



# National One World One Health Vision in support of the PREZODE initiative

8th March 2023

FPS Public Health, Food Chain Safety and Environment of Belgium,  
Galileelaan 5/2, 1210 Brussels

“One World, One Health” is based on the understanding that humans, animals, and the environment are inextricably linked, indicating that the world has suddenly realized the interrelation between ecology, animal diseases, and public health, striving to restore and maintain harmony and synergy.

## Context

With roughly billion yearly cases and millions of annual deaths, epidemic and endemic zoonoses are among the greatest burdens to human health and livelihoods, causing recurrent and persistent regional health problems worldwide. Zoonotic diseases pose a significant threat to global health and security and have caused hundreds of billions of US dollars of economic damage over the past 20 years; this number continues to increase with the current COVID-19 pandemic, estimated to have cost more than US \$11.7 trillion as of 2020. Scientific studies have shown us that “spillover” events, where pathogens jumped from animals to humans, are becoming increasingly frequent due to human actions altering the balance of our ecosystems like deforestation, land-use change or wildlife trade. Climate change, the loss in biodiversity and livestock industrial production are also key in understanding the evolutionary dynamics of viruses as well as the complex host-pathogen interactions.

The prevention of pandemic crises requires ambitious scientific and operational programs dedicated to preventing zoonotic disease emergence, ideally before human populations are affected, thus allowing the design of sustainable science-based prevention policies. Emergence events require the alignment of multiple drivers and conditions, ranging from reservoir and host distribution to adaptation to humans. Therefore, focusing only on the human link in the transmission chain overlooks the benefit of upstream intervention and the development of prevention strategies that would target the roots of these emergence events. It is more important than ever to synchronize research and set up global synergies between operational agendas against zoonotic disease emergence, climate change, and biodiversity loss in the post COVID-19 era, taking into account the need to build up sustainable food systems.

## Reaching a framework for Zoonoses prevention

A key step towards zoonotic disease prevention is assessing the costs and benefits of different socio-ecosystems by simultaneously considering agricultural practices, socio-economic activities, local populations’ social and economic well-being, various environmental impacts, and emerging disease threats, as suggested for sustainable food production.

No single strategy is expected to be 100% effective in preventing disease emergence; consequently, other safety nets are required to control the spread of unexpected emerging zoonotic diseases. Therefore, a major requirement for the implementation of scientific evidence-based prevention policies is to provide robust, cost-effective, and sensitive pathogen surveillance in wild and domestic animals, and install early warning systems for infectious disease outbreaks in animals and humans.

This approach allows a rapid response to emerging zoonotic diseases at the source and thus increases the effectiveness of interventions. It also illuminates trends and changes in the patterns of emerging diseases and helps develop cost-effective multisectoral response plans.



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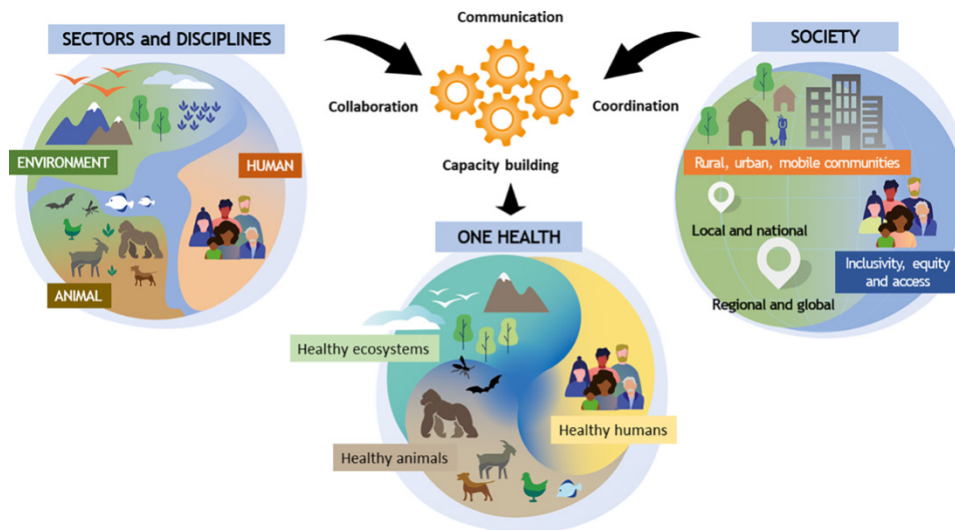


Fig. One Health toward a sustainable healthy future as developed by the OHHLEP.

## Pathways\*

(\*The list of pathways have been taken from the NL national action plan, it is not exhaustive)

Anthropogenic stressors to the environment, such as land use change, biodiversity decline, climate change and environmental pollution, cause or exacerbate animal-mediated diseases.

## Land use change

Land use change causes ecosystem fragmentation that enhances human contact with natural areas and wildlife. Habitat degradation – such as through agriculture, urbanization and deforestation – causes proliferation of species that are adapted to humans and live in closer contact with them. Increased environmental stress impairs wildlife immunity, causing shedding of pathogens to the environment and infection of other individuals and species, including humans.

## Vectors

Many vector-borne diseases are considered as emerging infectious diseases in the European Union. While some diseases and their respective pathogens are indigenous to Europe (e.g. Lyme disease), others have been introduced to Europe from tropical areas (e.g. chikungunya or dengue fever). These emerging diseases may represent a serious threat in near future due to e.g. climate change and better understanding of their spreading mechanisms, pathogenesis and consequent treatment is very important.



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### Climate change

Climate change and rising temperatures lead to the spread of zoonotic hosts and vectors, increasing the human population that is exposed to vector-borne diseases. Rising temperatures further stimulate the rate of reproduction of both pathogens and vectors. Foodborne infections also proliferate with increasing temperatures.

### Water and air

Reports of sickness, toxicity and death of wildlife and domestic animals due to air pollution are widespread. This can have an indirect effect on the spread of zoonotic disease by suppressing animals' immune systems and via biodiversity decline, although some surprising evidence showed a reduction in parasitic infections in pheasants and hares with higher air pollution. Effects on plant production and animal survival can also pose a human food security problem.

The proportion of zoonotic pathogens among all waterborne pathogens is unknown, but it is estimated to be substantial. Runoff from pastureland with free-ranging animals is also a major cause of faecal water pollution. Free-ranging animals have wide distribution and access to river and lakes, spreading pathogenic microorganisms such as *Campylobacter*, *Cryptosporidium* and *Giardia* into streams and rivers, compromising the safety of water sources.

### Wildlife Trade

Wildlife supports healthy ecosystems and it has been demonstrated that the increased interaction between humans and wild animals (dead or alive) gives rise to spillover events and outbreaks of such diseases. While recognizing its crucial role for the economy and food security, particularly in tropical countries, the trade in and consumption of wildlife is considered as a globally important risk for future pandemics. Initiatives to reduce the risks of zoonotic spillover as a result of the trade in a) wild meat and b) live exotic animals as pets imply actions in the countries of origin but also in the final destination countries that act as end consumers in the trade chain.



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## Priorities of the future

Solutions for the future lie in building resilient socio-ecosystems and reducing pressure on biodiversity and environmental health; empowering local communities in the reduction and early detection of emerging risks; better collaboration between sectors and partners from local to global levels; strong political engagement and evidence-based OWOH policies that maintain ethical practices and equity within countries and across borders.

## General questions for the breakout session

What is needed for a BE One World One Health vision - within the framework of zoonoses prevention?

What are the gaps / challenges that are preventing us from reaching this vision?

How can we bring people together (break the silos) and address some of these issues?

What are the One World One Health/Prevention priorities for the future?

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