SPRINGS Project

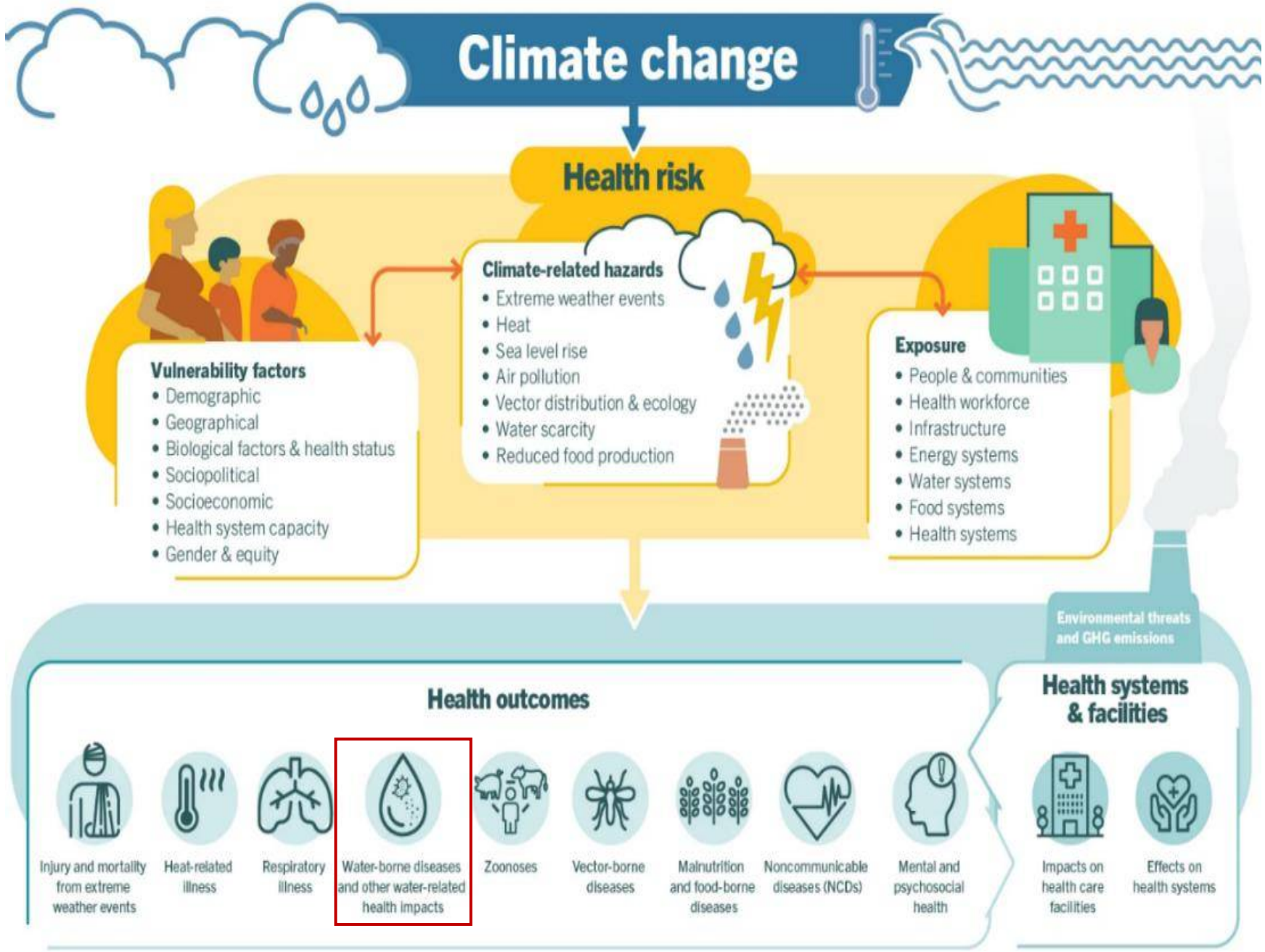
Supporting Policy Regulations and Interventions to Negate aggravated Global diarrheal disease due to future climate Shocks

IUSSP Webinar on Climate Change Research in Ghana
October 26 2026

Adelina Mensah

SPRINGS

Funded by the European Union



Climate-sensitive health risks, pathways of exposure & vulnerability factors *(WHO, 2023)*

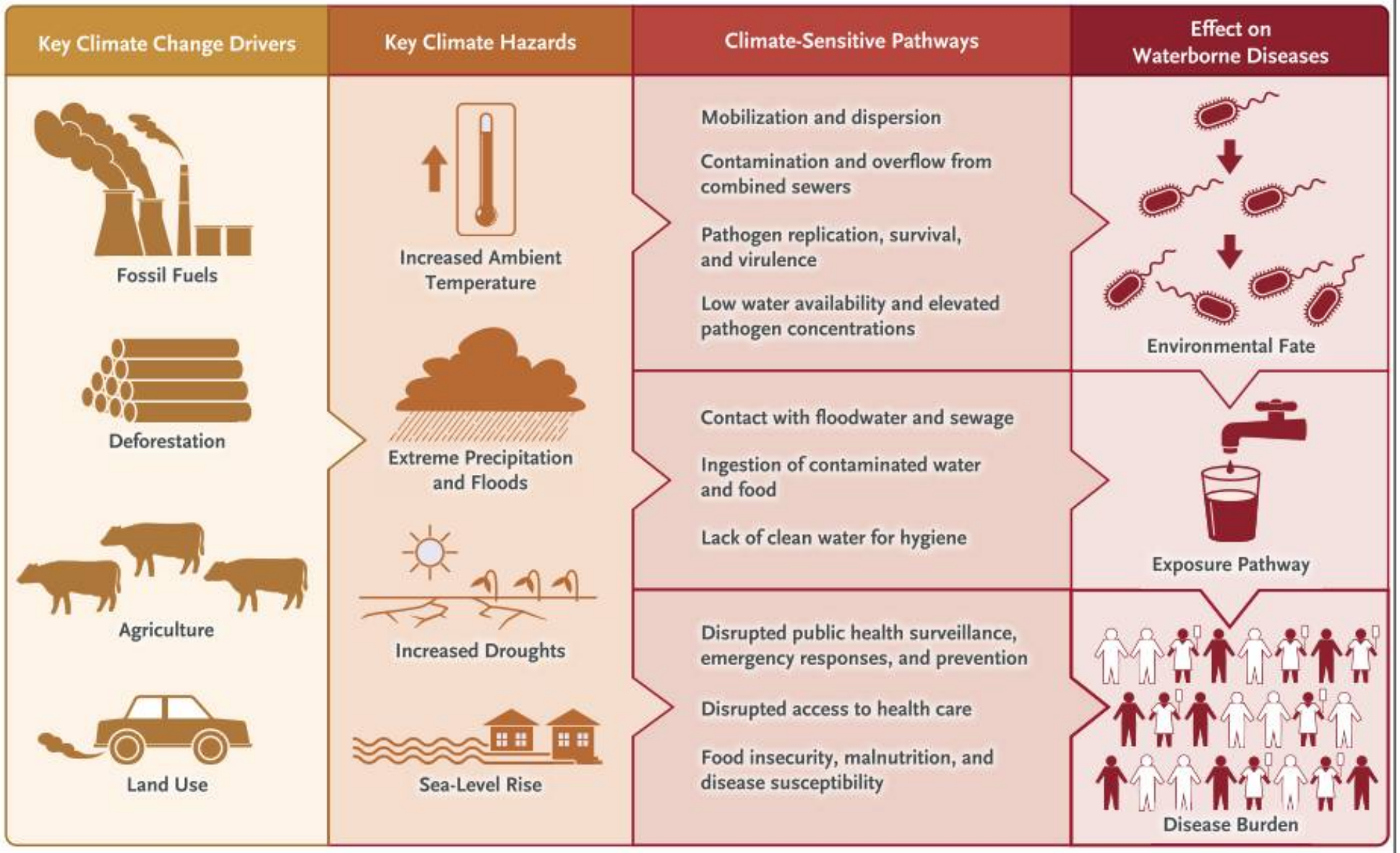


Figure 1. Pathways by Which Climate Change Drives the Burden of Waterborne Diseases.

Shown are the key drivers and hazards of climate change and the pathways by which these processes influence the environmental fate of waterborne pathogens, increase exposures of people to pathogens, and ultimately enhance the disease burden in vulnerable populations.

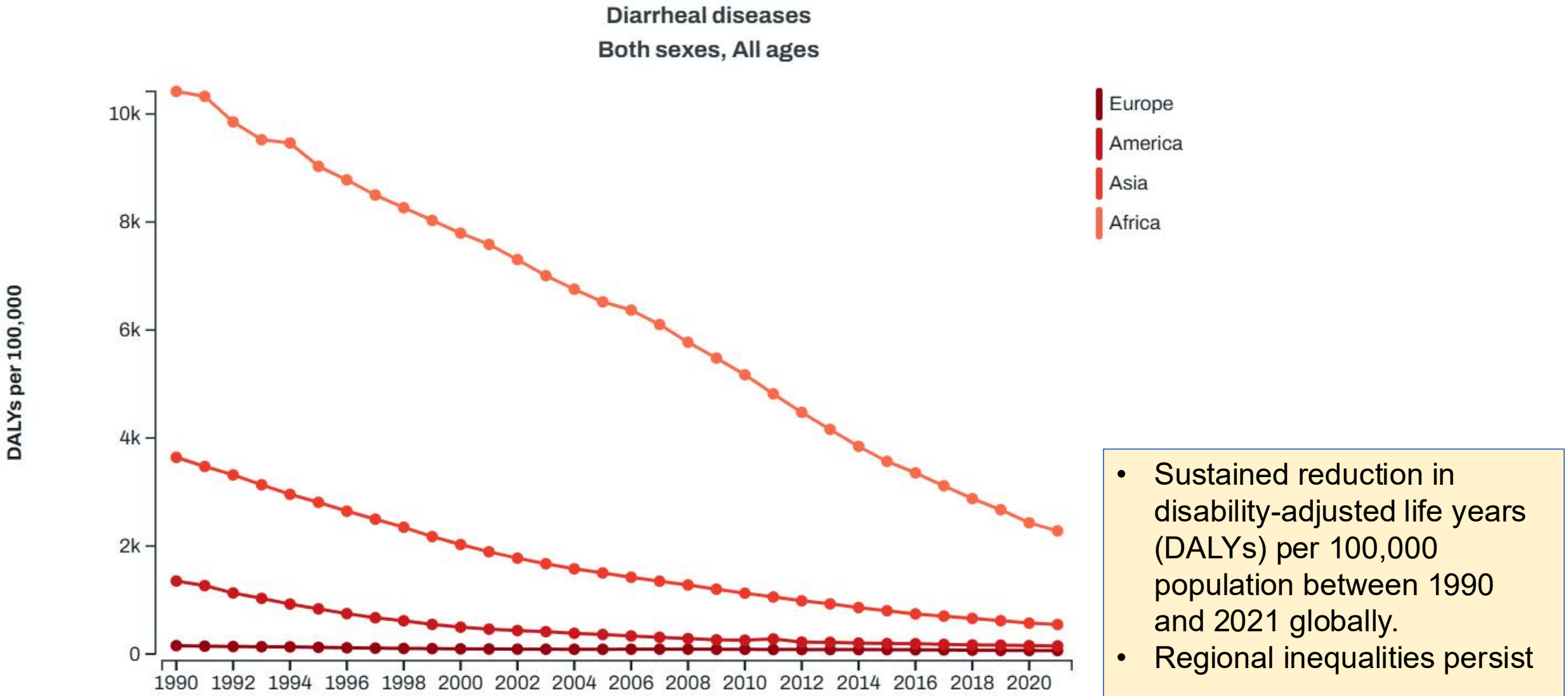
SPRINGS

SPRINGS

Why diarrhoea?

- Not a disease, but result of infection from pathogens transmitted though contaminated food and water
- Preventable
- Provides opportunity to understand the complex relationship between climate change, environmental contamination and human health
- Different disease outcomes due to differences in sanitation, access to safe water, hygiene practices, nutrition, healthcare access, etc.

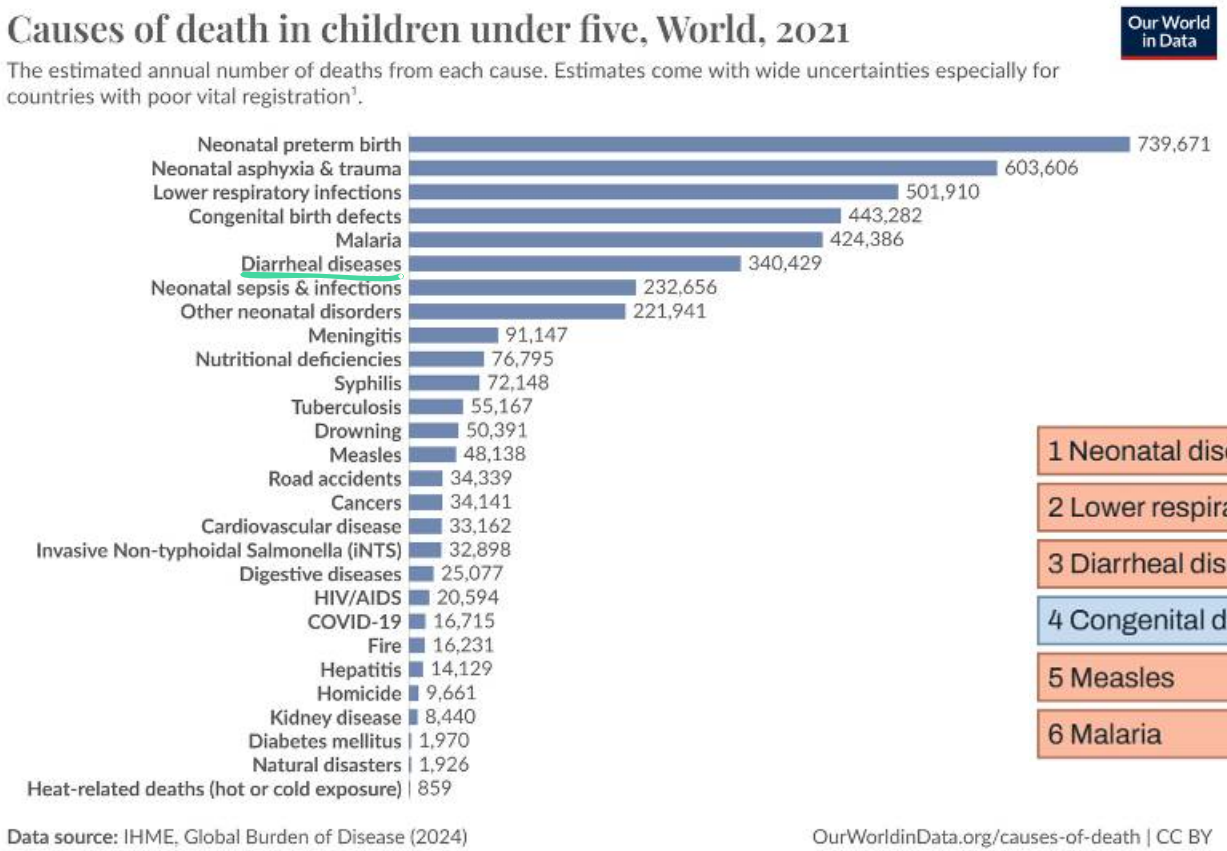
Background – Morbidity (Illness across all ages)

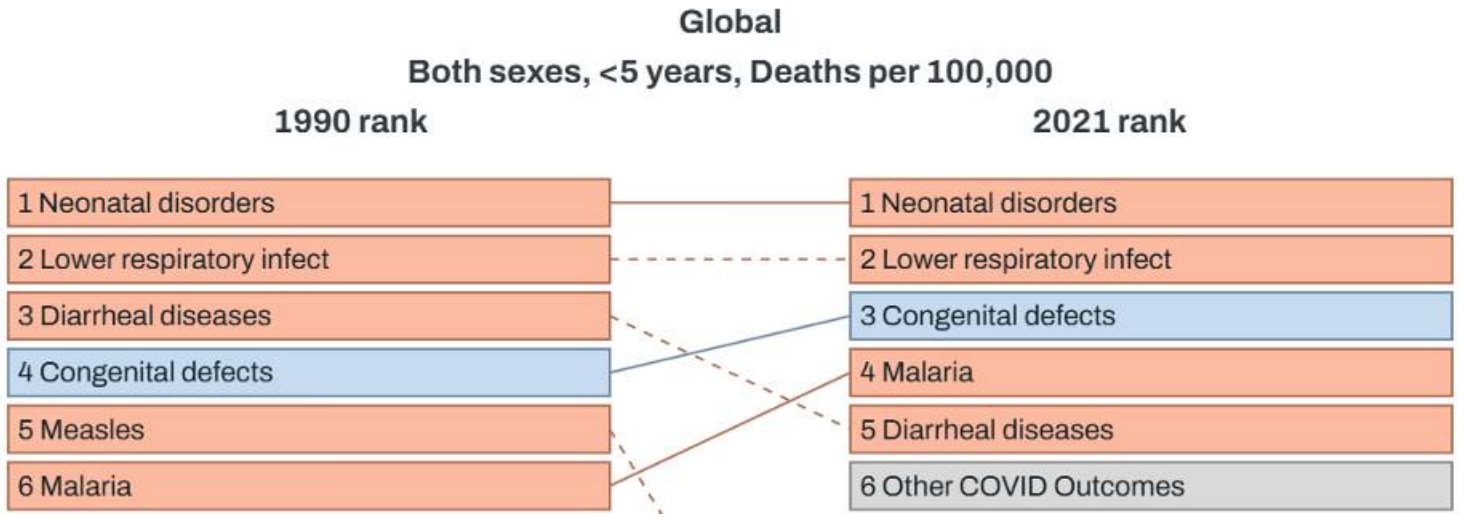


- Sustained reduction in disability-adjusted life years (DALYs) per 100,000 population between 1990 and 2021 globally.
- Regional inequalities persist

Institute for Health Metrics and Evaluation (IHME). (2024) GBD Compare. http://vizhub.healthdata.org/gbd-compare

Background – Mortality (deaths in children under five)





Institute for Health Metrics and Evaluation (IHME). (2024) GBD Compare. http://vizhub.healthdata.org/gbd-compare

SPRINGS Project

Supporting Policy Regulations and Interventions to Negate aggravated Global diarrheal disease due to future climate Shocks.

- Understand impact of climate change on diarrhea in four countries (Ghana, Tanzania, Italy and Romania).
- Improve predictions about future diarrheal disease risk
- Support policymakers to prioritize interventions to protect the population against increased risk of diarrhea
- Four key pathogens:
  - Rotavirus (virus)
  - Campylobacter (bacterium)
  - Cryptosporidium (protozoan parasite)
  - Giardia (protozoan parasite)

https://www.springsproject.eu

SPRINGS

Home Project Our research Resources News PoopLoop Campaign

Our partners

Amsterdam UMC Universitair Medische Centra

University of Virginia

University of Ghana

Norwegian Meteorological Institute

Aarhus University

AQUATIM

aighd

IHE Delft

VU Vrije Universiteit Amsterdam

Università degli Studi di Napoli Federico II

United Nations Educational, Scientific and Cultural Organization

London School of Hygiene & Tropical Medicine

Rijksinstituut voor Volksgezondheid en Milieu
Ministerie van Volksgezondheid, Welzijn en Sport

University of Bucharest

Three clock

Learn more

SPRINGS

Tackling the effects of climate change on diarrheal diseases

Down-scaled climate models

To understand what climatic changes can be expected in our case-study sites under different scenarios

Modelling pathogen dispersal through water

For specific watersheds in our case study locations, during floods

Water Safety Plans

Mapping out water and sanitation systems & vulnerabilities. Water testing + QMRA

Agent-based model

How do various factors, (incl. env. & behavioural) affect pathogen-specific diarrheal disease & simulating interventions

Diarrheal surveillance

Diarrheal episodes, rectal swab samples, etiology, risk factors

Akuse

Haydom

Naples

Timisoara

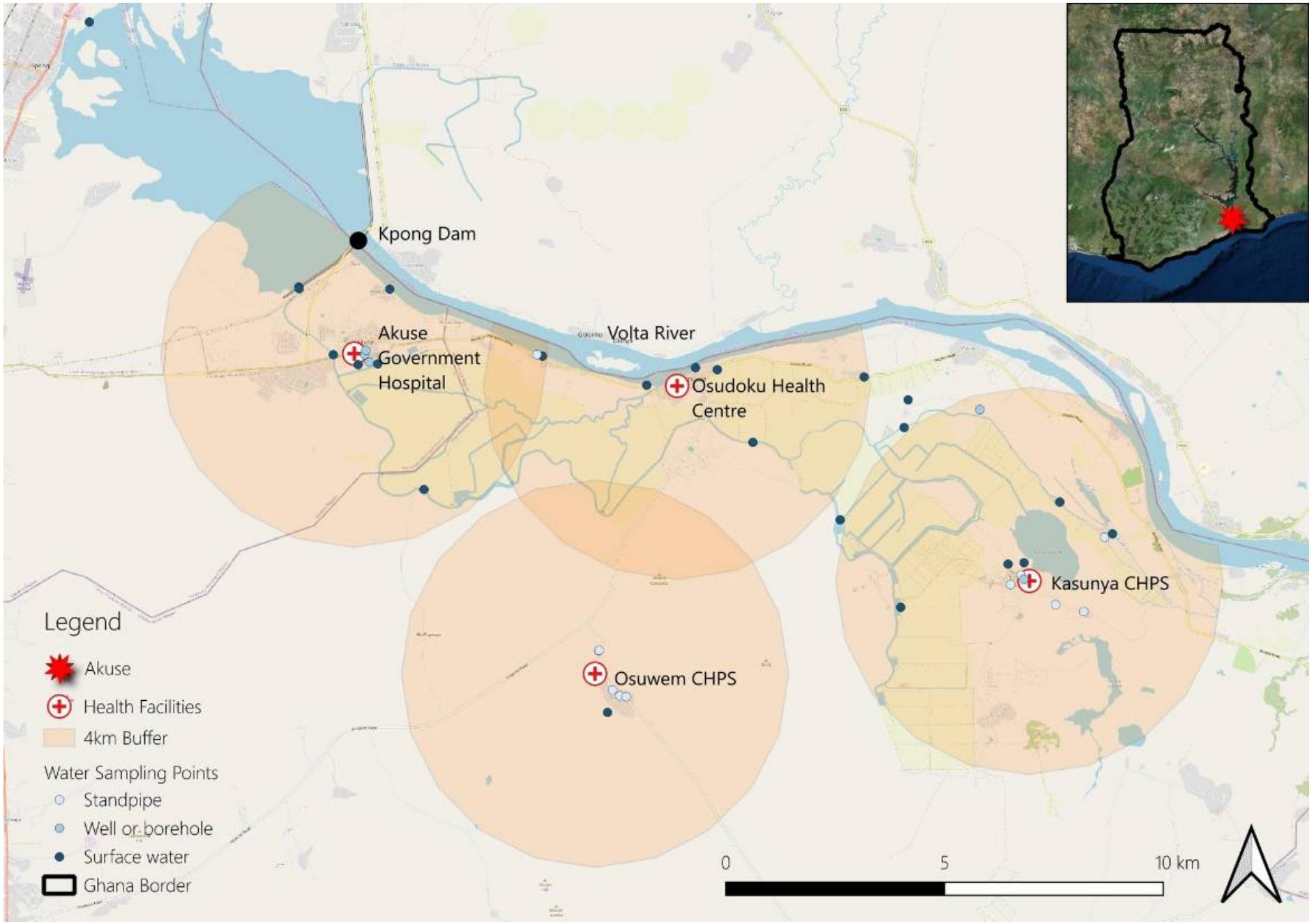
Ghana Study Objectives

SPRINGS

1. To determine the influence of weather variables on the odds of medically-attended diarrheal disease in children under 5 in Akuse, Ghana.
   a) To identify the **individual- and household-level risk factors** associated with increased odds of medically-attended diarrheal disease
   b) To assess whether weather variables affect the odds of medically-attended diarrheal disease risk **directly or through interaction with other risk factors**, or both.

2. To quantify the associations between weather variables and key pathogen concentrations in water samples in Akuse area.
   a) To identify risk factors for contamination of water samples.

Study Design

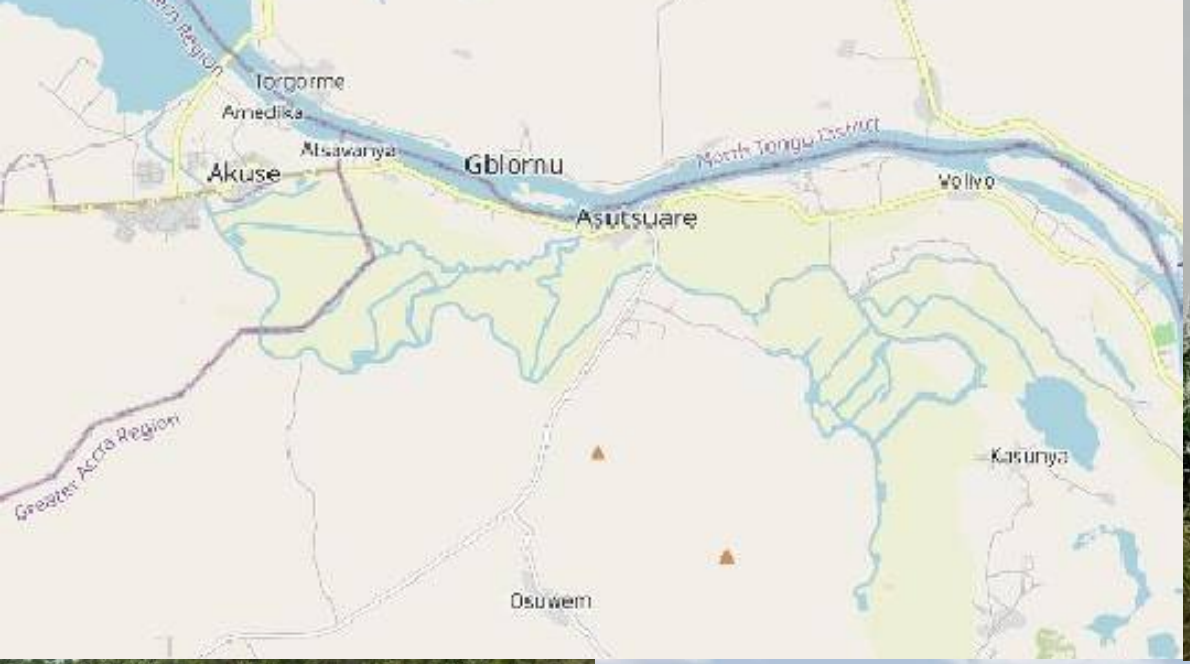


AKUSE, GHANA

- 24 months data
- Case-control study
  - Nested case-crossover (90 days))
- v ollecting…
  - Rectal swabs
  - Surveys
    - Risk factors
    - Symptoms
    - Costs
  - Water samples
  - Weather data

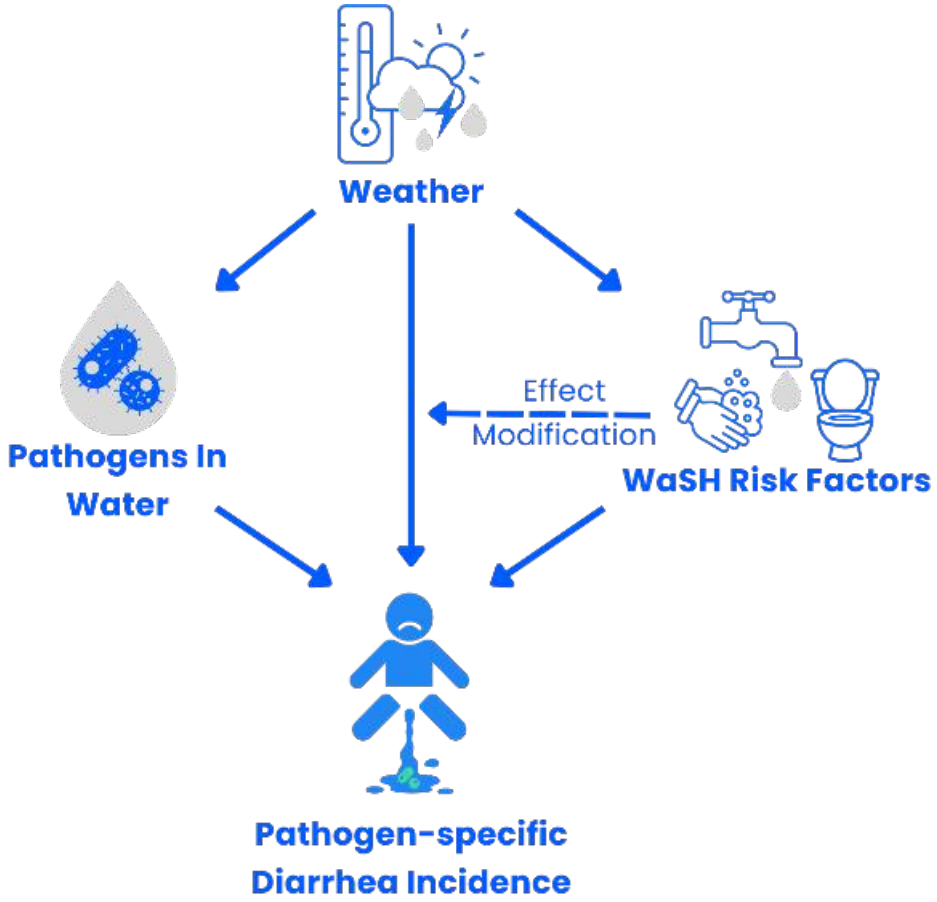
UNIVERSITY OF GHANA

SPRINGS


Torgorme
Amedika
Akuse
Atsawanya
Gblornu
Asutsuare
Wolivo
Kasunya
Osuwem

WARNING
NO BATHING
Dumi be

Outcomes & Impact



- Improve projections of future risk under different scenarios
- Identify potential interventions to mitigate the impact of climate change
- Inform decision-makers to help them implement effective changes

THANK YOU

SPRINGS

Name: Adelina Mensah
Contact: ammensah@ug.edu.gh

DISCOVER MORE

www.springsproject.eu @SPRINGS_EU springsproject

Funded by
the European Union