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## **SPEECHES AND CONGRESSIONAL TESTIMONY**

### **Statement of**

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**to**

**New York State Assembly**

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Ladies and Gentlemen,

My name is Dr. Roger Nasci. I am an entomologist with the Centers for Disease Control and Prevention (CDC). I want to thank you for the opportunity to testify on the multi-agency response to the recent outbreak of mosquito-transmitted encephalitis in the New York City area, and about the future of mosquito-transmitted disease surveillance and control in New York.

On August 29<sup>th</sup>, Dr. Marcelle Layton from the New York City Department of Health contacted CDC about a cluster of six patients with encephalitis in the Queens area. Diagnostic specimens were obtained from these patients and were sent for evaluation to the New York State Department of Health's virology laboratory, and then forwarded to the CDC Division of Vector-Borne Infectious Diseases, Arbovirus Diagnostic and Reference Laboratory in Fort Collins, Colorado, for confirmation. On August 31<sup>st</sup>, because this event was considered an emerging disease activity, CDC sent epidemiologists to assist New York City in investigating an outbreak of what was then being called "encephalitis of unknown etiology."

On September 3, CDC's diagnostic laboratory completed tests on the specimens and, like the New York State laboratory, results of antibody testing were consistent with infection by St. Louis encephalitis (SLE) virus, a common, mosquito-transmitted North American arbovirus. Once St. Louis encephalitis virus was implicated as the cause of the disease,

additional CDC epidemiologists, entomologists, and vertebrate ecologists traveled to the city to assist in efforts to further define the extent of the epidemic and to try to prevent the occurrence of additional cases.

The epidemiologic response efforts consisted of developing a case definition from the diagnosed cases, and using this definition to identify suspect cases in all hospitals in the city. Then, each suspect case was investigated to establish a detailed case history, including a travel history. Finally, diagnostic specimens were obtained from each case and sent to the New York State Department of Health's virology laboratory and CDC to confirm the diagnosis and the distribution of cases within the city.

The prevention component of the response was quickly initiated by the New York City's Department of Health and Office of Emergency Management. Working in concert with the New York State Department of Health and CDC, it was agreed that an aggressive program to reduce mosquito-human contact was necessary. On September 3 when the diagnostic results indicated St. Louis encephalitis, the City quickly initiated a multi-component program that was consistent with recommendations in CDC's published guidelines. I have brought several copies of this document with me, and I can provide more if needed.

There were three elements to the program to reduce human-mosquito contact. The first was an intensive public education effort, letting residents know about the presence of a mosquito-transmitted virus in the city, and that they could reduce mosquito exposure by curtailing evening outdoor activity or by using mosquito repellents when outdoors. This was accomplished by door-to-door distribution of informational pamphlets in neighborhoods where cases had occurred. In addition, the health department produced daily press releases and the Mayor held daily press conferences to use media resources to disseminate the information.

The second element was designed to assist the residents in applying the personal protection measures in follow up to the education message. The city obtained large supplies of deet-containing mosquito repellents, and disseminated the spray and lotion throughout the city through fire stations and other publicly accessible agencies. Residents were instructed to use repellents if they were going to engage in any outdoor activities during the evening, and were provided instructions on proper use of the repellents.

Third, to further reduce the risk of exposure to mosquitoes, the City embarked on a mosquito control program that consisted of removing mosquito larval habitats, applying larvicides to selected areas, and of spraying with Malathion and two synthetic pyrethroid formulations to

reduce the density of biting *Culex* mosquitos in the area. Initially, the control program was limited to the Queens area where the first human cases were detected.

After human cases were documented in other areas of the city, several more CDC epidemiologists were sent to assist in the epidemiologic investigation. In addition, the adult mosquito control program was expanded to include all 5 boroughs. Through the course of the emergency response, city-wide spraying to control adult mosquitoes was conducted twice. Ground and aerial mosquito control applicators were used in this effort. To support the adult mosquito control operations, larvicides were used in backyard swimming pools, sewage treatment plants, storm sewers and other locations that were identified as sources of mosquitoes. Mosquito surveillance conducted by CDC and the New York State Department of Health indicates that this program was successful in reducing the density of *Culex* mosquitoes.

Concurrent with the outbreak of encephalitis in humans, local birds were observed to be dying. Because SLE and related viruses do not normally kill birds, which are natural hosts of West Nile virus in other areas of the world, the outbreak in birds was thought to be unrelated to the human cases of encephalitis. Dead birds from the Bronx Zoo and other specimens collected from dead birds in the Bronx were sent to the United States Department of Agriculture, National Veterinary Services Laboratory for diagnosis. A virus was isolated but could not be identified as any of the commonly suspected avian pathogens. This virus was sent to CDC where it was identified as a West Nile-like virus on September 23, 1999. Simultaneously, viruses isolated from human autopsy samples were identified as West Nile-like virus in the CDC lab. Subsequently, genetic analysis determined that the virus was indeed West Nile. In response to this finding, human diagnostic samples were re-tested by the Fort Collins laboratory using more specific tests, and it was found that West Nile virus, not St. Louis encephalitis virus, was the cause of the epidemic.

West Nile virus is closely related to St. Louis encephalitis, but West Nile virus has not previously been found in North America. It is endemic in Africa, and is also found in West Asia and the Middle East. West Nile virus has also caused epidemics in Europe, where the virus is probably introduced to northern latitudes by migrant birds. Both viruses have similar mosquito vectors and transmission cycles and West Nile virus causes disease in humans that is similar to that caused by SLE virus.

Immediately upon learning that the etiologic agent was West Nile virus, CDC advised the City and State Departments of Health that the risk factors associated with acquiring St. Louis encephalitis virus or West Nile virus are the same, and are directly related to exposure to *Culex* species mosquitoes. This means that the public health interventions that

had already been taken to reduce mosquito-human contact were appropriate, and that this finding did not change CDC's recommendations regarding prevention and control activities.


After West Nile virus had been found outside of New York City, and appeared to be killing several species of birds as well as horses on Long Island, surrounding county and State health departments worked together with Federal agencies including the USDA, U.S. Geological Survey, and CDC to enhance surveillance for human cases of suspected West Nile encephalitis, and for birds and mosquitoes also infected with the virus. Several surrounding counties mounted programs to reduce human-mosquito contact, based on the model used in New York City, including the use of mosquito control applications.

Though human cases of disease attributable to West Nile virus were limited to Queens, the Bronx, Brooklyn, and Manhattan in the city, and to Nassau and Westchester counties, evidence indicated the virus was more widespread. West Nile Virus infected mosquitoes, birds, or horses were found in the New York City metropolitan area, including Suffolk and Nassau Counties and in several New York counties stretching as far north as Saratoga County. It has been found in southeast Connecticut, in several New Jersey counties, and as far south as Baltimore County, Maryland. Monitoring the distribution of this virus and its potential for establishing in the United States is still in progress.

Overall, the response to this unprecedented epidemic was prompt and appropriate. The initial response in New York City required cooperation and coordination among several city agencies, as well as New York State and Federal agencies. As the scope of the response grew and more counties and States became involved, the complexity increased but the efforts continued to be characterized by good cooperation and by a commitment to good public health practices.

We are now entering the phase of the response in which we must prepare for what may happen with West Nile virus next summer and in succeeding years. On November 8<sup>th</sup> and 9<sup>th</sup>, CDC hosted a conference in which panels of experts in a variety of fields, including those from New York, were asked to assist in developing guidelines for dealing with West Nile Virus in the United States. The formal document containing these guidelines is still being developed, but in general, recommendations were made to take aggressive short term actions to determine if West Nile Virus persists in the area, and to develop longer-term capabilities to monitor mosquito-transmitted viruses in the region, so that future occurrences of West Nile virus or of other exotic viruses may be predicted quickly and identified.

Acquiring these capabilities will require enhancement of health department infrastructure from the city and county level to the State and



the Federal level. The New York City Department of Health and many of the surrounding counties have already initiated plans to implement mosquito surveillance programs and to develop mosquito control contingencies. Through our Emerging Infectious Disease initiatives, CDC has promoted public health infrastructure enhancement at all levels, and our staff are prepared to provide necessary technical assistance and expertise to support the State and local efforts.

Again, thank you for the opportunity to comment.