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deforestation and incursion destroys wildlife health and habitat and speeds interchange between humans, wildlife and domestic animals. The threats to human, animal and environmental health are inextricably linked, and instruments to address them need to include climate change agreements and “30x30” global biodiversity targets<sup>(26, 27)</sup>.

**SARS-CoV-2 is just such a virus of zoonotic origin whose emergence was highly likely.** Current evidence suggests that a species of bat is the most likely reservoir host. The intermediate host is still unknown, as is the exact transmission cycle. WHO convened a technical mission to better understand the origins of the virus<sup>(28)</sup>. While the mission has now reported, investigations of the origins of the virus will continue. The experience of other pandemics, such as HIV, suggest that it will be some time, possibly years, before there is an accepted consensus about how and when the virus first infected humans and when and where the first human-to-human transmission clusters occurred. There is some evidence, based both on reconstructions looking backwards in time at the likely epidemiology and through the analysis of samples collected and stored, that the virus may already have been in circulation outside China in the last months of 2019. This evidence, however, still requires further examination, and confounding explanations, such as the contamination of samples, are still to be ruled out.

COVID-19 exposed a **yawning gap** between limited, disjointed efforts at pandemic preparedness and the needs and performance of a system when actually confronted by a fast-moving and exponentially growing pandemic.

The Panel’s conclusion is that closing the preparedness gap not only requires sustained investment, it requires a new approach to measuring and testing preparedness. **Drills and simulation exercises resulting in immediate rectification of identified weaknesses must become routine**, and preparedness assessment must place more focus on the way the system functions in actual conditions of pandemic stress.

**Zoonotic outbreaks are becoming more frequent, increasing the urgency for better detection** and more robust preparedness. Given the increasing stakes, monitoring pandemic threat needs to be on the agenda of decision-makers at the highest levels of governmental, intergovernmental, corporate and community organizations.

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