

# **Perspectives on the use of rapid diagnostic methods for detection of COVID-19**

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## **Abstract**

In the recent outbreak of the COVID-19, the use of rapid diagnostics have escalated drawing a large number of companies and manufacturers to come up with new testing kits. The merits and demerits of these rapid diagnostics must be carefully evaluated with proper validation and understanding prior to its use to help prevent misguidance. Research into improvement of these existing diagnostics towards disease surveillance and epidemiology should be highly encouraged.

**Key words:** SARS-CoV-2, Diagnosis, COVID-19, Coronavirus

## Background

Coronaviruses have become the cause of large-scale epidemics in human such as the severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) [1,2]. Subsequent to the global outbreak of COVID-19, (<https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020%5D>), a huge demand for rapid diagnostic kits for SARS-CoV-2 infection has led to the production of a wide range of assays by different manufacturers. The first line of diagnosis for COVID-19 is a PCR-based method for detection of viral nucleic acids. Another test is a serological test based on the detection of viral antigens or antibodies in the blood of infected individuals. However, these methods may be helpful either during the early stage of infection or later in the recovery phase [3]. This is because antigens are expressed only when the virus is actively replicating during the early phase of infection and also the immune system takes some time to synthesize the antibodies. On the other hand, antibody-based testing is applicable to recovery phase or asymptomatic carriers since it measures the antibody developed in response to the COVID-19 infection [8,9].

Besides, serological testing has a major advantage in detection of individuals who have recovered from an earlier COVID-19 infection and have developed an immune response. Further, they may be the source for obtaining convalescent blood plasma for possible treatment of critically ill COVID-19 patients (<https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-serological-tests>). The occurrence of false negatives or positives has been a problem in the use of rapid diagnostics that can be attributed by many external and intrinsic factors. This type of false result may slow-down the process of disease management and control, and therefore, it is necessary to be cautious in decision-making or confirmation of cases rather than be misinformed.

In view of the urgent need for rapid and reliable diagnostic methods, the US Food and Drug Administration (FDA) have expedited review of diagnostic tests to combat COVID-19 by providing unprecedented flexibility to laboratories and

manufacturers to develop and offer tests across the country (<https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-expedites-review-diagnostic-tests-combat-covid-19>). In a recent development, for example, FDA approves one rapid test for COVID-19, which is based on saliva test that will reduce the risk and is much faster than swab collections (<https://edition.cnn.com/2020/04/14/health/coronavirus-test-saliva-fda-emergency-use-bn/index.html>).

## **Conclusion:**

In order to prevent the widespread of SARS-CoV-2, more reliable diagnostics are necessary and more improvement is needed over the existing ones. Collaborative research and sharing of knowledge must be encouraged towards the development of faster and reliable diagnostics. At the same time, public awareness and dissemination of WHO guidelines must be of foremost priority in outbreak control and crisis management.

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