The next pandemic is coming, it’s time to take the ecological crisis seriously

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126 Swiss researchers, including 6 from Eawag, want to draw the attention their Swiss compatriots to the scientific evidence showing the link between the emergence of pandemics and human disturbance of the natural environment.

The COVID-19 pandemic was unimaginable for many and has given rise to the worst kind of conspiracy theories. For a large number of researchers, however, a widespread epidemic came as no surprise. In early 2018, the World Health Organization (WHO) even added “Disease X” to its list of “blueprint priority diseases.” It called on governments to plan ahead and stop the processes that cause mass epidemics, rather than just respond to diseases as they emerge.

Many laboratories around the world are devoting their efforts to understanding the epidemiological dynamics of emerging infectious diseases such as COVID-19. Some pandemics have already occurred, and it is almost certain that more will follow. The health, medical, social and economic problems we are discovering and experiencing right now are enormous. But these are not the only problems we need to solve.

The current epidemic belongs to the group of zoonoses, or diseases that link wildlife, domestic animals and humans. Humanity will always encounter viral, microbial and parasitic species for which it is neither adapted nor prepared.

It is estimated that the world’s 5,400 known mammal species are home to some 460,000 species of viruses, the vast majority of which are yet to be described. Most of these viral species are harmless to humans. Yet even a small percentage of infectious species represents a formidable pool of aggressors.

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For years, we have been dealing with HIV, Ebola, Dengue, Zika, Chikungunya, Lassa fever, SARS, H5N1, H1N1 and many other emerging diseases that, because they are less spectacular, have failed to make the headlines. But their numbers seem to have been rising steadily for half a century and epidemic episodes are becoming more and more frequent.

Wild mammals now represent only 5% of land-dwelling mammals by biomass, with humans and domestic animals accounting for the remaining 95%. One might believe that the threat of a virus passing from wild mammals to humans would therefore diminish. Rather, the opposite is happening because of humanity's pervasive footprint in every corner of our planet. As the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (https://ipbes.net) noted in its 2019 Global Assessment Report, our global footprint is becoming problematic, with 75% of terrestrial ecosystems and more than 65% of marine ecosystems significantly modified by human activities. These alterations are severely fragmenting natural landscapes and leading to biodiversity loss on a worrying scale. The resulting disruption of wild animal species' food chains can cause behavioral changes that push some species to exploit resources linked to human activities, thereby increasing the risk that pathogens could be transmitted to humans or domestic animals.

The viruses threatening humanity today are benefitting from this global expansion of interconnections between their potential hosts. For example, one such virus was still completing its life cycle in a bat population somewhere in Asia in the fall of 2019. It emerged in a Chinese market a few months later before spreading worldwide in March 2020. It seems that the virus we now know as SARS-CoV-2 came into contact with another virus carried by pangolins, picking up a gene that is particularly aggressive to humans in the process.

Pandemics are only one facet of global change. Equally worrying is the mass extinction of species caused by the transformation of natural environments, including habitat loss, resource extraction, widespread air, water and soil pollution, and climate change. We are now faced with the consequences of our actions, resulting from the economic and political choices that we as a species have made. Achieving sustainable development will require us to make different choices – choices that preserve, rather than destroy, natural environments. Just as the IPCC does for climate, the IPBES publishes a wealth of scientific facts and knowledge that governments can use to learn about the challenges of ecosystem and biodiversity conservation, and how to respond to them. People and organizations across society, starting with elected officials and politicians, should take advantage of this information to implement national and supranational policies that are commensurate with the challenges we face.

This need for political action inevitably shines a spotlight on the obstacles to better governance of our interactions with the biosphere and consideration of its sustainable limits. We, the undersigned, call on political leaders to act without delay on the causes of this dramatic pandemic in order to prevent future outbreaks, and to adopt a whole-systems approach that considers both our needs and our relationship with all living organisms.

In order to bring about the necessary changes, we call for innovative measures to counter climate change, to protect biodiversity, to preserve the rainforest and natural terrestrial and aquatic habitats, and to do everything possible to promote sustainable land use, as well as economic measures that allow us to significantly reduce our environmental footprint.

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