Update to the West Nile Virus Impact Worksheet, November 1999

For the latest information on West Nile Virus please visit the [APHIS West Nile Virus webpage](http://www.aphis.usda.gov/vs/ceah/cei/westnileupd.htm).

**Summary of previous worksheet (issued 10/06/99):**

An outbreak of arboviral encephalitis first occurred in New York City in late August and has since been identified in other New York, Connecticut, and New Jersey counties. As of September 28, there have been 17 confirmed, and 20 probable human cases, and 4 human deaths associated with West Nile-like virus.\(^1\) Prior to and during this outbreak there have been mortalities in crows around the New York City area. The virus was initially isolated at the NVSL laboratories from bird specimens submitted by the Bronx Zoo, then forwarded to the CDC for further identification and characterization. Surveillance is ongoing, and wild bird death reports are being encouraged. As of October 5, 1999 the Veterinary Authorities of Hong Kong have stopped issuing permits for the importation of live poultry and hatching eggs from the US due to the presence of West Nile virus in the US.

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**Summary of current situation:**

There have been 60 laboratory positive cases (as of 11/05/99) with 7 deaths associated with West Nile virus infection in humans. There have also been 192 laboratory confirmed infections in 18 native bird species, and 22 cases of West Nile virus in clinically ill horses with an additional 21 serologically positive, but not clinically ill, horses. Surveillance for cases in all species, and epidemiological studies continue. The countries of Argentina, Brazil, Hong Kong, European Union, and the United Arab Emirates have imposed restrictions on equine imports.

Surveillance for this virus in the human, avian, equine and mosquito populations is continuing through the cooperation of federal, state, and local government organizations. Cooler temperatures have reduced the risk for transmission in the northeast, and surveillance in avian and mosquito populations for WNV is focused on populations farther south. Veterinary Services is proposing retrospective and prospective epidemiologic studies in horses to determine historical exposure and extent of distribution of the WNV, risk factors for infection, and the possible impact of WNV on the horse population.
On 11/26/99, the Ministry of Agriculture and Rural Development in Israel reported an outbreak of West Nile virus in 400 geese from a susceptible population of 8,000 geese. Control measures include destroying all exposed geese, vaccination of domestic geese, spraying goose farms with insecticide, and expanded surveillance for West Nile virus.

**Current situation (as of November 15th unless otherwise stated):**

On October 22, 1999, the CDC confirmed that laboratory studies had identified the etiologic agent responsible for this outbreak as being West Nile virus.

**Incident cases--humans**

As of November 5th, there had been 60 laboratory positive cases of West Nile virus (WNV) in humans, with 7 deaths (12% case fatality). All of the human cases have occurred in New York City (NYC), and Nassau and Westchester counties of New York state, with the exception of one international case who was a Canadian citizen and had visited the NYC area in late August. Although cooler temperatures and vector-control programs have halted transmission of this vector borne infection to humans, more cases may be found as retrospective studies continue.

**Incident cases--birds**

Surveillance for bird deaths caused by WNV has been initiated in several counties in NYC, NY State, Connecticut, New Jersey and other states in the area. The Centers for Disease Control and Prevention (CDC) has tested a total of 392 birds by reverse transcriptase polymerase chain reaction (RT-PCR) or virus isolation, of which 192 have been positive for West Nile virus infection. The first positive bird was collected on August 9th, and the last positive bird on October 29th. To date, WNV infection has been confirmed in 18 native bird species in New York, New Jersey, Connecticut and Maryland, however, crows have been the most commonly positive bird, and appear to be the most severely affected.

**Incident cases--horses**

On October 8th, USDA, APHIS, Veterinary Services was officially notified by the state veterinarian with the New York Department of Agriculture of a cluster of 18 horses from 14 separate premises on Long Island which were exhibiting neurological signs. This cluster of horses had been examined by a local equine practitioner, and 5 of them had been laboratory positive for Equine Protozoal Myeloencephalitis. Of the 18 horses, 8 had died or were euthanised (44% case fatality).

**Outbreak investigation by VS**

On October 12 the Veterinary Services Early Response Team (ERT) reported to Suffolk County to provide assistance to NY in the investigation of this cluster. A case definition was created based on clinical signs in serologically positive animals. A suspect case is any equine which exhibits ataxia or staggering, plus any three of the following signs: depression, weakness of hind limbs, convulsions, inability to swallow, hyperexcitability, paresis, coma or death. The ERT visited the original 14 premises and one newly identified premises in the area. A total of 83 serological samples were collected from horses on these premises, and a questionnaire was administered at each premises in order to identify risk factors, and better understand the epidemiology of disease transmission.

Source: ERT report 10/21/99
Surveillance for WNV in horses

As of November 15th, there have been 22 reported horses fitting the suspect case definition for WNV in the US, 20 from an area that includes the towns of Riverhead, Jamesport, and Mattituck in Suffolk County, and 2 from Belmont Park in Nassau County on Long Island, New York. There are an additional 21 horses in Suffolk County which are serologically positive for West Nile virus but which were not clinically ill. Brain tissue samples from three of the clinically ill horses were sent to the National Veterinary Services Laboratories in Ames, Iowa for virus isolation and identification. WNV was isolated from brain tissue samples from all three horses. An additional fourteen of the clinically ill horses in Suffolk County were serologically positive by plaque reduction neutralization testing. Five clinically ill horses in Suffolk County did not have serum available for testing. These animals, however, fit the suspect case definition for West Nile virus infection.

Onset of illness in horses first occurred on August 26, 1999 and the last reported case had onset of signs on October 18, 1999. Of the 15 clinical cases which were serologically positive, the age distribution was from 3 to 28 years, with a mean age of 14.4 years and median age of 15. Of the 21 non clinical, but serologically positive horses, the age distribution was from 1 to 25 years, with a mean age of 8.5, and median age of 10.6 years. The age distribution for the 47 serologically negative horses was 1 to 37 years, with a mean age of 11.4 years and a median age of 11 years.

Risk factors for WNV in horses

Risk factor information for WNV infection in horses continues to be collected and analyzed.


Recent International Outbreaks Reported in Animals:

On November 26, 1999, the Director of Veterinary and Animal Health Services at the Ministry of Agriculture and Rural Development in Israel reported an outbreak of West Nile virus in geese in Israel. Diagnosis was made by virus isolation in tissue, and through hemagglutination inhibition and virus neutralization on serology. The report states there were two outbreaks in two different districts: Yizre’el and Ramla. Of 8,000 susceptible geese, there were 400 cases with 160 deaths (40% case fatality), and 7,840 birds were destroyed. Source of this infection is unknown, though migratory birds have been suspected. Preventive measures include vaccination of all domestic geese, spraying goose farms to decrease insect populations, and expanded surveillance for West Nile virus.


Responses by the International Community to US Outbreak:

Response to the US outbreak by the international community includes the following:

The Commission of the European Community has imposed the following import restrictions: 1) Equidae arriving from the U.S. can not have been resident during the previous 15 days in certain counties of Connecticut, New York and New Jersey, 2) These horses can not have been in contact with any equidae which has been resident on holdings where the presence of West Nile virus was confirmed.
Brazil has restricted horses and ostriches from the US.

Hong Kong has revised its earlier statement to include: "During the last 30 days, the horses have not been in any State or within 100 miles of any area where infections with West Nile Virus has occurred during the last 3 months." The Port of New York cannot be used as an exit point at this time.

United Arab Emerates restricts horses which have been in New York state within the last 14 days.

Argentina has prohibited the importation of horses from affected states.

Source: USDA/APHIS/VS/National Center for Import and Export

**Historical Data of Horse Exports to Restricting Countries**

*Table 1* provides information on the number of horses exported from the US to the restricting countries during 1997-1999. The 1999 data only includes exports through September. For Hong Kong, the EU, and the United Arab Emirates more than 50% of the horses exported to these countries during 1997 and 1998 occurred during the months October through December. We have included these months since these are the months which would be most affected by the restrictions, and since there is variation in numbers exported over time during the year.

The USDA;APHIS;VS Export Database provides information on the state of origin of the exported horses, and indicates that very few of the exported horses originate from states affected by WNV. Unfortunately, even though none of the horses exported to Brazil in 1997 and 1998 were reported to have originated in states affected by West Nile, no horses are currently allowed entry from the US.

According to the VS Export Database, there have only been 7 shipments of ostriches exported to Brazil since 1995. One shipment occurred in 1995 and included 6 ostriches. In 1997 there were 6 shipments of 120 ostriches each or 720 ostriches. There have been no other reports of ostriches exported to Brazil.

Since, in some cases, animals exiting through New York ports have been restricted, we have included information on the value of horse exports through New York ports (air and sea). In 1997 and 1998, more horses were exported through New York district airports than any other airport in the US with 63.1 and 59.6 million dollars worth of equidae exported in 1997 and 1998 respectively. During the same years, the NYC seaport was second behind Seattle, WA for exports of horses by sea with .123 and .156 million dollars worth of horses being exported from NY ports in 1997 and 1998 respectively.

*Sources: US Dept of Commerce, Bureau of the Census, and US Maritime Administration*

Table 1. Countries which have restricted imports of US horses, and US export data for years 1997-1999.

<table>
<thead>
<tr>
<th>Country</th>
<th>Horses exported from the US to listed countries (% exported during October through December in 1997 and 1998)</th>
<th>Value of horse exports (millions dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>74 (18)</td>
<td>184 (7)</td>
</tr>
</tbody>
</table>
### % horses originating in WNV states

<table>
<thead>
<tr>
<th>Country</th>
<th>%</th>
<th>%</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>0</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>94 (49)</td>
<td>123 (10)</td>
<td>55</td>
<td>0.3</td>
<td>0.59</td>
</tr>
<tr>
<td>European Union</td>
<td>324 (90)</td>
<td>2,195 (57)</td>
<td>27</td>
<td>3.5</td>
<td>4.2</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>25,084 (64)</td>
<td>23,204 (73)</td>
<td>7,816</td>
<td>117.5</td>
<td>162.4</td>
</tr>
<tr>
<td>World</td>
<td>58,429 (48)</td>
<td>67,967 (54)</td>
<td>42,734</td>
<td>271.2</td>
<td>317.5</td>
</tr>
</tbody>
</table>

**Sources:** World Trade Atlas, September 1999, USDA/APHIS/VS/Export Database

### Responses by Federal Agencies

The USGS National Wildlife Health Center, CDC, and USDA Wildlife Services, Veterinary Services and Agricultural Research Services are cooperating in the collection and analysis of data in an effort to better understand the geographical distribution, risk factors, and demographic occurrence of this virus. On November 8th and 9th 1999, representatives from these groups, as well as state, local, and international governments, and universities met in Ft. Collins, Colorado to discuss the current knowledge of and possible future surveillance plans for WNV.

### Current activities:

Veterinary Services and the Agricultural Research Services have initiated inoculation studies in chickens, horses, and turkeys to answer questions regarding viremia, incubation period, clinical signs, and antibody response. At 21 days post-inoculation in the equine study, none of the horses exhibited clinical signs. The
chicken inoculation studies indicated that chickens developed high, short-lived viremias, and shed virus in feces. Contact chickens remained healthy and free from WNV infection. These studies and data collection and analysis is ongoing.

Surveillance for wild dead birds has been implemented to determine the geographic distribution of WNV in the eastern US. Because southern states are expected to have active mosquito populations throughout the year, this multi-state effort will continue until May 31, 2000.

Veterinary Services is proposing retrospective and prospective epidemiologic studies in horses to determine historical exposure and extent of distribution of the WNV, risk factors for infection, and the possible impact of WNV on the horse population.

In addition to the above activities, there is an informal working group evaluating the possible sources of West Nile virus.

Source: USDA/APHIS/VS/Emergency Programs

CEI's plans for follow up: The situation will continue to be monitored, and should there be significant changes, another update will be issued. Should you have any questions or comments concerning this update, please contact Dr. Katherine Marshall at (970) 490-7801.

References:


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