

What Happens After Disease X: Using One Health to Prevent the Next Pandemic

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On March 11, 2020, the World Health Organization (WHO) officially declared COVID-19 a global pandemic. This is the first time the world has seen a pandemic sparked by a coronavirus, but it is not likely the last pandemic our world will experience. While the virus almost certainly originated in animals, COVID-19 is now a human-to-human transmitted disease. This is the fifth emergence of a major zoonotic disease in the two decades since 2000. The world's anticipation and response to the current crisis have been hampered and stunted by siloed responses to emerging and highly transmissible infectious diseases.

Nearly 75 percent of new emerging human pathogens are zoonotic—meaning they made the “jump” from animals to humans. Ebola, HIV, zoonotic influenza, MERS-CoV, and most recently SARS-CoV-2 are the major examples. The continuing expansion of human populations and increasing complexity of human food systems, worsened by climate-related impacts, have led to greater and more frequent human incursions into wildlife habitats, more interactions between humans and wild animals, and continued changes to livestock production and food consumption patterns, all resulting in increased exposure of humans to pathogens that previously resided in and were passed only between animals.

The COVID-19 pandemic is just the latest expression of these trends. Although public health systems have planned and prepared to respond to pandemics in the past, those efforts have often focused primarily on the human-related public health and clinical response rather than on prevention. Health systems and cross-sectional decision-makers have often ignored the source of the infection, the human behaviors that drive transmission risk, the need for rapid diagnostics, the importance of identifying routes of transmission, and the recognition of how interconnected the human

race is to other animals and the ecosystem. In short, the health systems and decision-makers have failed to establish biosurveillance at the human/animal interface that would allow actions to be taken to thwart pandemics.

The concept of “One Health” recognizes that human, animal, plant, and environmental health are interconnected. It is a collaborative framework that unites education, research, industry, government agencies, and health officials at the local, regional, national, and global levels. Human, veterinary, plant, and environmental health systems have historically functioned in isolation from one another. Barriers to sharing information, funding, goals, tools, priorities, and processes contributed to the failure to predict, prevent, and respond to this pandemic. Interdisciplinary and interagency collaborations and data sharing using a robust One Health framework will allow the world not only to be better prepared for the next crisis but perhaps to prevent it from happening at all. Even now, in the middle of this pandemic, adopting the One Health paradigm would enable a more efficient response and minimize loss of life. We must use the lessons of COVID-19 to build a better, more holistic and integrated system now. Building such collaborative systems would facilitate the prevention of new species jumps and allow early control of the spread of newly emerged diseases to and among humans.

Rahm Emanuel popularized the aphorism, “you never want a serious crisis to go to waste” and described the opportunity for change that comes in the wake of a catastrophe. This is a reminder to view the current pandemic as not only a global health crisis, but also a chance to demonstrate the value of using the One Health paradigm to learn from the COVID-19 pandemic. The magnitude of this pandemic's impact on the health and well-being of families and communities, the

health system, and the global economy not only provides a unique just-in-time opportunity to prevent and prepare for the next threat, but demands that health systems and decision-makers do so using a holistic, transdisciplinary, and enterprise-wide approach.

The emergence of the COVID-19 pandemic is a One Health challenge that begs for collaborative efforts from multiple disciplines and authorities. But a roadmap must be implemented first, by putting a One Health program in place. While a number of notable organizations have developed operational guidance, policies, and content embracing and advancing a global One Health approach, little guidance exists for the United States. Thus, state and local entities are left on their own to operationalize and implement One Health policies and actions—if and when they recognize its value. The One Health Action Collaborative, an ad hoc activity of the Forum on Microbial Threats at the National Academies of Sciences, Engineering, and Medicine, is engaging with stakeholders to fill this gap by recommending a workable framework for local and regional public health departments and other organizations to use when planning, implementing, and evaluating their One Health policies, strategies, and practices.

The WHO R&D Blueprint has been releasing an annual list of priority diseases to direct governmental attention to research and development on conditions that pose serious threats to society [1]. “Disease X,” a placeholder name serving as a reminder that the most serious disease threat is likely the one as yet unknown, topped the 2018 list [2]. Today’s Disease X is COVID-19, but there will surely be others. While it is unknown when the next threat will arrive or what it will be, health systems and decision-makers can seize this COVID-19 moment as an opportunity to highlight the complex interactions among humans, animals, plants, and the environment and to reorient our systems to be better prepared for the next complex One Health challenge that we will inevitably face.

We will get through this pandemic. But we do not have to wait until the next one before implementing the One Health approach to secure a healthier future for our nation and the world.

References

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