

## **Human Case Surveillance**

### **Introduction**

The intention of human case surveillance is to quickly detect human illness due to West Nile Virus (WNV). Locally acquired human illness occurred for the first time in Peel in 2002, when there were 112 residents with laboratory evidence of the virus (55 suspect cases, 20 probable cases and 37 confirmed cases, including two deaths).<sup>2</sup> Many cases required hospitalization and intensive care. In 2003, there were 10 residents in Peel who had laboratory evidence of WNV infection, nine of whom were confirmed as having West Nile Fever (WNV) and one having a diagnosis of West Nile Neurological Manifestations (WNNM). There were no deaths in 2003 from WNV. Each of the 10 cases reported onset of symptoms in August or September of 2003.<sup>2</sup> An additional 56 residents were assessed but either had a previous infection (49) or it was determined that they did not meet the case definition (7).<sup>2</sup>

While most human WNV infections are without symptoms, about one in five people (20%) develop a less severe illness referred to as West Nile fever.<sup>22</sup> The incubation period is estimated to be three to 14 days, with symptoms lasting approximately three to six days. West Nile Fever (WNV) is described as a sudden onset of fever that is often accompanied by malaise, headache, nausea, vomiting, anorexia, eye pain, myalgia, and less commonly, rash and/or swollen lymph nodes.<sup>22</sup>

Less than one percent of cases (approximately one case in 150) will develop severe neurological disease, with encephalitis being reported more often than meningitis. Additional symptoms among those with severe disease include muscle weakness and a change in mental status. Other symptoms include seizures, optic nerve involvement, cranial nerve abnormalities, paralysis and ataxia (difficulty coordinating movement or body functions).<sup>22</sup>

As there is no cure for WNV; treatment is supportive in nature and involves hospitalization, administering of intravenous fluids, providing respiratory support and preventing secondary infections for patients with severe disease.<sup>22</sup>

Modifiable risk factors for WNV include known travel in an area previously identified as having WNV activity, acquiring the infection through occupational exposure<sup>23</sup>, or having received blood, blood products or organ transplants from an infected donor. As a result of these known risk factors, the Canadian Blood Services have screened all donations of blood for WNV since July 1, 2003.<sup>24</sup>

### Methods

As of May 1, 2003, West Nile Virus Illness was specified as a Reportable and Communicable Disease under the Health Protection and Promotion Act (Appendix C). In 2004, there were two substantive changes to the WNV case definition. The first was the removal of the 2003 WNV human surveillance investigation category term “possible” from the case definitions. This left “suspect”, “probable” and “confirmed” as levels of confirmation for the diagnosis of WNV. The second change to the case definition was the omission of fever as a required clinical criterion of the West Nile Fever case classification.

Peel Public Health developed and faxed a Health Professionals Update (HPU) to physicians in the Region of Peel on June 21, 2004. This document contained an overview of the WNV experience in Peel in 2003, as well as reporting and diagnostic testing instructions for physicians.

All suspect WNV cases identified by hospitals and physicians were reported to the Public Health department. WNV was suspected in any adult presenting with fever and rash when WNV was present in the community.

Once a blood sample was taken from the patient it was submitted to the Ministry of Health and Long-Term Care (MOHLTC) Central Public Health Laboratory (CPHL) in Toronto. The first test performed on a blood sample was the Immunoglobulin M (IgM) Enzyme-Linked Immunosorbent Assay (ELISA), which, if positive, was run a second time to rule out false positive results. These two tests were followed by PRNT (Plaque Reduction Neutralization Test) to confirm diagnosis in the first three cases within each public health jurisdiction. ELISA test results were available within 24 hours, while the PRNT confirmation testing took an additional seven days.

Peel Public Health staff investigated all suspect probable and confirmed cases among residents in Peel. Standardized medical information including demographics, symptoms, risk factors (such as travel history or having received blood products) and test results were entered into the Reportable Diseases Information System (RDIS) by the Peel Surveillance Unit. The clients will be mapped according to postal code at a later date.

### Results

On August 2, 2004 a woman in the Windsor-Essex area was the first person to be reported with a WNV illness in Ontario; this was also the first case in Canada.<sup>25</sup> Ontario had a total of four probable and 10 confirmed cases in 2004 (Table 11).<sup>26</sup> One of the confirmed cases was a 59 year old female from York Region that died of the disease. This case was travel-related as the case contracted the virus while travelling to Florida in July. Toronto had the highest number of confirmed cases in the province with six.

**Table 11: Human Case Surveillance for West Nile Virus (WNV)  
by Health Unit, Ontario, 2004**

Health Unit	Probable Cases*	Confirmed Cases**
Chatham-Kent	1	0
Elgin-St.Thomas	0	1‡
Niagara	0	1
Ottawa	1	0
Toronto	0	6‡
Windsor-Essex	1	2
York Region	1***	0
<b>TOTAL</b>	<b>4</b>	<b>10</b>

\*Probable cases refer to patients with two positive IgM ELISA (enzyme-linked immuno sorbent assay) tests

\*\*Confirmed cases refer to patients with two positive ELISA tests AND either a positive confirmatory PRNT (plaque-reduction neutralization test) OR three previous cases have been confirmed by PRNT in the same health unit this year

‡ May have been exposed during travel

\*\*\*Travel case

Data as of January 5, 2005

Source: Ontario Ministry of Health and Long-Term Care

Available from URL:

[http://www.health.gov.on.ca/english/providers/program/pubhealth/westnile/wnv\\_04/wnv\\_humans](http://www.health.gov.on.ca/english/providers/program/pubhealth/westnile/wnv_04/wnv_humans)

In 2004, there were 30 cases reported throughout the country (Ontario 14, Saskatchewan 10, Manitoba 3, Alberta 2, Quebec 1). There were no deaths associated with the individuals that contracted the virus in Canada.<sup>25</sup>

In 2004, there were approximately 120 suspect cases, 0 probable, and 0 confirmed cases for WNV in the Region of Peel. WNV was subsequently ruled out as a cause of acute illness for the 120 suspect WNV cases in Peel. In 2003, there were 10 confirmed human cases in Peel. These results were much lower than the 112 residents with laboratory evidence of WNV identified in 2002, 37 of whom were “confirmed” and 20 were classified as “probable” cases (Table 12).

**Table 12: Number of Human Cases\* by Municipality,  
Region of Peel, 2002-2004**

Year	Peel	Mississauga	Brampton	Caledon
2002	57	52	5	0
2003	10	10	0	0
2004	0	0	0	0

\*Note: Cases include both probable and confirmed.

## Summary

Human illness due to WNV acquired in Peel occurred for the first time in 2002, with 112 residents having laboratory evidence of WNV (55 suspect cases, 20 probable cases and 37 confirmed cases, including two deaths).<sup>2</sup> In 2003, there were 10 residents of Peel who had laboratory evidence of WNV infection stemming from the 2003 season, nine of whom were confirmed as having West Nile Fever and one having a diagnosis of West Nile Neurological Manifestations.

There were no residents of Peel Region who had laboratory evidence of WNV infection stemming from the 2004 season. There were 120 Peel residents that were assessed in 2004. They either had a previous infection with WNV or a closely related virus or it was determined that they did not meet the WNV case definition.

Human surveillance for West Nile Virus in 2004 showed that the level of WNV activity in humans was much lower than in previous years. The efforts of hospital-based active WNV human surveillance have resulted in frequent routine diagnostic testing of patients with symptoms of WNV during the summer months when mosquitoes are prevalent.