

**Report to
Rapport au:**

**Ottawa Board of Health
Conseil de santé d'Ottawa
30 October 2017 / 30 octobre 2017**

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Ward: CITY WIDE / À L'ÉCHELLE DE LA VILLE File Number: ACS2017-OPH-HPS-0003

SUBJECT: WEST NILE VIRUS ACTIVITY – 2017 SEASON

OBJET: ACTIVITÉ DU VIRUS DU NIL OCCIDENTAL – SAISON 2017

REPORT RECOMMENDATIONS

That the Board of Health for the City of Ottawa Health Unit receive this report for information.

RECOMMANDATIONS DU RAPPORT

Que le Conseil de santé de la circonscription sanitaire de la ville d'Ottawa prenne connaissance du présent rapport à titre d'information.

BACKGROUND

West Nile virus (WNV) can cause infection in humans that ranges from:

- infection without any symptoms (about 80% of infections); to

- flu-like illness called West Nile fever (after a 2 to 14-day incubation period); to
- in less than 1% of infections, very serious illness affecting the brain and/or its lining and/or the spinal cord, causing paralysis. About 10% of these serious cases result in death.

While all age groups are susceptible to becoming infected, the risk for more serious illness increases with age and in people with weakened immune systems.

Each year, WNV is amplified in a bird–mosquito–bird transmission cycle. The mosquitoes involved preferentially feed on birds but will also take human blood meals, increasingly later in the summer when their preferred targets, such as American robins, disperse after their breeding season. As WNV amplifies each summer in birds and mosquitoes, it eventually spills over into humans as the number of WNV-infected mosquitoes taking advantage of human blood meals increases. Other bird species found in urban areas, such as house sparrows and the common grackle, are also important amplification hosts.

Many bird and other animal species can become infected with WNV. Most suffer no ill consequences, however some are very vulnerable to severe illness and death. This is especially true of birds of the crow family and of horses. Dogs and cats can also become infected but are generally not at risk of serious illness. Humans can suffer severe illness, as described above, but the amount of WNV in human blood when infected is too low for humans to become part of the WNV transmission chain. In other words, WNV is not transmitted from human to human by mosquitoes.

The most important mosquito for the transmission of WNV in our region is the northern house mosquito (*Culex pipiens*). This species has long been associated with humans and their urbanized areas because of this mosquito's preferences for where it lays its eggs. Mosquitoes need water to breed. Some lay their eggs on dry land where water will be when water levels rise. Others, such as *C. pipiens*, need to lay their eggs directly on the surface of standing pools of water, often in small containers or other man-made objects in urban areas, which over time have collected enough organic materials to support the feeding needs of mosquito larvae. Urban areas are of a particular concern with respect to WNV because, in addition to providing optimal breeding conditions as described above, the mosquito-bird-mosquito amplification cycle involves birds that are more common in urban areas.

WNV activity is also very dependent on weather factors, including heat and rainfall. Rainfall fills containers with water; heat speeds up viral replication within the mosquito,

shortens the time it takes from egg to larva to pupa to adult mosquito, and allows more mosquito biting activity that might be otherwise thwarted by cold days or nights. With current climatic conditions, the City of Ottawa is geographically situated on the northern fringes of North American WNV activity and even small changes in weather can lead to large proportionate changes in local WNV activity comparing one year to another.

DISCUSSION

From June to October each year, OPH coordinates a WNV prevention program that focuses on both proactive mosquito control activities and on-going surveillance across the City. Through its contractor, OPH traps, identifies, counts, and tests adult mosquitoes and monitors mosquito larvae. OPH also monitors human illness by receiving reports from physicians and laboratories. Monitoring is a continual process that provides feedback with consequent adjustments to OPH's mosquito control program and messaging to physicians and the public.

OPH's WNV prevention program includes:

- Surveillance in mosquito and human populations;
- 31 mosquito traps (expanded in 2017 from previous 29 traps to account for suburban expansion) are placed around the City to determine species and densities of mosquitoes. Trapping and testing are carried out on a weekly basis for WNV and eastern equine encephalitis (EEE);
- Mosquito larvae surveillance of natural and manmade standing water sites is ongoing throughout the season to identify areas of risk (OPH has approximately 150 surface water monitoring sites);
- A biological [larvicide \(Bti\)](#) (*Bacillus thuringiensis* subspecies *israelensis*) is used on surface waters (e.g., ditches, storm water management ponds) throughout the season and applied as needed; and
- A chemical [larvicide \(methoprene\)](#) is used to treat non-surface waters. Approximately 115,000 City-owned roadside catch basins are treated three times per season. Paint markings next to each catch basin indicate which treatment has been completed.

This year, 2017, saw the highest number of human cases of WNV reported in Ottawa since the first human cases were reported to Ottawa Public Health (OPH) in 2003 (see attached table at Document 1). A near record wet spring provided lots of breeding sites

for *C. pipiens* and the warm weather experienced at the end of June and early July helped the WNV amplification cycle. Finally, the extremely warm second half of September kept infected mosquitoes flying. That said, relatively cooler temperatures throughout the summer helped prevent an even greater number of human WNV cases. Human cases of WNV infection were reported from throughout the urban areas of Ottawa, reflecting the distribution of mosquitoes trapped by OPH that tested positive for WNV.

Of note, based on early results from mosquito traps positive for WNV, OPH forecasted that 2017 would be an unusual year for WNV activity. For this reason, on July 26, 2017, OPH issued a Public Service Announcement (PSA) reminding residents to protect themselves and their families from mosquito bites when going outdoors and urging them to do their part by getting rid of mosquito breeding sites around their homes. (See Document 2 for additional information on OPH WNV public messaging.) On the same date, OPH also wrote to local physicians advising them that 2017 may have higher than usual WNV activity. OPH issued a second PSA on August 4, 2017, advising the public of the first lab-confirmed human case of the WNV in Ottawa for the 2017 WNV season and reminding residents of the steps they could take to protect themselves and their families. Given the unusually warm second half of September, OPH issued a third PSA on September 20, 2017, urging residents to continue to protect themselves against WNV in Ottawa. Social media were used extensively as communication tools with the public throughout the season. OPH issued second and third reminders to Ottawa physicians on August 4 and August 18, 2017, respectively.

As with many other public health prevention programs, it would be difficult to compare the outcome of OPH's WNV program to the absence of some or all of the interventions we apply. We know that WNV is present and can cause human infections and illness and that the standard of response in Canada and the US is to have mosquito control programs that are tuned by WNV surveillance results. Ottawa's WNV program includes the major components that are typical of WNV programs in other Canadian jurisdictions. We are confident that Ottawa's mosquito control program is making an important difference and that the number of human cases would be significantly higher in its absence.

NEXT STEPS

Based on OPH's ongoing experience in coordinating its annual WNV prevention program, as well as learning from the year-to-year fluctuations such as seen in 2017, OPH will move forward with additional enhancements to its programming:

- Strengthen public education efforts to ensure Ottawa residents continue to have the necessary information to not only protect themselves and their families from mosquito bites, but also urging them to do their part by getting rid of mosquito breeding sites around their homes. OPH will continue to leverage its use of social media, PSA, and joint communications with partners to share this information.
- Continue surveillance of mosquitoes and their larvae to assist with early identification of high-risk geographical areas, as augmented by reported WNV human cases. Similar to 2017, OPH will add mosquito traps as indicated by other trapping results, human cases, and urban expansion.
- Maintain and adjust chemical and biological larvicide applications to reduce the overall target mosquito population and hence further reduce the risk of WNV infection to Ottawa residents.

RURAL IMPLICATIONS

There are no rural implications associated with this report.

CONSULTATION

There was no public consultation undertaken in preparing this information report.

LEGAL IMPLICATIONS

There are no legal impediments to receiving this report for information.

RISK MANAGEMENT IMPLICATIONS

There are no risk management implications associated with this report.

FINANCIAL IMPLICATIONS

There are no financial implications associated with this information report.

ACCESSIBILITY IMPACTS

There are no accessibility implications associated with this report.

SUPPORTING DOCUMENTATION

Document 1: Surveillance data for Ottawa and Ontario human cases and Ottawa positive mosquito trapping results

Document 2: Overview of OPH public messaging and education to ensure Ottawa residents have the information they need to protect themselves

DISPOSITION

The Board of Health to receive this report for information.