

Innovations in diagnostics during COVID-19: Implications for future genomic surveillance

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Abstract

The coronavirus virus disease 2019 (COVID-19) has claimed more than seven million lives with more than 775 million of confirmed cases as of 14 April 2024. During the COVID-19 pandemic, researchers and health industries raced towards the development of various diagnostic tests for early detection of the causative agent, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), with the aim of reducing the healthcare burden and implementing effective mitigation strategies. In a short span of four years since the onset of the pandemic, various innovative diagnostics for SARS-CoV-2 infections have been developed including PCR-, isothermal amplification- and sequencing-based approaches. Some diagnostics were developed for centralized laboratory testing while some were developed for self-testing by the patients themselves at home. Interestingly, whole genome sequencing of SARS-CoV-2 by using next-generation sequencing technologies became the method of choice for tracking of the viral evolution and epidemiology. In this presentation, a walk-through of innovations in diagnostics for COVID-19 will be given and the implications of these innovations for genomic surveillance in the future will be highlighted. It is believed that these innovations can serve as precedents for the development of tools to fight other communicable diseases and achieve SDG target 3.3.

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