

Immunization and Climate Change

ARVAC

September 2025



**World Health
Organization**



Fueled by increasing temperatures, extreme weather & natural disaster severe climate events are growing rapidly, and harming people.

For the last 10 years, I was making, or rather testing very few people, but **things have changed because of the climate**. Malaria has really increased. For a day I test about 15 to 20 people who test positive
Jeffrey Mutali (Milo Health Centre, Kenya)

In Uganda, we recently have had **many floods where people were displaced**, landslides, and people had to be reallocated to different places...Of course, when the whole village and the whole community are disturbed and dislodged, then **there are no services**
Moise Gwakolins Davis



Drought
A well in Lehele, Kenya, which residents say has been dry for 3 years (photo Feb 2023)



Extreme Floods
Pakistan Sept 2022



Wildfires causing severe air quality and releasing carbon into the atmosphere
New York, June 2023 from massive Canadian wildfires

Photo credit: WHO/Billy Miaron

Air quality image Credit: David Dee Delgado/Getty Images

The climate change impacts on health are worsening.

Global warming average, compared with pre-industrial average global temperature (prior to greenhouse gases from human and industrial activities)

During the rainy season, it was very difficult for people to seek care for their health needs. They wait for the condition to get worse before coming to the facility*

Man, Health facility, MOH, Ghana

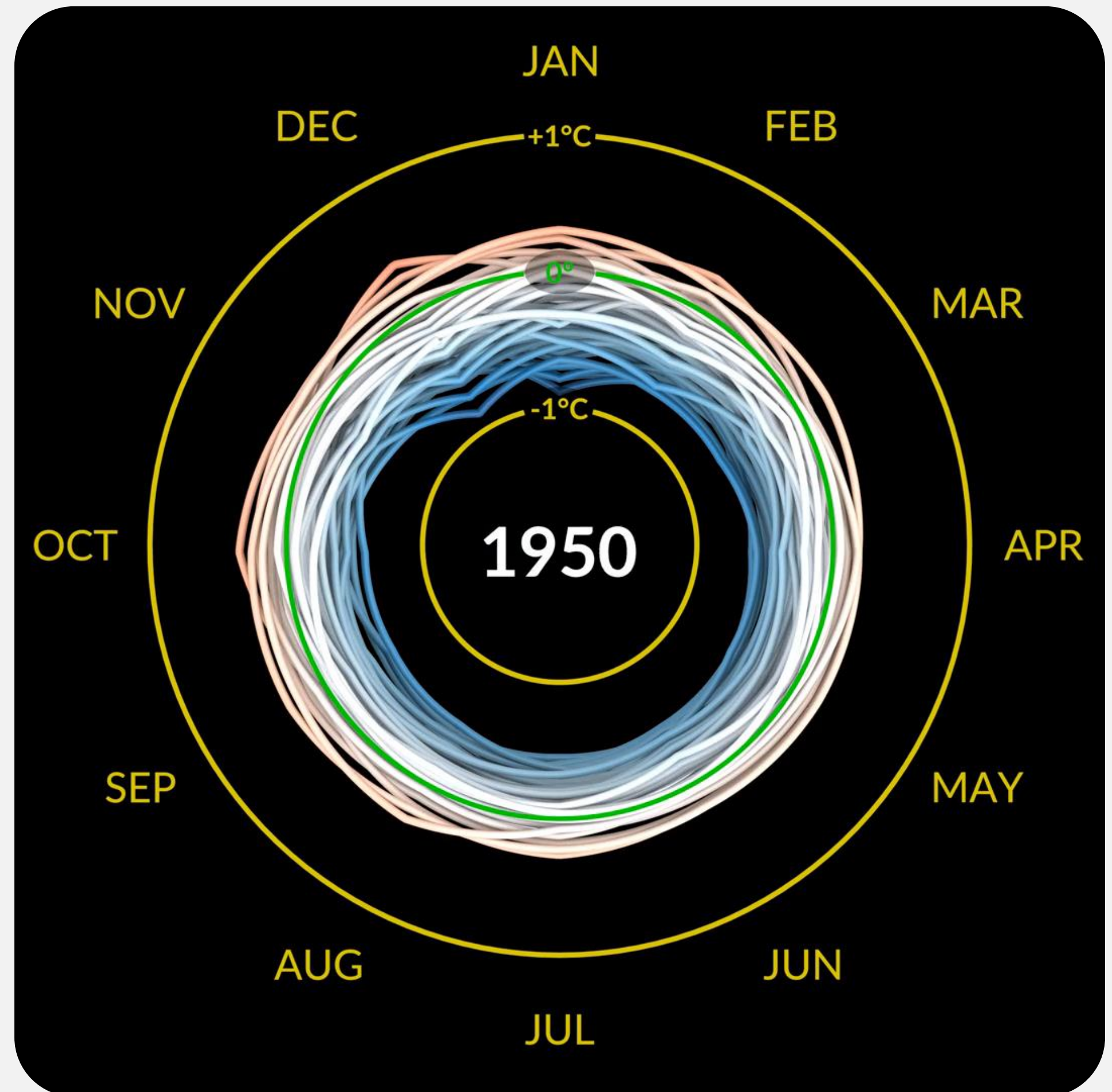
There was also a **pregnant woman in labor**. Unfortunately, they couldn't get a strong boat or canoe that could stand the high current waves coming from the seaside. In the process of searching for a better means of taking her to the nearest health center, **she got exhausted and died***

Woman, District, NGO, Nigeria

And we should remember, hopefully, that climate change, although it's a global phenomenon, **is affecting very, very locally people in very different ways.***

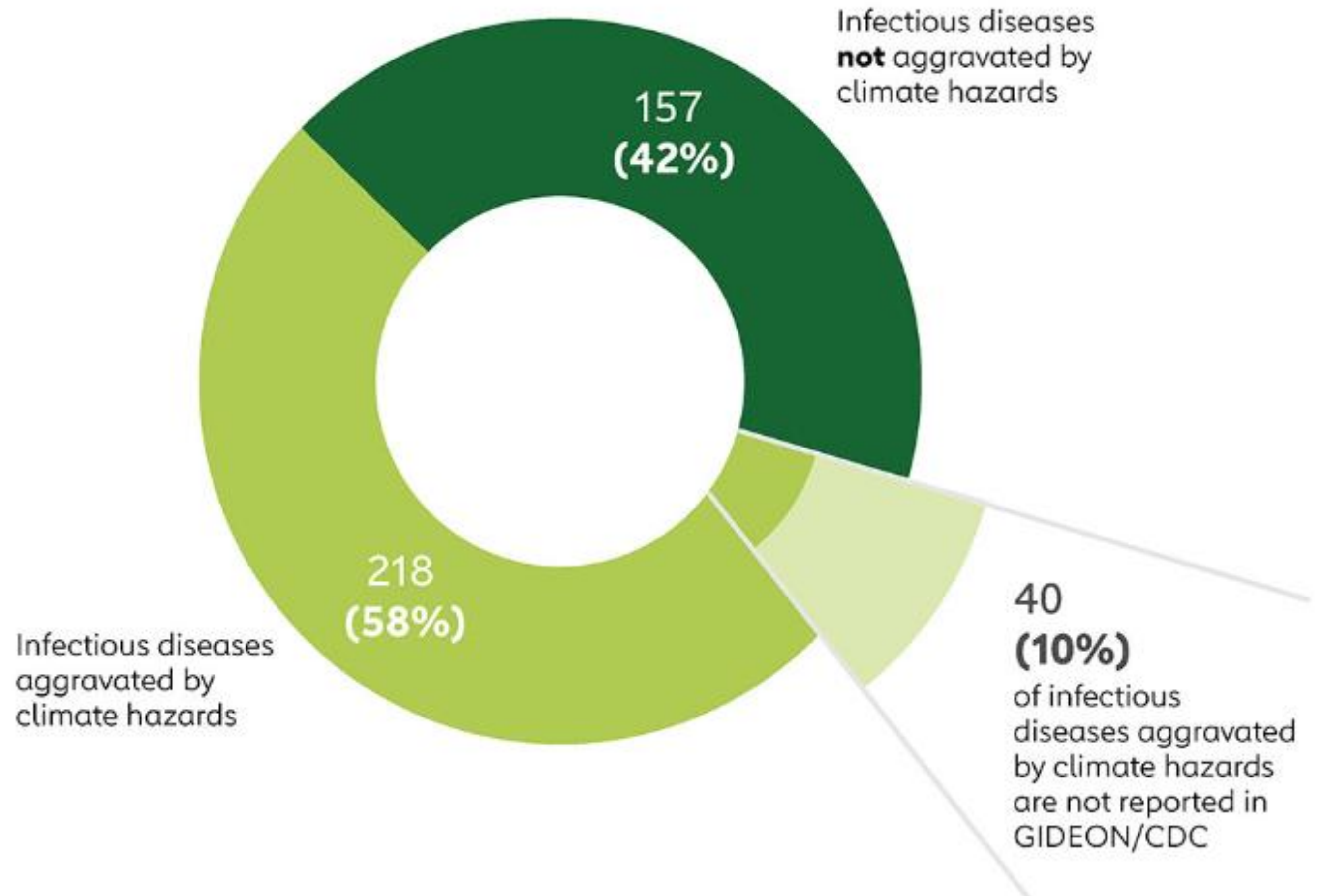
The Geneva Learning Foundation (2023). Eye witnesses to a changing world: Climate change and health. Listening and Learning Report. Geneva, Switzerland. <https://doi.org/10.5281/zenodo.8362817>

Average Global Temperature
(1880–2022)



https://climate.nasa.gov/climate_resources/139/video-global-warming-from-1880-to-2022/

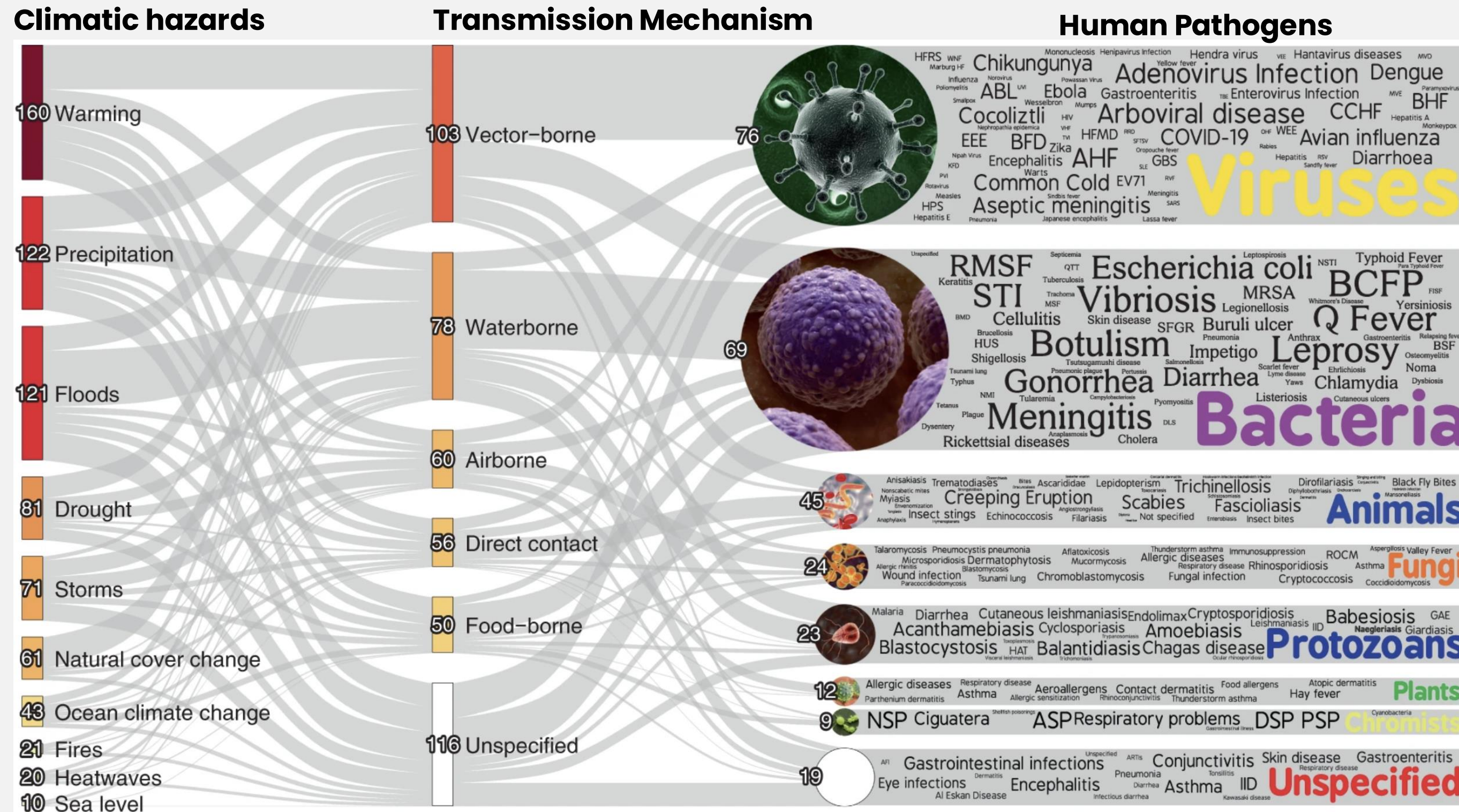
Infectious diseases are especially affected by climate change



Source: Nature (August 2022)

A warming planet: Floods, storms, droughts, heatwaves & human migration are changing the way pathogens are spread & increasing risk of disease

277 human pathogenic diseases aggravated by GHG-related climatic hazards, including 58% of all infectious diseases known to have impacted humanity in recorded history



17 of 19
Diseases with Gavi-supported vaccines are worsened by climate change

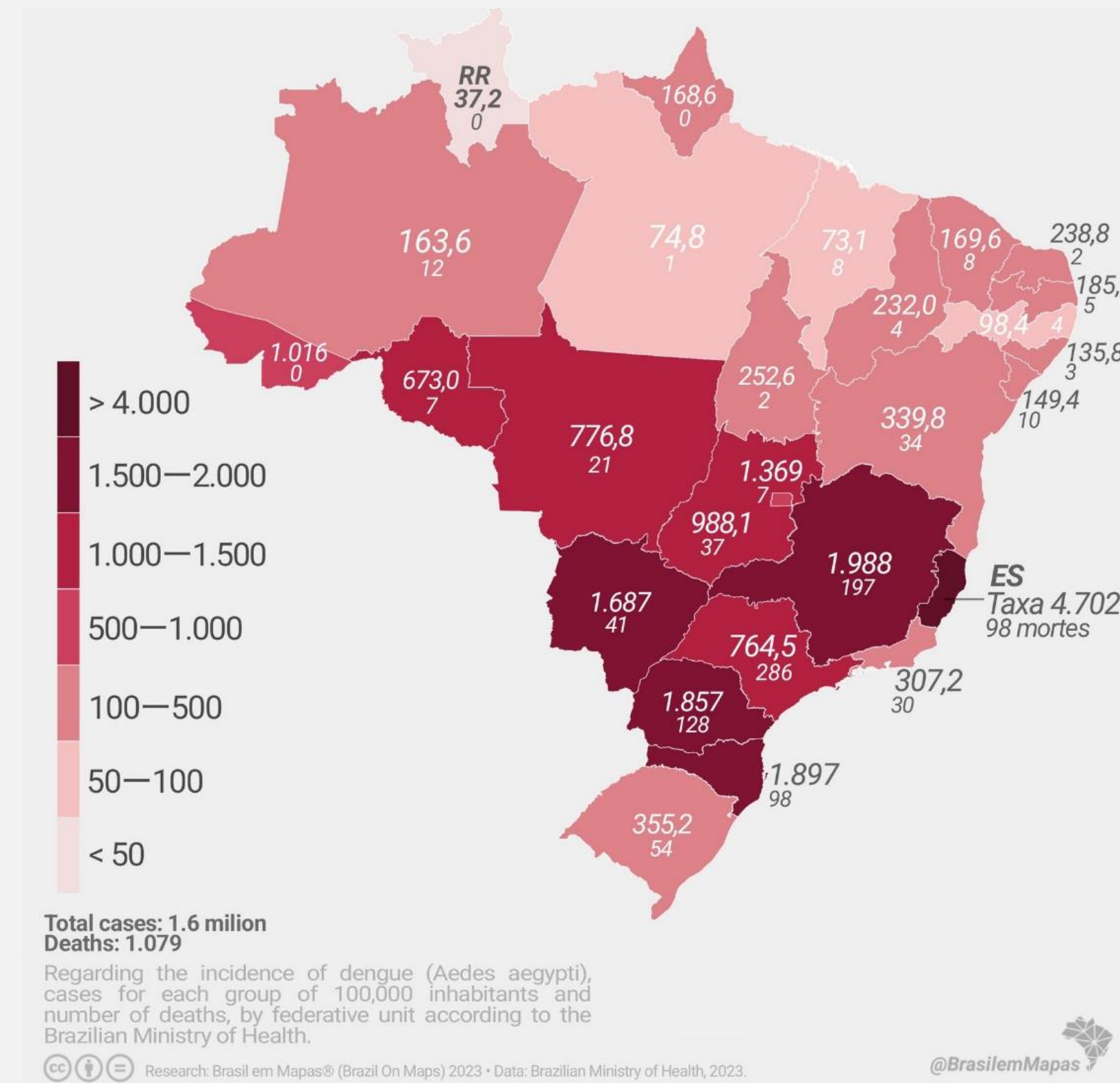
The thickness of the lines is proportional to the number of unique pathogenic diseases

The colour gradient indicates the proportional quantity of diseases, with darker colours representing larger quantities and lighter colours representing fewer

Numbers at each node are indicative of the number of unique pathogenic diseases

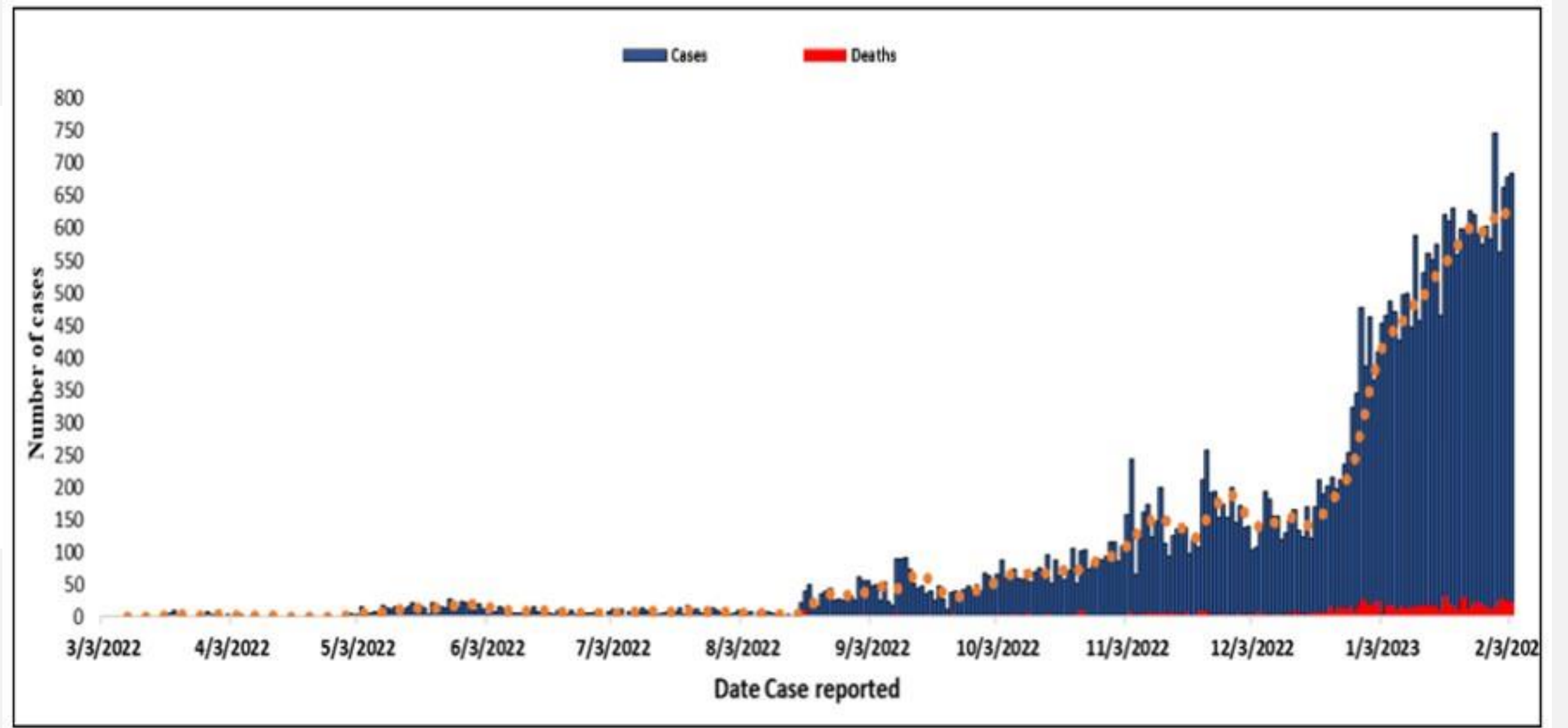


Cases of Dengue in Brazil in 2023 show the growing challenge



Dengue fever incidence by Brazilian state
(per 100k people, 2023)

(March 2022 to February 2023)





**Floods
displaced
8 million
people in
Pakistan in
2022.**

Thawing permafrost

(Drew Point, Alaska 2023)

Source: <https://climate.nasa.gov/news/3153/thawing-permafrost-could-leach-microbes-chemicals-into-environment/>



Climate change is a formidable and inequitable threat to vulnerable health systems



\$4bn
USD per year



Estimated cost of climate-related damages to health care systems; 80% of which will be borne by Sub-Saharan Africa



1.2bn
people



Estimated population that could be displaced globally in 2050 due to climate change and natural disasters



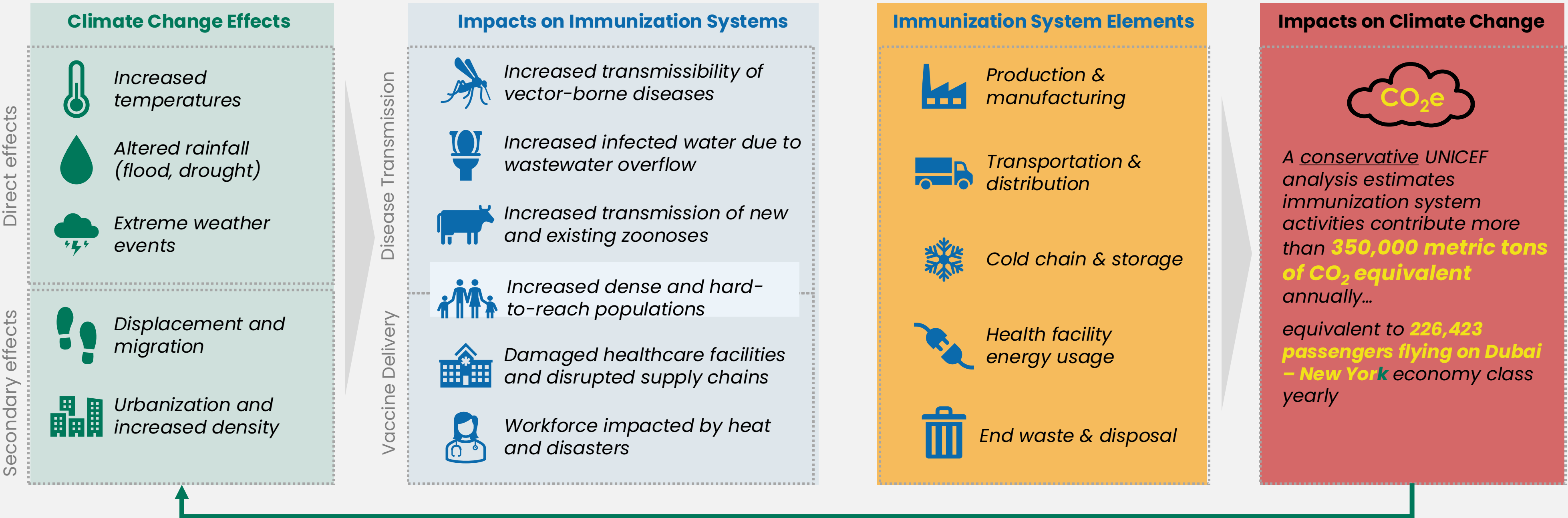
Women make up **70% of workers** in the health workforce and serve as **key decisionmakers** for family healthcare



Women are **disproportionately impacted** by forced displacement

Climate Change requires adaptation to and mitigation of the immunization programme

Climate change is increasing stress on immunization systems... and the impacts will accelerate



Centering Gender



Women are **disproportionately vulnerable** to the negative impacts of both climate change and immunization inequities. Centering a gender lens in this work is necessary to both understanding and addressing this harmful interplay.

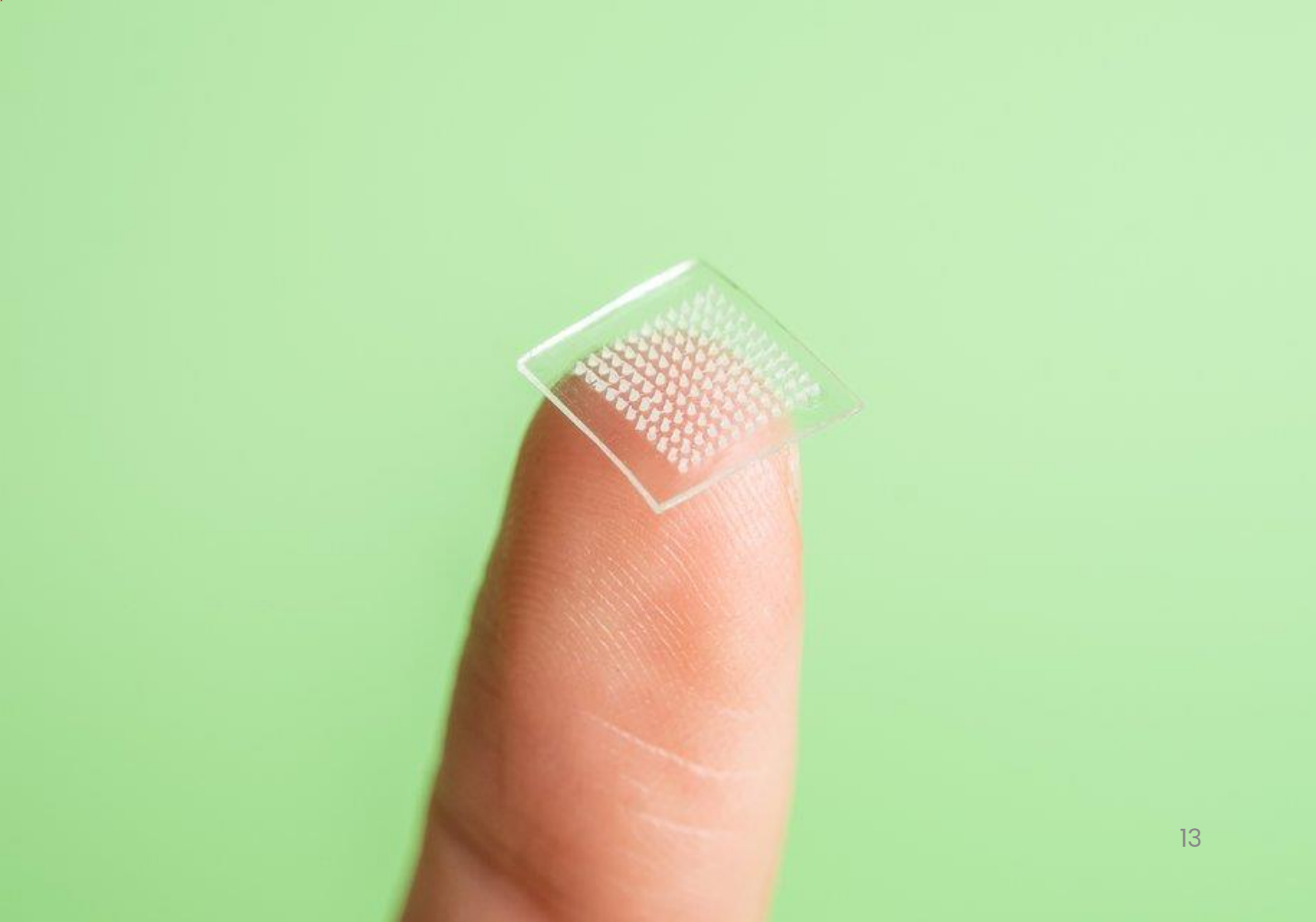
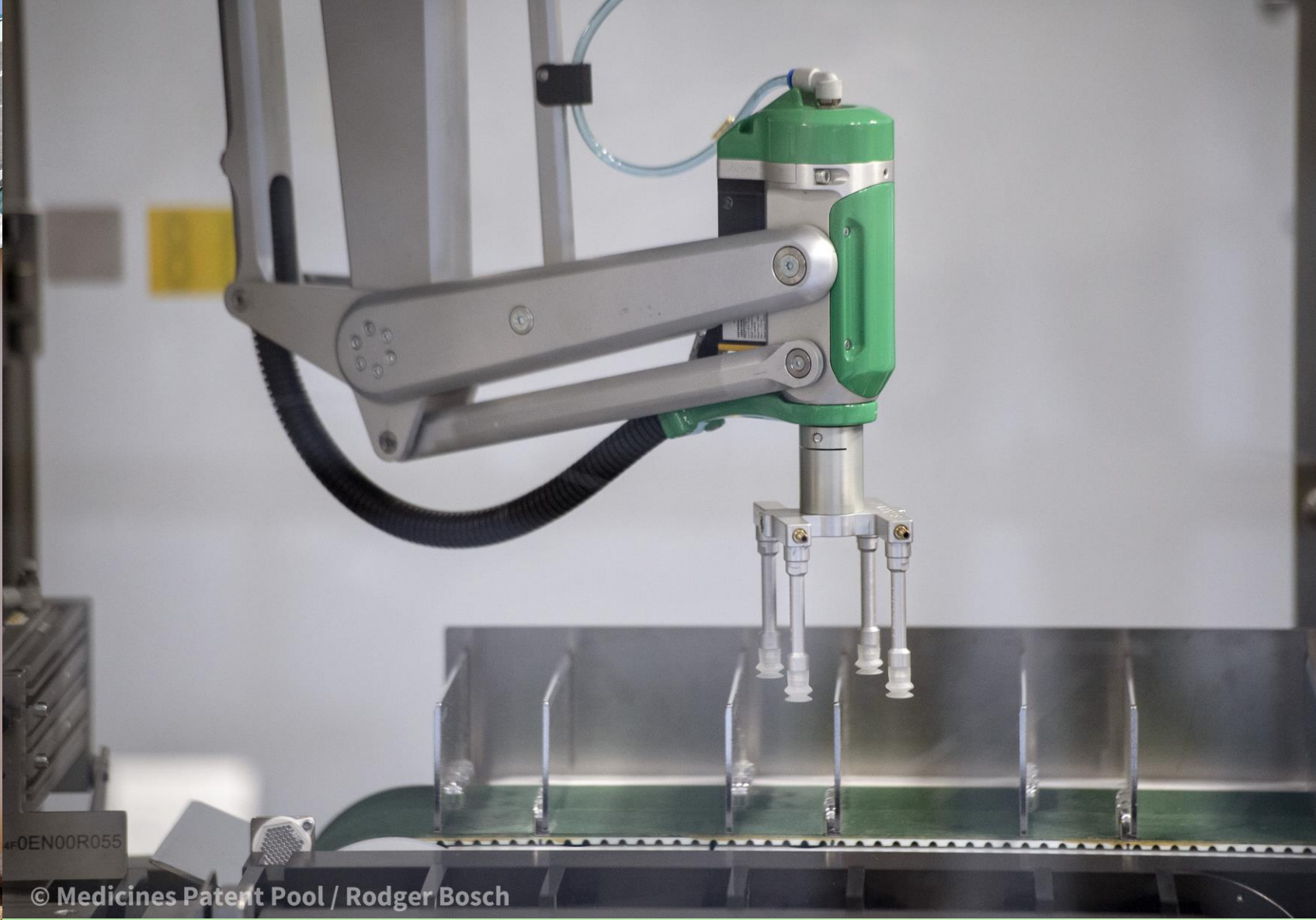
So, what next?

1 Mitigate

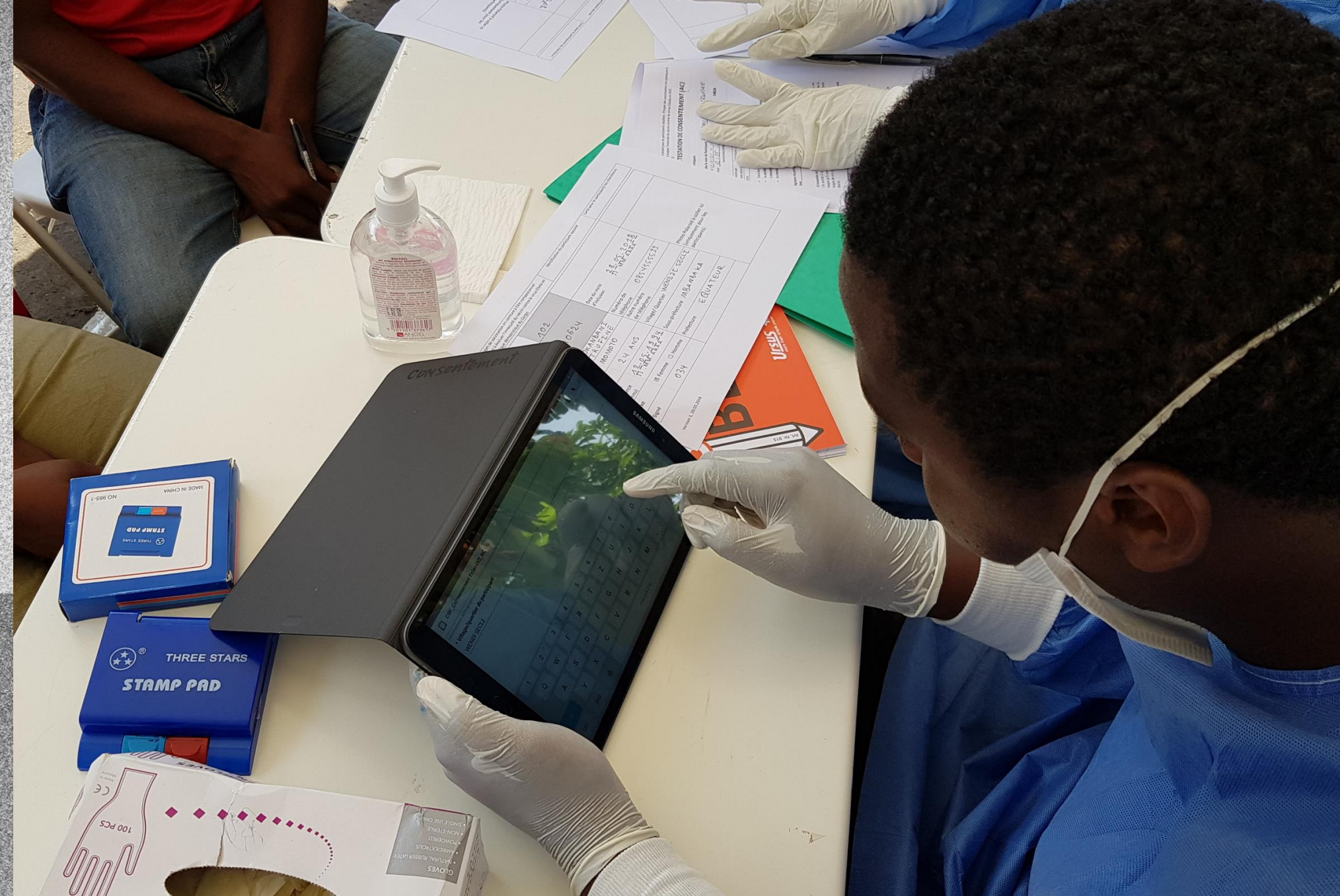
2 Adapt



Mitigate



Adapt





Hyper-responsive vaccine platforms



Distributed vaccine manufacturing



Single dose, non-injectable vaccines



Digitalised immunisation records



Rapid serology testing



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Thank you