

# Infectious disease case study assignment

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Retesting of clinically ill human cases and testing of horses presenting with CANIS disease in Long Island, NY revealed WNV as the cause of disease (Canals, Conant, Etcetera, Walden, Sampson, 2000). A total of 62 human cases of WNV were identified during this outbreak, including seven deaths. By extrapolation from a household based study it was estimated that the NYC WNV outbreak in 1999 caused around 8 200 asymptomatic infections, causing disease in approximately 1 700 individuals.

This was the first evidence of WNV activity in the Western Hemisphere (CDC, 1999).

During the first years of circulation in North America, WNV persistence over the winter months was attributed to continued transmission during winter, overwintering of the virus in mosquitoes and vertical WNV transmission from infected females to their offspring (Risen, Fang, Lothrop, Martinez, Wilson, O'Connor, 2006). WNV infection of migratory birds was suggested to contribute to the fast dissemination of WNV in North and South America. Nevertheless, WNV amplified and extended its distribution across the lower 48 continental states and has been declared endemic within 10 years of its introduction (Bernard, Kramer, 2001).

West Nile Virus is a concern because in the most rare and extreme cases it can cause a condition called encephalitis, which is irritation and swelling of the brain. 2. Season's physician ordered serological tests. Describe how antibody titers would assist the doctor in confirming her diagnosis. Serology is a study of immune responses in humans (1000). Immune responses are

the product of the defense mechanisms against disease causing organisms in the body.

The principle involved with serology is the antibody antigen response. The antigen actually comes first, in that the antigen is the substance which “provokes” the body to produce antibodies.

The CDC has established multiple serological, Appraised, and viral isolation criteria for confirmation of West Nile virus infection (CDC, 2001): Criteria for Confirmation of West Nile Virus Infection > Isolation of West Nile virus from tissue, blood, SF, or other body fluid, or demonstrate action of West Nile viral antigen or genomic sequences > IGMP antibody to West Nile virus in SF as detected by MANACLES > At least a fourfold serial change in plaque reduction neutralizing antibody titer to West Nile virus in paired, appropriately timed (i.e., at least 14 days apart) serum or SF samples > West Nile virus-specific IGMP (by MAC ELISE) and IgG antibody (screened by ELISE and confirmed by plaque reduction neutralizing tests) in a single serum specimen 3. When Jason was feeling at his worst, he had extreme malaise, vomiting, and diarrhea.

What stage of the illness was he experiencing at that time? Explain the physiologic mechanism(s) that give rise to the signs and symptoms of infectious illness.

The incubation period for WNV disease is typically 2 to 6 days but ranges from 2 to 14 days and can be several weeks in immunocompromised people. An estimated 70-80% of human WNV infections are substantial or asymptomatic. Most symptomatic persons such as Jason experience an acute systemic

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febrile illness that often includes headache, weakness, malaise, or arthritis; gastrointestinal symptoms and a transient macromolecular rash (CDC, 2015). 4. West Nile virus has a single stranded RNA genome.

Explain how this virus is able to replicate.