GLOBAL TASK FORCE ON
CHOLERA CONTROL

TARGETED MULTISECTORAL INTERVENTIONS: DEFINING CHOLERA HOTSPOTS AND TRANSMISSION PATTERNS

Dr. Francisco Luquero

GTFCC EPI-SURVEILLANCE WG: SEVERAL AXES OF WORK

Improving our understanding of cholera diseases burden and transmission dynamics

Developing real-time monitoring tools for cholera outbreaks

Developing new methods for cholera surveillance

- Sero-surveillance
- Integrated epi-lab methods: detection of areas with active cholera transmission and phylo-dynamic analysis

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CHOLERA: A MAJOR HEALTH PROBLEM TODAY

WHO data suggest a large cholera diseases burden

- More than 130,000 cases annually reported worldwide
- Between 2000–2015, Africa was responsible for 83% of the cholera deaths reported by the WHO

Burden estimates indicate a much larger problem as many cases are not reported (Ali et al.)

- 1.3 billion people are at risk for cholera
- 2.86 million cholera cases (1.3m–4.0m)
- 95,000 deaths (21,000–143,000)

Different epidemiological profiles

- Endemic cholera (eg. India or Bangladesh)
- Epidemic cholera (eg. Haiti, Zimbabwe)

IMPROVING OUR UNDERSTANDING OF CHOLERA DISEASES BURDEN AND TRANSMISSION DYNAMICS

Different groups working on this area, among others:

- Johns Hopkins University
- Epicentre
- Aix-Marseille Université
- …

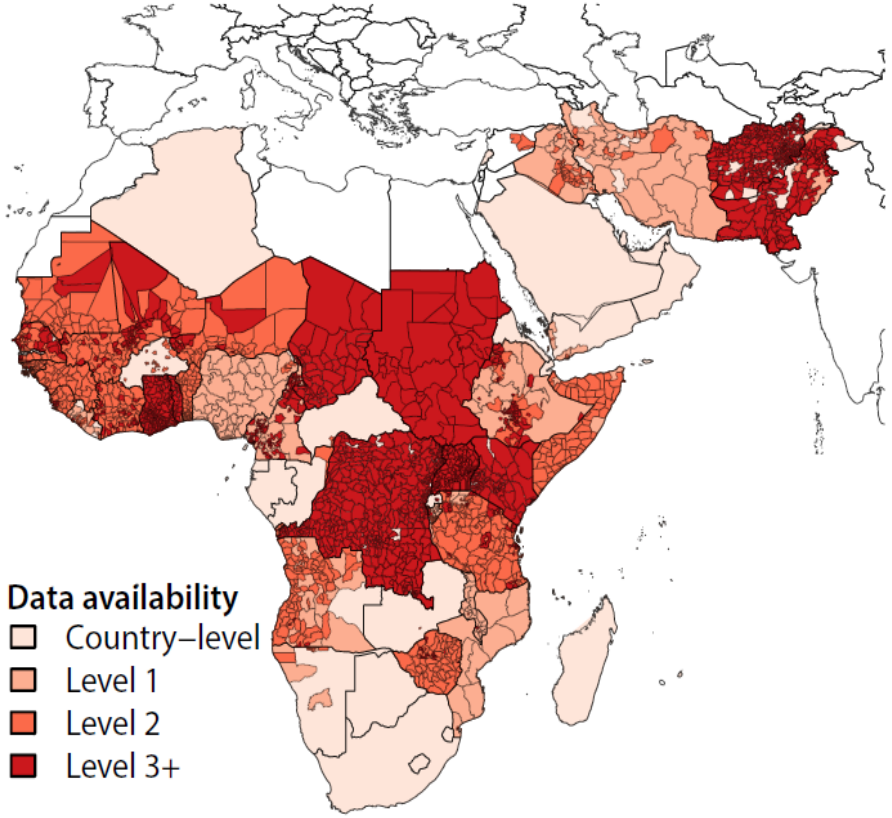
The main goal of this work is to detect areas with high diseases burden, where any intervention will maximize its impact: “hot-spots”

CHOLERA TAXONOMY PROJECT:
COLLABORATION LEAD BY THE JOHNS HOPKINS UNIVERSITY - PIS: JUSTIN LESSLER AND ANDREW AZMAN

Use the best epidemiologic data and methods available to:

- improve cholera burden estimates
- determine what populations are most affected and at highest risk
- develop the best strategies to control cholera
- to track progress towards the global roadmap

DATA SOURCES AND METHODS



World Health Organization

MEDECINS SANS FRONTIERES

epicentre

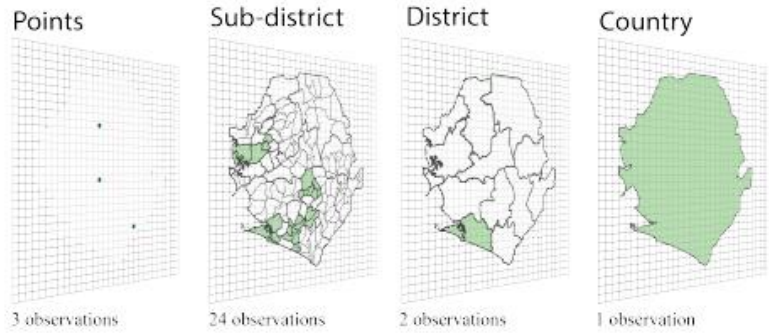
unicef

UNHCR
The UN Refugee Agency

Africhol

GLOBAL TASK FORCE ON CHOLERA CONTROL

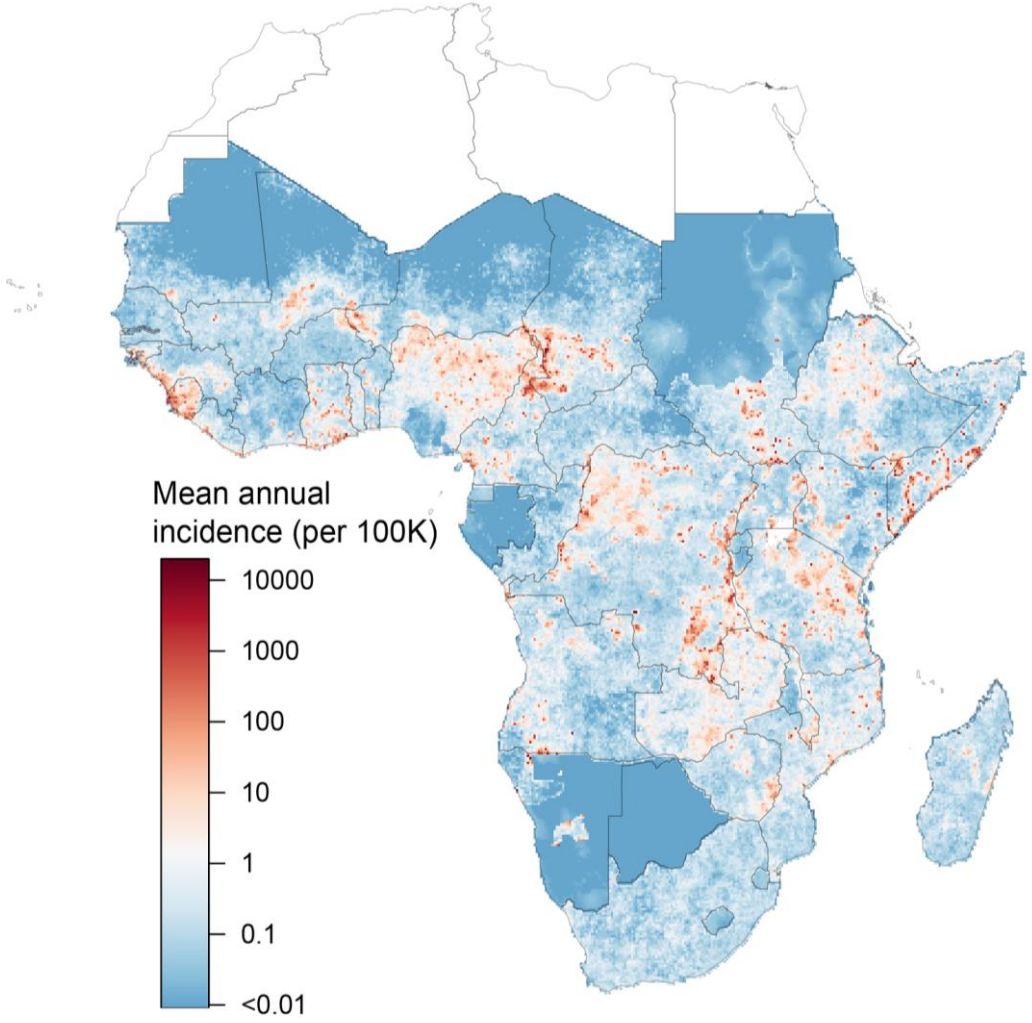
(and many MoHs)



$$Cases_i \sim Pois(\sum_{j=1}^{N} \lambda_j \times p_j)$$

meta)Data available at: `www.iddynamics.jhsph.edu/projects/cholera-dynamics/data`

MAPPING CHOLERA CASES IN AFRICA



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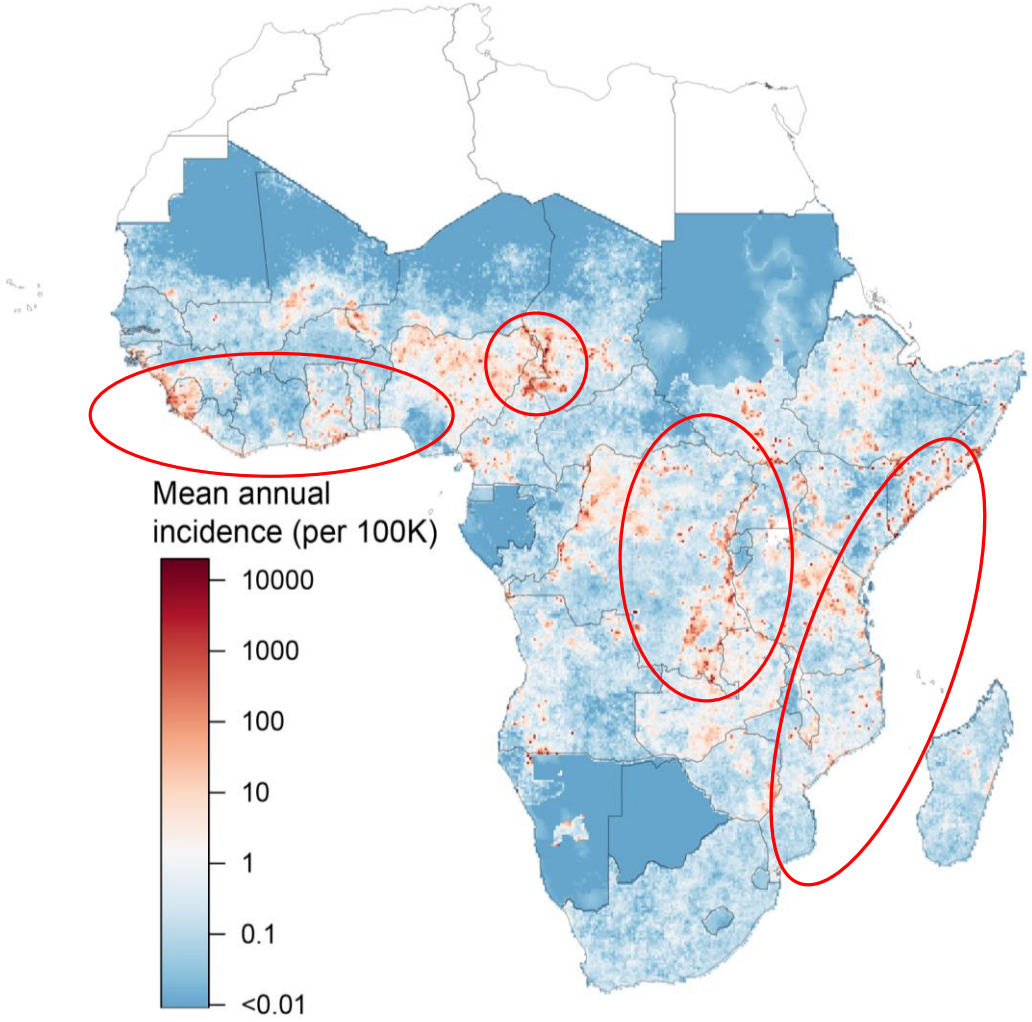
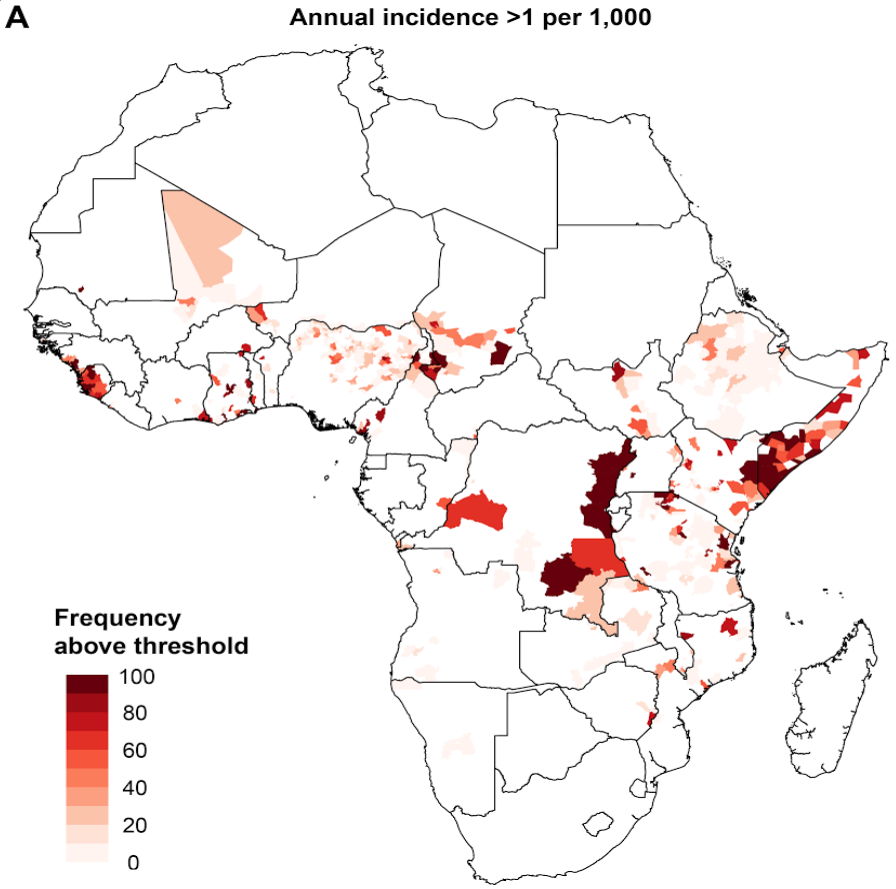
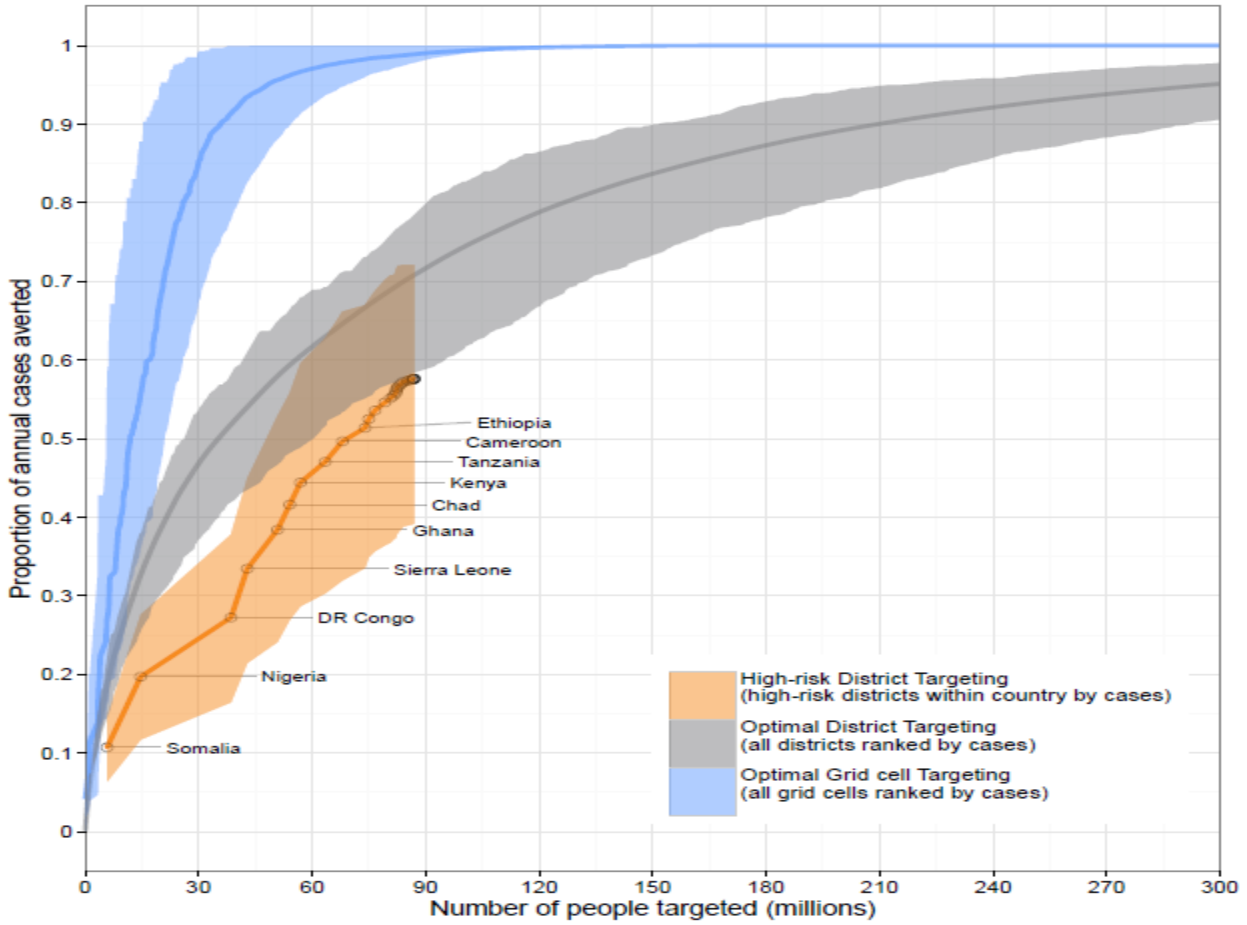


FROM MODELING TO FEASABLE TARGETS

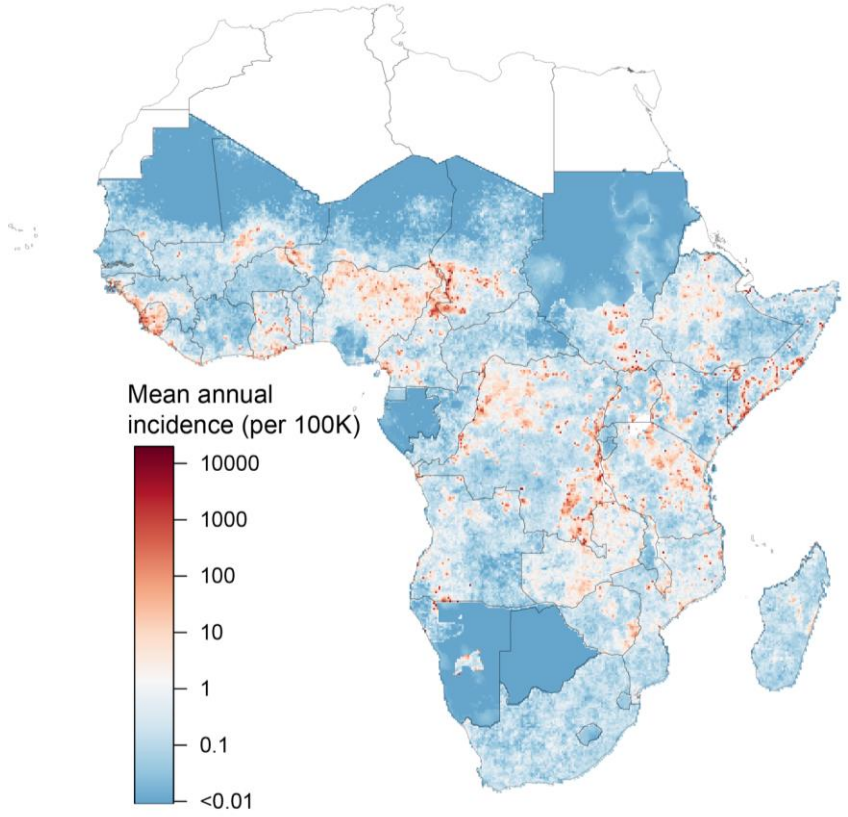


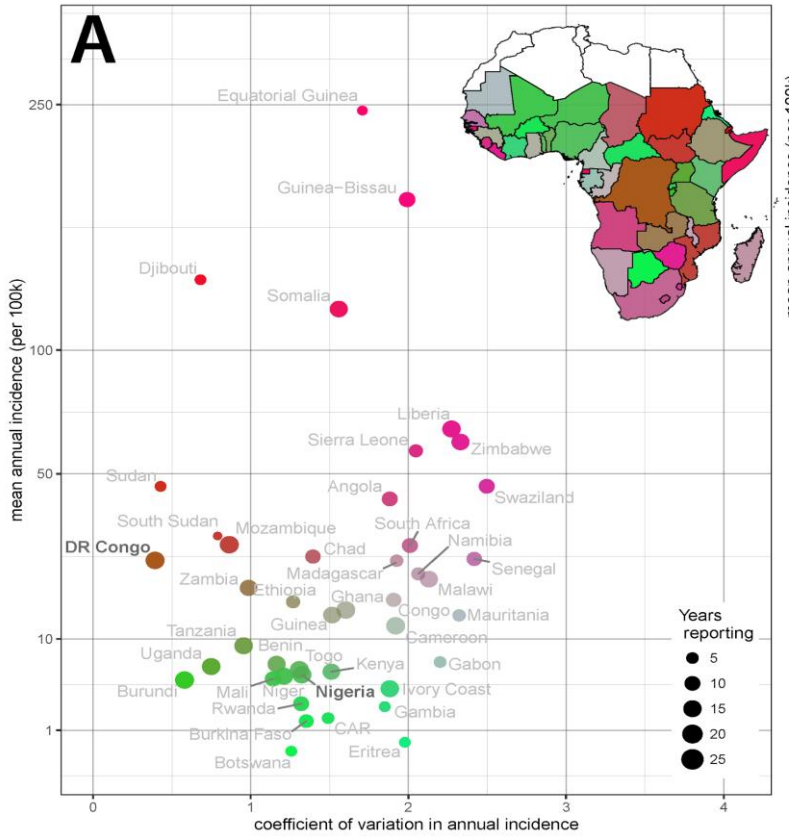
Overall, 4.2% (161/3844, 95% CrI, 1.8–16.9%) of districts in Africa, home to 86.9 million (95% CrI 59.4–118.7 million) people, are classified as high-incidence

A TOOL TO SUPPORT DECISION MAKING AT MACRO-SCALE

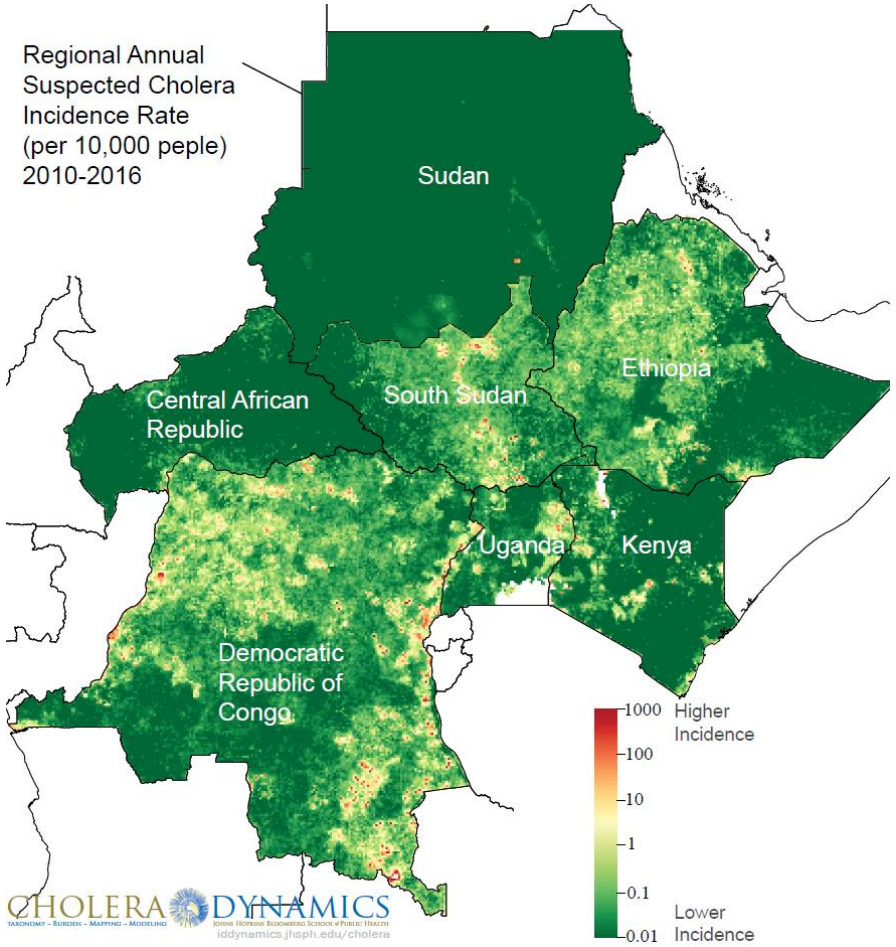


THE HOT-SPOTS ANALYSIS SHOULD ALLOW COUNTRIES TO PRIORITIZE AREAS FOR INTERVENTION

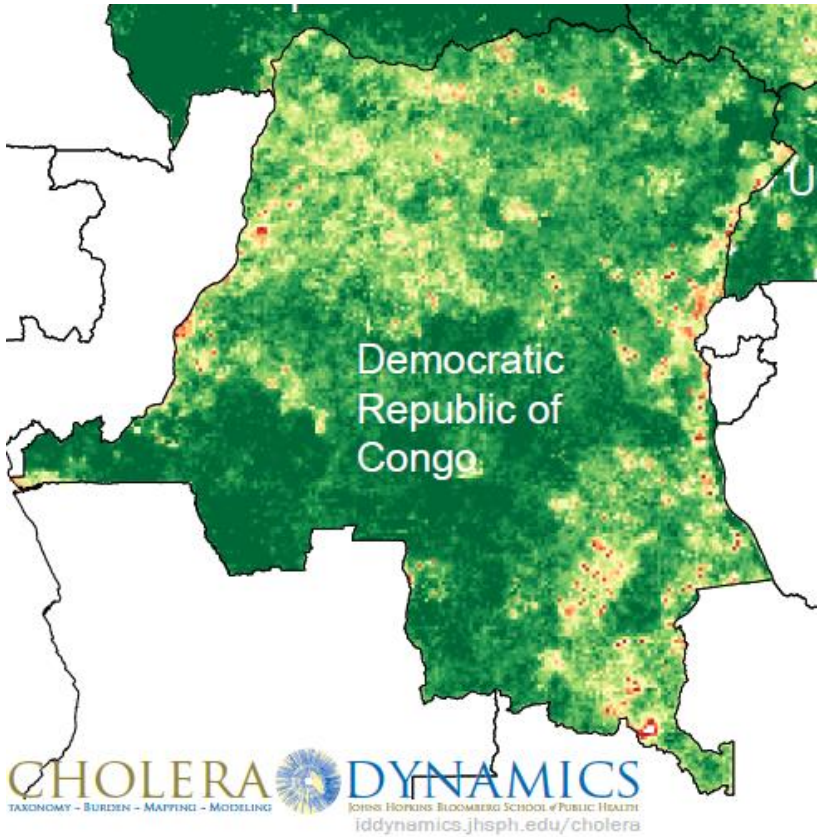


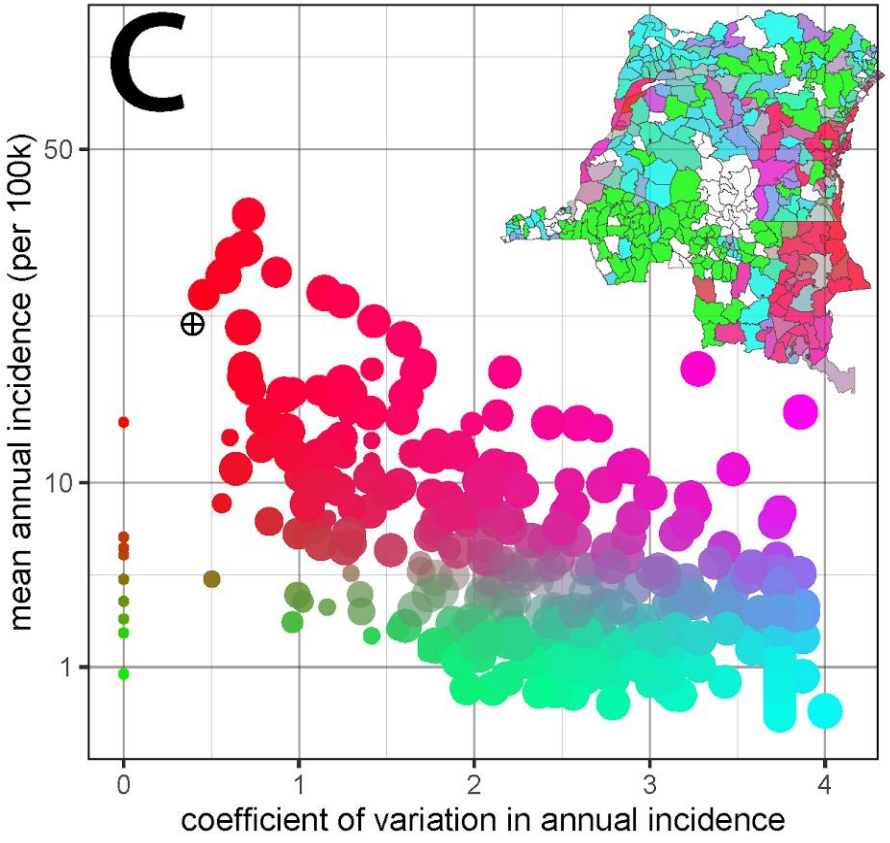


REGIONAL PERSPECTIVE



COUNTRY PROFILES





NEXT STEPS: HOT-SPOTS TO ESTABLISH PRIORITIES

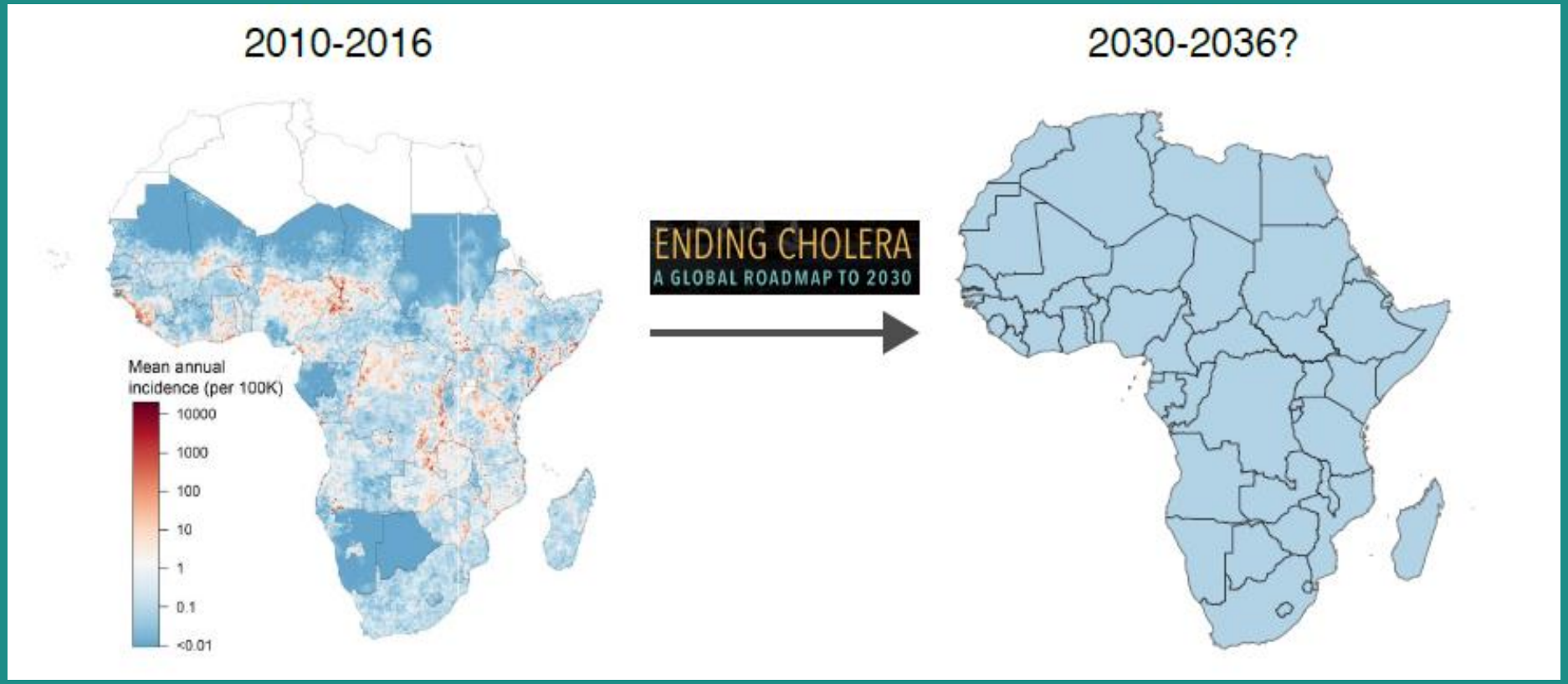
Develop regional and country profiles showing the “hot-spot” areas and seasonal periodicity if this exist and made the accessible on-line

Develop dynamic tools that allow to update this analysis in a ongoing basis

Identify factors that trigger spread in these areas

Combine this work with the microbiological surveillance to have better understanding of the spread dynamics

Final goal: to bring new tools to support decision making and prioritization for therapeutic and preventive interventions


2010-2016
2030-2036?
Mean annual
incidence (per 100K)
10000
1000
100
10
1
0.1
<0.01
ENDING CHOLERA
A GLOBAL ROADMAP TO 2030

THANKS