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WEST NILE VIRUS CONTROL ACTIVITIES 2007/2008

The Health and Emergency Medical Services Committee recommends the adoption of the recommendation contained in the following report, April 1, 2008, from the Commissioner of Community and Health Services:

1. RECOMMENDATION

It is recommended that:

1. This report be circulated by the Regional Clerk to local municipalities.

2. PURPOSE

This report summarizes the Public Health Branch's West Nile virus control actions in 2007 and outlines West Nile virus control activities planned for 2008.

3. BACKGROUND

West Nile virus is found in all parts of Ontario

West Nile virus is a potentially fatal virus that spreads to humans through the bite of an infected mosquito. It has been detected in mosquitoes and birds throughout Ontario since 2001 and in humans, in Ontario, since 2002. The virus is now prevalent in all regions of Ontario. There are no indications that the spread of the disease has stopped.

Human cases of West Nile virus increased in Canada in 2007

As of December 31, 2007, there were 2,355 human cases of West Nile virus in Canada, an increase from the previous year's total of 151 cases. In addition to 15 cases in Ontario, there were two cases in Quebec and one case in Nova Scotia. Western Canada saw a major increase in West Nile virus in 2007: 1,422 human cases were reported in Saskatchewan, 576 cases were reported in Manitoba, 320 cases were reported in Alberta, and British Columbia had 19 cases.

There was one West Nile virus-related death in Ontario, as well as three deaths in Manitoba, four deaths in Saskatchewan and one death in Alberta.

In 2007, there was one human case of West Nile virus, one West Nile virus-positive bird and no West Nile virus-positive mosquito pools in York Region. Table 1 summarizes West Nile virus detected in York Region from 2002 to 2007.

Table 1
York Region West Nile virus summary 2002-2007

	2002	2003	2004	2005	2006	2007
Positive human cases	7 (4 probable)	2	0	5	3	1
Suspect human cases investigated	29	81	0	44	3	2
Positive mosquito pools	14	5	1	14	10	0
Number of mosquito trap sites	10	41	30	40	40	38
Dead bird sightings (calls)	2,286	3,533	2,014	1,372	1,604	763
Birds picked up	127	813	1,647	1,098	1,328	968
Birds sent	55	48	64	53	34	24
Positive birds*	8	8	11	22	10	1
Complaints/investigations	25	992	379	222	232	106

* The number of positive birds does not reflect the intensity of the virus. Once a municipality has positive results, submission of specimens from that municipality ceases.

Weather plays a role in the variation of West Nile virus each year

Weather has played a role in the variation of the number of West Nile virus cases from year to year in southern Ontario. According to a study published in the *Journal of Vector Ecology*, higher temperatures are linked with a higher number of mosquitoes and a more rapid spread of West Nile virus in the mosquito population, making the virus more infectious sooner. However, when temperatures are high but levels of precipitation are low, mosquito breeding sites may dry up, leading to a lower number of infectious mosquitoes, as was the case in 2007.

4. ANALYSIS AND OPTIONS

2007 Public Health Branch West Nile virus control activities included education, surveillance and mosquito control

In 2007, West Nile virus control activities included the following components:

- Education and communication initiatives, which focused on personal protection (including the use of insect repellent and the wearing of proper clothing) and reducing larval development sites (by removing stagnant water).
- Surveillance in mosquito, bird and human populations.

- Larviciding to control mosquito populations in targeted areas such as municipal and regional catch basins, some stagnant surface water bodies, rear yard catch basins on private property by request, sewage lagoons and catch basins in municipal parks (with the exception of the Town of Markham, which provided screens for public park catch basins).

2007 surveys of industrial properties identified potential mosquito breeding sites and offered educational opportunities

An industrial property survey was carried out in the summer of 2007, in areas of West Nile virus activity in past years. Program staff visited 2,003 businesses, and completed property inspections at 1,612 businesses (80% of those visited). The top three potential mosquito breeding sites found were unused tires, garbage containers, open barrels and other containers. These findings will be used to shape the 2008 West Nile virus educational message. At businesses where no one was present or where owners declined a property inspection, staff provided educational materials telling business owners how they could inspect their own property and eliminate potential mosquito breeding sites.

2008 program initiatives will include education, surveillance, and larviciding activities

Public education remains one of the most important components of York Region's West Nile virus program. Key messages in 2008 will continue to focus on personal protection and reduction of mosquito larvae development, and will be conveyed through investigation of complaints, community workshops (on request), local newspapers, press releases, pamphlets, and the York Region website.

In addition, the three types of surveillance activities (bird, mosquito, and human) prescribed by the Ministry of Health and Long-Term Care will be continued in 2008.

Finally, experience to date suggests that larviciding activities are likely to continue for the foreseeable future. A variety of studies support the effectiveness of larviciding. For example, a Michigan study, *Mosquito Management Programs and West Nile Virus in Michigan 2002*, compared mosquito control activities in five counties and showed a ten-fold increase in the risk of humans contracting West Nile virus in counties with no larviciding activities versus counties with larviciding activities. York Region's neighbouring health units (Peel, Durham, Toronto and Halton) were canvassed in the fall of 2007 to determine their course of action for 2008. They all plan to carry out a larviciding program again. It is important that a consistent approach is taken by neighbouring municipalities.

2008 larviciding activities will include:

- Larviciding municipal and regional catch basins with Methoprene up to four times during the mosquito season. Ontario's Ministry of the Environment has approved Methoprene use for catch basin treatment. It prevents mosquito larvae from

developing into adult mosquitoes, and has not been found to pose risks to wildlife, people or the environment.

- Larviciding private rear yard catch basins upon request.
- Larviciding catch basins in parks and on the grounds of long term care facilities, other residential facilities, and municipally-owned properties such as community centres and municipal offices.
- Surveying and larviciding standing surface water such as road side ditches if required, using *Bacillus thuringiensis israelensis* (Bti). Ontario's Ministry of the Environment has prescribed Bti for use in these areas. Bti is a naturally occurring bacterium found in soil and water that targets and kills mosquito larvae. It has been found to have no effect on other aquatic organisms or the environment.
- Larviciding catch basins in environmentally-sensitive areas using *Bacillus sphaericus* (B. sphaericus). Ontario's Ministry of the Environment has prescribed that B. sphaericus be used in environmentally-sensitive areas. It is another naturally occurring bacterium found in soil and water which also targets and kills mosquito larvae and has been found to have no effect on other aquatic organisms or the environment.
- Larviciding sewage treatment lagoons.

5. FINANCIAL IMPLICATIONS

Costs for the West Nile virus program in the amount of approximately \$1,283,579 have been included in the proposed 2008 Public Health Budget. These costs are funded 75% by the Ministry of Health and Long-Term Care.

6. LOCAL MUNICIPAL IMPACT

The Region and the nine local municipalities worked collaboratively throughout the 2007 West Nile virus season. Meetings were held with representatives from the local municipalities to discuss West Nile virus control activities and to implement ways of working together efficiently. It is expected that these meetings will continue in 2008, and that the municipalities will continue to participate in West Nile virus control measures such as enforcement of local standing water by-laws.

7. CONCLUSION

Since West Nile virus is an emerging virus, there are still uncertainties regarding how the disease will behave from year to year. Therefore, it is important to continue the West Nile

virus program in 2008 utilizing the three components of education, surveillance, and larviciding. It is important that the Public Health Branch work collaboratively with area municipalities and it is recommended that this report be circulated to them for their information.

For more information on this report, please contact Dr. Karim Kurji, Medical Officer of Health and Director of Public Health Programs at Ext. 4012.

The Senior Management Group has reviewed this report.