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Board of Health

June 19, 2001

To: Economic Development and Parks Committee and Sustainability Roundtable

From: Secretary, Board of Health

Subject: Proposed 2001 West Nile Virus Response Plan

Recommendations:

The Board of Health, on June 18, 2001, recommended to Works Committee and Council adoption of the following Recommendations Nos. (1); (2); and (5) contained in the report (June 5, 2001) from the Medical Officer of Health, that:

(1) City Council endorse the Proposed Contingency Plan for the Prevention and Control of the West Nile Virus (WNV Contingency Plan);

(2) City Council reiterate its request to the Province of Ontario to provide 100 percent funding for comprehensive measures to prevent and control the spread of WNV, recognizing the inter-municipal and international aspects of WNV disease transmission, and the need for provincial coordination and support of WNV prevention and control activities; and

(5) the appropriate City Officials report back jointly through the 2002 budget process on recommended service levels and costs for WNV prevention and control.

The Board of Health advises having taken the following action:

(1) endorsed the Proposed Contingency Plan for the Prevention and Control of the West Nile Virus (WNV Contingency Plan);

(2) requested the Chair of the Board of Health to request a meeting through the Association of Local Public Health Agencies (alPHa) with the provincial Minister of Health and Long Term Care to request provincial funding for local WNV Contingency Plan, with progress to be reported to City Council for its July 24 meeting;

(3) requested the Medical Officer of Health to report through the 2002 operating budget process on:

(a) health-related criteria by which mosquito surveillance and control activities would be undertaken in the City of Toronto, along with associated costs;

(b) an update on the degree of WNV prevention and control activities having been undertaken in other Ontario health units, including associated costs and results to date;

(c) financial implications for 2002 and beyond from implementation of the WNV Contingency Plan;

(4) forwarded this report to the Economic Development and Parks Committee, and to the Sustainability Roundtable for their consideration with a request that they submit their comments directly to Council when this matter is considered; and

(5) forwarded this report to:

(a) the City's Occupational Health and Safety Committee, the Chief Building Official and the Executive Director, Municipal Licensing and Standards, for information and appropriate action; and

(b) the Toronto school boards and respective unions and associations and requested the school boards to provide students with educational material (fact sheets provided by the Medical Officer of Health) as soon as possible and before the end of the school year.

Background:

The Board of Health at its meeting on June 18, 2001, had before it a report (June 13, 2001) from the Medical Officer of Health, proposing a Contingency Plan for the Prevention and Control of the West Nile Virus (WNV Contingency Plan) for the City of Toronto, as requested by the Toronto Board of Health at its meeting on April 24, 2001.

The Medical Officer of Health gave an overhead slide presentation.

Mr. Peter Tabuns, Greenpeace, appeared before the Board of Health in connection with this matter.

May I draw your attention to Action No. (4) above.

Secretary
Board of Health

Y. Davies/jd

Attachment

Item No. 7

Also sent to: Medical Officer of Health
Chair, Board of Health
Economic Development and Parks Committee
Sustainability Roundtable
Occupational Health and Safety Committee
Chief Building Official
Executive Director, Municipal Licensing and Standards
Toronto District School Board
Toronto Catholic District School Board
French Public School Board
French Separate School Board
ALPHA
Minister of Health and Long Term Care
School Unions and Associations

c. Ms. Jane Speakman, Legal Services

0618.07a.tl

(Report dated June 13, 2001 addressed to the Board of Health
from the Medical Officer of Health)

Purpose:

To propose a Contingency Plan for the Prevention and Control of the West Nile Virus (WNV Contingency Plan) for the City of Toronto, as requested by the Toronto Board of Health at its meeting of April 24, 2001.

Financial Implications and Impact Statement:

Full implementation of the proposed WNV Contingency Plan requires a one-time investment of $42,000 for Interactive Voice Response (IVR) telephone technology for "Toronto Health Connection", the centralized client intake system used by Toronto Public Health to receive all public enquiries and referrals. The IVR upgrade will be used in future for a variety of applications that will improve efficiency and customer service within Toronto Public Health. This will be funded through internal reallocation and deferral of purchases within the approved 2001 Public Health Operating Budget.

Program expenses will include printing for public education materials. Temporary staffing may also be needed for dead bird surveillance, control of standing water and response to public enquiries and concerns; costs for emergency preparedness and response will be contingent upon actual disease levels and associated responses. These program expenses will be funded through internal reallocations within the approved 2001 Public Health Operating Budget and will be reported through the 2001 variance process.

To date there is no commitment by the Province of Ontario to cover WNV Contingency Plan costs, either fully or on a cost-shared basis. Financial implications for 2002 and beyond from implementation of the WNV Contigency Plan will be the subject of a report to the Board of Health and Policy and Finance Committee during the 2002 Budget Process.

Mosquito surveillance is estimated to cost approximately $240,000 a year for Works and Emergency Services and for Parks and Recreation combined, a cost that cannot be absorbed within their approved 2001 operating budgets, as mosquito control activities lie beyond the City's traditional core businesses. Service level options and associated costs for mosquito surveillance and control will be the subject of a future report through the 2002 operating budget process.

The Interim Chief Financial Officer and Treasurer has reviewed this report and concurs with the financial impact statement.

Recommendations:

It is recommended that:

(5) the Board of Health and City Council endorse the Proposed Contingency Plan for the Prevention and Control of the West Nile Virus (WNV Contingency Plan);

(6) City Council reiterate its request to the Province of Ontario to provide 100% funding for comprehensive measures to prevent and control the spread of WNV, recognizing the inter-municipal and international aspects of WNV disease transmission, and the need for provincial coordination and support of WNV prevention and control activities;

(7) the Chair of the Board of Health request a meeting through the Association of Local Public Health Agencies (alPHa) with the provincial Minister of Health and Long Term Care to request provincial funding for local WNV Contingency Plan, with progress to be reported to City Council for its July 24 meeting;

(8) the Medical Officer of Health report through the 2002 operating budget process on:

(c) health-related criteria by which mosquito surveillance and control activities would be undertaken in the City of Toronto, along with associated costs;

(d) an update on the degree of WNV prevention and control activities having been undertaken in other Ontario health units, including associated costs and results to date;

(c) financial implications for 2002 and beyond from implementation of the WNV Contingency Plan;

(9) the appropriate City Officials report back jointly through the 2002 budget process on recommended service levels and costs for WNV prevention and control; and

(10) this report be forwarded to the Works Committee, to the Economic Development and Parks Committee, and to the Sustainability Roundtable for their consideration.

Background:

At its meeting of April 23, 2001 the Board of Health endorsed the preparation of a WNV Contingency Plan that minimizes the use of pesticides and recommended that City Council ensure that the Inter-departmental West Nile Virus Co-ordinating Committee develop and implement this plan. It also requested that the Medical Officer of Health submit a report on staff activities to the Board of Health at its meeting scheduled to be held on June 18, 2001.

Comments:

Following its first North American detection in New York City in 1999, the WNV spread rapidly to 12 states plus the District of Columbia (Washington) in 2000. While the virus has not yet been confirmed within Ontario, it is likely to reach the City of Toronto within the foreseeable future. This highlights the need for the City to prepare for the possible occurrence of WNV or other arboviruses such as malaria, Eastern Equine Encephalitis, or St. Louis Encephalitis. Over the

past several months, Toronto Public Health, in co-operation with other City departments and other public health units in Ontario, has been engaged in an intensive planning effort to prepare for the possible emergence of the WNV. Since the WNV is only one of many possible vector-borne diseases that may pose a threat to health in Toronto in the future, the WNV Contingency Plan needs to lay the foundation for a long term comprehensive approach to preventing vector-borne diseases in the City.

The U.S. Experience:

In 1999, the WNV was responsible for 62 cases of encephalitis (inflammation of the brain), including 7 deaths, in New York City and surrounding areas. During 2000, there were 21 confirmed cases, including 2 deaths, in New York City and the surrounding area. Public Health officials in the U.S. believe that the rapid response to the disease, including the implementation of mosquito control measures, helped limit the impact of WNV on human health.

Once a cluster of cases of encephalitis that occurred in 1999 in New York City was identified as due to the mosquito-borne West Nile virus, the New York City Department of Health instituted a public education campaign to encourage people to take precautions against mosquito bites and started a pesticide spraying program to control adult mosquitoes.

To evaluate the capacity of the City to respond in the event of an outbreak of WNV disease in Toronto, Toronto Public Health evaluated the experience of New York City and other U.S. municipalities. In 1999, New York City was taken by surprise with the appearance of WNV in the City. Even with 75 emergency response operators, the New York Department of Health was unable to cope with the peak call volume. This resulted in many callers telephoning their councillors and the mayor's office. To address this problem the Department installed an Interactive Voice Response (IVR) system. With this system in place, only 17,000 of the 110,000 calls (about 15 percent) received, actually needed interaction with a live operator, which greatly reduced the staff time required to answer enquiries. Based on data from New York City and adjusting for the difference in population, it is estimated that in the event of a WNV outbreak in the City, Toronto Public Health could receive about 25,000 calls per month in the WNV season, (i.e. July to September).

In 2000, the New York City Department of Health implemented a comprehensive mosquito surveillance and control program. It included public education to encourage the elimination of mosquito breeding sites and the use of personal protective measures. As well, the Department directed a large-scale larvicide program in over 150,000 storm water catch basins and other potential breeding sites. Pesticides were also sprayed to control adult mosquitoes in a 3 km (two-mile) radius around locations where dead birds infected with WNV were found. The total cost of this program in 2000 was approximately $15 million (U.S.), which included $4.6 million (U.S.) for control of adult mosquitoes using pesticides. Westchester County, just north of metropolitan New York City, spent $2.6 million (U.S.) on its control efforts. This amounts to about $1.50 (U.S.) per person in New York City and $3 (U.S.) per person in Westchester County.

Lessons Learned:

There has been strong criticism of the New York response to the WNV in 1999. Pesticide spraying to control adult mosquitoes started in September after the peak of disease transmission occurred. This suggests that pesticide spraying may have had very little effect on the total burden of disease. A legal suit was launched against the City for its spraying program and is still in the appeal process.

It appears that WNV activity peaks in July and early August. To limit transmission of WNV to humans, mosquito abatement measures (including larval control if necessary) should start in June. This emphasizes the need for taking appropriate measures early enough in the season and before the appearance of the virus in Toronto.

The controversy regarding the use of pesticides in New York continued in 2000. There have been reports of safety violations by the contractor responsible for the pesticide spraying efforts, with some workers experiencing adverse health effects due to over exposure to the pesticide. As well, there have been some incidents of by-stander exposure and concerns about contamination of fruits and vegetables in outdoor stands. There are unconfirmed reports that the high reliance on pesticides has also affected the aquatic ecosystem with an adverse impact on the local fisheries. As a response to this criticism, New York City has announced reduced emphasis on pesticides in its 2001 plan.

Integrated pest management (IPM) is recommended in this report to reduce the future pesticide use, thereby avoiding direct costs as well as health and legal risks. However, this requires good mosquito surveillance data to ensure that pesticides are used only where and when they are essential.

Federal and Provincial Activities:

The Canadian government has formed a federal-provincial National Steering Committee for West Nile Virus to implement a co-ordinated WNV response. In 2000, it instituted a surveillance program which included the use of sentinel chickens at selected sites close to the Canada-U.S. border as well as the collection and testing of mosquitoes and dead birds. Based on the evaluation of the efforts in 2000 and the experience in the U.S., efforts this year will concentrate on the testing of dead birds of the corvidae family (e.g. crows and blue jays). At the request of the National Steering Committee, the Pesticide Management Regulatory Agency has prepared a guide entitled, “Municipal Mosquito Control Guidelines” to assist municipalities in their response to WNV. This report outlines the requirements for an effective program to control mosquitoes.

The Ontario Ministry of Health and Long Term Care has recently released “West Nile Virus: Surveillance and Prevention in Ontario, 2001”. This document outlines the two components of the provincial response which are the responsibility of the local health units to implement: surveillance and education. Although the document also provides information on mosquito control, it is not indicated who would take the responsibility for pesticide spraying should this become necessary. No provisions have been made for provincial coordination or funding of the activities outlined in the response template despite repeated requests by public health units (see Appendix 1).

In its contingency plan, the Ontario Ministry of Health and Long Term Care has indicated that health units in the southern zone, which includes Toronto, are to participate in dead bird surveillance. The public is requested to report sightings of dead birds to the local health unit which will collect specimens and send those in good condition to the Canadian Co-operative Wildlife Health Centre in Guelph. From there, birds will be sent for testing at the National Microbiology Laboratory. The federal government is covering the cost of dead bird analysis. If WNV is identified in a dead bird, the Ministry will provide mosquito traps to a local health unit to help them characterize the mosquito population in the vicinity of inhabited areas.

When the presence of WNV has been confirmed in a health unit or immediately adjacent health unit, health units are expected to continue to collect data on sightings of dead birds, submit specimens for testing, institute mosquito surveillance in the immediate vicinity where a positive bird or animal has been found, and to enhance their surveillance for human illness.

Status of Activities in Toronto:

Toronto has established the Inter-departmental WNV Committee to steer the development and implementation of WNV Contingency Plan for the City. Three working groups have been established: Communications, Data Management, and Surveillance and Control. These groups have outlined the requirements for WNV preparedness and response which form the basis for the proposed WNV Contingency Plan.

The City of Toronto proposes a staged approach related to the degree of risk posed by WNV in the City that is consistent with provincial direction:

Stage 1 – Current situation where there is no evidence of WNV in Toronto or its vicinity
Stage 2 – Confirmed presence of WNV in adjacent health unit
Stage 3 – Confirmed presence of WNV in Toronto (non-human)
Stage 4 – Human case of WNV in Toronto

The goal of the program is to limit the impact of WNV on human health, including the prevention of death, by reducing the number of breeding grounds for the mosquito vectors and by detecting the presence of WNV in the environment before humans are infected.

Unlike some other municipalities such as Winnipeg, the City of Toronto does not have an ongoing mosquito control program at this time. Toronto Public Health supports an integrated pest management approach that minimizes the need for the use of pesticides. Effective vector-disease control programs require on-going commitment to surveillance activities and the capacity for instituting vector control activities when needed. Municipalities that have mosquito management programs have operational units dedicated to this function. Therefore, WNV and other vector-borne disease control would require substantial investment in a new function by the City. Activities proposed under the plan will lay the foundation for such a program if it is found to be necessary in the long-term.

The specific components of the WNV Contingency Plan are outlined below and detailed in Appendix 2. Full implementation of the proposed plan will be dependent upon the outcomes of the 2002 operating budget process.

(A) Education

Public Awareness:

There is a need to make the public aware of their role in preventing illness due to WNV. They have a role to play in reporting dead birds, in eliminating mosquito breeding sites and in adopting personal protective measures.

Toronto Public Health, in conjunction with other City divisions and departments, has developed a communications plan and will encourage the public and businesses to eliminate existing artificial mosquito breeding sites on their properties and to avoid their creation. It will also enhance the public's knowledge of risk factors for vector-borne diseases and ways to avoid exposure. As a first step, Toronto Public Health has prepared fact sheets and added a web page on the City's Internet site with questions and answers on WNV and its prevention.

New York City and Albany, N.Y. found it impossible to respond to the number of calls during their WNV outbreaks without an enhanced telephone solution. Based on this experience, Toronto Public Health will enhance the capacity of its Toronto Health Connections telephone line through Interactive Voice Response (IVR technology) to address public enquiries on WNV and the reporting of dead birds or areas of standing water more efficiently. Based on NYC data and after adjusting for differences in population size, it is estimated that Toronto Public Health could receive an average of 24,000 calls per month during a threatened WNV outbreak, i.e. during the peak months of July and August. Implementation of an IVR system for WNV will enhance Toronto Public Health's telephone capacity to respond to other public health emergencies and public information requests in future.

Physicians and Other Health Care Providers:

Health care providers are critical to detecting and preventing vector-borne diseases. Toronto Public Health will increase awareness among physicians to alert them of the signs and symptoms of WNV disease and of the precautions their patients should take to reduce the risk of getting infected. Health care professionals will also be encouraged to participate in surveillance of West Nile virus and other vector-borne diseases. Specific efforts will be made to target those providing services to the elderly, who are at most risk to WNV. A mailing to long term care facilities is also planned.

Staff Training:

City staff can contribute to WNV control activities by reducing the number of artificial mosquito breeding sites on city-owned properties and avoiding their creation, as well as by participating in bird surveillance activities. Outdoor workers may need to take extra precautions to prevent their exposure to WNV. Toronto Public Health will work with other City divisions and departments to ensure that staff are aware of WNV, and to develop appropriate ways to reduce their risks of exposure to the WNV and ensure they provide the public with an accurate and consistent message.

Corporate Services is developing a fact sheet on WNV for City staff.

(B) Surveillance

Dead Bird Surveillance:

The analysis of dead birds, especially crows and blue jays, has been found to be the best sentinal indicator of the presence of the WNV virus in a region. The City of Toronto is joining in the national bird surveillance program in co-operation with the provincial and federal governments. The general public and the City's outside workers will be encouraged to report dead crows and blue jays to Toronto Public Health. Animal Services will collect these birds and select those to be sent to the Canadian Co-operative Wildlife Health Centre in Guelph for WNV testing.

The national bird surveillance started on May 15, 2001, and Toronto Public Health has already started to collect dead birds. In 2000, Toronto collected about 450 birds and sent 80 for analysis, including 13 crows and 2 blue jays. This compares to New York City which collected approximately 14,000 birds and sent over 1,000 crows for analysis. For surveillance to be effective, it is critical that the public be alerted to report sightings of dead birds to Public Health.

Human Surveillance:

Viral encephalitis is a reportable disease in Ontario. The Province has instituted enhanced passive human surveillance for West Nile encephalitis. The Chief Medical Officer of Health has reminded hospitals to report suspected cases of viral encephalitis to the local Medical Officer of Health and to the Public Health Branch.

Toronto Public Health has contacted all hospitals in the City to ensure that they are aware of their responsibility to report suspect WNV cases to the Medical Officer of Health.

Mosquito Surveillance:

Mosquito surveillance is an essential part of an integrated pest management (IPM) approach. It consists of identifying potential breeding sites, sampling them for larvae, and trapping adult mosquitoes to count total numbers and species. Not all mosquitoes bite humans and only a few of those that do are of high concern for spread of WNV to humans. Surveys and Mapping Services can assist in identifying and mapping potential breeding sites for mosquitoes in Toronto. Subject to the outcome of the 2002 operating budget process, both Parks and Recreation and Works and Emergency Services will monitor selected sites in the city for the number and type of mosquito larvae and adults. This will provide the City with better data on the major mosquito breeding areas in the City and improve the City's ability to evaluate the need for and effectiveness of a mosquito control program.

(C) Source Reduction and Mosquito Control

Since WNV is an arthropod-borne disease, vector control is an integral part of preventing its transmission to humans. Mosquito control can be divided into Source Reduction, Larva Control and Adult Mosquito Control.

Source reduction is the most sustainable form of mosquito control. The main approach is to avoid the creation of mosquito breeding grounds. In addition to source control, people are able to use personal protective measures to reduce their risk of mosquito-borne diseases. However, it is recognized that in some cases the use of pesticides may be necessary. When this is the case, preference is given to the control of the mosquito's aquatic life stages (i.e. use of larvicides) as larvae are more localized, rather than control of adult mosquitoes (i.e. use of adulticides) when mosquitos are dispersed. As well, use of larvicides has fewer adverse environmental and health concerns than the use of adulticides.

There is likely to be concern about mosquitoes breeding in parks and natural areas. Not all mosquitoes pose the same risk to human health, and those that breed closer to home are more likely to be involved in the transmission of the WNV to humans. The primary vector of WNV is Culex pipiens which breeds in small artificial containers that hold stagnant water such as cans, tires, clogged rain gutters etc. It will be important for people to realize that mosquitoes are a natural part of the ecosystem and of the need to use personal protective measures when they venture into areas that may harbour large numbers of mosquitoes. Many natural areas play important ecological functions such as flood prevention and reduction in surface water pollution. These areas also enhance the beauty and quality of life in the City. Therefore, it is essential to recognize that total elimination of mosquitoes is neither possible nor desirable.

At this time the City of Toronto does not have the capacity to undertake a larviciding program or a spraying program to control adult mosquitoes. The City will emphasize education and awareness to encourage residents and businesses to eliminate mosquito-breeding sites. In collaboration with other City departments, municipal agencies, and other organizations, Toronto Public Health will work to eliminate standing water that is breeding mosquitoes in empty lots, tire piles and other vessels. Continual vigilance will be required to ensure that source reduction efforts are sustained throughout the mosquito season.

Depending on the outcome of events, the Medical Officer of Health will review the effectiveness of mosquito control activities in the City and will advise if additional control measures are required, including the potential use of pesticides.

(D) Data Management and Evaluation

Given the very localized nature of mosquito breeding, the mapping of surveillance and control data is an essential tool to guide decision-making and to evaluate the effectiveness of a mosquito management program.

In conjunction with Surveys and Mapping Services of Works and Emergency Services and other affected Divisions, Toronto Public Health will develop a system to record and map surveillance data, including the locations where dead birds are sighted and collected for testing.

In collaboration with the provincial and federal governments and other Public Health Units, Toronto Public Health will evaluate the effectiveness of the prevention and control measures and examine the need for any modification of activities, including the potential institution of a long-term mosquito management program for the City.

Cost of Implementation:

The Working Groups of the Inter-departmental WNV Committee have generated preliminary estimates of the cost to implement the WNV Contingency Plan. These estimates will be verified in relation to the experience of other health units and requests for quotations and will be reported out through the 2002 operating budget process.

Implications:

Due diligence requires the City to implement a WNV Contingency Plan. Failure to do so may place Toronto's residents at increased risk of the emergence of disease and possible death due to WNV. Lack of preparedness could also result in adverse effects on health and the environment associated with the potentially preventable use of pesticides.

It is anticipated that with adequate prevention and control about 50-100 cases of WNV encephalitis could be avoided, including 5-10 deaths. Although difficult to quantify at this time, implementation of an integrated pest management approach could prevent substantial pesticide use. Not only would this reduce environmental risks, but surveillance activities and efforts to reduce mosquito-breeding sites could prevent the need for spraying for adult mosquitoes and avoid as much as $1 million in spraying costs.

Best practice for vector control is the use of an integrated pest management (IPM) approach. Mosquito surveillance is essential for IPM. These data are required to meet provincial requirements for the use of pesticides and to identify the specific areas where mosquito populations are high enough to need control, so that the Medical Officer of Health can make an informed decision on appropriate mosquito control measures. Experience in other municipalities with established mosquito control programs has also shown that ongoing surveillance reduces the overall cost of vector control by ensuring that efforts are directed to areas that need them most.

The best way to reduce mosquito populations is to reduce the number of places suitable for mosquitoes to breed. This means that the most important strategy for reducing the risk of transmission of WNV to humans is to encourage people to eliminate artificial breeding grounds on their properties. Personal protection measures are another important way for people to prevent mosquitoes from biting them. A public education campaign is essential to encourage the public to adopt these mosquito control and personal protective measures. Stage 1 strategies are essential for ensuring that the City is well prepared should WNV reach Toronto, and also to help ensure that the risk of disease due to WNV is minimized. By reducing the potential need for pesticide use, these activities also reduce the risk to health and the environment, along with significant cost-avoidance (estimated in the millions of dollars for adulticide use).

Artificial breeding grounds of stagnant water on private properties are the primary breeding grounds for the mosquito Culex pipiens, the main carrier of WNV. Without inspections it will be impossible to ensure that corrective action is taken to remove these breeding sites, resulting in an avoidable health risk to the community. The experience in many communities is that well publicized enforcement action provides an incentive for people to remove mosquito-breeding sites on their properties.

Enhanced monitoring will be required to ensure Toronto Public Health is knowledgeable of areas with high numbers of mosquito vectors and to determine the appropriate corrective measures in areas where the virus is known to be active. Without this information, the City of Toronto will be unaware of the specific breeding sites that need to be controlled and unable to ensure that use of pesticides is minimized by focussing on the control of breeding sites. Toronto could easily find itself in a situation similar to that in New York City in 1999, where large areas of the city would need to be sprayed using pesticides. However, in 1999, New York City was caught by surprise. Toronto has the option of being better prepared.

Conclusions:

Full implementation of the proposed WNV Contingency Plan requires a one-time investment of $42,000 for Interactive Voice Response (IVR) telephone technology for "Toronto Health Connection", the centralized client intake system used by Toronto Public Health to receive all public enquiries and referrals. The IVR upgrade will be used in future for a variety of applications that will improve efficiency and customer service within Toronto Public Health. This will be funded through internal reallocation and deferral of purchases within the approved 2001 Public Health Operating Budget for Information and Technology.

Program expenses will include printing for public education materials and temporary staffing (costs contingent upon actual disease levels and responses thereto). Health-related program expenses will be funded wherever possible through internal reallocations within the approved 2001 Public Health Operating Budget. Potential costs for project coordination remain unfunded at this time and will be included for consideration in the corporate 2002 budget submission.

The costs of the proposed WNV Contingency Plan will be reported through the 2002 operating budget process based on actual experience in Toronto and other municipalities. Any year-end budget shortfalls arising directly from WNV emergency preparedness will be reported through the Board of Health during the 2002 budget process. To date there is no commitment by the Province of Ontario to cover WNV Contingency Plan costs, either in whole or in part, for Toronto or other local health units.

The City of Toronto proposes a staged approach related to the degree of risk posed by WNV, which is consistent with provincial direction. The Plan has two main components: education and surveillance. The City's strategy emphasizes personal protective measures and the reduction of potential mosquito breeding sites. The City proposes to intensify its activities once the presence of the WNV is confirmed in adjacent health units or Toronto. The goal of the program is to limit the impact of WNV on human health, including the prevention of death, by reducing the number of breeding grounds for the mosquito vectors and detecting the presence of the WNV in the environment before humans are infected.

Due diligence requires that the City implement a WNV Contingency Plan. Failure to do so may place Toronto's residents at increased risk of the emergence of disease and possible death due to the West Nile virus (WNV). Lack of preparedness could also result in adverse effects on health and the environment associated with the potentially preventable use of pesticides. It is anticipated that with adequate prevention and control about 50-100 cases of WNV encephalitis

could be avoided, including 5-10 deaths. Although difficult to quantify at this time, the avoidance or lower use of pesticides would result in cost avoidance (as much as $ 1 million) and reduce health and environmental risk from the use of such pesticides. It also aims to achieve this goal in a manner that will minimize the use of pesticides and maximize the knowledge and cooperation of City businesses and residents in removing mosquito breeding grounds and practicing personal protective behaviours to reduce their risk.

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Dr. Sheela V. Basrur
Medical Officer of Health

List of Attachments:

Appendix 1: Correspondence between the Council of Ontario Medical Officers of Health and response from Ministry of Health and Long Term Care (2 letters)

Appendix 2: Proposed Contingency Plan for the Prevention and Control of the West Nile Virus for the City of Toronto (WNV Contingency Plan)

Appendix 2

PROPOSED CONTINGENCY PLAN FOR THE PREVENTION AND CONTROL OF THE WEST NILE VIRUS (WNV Contingency Plan) for the City of Toronto

INTRODUCTION

The appearance of West Nile Virus in New York City in late 1999 and its rapid spread to other states in 2000 highlights the need for Toronto to prepare for the possible occurrence of West Nile Virus (WNV) or other arthropod-borne infections such as malaria, Eastern Equine Encephalitis, or St. Louis Encephalitis. Over the past several months, Toronto Public Health, in co-operation with other City departments and other public health units, has been engaged in an intensive planning effort to prepare for the possible emergence of WNV. Since WNV is only one of many possible arthropod-borne diseases that may pose a threat to health in Toronto in the future, the WNV Contingency Plan needs to lay the foundation for a long-term comprehensive approach to preventing arthropod-borne diseases in the City.

The City of Toronto's WNV Contingency Plan has three components: educational outreach, surveillance, and mosquito control. The goal of the program is to limit the impact of WNV on human health, including the prevention of death, by reducing the number of breeding grounds for the mosquito vectors and detecting the presence of the WNV in the environment before humans are infected.

The City of Toronto proposes a staged approach related to the degree of risk posed by WNV in the City that is consistent with Provincial direction:

Stage 1: Current situation where there is no evidence of WNV in Toronto or its vicinity.
Stage 2: Confirmed presence of WNV in adjacent health units
Stage 3: Confirmed presence of WNV in sentinel species (i.e. birds) in Toronto
Stage 4: A case of WNV in humans in Toronto.

There are three main target audiences for educational outreach: the public, health care providers and City staff. The objectives of public education are:

1) to enhance surveillance activities by encouraging the reporting of dead birds;
2) to reduce mosquito breeding grounds by advising on ways to eliminate unwanted mosquito breeding sites around the home and business premises; and
3) to reduce the potential of the transmission of WNV to humans through the adoption of personal protective measures.

Health care providers will be informed on the detection and reporting of suspect WNV cases and on the appropriate advice to give to their patients. Special efforts will be made to target those providing services to the elderly who are at most risk of serious health effects due to WNV. Toronto Public Health will work with other City divisions and departments to ensure that staff

are aware of WNV, appropriate ways to reduce their risks of exposure to WNV and ensure they provide the public with an accurate and consistent message.

There are three components to surveillance: dead bird surveillance, human surveillance and mosquito surveillance. The testing of dead crows and blue jays for WNV provides the best early warning of the presence of WNV. Bird surveillance data will then inform on areas where additional mosquito surveillance control measures will need to be undertaken. Human surveillance will assist in quick detection of potential human cases of WNV encephalitis and provide for swift intervention that will reduce the risk of death in the infected person and of further transmission to humans. Mosquito surveillance is an essential part of an integrated pest management (IPM) approach. It guides mosquito control activities to areas where they are most needed.

The City of Toronto does not have a mosquito control program at this time. Toronto Public Health supports an integrated pest management approach that will minimize the need for the use of pesticides. An effective WNV control program requires on-going commitment to surveillance activities and the capacity for instituting mosquito control activities when needed. Municipalities that have mosquito management programs have operational units dedicated to this function. Therefore, WNV and other arthropod-borne disease control will require substantial investment in a new function by the City. Activities proposed under the Plan will lay the foundation for such a program if necessary in the long-term.

Toronto Public Health will evaluate the continued risk of WNV in Toronto and the effectiveness of the prevention and control measures in collaboration with other public health units and provincial and federal levels of government as much as possible. The City will then determine the need for any modification of activities including the potential institution of a long-term mosquito management program for the City.

PROPOSED ACTIVITIES

Table 1 provides a summary of the proposed activities for educational outreach, surveillance and mosquito control at each of the four stages.

STAGE 1: No evidence of WNV in Toronto or its vicinity

A) Educational Outreach

(1) Toronto Public Health and other appropriate City Departments will enhance WNV information on the City's website and keep it up-to-date. This will help to inform the public about ways to reduce mosquito breeding sites around the home, how to reduce the risk of exposure to disease, and how to report dead birds.

(2) Toronto Public Health will establish an information line for WNV enquiries.

(3) Toronto Public Health and other departments will encourage the Toronto news

media to provide information to the public on ways to reduce mosquito-breeding sites around the home, how to reduce the risk of exposure to disease, and how to report dead birds.

(4) Toronto Public Health will develop fact sheets for distribution to community-based organizations, councillors, schools, senior citizen facilities, libraries, recreational and community centres, and other organizations within the City.

(5) Information on WNV, ways to reduce mosquito breeding sites and personal protective measures will be included in various City publications such as Water Watch, staff newsletters, etc.

(6) In response to public enquiries and reports of standing water, Toronto Public Health will mail fact sheets on elimination of mosquito breeding grounds around homes and other premises.

(7) Toronto Public Health staff will contact the hospitals in the City to discuss the diagnosis and reporting of WNV.

(8) Toronto Public Health will provide information to practising physicians in Toronto on WNV, its diagnosis, reporting and precautions that can be taken to prevent infection.

(9) In-service training will be provided for staff in various city departments, for example those responsible for maintenance of city properties, parks, storm water management, and care of the elderly.

B) Surveillance

Dead bird surveillance:

(1) Toronto Public Health will collaborate with the federal and provincial governments by collecting and sending dead crows and blue jays to the Canadian Co-operative Wildlife Health Centre for WNV analysis.

(2) Toronto Public Health will record reported fatalities among crows and blue jays and analyse data for potential mortality clusters.

(3) Toronto Parks and Recreation will assist in the collection of dead birds and will identify partners such as wildlife rehabilitation or wildlife conservation organizations, bird watching communities and other organizations to assist in dead bird surveillance efforts.

(4) Protocols for the collection of dead birds reported by the public will be developed, including the use of an automated voice system and the Internet.

Human surveillance:

(1) Human surveillance data will be collected and analyzed for clusters which may indicate areas of higher risk of WNV transmission.

Mosquito surveillance:

(1) Reporting of standing water complaints on private property to Toronto Health Connection, and identification of potential mosquito breeding sites on City-owned properties.

(2) A survey of mosquito larvae in storm water catch basins and other areas will be initiated.

(3) An adult mosquito survey will be started using traps on selected City properties.

C) Mosquito Control

(1) City Departments will be encouraged to eliminate artificial breeding sites on city-owned properties.

(2) In response to reports of standing water, educational materials will be provided to residences and businesses with information on how to eliminate and avoid creation of artificial breeding sites on their properties.

STAGE 2: Confirmed presence of WNV in adjacent health units

As in Stage 1, plus:

A) Educational Outreach

(1) Toronto Public Health will enhance public education activities, including expanded capacity for responding to WNV enquiries.

(2) Toronto Public Health will enhance its educational outreach to hospitals, physicians and care-givers.

(3) Broadcast message to staff to advise them of the change in stage.

B) Surveillance

(1) Weekly contact with designated medical staff in Toronto hospitals to collect information on potential human cases.

(2) Standing water complaints will be investigated to confirm their mosquito breeding status.

C) Mosquito Control

(1) Owners of properties where artificial mosquito-breeding sites are found will be directed to eliminate them.

STAGE 3: Confirmed presence of WNV in sentinel species in Toronto

As in Stage 2, plus:

A) Educational Outreach

(1) Enhanced distribution of information to the public.

B) Surveillance

(1) Intensification of adult mosquito and larvae surveillance in a 1.5 km radius around the site where a WNV positive bird was found, including mapping of potential breeding sites.

(2) Active investigation of standing water as potential breeding sites on City-owned properties.

C) Mosquito Control

(1) Increased enforcement of elimination of artificial mosquito breeding sites, especially in areas within a 1.5 km radius of the site where a WNV positive bird was found.

(2) The MOH will evaluate the need for additional control measures.

STAGE 4: A case of WNV in humans in Toronto

As in Stage 3, plus:

B) Surveillance

(1) Epidemiological investigation.

(2) Increased mosquito surveillance across the City.

C) Mosquito Control

(1) The Medical Officer of Health will evaluate the need for additional control measures including the potential use of pesticides.

RATIONALE FOR PLAN

A) Educational Outreach

Objectives

1) To improve the public's awareness of the risk for arthropod-borne diseases and personal protective measures.
2) To encourage the public to report dead birds
3) To encourage the public to eliminate potential mosquito breeding sites.
4) To enhance knowledge of arthropod-borne diseases among health care professionals and to gain their cooperation in surveillance for arthropod-borne diseases.
5) To provide City staff with the necessary knowledge to address mosquito problems on City properties, ensure that workers are aware of the necessary precautions to take, and pick up dead birds safely.

Background

Culex pipiens, the primary vector for West Nile virus, is one of the most common mosquitoes found in urban and suburban areas. The female is a quick breeder and uses sites with standing water and decaying organic materials to lay her eggs. Prime breeding habitats include: discarded tires; unwashed bird baths; clogged rain gutters; plastic wading pools; pots and pans of standing water; inactive swimming pools; and storm water catch basins. The City does not have the capacity to remove all these potential mosquito habitats. Comprehensive public education and outreach to encourage residents to ameliorate sources of standing water can have an important impact on the number of mosquitoes in the City. Informing the public of how they can reduce mosquito-breeding sites on their premises is critical for the effective control of mosquitoes in the City.

There is likely to be concern about mosquitoes breeding in parks and natural areas. Not all mosquitoes pose the same risk to human health, and those that breed closer to home are more likely to be involved in the transmission of the WNV to humans. It will be important to make people realize that mosquitoes are part of the ecosystem and of the need to use personal protective measures when they venture into areas that may harbour large numbers of mosquitoes.

The City is collaborating with the federal and provincial governments on a dead bird surveillance program. Toronto Public Health will collect data on dead crows and blue jays found in the City and send selected birds to the Canadian Co-operative Wildlife Health Centre in Guelph for analysis. A public education campaign will be needed to encourage the public to report dead birds.

Many people will approach their health care providers for information on WNV. It will be necessary to ensure that health professionals are able to accurately answer these queries. As well, physicians will need to be aware of the early signs and symptoms of

WNV infection so that patients can get prompt and relevant treatment and cases are reported to the Medical Officer of Health. Given that the elderly are at increased risk from the ill effects of WNV, special attention has to be given to the education of their caregivers regarding measures that can be taken to reduce risk of exposure to WNV. Toronto Public Health will also approach hospitals to make sure that they are aware of their responsibility to report suspect and confirmed cases of West Nile encephalitis to the Medical Officer of Health.

There is also a need for outreach to city staff. The City will need to ensure that it does not have unwarranted mosquito breeding sites on its properties. Staff involved in the maintenance of city properties will have to be made aware of their responsibility to reduce mosquito-breeding sites. City workers, especially outside workers, will need information on appropriate protection measures and instructions on how to participate in the dead bird surveillance program. As well, staff will need to be informed on the WNV and mosquito control measures so that a consistent message reaches the public. Staff will be kept informed of new developments through e-mail broadcast messages and internal news releases.

As a first step to address enquiries, Toronto Public Health has created a web page for West Nile Virus on the City's Internet site and developed fact sheets for internal and public distribution. As well, it has instituted a single enquiry number for questions on WNV, including an automated system to provide answers to frequently asked questions and to collect reports of dead birds and standing water.

B) Surveillance

Objectives

1) To provide an early-warning of the presence of WNV in Toronto before it is detected in humans and to provide an opportunity for early intervention that will prevent or reduce the risk of human disease.
2) To quickly detect potential human cases of WNV encephalitis and provide for swift intervention that will reduce the risk of death in the infected person and of further transmission to humans.
3) To provide background data on mosquito populations in Toronto to enable the City to evaluate the need for a mosquito management program and minimize pesticide use.

Background

Dead Bird Surveillance

In 2000, the federal and provincial governments set up a WNV surveillance program using sentinel chickens, mosquito traps and dead bird surveillance. Toronto Public Health participated in the dead bird surveillance activities by receiving reports of dead birds from the public, collecting bird specimens and sending these to the Canadian Co-

operative Wildlife Health Centre (CCWHC) in Guelph for analysis at the National Microbiology Laboratory. None of the birds collected in 2000 in Canada tested positive for WNV.

Birds are the main host for the WNV. The United States experience suggests that an increase in mortality in birds, especially those of the crow family (corvids), can be an early indicator of WNV activity in an area. Therefore, for 2001, the federal and provincial governments will focus WNV surveillance on the collection and analysis of corvids. Toronto Public Health will continue to contribute to these efforts by sending reports of sightings of dead crows and jays. City outdoor workers and the public will be encouraged to report dead birds to Toronto Public Health. The birds will be collected and selected specimens will sent to CCWHC for analysis. These surveillance activities will enable Toronto Public Health to better assess the risk of WNV in Toronto and the need to take corrective measures.

In case there is a sudden increase in the reports of dead birds or a potential local die-off, surveillance activities will be intensified in the area(s) of concern. Data on areas where crows are nesting and roosting can help identify areas where the City should look out for dead crows. City Parks staff, Toronto Regional Conservation Authority staff, volunteers and naturalists can make an important contribution to this effort.

Human surveillance

Viral encephalitis and meningitis are reportable diseases in Ontario. Most cases of encephalitis are initially diagnosed by health care providers based on a set of clinical criteria and subsequently confirmed when a laboratory test for a viral cause is positive. Toronto Public Health will work with Toronto hospitals and physicians to ensure rapid and effective reporting of suspect WNV cases. Early detection of WNV in humans will facilitate enhanced care of the persons affected.

Mosquito surveillance

The risk of mosquito-borne disease depends on both the total number of mosquitoes capable of transmitting a virus and the percentage of mosquitoes with the virus. Collecting that information for larval and adult mosquitoes is important to ensure that appropriate control activities are instituted. Larval surveillance can provide information on expected adult mosquito density and areas where efforts to eliminate mosquitoes at their source should be targeted. Adult mosquito surveillance and viral testing provide early predictive information about the potential for a disease outbreak. Mosquito surveillance is an essential component of an integrated pest management (IPM) approach to mosquito control. Identifying the specific areas where mosquitoes are a problem helps focus control activities where they are most needed, thus ensuring that the measures taken are more cost effective and less damaging to the environment.

The City of Toronto does not presently have a mosquito management programme. Since WNV is transmitted from birds to humans by the mosquito, there may be a need to institute a mosquito control programme. However, to evaluate the need for such a

programme and to ensure that it is effective, the City will need data on potential breeding sites and the number and types of mosquitoes at these sites. The City will therefore begin to identify potential sites of concern and monitor selected sites for mosquito larvae and adults. It will also be important to outline sensitive natural areas that should not be subject to mosquito control measures.

C) Mosquito Control

Integrated pest management uses a hierarchy of methods to reduce mosquito populations in areas where surveillance activities have indicated the potential for unacceptably high numbers of mosquitoes. The first option is to reduce the number of mosquito breeding sites. As mosquitoes that breed closer to where people live are more likely to be involved in the transmission of WNV to humans, breeding sites of greatest concern are small pools of water that can form around homes, business properties and on unattended lands rather than natural habitats such as natural streams and wetlands. Mosquito control will therefore depend on reduction of mosquito breeding sites by the City's own efforts on City-owned lands and by the private sector and the public on their properties.

If source reduction activities are not sufficient to keep mosquito populations below levels of concern, the Medical Officer of Health will assess the need to control mosquito larvae in selected areas of the City.

Table 1
WNV Contingency Plan for the City of Toronto - Summary

	Educational Outreach	Surveillance			Mosquito Control
		Dead Bird	Human	Mosquito	
Stage 1	• Public enquiries phone line (Toronto Health Connection) • Website • Fact sheets • News releases • Inclusion of information in City-produced publications • Distribution of information to councillors, City staff, City departments, other organizations • Distribution of information in response to standing water complaints • Staff training • Outreach to hospitals and physicians in	• Recording reports of dead birds • Collection of dead birds and shipment to laboratory for WNV analysis	• Enhanced passive surveillance: reports of suspect WNV cases to the Medical Officer of Health	• Reporting of standing water to TPH • Identification of potential breeding sites on City-owned properties • Mosquito larvae survey in storm water catch basins • Adult mosquito survey on selected City properties • Development of a data management system for	• In response to reports of standing water, provide information on source reduction • City staff address potential mosquito breeding sites on City-owned properties

	Toronto			surveillance data	
*Stage 2	• Enhance public education activities • Enhance educational outreach to hospitals, physicians and care-givers • Broadcast message to staff to advise them of the change in stage		• Weekly contact with hospitals	• Investigate standing water complaints	• Enforcement of remediation of unsanitary conditions that result in mosquito-breeding sites
*Stage 3	• Enhanced distribution of information to the public			• Mapping of potential breeding sites and increased surveillance 1.5 km around where WNV infected bird is found • Enhanced investigation of standing water on City-owned properties	• Enhanced enforcement in 1.5 km around where WNV infected bird is found • Medical Officer of Health will evaluate need for additional control measures
*Stage 4			• Epidemiological investigation	• Increased surveillance across the City	• Medical Officer of Health to determine if additional mosquito control measures are required, including potential use of pesticides

*Each stage includes all activities in the previous stages plus the additional activities listed.