

PANDEMICS AND WILDLIFE

# Pandemics: The Animals are Innocent

Land-use change, agricultural expansion and urbanization cause more than 30 per cent of emerging disease events.

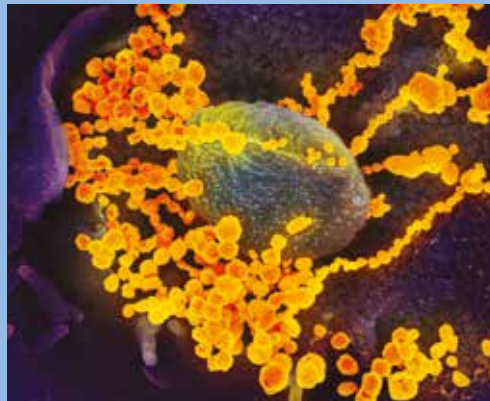
BY FELIX PATTON

**E**bola, Zika, influenza, HIV/AIDS and now Covid-19 -- the list of diseases and pandemics continues to grow, each with devastating well-being and economic effects on human life.

Understanding how the diseases originate and develop is vital to prevent such problems in future. It is generally accepted that without preventative strategies, pandemics will emerge more often, spread more rapidly, kill more people and affect the global economy with more a devastating impact than ever before.

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is an independent intergovernmental body established by states to strengthen the science-policy interface for biodiversity and ecosystem services for conservation and sustainable use of biodiversity, long-term human well-being and sustainable development. It currently reports having 137 member states.

The IPBES Bureau and Multidisciplinary Expert Panel authorized a workshop on biodiversity and pandemics in July 2020. Twenty-two experts from all regions of the world were brought together (virtually) to discuss several issues -- how pandemics



**TOP**

Severe acute respiratory syndrome (SARS) is a rapidly spreading, potentially fatal infectious viral disease.

**BELOW**

Pangolins are the world's most trafficked mammals. Trafficked pangolins can carry coronaviruses closely related to pandemic strain. Scientists and advocates say this new research is yet another reason to crack down on the illegal trade in these scaly mammals.

emerge from the microbial diversity found in nature; the role of land-use change and climate change in driving pandemics; the role of wildlife trade in driving pandemics; learning from nature to better control pandemics, and preventing pandemics based on a "one health" approach.

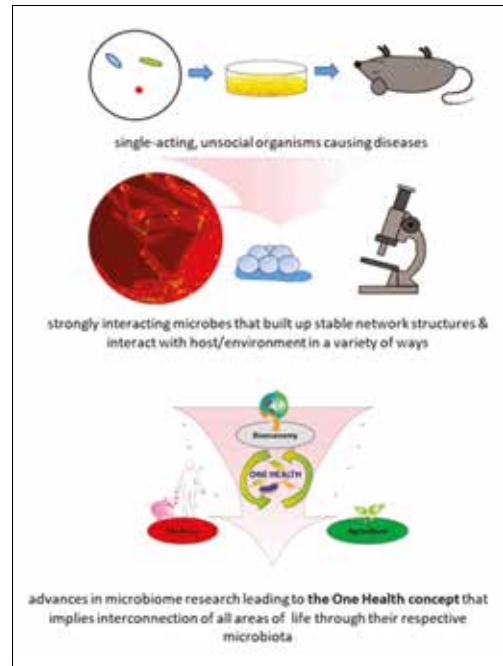
The scientific evidence on the origin, emergence and impact of COVID-19 and other pandemics was reviewed and options for controlling and preventing pandemics were identified. It was concluded that the underlying causes of pandemics include



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land-use change, agricultural expansion and intensification, and wildlife trade and consumption -- the same global environmental changes that drive biodiversity loss and climate change. These drivers of change bring wildlife, livestock, and people into closer contact.

Pandemics emerge from the microbial diversity found in nature. Diseases and almost all known pandemics caused by microbes of animal origin are known as zoonoses. Contact between wildlife, livestock, and people cause the microbes to cross over to humans. Such zoonoses include Ebola, Zika, Influenza, HIV/AIDS and now Covid-19.

Over half a million currently undiscovered viruses are thought to exist in mammal and avian hosts that could have the ability to infect humans. The most important reservoirs of pathogens with pandemic potential include mammals such as bats, rodents and primates and some, particular water birds as well as livestock such as pigs, camels and poultry.

Human ecological disruption and unsustainable consumption drive pandemic risk. It is understood that more than five new diseases are emerging in people every year, any one of which has the potential to spread and become pandemic. Emergence is caused by human activities and their impacts on the environment. The reported idea that wildlife is responsible for the emergence of diseases is misplaced.

The risk of a pandemic is driven by exponentially increasing human induced changes. Land-use change, agricultural expansion and urbanization cause more than

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30 per cent of emerging disease events.

Land-use change is believed to have caused the emergence of more than 30 per cent of new diseases reported since 1960 and so is a globally significant driver of pandemics. The change includes deforestation, human settlement in primarily wildlife habitats, the growth of crop and livestock production, and urbanization.

The trade and consumption of wildlife is a globally important risk for future pandemics. Statistics show that the legal and illegal trade in wildlife is growing annually and at a significant level. There has been a five-fold increase in the value of the international, legal wildlife trade in the last 14 years, which was estimated to be worth \$107 billion in 2019. The illegal wildlife trade is estimated to be worth \$7-23 billion annually.

About 24 per cent of all wild terrestrial vertebrate species are traded globally. One of the largest legal importers of wildlife is the United States, largely for the pet trade. Some 10-20 million individual wild animals (terrestrial and marine) are imported each year and the number of shipments rose from around 7,000 to 13,000 per month between 2000 and 2015.

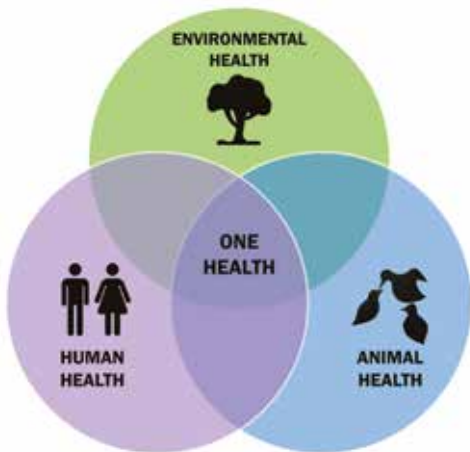
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Bats are a well-known mixing pot for viruses, some of which can spread to other animals and humans. The origins of diseases such as Sars and Ebola can be traced back to these flying mammals, and they have also been implicated in the spread of the new deadly Mers virus.

**24%**

Percentage of all wild terrestrial vertebrate species are traded globally.





There has been a substantial expansion of wildlife farming. This has been particularly so in China where, in 2016, ‘non-traditional animal’ farming generated \$77 billion while providing employment to 14 million people.

A major issue with the wildlife trade is that disease surveillance regulations are limited in scope. Such regulations as there are, are the responsibility of numerous authorities and are inconsistently enforced or applied.

Reducing human-induced global environmental change may reduce pandemic risk. Widespread human suffering and vast economic damage, likely to be worth more than a trillion dollars, are the outcomes from pandemics and other emerging zoonoses.

Global strategies to prevent pandemics based on reducing the wildlife trade and land-use change and increasing One Health (see box) surveillance are estimated to cost between \$22 and \$31.2 billion, reduced even further (\$17.7 to \$26.9 billion) if the benefits of deforestation on carbon sequestration are calculated -- two orders of magnitude less than the damages pandemics produce.

Conserving protected areas and measures that reduce the unsustainable exploitation of high biodiversity regions will reduce the wildlife-livestock-human contact interface helping to prevent the spill-over of novel pathogens.

**Controlling vs preventing a pandemic**

Current pandemic preparedness strategies aim to control diseases after they emerge. These strategies often rely on and can affect biodiversity.

Vaccine and therapeutic development are used to contain and then control a pandemic after the disease has emerged. Such strategies rely on a diversified nature for the organisms, molecules and genes from which to extract suitable products.



Emergency measures often have to be imposed to contain a pandemic, which can have significant negative implications for biodiversity, for example, culling of wildlife reservoirs and the release of insecticides. Travel restrictions to reduce the spread of COVID-19 have severely reduced ecotourism and other sources of income.

Escape from the Pandemic Era requires policy options that foster transformative change towards preventing pandemics. An alternative approach to pandemic preparedness strategies would be to reduce the drivers of pandemic risk to stop them before they emerge.

Research reviewed for the report identified a substantial body of knowledge that provides a pathway to predicting and preventing pandemics. There are ways to predict the geographic origins of future pandemics, to identify key reservoir hosts and the pathogens most likely to emerge, and that demonstrates how environmental and socioeconomic changes correlate with disease emergence.

The economic cost of pandemics should be integrated into consumption, production, and government policies and budgets. The experts suggested policies to tackle pandemic emergence.

**Reducing the role of land-use change**

Emerging disease-risk-health impact assessments should be developed and incorporated in major developments and land use projects. Benefits and risks to biodiversity and health should be recognized and explicitly targeted with financial rewards/penalties.

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One Health is both a call to action and a method. It involves breaking down the silos between the animal health, environmental health, and human health sectors so that we can track diseases wherever they are found and help prevent and quickly respond to outbreaks.

**\$77 BILLION**  
Amount in dollars that was generated in China from ‘non-traditional animal’ farming in 2016.



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Programmes should be developed based on the assessment of how effective habitat conservation Measures, including protected areas and habitat restoration programmes, can reduce pandemics and trade-offs where disease spill-over risk may increase.

The types of consumption, globalized agricultural expansion and trade that have led to pandemics (such as consumption of palm oil, exotic wood, products requiring mine extraction, transport infrastructures and meat/other products of globalized livestock production) should be significantly reduced. Taxes or levies may be useful for this.

### Reducing the impact of the wildlife trade

A new intergovernmental health and trade partnership should be formed, building on existing collaborations, focused on reducing

zoonotic disease risks in the international wildlife trade. Communities from all sectors in emerging infectious diseases hotspots need further education regarding the health risks associated with wildlife use and trade that are known to pose pandemic risks. Wildlife species in trade identified by expert review as posing a high risk of disease emergence should be reduced or removed.

The efficacy of establishing market clean-out days should be tested, cold chain capacity, biosafety, biosecurity and sanitation in markets should be increased. Disease surveillance of wildlife in the trade, and of wildlife hunters, farmers, and traders should be undertaken. Law enforcement collaboration on all aspects of the illegal wildlife trade should be enhanced.

### Critical knowledge gaps must be closed

Data is needed on the relative importance of the illegal/unregulated and the legal/regulated wildlife trade in disease risk. Sustainable mechanisms are required to achieve greater food security and reduce the consumption of wildlife. ●

*For further reading see the IPBES Workshop on Biodiversity and Pandemics, Workshop Report, 2020*



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### TOP

Trade in wildlife provides disease transmission mechanisms at levels that not only cause human disease outbreaks but also threaten livestock, international trade, rural livelihoods, native wildlife populations, and the health of ecosystems.

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Bushmeat is an important source of protein and income for many African people, but bushmeat-related activities have been linked to numerous emerging infectious diseases (EID) outbreaks, such as Ebola, HIV, and SARS.