

IMPLEMENTING ZIKA VIRUS (ZIKV) LABORATORY DIAGNOSTICS IN BRAZIL: PAST CHALLENGES, CURRENT DIFFICULTIES AND THE PROMISING FUTURE

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The development of new lab diagnostic mechanisms is crucial for high confidence among lab test results, especially in Brazil, where frequently, blood and urine samples are used for ZIKV diagnostics, displaying low sensitivity under RT-qPCR, due to the low ZIKV viral load. In an attempt to improve the arboviruses diagnostics in the public health settings, countries have developed their own lab-testing algorithm, based on their adopted criteria for surveillance, incidence rates, and target population. In the last year, ZIKV has been classified as ESPII.

In Brazil, the Ministry of Health (MOH), through the National Lab Coordination (CG-LAB) has led inter-agencies discussion on the best lab-testing algorithm, providing key lab supplies and equipment to the reference public health lab network (LACENs). Technological improvements have immediate impact in the algorithm, such as the recent adoption of rapid diagnostic tests (RDTs), IgM/IgG and IgM/IgG ELISA. The testing algorithm, proven relevant, enables accurate forecasting and procurement of lab equipment and supplies. The IgM/IgG is expected to be the first RDT algorithm adopted by the MOH for the public health services, initially offered to pregnant women. In the case of a reactive result, the patient's sample will be confirmed for possible ZIKV infection, through IgM/IgG ELISA, by the reference (LACEN) lab. If the patient additionally displays symptoms compatible with a ZIKV infection, a sample will be tested using RT-qPCR (gold standard). A false-negative result, in a patient without signs of viral infection, due to a weak sample viral load, is a limitation, but should not discard possible recent infection. Appropriate lab-testing algorithms, including serologic IgM/IgG ELISA and RDTs result in accelerated conclusions on cases previously not determined, enabling prompt lab reports.

A technical assistance partnership between the CDC/Brazil office and the Brazilian MOH was launched in November 2016, aiming to build diagnostics capacity in the areas of immunohistochemistry and immunopathology, improving the accurate post-mortem diagnostics in human tissues, preventing cross-reactive results from other arboviruses. A new lab-testing algorithm is being discussed among national public health stakeholders, including RT-qPCR on samples of semen, CRL, amniotic fluid, as well as ELISA.

The discussion on validating a lab algorithm, to be adopted by the MOH, is the key for ensuring speedy implementation of appropriate health surveillance processes, serving as guidance for other countries facing similar endemic challenges. Guaranteeing the quality control for all lab diagnostics, through up-to-date technology and reliable results, is the cornerstone towards the global epidemics.