

# Traiter les origines des émergences plutôt que leurs conséquences : l'importance de la santé des écosystèmes

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Faculty of Tropical Medicine



## Conflits d'intérêts

***Cette intervention est faite en toute indépendance vis-à-vis de l'organisateur de la manifestation. Je n'ai pas de conflit d'intérêts en lien avec le sujet traité.***

Matère  
à débattre • décider

# Emergence of infectious diseases

Risks and issues for society


Serge Morand, Muriel Figuié, eds.



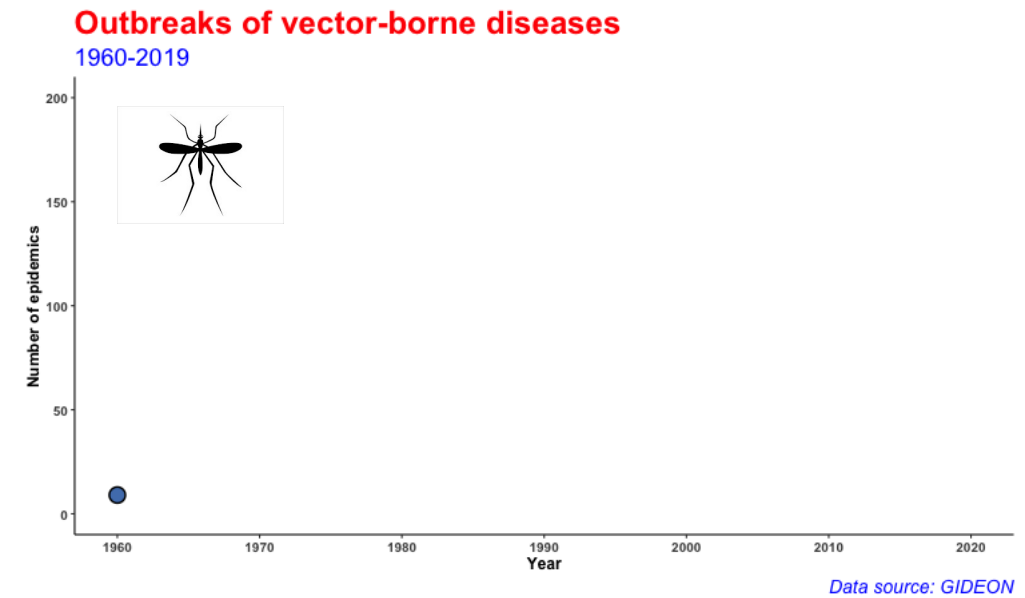
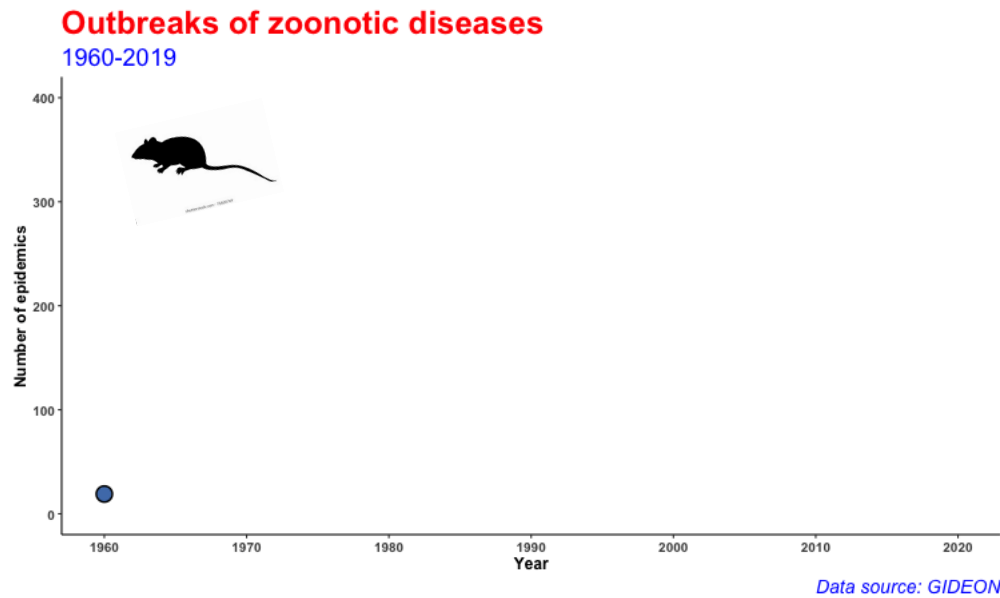
éditions  
Quæ

***Une épidémie d'épidémies***

# Une augmentation des épidémies

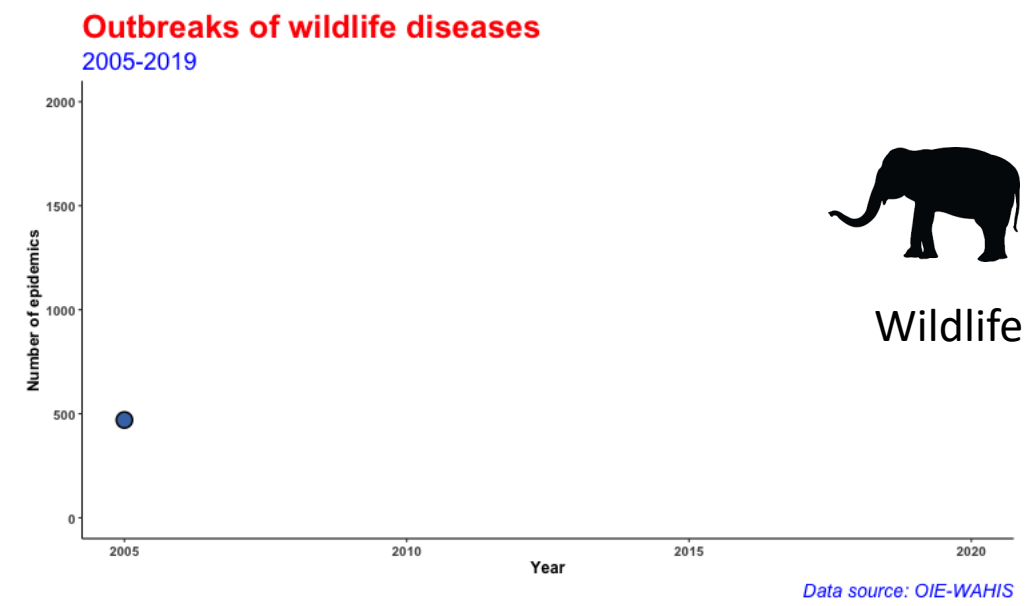
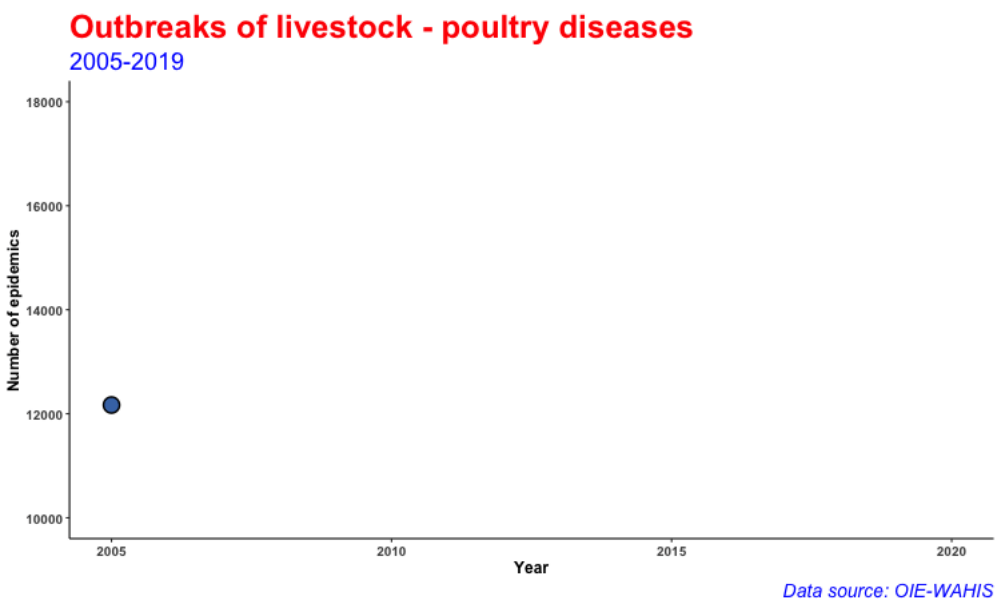


Humans





Livestock



# Climate Change and Global Health

Edited by Colin D. Butler



***Un dérèglement  
climatique***

# The 2021 report of the *Lancet* Countdown on health and climate change: code red for a healthy future

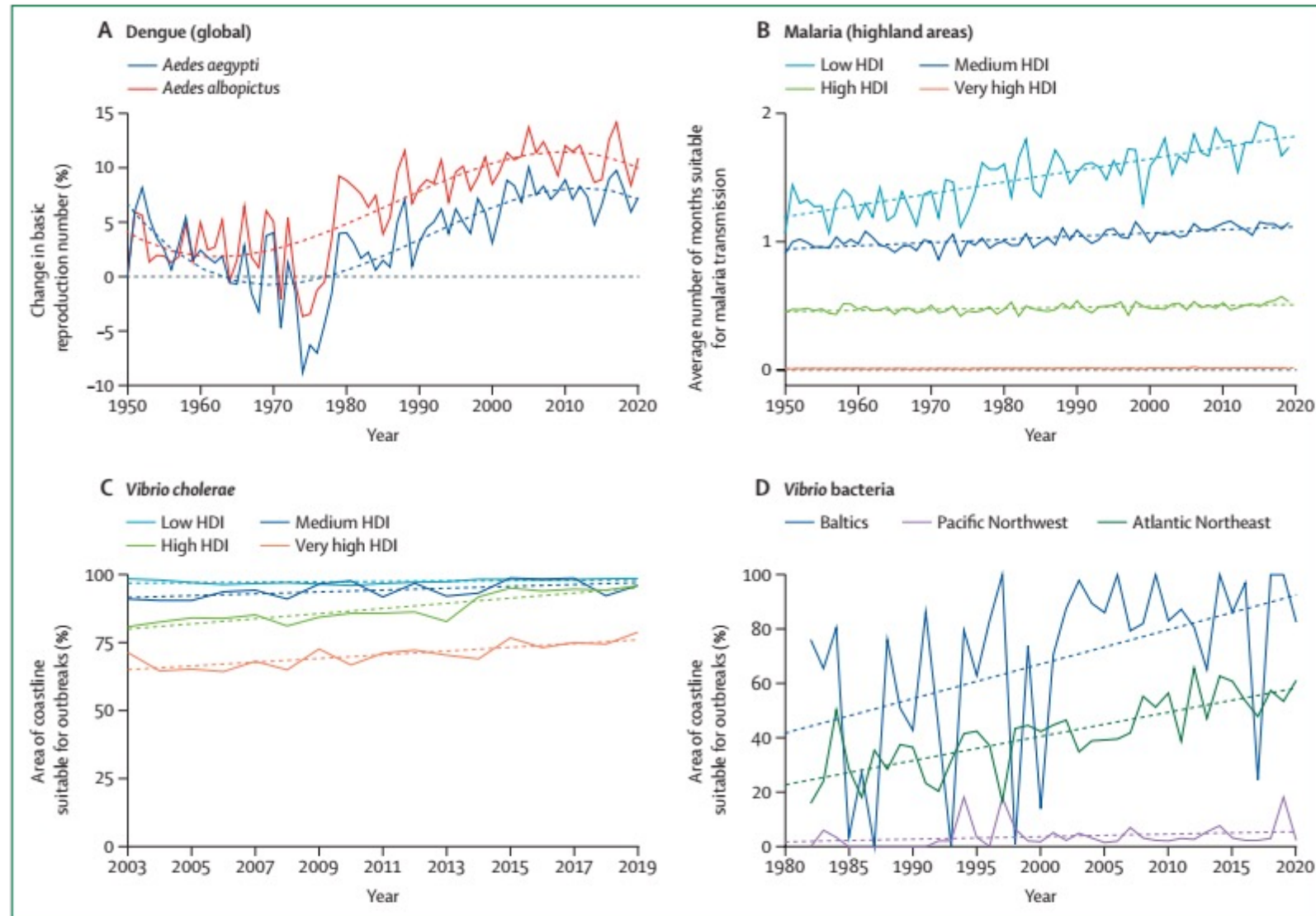
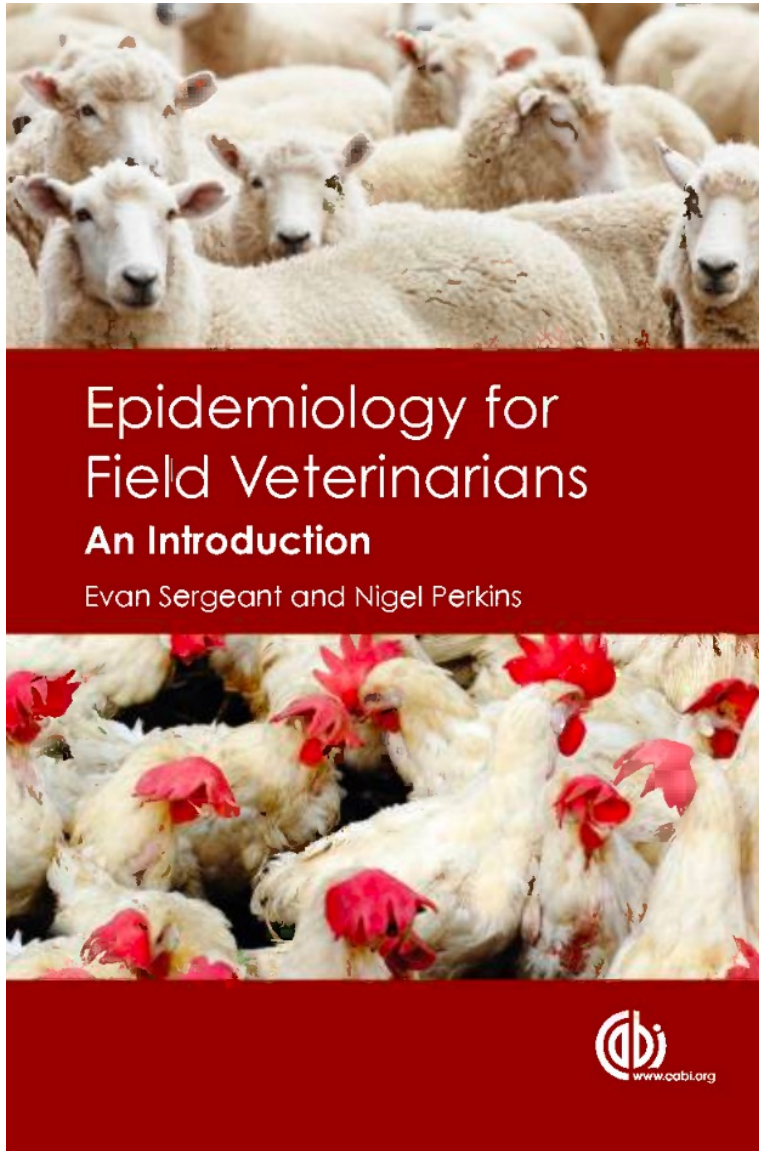


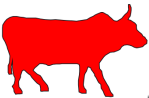
Figure 8: Change in climate suitability for infectious diseases





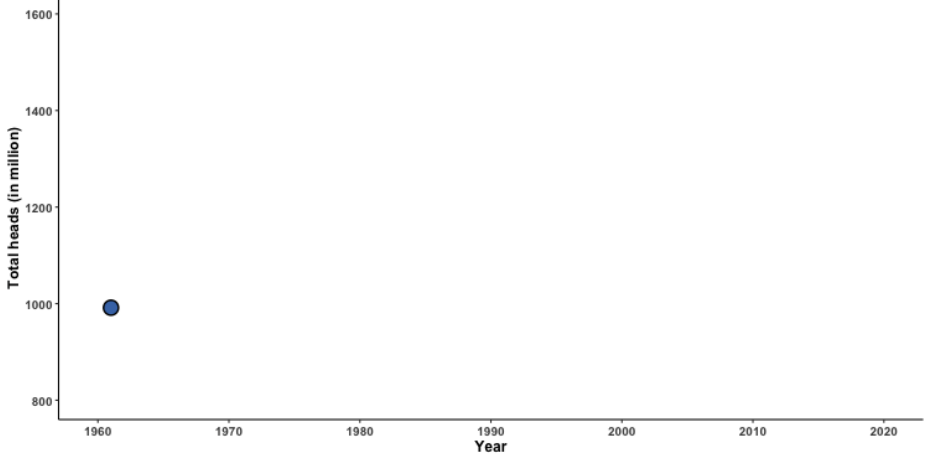
***Un élevage en croissance***

# Livestock and poultry increase

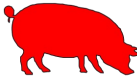


Total heads of cattle (in million)

1960-2020

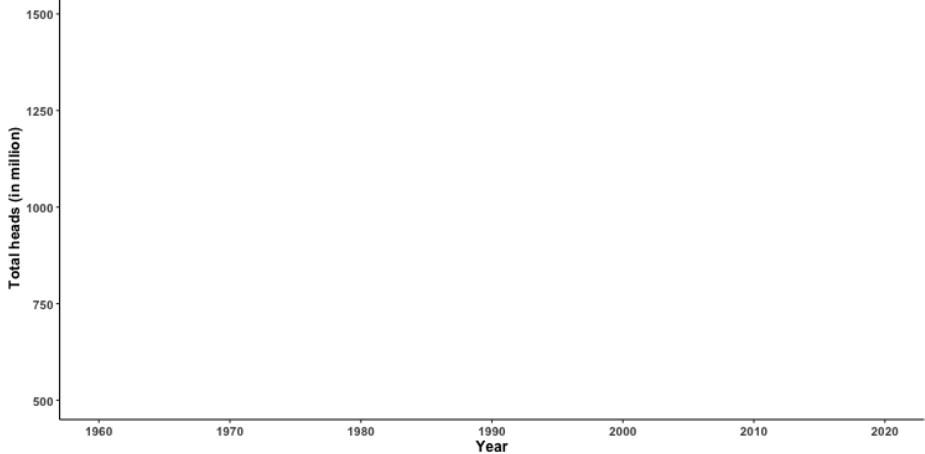


Data source: FAO



Total heads of pigs (in million)

1960-2020

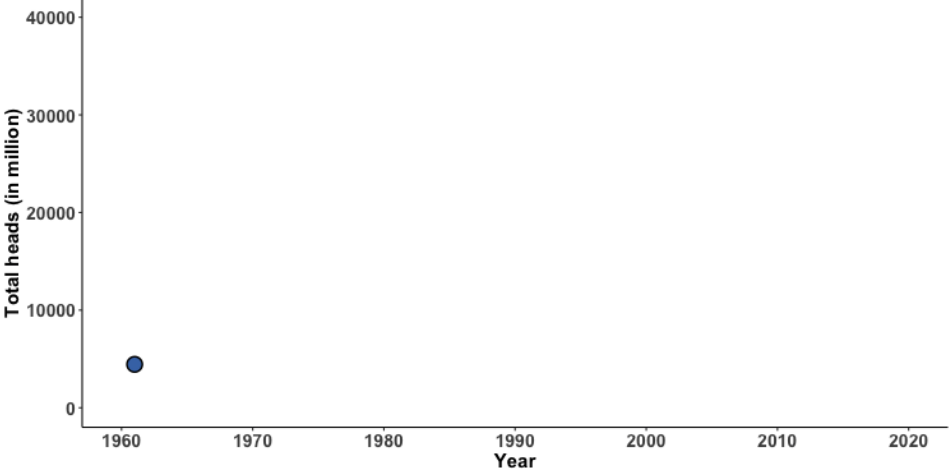


Data source: FAO



Total heads of chickens (in million)

1960-2020

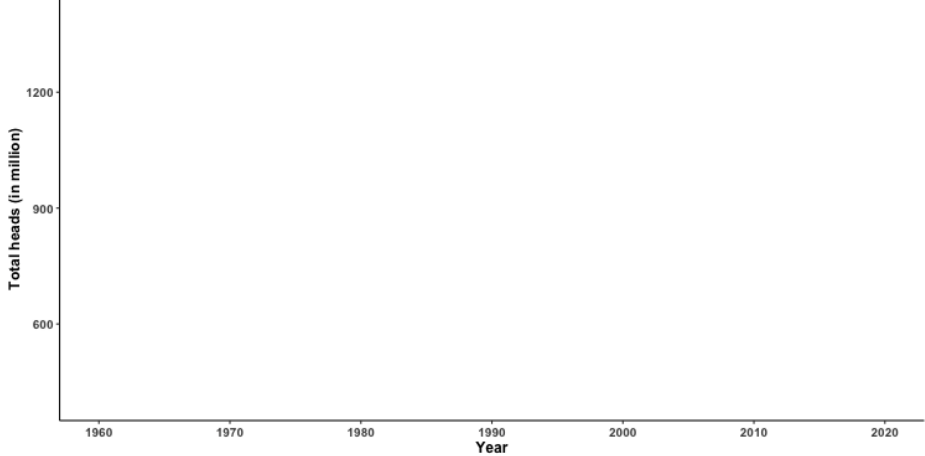


Data source: FAO



Total heads of goats (in million)

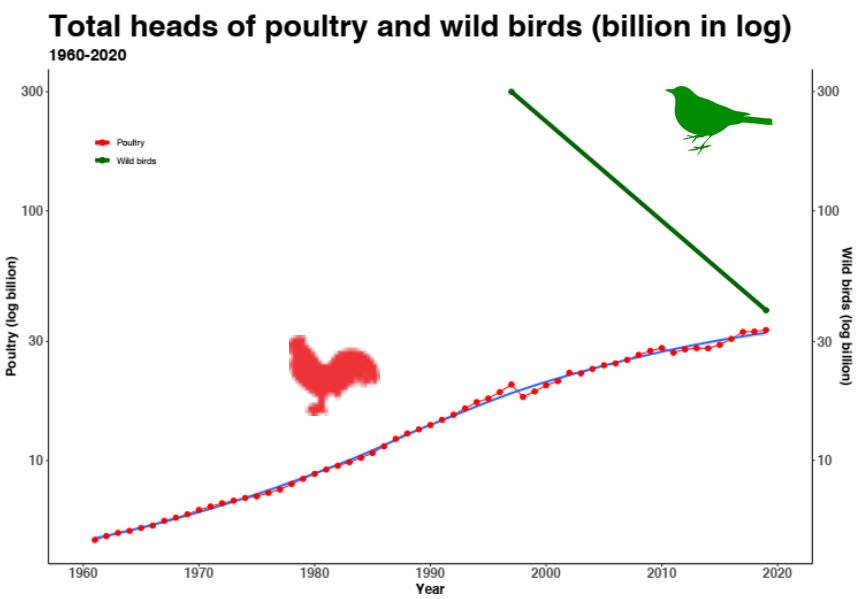
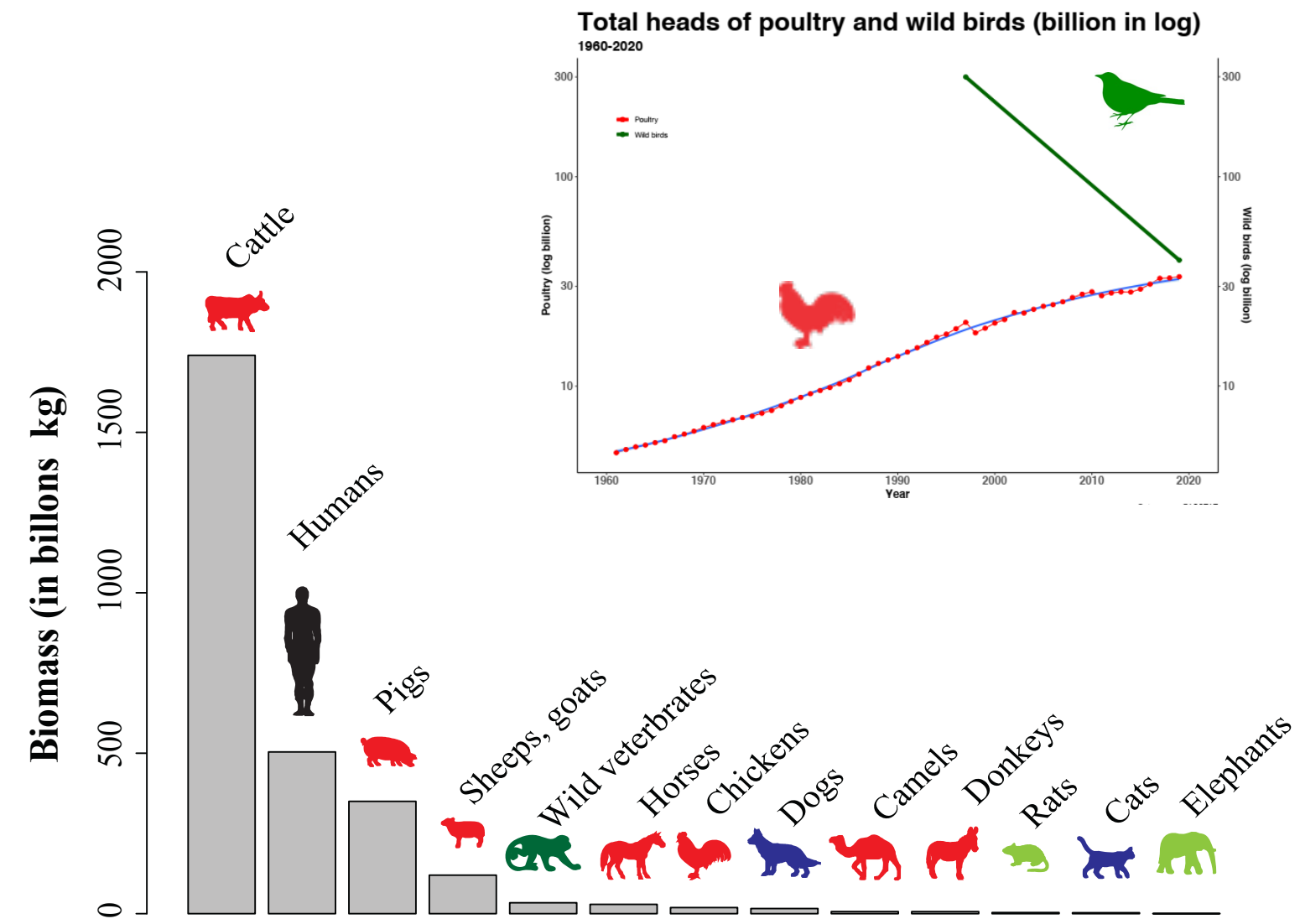
1960-2020



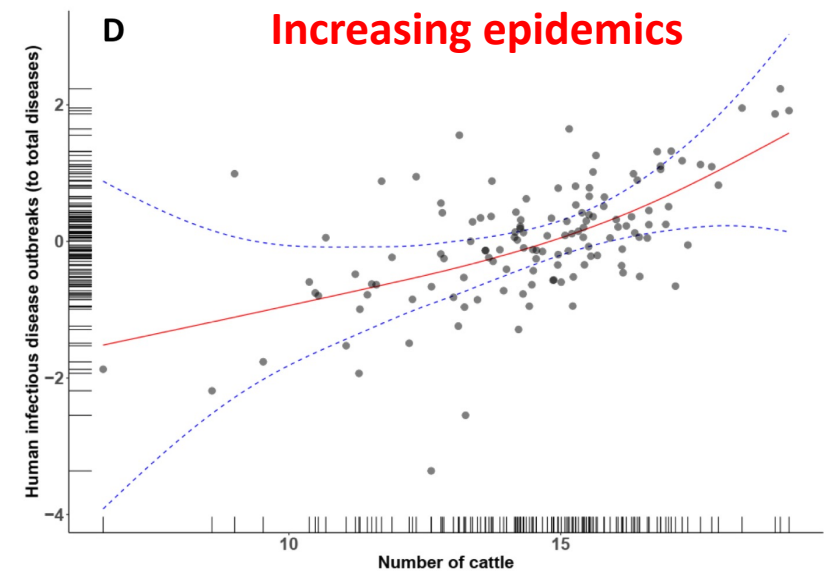
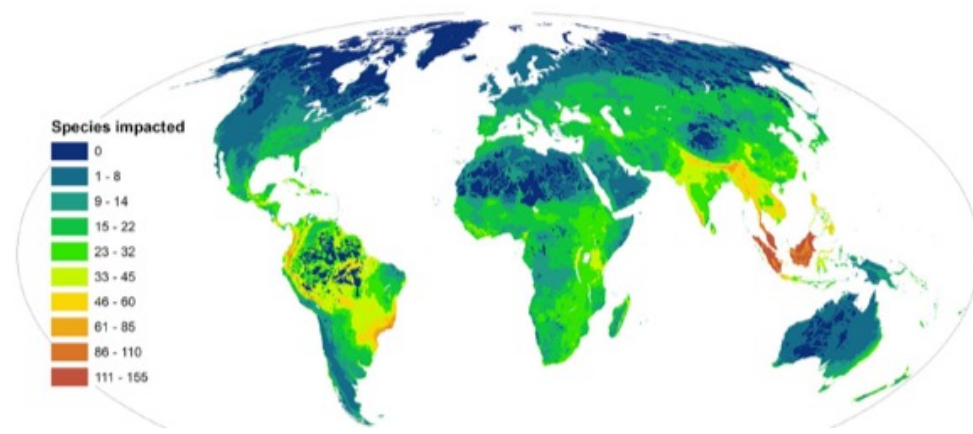
Data source: FAO



# Une planète dominée par l'élevage



Increasing biodiversity loss

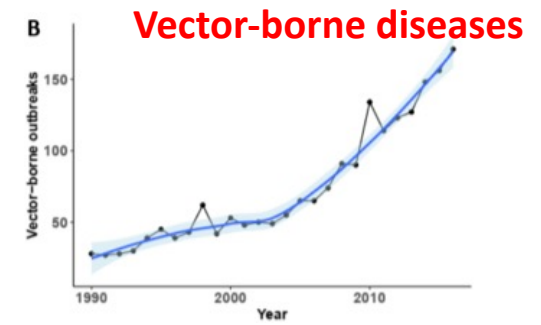
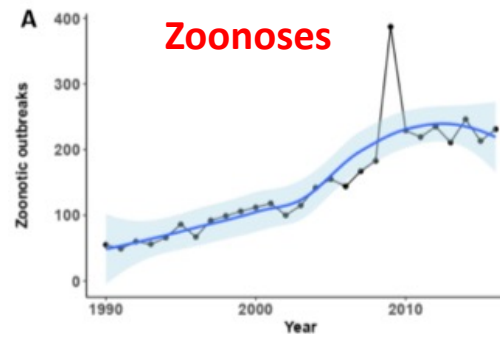


(Morand & Lajaunie, 2017; données de Vaclav Smill, 2002)



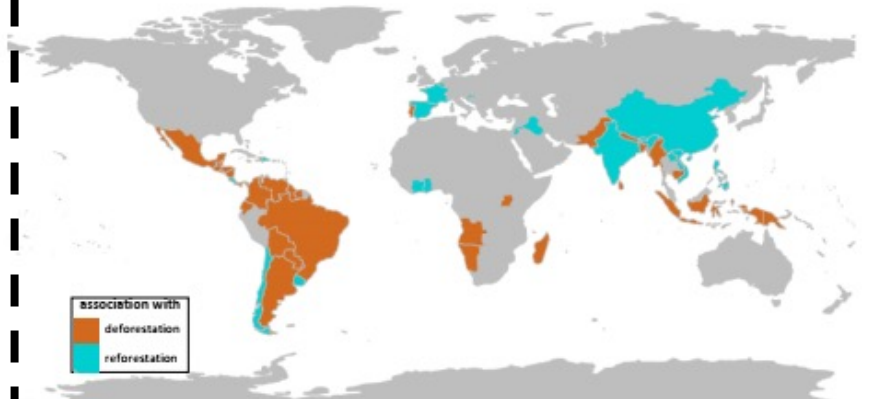
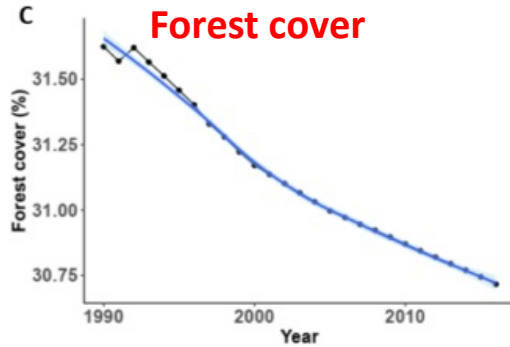
# *Forêts*

# Outbreaks of Vector-Borne and Zoonotic Diseases Are Associated With Changes in Forest Cover and Oil Palm Expansion at Global Scale



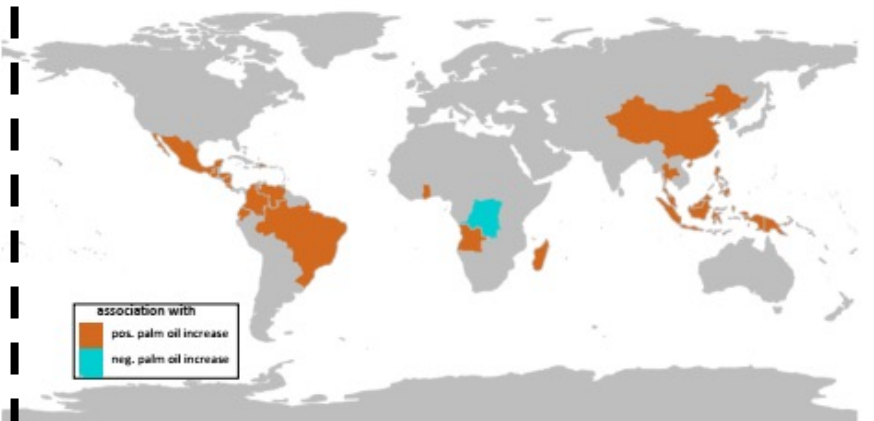
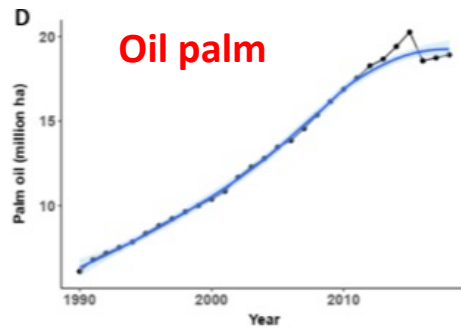
**A** Outbreaks of zoonotic diseases

**B** Outbreaks of vector-borne diseases



**C** Outbreaks of zoonotic diseases

**D** Outbreaks of vector-borne diseases





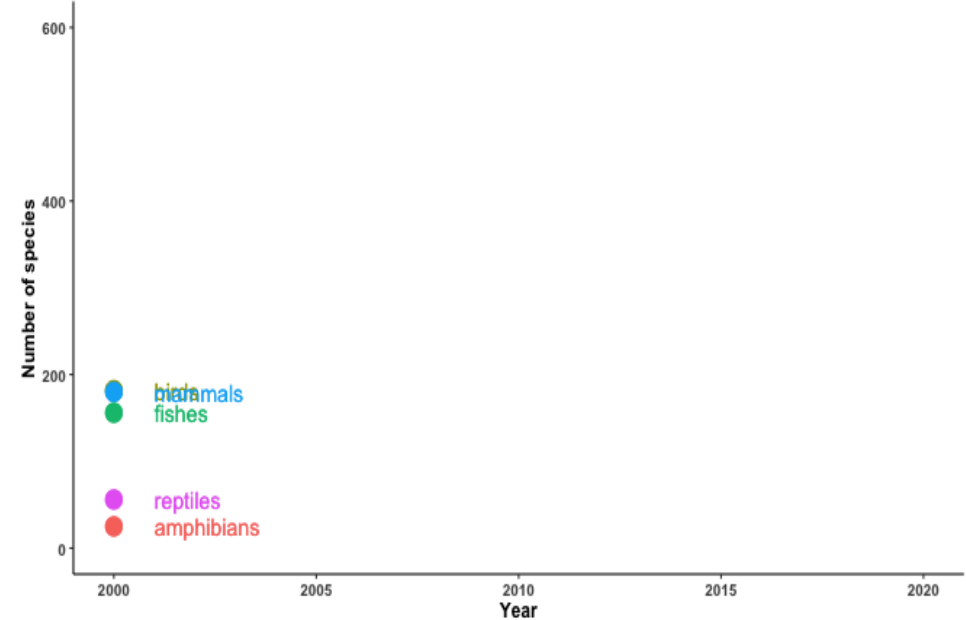
## ***Une biodiversité en crise***



# Living Planet Index



## IUCN number of critically endangered species 2000-2020



Data source: IUCN

## Biodiversity is declining at different rates in different places

The global LPI does not give us the entire picture – there are differences in abundance trends between regions, with the largest declines in tropical areas.

In 2019, the landmark IPBES global assessment on the state of biodiversity divided the world into different geographic regions (Figure 3) in order to complete regular and timely assessments of biodiversity, ecosystem services, their linkages, threats, and the impacts of these at regional and sub-regional levels<sup>1</sup>. Using a smaller spatial

scale of regions and sub-regions, rather than a global approach, also allows for a more focused way of monitoring progress towards targets developed under the Convention on Biological Diversity,

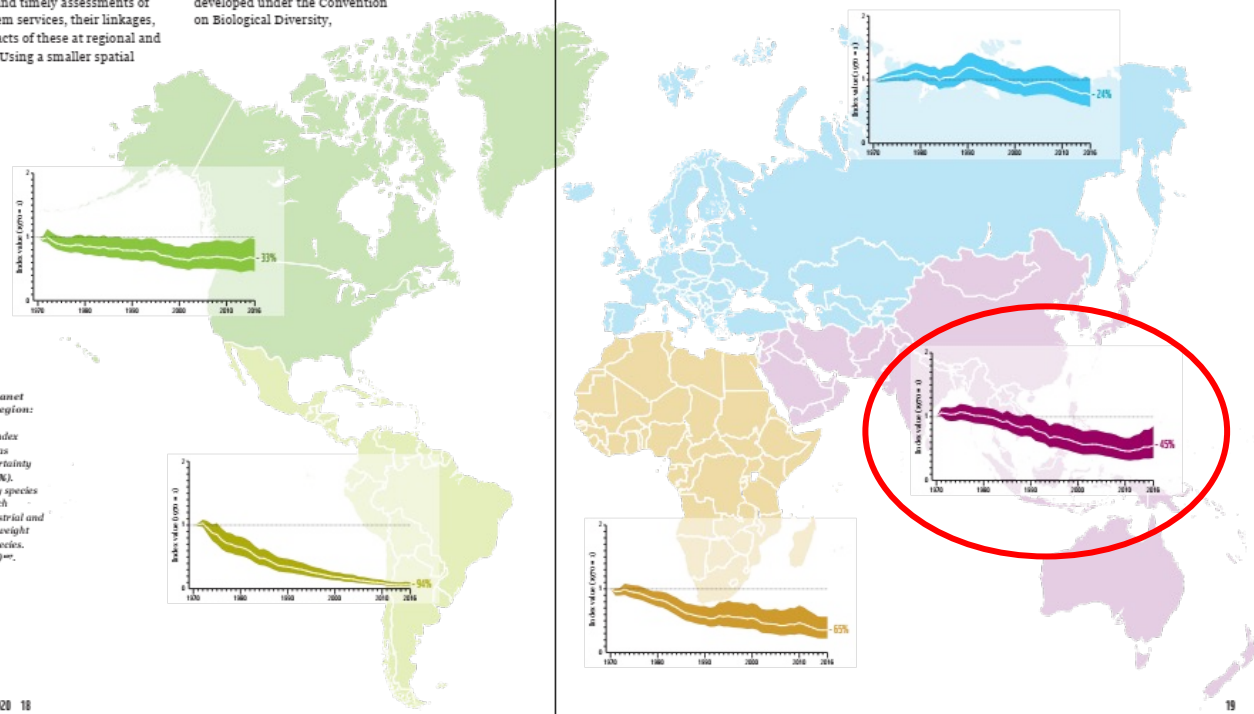


Figure 3: The Living Planet Index for each IPBES region: 1970 to 2016\*  
The white line shows the index values and the shaded areas represent the statistical certainty surrounding the trend (95%). All indices are weighted by species richness, giving species-rich taxonomic groups in terrestrial and freshwater systems more weight than groups with fewer species. Source: WWF/ZSL (2020)\*\*\*

including the Aichi Biodiversity Targets, Sustainable Development Goals, and National Biodiversity Strategies and Action Plans. In 2020, in order to align with IPBES, regional Living Planet indices have been divided slightly differently to previous years. Following the regional classifications in Figure 3, all terrestrial and freshwater populations within a country were assigned to an IPBES region. In the case of

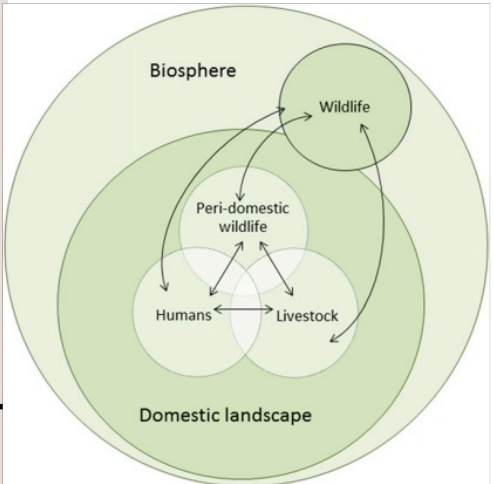
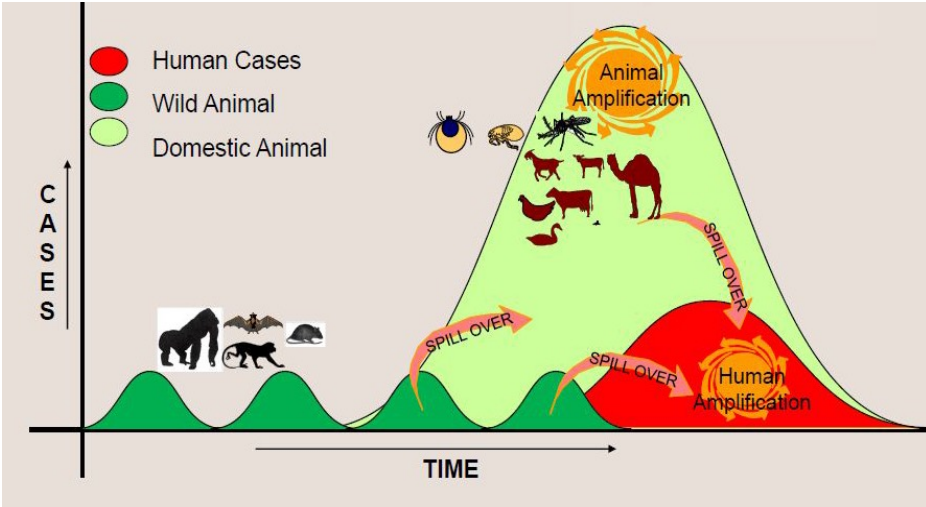
the Americas, this region was further subdivided in two: North America, and Latin America and the Caribbean (Mesoamerica, the Caribbean and South America combined). Trends for each species group are weighted according to how many species are found in each IPBES region. Threats to populations in each region are shown on page 21, and detail behind the trends can be found in the technical supplement.



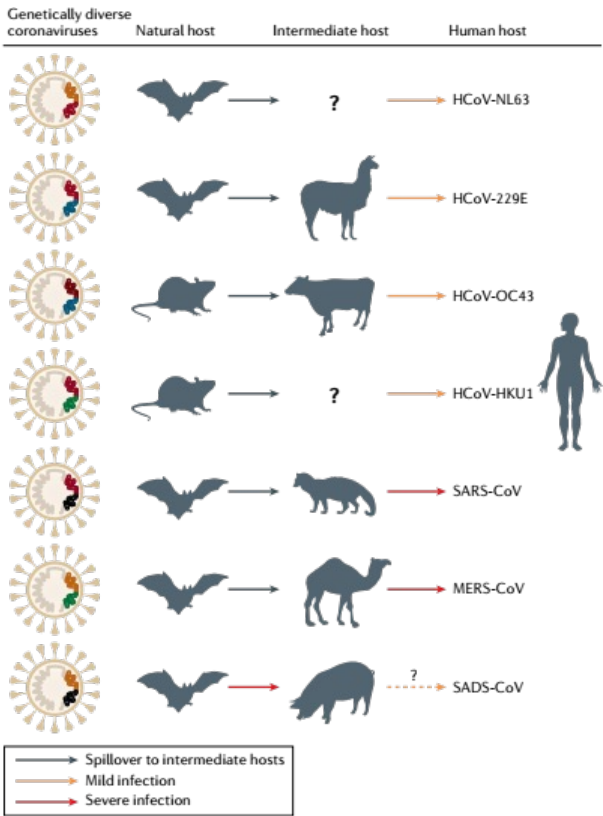
***Transmission aux  
interfaces environnement  
– faune sauvage –  
domestique - humains***

# La fabrique des pandémies

## Hot Spots for Emerging Diseases



## Animal origins of human coronaviruses.





# Susceptibility of White-Tailed Deer (*Odocoileus virginianus*) to SARS-CoV-2

© Mitchell V. Palmer,<sup>a</sup> © Mathias Martins,<sup>b</sup> Shollie Falkenberg,<sup>c</sup> Alexandra Buckley,<sup>d</sup> Leonardo C. Caserta,<sup>b</sup> Patrick K. Mitchell,<sup>b</sup> Eric D. Cassmann,<sup>d</sup> Alicia Rollins,<sup>b</sup> Nancy C. Zylch,<sup>b</sup> Randall W. Renshaw,<sup>b</sup> Cassandra Guarino,<sup>b</sup> Bettina Wagner,<sup>b</sup> Kelly Lager,<sup>d</sup> © Diego G. Diel<sup>b</sup>



## SARS-CoV-2 in animals used for fur farming

GLEWS+  
Risk assessment



20 January 2021



Animal and Plant Health Inspection Service  
U.S. DEPARTMENT OF AGRICULTURE

## Confirmation of COVID-19 in Deer in Ohio



### CORONAVIRUS

## Susceptibility of ferrets, cats, dogs, and other domesticated animals to SARS–coronavirus 2

Jianzhong Shi<sup>1\*</sup>, Zhiyuan Wen<sup>1\*</sup>, Gongxun Zhong<sup>1\*</sup>, Huanliang Yang<sup>1\*</sup>, Chong Wang<sup>1\*</sup>, Baoying Huang<sup>2\*</sup>, Renqiang Liu<sup>1</sup>, Xijun He<sup>3</sup>, Lei Shuai<sup>1</sup>, Ziruo Sun<sup>1</sup>, Yubo Zhao<sup>1</sup>, Peipei Liu<sup>2</sup>, Libin Liang<sup>1</sup>, Pengfei Cui<sup>1</sup>, Jinliang Wang<sup>1</sup>, Xianfeng Zhang<sup>3</sup>, Yuntao Guan<sup>3</sup>, Wenjie Tan<sup>2</sup>, Guizhen Wu<sup>2†</sup>, Hualan Chen<sup>1†</sup>, Zhigao Bu<sup>1,3†</sup>

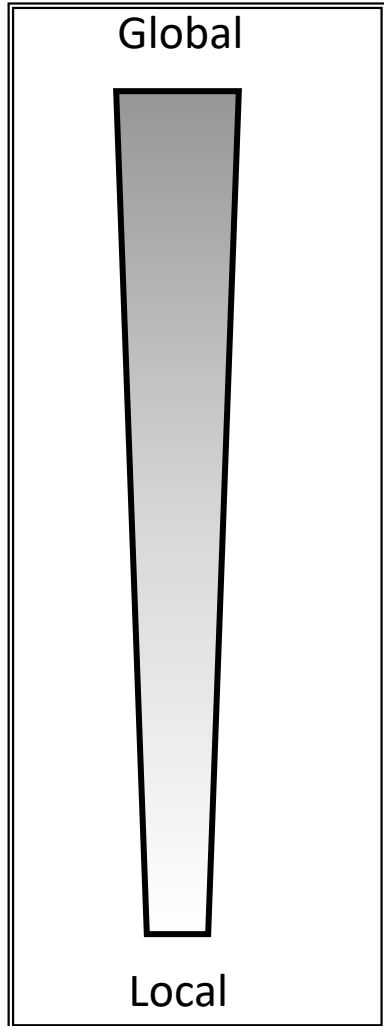
Article

## First Description of SARS-CoV-2 Infection in Two Feral American Mink (*Neovison vison*) Caught in the Wild

Jordi Aguiló-Gisbert<sup>1,†</sup> ©, Miguel Padilla-Blanco<sup>2,†</sup>, Victor Lizana<sup>1,3</sup> ©, Elisa Maiques<sup>4</sup>, Marta Muñoz-Baquero<sup>1</sup>, Eva Chillida-Martínez<sup>1</sup>, Jesús Cardells<sup>1,3,\*</sup> and Consuelo Rubio-Guerri<sup>2,\*</sup>

# Scaling and connection effects

Global change



Globalization



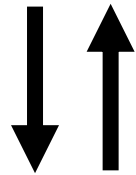
Increasing trade

Land conversion



Biodiversity loss  
Deforestation  
Agriculture intensification  
Livestock expansion  
Plantation expansion

mobility



Urbanization



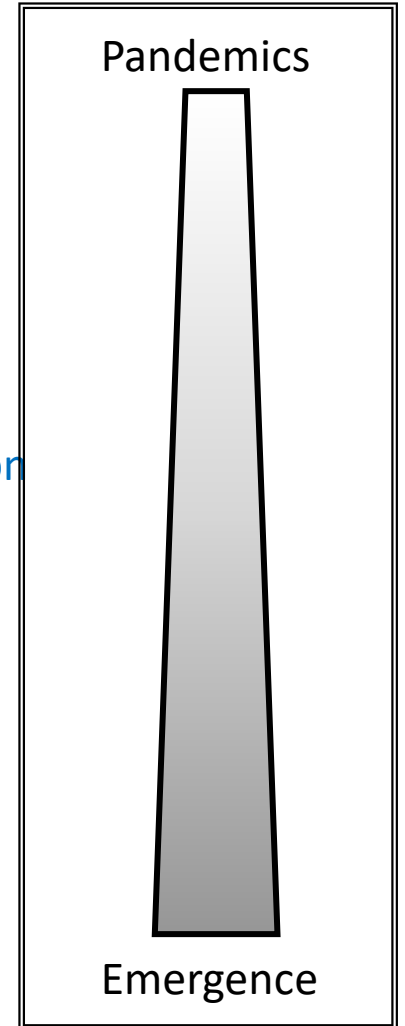
Infrastructure development



Roads  
Dams  
Mining

mobility

Infectious diseases



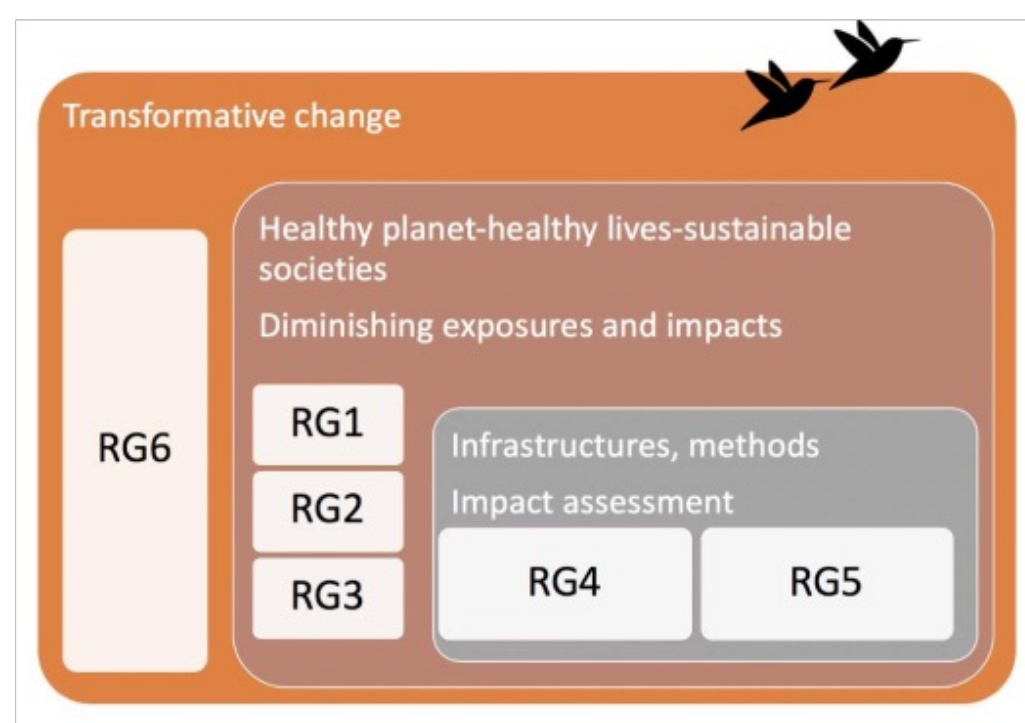


**RG6. Support transformational change approaches in environment and health:** transformational approaches are required to address the environmental challenges; they are based on interdisciplinarity and include technical, political, economic and ethical components.

**RG1. Reduce the effects of climate change and ecological degradation on health:** the identified research needs concern the effects of climate change on health, the role of biodiversity loss and the possible impact of the degradation of natural systems.

**RG2. Eliminate environmental exposures harmful to health:** additional research is required concerning a variety of stressors including chemicals and chemical mixtures, plastics, waste (also in relation to circular economy), water contaminants, different types of radiation and biological agents.

**RG3. Promote healthy lives in sustainable and inclusive societies:** this research goal covers a large number of critical research needs concerning urban and rural living, air pollution, mobility, sustainable energy consumption, occupational conditions including farming, and ecosystem services for more sustainable and inclusive societies.



**RG4. Improve health impact assessment of environmental factors and promote intervention research:** this goal covers methodologies in health impact assessment as well as the related social and economic costs and methods for implementation research.

**RG5. Develop infrastructures and new technologies for understanding environmental impacts on health:** robust infrastructures and tools are critical for the sustainability of research efforts in this field. Such infrastructures include cohorts, exposome, and planetary health monitoring.



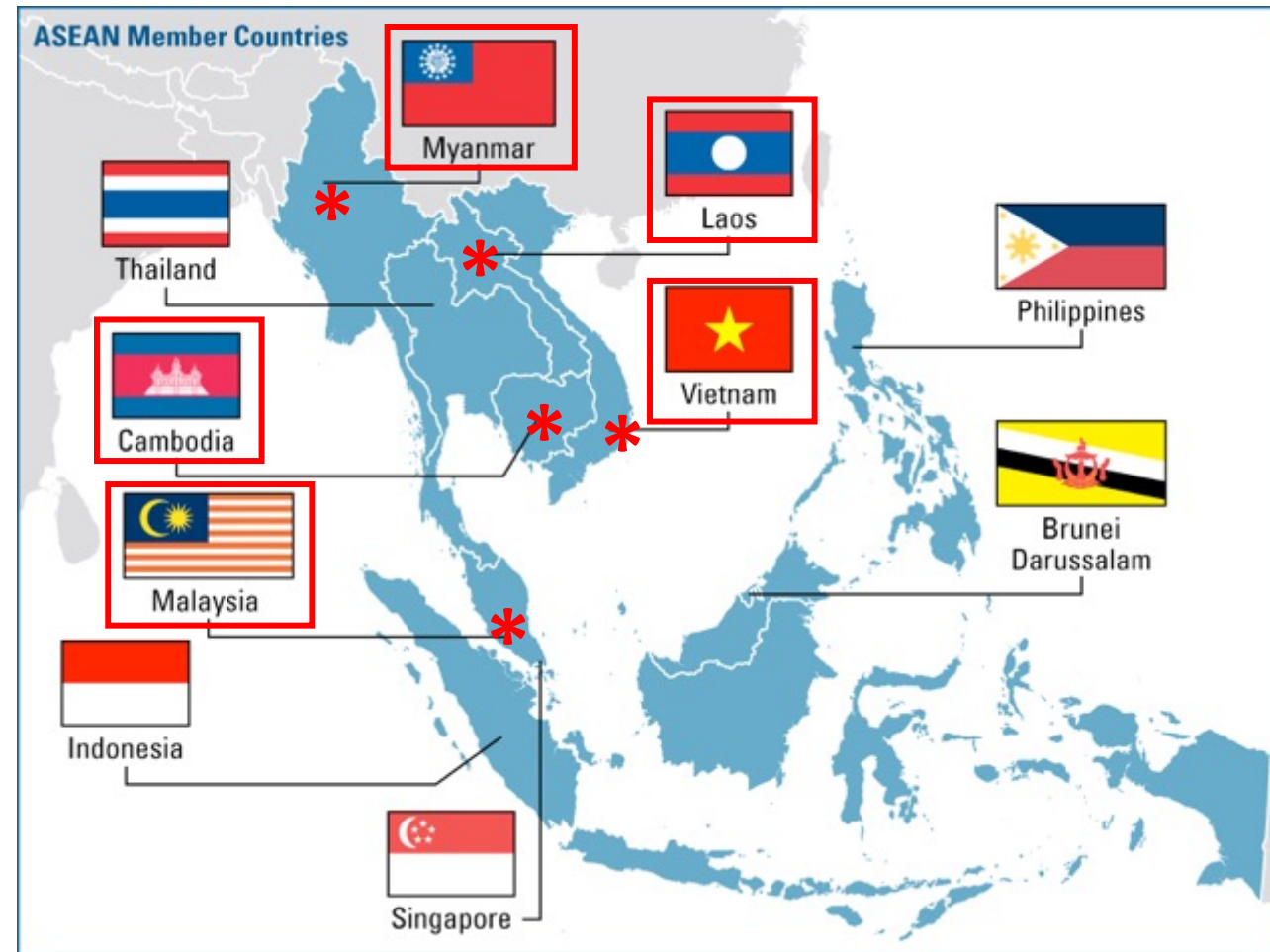
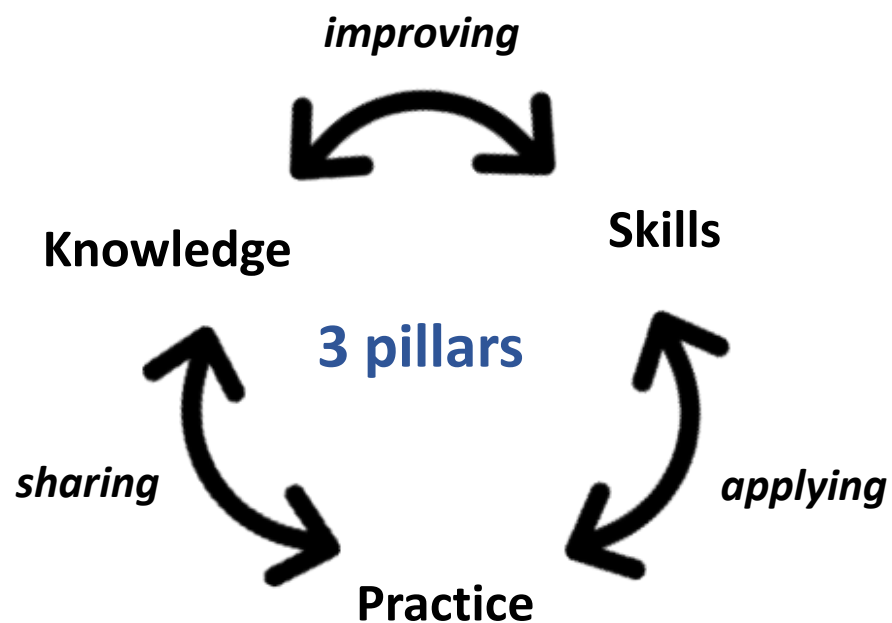


MINISTÈRE  
DE L'EUROPE  
ET DES AFFAIRES  
ÉTRANGÈRES

*Liberté  
Égalité  
Fraternité*

Approval of France as a development partner  
of the Association of Southeast Asian States (9  
Sept. 2020)

# FSPI - One Health in practice in Southeast Asia (2021-2022)

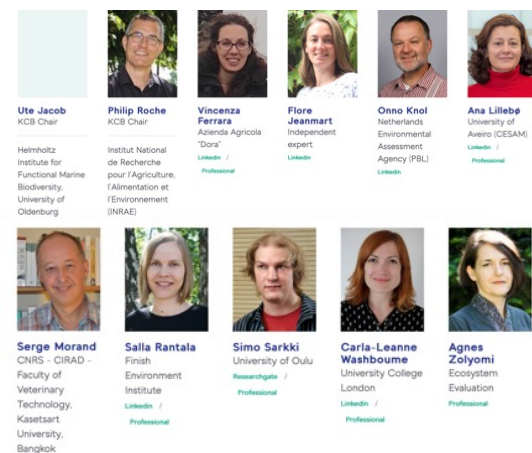




Bridging the gap between policy and knowledge  
on Biodiversity in Europe

The Knowledge Coordination Body

## Call for experts on Biodiversity and Pandemics



**Topic of evidence needs/request:** Building on existing relevant work on research agendas and knowledge gap analysis, identifying interdisciplinary research [and action] priorities that contribute to a strategic research agenda on Biodiversity and pandemics addressing the critical interlinkages between relevant sectors needed to make future actions more effective.

**Description:** Eclipse is inviting applications from different fields of expertise to join an Expert Working Group (EWG – Read the [EWG's guidance note](#) to learn more). This [request](#) was originally put forward by the [European Commission's Directorate-General for Research and Innovation \(EC-DG R&I\)](#) and is now also followed by a cross-sectoral consortium of requesters, including the EC Directorates-General [Agriculture and Rural Development \(AGRI\)](#), [Health Emergency Preparedness and Response Authority \(HERA\)](#), [Environment \(ENV\)](#), and key relevant stakeholders such as [PREZODE](#) (Preventing Zoonotic Disease Emergence), [One Health High-Level Expert Panel \(OHHLEP\)](#), [HERA project](#) and [Norwegian Veterinary Institute \(NRI\)](#).



PREZODE

Preventing ZOonotic Disease Emergence



## PREZODE Initiative (PREventing ZOonotic Disease Emergence)

L'initiative PREZODE a été officiellement lancée en janvier 2021 lors du **One Planet Summit**

INRAE



French National Research  
Institute for Sustainable  
Development



Institut de Recherche  
pour le Développement  
FRANCE

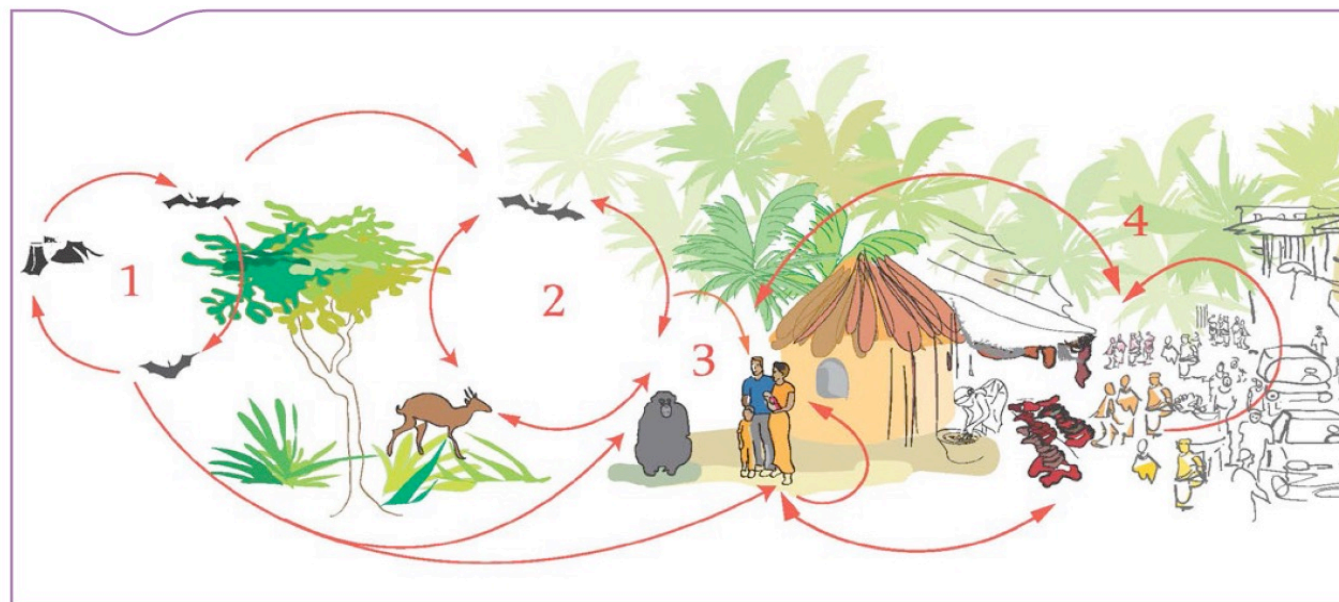


Figure 1. Circulation et transmission des virus Ebola dans un socio-écosystème forestier : (1) chauves-souris (2) espèces sauvages (3) contacts entre l'Homme et la faune sauvage (4) communautés humaines.

© D. Guard-Lavastre/Cirad, d'après CDC : <http://www.cdc.gov/vhf/ebola/resources/virus-ecology.html>

# Sortir des crises

One Health en pratiques

*Sous la direction de*  
Sébastien Gardon, Amandine Gautier,  
Gwenola Le Naour et Serge Morand



éditions  
Quæ

***One Health pour sortir des crises***



# Tripartite and UNEP support OHHLEP's definition of "One Health"

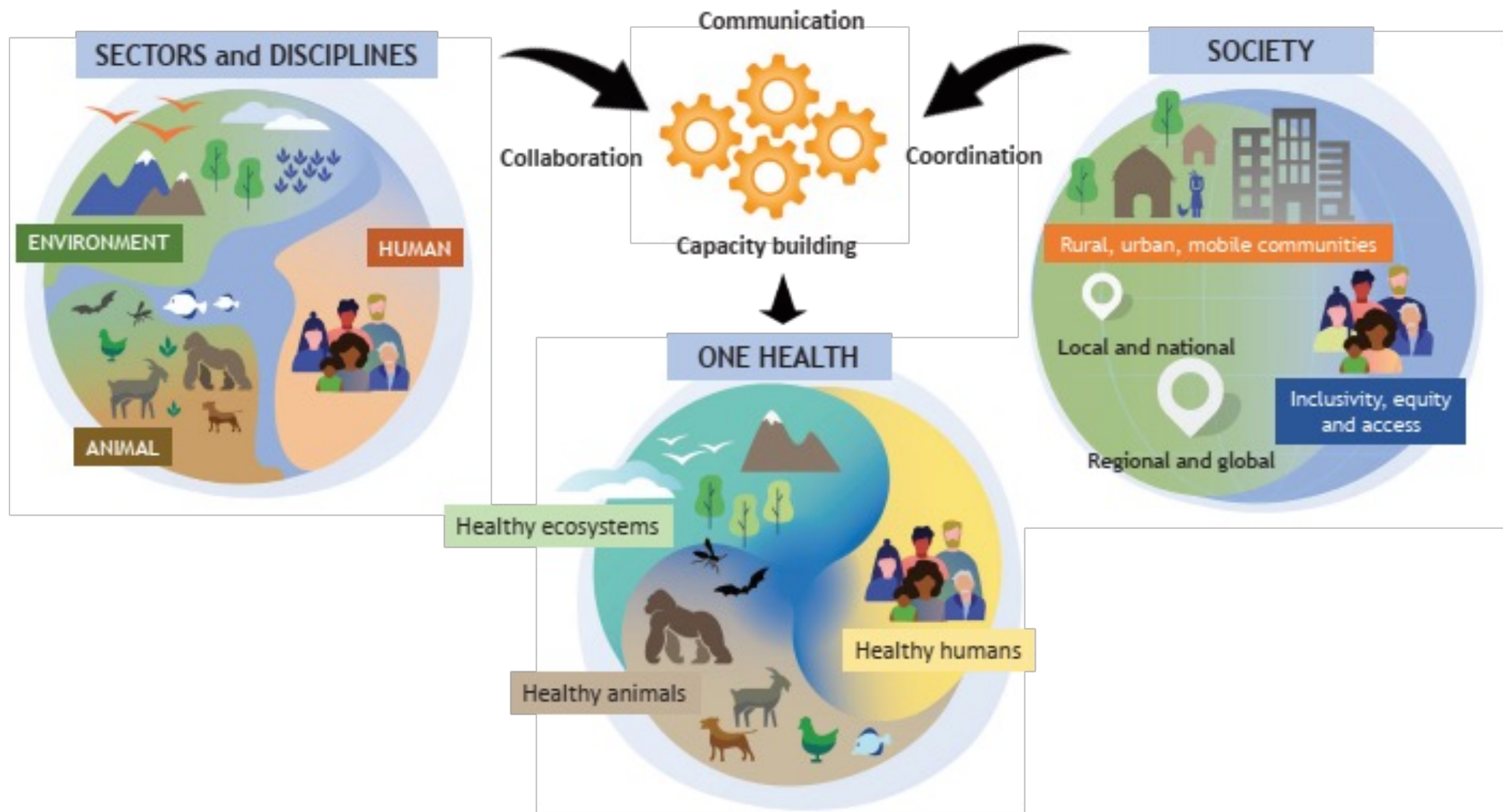
Joint Tripartite (FAO, OIE, WHO) and UNEP Statement

*In November 2020 at the Paris Peace Forum  
FAO, OIE, UNEP and WHO create a multidisciplinary  
One Health High-Level Expert Panel (OHHLEP)  
with the support of **France** and **Germany***

**One Health** is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems.

*It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent.*

*The approach mobilizes multiple sectors, disciplines and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development.*

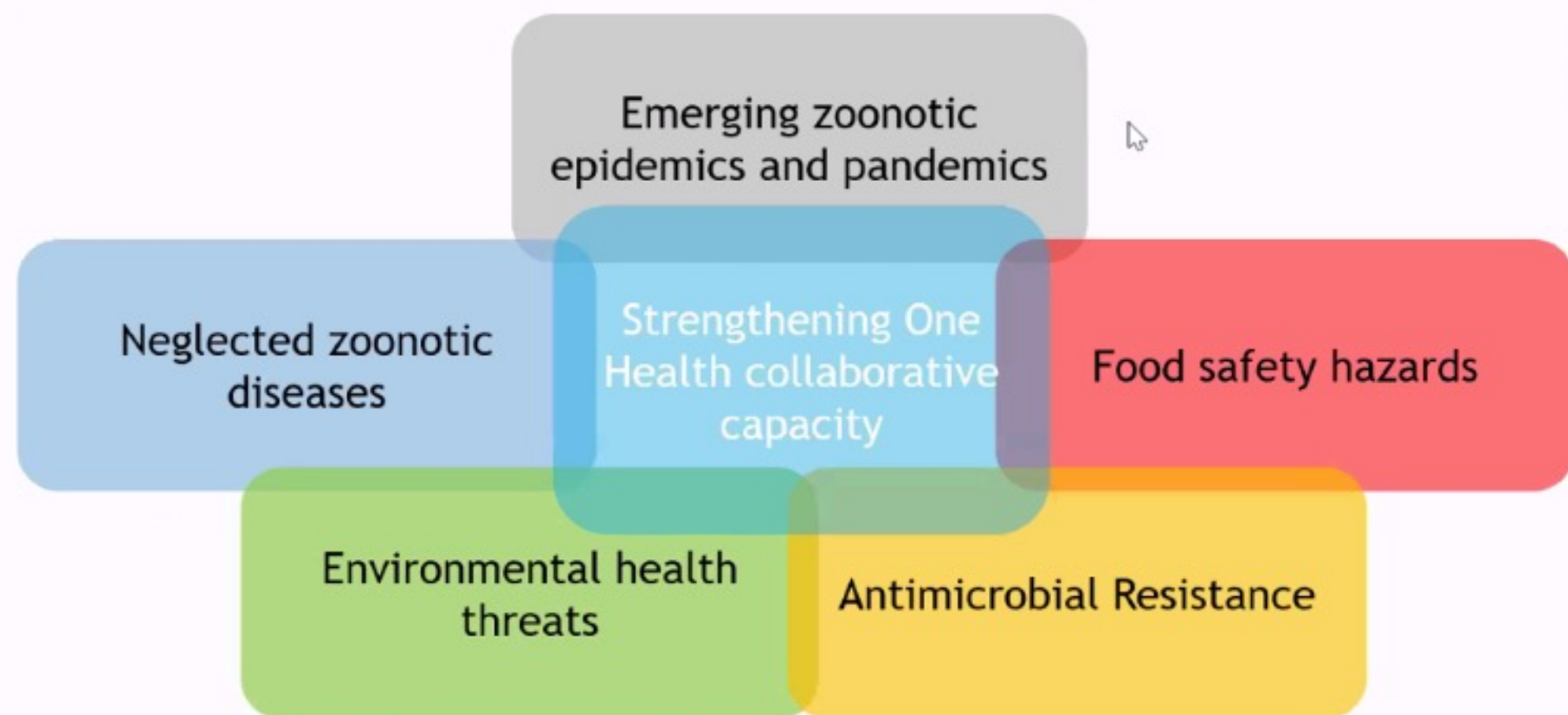


# Global Plan of Action for One Health (2022-2026)

Towards a more comprehensive One Health approach to global health threats  
at the human-animal-environment interface

Tripartite (FAO/OIE/WHO) and UNEP

## Action Tracks







2011

2014



PNSE4



## AXE 3

**Démultiplier les actions concrètes menées par les collectivités dans les territoires**

### > Action 15

Créer une plateforme collaborative pour les collectivités sur les actions en santé environnement et renforcer les moyens des territoires pour réduire les inégalités territoriales en santé environnement

### > Action 16

Sensibiliser les urbanistes et aménageurs des territoires pour mieux prendre en compte les problématiques de santé et d'environnement dans les documents de planification territoriale et les opérations d'aménagement

**Merci pour votre attention**