

## Towards pandemic preparedness beyond COVID-19



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Emerging and re-emerging zoonoses constitute major threats to human health and cause considerable socioeconomic problems globally. More than 60% of human emerging infectious diseases are zoonotic and most (72%) originate in wildlife.<sup>1</sup> Zoonotic microbes, with the capacity for human-to-human transmission, have the greatest pandemic potential.<sup>2</sup> The 1918 H1N1 influenza pandemic was the most severe in modern history to date and caused the deaths of tens of millions of people worldwide.<sup>3</sup> Since then, three other influenza pandemics have emerged: in 1957 (H2N2 or Asian flu), in 1968 (H3N2 or Hong Kong flu), and in 2009 (H1N1 or swine flu).<sup>4</sup> In addition, several epidemics caused by Ebola virus, Zika virus, chikungunya virus, Nipah virus, severe acute respiratory syndrome (SARS) coronavirus, and Middle East respiratory syndrome (MERS) coronavirus have been reported over the past two decades, causing numerous human deaths, with the potential for pandemic spread. COVID-19 is a new pandemic disease, first identified in China, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).<sup>5</sup> As of July 2, 2020, there had been more than 10·8 million confirmed human cases of COVID-19 across more than 200 countries, resulting in more than 519 000 human deaths, but the true numbers of cases and deaths are probably much greater, and continue to increase.

It is evident that the scientific community in many countries has been greatly affected by COVID-19. Billions of dollars have been invested in anti-pandemic efforts, including research and disease control. However, it is important to emphasise that these efforts—as crucial for global health as they are—also have high costs in terms of other global health aspects. A recent study in *The Lancet Global Health* predicted that child mortality could increase by as much as 45%, and maternal deaths by as much as 39%, in low-income countries because of lockdowns, interruption of vaccination programmes, and overload of health-care facilities, but also fear of visiting such facilities, all as a result of the COVID-19 pandemic.<sup>6</sup> In the same way, the COVID-19 pandemic has also affected continuous research and other pandemic preparatory efforts. Several disease surveillance programmes have been delayed, postponed, or cancelled. During the past few months of the COVID-19

pandemic there have been several outbreaks of zoonotic diseases that did not gain much concern from the international scientific community; for example a recent Ebola virus outbreak in the Democratic Republic of the Congo after a period of 2 years without any reported cases in that region of the country.<sup>7</sup> In addition, in 2020, 197 human deaths associated with Lassa virus infection have been reported in Nigeria, with a case-fatality rate of 19·4%.<sup>8</sup> Moreover, several novel strains of zoonotic avian influenza viruses have continuously evolved, as reported from many countries.<sup>9</sup> New outbreaks of infectious disease can easily emerge unnoticed when general health care is reduced. Vaccination programmes and other public health initiatives are important for prevention and surveillance of emerging zoonotic infections, not least in low-income and middle-income countries. Hence, when such activities are reduced, the risk of new emerging zoonotic disease outbreaks with potential for global spread is greatly increased. Although COVID-19 has increased our experience in pandemic preparedness, it is important to think about worst-case scenarios, and to consider pandemic pathogens other than coronaviruses. Are we sufficiently prepared for a new pandemic? Do we stock enough personal protective equipment and pharmaceuticals? Is there appropriate infrastructure in place for rapid dissemination and exchange of data and materials? How do we prepare for extensive testing for a new pathogen that is currently unknown? Are we ready to deal with another pandemic in parallel with COVID-19, or another pandemic in the near future? And maybe most importantly, how do we ensure continued capacity to treat the most common infections, such as pneumonia, influenza, and bacterial and viral gastroenteritis, during a pandemic?

The emergence of several zoonotic diseases over the past two decades calls for updated global systematic surveillance programmes in wildlife and for re-evaluation of current disease-control programmes. Although we are now focused on COVID-19, it is crucial not to forget about other zoonotic pandemic threats. The One Health approach is imperative to maximise the chances of identifying zoonotic pathogens with pandemic potential before they spread to humans. One Health is an effective framework to increase collaboration between different disciplines and

countries, and for effective data-sharing. We need to be proactive; COVID-19 has clearly shown the enormous costs of a pandemic, but the disease is also a good example of a pandemic that could have been prevented or mitigated by a clearer One Health perspective with increased surveillance in wildlife and in people who breed, trap, and sell live animals. Hence, One Health-oriented preventive measures need to receive appropriate attention and funding, in order to mitigate the risk of a new zoonotic pandemic outbreak.

We declare no competing interests.

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*\*Mahmoud M Naguib, Patrik Ellström, Josef D Järhult, Åke Lundkvist, Björn Olsen*  
**mahmoud.naguib@imbim.uu.se**

Zoonosis Science Centre, Department of Medical Biochemistry and Microbiology (MMN, ÅL) and Department of Medical Sciences (PE, JDJ, BO), Uppsala University, Uppsala SE-75237, Sweden

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