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VECTOR-BORNE DISEASE PROGRAM 2011/2012 ANNUAL UPDATE

The Community and Health Services Committee recommends:

- 1. Receipt of the communication from Carolyn Lance, Administrative Assistant to the Town Clerk, Town of Georgina, dated October 26, 2011 regarding 'Lyme Disease Resolution'; and**
- 2. Adoption of the recommendation contained in the following report dated March 26, 2012, from the Commissioner of Community and Health Services and Medical Officer of Health.**

1. RECOMMENDATION

It is recommended that:

1. The Regional Clerk circulate this report to local municipalities for information.

2. PURPOSE

This report is prepared for Council in order for it to carry out its legislative duties and responsibilities as the board of health under the *Health Protection and Promotion Act*. It summarizes York Region Public Health's 2011 vector-borne disease program, with a focus on West Nile virus and Lyme disease, and outlines activities planned for 2012. It also provides an overview of work that has been recently undertaken by Public Health Ontario in relation to Lyme disease.

3. BACKGROUND

Vector-borne diseases in Ontario include West Nile virus, Lyme disease, and Eastern Equine Encephalitis virus

Vector-borne diseases are diseases that are transmitted to humans through the bite of an infected vector organism such as a mosquito or tick. Vector-borne diseases of public health importance in Ontario include West Nile virus, Lyme disease, and Eastern Equine Encephalitis virus.

- **West Nile virus** first became known in 1937 in the West Nile region of Uganda. It was detected in the United States in 1999, and emerged in Ontario in 2001. West Nile

virus is spread to humans by mosquitoes, which become infected by biting an infected bird.

- **Lyme disease** was recognized as a distinct disease in the late 1970s. It is an infection caused by the bacterium *Borrelia burgdorferi*. In Ontario, the blacklegged tick is the primary vector of Lyme disease, but not all blacklegged ticks carry the bacterium that causes Lyme disease. Ticks become infected when they feed on animals such as mice, squirrels, and birds that are carrying the disease.
- **Eastern Equine Encephalitis virus** is, like West Nile virus, mosquito-borne. It can cause disease in horses, birds, and people, and is fatal in approximately a third of human cases. Mosquitoes, horses, and emus have tested positive for Eastern Equine Encephalitis virus in Ontario, but thus far no human cases have been reported in Ontario or elsewhere in Canada.

York Region Public Health's vector-borne disease program currently focuses on West Nile virus and Lyme disease. (Note: In 2009, the Ministry incorporated the surveillance of mosquito species that transmit Eastern Equine Encephalitis virus into the West Nile virus species identification and viral testing program across Ontario.) Since both the establishment and spread of vector-borne diseases are influenced by environmental factors, such as climatic conditions, it is possible that other vector-borne diseases will expand their range into the province in the future.

Local public health units are mandated to monitor vector-borne diseases and conduct prevention and control activities

The Ontario Public Health Standards mandate activities that must be conducted by local health units in relation to vector-borne diseases. These activities fall into four categories:

- 1) surveillance (i.e., monitoring of disease activity in the community)
- 2) education and awareness
- 3) vector control programs, where required
- 4) case investigation

4. ANALYSIS AND OPTIONS

WEST NILE VIRUS

Ten years of surveillance findings show West Nile virus is still present in the Region

The Public Health Branch monitors West Nile virus in York Region by collecting data on virus activity in mosquito and human populations, and by tracking influential factors such

as temperature. This assists in planning and in determining the immediate risk of contracting West Nile virus in York Region.

Mosquito surveillance of both larval and adult vectors is central to monitoring West Nile virus. Larval vector surveillance identifies larval habitats and provides baseline information to help guide control activities. Larval vector counts and locations also help determine the magnitude of the adult mosquito populations. Adult vector surveillance is conducted to monitor mosquitoes for known virus-carrying species and to provide data on virus infection rates and high-risk geographic areas. This helps assess possible threats to human health and the need for adulticiding.

Attachment 1 provides an overview of surveillance findings from 2002 to 2011. Numbers have fluctuated since West Nile virus was first detected in York Region in 2002, when there were seven human cases and 14 West Nile virus-positive mosquito pools. In 2011, there was one confirmed human case and four positive mosquito pools.

In 2012, York Region Public Health will continue its West Nile virus surveillance activities in line with Ministry of Health and Long-Term Care guidelines.

West Nile education and awareness activities continue to focus on personal protection and reduction of mosquito breeding sites

West Nile virus awareness activities were carried out in 2011 through a variety of media, including the York Region website. Newspaper ads in the York Region Media Group and multicultural newspapers throughout the summer gave notice of pesticide use in the Region and provided information on personal protection and reduction of mosquito breeding sites. Rogers Daytime and Fairchild television broadcast interviews on vector-borne diseases. These activities will continue to be carried out in 2012 with little change.

Larviciding is an important part of West Nile virus control

In York Region as in neighbouring health units, larviciding (control of the immature stage of mosquito populations) continues to control mosquito populations in target areas. The use of larvicides is guided by multiple factors, including:

- larval surveillance
- permitted uses
- efficacy
- larvicide formulation (pellets, briquettes, etc.)
- cost efficiency

The Ontario Ministry of the Environment has authorized the use of three larvicides under approved permits: *Bacillus sphaericus* (*B. sphaericus*), *Bacillus thuringiensis israelensis* (*Bti*) and methoprene.

Municipal, regional and private rear yard catch basins

Methoprene is approved for use in catch basins for larval mosquito control. It prevents mosquito larvae from developing into adult mosquitoes, with no identified risk to wildlife, people or the environment. Municipal and regional catch basins were treated with methoprene pellets four times during the mosquito season. Catch basins in parks and municipally-owned properties were treated once a season with long-lasting methoprene briquettes with the exception of the Town of Markham, which provided screens for public park catch basins. Catch basins on the grounds of long-term care, residential facilities, and private rear yards were treated once a season with long-lasting methoprene briquettes upon request.

Since methoprene may have a negative impact on some forms of aquatic life, it is not approved for use in areas where aquatic organisms such as freshwater invertebrates may be present.

Catch basins in environmentally-sensitive areas and sewage treatment lagoons

B. sphaericus is approved for use in catch basins and sewage/sludge lagoons for larval mosquito control. It is a naturally-occurring bacterium found in soil and water that targets and kills mosquito larvae with no impact on other aquatic organisms or the environment. In York Region, catch basins in environmentally-sensitive areas and sewage treatment lagoons were treated as required with *B. sphaericus*.

Standing surface water

Bti is another naturally-occurring bacterium found in soil and water that targets and kills mosquito larvae. It also has been found to have no effect on other aquatic organisms or the environment. The use of *Bti* is approved in surface waters of irrigation ditches, flood ditches, flood pastures, marshes, woodland pools, standing ponds, or storm water retention and detention ponds. In York Region, standing surface water such as road side ditches and standing ponds were treated as required with *Bti*.

These activities will continue in 2012, as will reduction of mosquito breeding sites through investigation of standing water complaints.

LYME DISEASE

Surveillance has determined that, while ticks carrying Lyme disease are established in certain areas of the province, the risk of contracting Lyme disease in York Region is low

Three categories are used to describe whether blacklegged ticks are present or absent in an area. The Ministry of Health and Long-Term Care defines these categories as follows:

- **Established**—populations of blacklegged ticks exhibit all three active stages (larva, nymph and adult) in a sampling area on resident animals, or in the environment, for at least two years.

- **Adventitious**--ticks are found only sporadically, both temporally and spatially, and usually only a single stage of tick is present.
- **Not present**--ticks have not been found in an area after studies have been performed to assess the level of establishment.

An area is considered endemic for Lyme disease when two conditions are met:

- There is an established tick population.
- The tick population and host mammals test positive for Lyme disease-causing bacterium over two consecutive years.

Both active and passive forms of tick surveillance can be used to assess the establishment of blacklegged tick populations in a given region and the possible risk of Lyme disease in the community. In passive surveillance, ticks found and brought in by members of the public are examined, while in active surveillance, ticks are collected from their habitat. Active surveillance is generally only conducted under certain conditions, such as if results from passive surveillance or the number of locally-acquired human cases point to a local risk.

York Region Public Health conducts passive Lyme disease surveillance and encourages the submission of ticks for identification and, if warranted, testing for the Lyme disease agent. In 2011, out of 11 tick specimens submitted, four were identified as blacklegged, two from within the Region. Of the two, one came back positive for the Lyme disease agent. Finding a small number of adventitious ticks does not justify active surveillance; however, in the fall of 2011, Public Health undertook active surveillance as an extra precaution. Three sessions of drag sampling were conducted, at the Hollidge, North, Robinson, Porritt, Dainty and Scout Regional Forest Tracts in Stouffville, Metro Road Tract in Georgina and a marshy area in Newmarket (see *Attachment 2*). None of the sessions produced any specimens that required identification. Currently, therefore, York Region is not an endemic area for blacklegged ticks.

Areas in the Province that are endemic for Lyme disease are:

- Long Point Provincial Park
- Turkey Point Provincial Park
- Rondeau Provincial Park
- Point Pelee National Park
- Prince Edward Point National Wildlife Area
- Wainfleet Bog Conservation Area
- St. Lawrence Islands National Park area

However, while the probability is low, it is possible to be bitten by an infected tick outside of high risk areas, because migratory birds can transport ticks throughout the province.

York Region increased its Lyme disease communication activities in 2011

In 2011, in response to growing public concern about Lyme disease, York Region Public Health increased education and awareness activities focusing on preventive measures. In addition to interviews with local newspapers and television stations on the various aspects of the vector-borne disease program, communication activities related specifically to Lyme disease in 2011 included:

- Distribution of Ministry of Health and Long-Term Care *Let's Target Lyme* pamphlets and York Region fact sheets at locations such as York Regional Forest, libraries, community and recreational centres, garden centres, and municipal offices.
- Distribution of Lyme disease posters to hospitals and regional and municipal offices.
- Article in newsletter for York Region's public schools.
- Detailed newspaper ads in the York Region Media Group in September 2011, translated into Chinese, Italian and Russian and placed in Ming Pao, Lo Speccio and the Russian Express, respectively.
- Regional webpage dedicated to Lyme disease.
- Displays at special events such as Regional Spring Forest Festival.

The Health Connection telephone line continues to be available for public concerns and inquiries about Lyme disease. To date there have only been nine calls, peaking with six in August. This number may increase as York Region continues to educate the public on Lyme disease.

A new initiative for 2012 will educate children attending recreational camps in the Region on both West Nile virus and Lyme disease through a book detailing personal protection, mosquito breeding sites and location of ticks.

Human case investigations help confirm area of exposure

Lyme disease has been a reportable disease in Ontario since 1988. This means that an occurrence or suspected occurrence of Lyme disease must be reported to the local public health unit by physicians and laboratories, in order to monitor disease levels in the community and guide public health preventive and educational activities.

Once a report of Lyme disease is received, the Public Health Branch conducts a case investigation to confirm diagnosis, collect epidemiological information and identify the location where the individual case encountered a Lyme disease-bearing tick. Identifying the geographic area of exposure is important to determine the level of risk in a health unit. Details regarding confirmed cases are used by the Ministry of Health and Long-Term Care in combination with tick surveillance findings to track Lyme disease trends across the province.

Public Health Ontario is responsible for Lyme disease testing

Diagnosis of Lyme disease is a complex process that relies on clinical signs and symptoms, tick exposure history and results of blood tests. Blood test results provide supportive evidence, but not the sole evidence, for a diagnosis of Lyme disease.

In Ontario, Public Health Laboratories under Public Health Ontario conduct blood testing for the bacterium that causes Lyme disease. In line with recommendations from the Canadian Public Health Laboratory Network and the U.S. Centers for Disease Control, Public Health Ontario follows a two-tier testing protocol:

- Initially, patient sera are tested using enzyme immunoassay to detect antibodies against the bacterium that can lead to Lyme disease.
- If results from the enzyme immunoassay are either positive or indeterminate, second tier testing using western blot is performed to detect antibodies against the bacterium that causes Lyme.

The two types of tests complement each other in confirming clinical symptoms. Test results (whether positive or negative) are sent to the health care provider and positive results are sent to the local health unit for case investigations.

Because laboratory results of patients tested during early infection may not yet reveal antibodies to the bacterium, Public Health Ontario recommends that persons exhibiting symptoms be tested again four weeks later to get an accurate result.

Provincial review of Lyme disease testing and treatment issues is underway

Both the testing for and treatment of Lyme disease have been the subject of some controversy in recent years. In the United States, certain private laboratories offer diagnostic tests for Lyme disease that are not available in Canada, and physicians who specialize in Lyme disease provide treatment based on those tests.

In Ontario, Member of Provincial Parliament for Sarnia-Lambton, Bob Bailey, presented a petition on Lyme disease to the Legislative Assembly of Ontario in November 2011. This petition called on the legislative assembly to direct the public health system and OHIP:

- to include all currently available and scientifically verified tests for Lyme disease
- to do everything necessary to create public awareness of Lyme disease in Ontario
- to have further treatment protocols available to patients and physicians

Two deputations were presented to Community and Health Services Committee in support of this petition on October 12, 2011. Regional Council received the petition on

October 20, 2011, through Report No. 8 of the Community and Health Services Committee.

While the government has yet to respond to the petition, Public Health Ontario has undertaken a review of controversies and evaluation of best practices with regards to the public health management of Lyme disease.

Link to key Council-approved plans

York Region Public Health's ongoing work in relation to vector-borne diseases speaks to the goal area "A Place Where People Achieve Optimal Health" in *Vision 2051*.

5. FINANCIAL IMPLICATIONS

Regional expenditures for the Vector-Borne Disease program in 2011 totaled \$400,028. This was offset by 75% provincial subsidy of \$300,021, resulting in a net tax levy impact of \$100,007. The program was managed within the Regional and provincial budget allocations.

6. LOCAL MUNICIPAL IMPACT

As in previous years, the Region will continue to collaborate with local municipalities through the West Nile Virus Operations Committee. This group meets throughout the year to discuss resources and updates related to vector-borne diseases, including Lyme disease. Local municipalities also participate in West Nile virus control measures through enforcement of local standing water by-laws.

7. CONCLUSION

The Public Health Branch will continue its mandated vector-borne disease-related activities in 2012, including surveillance, education and awareness, mosquito vector control programs, and human case investigations. While the program began with a focus on West Nile virus, it is responsible for responding to any vector-borne disease of public health importance. In recent years, the Branch has increased its focus on Lyme disease, in response to public concerns.

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

The Senior Management Group has reviewed this report.

(The two attachments referred to in this clause were included in the agenda for the April 11, 2012 Committee meeting.)



TOWN OF GEORGINA

26557 Civic Centre Rd., Keswick, Ontario L4P 3G1

**REGION OF YORK
CLERK'S OFFICE**

FILE No.: P41

October 26, 2011

Region of York,
Regional Clerk's Office,
17250 Yonge Street,
NEWMARKET, Ontario
L3Y 6Z1

Attn: Denis Kelly, Regional Clerk



Dear Mr. Kelly:

Re: Lyme Disease Resolution

Please be advised that Town Council received a deputation made by James Christie concerning his life with Lyme Disease and requesting Council to endorse the petition requesting specific testing and proper treatment for the disease become available in Ontario.

Town Council passed the following motion:

THAT COUNCIL RECEIVE THE DEPUTATION MADE BY JAMES CHRISTIE, THAT COUNCIL ENDORSE THE PETITION SUPPORTING THE RECOMMENDATION TO PETITION THE LEGISLATIVE ASSEMBLY OF ONTARIO TO REQUEST THE MINISTER OF HEALTH TO DIRECT THE ONTARIO PUBLIC HEALTH SYSTEM AND OHIP TO INCLUDE ALL CURRENTLY AVAILABLE AND SCIENTIFICALLY VERIFIED TESTS FOR ACUTE AND CHRONIC LYME DIAGNOSIS, TO DO EVERYTHING NECESSARY TO CREATE PUBLIC AWARENESS OF LYME DISEASE IN ONTARIO AND TO HAVE INTERNATIONALLY DEVELOPED DIAGNOSTIC AND SUCCESSFUL TREATMENT PROTOCOLS AVAILABLE TO PATIENTS AND PHYSICIANS, AND THAT THIS MOTION AND PETITION BE FORWARDED TO THE REGION OF YORK REQUESTING ENDORSEMENT BY REGIONAL COUNCIL.

Accordingly, I have attached the referenced petition and respectfully request its consideration and endorsement by Regional Council.

Sincerely,
FOR THE TOWN OF GEORGINA,

Carolyn Lance
Administrative Assistant to the Town Clerk



Bob
BAILEY
MPP • Sarnia-Lambton

PETITION

TO THE LEGISLATIVE ASSEMBLY OF ONTARIO

WHEREAS, the tick-borne illness known as Chronic Lyme Disease, which mimics many catastrophic illnesses, such as Multiple Sclerosis, Crohn's, Alzheimer's, arthritic diabetes, depression, Chronic Fatigue and Fibromyalgia is increasingly endemic in Canada, but the scientifically validated diagnostic tests and treatment choices are currently *not* available in Ontario, forcing patients to seek these in the USA and Europe;

WHEREAS, the *Canadian Medical Association* informed the public, governments, and the medical profession in May 30, 2000 edition of their professional journal that **Lyme Disease is endemic throughout Canada**, particularly in Southern Ontario;

WHEREAS, the Ontario Public Health system and the Ontario Health Insurance Plan currently do not fund those specific tests that accurately serve the process for establishing a clinical diagnosis, but only recognize testing procedures known in the medical literature to provide false negatives 45 to 95% of the time;

WE, THE UNDERSIGNED, petition the legislative assembly of Ontario to request the Minister of Health to direct the Ontario Public Health system and OHIP to include all currently available and scientifically verified tests for Acute and Chronic Lyme diagnosis, to do everything necessary to create public awareness of Lyme Disease in Ontario, and to have internationally developed diagnostic and successful treatment protocols available to patients and physicians.

Name (print clearly):	Address:
Signature:	Town/City:
E-mail Address:	Postal Code:

Name (print clearly):	Address:
Signature:	Town/City:
E-mail Address:	Postal Code:

Name (print clearly):	Address:
Signature:	Town/City:
E-mail Address:	Postal Code:

REFERENCES ON LYME DISEASE

Scientific Studies on the faultiness of the ELISA test used for testing for Lyme in Ontario

1. Tilton RC, Sand MN, Manak M. The Western immunoblot for Lyme disease: determination of sensitivity, specificity, and interpretive criteria with use of commercially available performance panels. Clin Infect Dis 1997;25(Suppl 1):S31-4.
2. Schmitz JL, Powell CS, Folds JD. Comparison of seven commercial kits for detection of antibodies to *Borrelia burgdorferi*. Eur J Clin Microbiol Infect Dis 1993;12:419-24
3. Engstrom SM, Shoop E, Johnson RC. Immunoblot interpretation criteria for serodiagnosis of early Lyme disease. J Clin Microbiol 1995;33:419-27.
4. C. W. Ang & D. W. Notermans & M. Hommes & A. M. Simoons-Smit & T. Herremans Large differences between test strategies for the detection of anti-*Borrelia* antibodies are revealed by comparing eight ELISAs and five immunoblots Eur J Clin Microbiol Infect Dis DOI 10.1007/s10096-011-1157-6

Studies on the spread of Lyme disease throughout Canada and Ontario

1. Birds Disperse Ixodid (Acari: Ixodidae) and *Borrelia burgdorferi*-Infected Ticks in Canada Authors: Scott, John D.; Fernando, Keerthi; Banerjee, Satyendra N.; Durden, Lance A.; Byrne, Sean K.; Banerjee, Maya; Mann, Robert B.; Morshed, Muhammad G. Source: Journal of Medical Entomology, Volume 38, Number 4, July 2001 , pp. 493-500(8)
2. Presence of spirochete causing Lyme disease, *Borrelia burgdorferi*, in the blacklegged tick, *Ixodes scapularis*, in southern Ontario S N Banerjee, M Banerjee, K Fernando, J D Scott, R Mann, and M G Morshed CMAJ. 2000 May 30; 162(11): 1567-1569.
3. The rising challenge of Lyme borreliosis in Canada, Canada Communicable Disease Report 1 January 2008 ■ Volume 34 ■ Number 01 NH Ogden, DPhil, (1), LR Lindsay, PhD, (2), M Morshed, PhD, (3), PN Sockett, PhD, (4), H Artsob, PhD, (2)
4. *Ixodes scapularis* ticks collected by passive surveillance in Canada: analysis of geographic distribution and infection with Lyme borreliosis agent *Borrelia burgdorferi*. Ogden NH, Trudel L, Artsob H, Barker IK, Beauchamp G, Charron DF, Drebot MA, Galloway TD, O'Handley R, Thompson RA, Lindsay LR. J Med Entomol. 2006 May;43(3):600-9

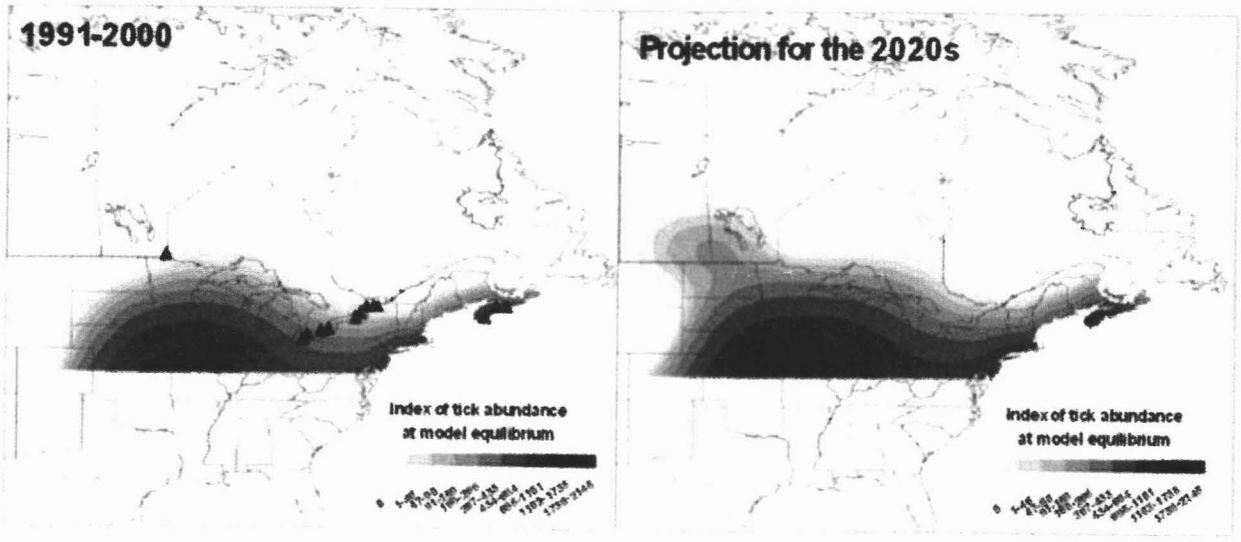
Some of the Canadian News Coverage on the spread of Lyme disease and lack of treatment options in Canada

- **W5 Out of the Wild**
http://www.ctv.ca/CTVNews/WFive/20091113/w5_lyme_091114/
- **16:9**
<http://www.globalnews.ca/Lyme+Disease+Lepers/2097103/story.html>
- **CTV news coverage on Lyme**
http://www.ctv.ca/CTVNews/Health/20090608/lyme_090608/
http://www.ctv.ca/CTVNews/Health/20090919/lyme_disease_090919/
- **Canadian Lyme Foundation** www.canlyme.com
 (Has information and research on Lyme disease as well as personal stories of Canadians suffering from Lyme)
- **Dr. E. Murakami Centre for Lyme**
murakamicentreforlymebc.giving.officelive.com/default.aspx
 (Dr. E Murakami is a Lyme literate Physician from BC who treated thousands of people with Lyme disease. His Centre provides information on Lyme disease and its treatments. He also does seminars and phone consultations with patients and doctors across this country trying to educate about Lyme disease.)
- **LYME DISEASE ASSOCIATION OF ONTARIO**
<http://www.lymeontario.org/>

These maps are from the Public Health of Canada – Canadian Communicable Disease Report Jan 2009

The rising challenge of Lyme borreliosis in Canada, Canada Communicable Disease Report 1 January 2008 • Volume 34 • Number 01 NH Ogden, DPhil, (1), LR Lindsay, PhD, (2), M Morshed, PhD, (3), PN Sockett, PhD, (4), H Artsob, PhD, (2)

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/08vol34/dr-rm3401a-eng.php> (to view whole doc)



York Region West Nile Virus Summary 2002 – 2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Confirmed human cases	7*	2	0	5	3	1	1	0	0	1
Suspect human cases investigated	29	81	0	44	3	2	1	0	0	0
Positive mosquito pools	14	5	1	14	10	0	2	1	0	4
Mosquito trap sites	10	41	30	40	40	38	37	34	37	38
Dead bird sightings (calls)	2,286	3,533	2,014	1,372	1,604	763	889	NA [†]	NA [†]	NA [†]
Birds picked up	127	813	1,647	1,098	1,328	968	757	NA [†]	NA [†]	NA [†]
Birds sent	55	48	64	53	34	24	14	NA [†]	NA [†]	NA [†]
Positive birds **	8	8	11	22	10	1	2	NA [†]	1 ^{†*}	NA [†]
Standing water complaint investigations	25	992	379	222	232	106	111	78	49	63

* 4 cases probable.

** Number of positive birds does not reflect the intensity of the virus. Submission of specimens from a municipality ended after first positive.

[†] Dead bird pick-up, testing and reporting was discontinued province wide in 2009.

^{†*} Dead bird sent by resident for private testing. An environmental scan was conducted due to activity in the City of Toronto in the vicinity of the dead bird location. No mosquito larvae were found within 2km of the dead bird in York Region.

Active Tick Surveillance Locations

2011

