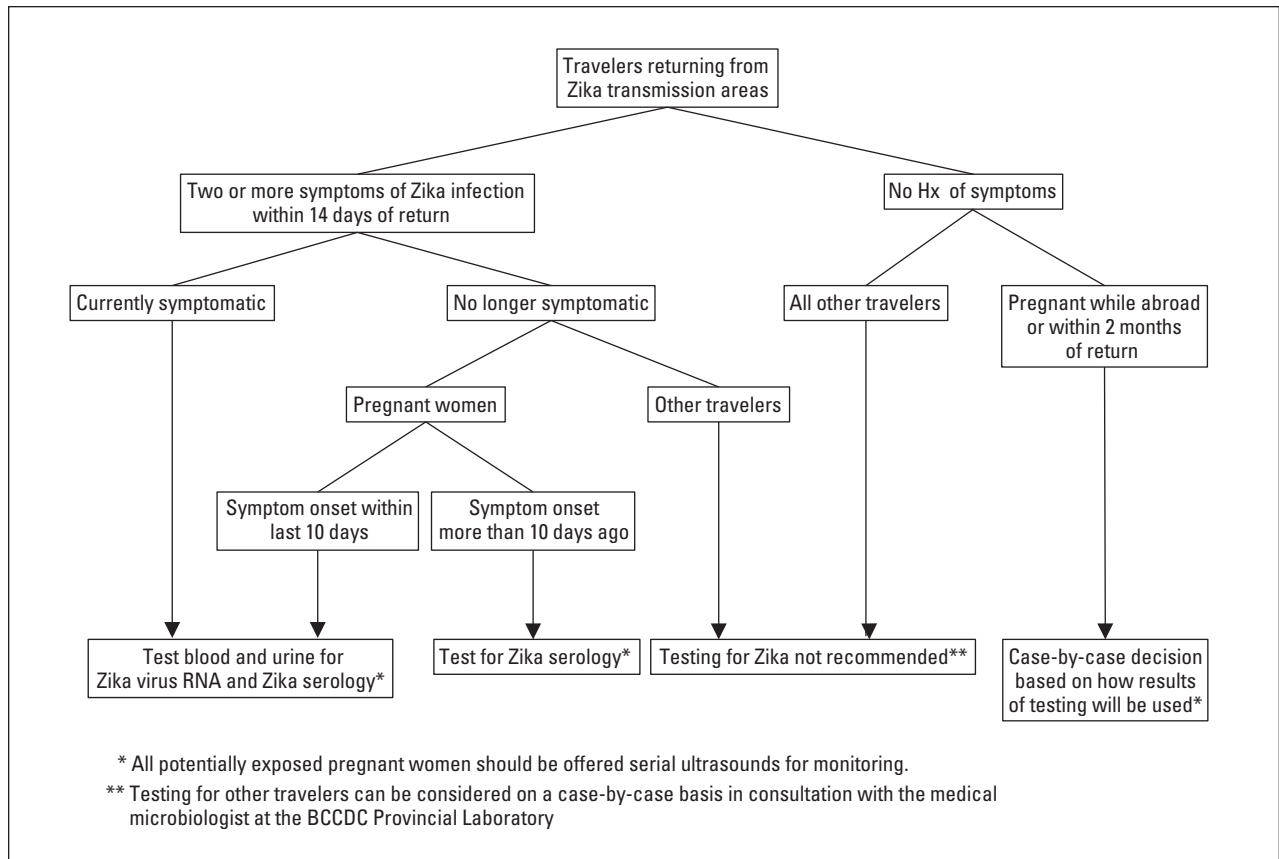


Figure 2. The BCCDC Public Health Laboratory’s Zika virus testing recommendations.

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How and when to order testing

Testing for Zika virus RNA and serology is available through the BCCDC Public Health Laboratory (Figure 2). Viral RNA detection via PCR is the most effective means of detecting the virus; however, it is only positive in blood samples for up to 7 days from symptom onset. Urine samples can be positive for Zika virus RNA for more than 10 days.^{19,21} Zika virus antibodies (serology) are detectable approximately 1 week after the start of symptoms and the test remains positive for several months. Zika serology is the test of choice for asymptomatic patients. While it is quick to perform, Zika serology is prone to cross-reactivity and confirmatory testing requires additional time.¹⁹ Details regarding sample collection can be obtained from the BCCDC Public Health Laboratory (www.bccdc.ca/health-professionals/professional-resources/laboratory-services).

Testing should be limited to travelers returning from Zika-affected areas and their female partners. All symptomatic patients with onset of Zika-like symptoms abroad or within 14 days of return should be offered both viral and serologic testing as part of a workup for fever in a returning traveler. Testing should also be offered to asymptomatic pregnant women with a history of Zika-like illness while abroad or shortly following their return, as well as those whose fetus is suspected of having a congenital abnormality.¹⁹ In pregnant women and those who become pregnant within 2 months of return with no history of Zika-like symptoms, testing should be assessed on a case-by-case basis.¹⁹ These patients should be counseled on the risks of Zika infection, pregnancy options including termination, and sensitivity, specificity, and turnaround time of current diagnostic testing.¹⁹ The decision to test these patients should be based on

how the results will be used. Testing is not recommended for other asymptomatic travelers.^{19,21}

It is recommended that all exposed pregnant women undergo serial monitoring by ultrasound with close attention to cranial measurement trends over time. Unfortunately, ultrasound cannot reliably detect microcephaly until late in the second trimester, and there is no gestational age by which microcephaly can be ruled out.¹⁹

Referral of exposed pregnancies

Referral to the Reproductive Infectious Diseases Clinic at BC Women's Hospital (tel: 604 875-2160, fax: 604 875-2871) is recommended for pregnant women returning from a Zika-affected area who have a positive test for Zika virus infection or an ultrasound showing an abnormality consistent with congenital viral infection.²²

Sample case

A 30-year-old woman presents to her family doctor's office after returning from a vacation to South America with her husband. She left on her trip 4 weeks ago and is currently 12 weeks pregnant. She has heard news of recent outbreaks of Zika virus in South America and its links to congenital abnormalities. She is concerned that her pregnancy might be affected.

The patient notes that she and her husband did get a few mosquito bites while in Brazil, but denies any history of illness while abroad and currently feels well. She and her husband have not had sex since their return 5 days ago. Her family doctor counsels her on the available testing methods and the use of condoms with her husband for at least 2 months. The patient requests to be tested for Zika virus as it will impact her decisions regarding her pregnancy, and Zika virus serology is ordered. Her family doctor also arranges for serial ultrasounds for fetal monitoring.

The bottom line

Recent outbreaks of the mosquito-borne Zika virus pose a new risk to travelers to the Caribbean, Mexico, and Central and South America. Given the lack of suitable vector in Canada, the risk to most Canadians is low. There is concerning data linking Zika virus infection with GBS and microcephaly, warranting vigilant prevention and screening measures for travelers to Zika-affected areas, particular pregnant women.

Zika virus disease is still largely a condition of poverty that is thriving in an at-risk climate. In many countries affected by the recent outbreaks, access to mosquito precautions, contraception, and abortion services is very limited if available, putting women of childbearing age at particularly high risk. In addition to vigilant screening measures for Canadian travelers, we can contribute to the global effort to control this outbreak by supporting Zika virus research here in Canada and by providing laboratory, surveillance, and logistical support to those countries most affected.

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