U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

June 29, 2017

The Honorable Tim Murphy
Chairman
Subcommittee on Oversight and Investigations
Committee on Energy and Commerce
House of Representatives

Subject: Zika Virus Response – GAO Response to Questions for the Record

This letter notifies you of our enclosed responses to questions for the record, following the May 23, 2017 hearing, "Emerging Infectious Diseases: Actions Needed to Ensure Improved Response to Zika Virus Disease Outbreaks." I am pleased to be able to provide you with the requested information. If you or your staff have any questions about our responses, please contact me at (202) 512-6412 or personst@gao.gov.

T. M. Persons

Timothy M. Persons, Ph.D.
Chief Scientist

Enclosure

The Honorable Tim Murphy

1. **Why does the GAO think that it is important that the FDA consolidate information about tests, and require manufacturers to list the identity of the comparator assay?**

Currently, the lack of access to performance data prevents diagnostic test users from making informed decisions about which diagnostic test to adopt or recommend during the outbreak. Information on performance characteristics presented in each diagnostic test product label was not consolidated across available tests, and the identity of the comparator assay was not listed on some labels, making it challenging for users to make informed decisions about which test to adopt or recommend to patients. As a result, recommendations on diagnostic tests in our May 2017 report encourage increased access to performance data on diagnostic tests to allow for a more informed environment for patient care (i.e., increased access to performance information for clinicians as well as a higher quality of insight in support of patient decision-making).[1]

2. **You reported that some diagnostic test users also faced challenges complying with some equipment requirements to perform specific tests. (How) has this problem been addressed, how did the costs of obtaining new equipment affect localized budgets, and can you provide some examples?**

Since our work focused on selected organizations, we are not aware of the extent to which, if any, this problem has been addressed across public health laboratories such as the Laboratory Response Network (LRN), or other laboratories at the local, state, and federal level. Even so, representatives from several public health laboratories we interviewed stated that they had to acquire specific new equipment to be able to perform a certain authorized diagnostic test and that it posed some unexpected budgetary burden upon them. For example, according to Department of Defense (DOD) officials, many DOD laboratories needed to procure the equipment required to perform the Centers for Disease Control and Prevention (CDC)'s IgM antibody capture enzyme-linked immunosorbent assay (MAC-ELISA).[2] There was delayed implementation of this serological assay within DOD laboratories primarily due to the need for Army LRN participating laboratories, which constitute the majority of the DOD's LRN participating laboratories, to acquire the equipment required to perform the assay. The Army was able to secure funding for the purchase of the equipment, which was subsequently distributed down to the individual laboratories for their procurement action. As another example, a state public health laboratory we interviewed stated that they were hesitant to change to an Emergency Use Authorized test because they would have to purchase specific new equipment. CDC officials stated that the agency is working to expand diagnostic testing capacity within both public health and commercial laboratories in the United States.

The Honorable Kathy Castor

1. **Please provide an update on vaccine development and clinical trials.**

[1]GAO. *Emerging Infectious Diseases: Actions Needed to Address the Challenges of Responding to Zika Virus Disease Outbreaks*, GAO-17-445 (Washington, D.C.: May 23, 2017).

[2]The MAC-ELISA is used to detect antibodies created against the Zika virus. ELISA is a technique designed for detecting and quantifying substances such as antibodies. Antibodies are made by the body in response to antigens such as viruses.

At present no vaccine has been approved by the Food and Drug Administration to prevent Zika virus disease but there are several vaccines that are in different development phases. For instance, according to National Institutes of Health (NIH) officials, the National Institute for Allergy and Infectious Diseases (NIAID) is developing and investigating multiple Zika vaccine candidates, including vaccines based on technologies that have shown promise against other related diseases.[3] One candidate Zika vaccine entered a Phase 1 clinical trial in 2016. According to officials, NIAID launched a multi-site Phase 2a/2b clinical trial of this vaccine in March 2017 that aims to enroll at least 2,490 healthy participants in various sites in the Americas. The study will evaluate whether the experimental vaccine is safe and able to stimulate an adequate immune response, and importantly whether it can prevent disease in areas with ongoing mosquito-borne Zika transmission. NIAID scientists also are developing other Zika vaccine candidates using a variety of approaches that are anticipated to start clinical trials in late 2017 and 2018. According to NIAID officials, while multiple vaccine approaches are promising, it is important to realize that the development of investigational vaccines and the clinical testing required to establish their safety and effectiveness take time and a safe, effective, and fully licensed Zika vaccine likely will not be available for several years.

2. **Please provide the latest information on the Zika vaccine licensing agreement between the U.S. Army and Sanofi and any relevant details.**

We have not conducted the work necessary to answer this question. The U.S. Army should be able to provide an up-to-date answer on this inquiry.

3. **With many members of Congress, states and public health advocates worried that the Zika vaccine being developed at Walter Reed Army Institute of Research with taxpayer dollars will be priced too high, how is the federal government working to ensure Sanofi, when/if a licensing agreement is made, will sell this taxpayer funded vaccine at an affordable price to federal and state governments and to consumers?**

We have not conducted the work necessary to answer this question. The U.S. Army should be able to provide an up-to-date answer on this inquiry.

4. **How has public health advice regarding Zika evolved over the past few years for young men and women? What do we know now that we did not before and what new information could be on the horizon**?

Since the Zika virus was a newly emerging infectious disease threat in the United States relatively little was known about the virus prior to 2016. There was a lack of knowledge of Zika virus biology and infections, especially at the beginning of the U.S. outbreak. In January 2016, the Centers for Disease Control and Prevention (CDC) released interim guidelines for pregnant women that recommended that all pregnant women consider postponing travel to areas where Zika virus transmission is ongoing, and pregnant women with a history of travel to an area of Zika virus transmission should be evaluated for Zika virus infection.[4] In February 2016, the CDC

[3]Anthony Fauci, Director, National Institute of Allergy and Infectious Diseases, *Research Conducted and Supported by the National Institutes of Health (NIH) in Addressing Zika Virus Disease*, testimony before the House Committee on Energy and Commerce Subcommittee on Oversight and Investigations, May 23, 2017.

[4]E. E. Petersen, J. E. Staples, D. Meaney-Delman, *et al.* "Interim Guidelines for Pregnant Women During a Zika Virus Outbreak — United States, 2016." *Morbidity and Mortality Weekly Report,* vol. 65, no. 2 (2016):30–33.

also published guidelines for sexual transmission that recommended that men who reside in or have traveled to areas with active Zika virus transmission with pregnant partners should abstain from sexual activity or use condoms for the duration of the pregnancy.[5] For men with partners that are not pregnant CDC recommended taking several factors into account but did not suggest a timeframe that Zika virus may persist in the semen. CDC updated guidance in April 2016, stated that women with possible Zika virus exposure are recommended to wait to conceive until at least 8 weeks after symptom onset (if symptomatic) or last possible Zika virus exposure (if asymptomatic).[6] Based on new data, CDC updated guidance in September 2016 recommending that all men with possible Zika virus exposure who are considering attempting conception with their partner, regardless of symptom status, wait to conceive until at least 6 months after symptom onset (if symptomatic) or last possible Zika virus exposure (if asymptomatic).[7]

At the beginning of the outbreak, there was uncertainty regarding, which sample type to use for diagnostic testing. For instance, the Zika virus had been found to be present longer in urine than in serum or plasma, but information on just how long the virus could persist in different bodily fluids was still evolving. We now know that compared to related viruses, the Zika virus is present at low levels in bodily fluids of patients during an active infection. Information is still evolving about antigens that are unique to the Zika virus and how long the virus persists in various bodily fluids, making it difficult to develop diagnostic tests for the virus.

Knowledge about Zika virus has increased in the past year, including information about Zika virus disease incidence and distribution of cases and its associated adverse health outcomes. For example, researchers have concluded that a causal relationship exists between prenatal Zika virus infection and microcephaly and other serious brain abnormalities. While much has been learned about the Zika virus, many unknowns still remain in regards to its epidemiology, including the total number of infections, the biological mechanisms, risks, reasons for geographic differences, the full spectrum of outcomes associated with maternal-fetal transmission, the presence and duration of the virus in different bodily fluids, the role of prior Zika virus infections or exposure to other related flaviviruses, and the full spectrum of short and long-term outcomes of Zika virus infection.

5. When does each federal agency believe they will run out of money to respond properly to Zika, including vector control, surveillance, vaccine and diagnostics development/improvement and research?

We have not conducted the work necessary to answer this question but the Zika supplemental appropriation funds provided for in the Zika Response and Preparedness Appropriations Act, 2016 (Pub. L. No. 114-223, div. B) must be obligated by the end of the Fiscal Year 2017 (i.e., September 30, 2017). The Act also includes a provision that GAO conduct oversight of the activities supported with funds appropriated by the Act, which we have begun.

---

[5]A. M. Oster, J. T. Brooks, J. E. Stryker, *et al.* "Interim Guidelines for Prevention of Sexual Transmission of Zika Virus — United States, 2016." *Morbidity and Mortality Weekly Report,* vol. 65, no. 5 (2016):120–121.

[6]E. E. Petersen, K. N. D. Polen, D. Meaney-Delman, *et al.* "Update: Interim Guidelines for Health Care Providers Caring for Pregnant Women and Women of Reproductive Age with Possible Zika Virus Exposure — United States, 2016." *Morbidity and Mortality Weekly Report,* vol. 65, no. 5 (2016):315–322.

[7]E. E. Petersen, D. Meaney-Delman, R. Neblett-Fanfair, *et al.* "Update: Interim Guidance for Preconception Counseling and Prevention of Sexual Transmission of Zika Virus for Persons with Possible Zika Virus Exposure — United States, September 2016." *Morbidity and Mortality Weekly Report,* vo. 65, no. 39 (2016):1077-1081.