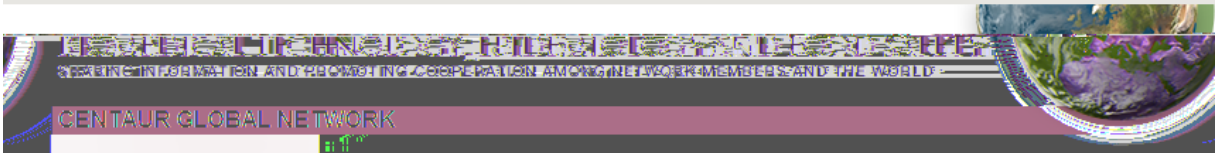

2013-07-23-051 West Nile virus - USA (05): (TX) human, 2012
To: (01) Public health and One Health Initiative; (06) Virology, general; (07) Zoonoses, general;

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WEST NILE VIRUS - USA (05): (TEXAS) HUMAN, 2012
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A ProMED-mail post
Date: Tue 16 Jul 2013
Source: MedPage Today [edited]
<http://www.medpagetoday.com/TheGuptaGuide/InfectiousDisease/40507>

Combined with information from outbreaks in previous years, a look at the 2012 West Nile virus [WNV] epidemic in Dallas County, Texas -- the hardest-hit part of the country -- may provide some insights that can be used to prevent future disease, researchers found.

Symptoms of the 1st cases of neuroinvasive disease tied to infection with the virus started in June [2012], about a month earlier than usual, and that was followed by a rapid rise in cases, according to Robert Haley, MD, of the University of Texas Southwestern Medical Center in Dallas, and colleagues.

An index that estimates the average number of West Nile virus-infected mosquitoes per trap-night was significantly related to neuroinvasive disease cases that occurred 1-2 weeks later (P less than 0.001), the researchers reported in the [17 Jul 2013] issue of the Journal of the American Medical Association (JAMA).

And other factors, including a warm winter preceding the season and a concentration of cases in the north-central part of the county, were consistent with characteristics of previous seasons.

"Consideration of weather patterns and historical geographical hot spots and acting on the vector index may help prevent West Nile virus-associated illness," Haley and colleagues wrote. "Our findings support incorporating mosquito infection indices into response plans and closely monitoring the mosquito vector index in real time," they wrote. "The goal is to recognize significant increases above historically predictive thresholds of epidemic transmission when augmented mosquito control measures can prevent the most human illness."

Since West Nile virus 1st turned up in the US in 1999 (in New York City), it has caused 16 196 cases of neuroinvasive disease -- which develops in less than 1 percent of infected individuals -- and 1549 deaths, Lyle Petersen, MD, MPH, of the CDC's Division of Vector-Borne Diseases in Fort Collins, Colorado, and colleagues noted in a literature review also published in JAMA.

Last year's [2012] West Nile virus outbreak -- the deadliest since the virus 1st emerged with 286 deaths -- touched all 48 contiguous states, although Texas (and Dallas County in particular) had the heaviest disease burden.

To help gather information of future prevention and control efforts, Haley and colleagues examined characteristics of the epidemic in Dallas County.

>From [30 May 2012] to [30 Dec 2012], there were 173 cases of neuroinvasive disease related to West Nile virus, 225 cases of the less-severe West Nile fever, and 19 deaths reported through the National Electronic Disease Surveillance System. The researchers also identified 17 virus-positive blood donors.

Of the patients with neuroinvasive disease, nearly all (96 percent) required hospitalization, 35 percent received intensive care, and 18 percent underwent assisted ventilation. The case-fatality rate was 10 percent.

The rate of neuroinvasive disease was 7.3 per 100 000 residents, substantially higher than the rate during 2006 (2.91 per 100 000), which saw the largest West Nile virus outbreak in Dallas County before last year.

A rapid rise in human disease cases followed shortly behind increased infection detected among mosquitoes in the area, primarily the southern house mosquito (_Culex quinquefasciatus_).

After seeing widespread disease activity throughout the county in the early part of the outbreak, the neuroinvasive cases became concentrated in neighborhoods in the north-central part of the county, in neighborhoods with high property values and housing density, and an increased percentage of houses that were unoccupied. The geographical concentration was similar to that seen in prior years.

West Nile virus was first detected in 2002, and combining data for all seasons since then uncovered some weather factors associated with the West Nile virus disease burden, including total rainfall in the winter and early spring and summer heat. However, the number of days in the winter with a hard freeze (low temperature below 28 F) was the strongest predictor of disease; fewer such days corresponded to more disease (P less than 0.001).

Officials in Dallas County resorted to aerial spraying of insecticides to suppress mosquito levels during the outbreak, sparking some concern about health problems. But the researchers found that the spraying was not associated with more emergency department visits for respiratory symptoms, including asthma exacerbations, or skin rash.

That's consistent with previous experiences in the US, according to Petersen and colleagues, who wrote in their review that "pesticide exposure and adverse human health events following adult mosquito control operations for West Nile virus appear negligible."

Such measures remain important because "West Nile virus has [become] and will remain a formidable clinical and public health problem for years to come," they wrote.

"Thus, sustainable, community-based surveillance and vector management programs are critical, particularly in metropolitan areas with a history of West Nile virus and large human populations at risk," they continued. "Community response plans must include provisions for rapidly implementing large-scale adult mosquito control interventions when surveillance indicates such measures are necessary."

In an accompanying editorial, Stephen Ostroff, MD, formerly of the CDC and the Pennsylvania Department of Health, echoed that call.

"Effective West Nile virus prevention and control require an integrated vector management approach that includes source reduction by minimizing breeding sites; using larvicides where breeding sites cannot be eliminated; and monitoring for the presence of virus in adult mosquitoes, coupled with targeted pesticide use, when virus is found," he wrote. "Weaknesses in any of these areas will diminish the overall potential effectiveness of a vector control program and increase risk."

Although such programs are pricey, he wrote, "the cost of surveillance and preventive efforts are likely to be less than the costs associated with responding to major West Nile virus outbreaks, as evidenced by the [USD] 8 million in estimated West Nile-related healthcare costs and [USD] 1.6 million for aerial spraying ... combined with the significant burden of illness, disability, and death."

"The tragic consequences of the Dallas West Nile virus epidemic must not be forgotten," Ostroff wrote, "for they serve as a cogent reminder of the need to sustain vector monitoring and prevention programs in all communities."

[Byline: Todd Neale]

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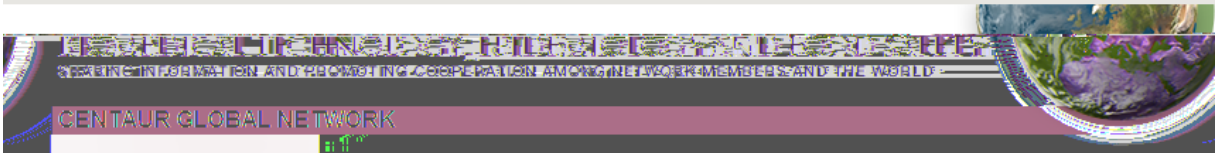
Communicated by:
Roland Hubner



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[A variety of climatic factors have been implicated speculatively as causal factors in the 2012 WNV outbreak in the Dallas, Texas area. The articles cited in the above report provide a quantitative assessment of their importance. The above report makes a good case for the value of surveillance programs, both monetarily and in terms of reduction of human and equine disease. However, it can be difficult to maintain the political will for providing continuous surveillance budgets if there have been no recent, significant outbreaks.

It will be interesting to see what this year brings for WNV cases in the Dallas, Texas area. Equine WNV cases have already occurred this year (2013), indicating that virus transmission has already begun this season. The USDA Animal and Plant Health Inspection Service (APHIS) reported 627 equine WNV cases nationwide in 2012, the highest total since 2006, when veterinarians reported 1086 equine cases. Texas reported the most cases in 2012 (120) (ProMED-mail archive nos. 20130622.1786262 and 20130515.1715749).

ProMED-mail thanks Roland Hubner for sending in this report.

References:
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The state of Texas can be located on the HealthMap/ProMED-mail interactive map at <http://healthmap.org/r/2E*U>. Dallas County in northeastern Texas can be seen on the map at <http://www.digital-topo-maps.com/county-map/texas.shtml>. - Mod.TY]

[see also:
West Nile virus - USA (04): (TX) equine 20130622.1786262 West Nile virus - USA (02): 2012 20130515.1715749
2012

West Nile virus - USA (21) 20121122.1420567 West Nile virus - USA (17) 20120930.1316227 West Nile virus - USA (12): (TX, OK) 20120905.1282592]
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