
WEST NILE VIRUS in ALBERTA HORSES:
A Descriptive Summary (2004)



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Introduction

West Nile virus (WNV) affects the central nervous system in humans, birds and horses, causing mild to severe illness and sometimes death. The virus is spread by mosquitoes that become infected by feeding on infected birds. First reported in Uganda in 1937, WNV is widespread in most of Africa and Eurasia. In 1999 it was identified in New York City, marking its presence in North America. Since then, WNV has been detected everywhere in North America, except British Columbia and Washington State. Alberta detected its first cases in mosquitoes, humans, birds and horses in 2003. The *Culex* species of mosquito is responsible for spreading the virus in Alberta.

Horses become infected by WNV by being bitten by mosquitoes that carry the virus. Research suggests that most horses bitten by infected mosquitoes will not develop clinical disease, but instead will eliminate the virus uneventfully. Symptoms of WNV can include weakness, fever, incoordination, listlessness and an inability to rise. There is no specific treatment for horses affected with WNV. Up to 35 percent of horses that develop clinical signs may die or have to be euthanized due to complications of illness.

WNV in horses became a provincially reportable disease in Alberta in 2003, meaning all suspected or confirmed cases are required to be reported to the Chief Provincial Veterinarian (CPV). Alberta veterinary practitioners were asked to complete an initial survey when they suspected a case and then a follow-up survey if the case was confirmed positive. There were 222 suspected cases of WNV in 2003. Of these, 170 were laboratory confirmed positive and 59 horses died or were euthanized.

In 2004, private veterinary practitioners were asked to complete a survey for each horse they suspected of having the virus. The survey focussed on clinical signs, environmental risk factors and preventive measures. The CPV Office was notified of the results of confirmatory testing by the laboratory conducting the test. Owners of horses that were confirmed positive were asked a follow-up question regarding the horse's recovery status.

WNV in all species of animals is Immediately Notifiable under Canada's *Health of Animals Act*, meaning that laboratories are required to contact the Canadian Food Inspection Agency (CFIA) regarding the suspicion or diagnosis of the virus.

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Objectives

The objectives of the 2004 WNV surveillance program and survey of WNV suspect horses in Alberta were to:

- Determine the number of horses affected with WNV in Alberta in 2004,
- Explore the distribution of environmental risk factors involved, and
- Determine the use of preventive measures.

Methods

WNV is a reportable disease in horses in Alberta, therefore, all veterinary practitioners who examined a horse with suspicious clinical symptoms were required to report this fact to the CPV. Veterinarians were asked to complete a survey for each suspect horse, which focussed on clinical signs, environmental risk factors and preventive measures used, if any. The CPV Office was notified of the results of laboratory tests (IgM Elisa serology) and a follow-up question regarding the horse's recovery status was asked of owners whose horses tested positive for WNV.

Results

The first suspected case of WNV in horses was reported in early August 2004, with reporting continuing until October 2004. During 2004, private veterinary practitioners reported 65 suspect cases of WNV. Of these, 4 were laboratory confirmed positive, 57 were negative and 4 horse owners declined confirmatory testing. Of the 4 horses confirmed positive, 3 recovered and 1 (25 percent) was euthanized due to complications associated with the virus. Of the 65 horses suspected of possible WNV infection, 23 had been vaccinated, either for the first time or with a follow-up booster. None of the horses confirmed positive for the virus had been vaccinated.

Although veterinarians completed a survey for each "suspect" case of WNV, not every case could truly be defined as suspect. Veterinarians who submitted a blood sample to the laboratory, may have only been doing so to rule-out WNV as a potential diagnosis. Consequently, data collected from suspect cases that were confirmed negative will not be summarized in this report.

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Clinical Findings

To investigate the presence of clinical signs of WNV infection in horses, veterinarians were asked to report if the horse demonstrated specific clinical signs. Survey results for the four horses that were laboratory positive indicated that one had a fever, two experienced loss of appetite, two experienced depression, one developed muscle tremors, two exhibited circling and/or hyperexcitability, all four experienced weakness in their hind limbs, three demonstrated an inability to rise, and none exhibited head pressing, seizures, blindness or coma, which can also be associated with WNV infection.

Risk Factors---Environmental

Veterinarians were asked to indicate what type of environment the horse lived in, including: 1) in a corral all of the time, 2) on pasture all of the time, 3) in a stable with an outdoor corral, 4) in a stable or barn all of the time, or 5) on pasture during the day and in a stable at night. All four laboratory confirmed horses were on pasture all of the time. Of these, two had access to bodies of water, while two had access to thick bush.

Risk Factors---Horse Age/Breed/Condition

The four horses confirmed positive for WNV were male. One was under two years of age, two were between three and ten years and one was over fifteen years of age. This horse had to be euthanized due to complications associated with the virus. Three of the confirmed positive horses were quarterhorses and one was a draft horse. The survey inquired about body condition of the suspect horse, under the assumption that a fit horse is more likely to recover from WNV than a thin or fat horse. Three of the confirmed positive horses were reported to be fit, while one was thin. The thin horse did not recover from the virus and was euthanized.

Geographic Distribution

The locations of confirmed positive horses according to natural region are shown in Figure 1. Three of the horses confirmed positive for WNV lived in the Grassland natural region, while the fourth was located near the boundary of the Grassland and Parkland natural regions. The geographic distribution of confirmed WNV cases according to health authority region is illustrated in Figure 2. Two horses confirmed positive for WNV were from Chinook, one was from Palliser and one was from David Thompson health regions.

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Conclusion

In 2004, there were four horses that were laboratory confirmed positive for WNV in Alberta. Due to the fact that there were so few positive cases, it is impossible to draw meaningful conclusions about risk factors that may predispose an animal to WNV.

A summary of WNV in Alberta horses for 2003 and 2004 is provided in Table 1.

No one is sure why there was so little evidence of WNV in Alberta in 2004. One possible reason was the cool weather Alberta experienced throughout most of the summer.

Surveillance for WNV in horses will be continued in 2005, however, veterinarians will be asked to indicate whether the horse in question is a true suspect, or if they are only requesting WNV serology as a rule-out. Eliminating data from rule-outs will provide a more accurate evaluation of the risk factors and preventive measures present.

Acknowledgements

The Chief Provincial Veterinarian's Office would like to thank the veterinary practitioners in Alberta who took the time to complete the 2004 survey and horse owners for their cooperation. Thanks are also extended to the Alberta Veterinary Medical Association (AVMA) for publicizing and distributing information about the 2004 survey.

Table 1. Summary of West Nile virus (WNV) in Horses in Alberta for 2003 and 2004

Year	Total Positive	Total Deaths	Deaths per Positive Case (%)	Positive Vaccinates
2003	170	59	34.7	11
2004	4	1	25.0	0

Figure 1. Geographic Distribution of Equine Laboratory Confirmed Positive Cases of West Nile virus (WNV) by Natural Area in Alberta (2004) (n = 4)

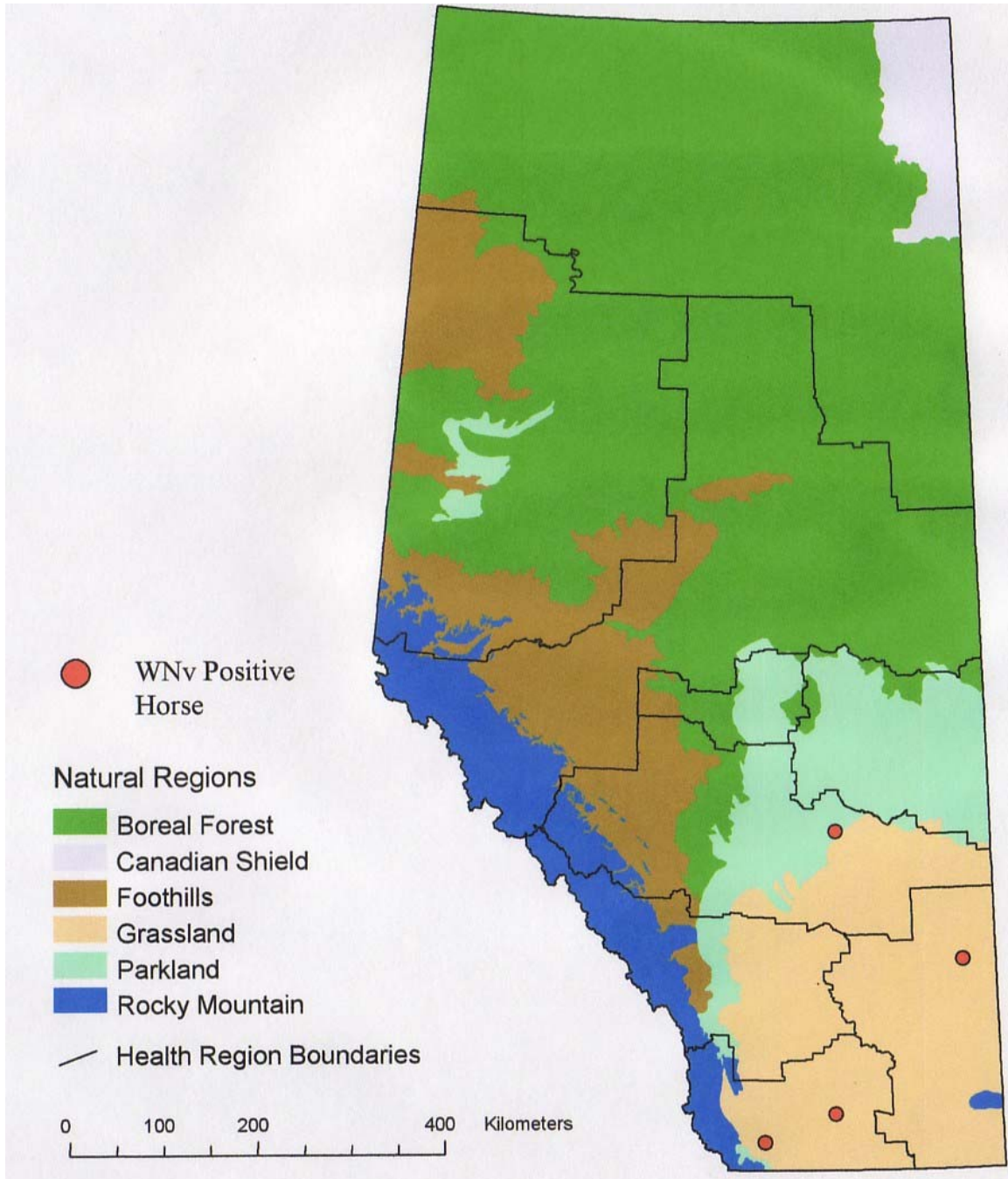


Figure 2. Geographic Distribution of Equine Laboratory Confirmed Positive Cases of West Nile virus (WNV) by Regional Health Authorities in Alberta (2004) (n = 4)

