Yellow fever and the global strategy to Eliminate Yellow fever Epidemics (EYE)

Overview

Laurence Cibrelus, MD, MPH

Lead, EYE Strategy Secretariat, WHO

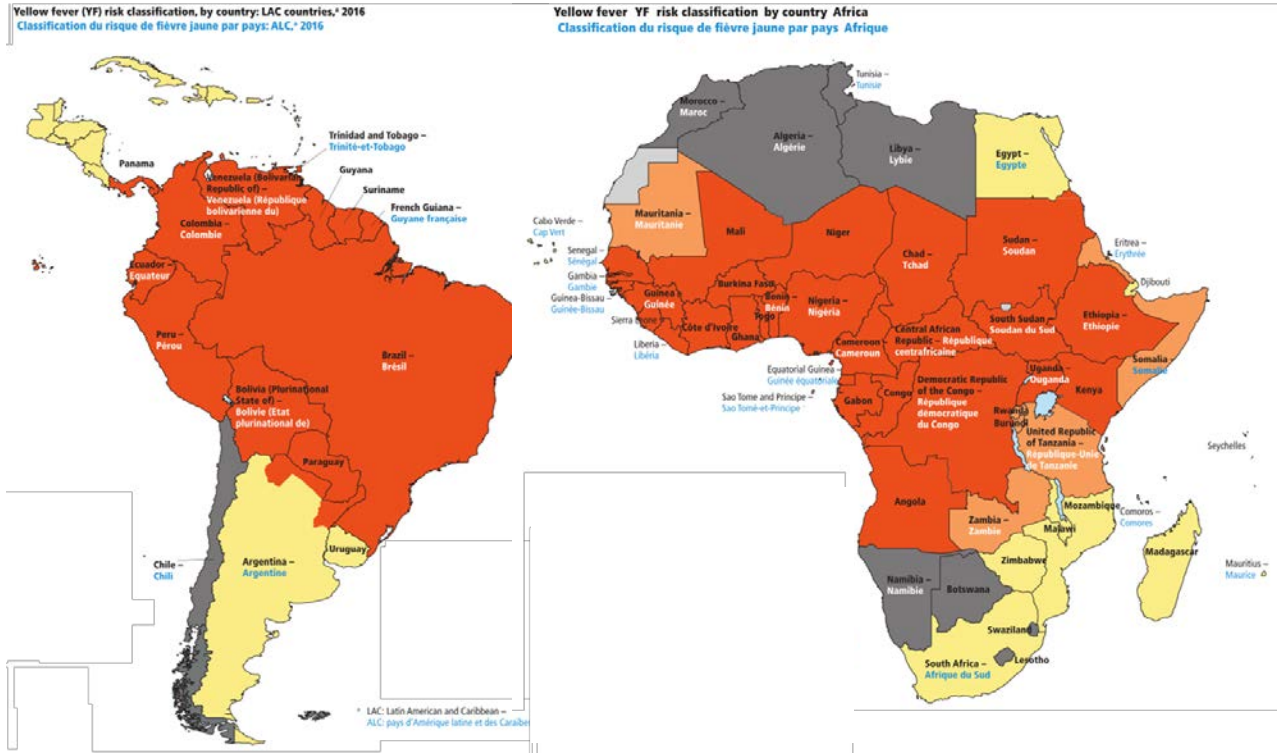
Epi-Win Yellow Fever Series

11 June 2025

ELIMINATE YELLOW FEVER EPIDEMICS

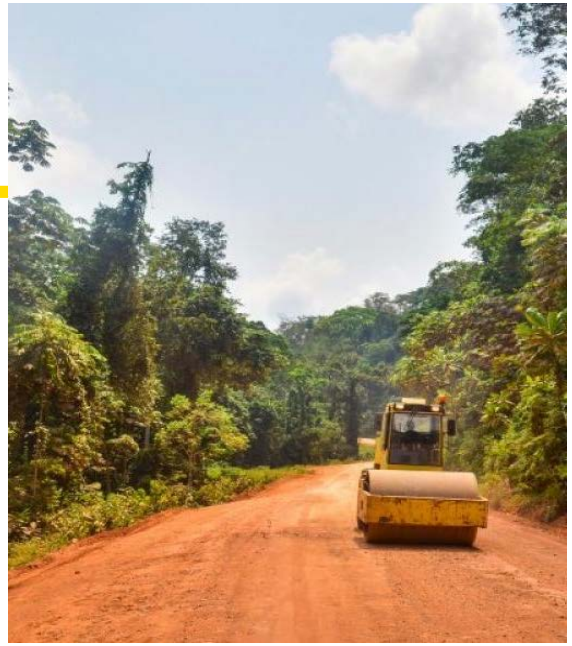
High impact disease with 40 high risk countries in Africa and the Americas – risk of exportation exists

- Flavivirus
- 3 transmission cycles : Jungle/sylvatic (*Aedes* spp (Afr.); *Haemagogus*, *Sabethes* (Am.)); Intermediate (Africa); Urban (*Aedes aegypti*)
- 109,000-130,000 severe infections and 51,000-78,000 deaths annually, mostly in Africa
- Clinical presentation includes asymptomatic infection, mild illness, severe disease and death
  - ➢ Limited therapeutic options for routine use
  - ➢ ~50% of the severe cases are fatal
- Vaccination by a safe and effective vaccine can prevent human disease, with prolonged immunity (1 dose)
- YF cannot be eradicated but the risk of outbreaks can be controlled with high levels of vaccination coverage



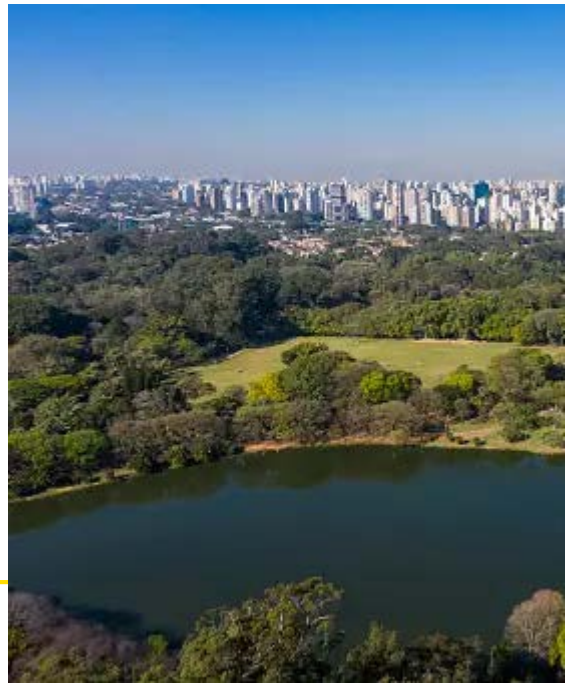
(1) Monath, TP. Yellow fever: an update. Lancet Infectious Diseases, 2001, 1(1):11–20
(2) Barnett, ED., Yellow Fever: Epidemiology and Prevention, Clinical Infectious Diseases, 2007, 44(6).
(3) Johansson MA et al. The whole iceberg: estimating the incidence of yellow fever virus infection from the number of severe cases. Trans R Soc Trop Med Hyg, 2014; 108:482–7.

Increased risk of urban outbreaks with potential for international spread and extended disruption



2016 Angola and DRC, linked outbreaks affecting the 2 capital cities, with exportation of 11 cases to China

- 963 confirmed cases and 137 deaths; > 7,440 suspected cases
- Outbreak was widespread in Angola (28-year hiatus since last outbreak)
- > 30 million persons vaccinated
- Global stockpile of YF vaccine exhausted
- Resort to fractional YF vaccination for the first time (1/5th of the full dose)
- Disruption of preventive programmes over extended time



2017-18 Brazil, active YF circulation in coastal areas surrounding large urban centers (Rio de Janeiro, Sau Paulo, Bahia)

- Largest YF outbreak in the Americas in over 50 years; in areas unaffected in over a century
- 2 154 confirmed cases and 745 deaths (2016-18)
- 21.65 million persons vaccinated in Rio (6.5 mill), Sau Paulo (3.3 mill.), and Bahia-1.85 mill) in 2017-18, including 17 million with fractional dose

The global partnership to Eliminate Yellow Fever Epidemics (EYE), 2017-2026

- Immunization community
- Arboviral community
- Emergency community (ICG & working groups)
- Academia
- Advisory groups (SAGE, STAG-IH, RITAG)
- WHO regions, AFRO, PAHO, EMRO
- Countries and their governments
- Country-level partners: PATH, CHAI, JSI
- Public and private resource partners

World Health Organization · unicef · Gavi The Vaccine Alliance · Bill & Melinda Gates foundation · CDC Centers for Disease Control and Prevention · Global Vector Hub

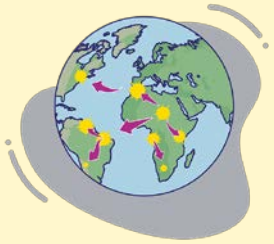
VACCINE IMPACT MODELLING CONSORTIUM · Imperial College London · Médecins Sans Frontières · TDR For research on diseases of poverty UNICEF · UNDP · World Bank · WHO · IFRC · FIND Diagnosis for all

amp · PATH · Clinton Health Access Initiative · JSI · Save the Children · ...

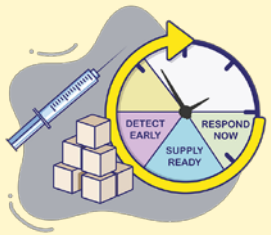
Strategic objectives and competencies for success, based on needs, risks and lessons learned from other programmes

- **Protect at-risk populations**
  - Where risk is high, vaccinate everyone (Preventive mass vaccination campaigns, PMVC; catch-up vaccination)
  - Reach every child (routine immunization, RI)
  - Risk assessments

- **Prevent international spread**
  - Protect high risk workers
  - Apply the International Health Regulations (IHR)
  - Build resilient urban centres



- **Contain outbreaks rapidly**
  - Strengthen surveillance and laboratory capacity for early detection and confirmation
  - Streamlined international samples transport
  - Ensure emergency stockpile vaccines
  - Immediate outbreak response



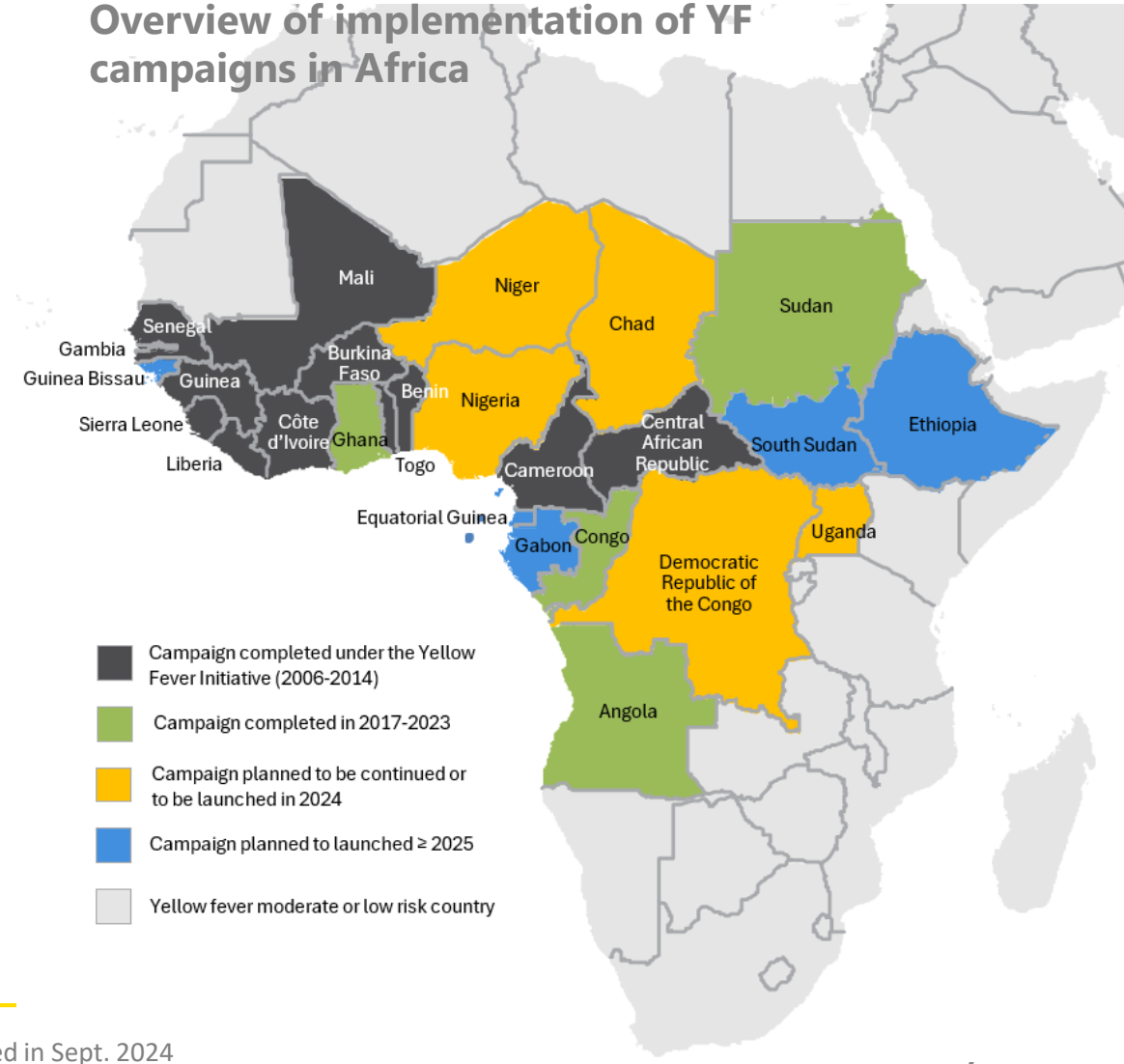
5 Competencies for Success

- Strong political **commitment** at global, regional and country levels
- High level **governance** with long-term partnerships
- Affordable **vaccines** and sustained vaccine market
- **Synergies** with other health programmes and sectors
- Research and development for **better tools and practices**

By end 2024, ~ 366 million people protected against YF via campaigns in Africa

- Campaigns initiated in 2017 (EYE inception)
- From 2026 onward: Ethiopia*; South Sudan also to introduce YF vaccine into routine immunization; Equatorial Guinea**, Gabon**. Kenya is yet to scale up YF routine immunization
- Global vaccine supply more than doubled since EYE inception; 6M ICG emergency vaccine stockpile available at all times
- Structure decision-making processes based on risk and programmatic considerations
- Innovative approaches (e.g., private sector engagement)
- Efforts toward enhancing YF surveillance, detection and confirmation & timely outbreak response
- Greater laboratory capacity and streamlined processes (e.g., greater capacity, training and guidance, faster transport, standardized testing)

Overview of implementation of YF campaigns in Africa



* Gavi application submitted in Sept. 2024
** Non-Gavi eligible

"2023-24 data are preliminary

Continued threats, emerging issues & perspectives

- **Delayed outbreak investigation and response**
- **Urbanization, re-urbanization of YF – urban risk management**
- **Resurgence of outbreaks in countries or settings where some populations were missed or under-protected. E.g.,**
  - Vulnerable, underserved populations, refugees, migrants
  - Zero dose children and zero-dose communities
  - Workers with occupational exposure (private sector engagement)
- **Routine immunization and catch-up efforts need to accelerate for the sustainability of YF control**
- **Risk characterization and mitigation in moderate risk countries**
- **Enhancing existing collaboration and integration with global initiatives such as the Immunization Agenda 2030 (IA2030) and the Global arbovirus initiative (GLAI)**
  - Synergies and efficiencies
  - **Simplify and strengthen country-level implementation**

Acknowledgements

- Immunization community
- Arboviral community
- Emergency community (ICG & working groups)
- Academia
- Advisory groups (SAGE, STAG-IH, RITAG)
- WHO regions, AFRO, PAHO, EMRO
- Countries and their governments
- Country-level partners: PATH, CHAI, JSI
- Public and private resource partners

World Health Organization
unicef
Gavi The Vaccine Alliance
Bill & Melinda Gates foundation
CDC Centers for Disease Control and Prevention
Global Vector Hub
VACCINE IMPACT MODELLING CONSORTIUM
Imperial College London
Médecins Sans Frontières
TDR For research on diseases of poverty UNICEF · UNDP · World Bank · WHO
IFRC
FIND Diagnosis for all
amp
PATH
Clinton Health Access Initiative
JSI
Save the Children
...

ELIMINATE
YELLOW FEVER
EPIDEMICS

Thank you for your attention

cibrelusl@who.int

For further information
https://www.who.int/initiatives/eye-strategy
eye.strategy@who.int

Follow us on: Twitter | Facebook | LinkedIn | YouTube