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2003 WEST NILE VIRUS (WNV) CONTROL ACTIVITIES

The Health and Emergency Medical Services Committee recommends the adoption of the recommendations contained in the following report, December 17, 2003, from the Commissioner of Health Services:

1. RECOMMENDATIONS

It is recommended that:

1. Health and Emergency Medical Services Committee and Regional Council receive this report for information purposes regarding the West Nile virus (WNv) activities in 2003.

2. The Regional Chair write a letter to the Premier of Ontario and the Minister of Transportation requesting that construction standards for catch basins be reviewed in and effort to reduce potential mosquito breeding sites as an ongoing long-term preventative measure for WNv activity in the Province of Ontario, and that this letter be copied to the Minister of Health and Long-Term Care, the Minister of Environment, the Chief Medical Officer of Health, Council of Ontario Medical Officers of Health, the Ontario Public Health Association and local area municipalities.

3. The Regional Chair write a letter to the Premier of Ontario, the Minister of Environment, the Toronto Regional Conservation Authority and the Lake Simcoe Region Conservation Authority requesting that construction standards for storm water retention ponds be reviewed in and effort to reduce potential mosquito breeding sites as an ongoing long-term preventative measure for WNv activity in the Province of Ontario, and that this letter be copied to the Minister of Health and Long-Term Care, the Minister of Transportation, the Chief Medical Officer of Health, Council of Ontario Medical Officers of Health, the Ontario Public Health Association and local area municipalities.

4. The Regional Clerk circulate this report to area municipalities for their information.

2. PURPOSE

The purpose of this report is to provide Health and Emergency Medical Services Committee and Regional Council with a summary of the activities related to the spread and control of West Nile virus (WNv) in 2003.

3. BACKGROUND

WNv is a potentially fatal mosquito-borne arbovirus that spreads in nature primarily through a bird-mosquito-bird cycle, spilling over into other species such as humans when there is a significant increase in the infected mosquito population. Most people who

contract the disease will experience mild flu-like symptoms; however WNv can cause severe illness or death. In the past, it was believed that the elderly and the immune compromised were more susceptible to the disease; however recent findings indicate that all ages can be negatively impacted by WNv.

Although the virus was initially brought into Canada by migrating birds that had acquired the disease by mingling with infected birds in the United States, research has determined that the virus is now present in over-wintering mosquitoes and therefore is now endemic in Ontario.

In 2002 Ontario experienced its first human case of WNv and by the end of the year; there were 307 confirmed cases and 84 probable cases in the human population. Of these positive cases, 7 confirmed and 4 probable were York Region residents. Seventeen deaths occurred in Ontario in 2002 due to the virus.

In the United States, WNv human cases increased from 61 in 1999 to 4,161 in 2002. Due to this significant increase, it was anticipated that the level of WNv activity in the mosquito and bird populations, and subsequently the human population, would continue to increase in Ontario unless measures were undertaken to actively control the spread of the disease. Mosquito control measures needed to be implemented and surveillance and educational programs needed to be enhanced from the previous year, to try and mitigate the activity of the virus.

On May 16, 2003 Ontario Regulation 199/03 to the *Health Protection and Promotion Act* was filed (*see Attachment 1*). Ontario Regulation 199/03 requires a Medical Officer of Health to make a determination, based on a local risk assessment, whether action including the use of larvicides or adulticides is required to decrease the risk of WNv. Larviciding is the use of approved insecticides to kill larvae before becoming adult mosquitoes. Adulticiding is the use of approved pesticides to kill adult mosquitoes. The local risk assessment weighs the level of risk to the public from WNv based on the most current evidence of local WNv activity including WNv in the human population and in non-human species.

Ontario Regulation 199/03 also indicates the circumstances under which a local Medical Officer of Health may consider the use of adulticides to decrease the risk of WNv. Therefore a contingency adulticiding plan was implemented for York Region during the summer of 2003. The plan includes a registry for residents to advise Health Services if they have health concerns relating to adulticiding. In the event that adulticiding is necessary people on the registry living in the affected area would be notified by telephone 48 hours in advance that adulticiding would be occurring in the neighbourhood so that they would have time to take any precautions they deem necessary and/or make alternative living arrangements. The plan also included provisions for alerting the homeless population of adulticiding through outreach vehicles, posters at shelters and word of mouth. York Region Public Health met with member agencies of the York Alliance on Homelessness and Isolation to discuss how best to inform the homeless population of adulticiding activity. This plan was not activated in 2003.

3.1 West Nile Virus Activity in York Region

The following table provides the positive activity for WNv from 2001 to 2003.

Table 1
York Region WNv Statistics 2001–2003
(Update: November 18, 2003)

Activities	2001	2002	2003
Human Cases	0	7+ (4 Probable)	2
Birds	1	8	9
Mosquito Pools	0	14	6

The following table shows a comparison of positive human cases 2002 and 2003 for the surrounding regions. There were no positive human cases in Ontario in 2001.

Table 2
Surrounding Regions' WNv Human Cases 2002 - 2003
(Update: November 18, 2003)

Region	2002	2003
York Region	**7+ (4 probable)**	**2**
Toronto	127+ (41 probable)	44
Peel Region	38+ (20 probable)	10
Halton Region	56+ (3probable)	0
Simcoe Region	0	0
Durham Region	0	0

In 2003 the WNv program in York Region included:

- Increased educational initiatives
- Increased surveillance in mosquito bird and human populations
- Use of larvicides to control mosquito populations in targeted areas such as catch basins and some standing surface waters
- Contingency planning for adulticiding

Attachment 2 indicates the different activities that were undertaken for the WNv program and compares initiatives between 2002 and 2003.

4. ANALYSIS AND OPTIONS

In order to help control the spread of the WNv in the Regional Municipality of York, there were several initiatives that were undertaken or expanded from the program of 2002.

4.1 Education and Communication

Education remains one of the most important components of York Region's WNv program. It was vital in 2003 to ensure all residents knew about the disease and that they understood how they could play a part in the mitigation of the disease within the Region.

The public education program focused on two messages: personal protection (use of proper clothing and insect repellents) and the need to reduce the mosquito breeding habitats around their homes (changing water in the bird baths etc.). Information was made available through weekly planned media conferences and readily available on the York Region website. Pamphlets were developed and sent to all homes. Inspectors dropped off educational materials at garden centres and variety stores. Displays were placed in malls and libraries. Workshops were carried out in long term care facilities, public groups and businesses. Over a five-month period 101 workshops were given.

In April, letters were sent to all York Region companies with outside workers advising them of the need to reduce standing water on work sites and ensure that outside workers were protected against the virus by using personal protection. In addition, educational workshops were conducted by Health Protection Division staff to outside workers at both the regional and municipal levels of government.

The York Children's Water Festival presented a venue for teaching children in grades 3, 4, and 5 about WNv and the importance of eliminating standing water around their homes using an interactive display.

Other educational initiatives included two sets of open houses held in each of the nine municipal offices. The first round of open houses held in May and June were designed to advise residents about WNv and the larviciding program. The Ministry of the Environment (MOE) local officer and employees of the contracted pest control company as well as Health Department staff attended all meetings. The second set of open houses started in July and was held to update the public about the program and introduce the possibility of adulticiding should the need arise.

An open forum was held on August 20 to meet with environmental groups from York Region to discuss their concerns about the use of Malathion should adulticiding be needed. The MOHLTC as well as the MOE and Health Services representatives gave presentations. Environmental groups were advised that Health Canada's Pest Management Regulatory agency recently renewed the pesticide that would be used in adulticiding and concluded that its use for adult mosquito control in residential areas using ultra-low volume application did not pose a health concern.

In most cases, once positive WNv cases in mosquitoes, birds or humans were identified, information was distributed door-to-door by staff to residents living within a one kilometre radius of the positive findings.

Overall, the educational initiatives, combined with increased media coverage, were successful in ensuring residents were aware of the disease. In an analysis of the Rapid

Risk Factor Surveillance System (RRFSS) survey conducted by the Health Services Department, the percentage of York Region adults aged 18+ who were asked if they had heard about WNv increased from 68% in 2001 to 98% in 2003.

4.2 Surveillance

Three types of surveillance are prescribed by the MOHLTC to detect the presence and spread of WNv. The bird, mosquito and human populations are studied to determine the presence of the virus and to determine actions that will be taken to mitigate the disease. The Geomatics Division of the York Region Planning and Development Services Department developed a database for Health Services that allows for the compilation of data and mapping of WNv activity. This allows the pattern of the disease to be tracked.

4.2.1 Bird Surveillance

Bird surveillance has been part of the overall WNv program for the last three years in Ontario. Since crows are very susceptible to the virus and die within a few days of contracting it, they act as sentinels (early warning system) for the disease and are sent for testing. In 2003 the collection of crows started in April, a month earlier than previous years, to determine if the virus was present in the environment earlier then first thought. In 2003 the first positive crow in Canada was found in the Newmarket area of York Region. Attachment 3 shows a map of the positive crows detected in 2003.

When positive bird results were identified, residents within a one kilometre radius were informed by door-to-door visitation by staff delivering pamphlets. Standing water on municipal property in the area was also checked for larvae and treated if necessary. All York Region residents were informed by media releases of the positive results.

During 2001 and 2002, residents were asked to bury birds that were not crows or crows that were not suitable specimens for testing. Health and Emergency Medical Services Committee requested that, in order to enhance service to residents, all birds be picked up in 2003. A private company was contracted to pick up all bird species. The contractor was asked to visit all locations after public calls and pick up birds, noting the type of bird and the location for surveillance purposes. Suitable crow specimens were sent to the lab for WNv testing by the York Region Health Protection Division staff. A cap was put on the number of birds submitted for testing by the MOHLTC, in conjunction with Dr. Ian Barker of the Canadian Corporative Wildlife Health Centre of the University of Guelph, so the positive crows reported are not a true reflection of the number of positive crows throughout the Region.

4.2.2 Mosquito Surveillance

The mosquito surveillance program consisted of three major components: response to standing water complaints, trapping adult mosquitoes and a storm water retention pond survey.

Staff responded to complaints by the public about standing water issues as part of the mosquito surveillance program. During the investigation, residents with the standing water were educated about the role of water in the spread of the disease and advised of

remedial actions. Re-inspections were carried out and if the problem had not been rectified, the complaint was referred to the local municipalities for further action under their local by-laws.

Since mosquitoes are the vectors (carriers) of the disease it is important to detect the presence of positive adult mosquitoes. Traps designed to attract mosquitoes were set up weekly throughout the Region from the third week in May until mid-October to collect mosquito pools. Although York Region was originally allowed five traps from the MOHLTC, it was felt that more traps would be needed to understand the spread of the disease. Ten additional traps were set weekly by the hired pest control company and sent to a private lab. As positive birds and human cases were identified, additional traps were sent for testing and the program expanded to include 41 trap sites. Six pools were positive in 2003.

4.2.3 Human Surveillance

WNv is detected by blood specimens taken from humans exhibiting symptoms. During 2003, York Region Health Services Infectious Diseases Control Division investigated 89 suspect human cases. As of November 18, 2003 only two cases have been identified as positive for WNv within the Region. In 2002, 29 suspect cases were investigated and 7 cases were confirmed while 4 remain classified as probable. A seroprevelance study undertaken in 2002 by Halton Region Health Unit and the MOHLTC shows that 3.1 % of the population has already been exposed to the disease without becoming ill. Assuming York Region has a similar rate of infection described in the Halton Region study; this would translate into approximately 26,350 York Region residents who have already been exposed to WNv without becoming ill.

As part of the surveillance program, letters were sent in June, July and August to physicians and hospital infection control practitioners reminding them to be actively looking for patients with potential symptoms of the virus. Weekly communications with the local hospitals by the Infectious Diseases Control Division were carried out to keep hospitals informed and to answer concerns about the virus.

4.3 Mosquito Control

Under present circumstances, the MOHLTC has endorsed the implementation of a larviciding program as an effective method to curb the spread of the virus. Controlling mosquitoes during their larval stage is preferred to controlling adult mosquitoes since larviciding offers greater efficacy and limited impact on the environment.

As part of the abatement program, York Region Health Services had contracted the services of a pest control company to provide a larviciding program throughout the Region. Since it was identified by the MOHLTC that catch basins were primary targets for mosquito control of the Culex pipiens, three rounds of the larvacide methoprene was applied to public catch basins in an effort to break the chain of infection. Methoprene in pellet form was applied three times over the summer months. It was applied approximately every 28 days as the residual of the product was to last for about 28 days. The larviciding started the week of June 12 and finished August 25, 2003.

During the summer, standing water on municipal property such as the storm water retention ponds found to contain larvae were treated by the pest control company using Bti. Bti is a larvicide with little residual affect that targets only mosquito larvae and does not impact other species of insects.

These activities reinforced that the current construction standards for catch basins and storm water retention ponds allow for ideal mosquito breeding sites. Future catch basins and storm water retention ponds should be constructed with additional consideration given to minimizing the attractiveness of these sites to mosquitoes for breeding opportunities.

4.4 Relationship to Vision 2026

The implementation of both the 2003 WNv control activities and the *West Nile Virus: York Region Contingency Plan* support various goals of Vision 2026. Responding to the Needs of our Residents and Engaged Communities and a Responsive Region are examples of the identified goals of Vision 2026.

5. FINANCIAL IMPLICATIONS

The costs associated with 2003 WNv control activities are outlined in the table below.

Table 3
Summary of WNv Budget and Expenditures for 2003

	2003 Budget	2003 Estimated Expenditures
Larviciding	$1,928,000	$1,472,059
GIS Mapping & Database	0	108,600
Additional Traps	0	0
Program Costs (including advertising, materials & supplies, printing, and communications)	267,000	138,168
Total Gross Expenditures	**$2,195,000**	**$1,718,827**
Provincial Funding (50%)	1,097,500	859,414
Contribution from Contingency Reserve Fund	997,500	759,413
Net Tax Levy	**$ 100,000**	**$ 100,000**

At its meeting of April 17, 2003, Regional Council authorized an expenditure increase to the 2003 Public Health budget in the amount of $1,995,000 for additional program costs which had not be included in the 2003 Health Services budget. As noted above, the Region's share of these costs was to be funded from a contingency reserve fund. Therefore, the net tax levy impact for 2003 was only $100,000 (as originally budgeted).

Staffing costs related to WNv activities for 2003, estimated at $388,000, have been absorbed within the 50% cost shared Public Health programs.

6. LOCAL MUNICIPAL IMPACT

The Region and the area municipalities developed a successful working relationship throughout the 2003 WNv season. Biweekly meetings were held with representatives from all nine area municipalities to discuss WNv control activities in York Region. All area municipalities now have varying degrees of standing water bylaws to assist in the enforcement of reducing potential mosquito breeding sites.

Roles of the municipalities were defined in the *West Nile Virus: York Region Contingency Plan* and distributed to the local municipalities in the spring of 2003. These responsibilities include:

- Maintaining an inventory of potential mosquito breeding sites on municipal property
- Reducing or eliminating mosquito breeding sites on municipal property where possible
- Flushing and maintaining storm drains, catch basins and drainage ditches on a regular basis and in co-ordination with planned mosquito larviciding activities
- Addressing mosquito breeding control measures in the design of new systems or retrofitting of existing systems
- Participating fully on all multi-stakeholder regional WNv control meetings

7. CONCLUSION

The efforts of the York Region Health Services Department to control the spread of WNv in the Region have contributed to minimal impacts to residents throughout the 2003 mosquito season.

The 2003 WNv Control Activities raised the issue of current construction standards for catch basins and storm water retention ponds. These standards should be reviewed by the appropriate Provincial Ministry in order to reduce potential mosquito breeding sites and reduce WNv activity in Ontario.

A further report detailing proposed WNv Control Activities for 2004 will be brought forward in February.

The Senior Management Group has reviewed this report.

(A copy of the attachments referred to in the foregoing has been forwarded to each Member of Council with the January 8, 2004 Health and Emergency Medical Services Committee agenda and a copy thereof is on file in the Office of the Regional Clerk.)