

# WEST NILE VIRUS AND OTHER MOSQUITO-BORNE DISEASE SURVEILLANCE REPORT

## FINAL SURVEILLANCE REPORT, 2015

### WEST NILE VIRUS IN CANADA

#### HUMANS

During the 2015 West Nile virus season, three provinces: Manitoba (3 health regions), Ontario (15 health regions) and Quebec (8 health regions) reported human cases of West Nile virus to the Public Health Agency of Canada (Figure 1).

A total of 80 human clinical cases were reported in Canada: Manitoba (5), Ontario (33), and Quebec (42). Of these, forty-seven (59%) were classified as West Nile virus Neurological Syndrome, twenty-six (32%) as West Nile virus Non-Neurological Syndrome, and seven (9%) unclassified. No fatalities were reported.

In addition, four (4) asymptomatic infections have been reported: one in Ontario [Toronto], and three in Quebec [Laval (1) and Montérégie (2)] (Table 2).

#### MOSQUITOES

A total of 173 (0.86%) out of 20,046 mosquito pools tested positive for West Nile virus in the following provinces: Saskatchewan 16 (3.04%), Manitoba 30 (1.61%), Ontario 94 (0.59%), and Quebec 33 (1.89%) (Table 4). Mosquito species positive for WNV were identified as *Culex tarsalis*, *Culex pipiens* and *Culex restuans*.

#### WILD BIRDS

The [Canadian Wildlife Health Cooperative](#) and the [Québec Centre for Wild Animal Health](#) examined a total of 104 dead birds for West Nile virus in 2015, of which 50 (48%) have tested positive for West Nile virus: Saskatchewan (1), Ontario (23), and Quebec (26).

The positive birds were identified as American crow (36%), Great horned owl (18%), Red-tailed hawk (10%), Merlin (8%), Sharp-shinned hawk (8%), Snowy owl (4%), Mallard (4%), Bald eagle (2%), Common Grackle (2%), Gyrfalcon (2%), Northern Harrier (2%), Northern Saw-whet Owl (2%), and Double-crested cormorant (2%).

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## DOMESTIC ANIMALS

The [Canadian Food Inspection Agency](#) (CFIA) and the Québec Ministry of Agriculture, Fisheries and Food, reported a total of 19 horses tested positive for West Nile virus: Alberta (8), Saskatchewan (5), Manitoba (2), Ontario (3), and Quebec (1). Cases reported to the CFIA were collected through provincial and private animal health laboratories.

## CALIFORNIA SEROGROUP VIRUSES IN CANADA

In 2015, 40 human cases of laboratory confirmed cases/exposures of California serogroup virus were diagnosed by the National Microbiology Laboratory in the following provinces: Alberta (6), Saskatchewan (2), Manitoba (2), Ontario (4), Quebec (16), New Brunswick (5), and Nova Scotia (5). Of these cases, 30 were further classified as Jamestown Canyon virus, seven as Snowshoe hare virus, and the rest as unknown. Most of the samples were initially collected for testing West Nile virus, and further assayed for non-West Nile virus mosquito-borne agents.

## EASTERN EQUINE ENCEPHALITIS IN CANADA

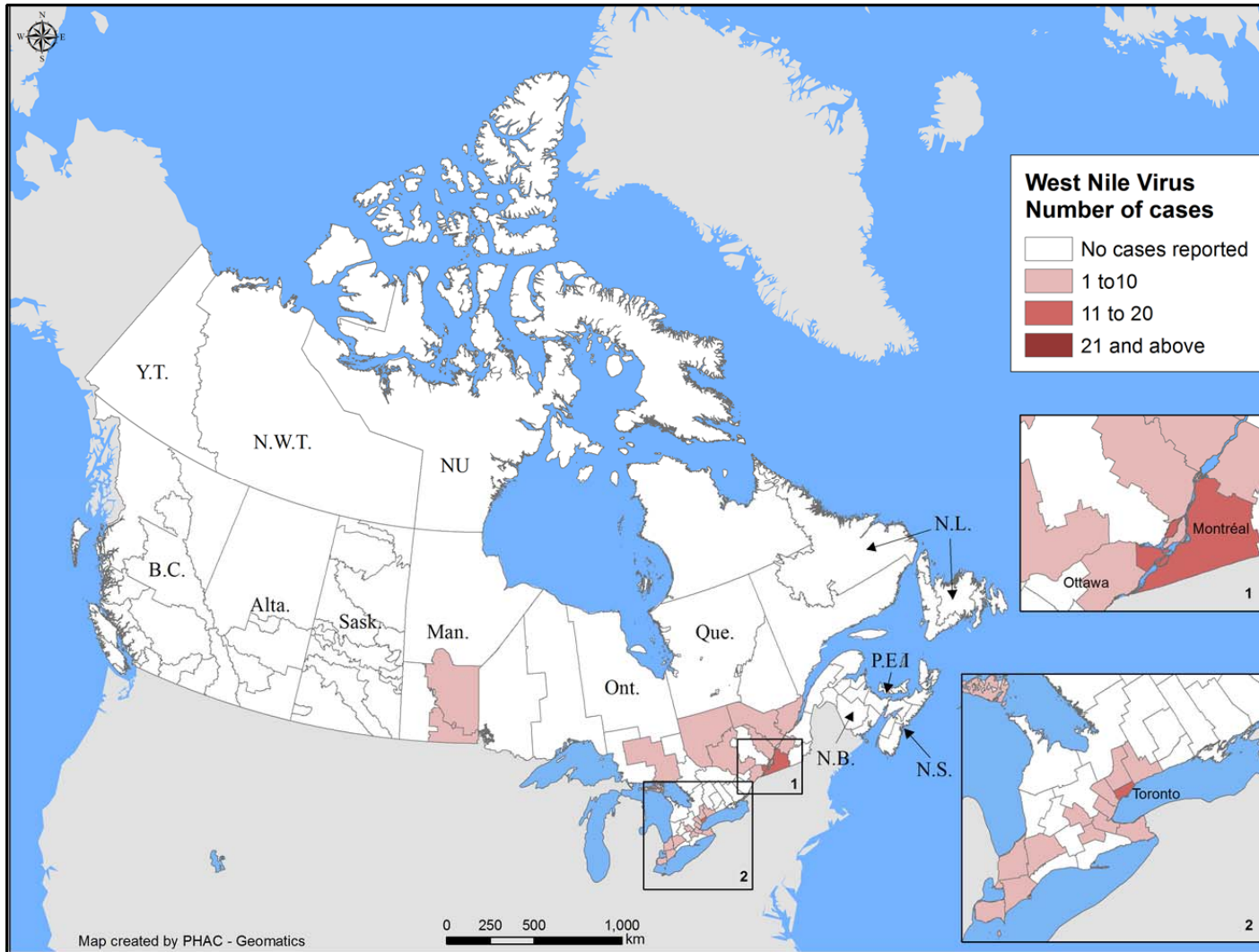
### HUMANS

No human cases of Eastern Equine Encephalitis were reported in Canada.

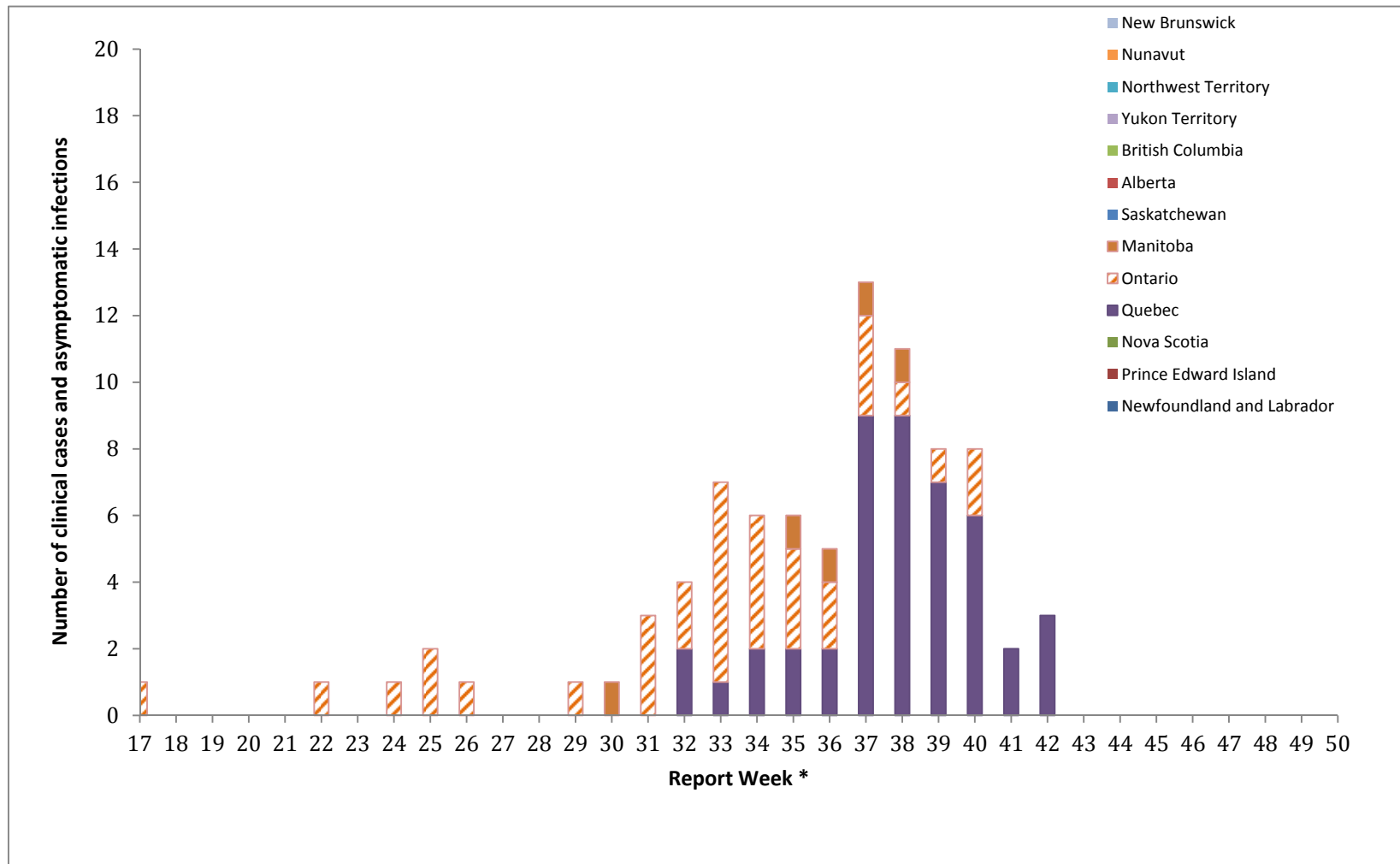
### DOMESTIC ANIMALS

A total of nine horses of Eastern Equine Encephalitis virus were reported in the following three provinces: Ontario (5), Quebec (1) and Nova Scotia (3) (Figure 5). These cases were reported to the [Canadian Food Inspection Agency](#) through a variety of provincial and private animal health laboratories.

**FIGURE 1: Geographic distribution of reported human clinical cases of West Nile virus infection in Canada, 2015**



**FIGURE 2: West Nile virus clinical cases and asymptomatic infections by Province/ Territory, Canada, 2015**



\* West Nile virus clinical cases and asymptomatic infections are grouped by report week, based on episode date. Episode date could include one of the following: onset date, diagnosis date, lab sample date or reporting date

**TABLE 1: West Nile virus human clinical cases and asymptomatic infections, by Province/Territory and by report week, 2015 season \***

	Report Weeks of 2015																														Total							
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46		47	48	49	50			
Newfoundland and Labrador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Prince Edward Island	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
New Brunswick	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nova Scotia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Quebec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	2	2	9	9	7	6	2	3	0	0	0	0	0	0	0	0	0	0	0	
Ontario	1	0	0	0	0	1	0	1	2	1	0	0	1	0	3	2	6	4	3	2	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
Manitoba	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Saskatchewan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Alberta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
British Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yukon Territory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northwest Territory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nunavut	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>13</b>	<b>11</b>	<b>8</b>	<b>8</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>84</b>	

\* West Nile virus clinical cases and asymptomatic infections are grouped by report week, based on episode date. Episode date could include one of the following: onset date, diagnosis date, lab sample date or reporting date.

**TABLE 2: West Nile virus human clinical cases and asymptomatic infections by Province/Territory for the 2015 season**

	West Nile virus neurological syndrome	West Nile virus non-neurological syndrome	Unclassified/unspecified	Total clinical cases <sup>1</sup>	Number of travel-related cases <sup>2</sup>	West Nile virus asymptomatic infection <sup>3</sup>
Newfoundland and Labrador	0	0	0	0	0	0
Prince Edward Island	0	0	0	0	0	0
Nova Scotia	0	0	0	0	0	0
New Brunswick	0	0	0	0	0	0
Quebec	32	10	0	42	2	3
Ontario	14	12*	7	33*	0	1
Manitoba	1	4	0	5	0	0
Saskatchewan	0	0	0	0	0	0
Alberta	0	0	0	0	0	0
British Columbia	0	0	0	0	0	0
Yukon Territory	0	0	0	0	0	0
Northwest Territory	0	0	0	0	0	0
Nunavut	0	0	0	0	0	0
Total	47	26*	7	80*	2	4

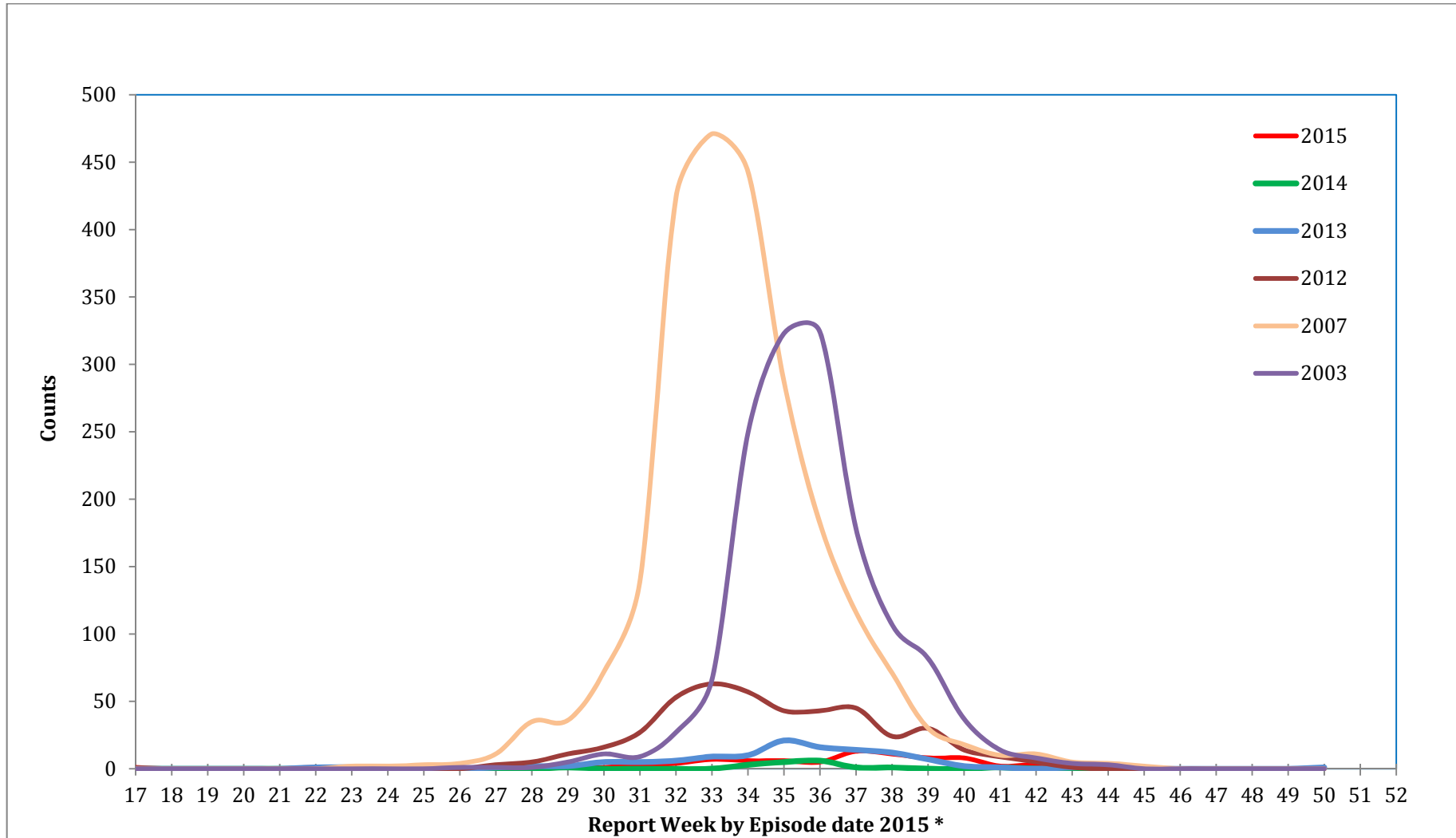
<sup>1</sup> Total clinical case is the sum of both probable and confirmed: West Nile virus neurological and non-neurological syndromes, along with any unclassified or unspecified cases.

<sup>2</sup> Likely related to travel outside the Province/Territory. These cases are included in either the total clinical cases or West Nile virus asymptomatic infections.

<sup>3</sup> Satisfies West Nile virus diagnostic test criteria in the absence of clinical criteria. This category could include asymptomatic blood donors whose blood is screened using a nucleic acid amplification test, by blood operators (i.e. Canadian Blood Services or Hema-Quebec) and is subsequently brought to the attention of public health officials. Blood operators in Canada perform a supplementary West Nile virus specific nucleic acid amplification test following any positive donor screen test result.

\*One of these cases was likely exposed prior to the 2015 West Nile virus season.

**FIGURE 3: West Nile virus clinical cases and asymptomatic infections by report week for selected years**



\* West Nile virus clinical cases and asymptomatic infections are grouped by report week, based on episode date. Episode date could include one of the following: onset date, diagnosis date, lab sample date or reporting date.



**TABLE 3: West Nile virus clinical cases and asymptomatic infections by report week for selected years**

	Report Week																														Total					
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46		47	48	49	50	
2015	1	0	0	0	0	1	0	1	2	1	0	0	1	1	3	4	7	6	6	5	13	11	8	8	2	3	0	0	0	0	0	0	0	0	0	84
2014	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4*	3	5	6	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	22
2013	0	0	0	0	0	1	1	0	0	0	1	2	2	5	5	6	9	10	21	16	14	12	7	2	1	0	1	1	0	0	0	0	0	0	1	118
2012	0	0	0	0	0	0	1	0	0	0	3	5	11	16	27	53	63	57	43	43	45	24	30	14	9	5	1	0	0	0	0	0	0	0	0	450
2007	0	0	0	0	0	0	2	2	3	4	11	35	36	72	139	424	471	443	287	182	116	71	30	18	10	11	5	4	2	0	0	0	0	0	0	2378
2003		0	0	0	0	0	0	0	0	1	1	1	5	11	9	27	66	249	323	324	178	107	82	37	14	8	4	3	0	0	0	0	0	0	0	1450

\* One of these cases was likely exposed prior to the 2014 West Nile virus season.

**TABLE 4: Number of mosquito pools tested for West Nile virus and number of positive mosquito pools by Province/Territory, 2015 season**

Province	Year to date: January 1 to Dec 19, 2015*		
	Number of positive mosquito pools	Number of mosquito pools tested	Percentage of positive mosquito pools (%)
Quebec	33	1743	1.89
Ontario	94	15918	0.59
Manitoba	30	1858	1.61
Saskatchewan	16	527	3.04
Total	173	20046	0.86

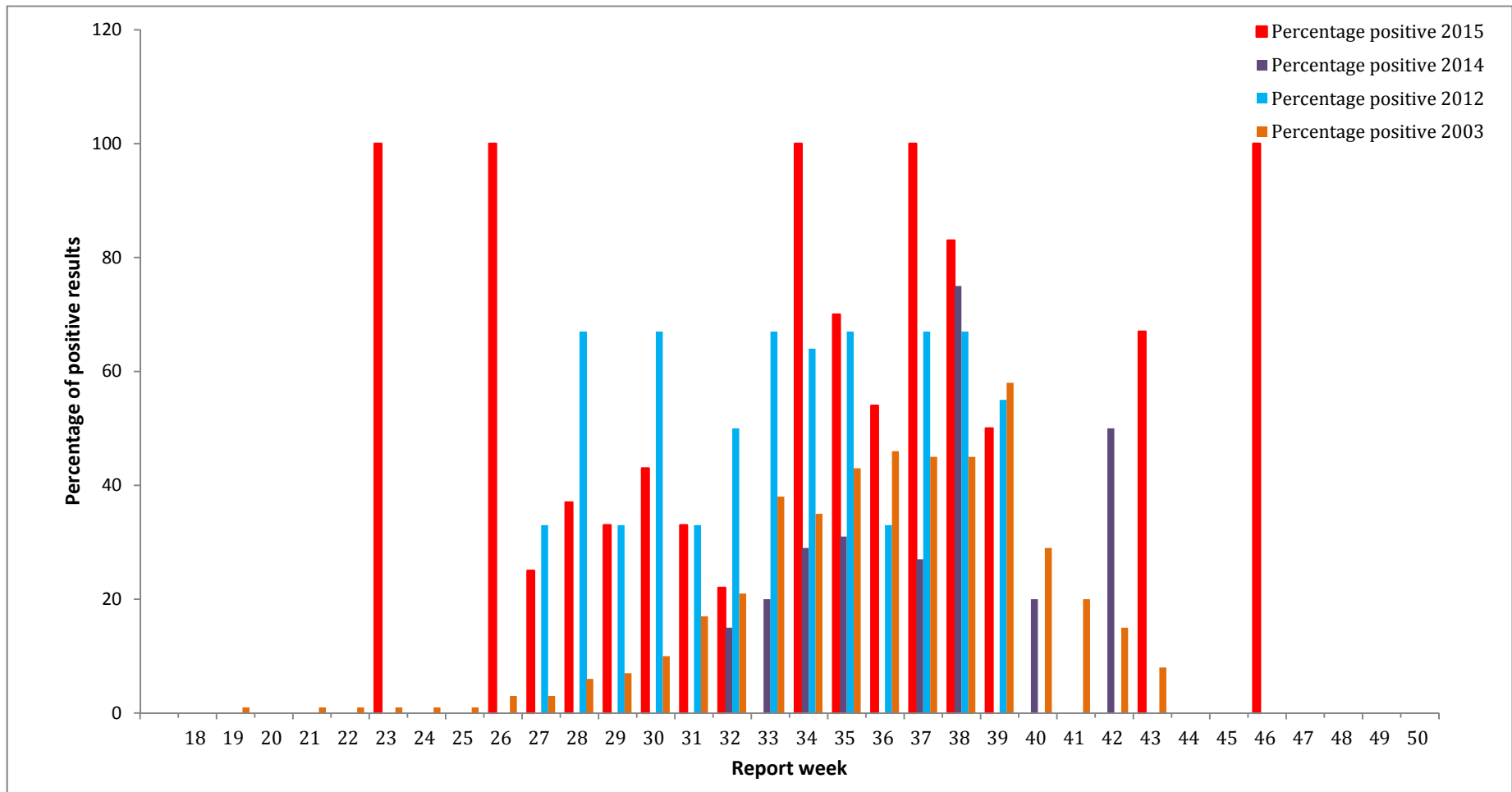
\*In 2015, mosquito surveillance was conducted by the following provinces only: Quebec, Ontario, Manitoba and Saskatchewan

**TABLE 5: Reported number of dead birds tested positive for West Nile virus by Province/Territory and by report week, 2015 season\***

	Report Weeks of 2015																														Total						
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46		47	48	49	50		
Newfoundland and Labrador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Prince Edward Island	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
New Brunswick	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Nova Scotia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Quebec	0	0	0	0	0	0	0	0	0	1	1	1	0	2	0	0	0	5	7	3	2	0	3	0	0	0	1	0	0	0	0	0	0	0	0		
Ontario	0	0	0	0	0	0	1	0	0	0	0	2	3	1	1	1	0	1	0	3	3	5	0	0	0	0	1	0	0	1	0	0	0	0	0		
Manitoba	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Saskatchewan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Alberta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
British Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Yukon Territory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Northwest Territory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nunavut	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>		

\* Data from the Canadian Wildlife Health Cooperative and the Québec Centre for Wild Animal Health

**FIGURE 4: Percentage of dead birds tested positive for West Nile virus in the 2015 season by report week, as compared to the 2003, 2012 and 2014 seasons**



**TABLE 6: Percentage of dead birds tested positive for West Nile Virus in the 2015 season by report week, as compared to the 2003, 2012 and 2014 seasons**

		Report Weeks																																	
		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Numbers positive	2015	0	0	0	0	0	0	1	0	0	1	1	3	3	3	1	2	0	6	7	6	5	5	3	0	0	0	2	0	0	1	0	0	0	0
Numbers tested	2015	0	0	0	0	0	1	1	1	0	1	4	8	9	7	3	9	5	6	10	11	5	6	6	4	2	0	3	1	0	1	0	0	0	0
Percentage positive	2015	0	0	0	0	0	100	0	0	100	25	37	33	43	33	22	0	100	70	54	100	83	50	0	0	0	67	0	0	100	0	0	0	0	
Numbers positive	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	4	0	3	3	0	1	0	1	0	0	0	0	0	0	0	0	
Numbers tested	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	43*	10	13	10	7	13	6	11	4	1	5	3	2	0	0	1	0	0	1	0	0
Percentage positive	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	20	29	31	0	27	75	0	20	0	50	0	0	0	0	0	0	0	0	
Percentage positive	2012	0	0	0	0	0	0	0	0	0	33	67	33	67	33	50	67	64	67	33	67	67	55	0	0	0	0	0	0	0	0	0	0	0	0
Percentage positive	2003	0	0	1	0	1	1	1	1	1	3	3	6	7	10	17	21	38	35	43	46	45	45	58	29	20	15	8	0	0	0	0	0	0	

\* Data became available during Week 30; this is a cumulative number of dead birds tested from Week 1 to Week 30.

FIGURE 5: Geographic distribution of Eastern Equine Encephalitis in horses in Canada, 2015

