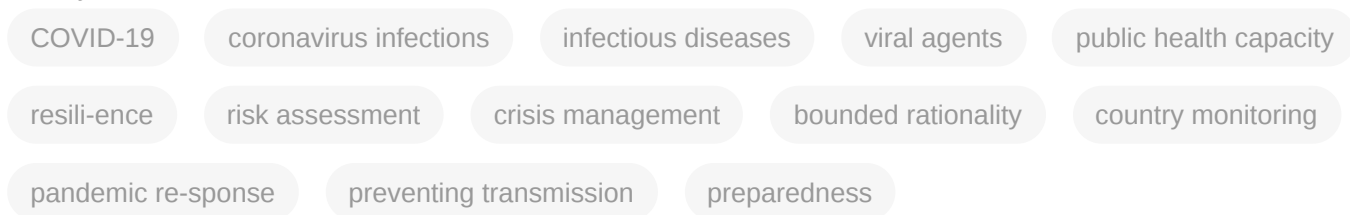# Pandemic Prevention: Lessons from COVID-19

Subjects: Virology

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Coronavirus disease 2019 (COVID-19) is caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which appeared in late 2019, generating a pandemic crisis with high numbers of COVID-19-related infected individuals and deaths in manifold countries worldwide. Lessons learned from COVID-19 can be used to prevent pandemic threats by designing strategies to support different policy responses, not limited to the health system, directed to reduce the risks of the emergence of novel viral agents, the diffusion of infectious diseases and negative impact in society.

COVID-19   coronavirus infections   infectious diseases   viral agents   public health capacity

resili-ence   risk assessment   crisis management   bounded rationality   country monitoring

pandemic re-sponse   preventing transmission   preparedness

Coronavirus disease 2019 (COVID-19) is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which appeared in late 2019 [1]. SARS-CoV-2 and its mutations have generated a pandemic with high numbers of infected individuals and deaths in manifold countries worldwide [2][3]. In this context, it is important to design strategies of crisis management to cope with/prevent pandemics of novel infectious diseases similar to COVID-19. The concept of strategy has a critical role in a framework of crisis management [4]. Strategy is a current mode of cognition and action to enable individuals and/or organizations to take advantage of important opportunities or to cope with consequential problems and/or environmental threats in society, such as pandemics, earthquakes, etc. Nations and their institutions have to prepare long-run strategies and specific plans of crisis management for pandemic threats to guide timely processes of decision-making to support the application of effective actions and interventions for solving consequential problems in society [4][5]. Strategies of crisis management should deal with pandemic threat before the emergence and in the presence of an unforeseen pandemic, they have to reduce negative effects in society [6]. The main goal of these strategies is to reduce hazards and risks that certain factors pose to public health and the environment, and solve the problems of pandemic crises with effective and rapid decisions directed to policy responses for reducing uncertainty and supporting, as soon as possible, the recovery of socioeconomic systems. In particular, strategies of countries for unforeseen pandemic crisis can be [7][8][9]:

- Responsive, based on the application of a previous plan of interventions ready to be used that endeavors to solve all consequential problems of pandemic crisis.

- Preventive, based on the planned interventions directed to reduction of risk factors associated with the emergence and diffusion of pandemics, and the design ex-ante of effective solutions for problems generated by a pandemic threat/crisis, preparing rapid strategic actions to stop or reduce negative effects in society.

The logical structure of these strategies of crisis management is based on the following vital aspects:

- Analysis of the causes, hazards, risk factors and effects of pandemic threat (problem) in society, and possible solutions.

- Analysis of a limited number of variables associated with proposed solutions for achieving and sustaining specific goals given by the reduction of hazards and risk factors of the emergence of pandemics or negative effects in the presence of ongoing pandemic in society.

- Analysis of different solutions to pandemic threats and crises, and evaluation of pros and cons.

- Choice of the satisfying solution in the context of limited rationality and a turbulent environment.

- Application of the critical decision of problem solving for achieving the goals, evaluating expected results in a short period of time to refine and improve the decision-making process with continuous learning processes.

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