

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

## 2016- FINAL- SUMMARY

### WEST NILE VIRUS IN CANADA

#### HUMANS

During the 2016 West Nile virus (WNV) season, seven provinces (Alberta, Manitoba, Ontario, Quebec, Saskatchewan, New Brunswick and Prince Edward Island) reported West Nile virus activity to the Public Health Agency of Canada.

104 human clinical cases (both confirmed cases and probable cases) were reported in Canada: Alberta (5), Manitoba (23), Ontario (44), Quebec (30), New Brunswick (1), and Prince Edward Island (1). Of these, sixty (58%) were classified as West Nile virus Neurological Syndrome, thirty-seven (35%) as West Nile virus Non-Neurological Syndrome, and seven (7%) as unclassified. Nine fatalities were reported. In addition, two asymptomatic infections were reported: one in Manitoba, and the other in Saskatchewan.

#### MOSQUITOES

345 (2.28 %) out of 15,124 mosquito pools tested positive for West Nile virus in the following provinces: Saskatchewan 67 (11.22%), Manitoba 39 (2.80 %), Ontario 211 (1.73 %), and Quebec 28 (2.99%).

#### WILD BIRDS

The [Canadian Wildlife Health Cooperative](#) and the Québec Centre for Wild Animal Health examined a total of 141 dead birds for WNV in 2016, of which 37 (26%) dead birds were positive for West Nile virus: British Columbia (2), Saskatchewan (4), Ontario (20), and Quebec (11).

The positive bird species included Red-tailed hawk (29%), American crow (24%), Sharp-shinned hawk (16%), Merlin (8%), Goshawk (8%), Black-billed Magpie (3%), Blue Jay (3%), Burrowing Owl (3%), Cooper's Hawk (3%), and Great horned owl (3%).



## DOMESTIC ANIMALS

Forty-six horses with WNV infection were reported to the Canadian Food Inspection Agency by various provincial/private animal health laboratories. In addition, the Quebec Ministry of Agriculture, Fisheries and Food, reported two horses positive for West Nile virus.

Ten horses were reported in British Columbia [Langley(1), Nelson (1), Cranbrook (4) and Creston (4)], seven in Alberta [ Lethbridge (3), Taber (1), Brooks (1), Dalemead (1), Strathmore (1)], thirteen in Manitoba [Minnedosa (1), Steinbach (2), Winnipeg (1), Beauséjour (1), Hartney (3), Stonewall (1), Virden (2), Glenboro (1), Elm Creek (1) ], thirteen in Saskatchewan [ Maple Creek (3), Moose Jaw (2), Ogema (1), Swift Current (2), Redvers (1), Assiniboia (1), Melfort (1), Saskatoon (1), Simmie (1) ], two in Ontario [ Mississauga (1), Denfield (1)], and three in Quebec [ Saint-Hyacinthe (1), Lanaudiere (1), Mauricie-Centre du Quebec (1) ].

## EASTERN EQUINE ENCEPHALITIS VIRUS IN CANADA

### HUMANS

In the summer 2016, the first human case of mosquito-borne Eastern Equine Encephalitis (EEE) virus was reported in Canada. The individual was a resident of Ontario and has fully recovered.

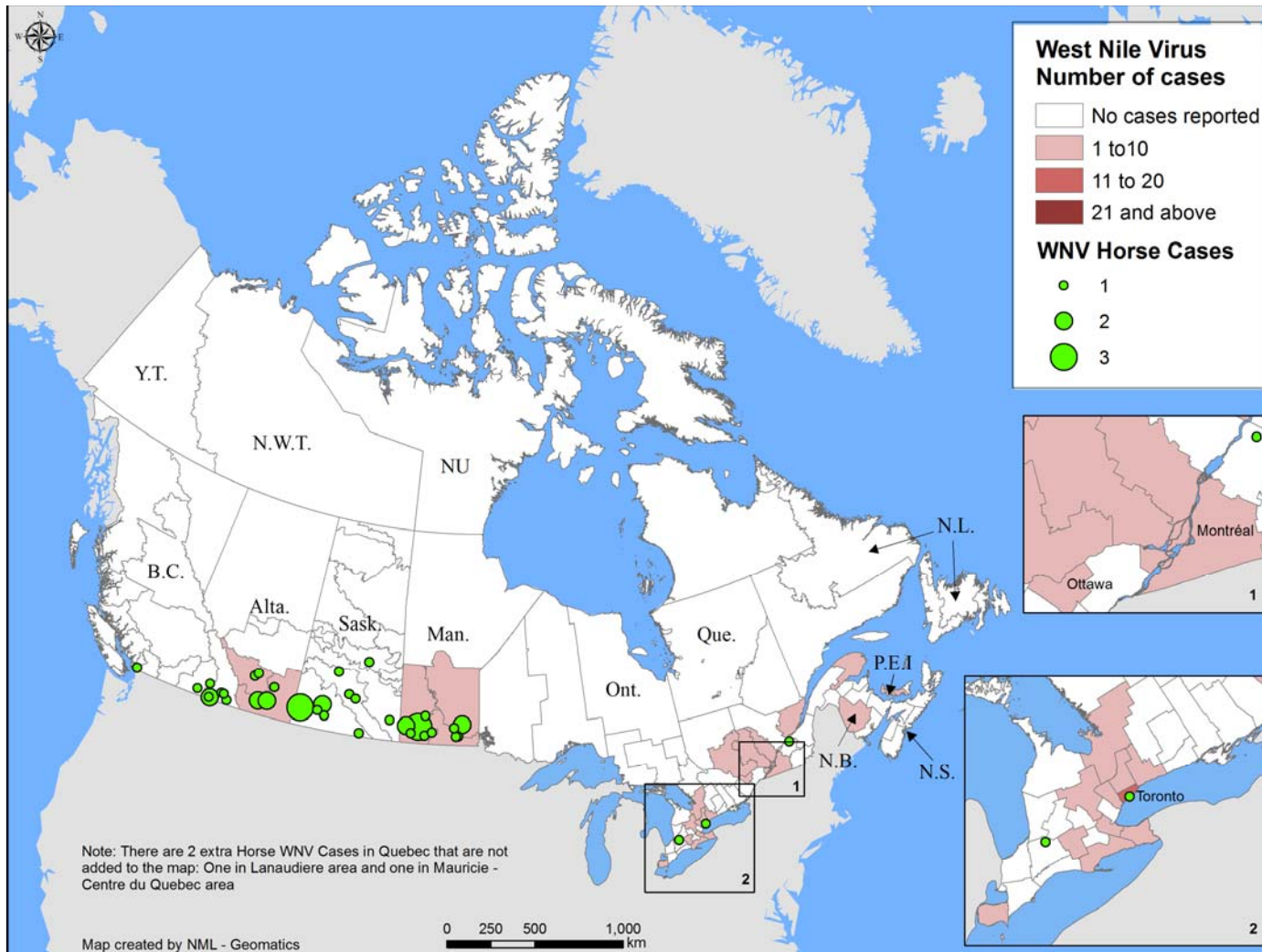
### DOMESTIC ANIMALS

Two horses tested positive for Eastern Equine Encephalitis virus in Quebec and were reported by the [Canadian Food Inspection Agency](#) through various private animal health laboratories.

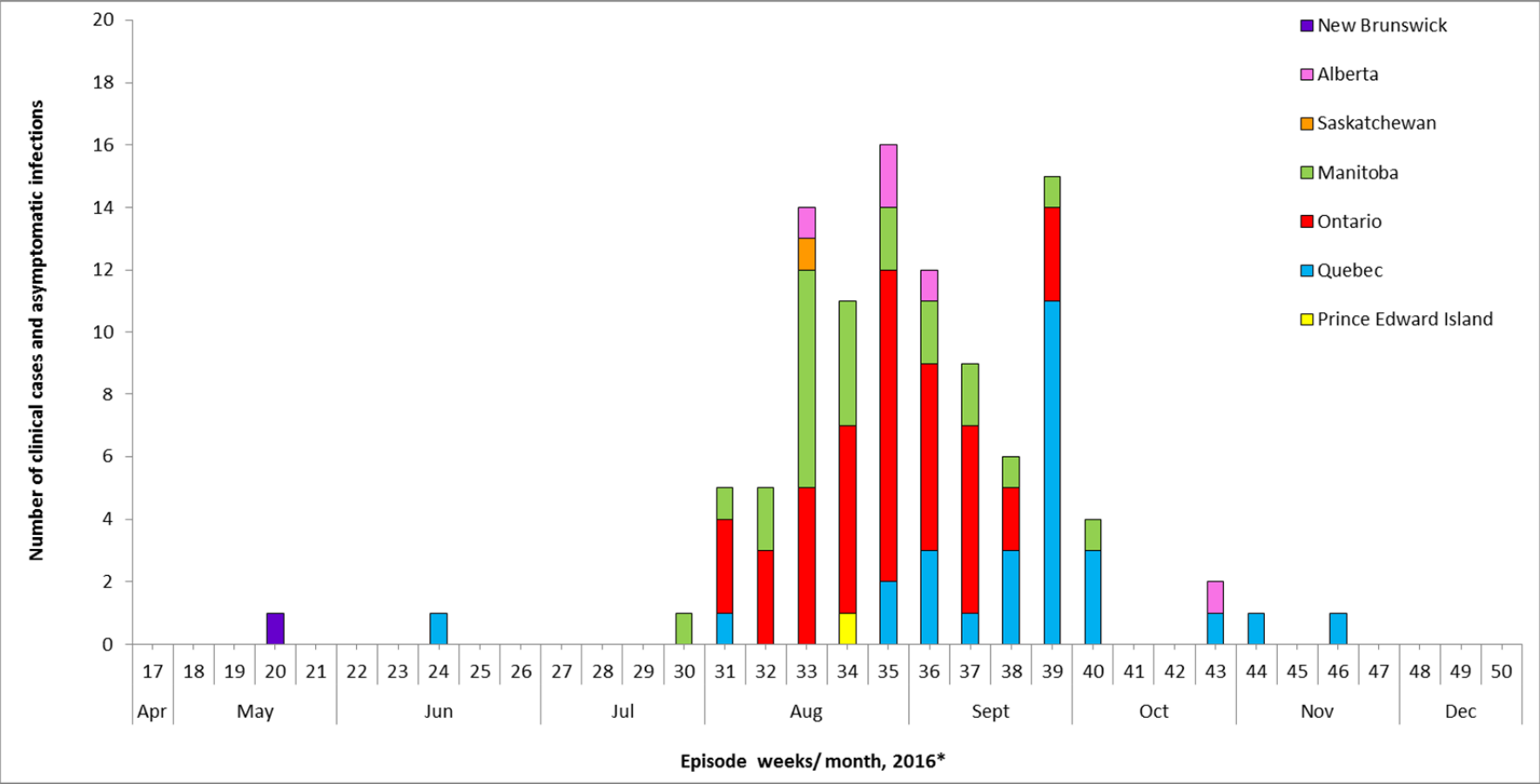
## CALIFORNIA SEROGROUP VIRUSES IN CANADA

In 2016, 24 human cases of laboratory confirmed cases/exposures of California serogroup virus were diagnosed by the National Microbiology Laboratory in the following provinces: Alberta (3), Manitoba (3), Ontario (2), Quebec (11), New Brunswick (2), and Nova Scotia (3). Of these cases, 14 were further classified as Jamestown Canyon virus, 3 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.

**FIGURE 1: Geographic distribution of West Nile virus in humans (clinical cases) and horses in Canada, 2016**



**FIGURE 2: West Nile virus clinical cases and asymptomatic infections by Province/ Territory, Canada, 2016**



\* 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, 2016 season \***

Province	Episode weeks/ month, 2016																																					
	Apr	May				Jun					Jul				Aug					Sept				Oct				Nov				Dec						
	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				
Prince Edward Island	0	0	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
New Brunswick	0	0	0	1	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	1	0	0	0	0	0	0	1	0	0	0	2	3	1	3	11	4	0	0	2	1	0	1	0	0	0	0	0	0	0	
Ontario	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	5	6	10	6	6	2	3	0	0	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	1	2	7	4	2	2	2	1	1	1	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	1	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	1	0	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	1	0	0	0	0	0	1	5	5	14	11	16	12	9	6	15	5	0	0	3	1	0	1	0	0	0	0	0	0	0	

\* 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 2016 season**

Province	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>
Prince Edward Island	0	1	0	1	1	0
New Brunswick	0	1	0	1	1	0
Quebec	18*	12	0	30*	0	0
Ontario	29	8	7	44	2	0
Manitoba	12	11	0	23	0	1
Saskatchewan	0	0	0	0	0	1
Alberta	1	4	0	5	1	0
Total	60	37	7	104	5	2

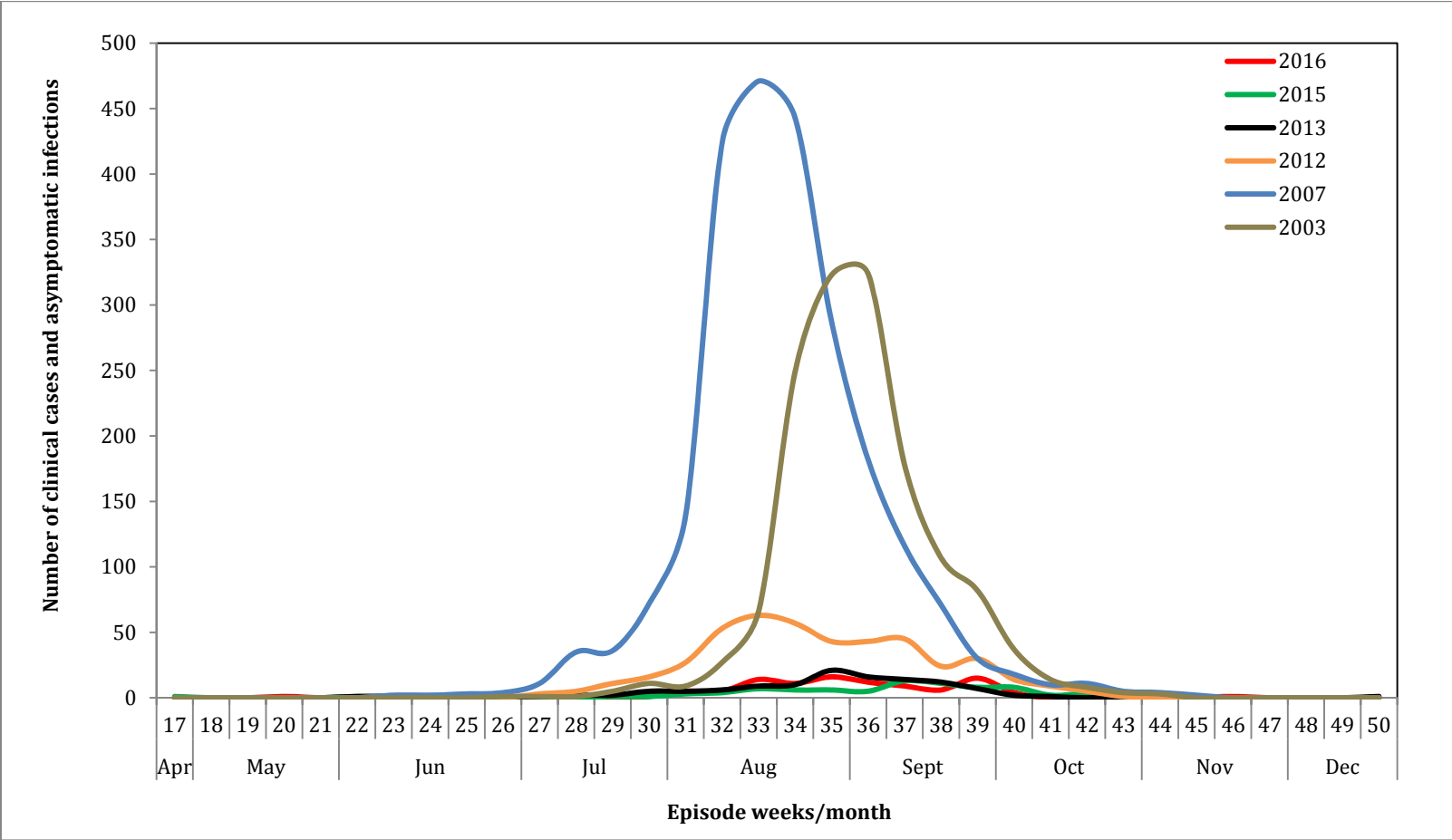
<sup>1</sup> Total clinical case is the sum of both probable and confirmed: West Nile virus neurological and non-neurological syndromes, along with any unclassified or unspecified cases.

<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 2016 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 4: Number of mosquito pools tested for West Nile virus and number of positive mosquito pools by Province/ Territory, 2016 season**

Province	2016 West Nile virus season*		
	Number of positive mosquito pools	Number of mosquito pools tested	Percentage of positive mosquito pools (%)
Quebec	28	935	2.99
Ontario	211	12198	1.73
Manitoba	39	1394	2.80
Saskatchewan	67	597	11.22
Total	345	15124	2.28

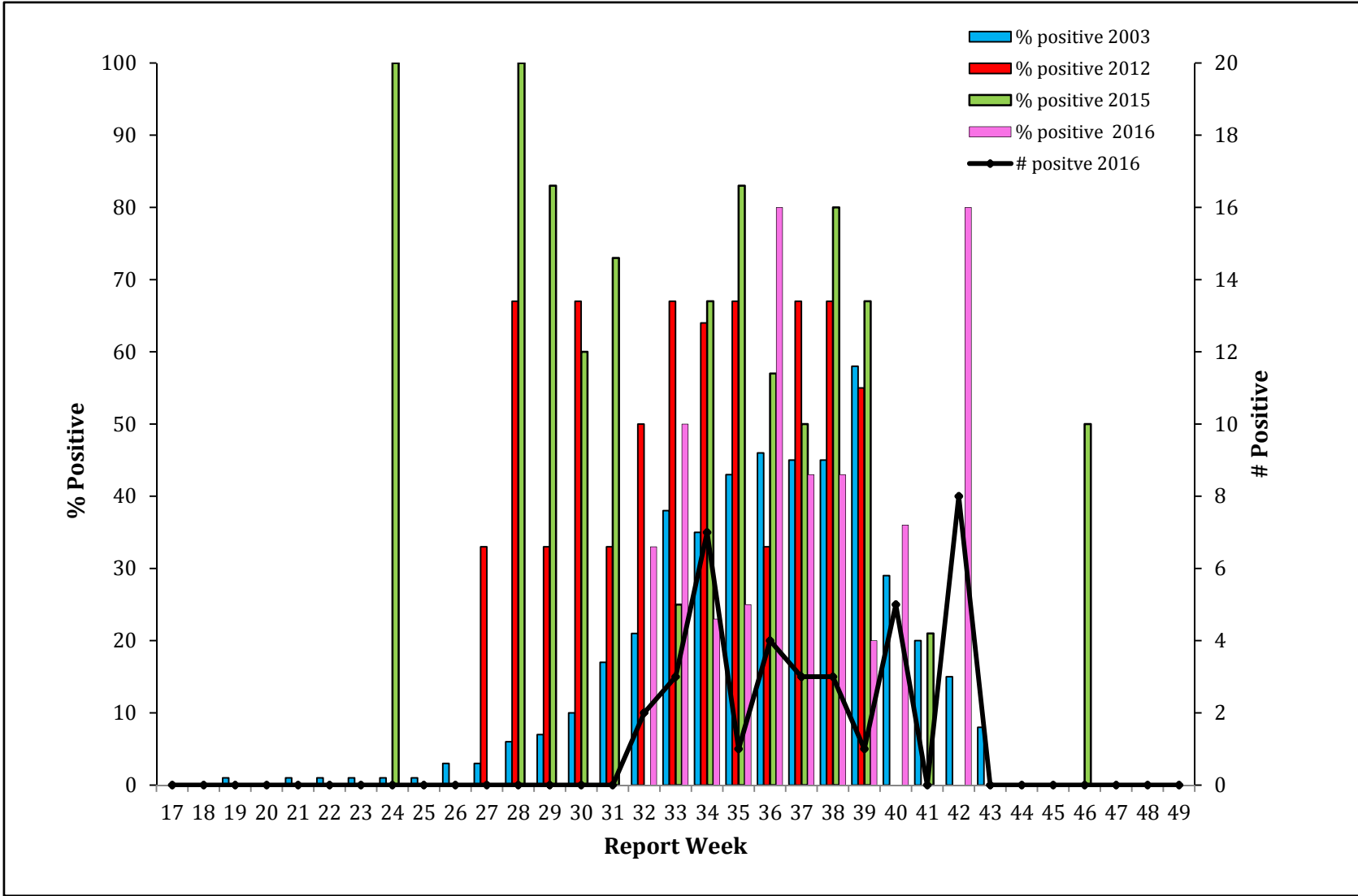
\*In 2016, mosquito surveillance was conducted by the following provinces only: Quebec, Ontario, Manitoba and Saskatchewan

**TABLE 5: Reported number of dead birds tested positive for West Nile virus by Province/ Territory and by report week, 2016 season\***

Province	Report Weeks of 2016																												
	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
Quebec	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	2	2	0	1	1	0	0	0	0	0
Ontario	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	1	2	0	4	0	8	0	0	0	
Saskatchewan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1	0	0	0	0	0	0	0	
British Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	7	1	4	3	3	1	5	0	8	0	0	0	

\* Data from the [Canadian Wildlife Health Cooperative](#) and the [Québec Centre for Wild Animal Health](#)

**FIGURE 4: Numbers and Percentages of dead birds tested positive for West Nile virus in the 2016 season by report week, as compared to percentages in 2003, 2012 and 2015 seasons**



**TABLE 6: Numbers and Percentages of dead birds tested positive for West Nile virus in the 2016 season by report week, as compared to percentages in 2003, 2012 and 2015 seasons**

	Year	Report Weeks																																	
		1 to 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	
Numbers positive	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	7	1	4	3	3	1	5	0	8	0	0	0	0	0	0	0	0
Numbers tested	2016	4	1	0	0	1	4	3	1	3	1	2	5	9	4	2	6	6	30	4	5	7	7	5	14	3	10	1	1	1	1	0	0	0	1
Percentage positive	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	50	23	25	80	43	43	20	36	0	80	0	0	0	0	0	0	0	
Percentage positive	2015	0	0	0	0	0	0	0	100	0	0	0	100	83	60	73	0	25	67	83	57	50	80	67	0	21	0	0	0	0	0	50	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	0

**FIGURE 5: Geographic distribution of Eastern Equine Encephalitis in horses in Canada, 2016**

