EEAC

Planetary Health in the Anthropocene

Generalitat de Catalunya
Consell Assessor
per al Desenvolupament Sostenible

# Escaping the “Era of Pandemics”

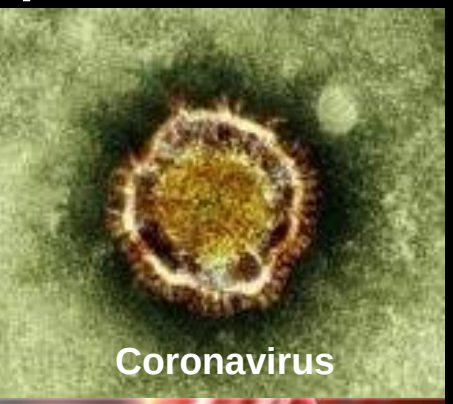

Jordi Serra-Cobo

Dep. Biologia Evolutiva, Ecologia i Ciències Ambientals
Institut de Recerca de la Biodiversitat (IRBIO)
Facultat de Biologia
Universitat de Barcelona



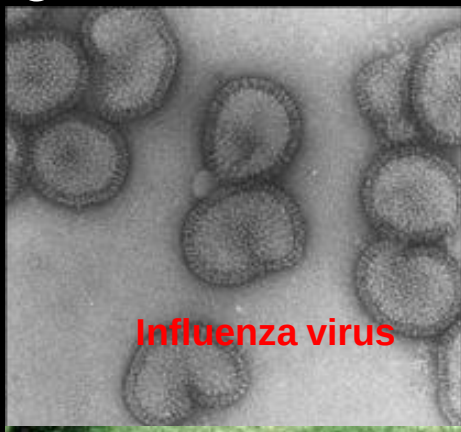



**The most of emerging diseases have their origin in animals. The wildlife provides a zoonotic pool from which pathogens can emerge**















**What are the factors that cause pandemics?**



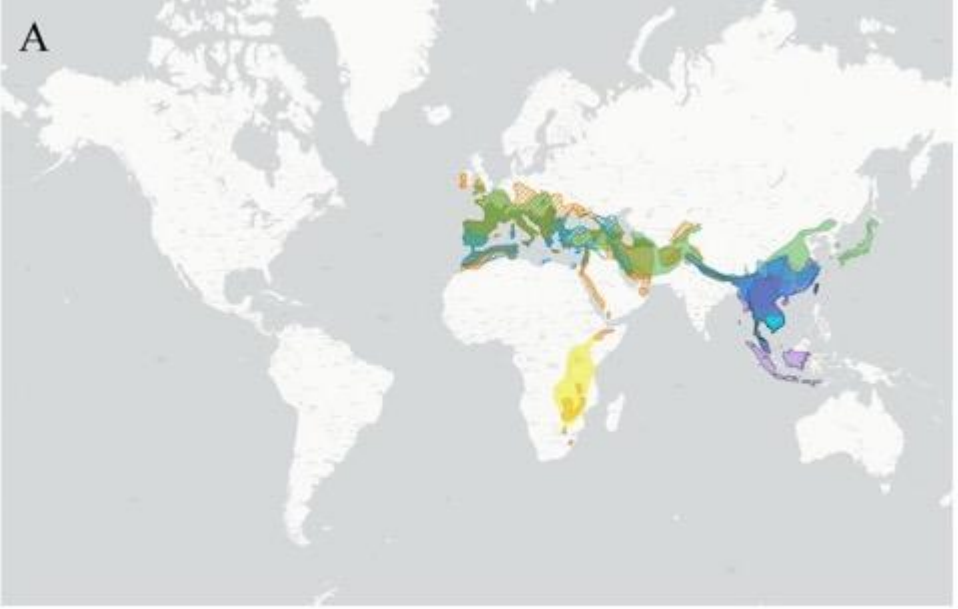






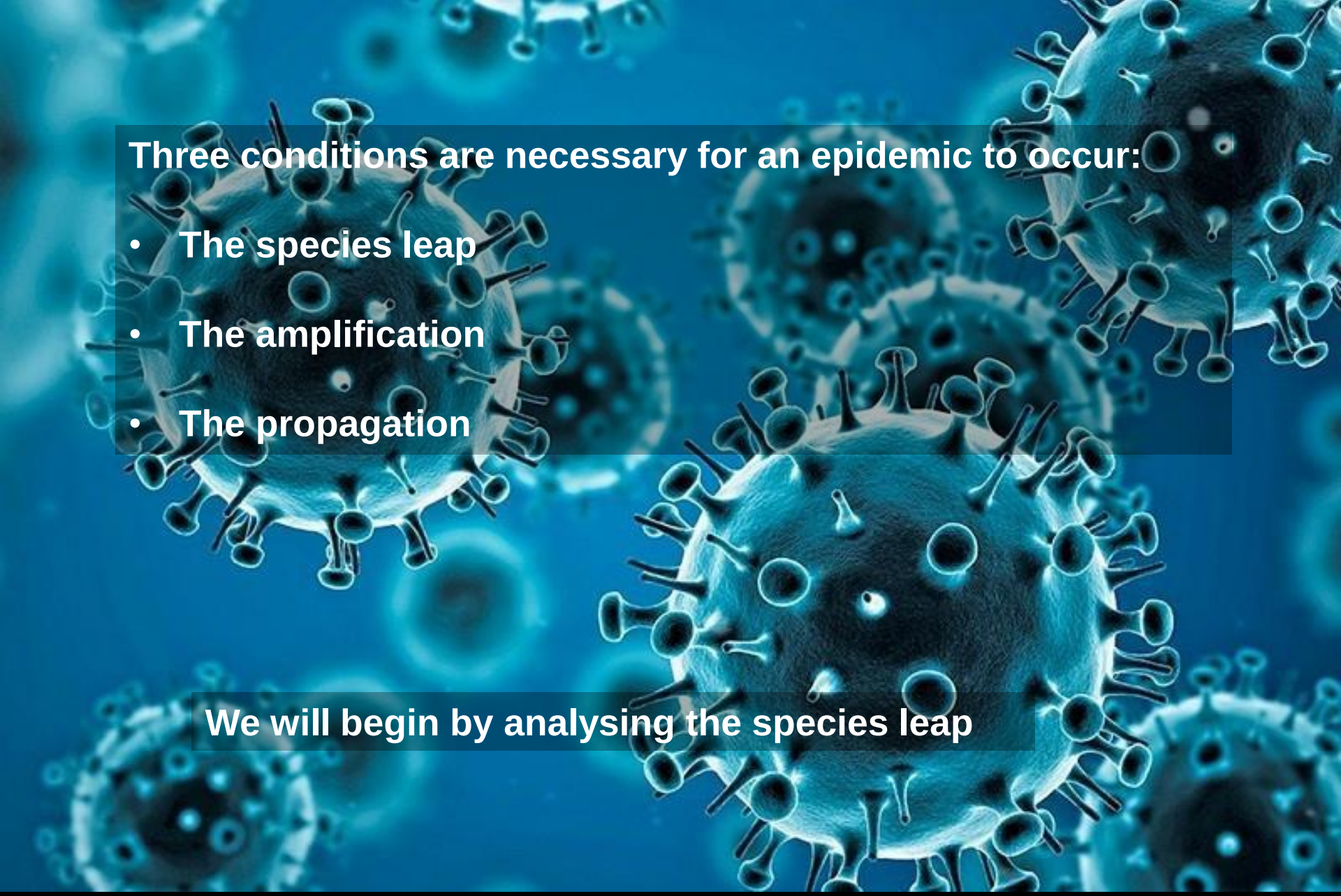
**The zoonotic emergence is a complex process involving not only the wildlife and natural ecosystems, but also many anthropogenic and societal aspects**

**Biological compatibility is not enough to cause a pandemic**


Bat-borne SARS-CoV/SARS-CoV-2

- *Rhinolophus affinis*
- *Rhinolophus blasii*
- *Rhinolophus euryale*
- *Rhinolophus ferrumequinum*
- *Rhinolophus formosae*
- *Rhinolophus hildebrandtii*
- *Rhinolophus hipposideros*
- *Rhinolophus macrotis*
- *Rhinolophus malayanus*
- *Rhinolophus mehelyi*
- *Rhinolophus pearsonii*
- *Rhinolophus pusillus*
- *Rhinolophus rex*
- *Rhinolophus sinicus*
- *Rhinolophus thomasi*



Three conditions are necessary for an epidemic to occur:

- The species leap
- The amplification
- The propagation

We will begin by analysing the species leap





## Species leap

**The structure and functionality of ecosystems are changing at an unprecedented rate due to human activity**






## Human activity: Deforestation

**The SE of Asia has lost 30% of the forest surface in 40 years.**

**There are other regions where the deforestation is important, for example in Africa or Amazonia.**



**The fast expansion of urbanized and cultured areas has altered ecosystems that had remained in equilibrium for hundred years.**





**After the deforestation the fauna looks for refuge in human constructions and the probability of diseases transmission increases**



Growing urban demand for meat fuels the wildlife trade, increasing contact between hunters and wild animals

Roads construction provides hunters with better access to hunting areas that were previously difficult to access





**Exposure to new pathogens is not always the result of forest exploitation, poverty and armed conflicts also lead people to enter the jungle in search of new resources to survive**

**The legal and illegal trade of wildlife species to provide food, medicine and other products is another threat to human health**

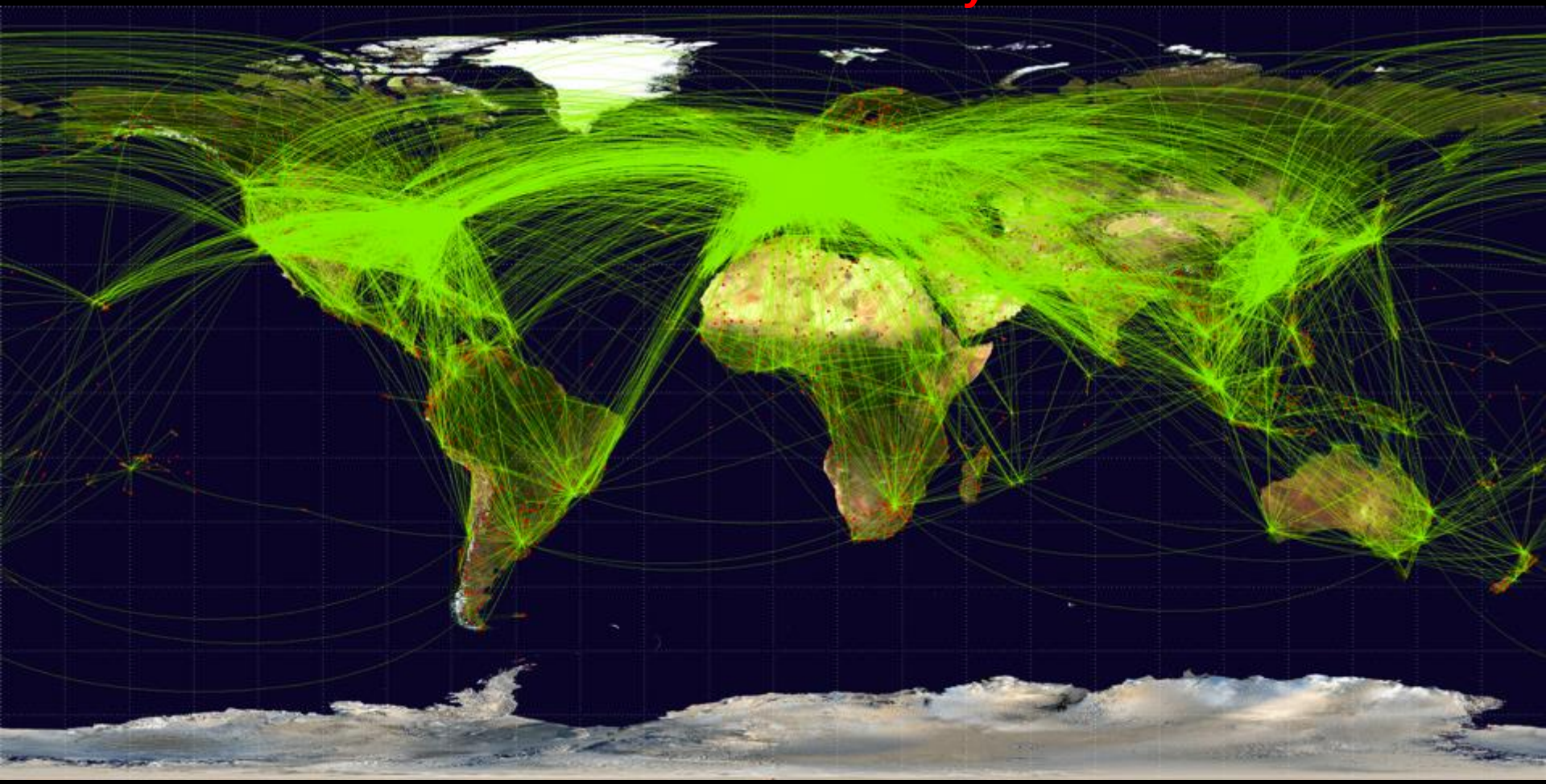




## Amplification process

## Demographic increase

## Increased mobility

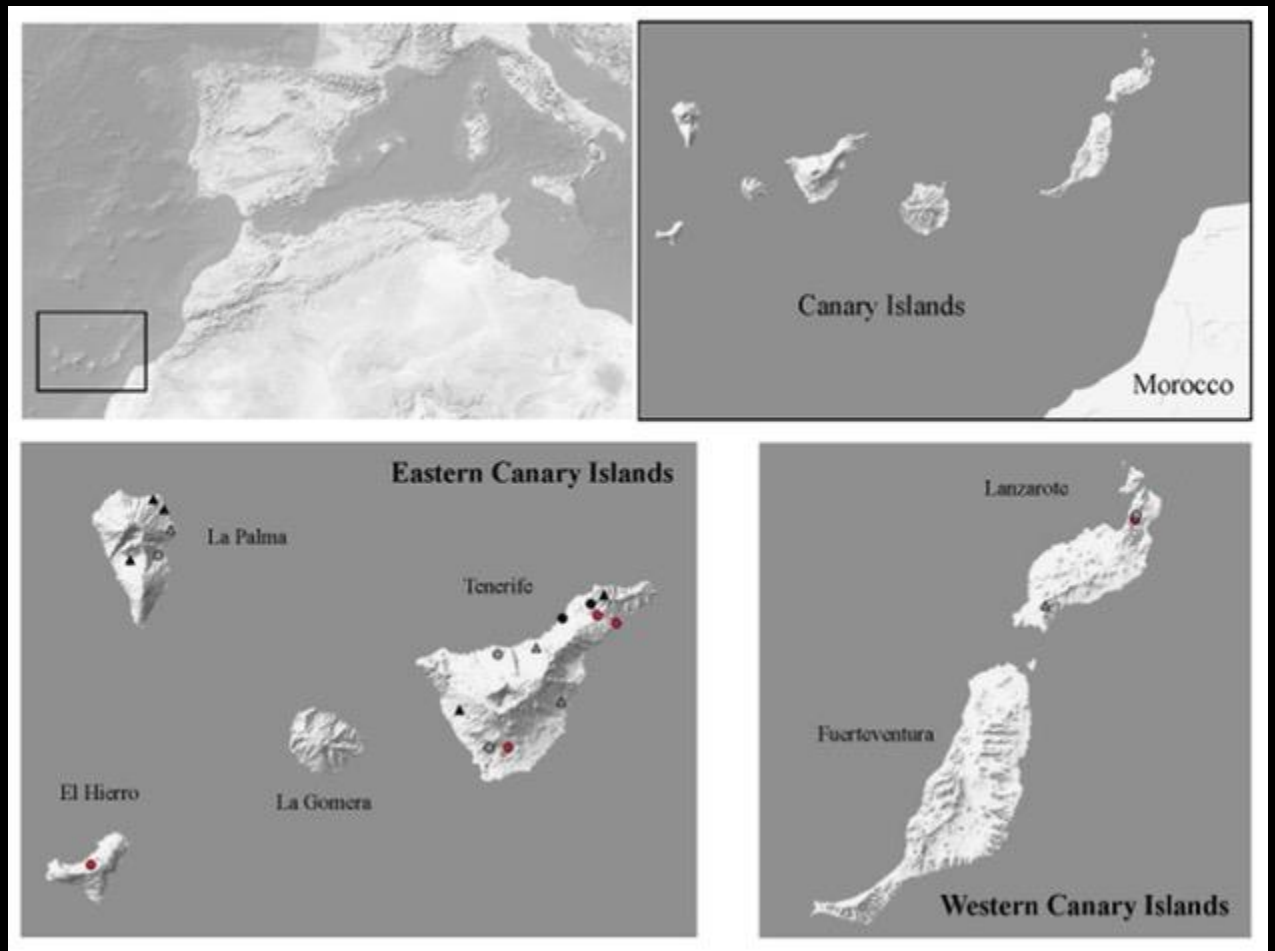


**Approximately 225,000 flights take place around the world every day before the pandemic**

# M-CoV in Canary Islands

Frontiers in Veterinary Sciences 2021. Doi: 10.3389/fvets.2021.708079

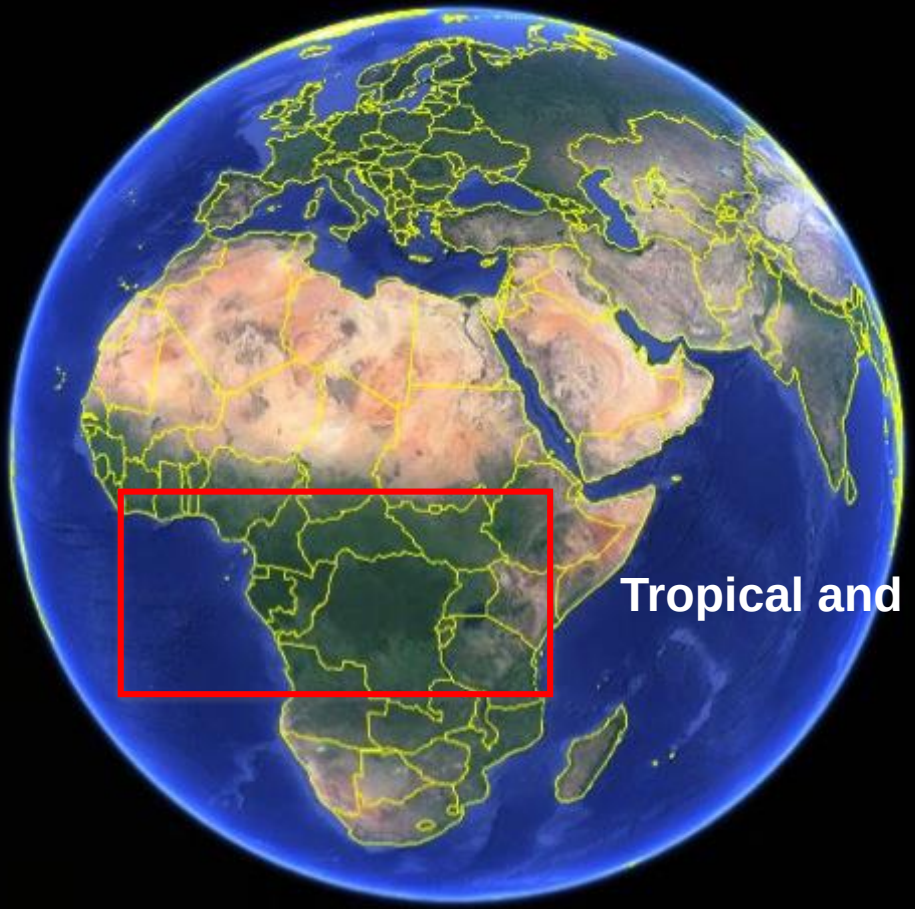
**A recent work provides data suggesting a relatively recent introduction of M-CoV in the Canary Islands and suggests an European continental origin. The viruses probably arrived with ships carrying infected European mice**



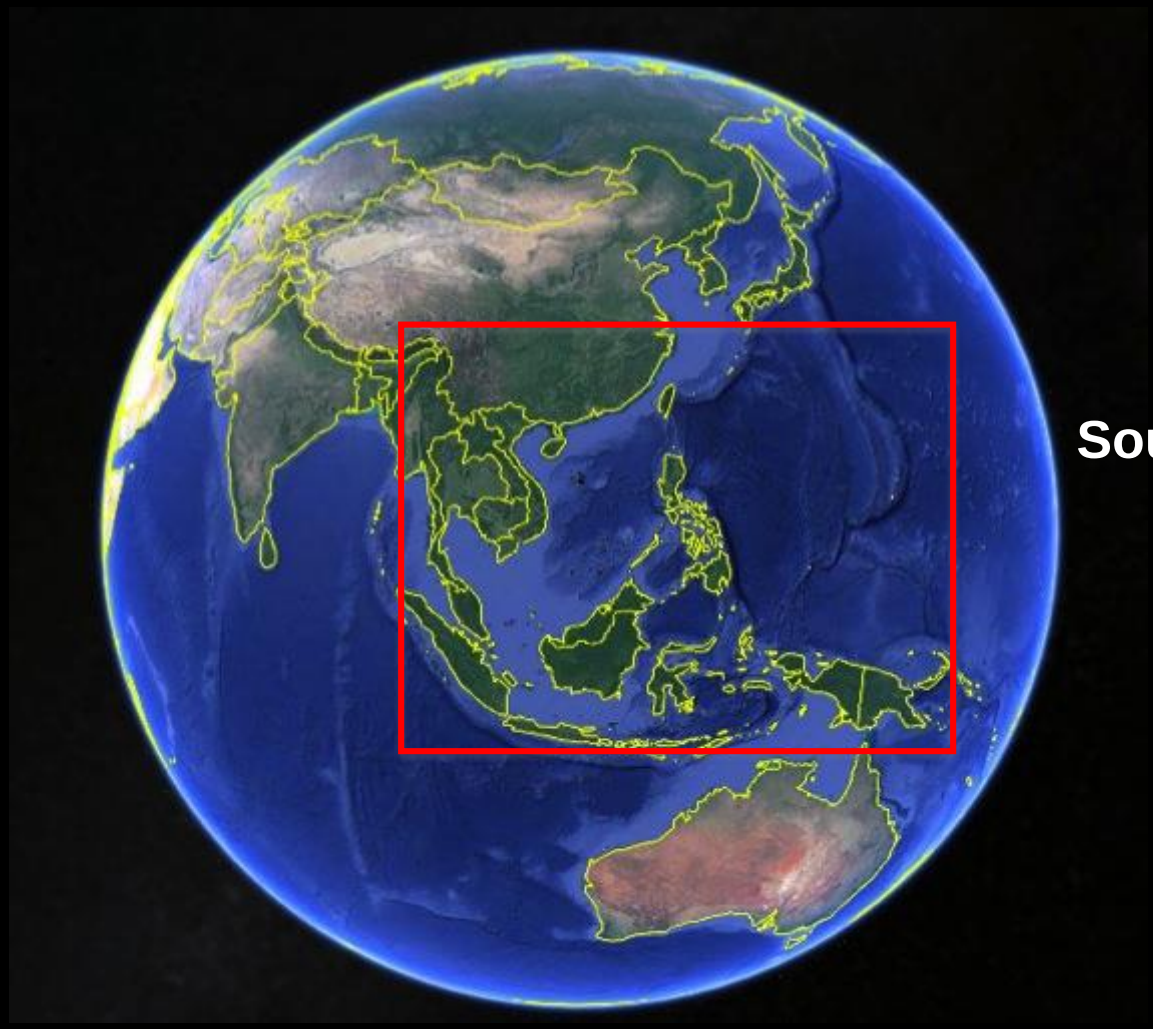




**There are three regions of our planet where the maximum diversity of living beings is concentrated, also of viruses**



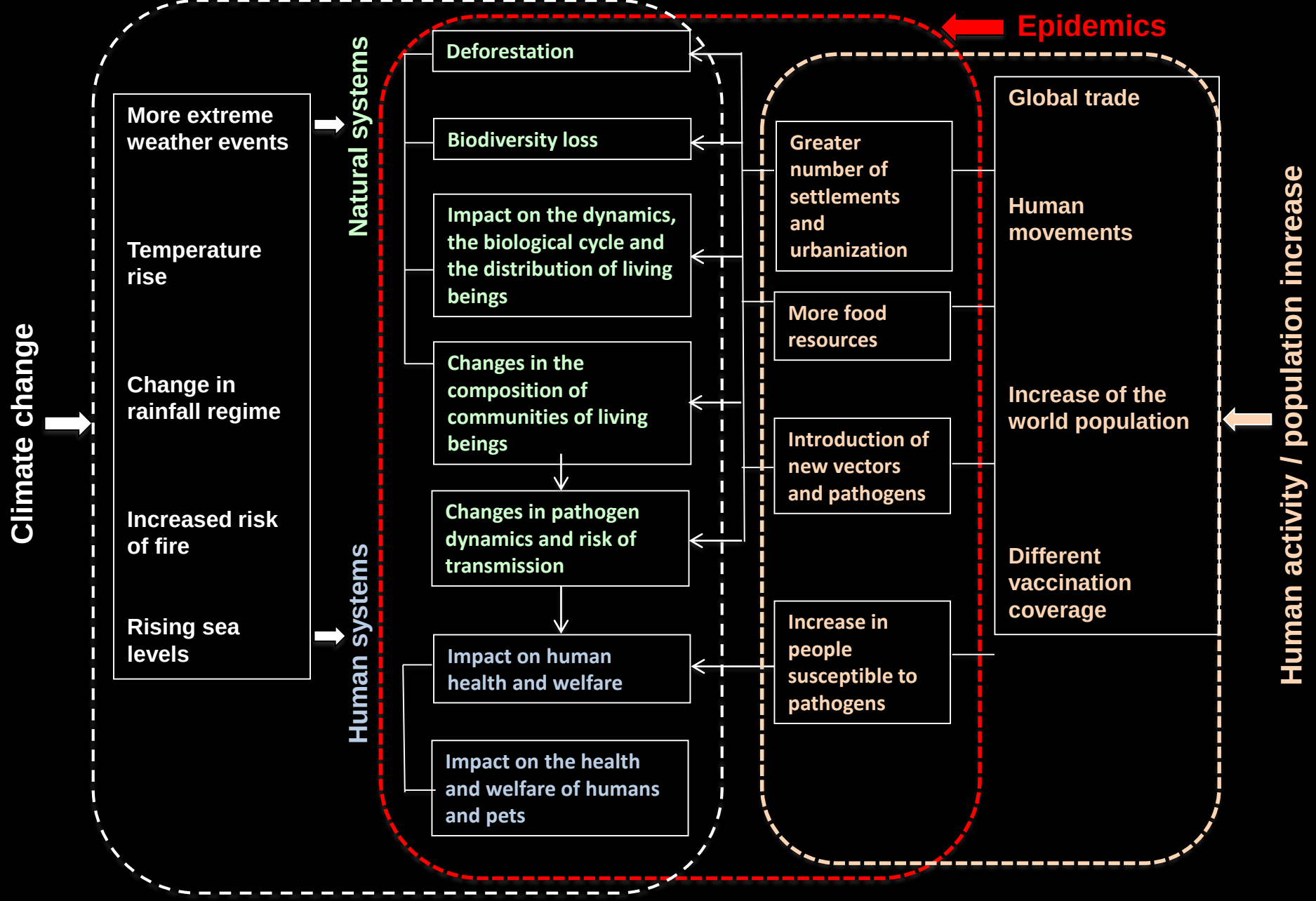
**Tropical and subtropical Africa**



Southeast Asia


Central America & Amazonia

# Three great challenges for the future



# What measures should be taken?

Change our relationship with our environment

Control the demographic growth

Take into account the societal aspects that can spread the pathogens

Protect the cities

Devote greater efforts to research, biodiversity conservation, prevention, combined with rapid detection and intervention to tackle future epidemics





# Thank you for your attention