

Human Case Surveillance

Human Case Surveillance Highlights in 2006

- Two confirmed human cases in Peel Region compared to three in 2005
 - Both in Brampton - one case had neurological symptoms
 - Cases in adjacent municipalities - Toronto – 6; Halton – 1; York – 3; Simcoe Muskoka - 1
- The onset date of the first Peel Region case was August 14, 2006; the two cases were unrelated
- Of the nineteen Ontario health units reporting WNV cases, Peel Region had the lowest number of cases per 100,000 population
- Two deaths in Ontario (Toronto and Lambton) compared to eight in 2005
- Nationally, Manitoba reported the greatest number of cases, followed by Ontario and Alberta
 - Ontario – 41 cases in 2006 compared to 101 cases in 2005
- All seven Great Lake States reported cases
 - State of Illinois had the most – 211
 - State of Pennsylvania had the least - 9

Approximately one in five people (20%) who are bitten by a mosquito infected with WNV will develop symptoms. Most people who are infected have either no symptoms or mild illness such as West Nile Virus fever. The incubation period is estimated to be three to 14 days with symptoms lasting approximately three to six days. Cases are classified as West Nile Virus Neurological Syndrome (WNNS) or West Nile Virus Non-Neurological Syndrome (WN Non-NS).

WNV fever 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. This is typically classified as WN Non-NS.⁶

In about 1% of infected individuals, WNV can cause serious illness including severe neurological disease which is classified as WNNS. Additional symptoms among those with severe disease include muscle weakness and a change in mental status.⁶

Long-term health effects are possible but less well understood. They can include physical (long-term muscle weakness and paralysis, fatigue and headache) cognitive (depression, confusion, and memory loss) and functional effects (difficulty with meal preparation and shopping)⁶.

2006 – West Nile Virus in the Region of Peel

The human case surveillance program for WNV is intended to detect human illness in the Region of Peel. In May 2003, West Nile Virus illness was specified as a reportable and communicable disease under the Health Promotion and Protection Act. The current case definitions, developed by the MOHLTC, can be found in Appendix F.⁷

All probable or confirmed cases identified by hospitals and physicians are reported to the Public Health department. A blood sample is taken from the patient and submitted to the Ministry of Health and Long-Term Care (MOHLTC) Central Public Health Laboratory (CPHL) in Toronto. The first test performed is the Enzyme-linked Immunosorbent Assay (ELISA), which, if positive, is run a second time to rule out false positive results. If these two are positive then a Plaque Reduction Neutralization Test (PRNT) is conducted to confirm the diagnosis. PRNT is only conducted in the first three cases within each public health region. ELISA results are available within 24 hours compared to days for PRNT test results.

Peel Public Health staff investigates all reported probable and confirmed cases of WNV among Peel residents. Medical information including demographics, symptoms and risk factors (i.e. travel history, blood products recipient) is collected and entered into the integrated Public Health Information System (iPHIS).

Human Surveillance Program - 2006

Table 1 presents comparative data of human cases in the Region of Peel between 2002 and 2006. In 2006, there were two confirmed human cases (one female and one male) of WNV. Both cases were residents of Brampton and reported in week 33 (Aug 13-19) and week 36 (Sept 3-9). One case was over the age of 60 years and other case was in his/her forties. The younger case was the only case with WNV neurological symptoms which included fever, headache, rash, nausea, vomiting, and weakness. Both patients have recovered from the virus.

Map 1 illustrates the two cases by municipal ward. The cases live in adjacent wards, Brampton wards 3 and 8, respectively. Peel Public Health staff interviewed each case to assess their activities around the time of infection. The cases could not be linked to one another in any way.

The two cases reported in 2006 in the Region of Peel compared to three cases in 2005, no cases in 2004 and 10 cases in 2003. In 2002, there were 57 WNV probable and confirmed cases when using the 2002 cases definition. However, the human case definition has changed since 2002. If the present day classification were applied there would have been 18 confirmed human cases in 2002. Two WNV-related deaths occurred in 2002. No WNV-related deaths have occurred in the Region of Peel in subsequent years.

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Upon notification of a positive human case, seasonal staff in the WNV program went door-to-door in the immediate area advising residents and offering to survey the property for mosquito breeding sites. In addition, educational material on symptoms of WNV, reduction of mosquito breeding sites and personal protection were provided to the residents. An intensified environmental scan around the area of the identified positive case was conducted to verify that roadside catch basins were treated and stagnant water sites identified. Any mosquito breeding sites identified on public property were larvicided or remediated.

Table 1 **Number of Human Cases by Municipality, Region of Peel (2002-2006)**

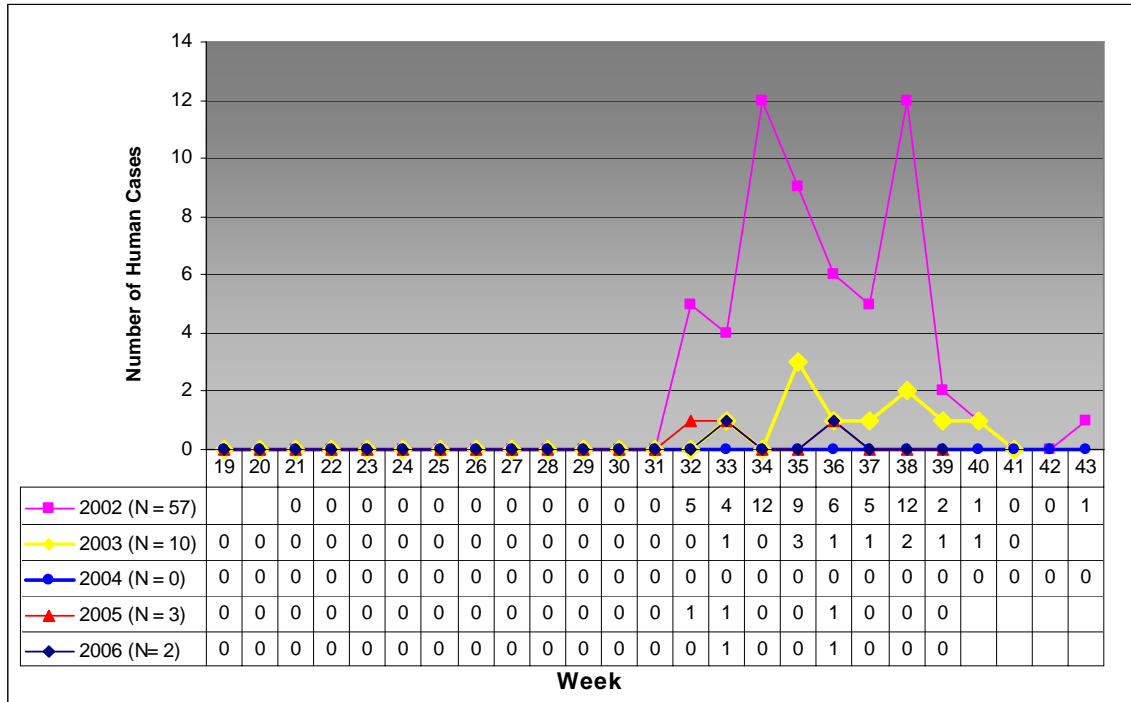
	Peel Region	Mississauga	Brampton	Caledon
2002[†]	57	52	5	0
2003	10	10	0	0
2004	0	0	0	0
2005	3	2	1	0
2006	2	0	2	0

[†]In 2002, there were a total of 112 cases with laboratory and/or clinical evidence of WNV infection; 57 cases were classified as probable or confirmed. In subsequent years, only confirmed cases were reported as a result of changes in disease classifications. If the present day classifications were applied there would have been 18 confirmed human cases in 2002.

Figure 1 presents the temporal analysis of cases in Peel Region for all years since 2002. This weekly analysis shows the overall decrease in number of cases reported since 2002. It also shows that most cases are consistently reported in the months of August and September. However, cases can be reported as late as October, as was the case in 2003. The reporting period for 2002 was longer than any other year which is consistent with the relatively greater number of cases being reported.

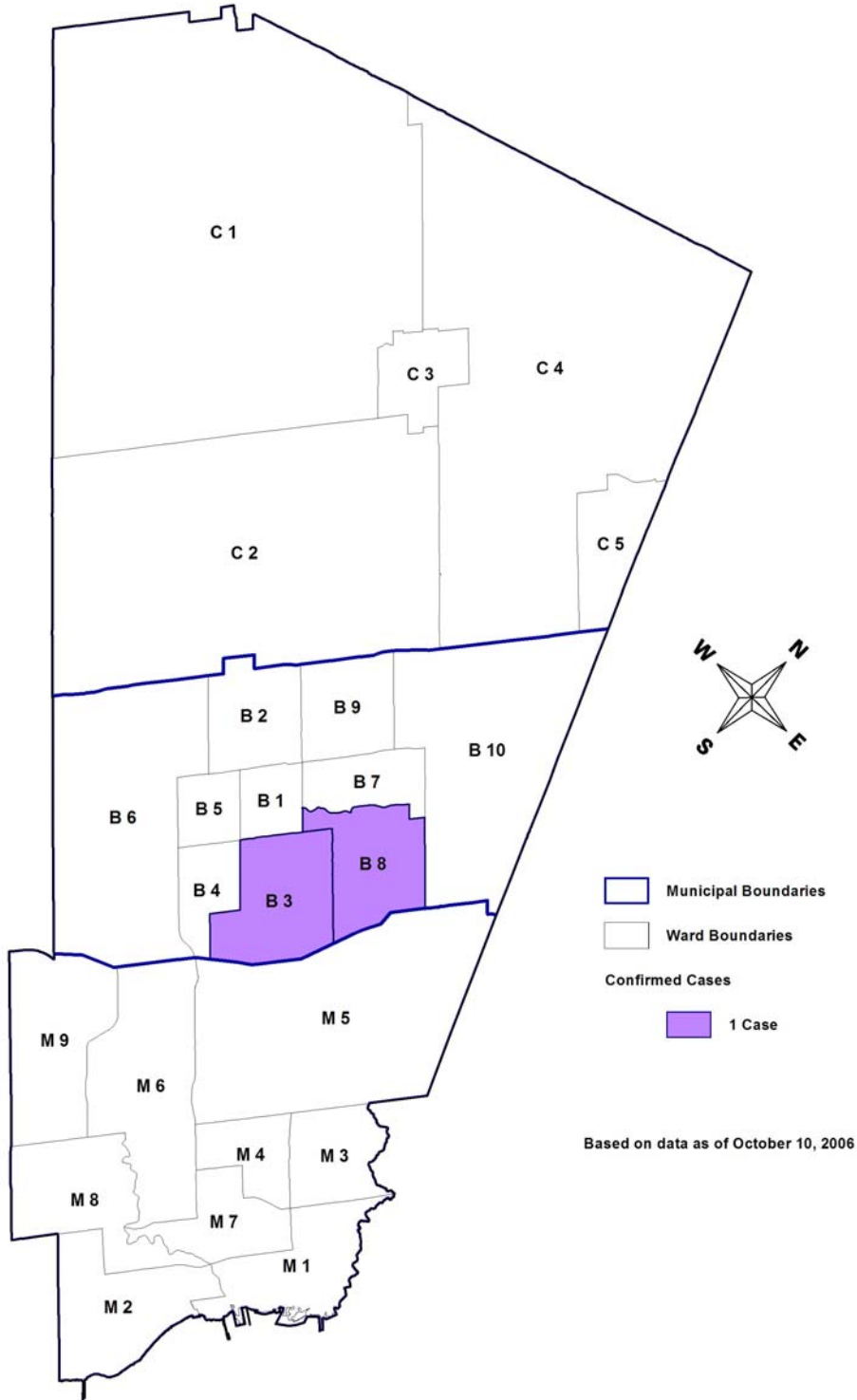
2006 – West Nile Virus in the Region of Peel

Figure 1 Confirmed and Probable Human Cases, Region of Peel, 2002* – 2006



* In 2002, there were a total of 112 cases with laboratory and/or clinical evidence of WNV infection. 57 cases were classified as probable or confirmed. In subsequent years, only confirmed cases were reported as a result of changes in disease classifications. If the present day classification were applied there would have been 18 confirmed human cases in 2002.

Map 1 Number of Confirmed Human WNV Cases by Municipal Ward, Region of Peel, 2006



Comparison with other Health Units

Across Ontario in 2006, there were a total of 42 human WNV cases compared to 101 in 2005 and 14 in 2004.⁸ In addition, there were two WNV-related deaths reported in Ontario in 2006 compared to eight in 2005.⁹

Table 2 presents the breakdown of human cases in Ontario by health unit in 2006. Nineteen out of 36 health units reported human cases in 2006. The City of Toronto and Windsor Essex County had the greatest number of cases, with six each. The City of Toronto and Lambton County each reported one death.

Table 2 also presents the rate of cases per 100,000 population derived from Ministry of Finance data - Ontario Population Projections Update. North Bay and District Health Unit had the highest human WNV case rate followed by Lambton County at 1.57 and 1.51 per 100,000, respectively. Peel Public Health had the lowest human WNV case rate of 0.16 per 100,000 population (ranked 19th out of 19 health units reporting cases); when compared to the five health units adjacent to the Region of Peel, four health units reported having human cases: Halton Region (1), York Region (3), Simcoe Muskoka (1) and the City of Toronto (6).

2006 – West Nile Virus in the Region of Peel

Table 2 Summary of Human Cases, Deaths and Rate by Ontario Health Unit

Health Unit	Cases *	Deaths *	Population **	# of cases per 100,000 population
Simcoe Muskoka District Health Unit	1	0	495,200	0.20
York Region Health Services Department	3	0	956,800	0.31
Peterborough County-City Health Unit	1	0	134,500	0.74
Haliburton, Kawartha, Pine Ridge District Health Unit	0	0	176,000	0.00
Durham Region Health Department	0	0	586,200	0.00
Brant County Health Unit	2	0	135,300	1.48
City of Hamilton	3	0	525,300	0.57
Regional Municipality of Haldimand-Norfolk Health Department	0	0	112,600	0.00
Regional Niagara Public Health Department	3	0	436,000	0.69
Peel Regional Health Unit	2	0	1,248,600	0.16
Wellington-Dufferin-Guelph Health Unit	0	0	265,800	0.00
Halton Regional Health Department	1	0	453,800	0.22
Regional Municipality of Waterloo, Community Health Department	0	0	492,100	0.00
Hastings and Prince Edward Counties Health Unit	0	0	162,700	0.00
Leeds, Grenville and Lanark District Health Unit	0	0	170,900	0.00
Eastern Ontario Health Unit	0	0	200,800	0.00
Kingston, Frontenac and Lennox and Addington Health Unit	0	0	190,700	0.00
City of Ottawa Health Department	2	0	840,900	0.24
Renfrew County and District Health Unit	0	0	99,600	0.00
Northwestern Health Unit	1	0	88,400	1.13
Timiskaming Health Unit	0	0	33,900	0.00
North Bay and District Health Unit	2	0	127,700	1.57
Algoma Health Unit	1	0	120,100	0.83
Sudbury and District Health Unit	1	0	182,700	0.55
Thunder Bay District Health Unit	0	0	152,700	0.00
Porcupine Health Unit	0	0	98,100	0.00
Chatham-Kent Health Unit	0	0	108,900	0.00
Huron County Health Unit	0	0	61,600	0.00
Middlesex-London Health Unit	3	0	438,000	0.68
Grey Bruce Health Unit	0	0	162,900	0.00
County of Lambton	2	1	132,200	1.51
Elgin-St. Thomas Health Unit	0	0	89,100	0.00
Perth District Health Unit	1	0	78,200	1.28
Windsor-Essex County Health Unit	6	0	410,000	1.46
Oxford County Board of Health	1	0	105,800	0.95
Toronto Public Health	6	1	2,622,200	0.23
TOTAL	42	2	-	-

* Source: Ministry of Health and Long-Term Care, 2006

http://www.health.gov.on.ca/english/providers/program/pubhealth/westnile/wnv_06/wnv_humans.html^B

** Source: Data derived from Ontario Population Projections Update, 2005-2031, Ontario Ministry of Finance
Rows shaded in blue are the municipalities adjacent to the Region of Peel (shaded in yellow).

2006 – West Nile Virus in the Region of Peel

Map 2 shows the locations of human WNV cases by Ontario health unit for 2006. In 2005, all the cases occurred in southern Ontario. However, in 2006 northern Ontario health units reported many cases.

Comparison with other Provinces

In 2006, there were a total of 128 human cases of WNV and two WNV-related deaths compared to 2005 where there were 226 cases and 12 deaths across Canada. This compares to 25 clinical cases and no deaths reported in 2004.⁹

Table 3 presents the provincial breakdown of cases and deaths by province. Manitoba reported the greatest number of cases, followed by Ontario, Alberta and Saskatchewan. Sixty-six per cent of all Canadian cases were non-neurological.⁹

Map 2 West Nile Virus Cases by Ontario Health Unit Region – 2006⁸

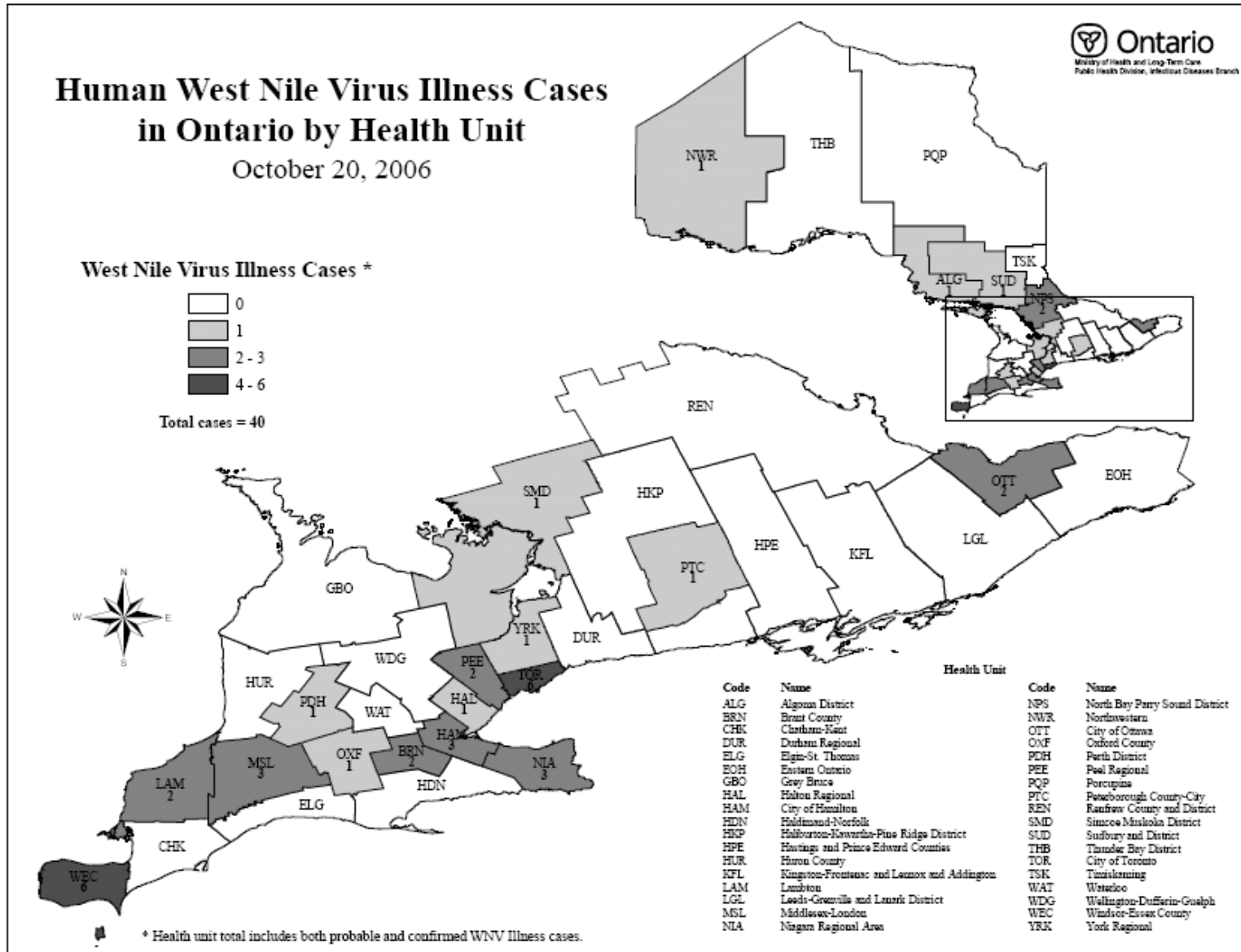


Table 3 Number of Human Cases and Deaths by Province – 2005 and 2006

Province/Territory	2005		2006	
	Cases*	Deaths	Cases*	Deaths
Newfoundland and Labrador	0	0	0	0
Prince Edward Island	1	0	0	0
Nova Scotia	1	0	0	0
New Brunswick	1	0	0	0
Quebec	5	1	1	0
Ontario	101	8 ^{***}	41	2
Manitoba	54	1	51	0
Saskatchewan	53 ^{**}	2	11	0
Alberta	10	0	24	0
British Columbia	0	0	0	0
Yukon	0	0	0	0
Northwest Territories	0	0	0	0
Nunavut	0	0	0	0
TOTAL	226	12	128	2

* sum of WNNS + WN Non-NS + Unclassified/Unspecified

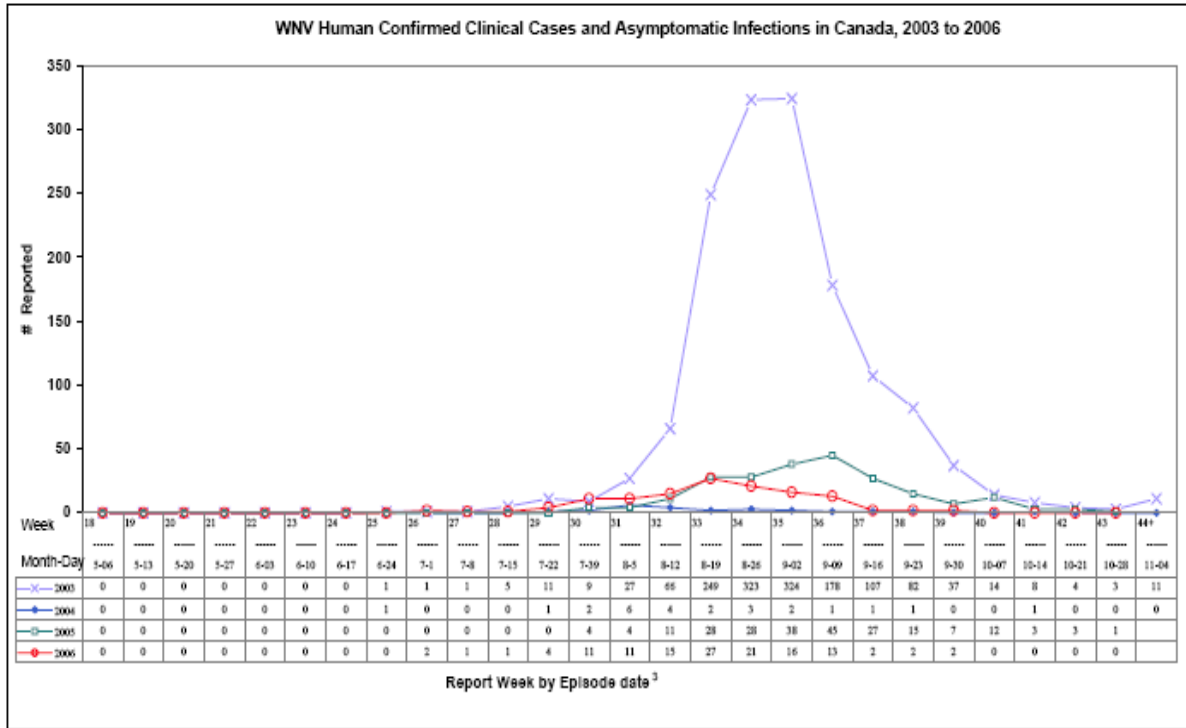
** Three additional cases under investigation

*** WNV has not been deemed the cause of death

Source: Public Health Agency of Canada, 2006⁹

A temporal analysis of human clinical cases was conducted for the four year period, 2003 to 2006, nationwide. Figure 2 shows a generally consistent pattern in terms of the time of year cases were reported. Over this period, 2003 was the year in which the highest numbers of cases were reported, as well as the year with the greatest number of cases in any one week period, followed by 2005. In 2006, the latest human cases were reported in week 39 compared as late as week 43 in the previous two years.

Figure 2 WNV Human Confirmed Cases and Asymptomatic Infections in Canada, 2003-2006



Source: Public Health Agency of Canada, 2006⁹

Comparison with the Great Lake states

In the United States there were a total of 3,887 WNV human cases and 120 WNV-related deaths in 2006.¹⁰ Table 4 lists the number of cases in the seven Great Lake states for 2004 through 2006. Similar to what was observed in Canada, the number of cases reported in the Great Lake states in 2004 was less than that in 2005. However, 2006 saw a slight increase in cases in these states (to 438 from 427) compared to decreases in Canada overall and in Ontario, more specifically. The State of Illinois reported the most cases in both 2005 and 2006 at 245 and 211, respectively. Pennsylvania reported the fewest in 2006 as did New York in 2005.

Table 4 **Number of Human WNV Cases Reported in the Great Lake States, 2004-2006***

State	Number of Cases		
	2004	2005	2006
Illinois	60	245	211
Indiana	13	22	75
Minnesota	34	43	65
New York	10	14	12
Ohio	12	61	46
Pennsylvania	15	25	9
Wisconsin	12	17	20
TOTAL	156	427	438

*As of November 21, 2006

Source: United States Centers for Disease Control, 2006 – updated November 14, 2006 - downloaded November 21, 2006¹⁰