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EMERGING INFECTIOUS DISEASES

PRELIMINARY OBSERVATIONS ON THE ZIKA VIRUS OUTBREAK

GAO Highlights

Highlights of GAO-16-470T, a testimony before the Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives.

Why GAO Did This Study

Emerging infectious diseases constitute a clear and persistent threat to the health and well-being of people and animals around the world. The Zika virus, which at present appears to be primarily transmitted to humans by infected mosquitos, can cause symptoms including fever, rash, and joint pain. A large ongoing outbreak is occurring in Brazil that started in May 2015. As of February 24, 2016, over 100 cases of U.S. travel-associated Zika virus disease cases have been reported.

Due to concerns about its potential impact, you asked GAO to present preliminary observations on the Zika virus. This statement addresses (1) the epidemiology and transmission of the Zika virus disease, including reporting on the incidence of disease and what is known about its link to microcephaly; (2) detection and testing methods; (3) methods for mosquito control; and (4) the proposed federal research agenda as it relates to the Zika virus and Zika virus disease.

To report on these questions, GAO reviewed relevant peer-reviewed scientific literature, epidemiological alerts, agency documents, and prior GAO work from 2003-2016 on related topics; consulted experts in the fields of virology, infectious diseases, and vector control, including industry representatives; and interviewed officials of the CDC and NIH.

What GAO Recommends

GAO is not making recommendations at this time.

View GAO-16-470T. For more information, contact Timothy Persons at (202) 512- 6412 or personst@gao.gov

What GAO Found

While several countries have reported outbreaks of Zika virus disease—which appear to be primarily transmitted to humans by mosquitos—unanswered questions remain regarding the epidemiology and transmission of the disease. Many factors—including a large number of asymptomatic patients and patients with mild symptoms, and a lack of a consistent international case definition of Zika virus disease—complicate understanding of the virus and may hinder responses to the current outbreak. For example, an estimated 80 percent of individuals infected with the Zika virus may not manifest clinical symptoms. As a result, incidence of the infection may be underestimated. Questions also remain regarding the strength of the association between Zika virus infection and two other conditions: microcephaly and Guillain-Barré syndrome.

A lack of validated diagnostic tests, consistent international case definitions, and trend information may also contribute to difficulty in estimating the prevalence of the virus. The United States uses two diagnostic tests for Zika, and according to the U.S. Centers for Disease Control and Prevention (CDC), while there are no commercially-available diagnostic tests for Zika, an antibody-based test for Zika virus was recently authorized for Emergency Use by the U.S. Food and Drug Administration. Diagnosing Zika virus infection is also complicated because it is difficult to differentiate it from other similar diseases, such as dengue or yellow fever. For example, a person previously infected with dengue could be falsely identified as also having been exposed to the Zika virus (and vice-versa). Moreover, the World Health Organization has acknowledged the need for a consistent case definition—that is, a set of uniform criteria to define the disease for public health surveillance and to determine who is included in the count and who is excluded. Additionally, a lack of pattern and trend data has made surveillance challenging.

Because Zika virus disease cannot yet be prevented by drugs or vaccines, vector (mosquito) control remains a critical factor in preventing and mitigating the occurrence of this disease. There are three methods for mosquito control: (1) standing water treatment, (2) insecticides, and (3) emerging technologies. Mosquito control has been achieved in some locations by methods such as reducing or chemically-treating water sources where mosquitoes breed or mature, or by insecticide dispersal. Emerging technologies, including biological control methods—such as infecting mosquitoes with bacteria— genetically-modified mosquitoes, and auto-dissemination traps, show some promise but are still in development and testing phases.

The National Institutes of Health (NIH) and the CDC have identified several high priority areas of research. Research priorities include basic research to understand viral replication, pathogenesis, and transmission, as well as the biology of the mosquito vectors; potential interactions with co-infections such as dengue and yellow fever viruses; linkages between Zika and the birth defect microcephaly; improving diagnostic tests; vaccine development; and novel vector control methods. These efforts are ambitious, and agencies may face challenges in implementing this agenda.