

Can we prevent a New COVID-19 Wave? Current Knowledge and Experience

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COVID-19 cases, need for the intensive care unit beds and the deaths increased in the new wave, despite improvised therapy with knowledge gained. Burnouts and depressions are rampant among health-care workers.^[1] Now even the medical and nursing students have been roped in. The health infrastructure is stretched to its extreme. Many fires have occurred in healthcare facilities providing treatment to COVID-19 patients. Major measures like declaring the state of emergency or lockdowns witnessed large economic impact forcing governments to relax these to support economic activity. During the newer waves, bed availability has been an unrelenting problem because of the unprecedented number of the infected. Although the capacity building of the medical systems has been done, maintaining that system is an issue.^[2]

During the two waves, factors reducing containment delays have effectively controlled the spread of disease. Practical surveys are needed to establish contact dimensions based on the shorter time intervals of symptoms between infector and infected. More vigil is required due to transmission during the presymptomatic phase. High transmission in groups requires prohibition on large crowds while still focusing on home-based precautions.^[3] Newer disease waves have witnessed extensive rapid antigen testing for rapid diagnosis and isolation while more infectious strains and reinfections were presumed indicated by polymerase chain reaction testing and antibodies testing.^[4]

Since the tertiary care systems are both costly and limited and not adequate to handle the sheer catastrophic nature of this pandemic, we need smart solutions to predict an impending disease wave. Trends analysis of the number of patients, emergency referral, and advanced life support ambulances dispatched and a 20% increase compared to 5 years mean can indicate an impending crisis. Experience has shown that there is a window of opportunity of 30 days for instituting suitable measures before a COVID-19 wave arrives following

such surge in critical patients.^[5] Dynamic surveillance using indicators of speed, acceleration, jerk, and persistence can also assist proactive interventions. Geographical containment measures can be suitably guided to avoid economic impacts.^[6] A combination of making the response local but coordinated centrally seems to be the most successful practice to assess track and trace systems and their capability to pinpoint accurately those who are spreading the disease or most at risk.^[7]

Developing and maintaining the huge healthcare infrastructure needed has a large economic burden requiring stronger measures and additional assistance. Political commitment for prioritizing requirements of hospitals and adequate compensatory payments are needed to be in place. The management of science policy and its communication needs focus to ensure an understanding of both the engineering and virology of society.^[7]

Environmental health indicators are weakly associated with COVID-19. Countries with higher levels of PM_{2.5} exposure are likely to have higher number of confirmed cases and death cases.^[8] Transmission dynamics are twofold. Human-to-human transmission depending on the density of the population and a stronger mechanism of air pollution to human transmission with accelerated diffusion of viral infectivity in polluted industrialized cities with low wind speed. A comprehensive socioeconomic and environmental strategy based on sustainability science and environmental science, and not only in terms of biology, medicine, healthcare, and health sector is needed to prevent such epidemics.^[9]

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How to cite this article: Mohammad K, Choudhary AH. Can we prevent a new COVID-19 wave? Current knowledge and experience. *Int J Env Health Eng* 2021;XX:XX-XX.

Received: 04-06-2021, **Accepted:** 16-08-2021, **Published:** 30-09-2021

Access this article online

Quick Response Code:



Website:
www.ijehe.org

DOI:
10.4103/ijehe.ijehe_9_21

Vaccination will take due time before herd immunity is affected allowing unrestricted social contact.^[1] COVID appropriate behavior including face masks, hand washing, and physical distancing are valuable in containing spread in combination with extensive testing, isolating, and contact tracing. As administrations withdraw lockdowns, maintaining low positivity rates through reduced spread is the key that can keep hospital-based care requirements within the handling capacities of the health-care systems until vaccination can be fully effective.^[10]

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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