

# Cholera Epidemiological study in the East and Southern Africa region

## UNICEF ESARO study

Presentation for the GTFCC Surveillance Working Group  
 April 16, 2018

**CHOLERA EPIDEMIOLOGY AND RESPONSE FACTSHEET GUINEA**

**UNICEF**

**OVERVIEW OF CHOLERA**

Cholera was first reported in Guinea in 2010. Since 2012, there have been large outbreaks in 2012, 2014, 2015 and 2017 (Fig. 1). Between 2015 and 2017, approximately 140,000 people were reported to have died from cholera, with more than 1.5 million people hospitalized in coastal regions. **Cholera, Malaria and Ebola** (Fig. 2 and 3).

Cholera outbreaks are closely associated with cases in Guinea Leone in Guinea, Sierra Leone, Liberia and Ivory Coast. These outbreaks are linked to Guinea and Liberia, between Sierra Leone and Ivory Coast, and between Sierra Leone and Liberia.

**CHOLERA DISTRIBUTION**

Between 2010 and 2017, the coastal region of **Guinea, Sierra Leone** and **Liberia** reported 85% of cases with 85% reported in the coastal region of Guinea (Fig. 4 and 5).

Guinea is a coastal country with a long coastline. The coastal region is densely populated and has a high density of people. The coastal region is also a major trade hub and a major port for the country.

The urban outbreak in Conakry spread to rural areas including the city of Kankan. The outbreak in Kankan spread to rural areas including the city of Kankan. The outbreak in Kankan spread to rural areas including the city of Kankan.

The region of outbreak was higher in coastal areas near the coast. The region of outbreak was higher in coastal areas near the coast. The region of outbreak was higher in coastal areas near the coast.

**Table 1: Epidemiological parameters of cholera outbreaks by coastal region in Guinea, 2010-2017**

Region	Cases (Deaths)	CRF	CRF	CRF	CRF
Guinea	140,000 (10,000)	100	100	100	100
Sierra Leone	100,000 (10,000)	100	100	100	100
Liberia	100,000 (10,000)	100	100	100	100
Ivory Coast	100,000 (10,000)	100	100	100	100
Senegal	100,000 (10,000)	100	100	100	100
Sierra Leone	100,000 (10,000)	100	100	100	100
Liberia	100,000 (10,000)	100	100	100	100
Guinea	100,000 (10,000)	100	100	100	100

**CHOLERA HOTSPOT IDENTIFICATION**

Cholera is a hot spot and a major threat to public health in the coastal region of Guinea, Sierra Leone, Liberia and Ivory Coast. The coastal region is densely populated and has a high density of people. The coastal region is also a major trade hub and a major port for the country.

**Figure 1: Annual number of cholera cases and case fatality rate (CFR) in Guinea, 2010-2017**

**Figure 2: Cumulative incidence of cholera hospitalizations in Guinea, 2010-2017**

**Figure 3: Cholera cases by region in Guinea, 2010-2017**

**Figure 4: Cholera cases by region in Guinea, 2010-2017**

**Figure 5: Cholera cases by region in Guinea, 2010-2017**

**Table 2: Cholera cases by region in Guinea, 2010-2017**

Region	2010	2011	2012	2013	2014	2015	2016	2017
Guinea	100	100	100	100	100	100	100	100
Sierra Leone	100	100	100	100	100	100	100	100
Liberia	100	100	100	100	100	100	100	100
Ivory Coast	100	100	100	100	100	100	100	100
Senegal	100	100	100	100	100	100	100	100
Sierra Leone	100	100	100	100	100	100	100	100
Liberia	100	100	100	100	100	100	100	100
Guinea	100	100	100	100	100	100	100	100



## Cholera burden

- Cholera epidemics remain a public health concern in East and South Africa
- The brunt of the cholera burden affects a small number of specific zones and communities: “cholera hotspots” ↔ targeted approach

## Control and Prevention

- Cholera can be eliminated where access to WaSH services are ensured
- Oral cholera vaccine can help provide protection for a population while sustainable WaSH interventions are being implemented

## Challenges for sustainable intervention in cholera high-risk areas

- Communities in cholera hotspots are often neglected by WaSH development programs, as WaSH sector objectives are coverage (and not health) driven
- Lack of common understanding and knowledge about priority areas
- Lack of donor investment in cholera hotspots

# UNICEF Strategic Framework in Eastern and Southern Africa (1/2)

Aims to guide UNICEF Offices and partners in more effective and coordinated cholera preparedness, response and prevention activities

## Before an outbreak

### PREPAREDNESS

Prepositioning of necessary supplies and capacity building in identified hotspots

## During an outbreak

### RESPONSE

Delivery of a timely, epidemiologically-driven, targeted multi-sectoral (Health, WASH, C4D) response

## After an outbreak

### PREPAREDNESS

Improvement of preparedness measures based on lessons learned from past outbreaks and new epidemiological data

### PREVENTION

Implementation of WASH and C4D activities in hotspots during pre-outbreak season

### PREVENTION

Containment of outbreak to avoid spread beyond hotspots and across borders

### PREVENTION

Improvement of overall WASH, Health and social/behaviour conditions in hotspots

# UNICEF Strategic Framework in Eastern and Southern Africa (2/2)

Implementation of the framework hinges on epidemiological studies focused on identifying areas regularly affected by cholera outbreaks

- 1 Development of national and subnational plans**
- 2 Well-targeted capacity development**
- 3 At-scale social and behaviour change communication**
- 4 Information management for improved monitoring and action**
- 5 Regional coordination and greater cross-border collaboration**
- 6 Knowledge management and operational research**
- 7 Partnerships, public advocacy, social movements and influencers**

## Study objective

- Better understand the local dynamics of cholera at a national and sub-regional level
  - Apply an approach combining field research, epidemiology and biomolecular analysis of clinical isolates of *Vibrio cholerae*
- Identify cholera hotspots as well as high-risk populations and practices for targeted emergency and prevention programs
- Establish effective strategies to combat cholera in the Greater Horn of Africa (South Sudan, Kenya and Somalia) and the Zambezi Basin (Mozambique, Angola, Malawi, Zambia and Zimbabwe)

# Study region



# Methods : Data-management and Statistical analysis

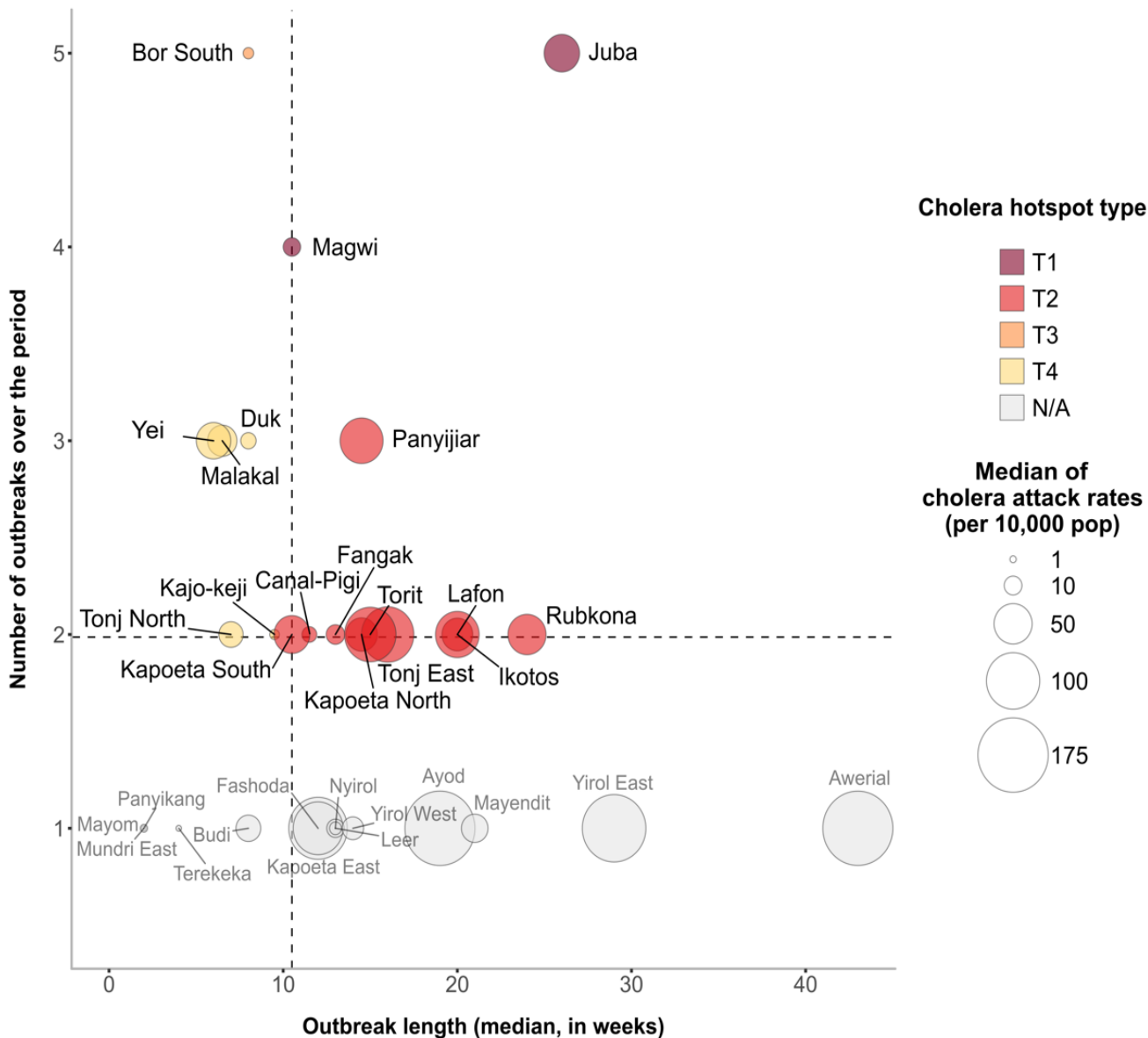
## Core data

- Cholera cases and deaths from MoH
  - Time series (min. 10 years)
  - At the lowest administrative unit possible (min. at district level)
- GIS background layers and demographic information (UNOCHA, MoH and Open Access databases)

## Data Analysis Process

- Data cleaning and Quality Assessment, including missing data and outlier detection
- Smoothing and interpolation procedure
- Outbreak: extraction of the key epidemiological features (onset, peak, duration, incidence, case fatality rate, inter-epidemic period)
- Hotspot characterization and mapping
- Interpretation of the results according to local contexts, literature and national expertise

# Hotspot classification – South Sudan (1/2)



**T1:** Highest-priority area with high frequency (>90th percentile) and extended duration (≥40th percentile) of cholera outbreaks;

**T2:** High-priority area with moderate frequency (between 60th and 90th percentile) and extended duration of cholera outbreaks;

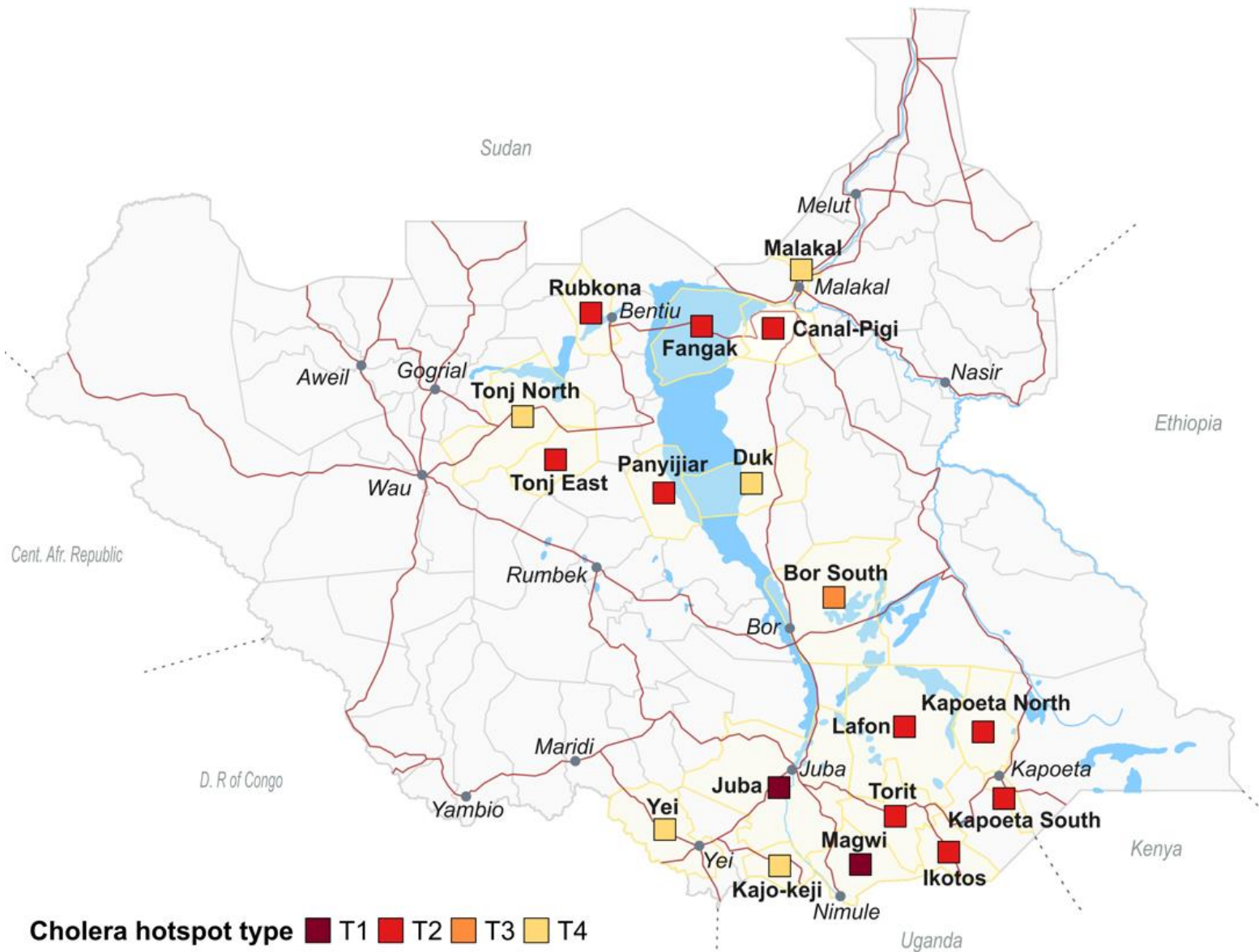
**T3:** Medium-priority area with high frequency and short duration of cholera outbreaks (<40<sup>th</sup> percentile);

**T4:** Low-priority area with moderate frequency and short duration of cholera outbreaks.

Cholera hotspot classification chart, South Sudan. Periods 2006-2007 and 2014-2017



# Hotspot classification – South Sudan (2/2)



**Cholera hotspot type** ■ T1 ■ T2 ■ T3 ■ T4

**Cholera hotspot map of South Sudan for the periods 2006-2007 and 2014-2017**

# Recommendations

- ✓ The priority strategic actions in the **17 identified cholera hotspots (Type 1 to Type 4)**, include early detection, community-based surveillance, cross-border activities, and preparedness plans and actions
- ✓ **Mid-term WASH and social mobilization activities (1-3 years)** should be implemented in priority in counties regularly affected by cholera and characterized by extended-duration outbreaks (**Type 1 and Type 2**)
- ✓ **The priority hotspots (Type 1 and Type 2)** comprise **12 counties** with both urban and rural features which account for **two-third of the disease burden**. Those cholera foci host approximately 2,280,000 people (**18% of the total estimated population**)
- ✓ An identification of **transmission foci at a finer geographical scale** (e.g., city section, boma, village) within the priority counties is necessary to better **target the at-risk population**

# Limitations

- ✓ Significant inaccuracy of the population denominator with 15% of the population being IDPs
  - ✓ The limited number of time series (5 outbreaks) influenced the calculation of the median recurrence and the median incidence, as the 2017 outbreak involved significantly high incidence and widespread geographic reach.
- The classification framework, based on the cholera epidemiology in West Africa, has been revised and refined to the South Sudan context
- The threshold for high recurrence was increased (from 80th to 90th percentile) to enhance discrimination between spatial units
  - The median incidence was not considered to characterize Type 3 and Type 4 hotspot

# Cholera study opportunities

- ✓ Identify cholera hotspots in each country and engage in a targeted approach with a reproducible methodology
- ✓ Mainstream epidemiological findings into national policies and gain national commitment from the WaSH and Health sectors
- ✓ Provide decision makers with evidence-based information to implement efficient prevention and control activities
- ✓ Mobilize resources for cholera prevention program in hotspots as a long-term investment

## *Contact us*



### **Jessica Dunoyer - Project coordination**

E-mail : [jessicadunoyer@Hotmail.com](mailto:jessicadunoyer@Hotmail.com)

Skype pseudo: jessdunoyer

Field mission: South Sudan & Zambia

### **Sandy Moore - Biologist & Epidemiologist**

Email: [sandy.moore17@gmail.com](mailto:sandy.moore17@gmail.com)

Skype pseudo: sandita319

Field mission: Kenya, Somalia (remote),  
Angola & Malawi



### **Christophe Valingot - Field epidemiologist & WASH engineer**

Email: [christophe.valingot@outlook.com](mailto:christophe.valingot@outlook.com)

Skype pseudo: christophe\_anjouan

Field mission: Zimbabwe & Mozambique