

An Analytical Study of the Perceptions, Prevention Strategies, Treatment and Economic Impact of Equine West Nile Virus

Robert Galvan, MPH, MS, DrPH_{ABD}, Associate Dean

Department of Health Management & Policy, School of Public Health, University of North Texas
Health Science Center at Fort Worth, Fort Worth, Texas 76107-2699, USA
E-mail: rgalvan@hsc.unt.edu, Tel: 817-735-2372, FAX: 817-735-0324

Antonio Rene, Ph.D., Assistant Professor

Department of Epidemiology, School of Public Health, University of North Texas Health Science
Center at Fort Worth, Texas 76107-2699, USA
E-mail: arene@hsc.unt.edu, Tel: 817-735-0327, FAX: 817-735-0324

K.P.Singh, Ph.D., Professor and Chair

Department of Biostatistics, School of Public Health, University of North Texas Health Science
Center at Fort Worth, Texas, 76107-2699, USA
E-mail: ksingh@hsc.unt.edu, Tel: 817-735-0490, FAX: 817-7352314

Abstract: Since the introduction of the West Nile Virus (WNV) in the United States in 1999, WNV has been the cause of disease and deaths in humans, wild birds, zoo birds, and horses. In 2002, more than 15,000 equines in 40 states were diagnosed with illness associated with WNV. Approximately one third of those horses died or was euthanized. Horses are infected with the WNV more often than humans or any other mammal. It is becoming one of the fastest growing health threats to horses nationwide. Texas responded to the discovery of WNV by expanding their surveillance systems in the eastern counties of the state. Positive reports for WNV were announced in 2002, which prompted an increase in public education and equine vaccination recommendations. Although much has been reported on the economic impact WNV has on human health and hospital care facilities, documentation is lacking on these issues in the equine population. Understanding the biology, epidemiology, economic impact, and how WNV affects the equine industry are important aspects to public health programs and prevention activities.

Objectives: The objectives of this study are to: (1) examine WNV cases in the equine population in Texas in order to better understand the distribution of clinical disease, signs, treatments and outcomes; (2) to provide information regarding the knowledge, concerns, and treatment of the WNV by Texas veterinarians; and (3) to determine the economic impact of the WNV on the equine population in the state.

Methods: A 14 question survey was mailed to licensed veterinarians in Texas in an effort to gather information about their perceptions and beliefs of the WNV,

recommended treatment preferences, and the estimated cost of treatment. Outcomes included case fatality rate, descriptive data, veterinarians' knowledge of WNV, veterinarians' beliefs/perceptions of WNV, and the economic impact of WNV. Descriptive analyses were performed by using SPSS version 11. The methods used for analysis of WNV data were primarily simple descriptive statistics including summations and frequencies. A cross-tabulation was performed between the results of Questions 1, 2, and 3 and a variable created to approximate the number of veterinarians that actually treated cases of WNV (treat). A cross-tabulation and Chi-square analysis was performed between the treatment variable (treat) and derived variables of Questions 1, 2, and 3 to examine differing beliefs and knowledge between veterinarians who had treated WNV and those who had not.

Results: Seven hundred of 4,177 surveys returned yielded a response rate of 16.8 percent. Among the veterinarians, 73.4% (514/691) believed that they are knowledgeable about WNV. Only 49.7% (348/691) believed that they are receiving or received enough training and/or education concerning WNV. The vaccination regimen is believed to be effective and reliable by 56.1% (393/691) of the respondents. There were 1,256 cases of equine WNV reported confirmed via laboratory testing. There were also 766 cases reported that were not confirmed via laboratory testing. Among the 2,022 diagnosed cases, 257 were vaccinated against WNV prior to illness; and, 159 cases were vaccinated after signs of illness. A total of 441 horses died as either a direct cause of the disease or by owner or veterinarian elected euthanasia. The most common criteria used to decide euthanasia in these horses was prolonged recumbency as reported by 44.2% (87/197) of the veterinarians. Fifty-two percent (233/448) of the veterinarians did not recommend prevention strategies to equine owners. The cost of the vaccination regimen was reported by 62% (269/434) of the veterinarians to be \$25 or less.

Conclusions: The results of the survey suggest that there could be a need for WNV education among veterinarians in areas of prevention, control, and treatment. Future studies should be conducted to examine owner knowledge and beliefs of WNV vaccinations and prevention strategies. Values for lost horses were not solicited in the survey, thus, a total economic impact could not be completely estimated. However, a formula to approximate the aggregate economic impact of the WNV on the Texas equine industry was employed.