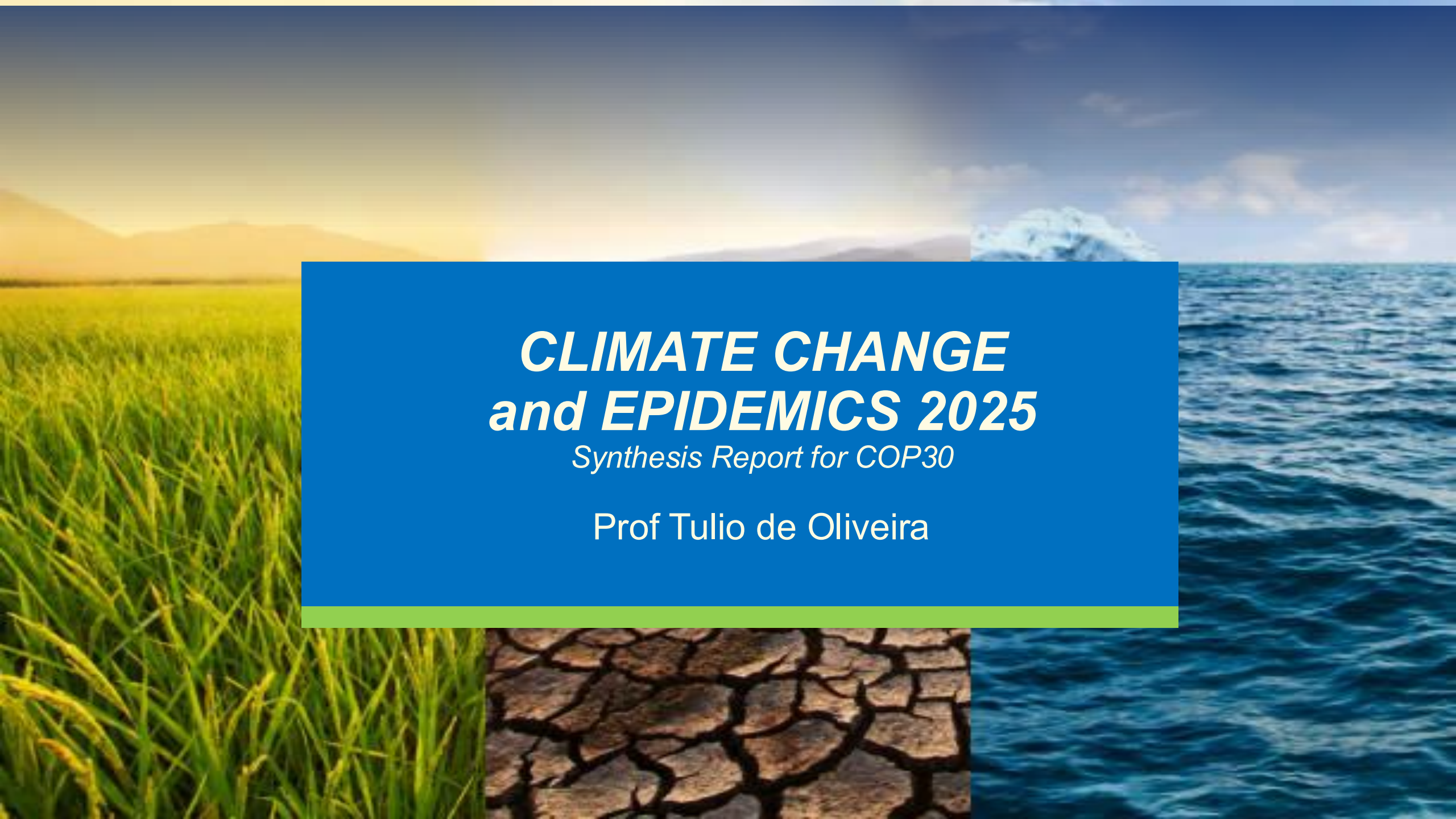




CLIMATE CHANGE and EPIDEMICS 2025

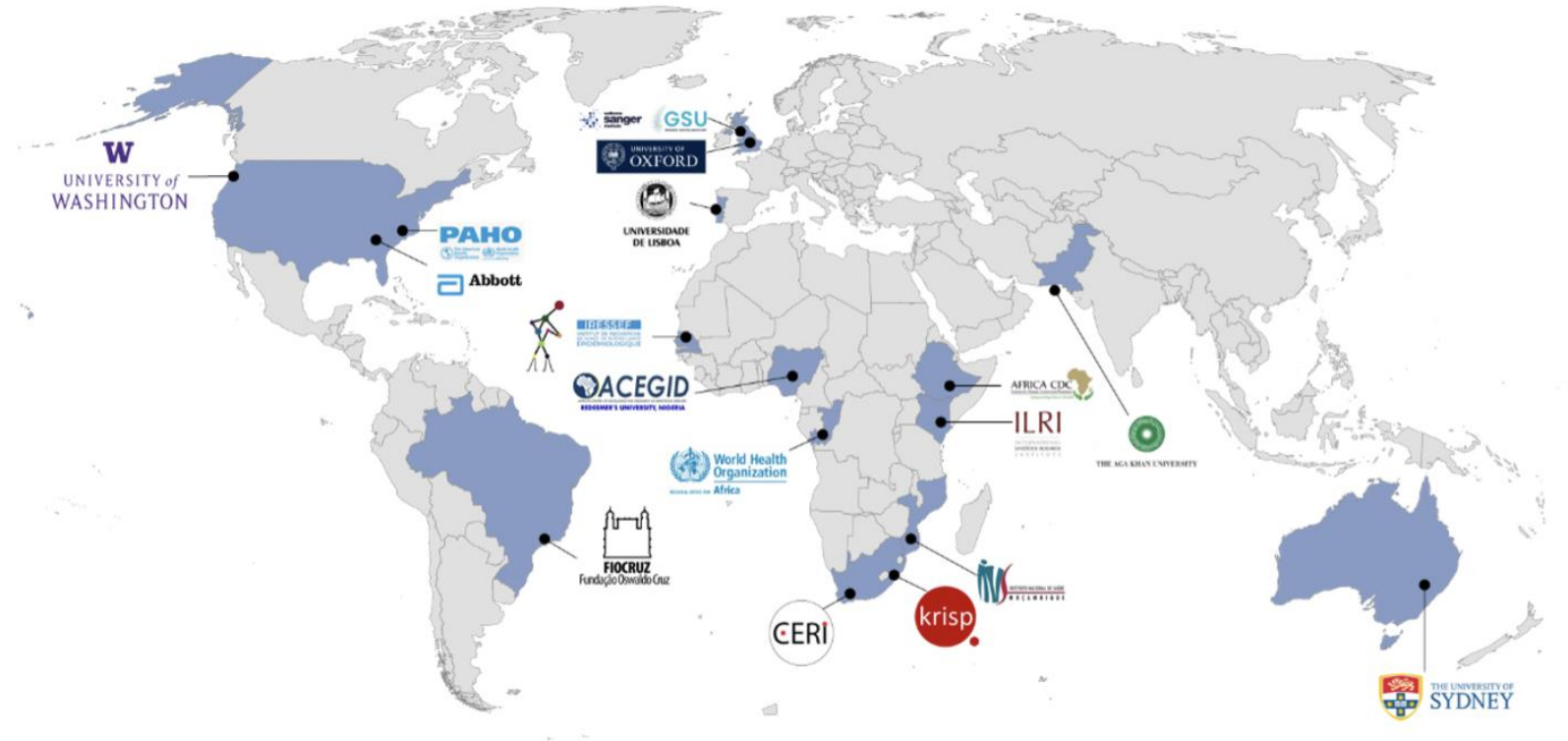
Synthesis Report for COP30

Prof Tulio de Oliveira

Partnership to protect the world



“The CLIMADE consortium brings together partners from around the globe that have long-term experience with pathogen genomics and epidemics amplified by climate change. Partners include public health agencies, academic organisations, and industry.



Fellowships to create a global workforce



- Climade, African STARS and Genomics Africa Fellows: 862 fellows from 52 African countries
- 2025 call - 6 to 12 month translational fellowships, 3,000 applicants for 40 fellows.
- 2026 call - MSc fellowships, >4,000 applicants for 21 fellows.

Fellows go back to country (52 African countries) to advance idea, have access to the laboratory assays, reagents and software applications to respond to epidemics that are amplified by climate change.



It is not an option, it is the cornerstone...



“As climate change accelerates the spread and severity of infectious diseases, building resilient capacities in surveillance, research, and health systems is no longer optional - it is the cornerstone of protecting vulnerable populations and ensuring global health security.”

Dr Alex Durand Nka, Chantal BIYA
International Reference Centre
(CIRCB), African STARS Fellow



The warning

Climate change has the potential to aggravate over 50% of known human pathogens

Key Mechanisms



Gradual Temperature Rise: Impacts on the spread of infectious diseases, such as West Nile virus.



Evolving Pathogens: Driven by viral adaptation to new vectors and expanding environments.



Extreme Weather Events: Drought as a catalyst for the 2023–2024 Amazon event and Oropouche virus expansion.



Climate Migration: Climate-induced migration in Africa and its public health implications.

1 – Gradual Temperature Rise



Infectious diseases outbreaks becoming more common, including in regions where they did not historically occur

> 20 EUROPEAN COUNTRIES WITH HUMAN CASES OF WEST NILE VIRUS

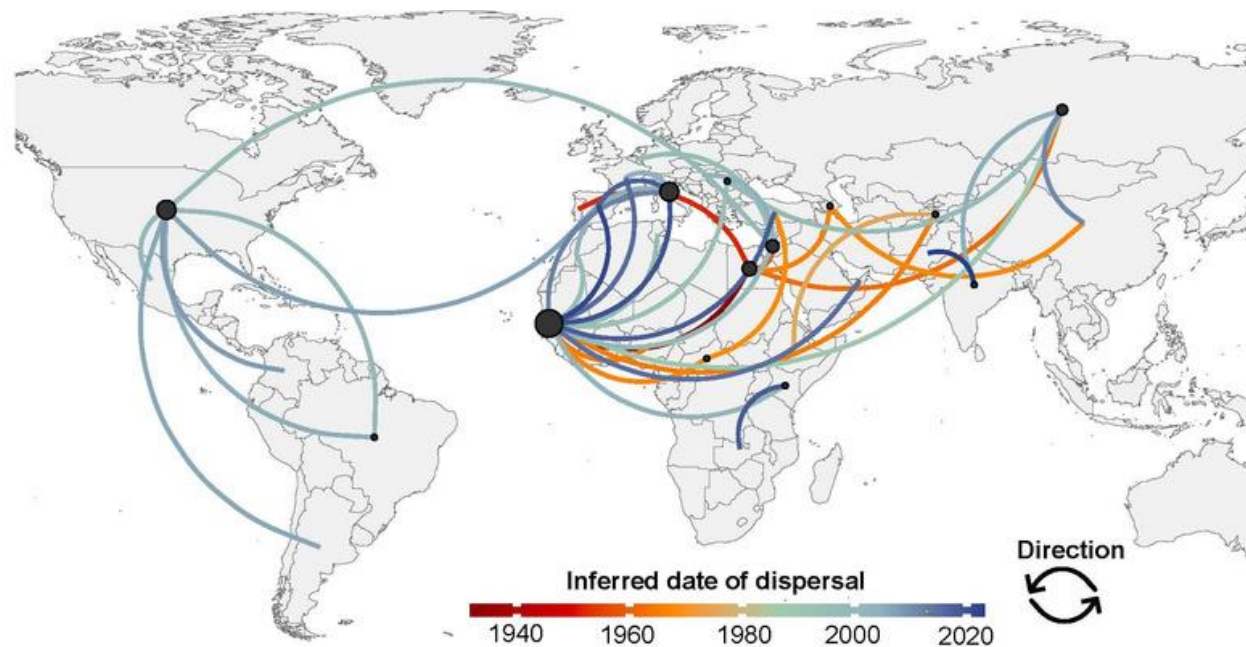
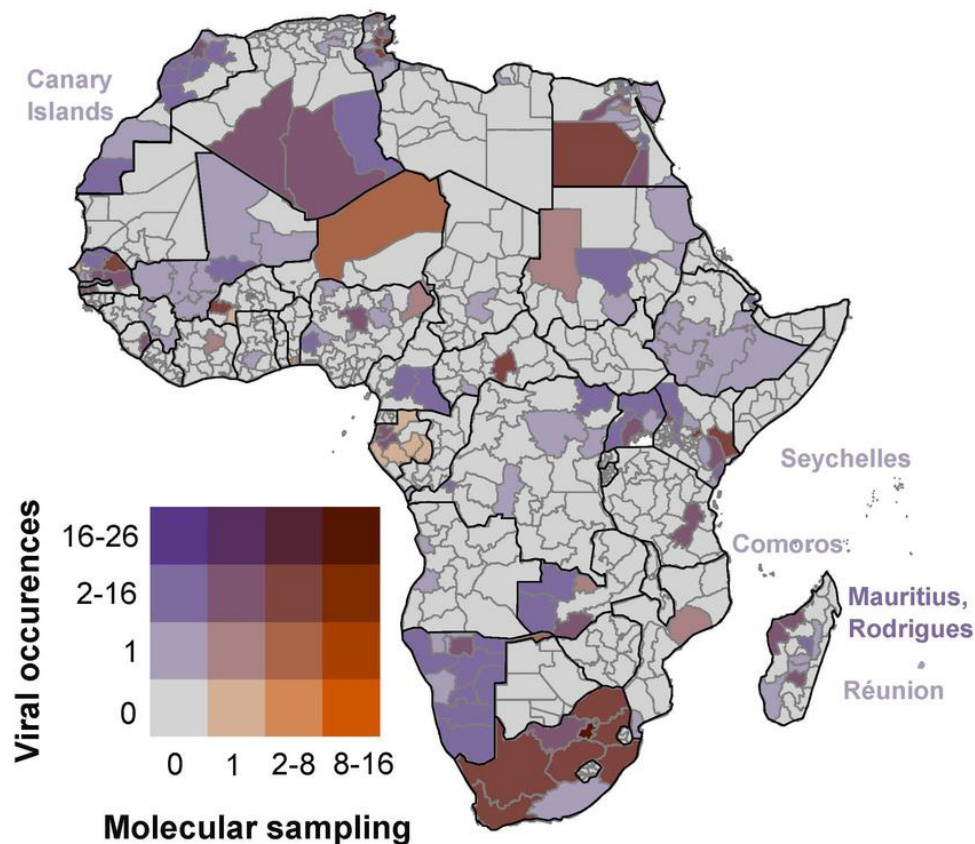
West Nile is spreading around the world, mostly undetected

> 14 MILLION CASES OF DENGUE

>14 million dengue reported from 70 countries globally, 2024 was the year with record cases of Dengue in the world



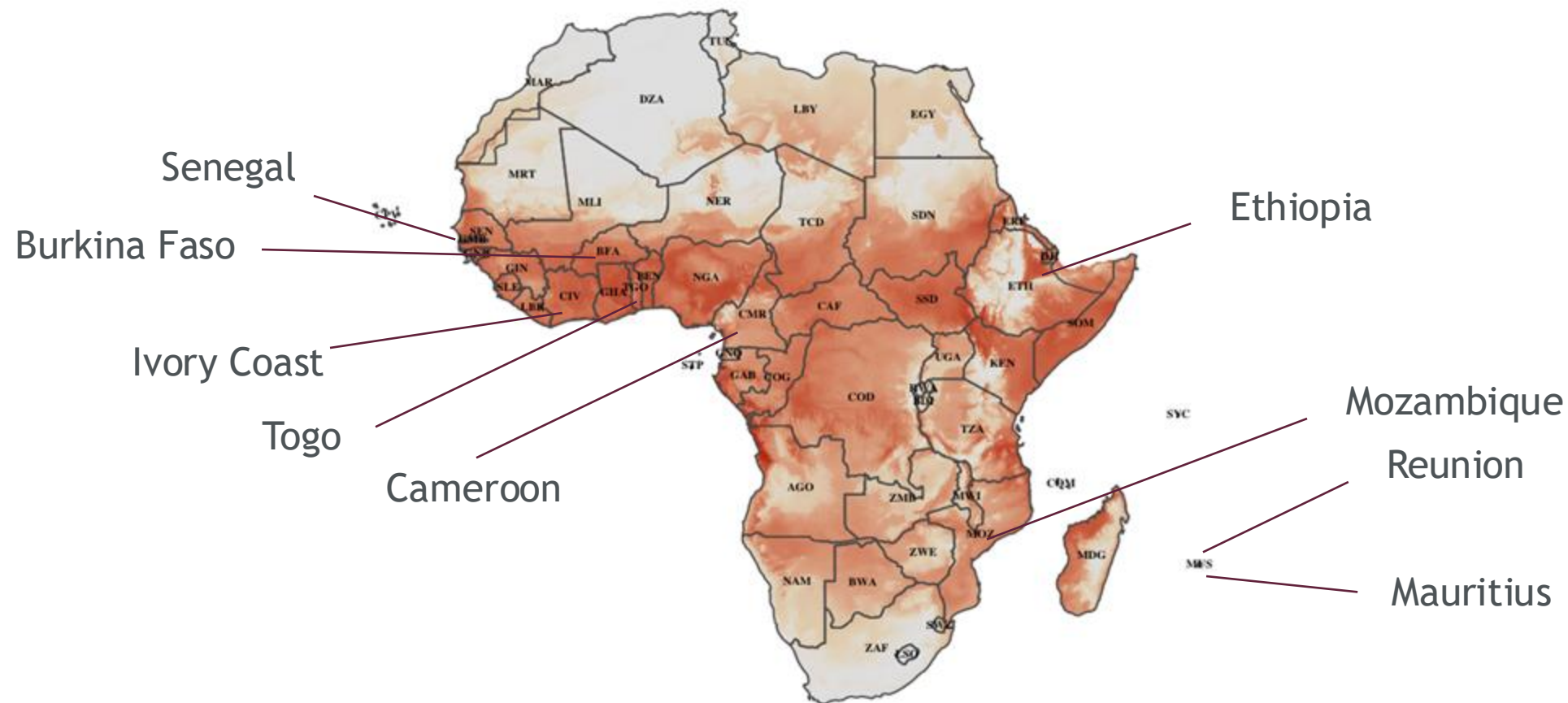
A climate-sensitive Pathogen: West Nile virus



Moir et al The Lancet Microbe 2025

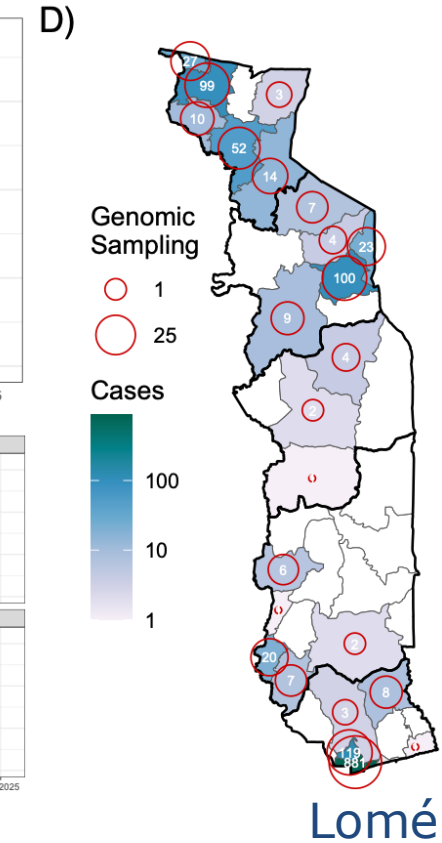
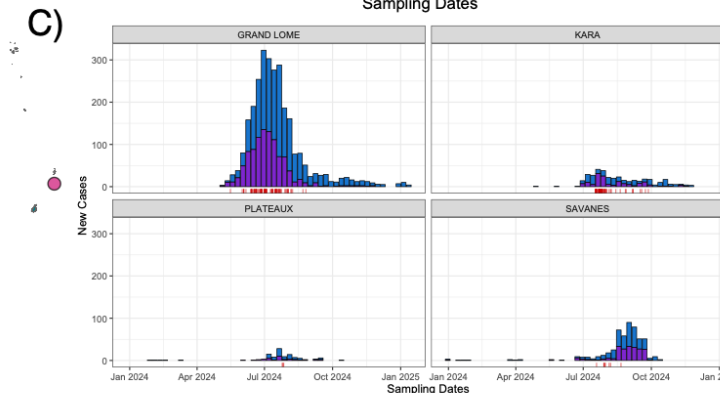
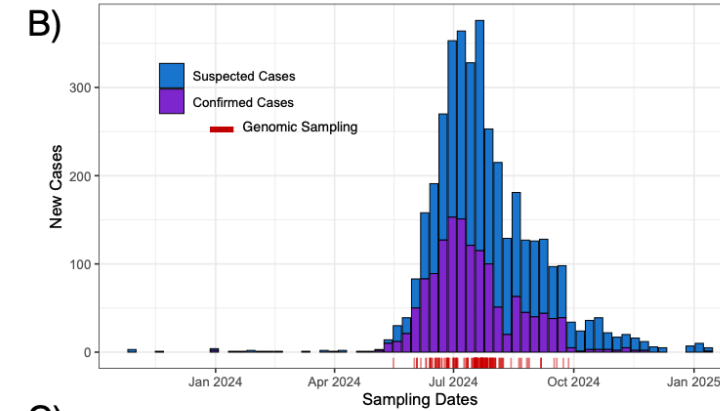
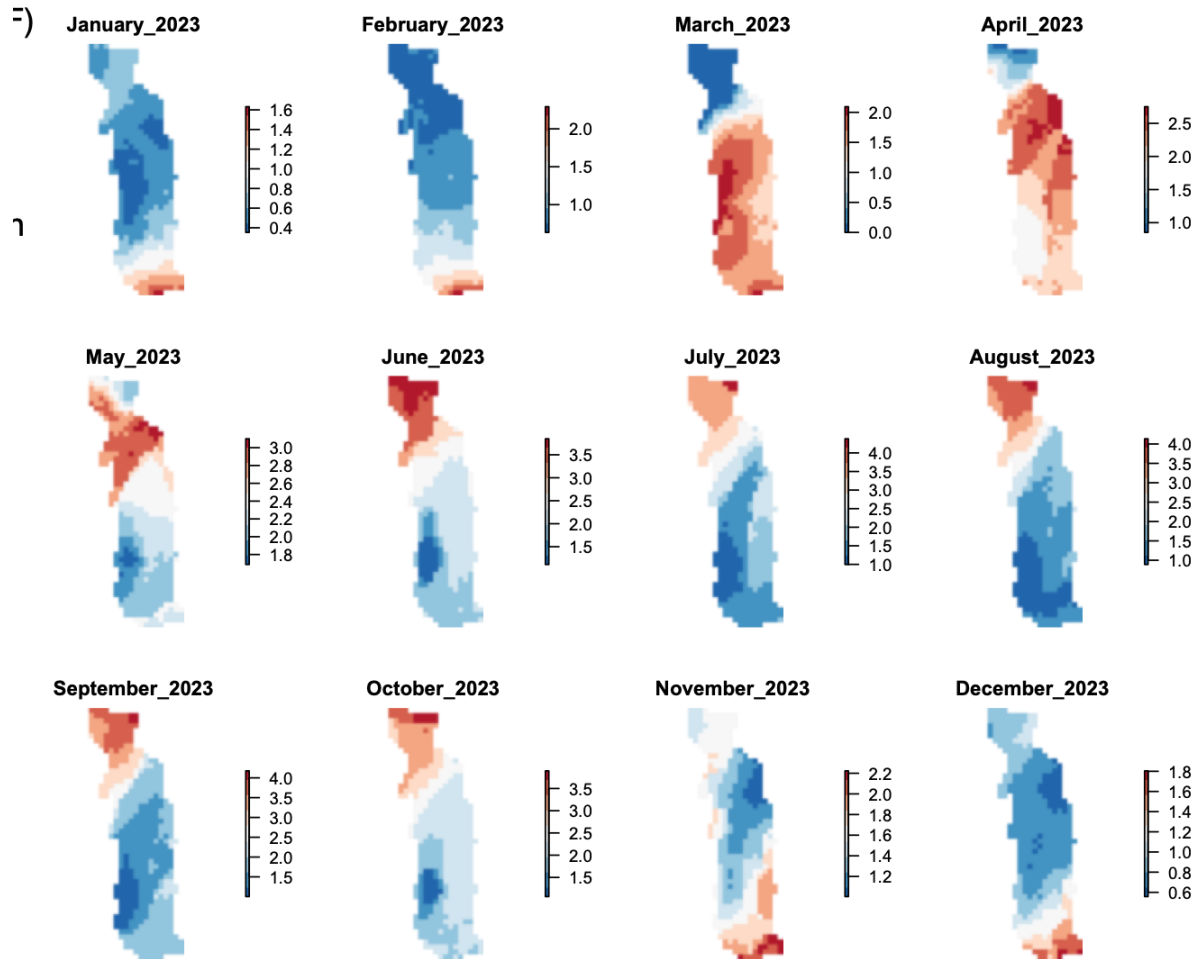
West Nile: Infectious in over 20 European and North American countries

Dengue Outbreaks in Africa in 2024-2025

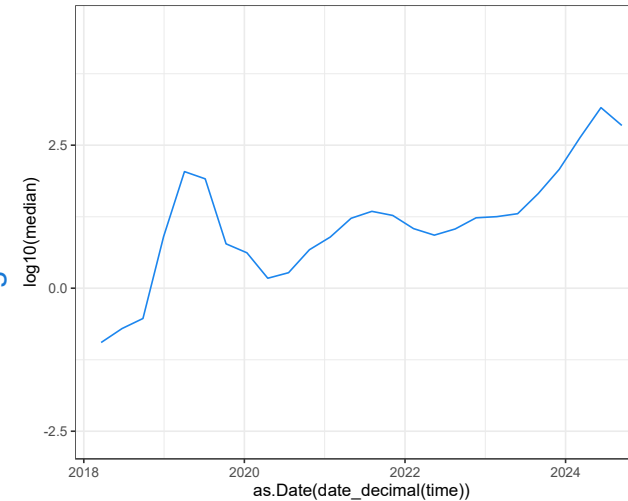


Dengue: 14 million Global cases in 2024

New lineage of Dengue causes large outbreak in Togo: Enter the South (Lomé) and spread North



New lineage of Dengue cryptically transmitted in Africa and multiple introductions to Togo and rapid spread



Dr Issaka MAMAN, PhD
Laboratoire de Biologie
Moléculaire-Virologie
Institut National d'Hygiène
Lomé, Togo

2 – Evolving Pathogens

Like COVID-19, pathogens are evolving to spread further

> 500,000 CASES OF CHIKUNGUNYA

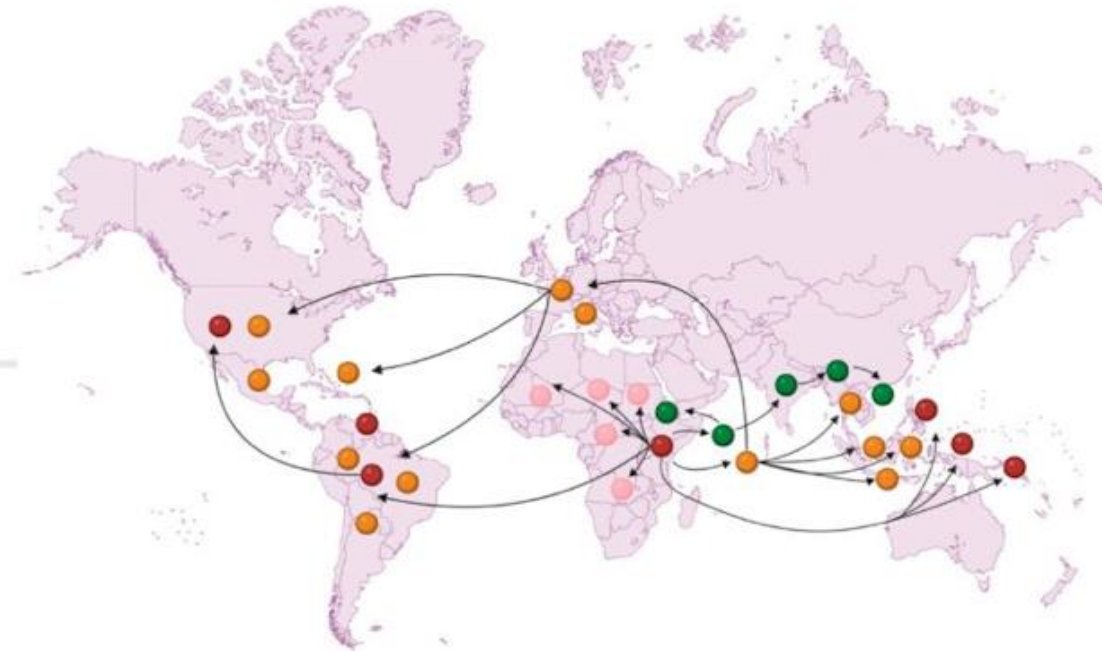
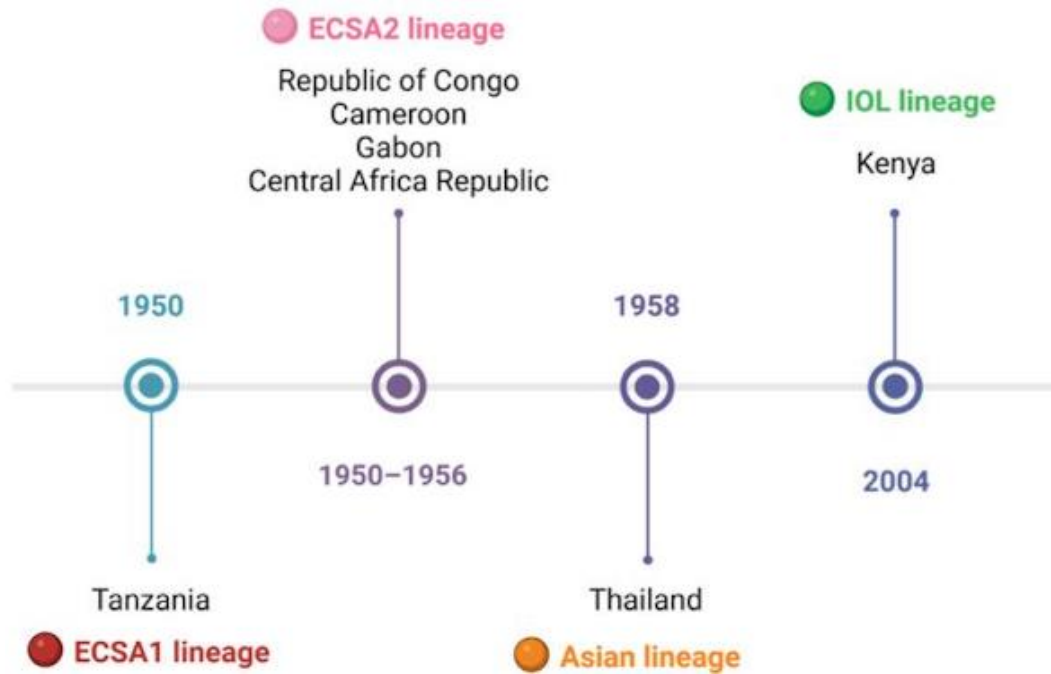
Chikungunya reported from 20 countries worldwide in 2024. New variant emergence in Africa and 40 countries with infectious in 2025 potential global spread with millions of cases in 2025

> INFLUENZA

Birds are flying further and together with evolution of Influenza are affecting over 400 species of wild birds and mammals. Potential to cause a new pandemic.



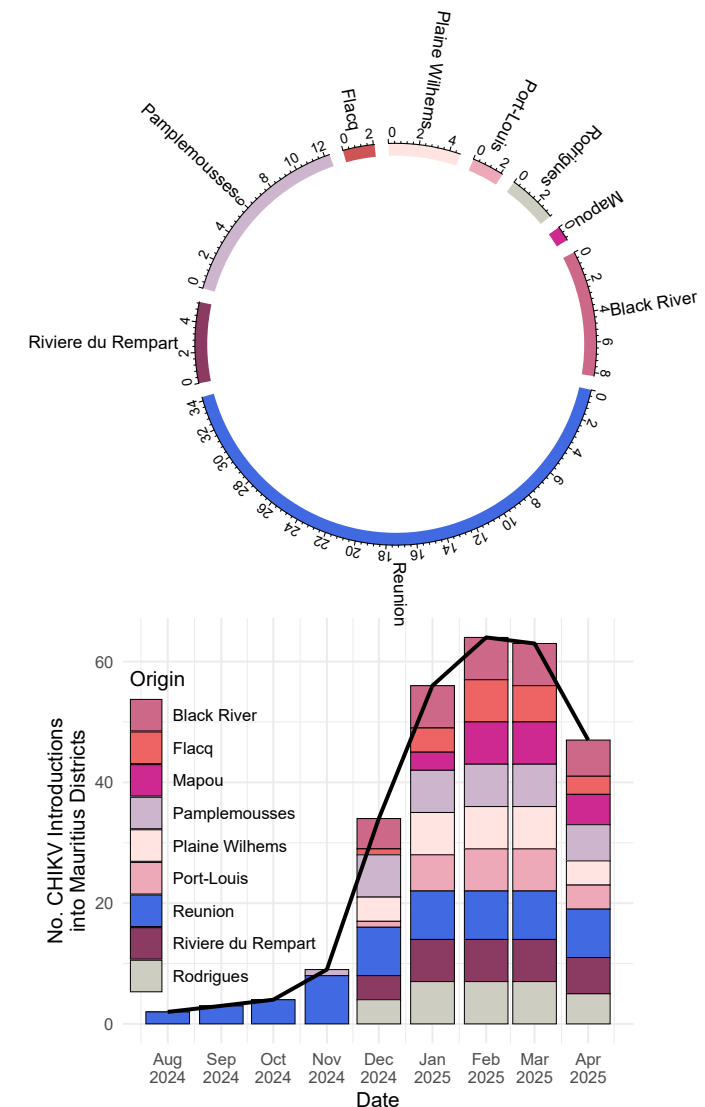
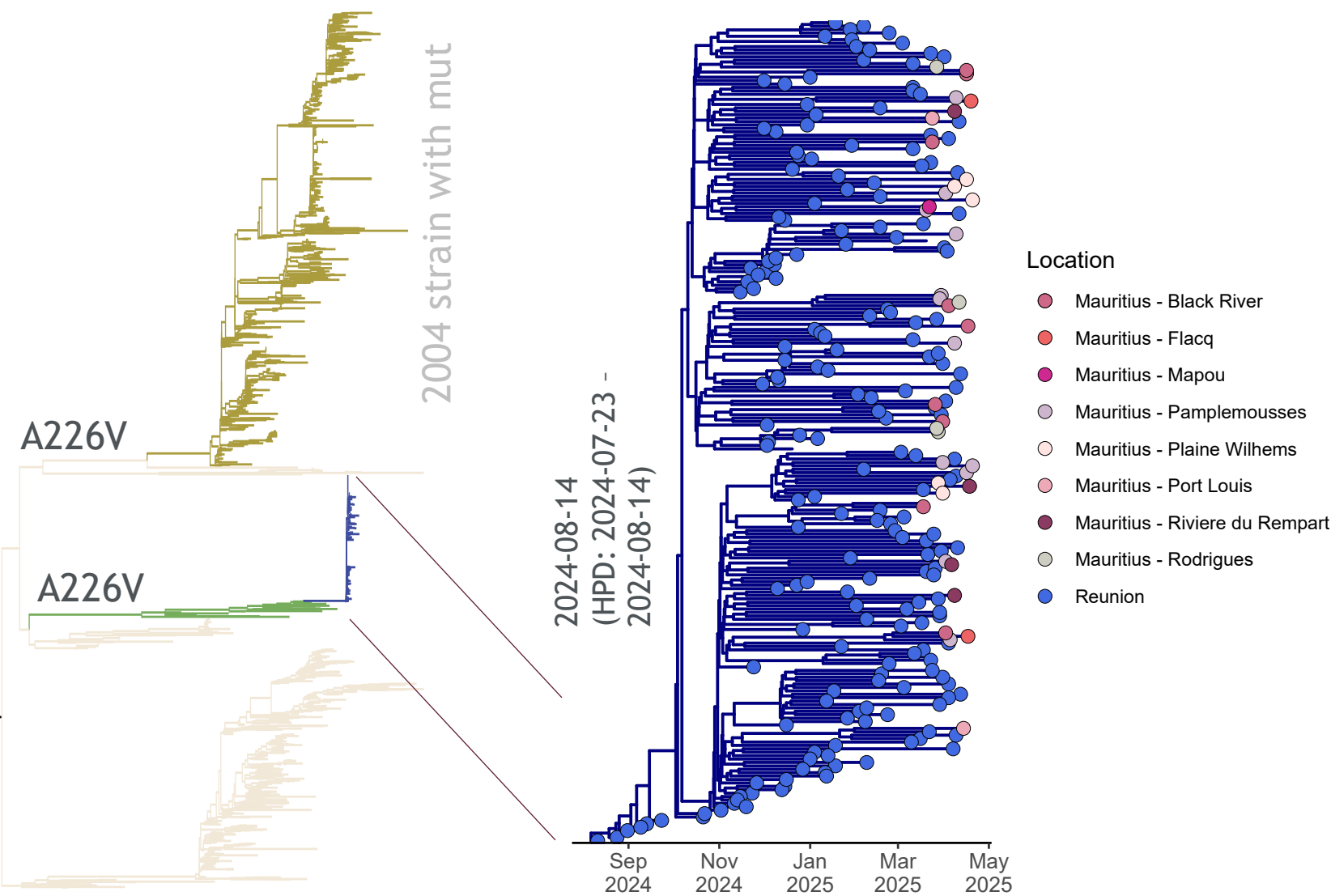
Chiungunya variants and global spread



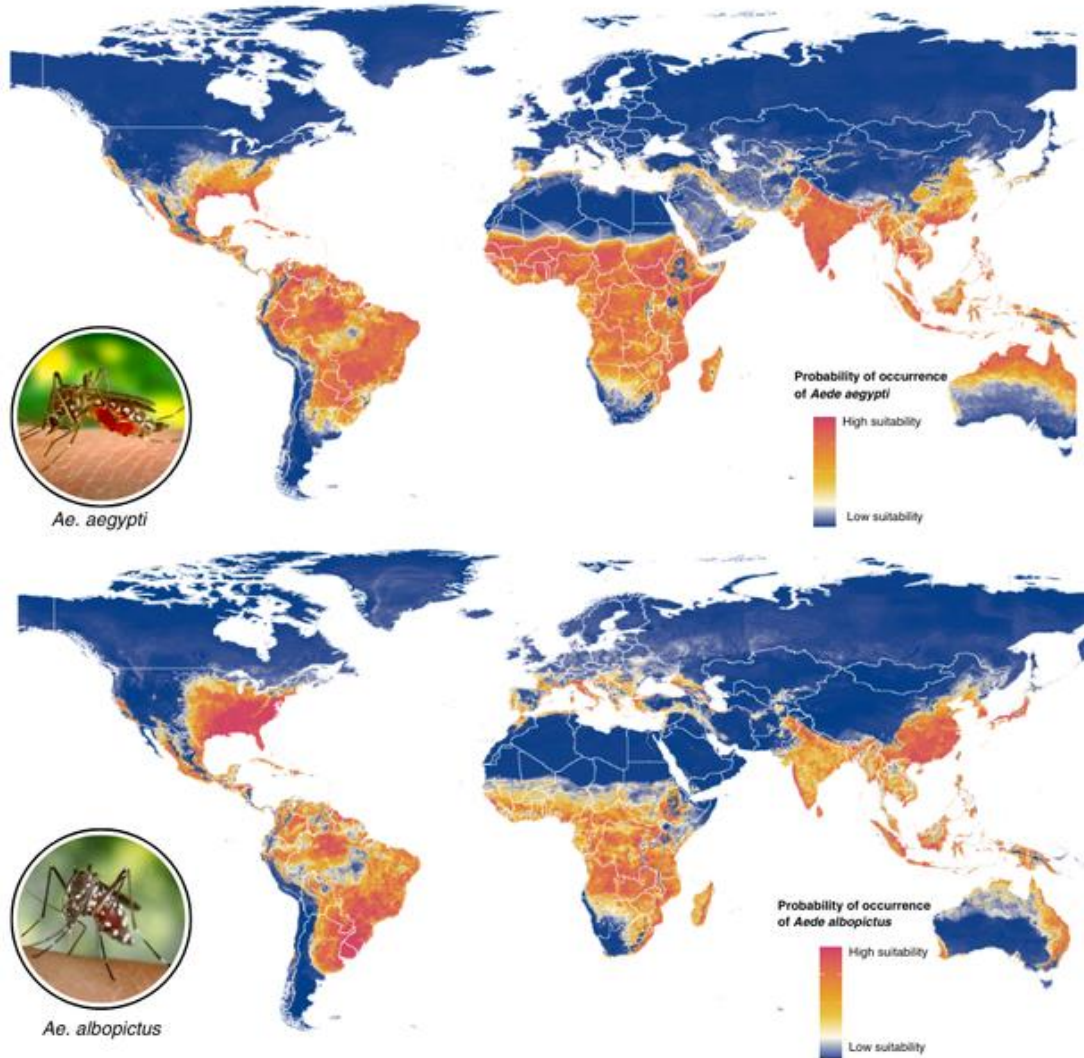
Affecting over 119 countries

Martelossi-Cebinelli *et al.* (2025). *Pathogens*

New variant of Chikungunya with Adaptation for Aedes Albopictus Transmission



Evolution of Chikungunya to transmit in multiple vectors



- Increase in **ecological suitability** for both the pathogen and vector
- Altered precipitation patterns create new breeding habitats
- *Aedes Albopictus* expand area of transmission in Asia, Oceania, Europe and North America.
- Large outbreaks in 2025 in China, Indian Ocean Islands and large to spread further in 2026.



Vanessa Ramuth
Ministry of Health, Mauritius

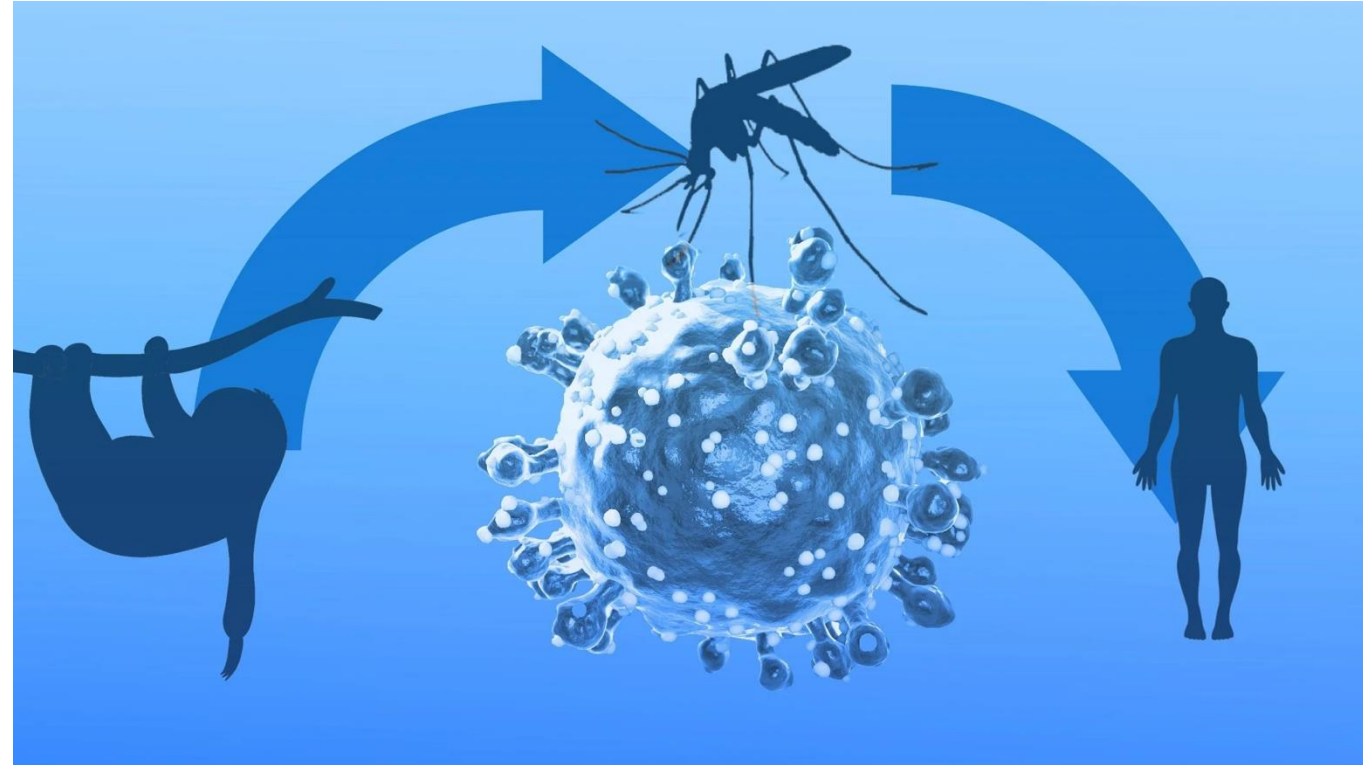


Dr Houriiyah Tegally, PhD
Head of Data Sciences, CERI
Mauritian

3 – Re-emergence of pathogens

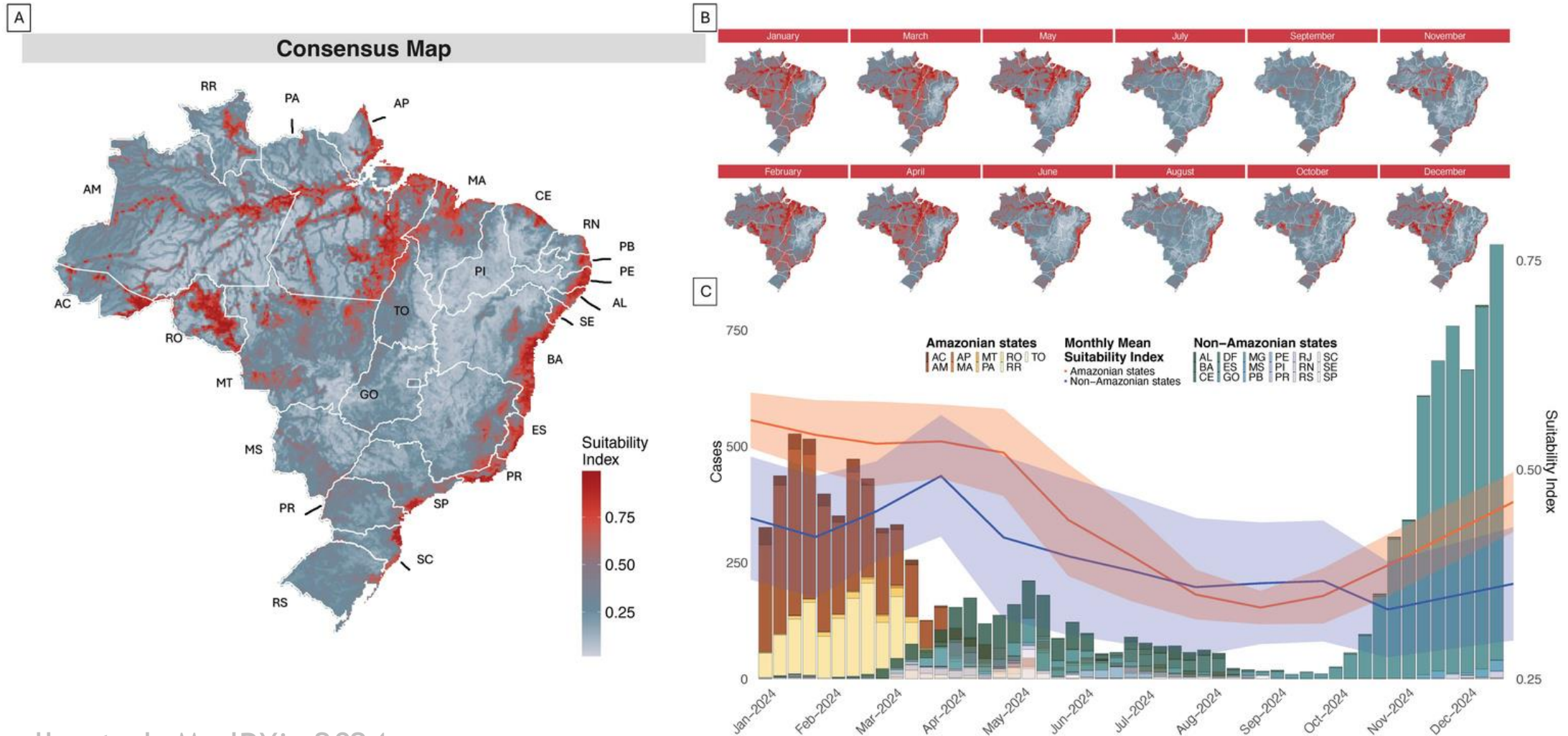


Marburg Hemorrhagic Fever Virus
2024 outbreak, Rwanda. New outbreaks of
Ebola in Uganda and DRC in 2025



Oropouche Fever Virus
2024 Outbreak, Brazil, Colombia & Cuba

Oropouche re-emerge in the Amazon and spread during the worst draught



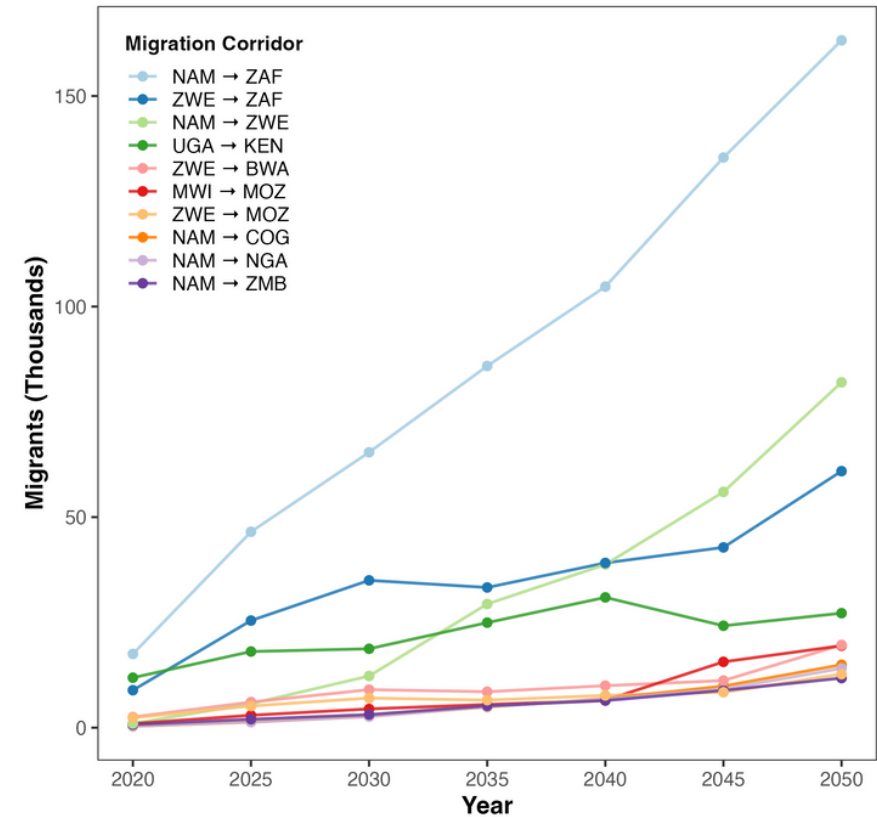
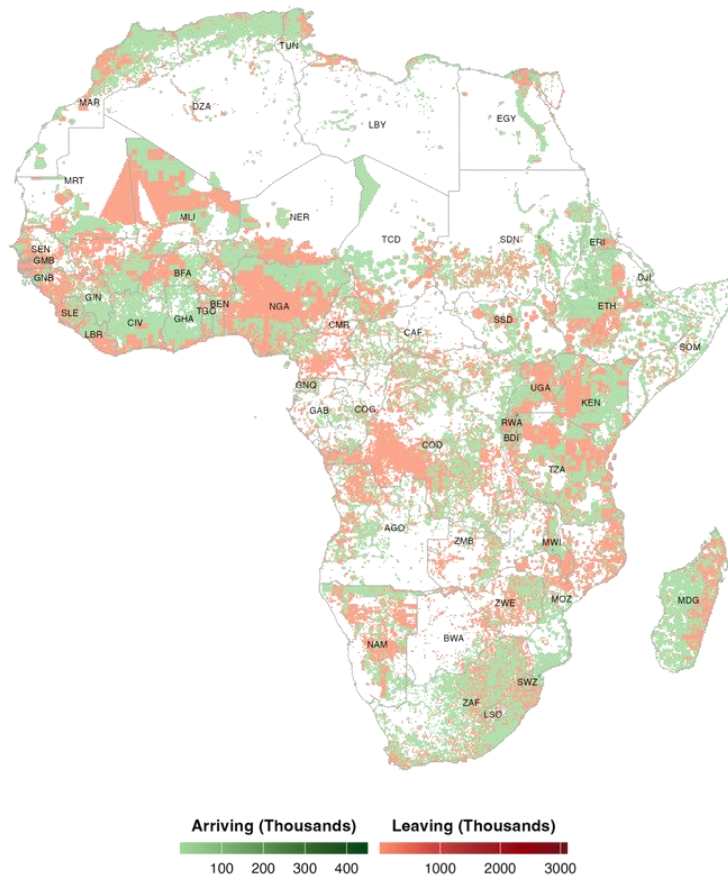
Tegally et al. MedRXiv 2024

4 – Climate Migrants and Epidemics

- Movement of people, animals, and cargo can further compound the challenges of climate change and epidemics.
- Climate change can drive populations to migrate, causing more interactions with wildlife and increasing the risk of spillover of pathogens.
- Highly transmissible pathogens can also easily cross borders.
- El Niño will likely produce severe drought in some regions of the world, potentially spurring mass temporary and permanent migrations.



Cross-Border Climate Migration



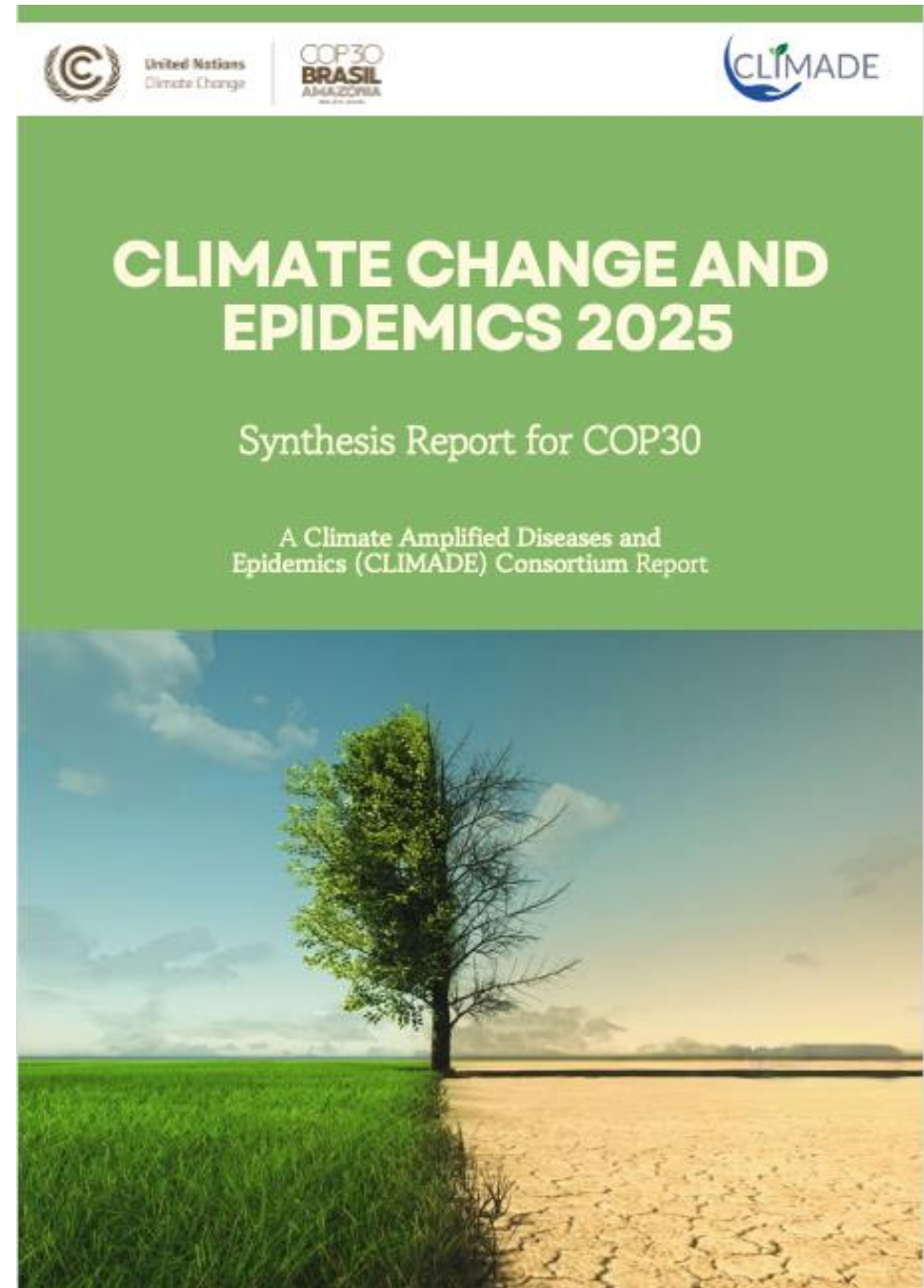
Africa will bear the brunt of cross-board climate migration with potential to spread globally.

Climate Change & Epidemics 2025

Synthesis Report for COP30

- Produced by over 200 scientists from 40 countries
- Provide the laboratory assays and software applications to track epidemics amplified by climate change
- Provide a call for action for government, private companies, academics and NGOs
- Through cross-border collaboration and partnership, we can create a more effective, global approach to climate change & infectious diseases.

“A stick is easily broken, sticks in a bundle are unbreakable”



Call to Action



Strengthen surveillance

Implement One Health surveillance systems

Reporting outbreaks timeously

Immediate & transparent reporting is paramount.

Prioritising vulnerable populations

Regional collaboration and national commitment

Call to Action



Promote climate resilience

Adapt surveillance systems and vector control

Commit to sustainable funding

Regional collaboration and national commitment

“We develop laboratory assays and tools to predict, track, and control diseases and epidemics in the most affected regions in the world.

- Prof Tulio de Oliveira, which team discovered Beta and Omicron variants but decided to focus on the next big challenge – climate change & epidemics.

