THE REGIONAL MUNICIPALITY OF YORK

Health and Emergency Medical Services Committee
March 2, 2006
Report of the
Commissioner of Community Services, Housing and Health Services

2005 WEST NILE VIRUS CONTROL ACTIVITIES AND PROPOSED WEST NILE VIRUS CONTROL ACTIVITIES FOR 2006

1. RECOMMENDATIONS

It is recommended that:

1. Effective 2007, the costs of the West Nile virus (WNV) program currently funded through reserves be transferred to the tax levy component of the 2007 Public Health base budget.

2. A letter be written to the Minister of Health and Long-Term Care requesting that the Ministry of Health and Long-Term Care (MOHLTC) provide 100% funding for mosquito speciation in 2006, as it has done for the previous two years, and that this letter be circulated to Chairs of the Boards of Health in the Greater Toronto Area (GTA) and to the Chief Medical Officer of Health for Ontario seeking their support.

3. The Regional Clerk forward this report to area municipalities for their information.

2. PURPOSE

The purpose of this report is to provide Council with a summary of York Region activities related to WNV control in 2005, and to outline WNV control activities for 2006.

3. BACKGROUND

WNV is a potentially fatal virus that spreads to humans through the bite of an infected mosquito. The virus is endemic and now prevalent in Ontario. It has been detected in mosquitoes and birds throughout Ontario since 2001 and in humans in Ontario since 2002. Table 1 below summarizes WNV detection in York Region from 2001 to 2005.

Table 1
York Region WNV Statistics 2001 to 2005*

	2001	2002	2003	2004	2005*
Human Cases**	0	4	2	0	5†
Positive Birds***	1	8	9	11	22
Positive Mosquito Pools	0	14	5	1	14

* As of December 31, 2005.
** Only includes lab confirmed cases.
*** The number of positive birds does not reflect the intensity of the virus, since each year submission of specimens ceased once all municipalities had positive results.
† Two of the five cases were hospitalized.

Table 2 shows a comparison of human cases of WNV in various jurisdictions from 2002 to 2005.

Table 2
2002 to 2005 WNV Human Cases*

	2001	2002	2003	2004	2005*
York Region	**0**	**4**	**2**	**0**	**5**
Toronto	0	129	44	6	38
Peel Region	0	40	10	0	4
Halton Region	0	56	0	0	5
Simcoe Region	0	0	0	0	0
Durham Region	0	2	0	0	0
Ontario	**0**	**319**	**89**	**13**	**101**

*As of December 31, 2005.

In 2001 and 2002, YRHS initiated WNV surveillance and public education activities. In 2003, WNV activities were expanded to include the application of larvicide in catch basins and in some areas of standing water on public property.

4. ANALYSIS AND OPTIONS

In 2005, WNV control activities within the Region included the following components:

- Education and communication initiatives
- Increased surveillance in mosquito, bird and human populations
- Use of larvicides 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 on request, and catch basins in municipal parks (with the

exception of Markham which provided screens for rear yard catch basins and public park catch basins)

In 2006, YRHS proposes to continue the education, surveillance, and larviciding activities carried out in 2005.

4.1 Education and Communication

The public education and awareness program in 2005 continued to focus on two key messages: personal protection (including the use of insect repellent and the wearing of proper clothing) and reducing mosquito breeding sites (by removing stagnant water).

As awareness of WNV has increased over the years, the nature of education initiatives has shifted. Staff now spend less time conducting general group education sessions and more time conducting one-on-one instruction on specific ways to reduce the risk of WNV. For example, staff carried out education on an individual basis during the investigation of complaints, by informing residents of the role of standing water in the spread of WNV and of corrective measures that should be taken.

4.2 Surveillance

As prescribed by the MOHLTC, bird, mosquito, and human surveillance are carried out to determine the presence of WNV and to inform decision making so that preventative actions can be taken to mitigate the disease. A database developed by the Geomatics Division of the York Region Planning and Development Services Department assists YRHS with the compilation of surveillance data and the mapping of positive WNV activity.

As outlined in Table 3, data gathered in 2005 show an increase in WNV activity in York Region compared to the 2003 and 2004 seasons. Some of this may be due to higher temperatures in 2005, which increase the body temperature of mosquitoes, producing an environment conducive to faster replication of the virus. As a result, higher levels of virus exist within mosquitoes.

Table 3
WNV Surveillance Summary

Surveillance	2002	2003	2004	2005
Positive mosquito pools	14	5	1	14
No. of mosquito trap sites	10	41	30	40
Bird sightings (calls)	2,286	3,533	2,014	1372
Birds picked up	127	813	1,647	1098
Birds sent	55	48	64	53
Positive birds	8	8	11	22
Suspect human cases investigated	29	81	0	44
Positive human cases (confirmed)	7 (4 Probable)	2	0	5
Positive horses	4	0	0	0

4.2.1 Bird Surveillance

Bird surveillance continues to be an integral part of the WNV program. Since crows and blue jays are susceptible to the virus and die within days of contracting the disease, they act as an early warning system indicating the presence of the virus within the region. As in past years, a private company was contracted to pick up and dispose of all dead birds reported. In 2005, the collection of dead crows and blue jays started in May, and suitable specimens were submitted to the Canadian Corporative Wildlife Health Centre of the University of Guelph for testing. Since the purpose of the submissions is to detect the presence of the virus, not its intensity, submission of specimens ceased once municipalities had positive results. As of December 31, 2005, 1,372 birds representing all local municipalities were collected in York Region, including 164 crows and 50 blue jays, of which 53 were sent for testing and 22 were positive for WNV (21 crows and one blue jay).

4.2.2 Mosquito Surveillance

The mosquito surveillance program in 2005 consisted of five components. Three of these components were employed in past years:

- The trapping of adult mosquitoes
- Responding to stagnant water complaints
- A survey of stormwater management ponds

Two components were new initiatives in 2005:

- A survey of long-term care (LTC) facilities
- A survey of sewage treatment facilities

4.2.2.1 Trapping Adult Mosquitoes

Of the 57 species of mosquitoes identified in Ontario, 16 have now been identified as being able to act as vectors (carriers) of the disease. This is an increase from eight

species when the disease was first found in Ontario in 2001. Traps designed to attract adult mosquitoes were set up throughout the region from mid-June until mid-October 2005, in locations based on historical findings of WNV and proximity to human populations, as well as in areas where positive birds and human cases were identified. Although originally York Region was allocated 30 traps by the MOHLTC, this number was increased to 40 to accommodate the increase in hot spots in 2005. Once positive mosquitoes were found in an area, staff members were sent to the area to help eliminate sources of standing water.

4.2.2.2 Stagnant Water Complaints

In 2005, staff responded to 222 stagnant water complaints from the public by carrying out inspections and recommending corrective measures. Any situations outstanding upon re-inspection after seven days were referred to the local municipality for further action under local standing water by-laws.

4.2.2.3 Survey of Stormwater Management Ponds

During the summer of 2005 Stormwater Management Ponds and other identified municipally-owned properties with stagnant water were surveyed. If larvae were found these water bodies were treated with larvicide.

4.2.2.4 Survey of LTC Facilities

A survey of LTC facilities was one of two new initiatives incorporated into the mosquito surveillance program in 2005. The survey proved to be a useful tool in identifying potential mosquito breeding sites and in ensuring preventative measures were taken to protect a vulnerable sector of York Region's population prior to the mosquito breeding season. In order to determine potential breeding sites at LTC facilities, the grounds of 33 LTC facilities (including nursing homes, homes for the aged, lodging homes, and rest homes) were inspected. In 11 facilities (or 33%), potential breeding sites were found. Staff of these facilities were advised so that they could take steps necessary to correct the identified problems.

4.2.2.5 Survey of Sewage Treatment Facilities

Another new initiative for 2005 was a survey of the seven sewage treatment facilities within the Region to detect the existence of mosquito breeding sites and the presence of WNV in the mosquito population at these locations. Due to the nature of operations at these facilities, evidence of mosquito breeding was found at each of the surveyed sites. In order to detect WNV in mosquitoes, adult mosquito traps were set bi-weekly. Three sewage treatment plants were found to have WNV-positive adult mosquitoes. Two of these plants, located in populated areas, were treated with larvicide. Subsequent testing resulted in no further positive WNV activity.

4.2.3 Human Surveillance

As part of the surveillance program, packages were sent to physicians and hospital infection control practitioners reminding them to actively look for WNV cases. Human cases are diagnosed by blood specimens taken from patients exhibiting symptoms. During 2005, YRHS Infectious Diseases Control Division investigated 44 suspect human cases of WNV within York Region. As of December 31, 2005, five human cases had

been identified as positive. In 2004, there were no human cases of WNV identified in York Region.

4.3 Larviciding

Since WNV continues to be present in Ontario, the MOHLTC has endorsed the implementation of a larviciding program as an effective measure to control the spread of the virus. Larviciding, used to control mosquitoes during the larval stage, is preferable to trying to control adult mosquitoes since it offers greater efficacy and limited impact on the environment.

The use of larvicides is in accordance with Ontario Regulation 199/03 under the *Health Protection and Promotion Act.* This Regulation requires that the local Medical Officer of Health 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. The risk assessment is based on the most current evidence of local activity including WNV in the human population and non-human species.

As part of its WNV control program, YRHS contracted the services of a pest control company to provide larviciding throughout York Region. Catch basins, which have been identified by the MOHLTC as primary targets for mosquito control of the WNV vector species Culex pipiens and Culex restuans, were treated with the larvicide Methoprene. Catch basins on regional and municipal roads were treated with four rounds of Methoprene in pellet form. With the exception of Markham, methoprene was also applied in catch basins in municipal parks and in private rear yard catch basins. The Town of Markham, as described in Section 4, provided screens for catch basin in rear yards and municipal parks. Catch basins on the property of LTC facilities were treated at their request. Attachment 1 gives the number of catch basins treated in 2005.

Stormwater Management Ponds and other municipally-owned properties with stagnant water that were found to contain larvae were treated with the larvicide Bacillus thuringiensis israelensis (Bti) by the pest control company. Bti, a bacterium that produces toxins activated only by the digestive systems of mosquito and blackfly larvae, is approved for use by the Ministry of the Environment (MOE). A total of 127 water bodies were treated with Bti.

In 2005, the MOE approved Bacillus sphaericus (B. sphaericus), a larvicide similar to Bti, for use in environmentally-sensitive areas (ESAs). Approximately 1,795 catch basins in ESAs were treated with this new product.

4.4 2006 Program Initiatives

In order to contain the spread of WNV in York Region, YRHS will continue the education, surveillance, and vector control activities carried out in 2005.

4.4.1 Education and Communication Initiatives

Public education remains one of the most important components of York Region's WNV program. Key messages in 2006 will continue to focus on mosquito breeding source reduction and personal protection, and will be conveyed through one-on-one instruction,

community workshops (on request), advertisements in local newspapers, press releases, pamphlets, and information on the YRHS website.

4.4.2 Surveillance

The three types of surveillance activities (bird, mosquito, and human) prescribed by the MOHLTC will be continued in 2006. The Geomatics Division of the York Region Planning and Development Services Department will be asked for their continued expertise and technical support in updating the WNV database and mapping positive WNV locations.

4.4.3 Larviciding

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 WNV in counties with no larviciding activities versus counties with larviciding activities.

YRHS' experience to date suggests that larviciding activities are likely to continue for the foreseeable future.

According to MOHLTC staff, no jurisdiction in the United States with a history of WNV has stopped their mosquito control program. In Canada, the province of Quebec discontinued its larviciding program in 2005, based on the fact that it had no evidence of the virus in the previous year. During the 2005 season, however, Quebec once again saw cases of WNV. According to the Public Health Agency of Canada, as of November 2005, Quebec reported five human WNV cases, including one death, and 100 positive mosquito pools.

Neighbouring health units (Simcoe, Peel, Durham, Toronto and Halton) were canvassed in the fall of 2005 to determine their course of action for 2006. They all plan to carry out a larviciding program to target the WNV vectors again. It is important that a consistent approach is taken by neighbouring municipalities. Any change in policy would have to be coordinated between all the GTA health units.

2006 larviciding activities include:

- Larviciding municipal and regional catch basins with Methoprene up to 4 times during the mosquito season
- Larviciding private rear yard catch basins upon request
- Larviciding catch basins in parks, nursing homes and municipally-owned properties such as community centres and municipal offices
- Survey and larvicide standing surface water such as road side ditches if required, using Bti
- Larviciding catch basins in environmentally-sensitive areas using B. sphaericus

4.4.4 Local Municipal Involvement

YRHS responded to a number of concerns by residents from each local municipality. Table 5 outlines the number of residential concerns that resulted in a number of

investigations from YRHS staff. The number of concerns raised and investigations required have decreased steadily since 2003 when comprehensive education and communication strategies were employed.

Table 5
WNV Related Investigations/Complaints

Municipality	2002	2003	2004	2005
Aurora	2	27	33	22
East Gwillimbury	1	40	16	6
Georgina	3	73	18	30
King	2	49	24	8
Markham	12	190	67	45
Newmarket	1	143	27	18
Richmond Hill	3	305	89	48
Vaughan	1	144	103	36
Whitchurch-Stouffville	0	21	2	9
Total	25	992	379	222

The Region and the nine area municipalities worked collaboratively throughout the 2005 WNV season. Monthly meetings were held with representatives from the area municipalities to discuss WNV control activities in York Region and to implement ways of working together efficiently. It is expected that these meetings will continue in 2006, and that the municipalities will continue to participate in WNV control measures such as enforcement of local standing water by-laws.

4.5 Relationship to Vision 2026

The York Region WNV control program supports the Vision 2026 goal of responding to the needs of our residents.

5. FINANCIAL IMPLICATIONS

5.1 2005/2006 WNV Budget

Costs associated with 2006 WNV control activities are outlined in Table 4 below.

Table 4
Summary of 2006 WNV Budget

	2005 Budget	2005 Actuals	2006 Budget	Budget Increase/ (Decrease)
Purchase of Service*	$1,160,000	$ 619,282	$ 920,000	($240,000)
Contract Staff (i.e. students)	166,022	161,524	198,193	32,171
Advertising/Publicity	150,000	58,366	80,000	(70,000)
GIS/Planning	70,000	70,000	65,000	(5,000)
Supplies & Equipment	273,000	102,626	223,000	(50,000)
Total Gross Expenditures	$1,819,022	$1,098,663	$1,486,193	($332,829)
Funding Sources				
MOHLTC 55% Funding	$1,000,462	$ 556,489	$ 0	$ 0
MOHLTC 65% Funding	0	0	966,025	(34,437)
MOHLTC 100% Funding	0	86,865	0	0
Contribution from Reserve	818,560	455,309	520,168	(298,392)
Total Funding	$1,819,022	$1,098,663	$1,486,193	($332,829)

* Includes cost of larviciding and dead bird pickup.

Budgeted costs between 2005 and 2006 have decreased by $332,829. Factors contributing to this reduction include the negotiation of better contracts for purchase of service, an adjustment of advertising costs to reflect the unlikelihood of having to adulticide, and a revision of supplies and equipment costs to reflect current costs of mosquito speciation.

In 2003, mosquito speciation costs were cost-shared. In 2004 and 2005, the MOHLTC provided 100% funding for this program. The MOHLTC has not committed to 100% funding in 2006, however, YRHS staff have been verbally advised that mosquito speciation costs will become part of the cost-shared budget.

The WNV program has been funded through reserve funds for the past four years. Since YRHS larviciding policy is not likely to change in the near future, it is proposed that effective 2007 the costs currently covered through reserves be moved into the tax levy component of the 2007 Public Health base budget.

6. LOCAL MUNICIPAL IMPACT

The Region and the area municipalities developed a successful working relationship throughout the 2005 WNV season. York Region Public Health will continue with WNV control measures in order to address the health concerns of the residents of York Region.

7. CONCLUSION

YRHS WNV control activities help minimize the impact of the disease on residents of York Region.

Since WNV is an emerging virus there are still uncertainties regarding how the disease will behave from year to year. It is important that YRHS continue its WNV program in 2006 utilizing the three components of education, surveillance, and vector control. It is therefore recommended that effective 2007 costs currently funded through reserves be transferred to the tax levy component of the 2007 Public Health base budget.

It is also recommended that the Regional Chair write a letter to the Minister of Health and Long-Term Care requesting the continuation of 100% funding for mosquito speciation for 2006. The Regional Clerk be requested to circulate this letter to Chairs of the Boards of Health in the Greater Toronto Area (GTA) and to the Chief Medical Officer of Health for Ontario seeking their support.

The Senior Management Group has reviewed this report.

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