

Evaluation and Conclusions

Surveillance of humans, birds and mosquitoes in 2006 showed a decrease in West Nile Virus (WNV) activity in the Region of Peel and across Canada. A number of factors influence the risk of human WNV infection requiring the implementation of multiple surveillance and risk reduction strategies to minimize the risk of human WNV infection.

Human Case Surveillance

In the Region of Peel, human cases decreased from three in 2005 to two in 2006. As in the previous three years, no deaths due to WNV infection occurred in the Region of Peel in 2006. Of the health units reporting cases, the Region of Peel had the lowest WNV case rates when adjusted for population size.

During 2006, Communicable Disease staff monitored local hospitals to identify suspected human WNV cases. Upon notification of a suspected human case, seasonal staff in the WNV program went door-to-door in the immediate area advising residents of the human case and offering to survey the property for mosquito breeding sites. In addition, educational material on symptoms of WNV, reduction of mosquito breeding sites and personal protection were provided to the residents. An intensified environmental scan around the area of the identified human case was conducted to verify that roadside catch basins were treated and to identify any stagnant water sites. Any mosquito breeding sites identified on public property were larvicided or remediated. These targeted risk reduction measures will continue in 2007.

Dead Bird Surveillance

In 2006, there was a decrease in the reported number of dead birds of all species. As well, the number of target birds (crows and blue jays) being reported decreased by 27% in 2006. The first positive bird in 2006 was reported two weeks prior to the first human case and one week after the first positive mosquito batch. For two consecutive years, a positive mosquito batch occurred before the finding of a positive bird. One of the primary purposes of dead bird testing is to be an early warning indicator that the virus is present in an area. If positive mosquito batches are reported prior to positive birds again in 2007, the need for the dead bird surveillance program will be reviewed.

Eleven birds tested positive for WNV in the Region of Peel, corresponding to 41% of the birds tested. A complete assessment of the infection rate in birds is limited by the capping of bird submissions toward the end of the season. Dead bird surveillance continues to be a tool for identifying the presence of WNV in the community. This program will continue in 2007.

2006 – West Nile Virus in the Region of Peel

In 2005 and 2006, a private pest control company was contracted to pick up dead crows and blue jays for testing. In previous years, local animal control in the City of Mississauga, City of Brampton and Town of Caledon provided this service. This service worked well and there were significant cost-savings. This service will be continued in 2007.

Mosquito Surveillance and Reduction

In 2006, the number of mosquito batches testing positive decreased from the previous year.

In 2006, twenty different mosquito species were found in the Region of Peel. The *Culex* species (*Culex pipiens* and *Culex restuans*) are associated with a greater risk of WNV transmission. This year, *Culex* mosquitoes were predominant among the positive mosquito batches in the Region of Peel (12 of 14 positive batches). The proportion of the *Culex* species remained stable at five per cent in 2006. Since the WNV Prevention Plan has been in place, there has been a marked decline from a high of 30%. The decrease in *Culex* species might be attributed to a successful larviciding program targeted at reducing the abundance of *Culex*, and a reduction in breeding sites preferred by the *Culex* species. Other jurisdictions in North America, such as the Greater Chicago Area and the State of Michigan, have reported a decrease in mosquito populations and human cases where mosquito reduction programs are in place.²⁸ A Michigan study observed an increased risk of WNV infection of 10.5 times for citizens living outside of a mosquito control jurisdiction.²⁹ Without taking preventive actions against the *Culex* species, the Region of Peel may well have seen an increase in their abundance.

In 2006, the Region of Peel along with two other health units participated in a pilot study to assess the abundance of the Asian tiger mosquito (*Stegomyia albopicta*). The Asian tiger mosquito was first found in the Region of Peel and in two other Ontario health units in 2005. This mosquito species is a known carrier of WNV and other viruses. The Asian tiger mosquito was not captured in Ontario in 2006.

Other than *Aedes vexans*, *Coquillettidia perturbans* and *Culex* species, most mosquito species decreased in abundance in 2006. The exception was *Ochlerotatus japonicus* which increased in abundance by four times over a one-year period. While *Ochlerotatus japonicus* is not as abundant as other species, its increase in proportion relative to the others, along with the fact that it is an efficient WNV vector, warrants continued monitoring in the coming season.

Upon notification of a positive mosquito batch, seasonal staff in the WNV program went door-to-door in the immediate area advising residents of the positive batch and offering to survey the property for mosquito breeding sites. In addition, educational material on symptoms of WNV, reduction of mosquito

breeding sites and personal protection were provided to the residents. An intensified environmental scan around the area of the identified positive batch was conducted to verify that roadside catch basins were treated and to identify stagnant water sites. Any mosquito breeding sites identified on public property were larvicided or remediated. These targeted risk reduction measures will continue in 2007.

Larval surveillance activities were useful in monitoring the emergence of mosquitoes throughout the season, particularly in areas where the elimination of standing water is difficult. This information was then used to determine the need for surface water treatment. The mosquito reduction activities identified in the 2007 WNV Prevention Plan will be implemented to reduce mosquito populations.

Conclusions

There is no information suggesting that the spread of WNV has stopped. While WNV activity, as measured in the three main surveillance systems, will vary from year to year, it is reasonable to assume that the disease has established itself in North America and Peel Region.

The information collected in the various surveillance activities continues to be valuable in assessing and minimizing the risk of human WNV infection to Region of Peel residents. This information is helpful in assessing the need for enhanced mosquito reduction systems which include larviciding and increased promotion of breeding site elimination.

The surveillance systems implemented in the Region of Peel suggest that prevention and reduction activities are resulting in reduced risk of human WNV infection in the Region of Peel. The mosquito surveillance data for 2006 show a stabilization in the percentage of *Culex* species relative to other mosquito species. Given that the *Culex* species was predominantly responsible for the WNV mosquito pools in the Region of Peel in 2006 and in previous years, targeted mosquito vector reduction focussing on the *Culex* species should continue.

Public education and community outreach are also important components of the program, particularly in preventing personal exposure and in eliminating breeding sites on private property. The education program has been successful in building awareness of the WNV risks and prevention. Peel Public Health will continue to work with the Ministry of Health and Long-Term Care, the local municipalities and conservation authorities to identify strategies to promote taking personal protection measures against mosquito bites.

The results of the 2006 WNV program suggest that the 2007 WNV Prevention Plan should continue to focus on surveillance, mosquito reduction and public education and community outreach.