

## Early Communications

### CHIKUNGUNYA OUTBREAK IN THE CARIBBEAN 2013-2014

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#### ABSTRACT

**Background:** In December 2013, the local transmission of the mosquito-borne chikungunya virus was confirmed for the first time in several Caribbean islands.

**Objective:** To outline what is known to date on the outbreak of chikungunya in the Caribbean, and identify what is being done to detect and limit this infection.

**Results:** PAHO/WHO has recommended that chikungunya surveillance be set up in countries where there is existing dengue surveillance. Prospective travellers should be advised to take personal protective measures to avoid mosquito bites to decrease risk of exposure. Patients typically present with fever and arthralgia. If there is a positive travel history, serology for both chikungunya and dengue virus infection should be considered after consultation with local public health officials. Treatment is supportive. Transmission in Canada is not expected.

**Conclusion:** Clinicians and public health professionals in Canada should be on the alert for sporadic cases of chikungunya virus in patients who present with fever and arthralgias after a stay in an affected Caribbean island.

#### INTRODUCTION

Chikungunya fever is a dengue-like illness caused by a virus transmitted to humans by the *Aedes* mosquitoes, primarily *Aedes aegypti* and *Aedes albopictus*. The name "chikungunya" is derived from the Makonde language (Tanzania and northern Mozambique) meaning « that which bends up » referring to the severe arthralgias that manifest with infection. The virus typically circulates in Africa and parts of Asia. However, sporadic imported cases and occasional outbreaks of chikungunya fever have occurred in other geographical regions such as in Italy in 2007 (1) and in France in 2010 (2, 3). Previously, only imported cases of chikungunya virus-associated illness with travel or infection abroad were reported in the Americas. Recently it has been reported in the Caribbean and for the first time local transmission has been verified in the western hemisphere.

#### Event description

On December 6, 2013, the Pan American Health Organization (PAHO)/World Health Organization (WHO) was notified of two confirmed cases of chikungunya virus on the Caribbean island of Saint-Martin/Sint Maarten (4). These were detected amidst a dengue fever outbreak, following an investigation of cases for whom the diagnosis of dengue was excluded. The health authorities of Saint Martin (northern French part) and Sint Maarten (southern Dutch part) are cooperating closely to respond to this outbreak.

In consultation with PAHO, a "suspect" case of travel-related chikungunya disease has been defined as a patient with acute onset of fever  $>38.5^{\circ}\text{C}$  ( $101.3^{\circ}\text{F}$ ) who exhibits severe arthralgias or arthritis not associated with other medical conditions and has visited epidemic or endemic areas within two weeks prior to the onset of symptoms (5).

As of January 17, 2014, there have been 480 confirmed human cases of chikungunya virus in the Caribbean reported to PAHO/WHO with many additional cases under investigation (6). Indigenous cases of chikungunya virus have been confirmed on the islands of Saint Martin/Sint Maarten, Martinique, British Virgin Islands, Guadeloupe and Saint Barthélemy. An additional case from French Guiana has been associated with travel to Martinique and one from Dominica with travel to St Martin. Results are pending on two suspected travel-related cases in the United States (1 to Saint Martin and 1 to St Lucia). To date, there have not been any human cases of chikungunya virus reported among Canadian travellers returning from the Caribbean. The recent outbreak in the Caribbean islands marks the first indigenous transmission of chikungunya in the Region of the Americas.

### **Investigations and response**

Working closely with PAHO, actions implemented by local authorities to date include:

- Epidemiological surveillance including syndromic surveillance and surveillance of severe cases.
- Vector control activities in the affected area that will rapidly be extended to the entire island, including around airports, schools, day nurseries, and hospitals.
- Communication and social mobilization: Information is being disseminated to health professionals, to the public (on individual protection and how to eliminate larvae breeding grounds), and to travellers by specific information in the airports.

PAHO/WHO has recommended that chikungunya virus surveillance be set up in countries where there is an existing dengue surveillance system taking different clinical presentations into account. Surveillance should be carried out to determine whether chikungunya virus may have been introduced, to track chikungunya virus once it has been introduced and then to track the disease once it is established (4).

### **Assessment**

In 2012, Canadians made over 2.5 million visits to Caribbean countries (7). Therefore, travel-related cases of chikungunya virus returning from the Caribbean can be expected. There is a risk to travellers going the Caribbean islands and they should be advised to practice personal protective measures against mosquito bites.

The current risk in Canada of local transmission of chikungunya virus is low as the mosquitoes that typically transmit it among humans are not found in Canada.

## **RECOMMENDATIONS**

### **Prevention**

There is no effective vaccine or preventive medicine for chikungunya virus therefore preventive measures such as avoidance of mosquito bites and mosquito vector control should be implemented. (Table 1) These preventive measures are similar to those that are used to prevent other common mosquito transmitted diseases such as dengue and West Nile virus (8).

Travellers should be advised to contact their health care professional if they develop flu-like symptoms while they are travelling or within 12 days after their return to Canada.

Table 1: Personal Protective Measures against mosquito bites (8)	
<b>Avoiding mosquitoes:</b>	Reduce exposure by avoiding times or places when/where mosquitoes are known to be active (e.g., by staying indoors during peak activity periods, minimizing exposure in rural areas or other habitats associated with specific vectors).
<b>Physical Barriers:</b>	<p>Use screens on doors and windows.</p> <p>Wear appropriate clothing (e.g., full length, loose fitting and light-coloured garments).</p> <p>Use insecticide treated clothing, gear and bed nets.</p>
<b>Topical Repellents or Insecticides:</b>	<p>Use topical repellents that are registered in Canada on exposed areas of skin.</p> <p>Repellents that contain DEET (20-30%) or picaridin (20%) should be the first choice for adults.</p> <p>Repellents that contain picaridin (20%) should be the first choice for children aged six months to twelve years.</p> <p>For travel outside of Canada to endemic/epidemic areas, the risk for arthropod-associated diseases likely outweighs the risk of an adverse reaction to DEET or picaridin. In such situations, and if vectors cannot be otherwise excluded (e.g., through use of insecticide-treated netting), use of up to 10% DEET or 10% picaridin should be considered for infants under six months of age.</p> <p>Do not use repellent and sunscreen combination products.</p> <p>It is preferable to apply sunscreen first and allow it to penetrate the skin before applying repellent. Where this is not possible, apply both products even if such is done contemporaneously</p> <p>Use insecticide-treated clothing, gear and bed nets. Products treated with insecticides that repel and kill mosquitoes are not currently registered for use by the public in Canada. However, they can be purchased from on-line retailers in the United States or from travel medicine clinics in Canada prior to departure</p>

	<p>from Canada. United States Environmental Protection Agency registered products are preferred over those available in other non-Canadian jurisdictions (i.e., in countries of destination).</p>
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**Early detection**

It is important to obtain a travel history for anyone presenting with fever and arthralgia. Typically, after a 3 to 7 day incubation period (range 1-12) there is abrupt onset of fever and arthralgia with constitutional symptoms such as chills, headache, photophobia, conjunctival injection, anorexia, abdominal pain, and nausea. Migratory polyarthritits primarily involves the small joints of the hands, wrist, ankles, and feet with lesser involvement of larger joints. Rash may appear several days after disease onset and typically correlated with defervescence. The rash is most prominent on the trunk and limbs and may desquamate lasting for 1-7 days. Leucopenia and mild thrombocytopenia can be found. Neurological, cardiac, and hepatic complications are rare. (Table 2) Older patients may develop persistent stiffness, arthralgia, and joint effusions for several years, especially in HLA-B27 patients. Chronic inflammatory joint symptoms were observed in up to 50% of adult cases, and after two years in some outbreaks (4, 5). It is typically a self-limited illness and is rarely fatal.

Previous studies have shown that a combination of fever and polyarthralgia had the best sensitivity and specificity at 84% and 89%, respectively, and correlated with the correct classification 87% of individuals with serologically confirmed chikungunya virus infection.

Table 2: Presenting symptoms of chikungunya infection and differential diagnosis

<b>Common symptoms</b>	<b>Rare symptoms</b>	<b>Differential diagnosis</b>
Sudden onset of fever	Neurologic (meningoencephalitis, encephalopathy, seizures, Guillain-Barré syndrome, paresis, palsies & neuropathy)	Symptoms of chikungunya virus infection can be clinically indistinguishable from dengue fever.
Severe polyarthralgia, mainly involving distal joints	Ocular (optic neuritis, iridocyclitis, episcleritis, retinitis & uveitis)	Co-infection of chikungunya virus and dengue fever has been reported.
Headache, back pain, myalgia	Dermatologic (photosensitive hyperpigmentation, intertriginous aphthous-like ulcers & vesiculobullous dermatosis)	Other acute febrile illnesses similar to chikungunya virus including: O'nyong-nyong virus infection, Sindbis virus infection, leptospirosis, and post-infection arthritis (11, 12).
Rash (50% of cases)	Renal (nephritis, acute renal failure) Other (bleeding dyscrasia, pneumonia, respiratory failure, hepatitis, pancreatitis, syndrome of inappropriate secretion of antidiuretic hormone (SIADH) & hypoadrenalism) (6).	

### Investigation

Suspected cases of chikungunya virus should be discussed with local public health authorities who can help arrange testing through provincial or territorial public health laboratories. The National Microbiology Laboratory (NML) is currently the only laboratory in Canada with the capacity to test for chikungunya virus and will provide support to the provinces and territories by carrying out diagnostic procedures for documenting infections by chikungunya virus. NML can also provide training to staff in provincial public health laboratories so that they have the capacity to do their own testing for chikungunya virus.

The laboratory testing criteria for identifying cases include viral isolation, detection of viral RNA, and presence of viral specific IgM or IgG / neutralizing antibody. Viral isolation and RT-PCR can be used to detect virus or viral RNA in serum or blood samples collected within 7 days of symptom onset. IgM antibodies are detectable in in serum samples collected 5-7 days post onset.

Testing for chikungunya virus should be considered every time a suspect dengue cases is tested to rule out or identify co-existent disease.

### Treatment

There is no specific treatment and supportive care, such as fluids, analgesia and NSAIDs, with rest is indicated during the acute symptoms. Patients with severe joint pain can be treated with narcotics or short-term corticosteroids. Mortality is rare and recovery without sequelae is expected in most cases. Occasionally, arthralgia can persist for months to over a year (6, 7).

### Reporting

Chikungunya virus and dengue are not nationally notifiable diseases in Canada but detecting and reporting this disease are very useful in tracking its reach. It is recommended that cases diagnosed with chikungunya virus be reported to local public health authorities, who can report to provincial/territorial health authorities, who can in turn report nationally. The Public Health Agency of Canada can in turn report to PAHO/WHO.

### Conclusion

Clinicians and public health professionals in Canada should be on the alert for sporadic cases of chikungunya virus in patients who present with fever and arthralgia after a stay in an affected Caribbean island.

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