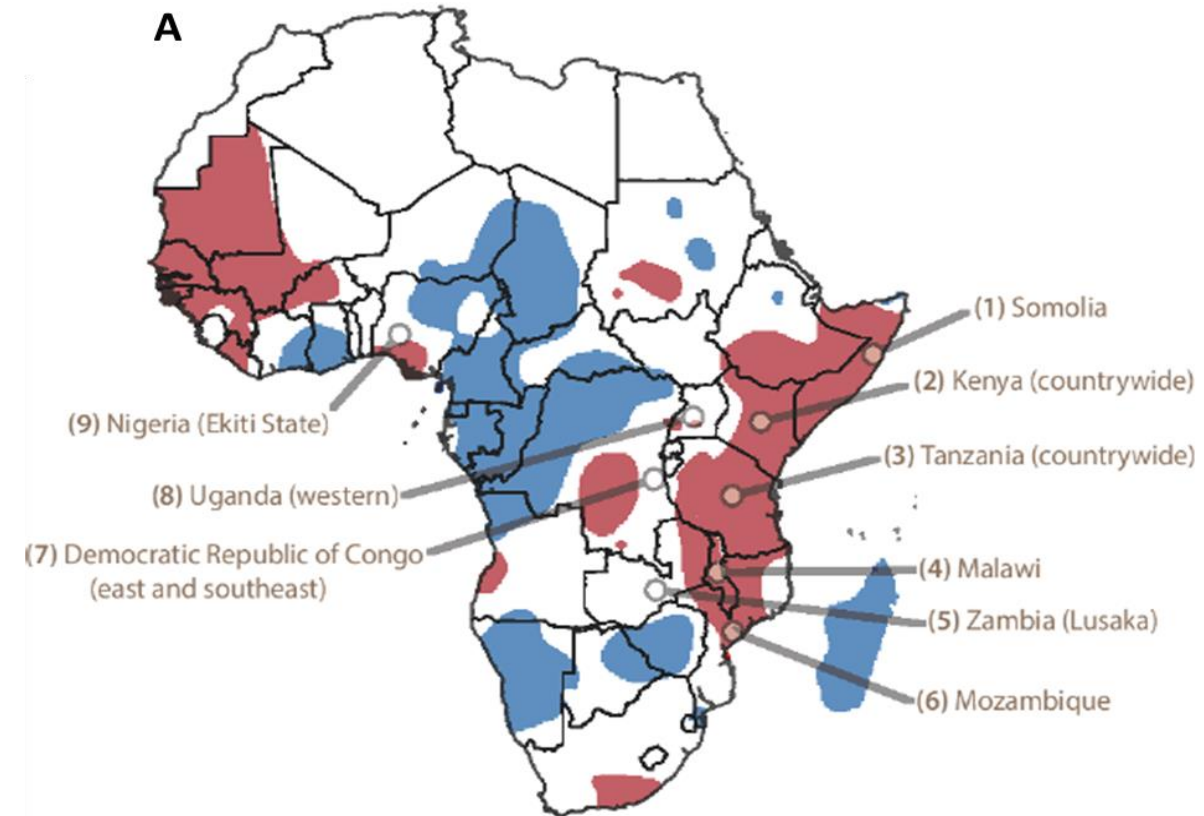# THE AFRICAN CHOLERA RISK EARLY WARNING SYSTEM (ACREWS)

Benjamin Zaitchik, Johns Hopkins University

Javier Perez-Saez, Johns Hopkins University

Justin Lessler, University of North Carolina

Andrew Azman, Johns Hopkins University

Sean Moore, Notre Dame University

Emma Diggle, Save The Children

PROJECT GOAL

Develop and operationalize an **Earth Observation-informed African Cholera Risk Early Warning System (ACREWS)** to support rapid response interventions
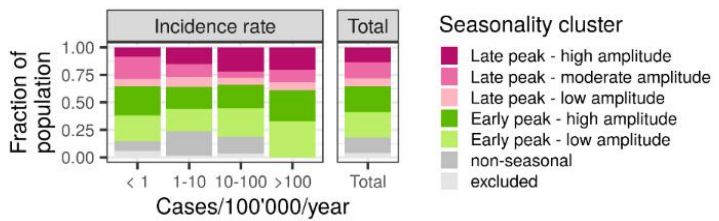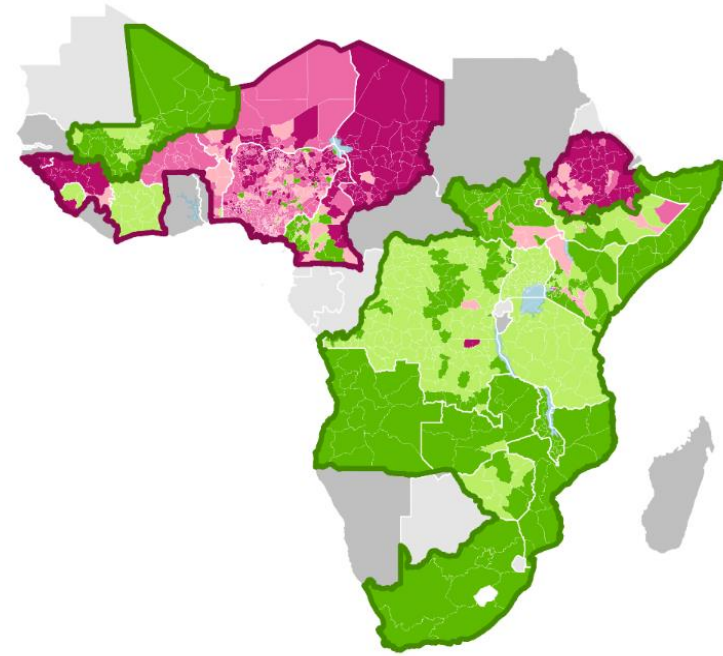
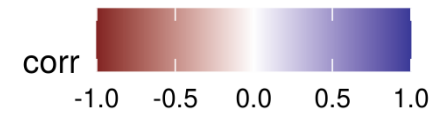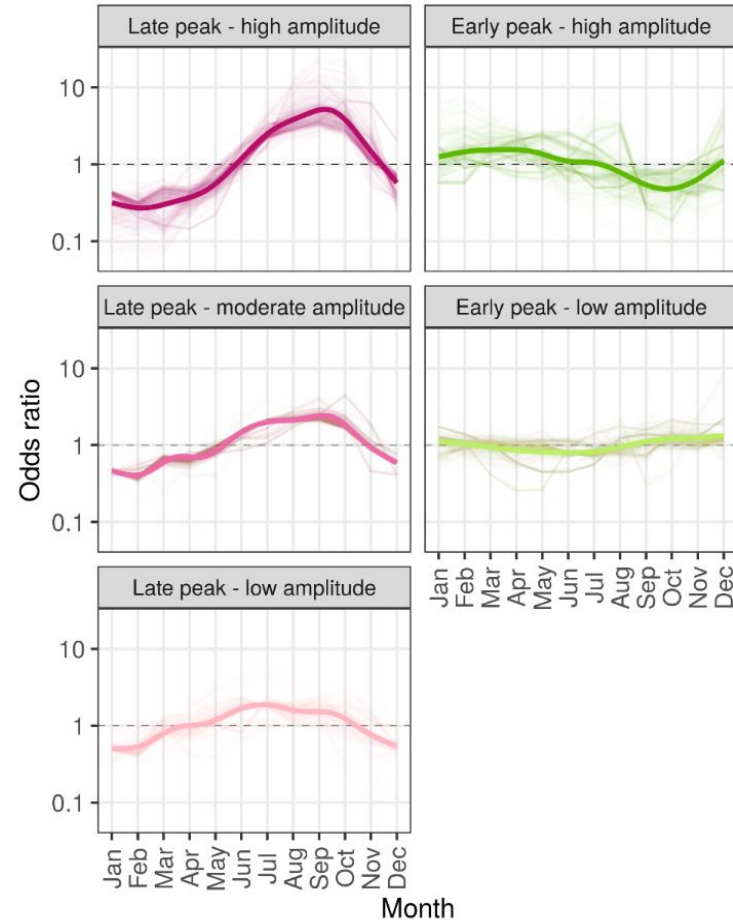End users: UN Taskforce on Cholera Control, Save the Children, MSF

A

(9) Nigeria (Ekiti State)
(8) Uganda (western)
(7) Democratic Republic of Congo (east and southeast)

(1) Somolia
(2) Kenya (countrywide)
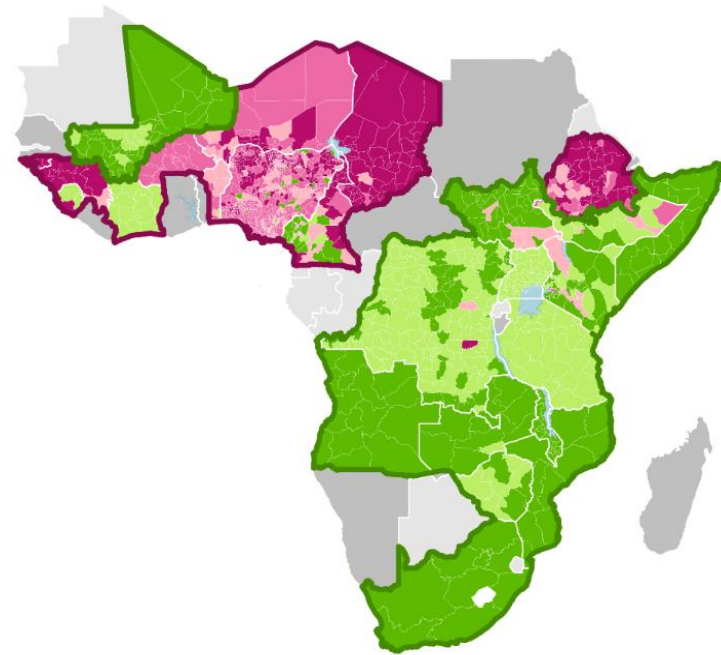(3) Tanzania (countrywide)
(4) Malawi
(5) Zambia (Lusaka)
(6) Mozambique

Moore et al. (2017)

SEASONALITY

Perez-Saez et al. (2022)

SEASONALITY

Perez-Saez et al. (2022)
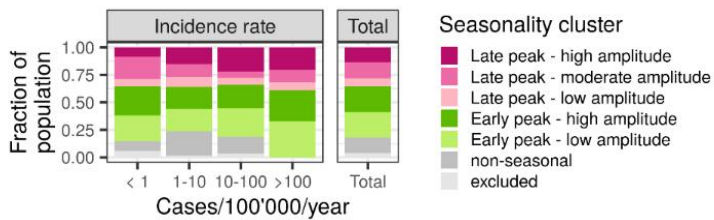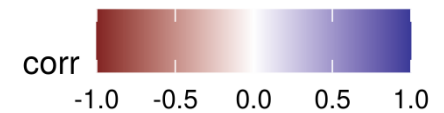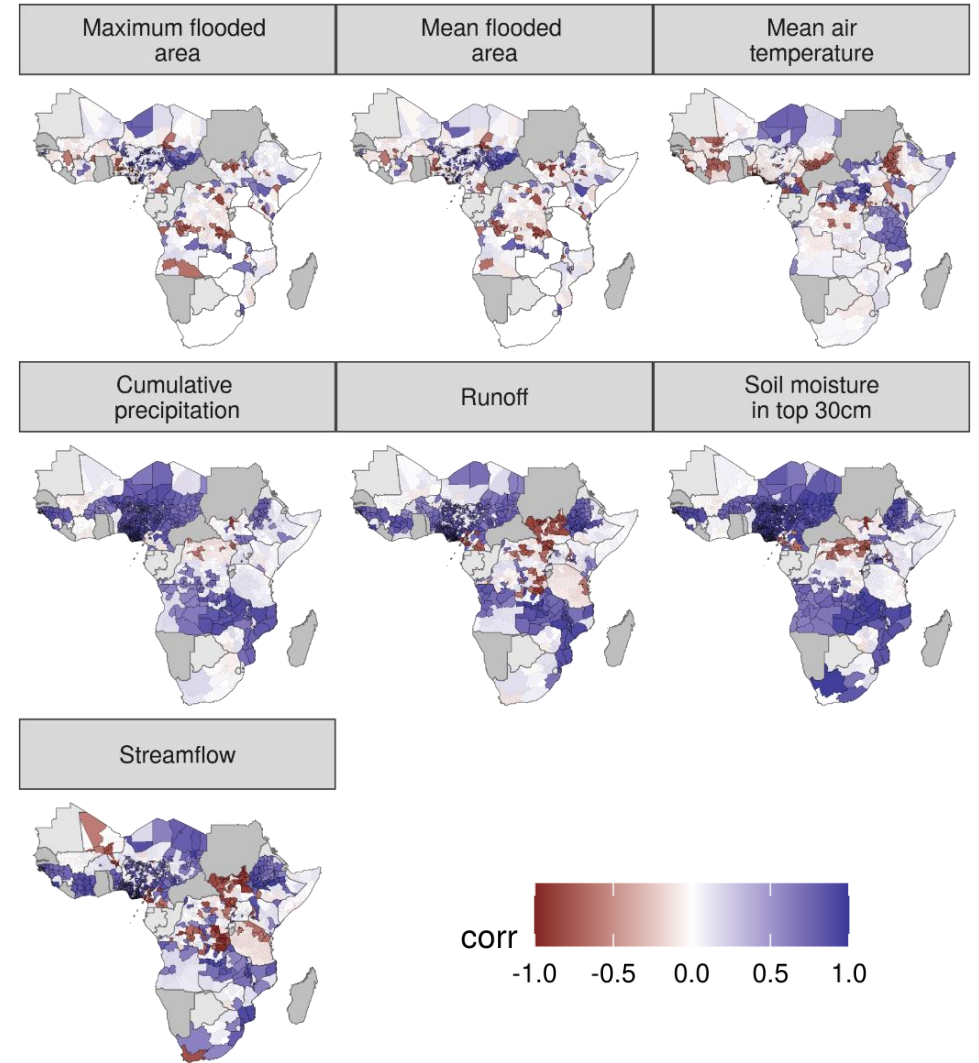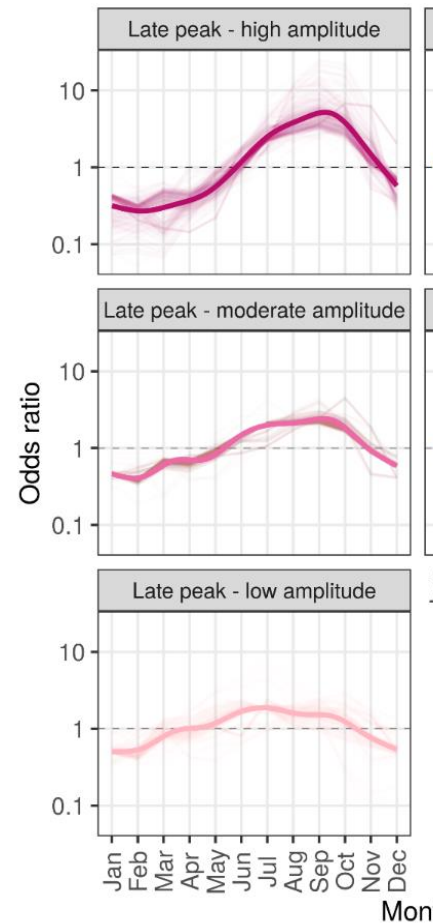
GTFCC WEB PORTAL

Compare Figures and Maps

☐ Sync maps

Maps	Figures

- Sanitation access
- Water access
- Cases
- Rates
- Clear overlays

Modeled estimate of the percent of the population with access to improved water in 2017 (5 km x 5 km grid)
Source: Institute for Health Metrics and Evaluation, https://doi.org/10.1016/S2214-109X(20)30278-3

Maps	Figures

- Sanitation access
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Modeled estimate of mean annual suspect cholera cases from 2010-2016 (20 km x 20 km grid)
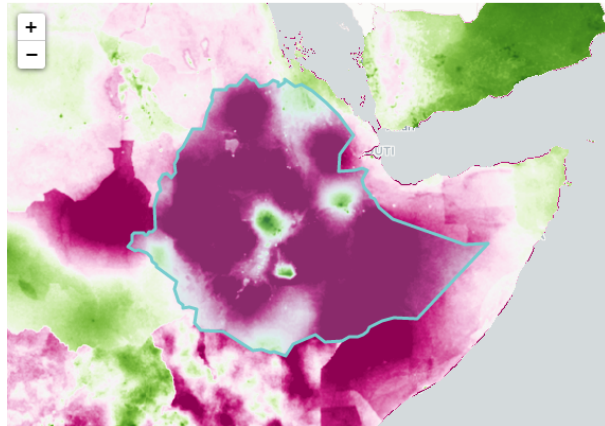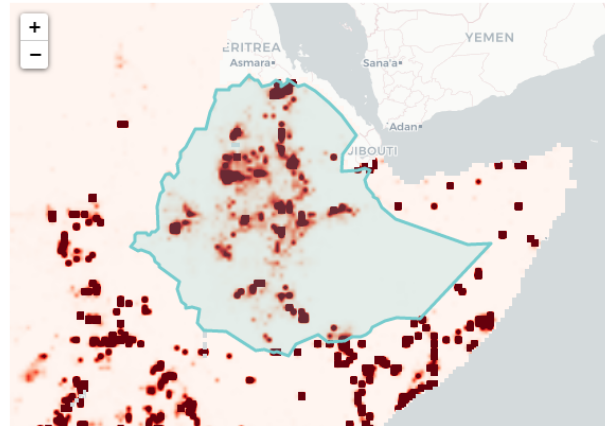Source: Johns Hopkins Infectious Disease Dynamics Group, https://doi.org/10.1016/S0140-6736(17)33050-7

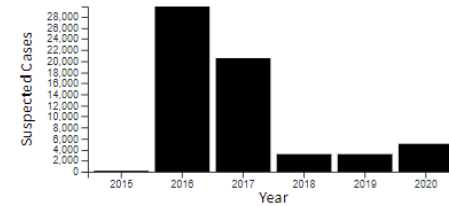# GTFCC WEB PORTAL

Compare Figures and Maps

Maps | Figures

- Sanitation access
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- Cases
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- Clear overlays

Modeled estimate of the percent of the population with access to improved water in 2017 (5 km x 5 km grid)
Source: Institute for Health Metrics and Evaluation, https://doi.org/10.1016/S2214-109X(20)30278-3

Maps

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- Water access
- Cases
- Rates
- Clear overlays

Modeled estima...
20 km grid)
Source: Johns H...
https://doi.org/1...

Cases

Annual suspect cholera cases reported nationally
Source: Ethiopian Public Health Institute

Seasonality
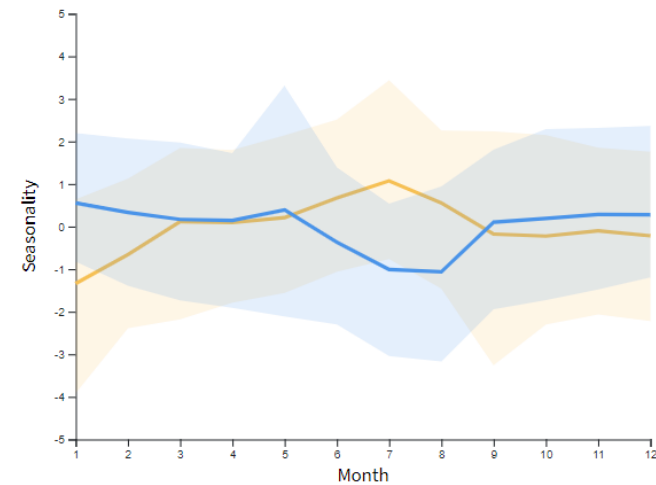
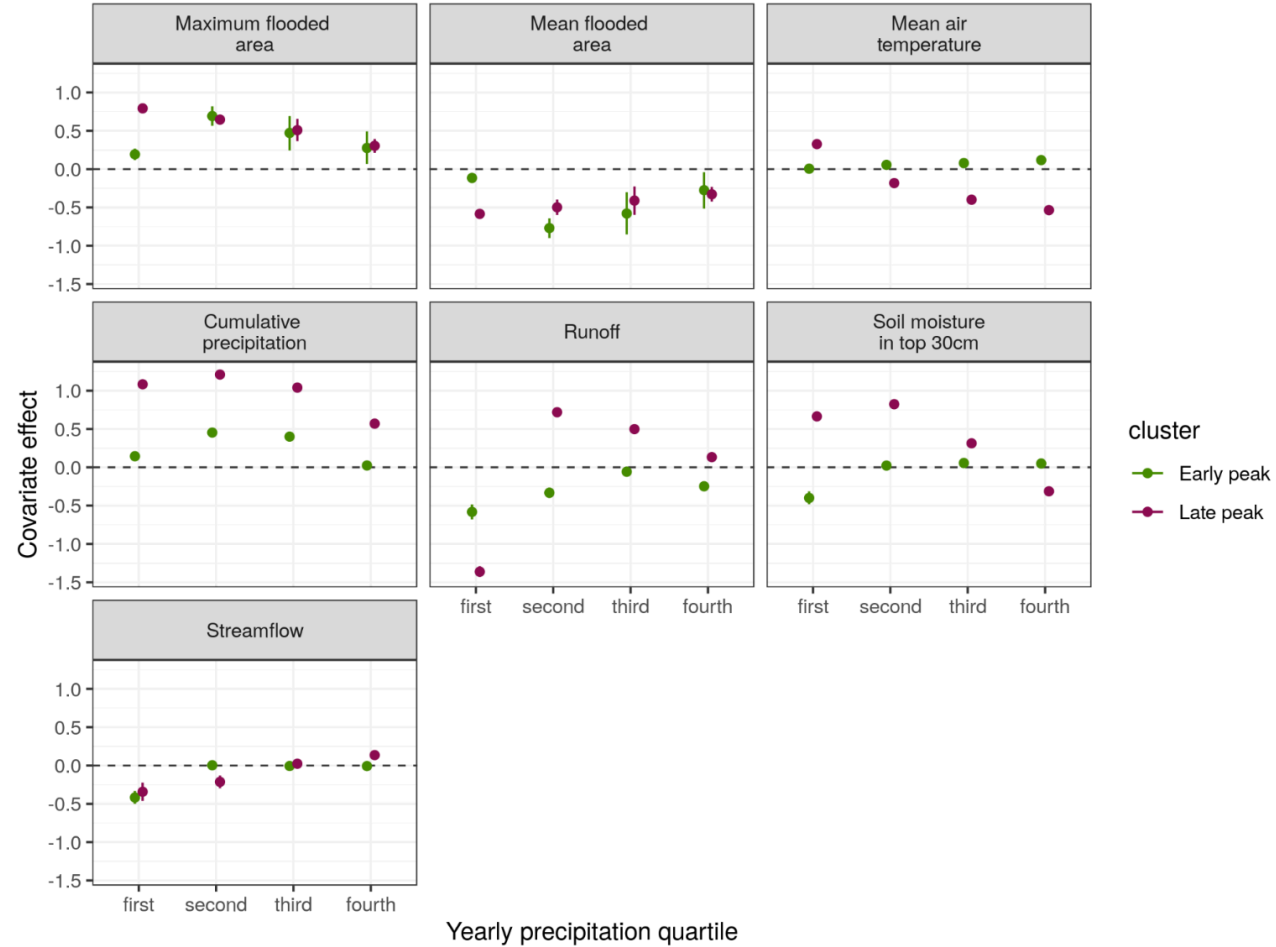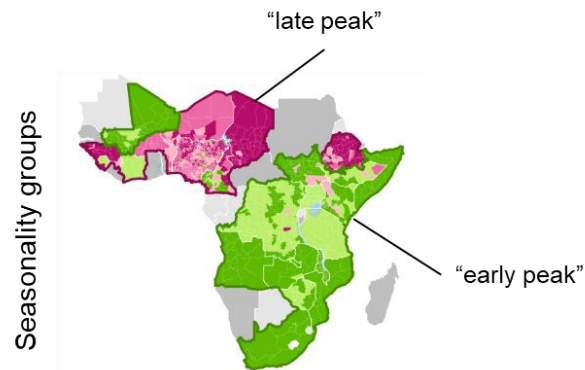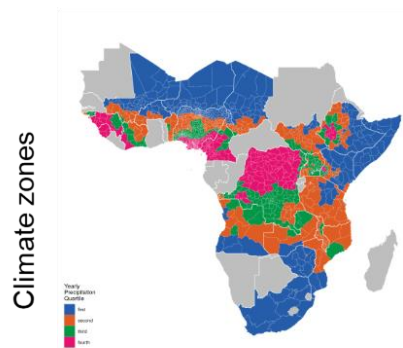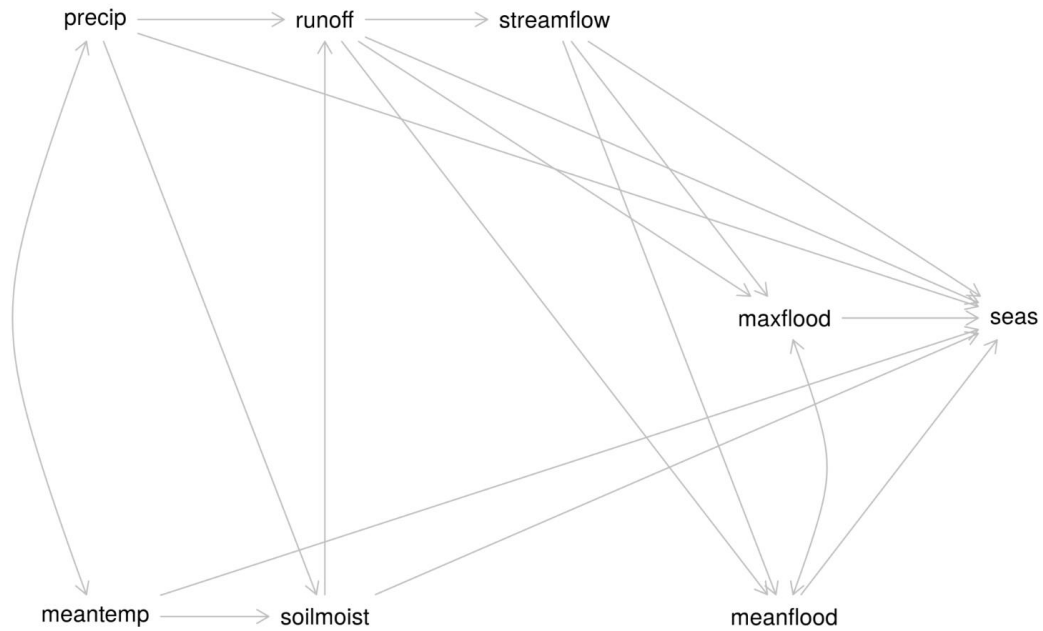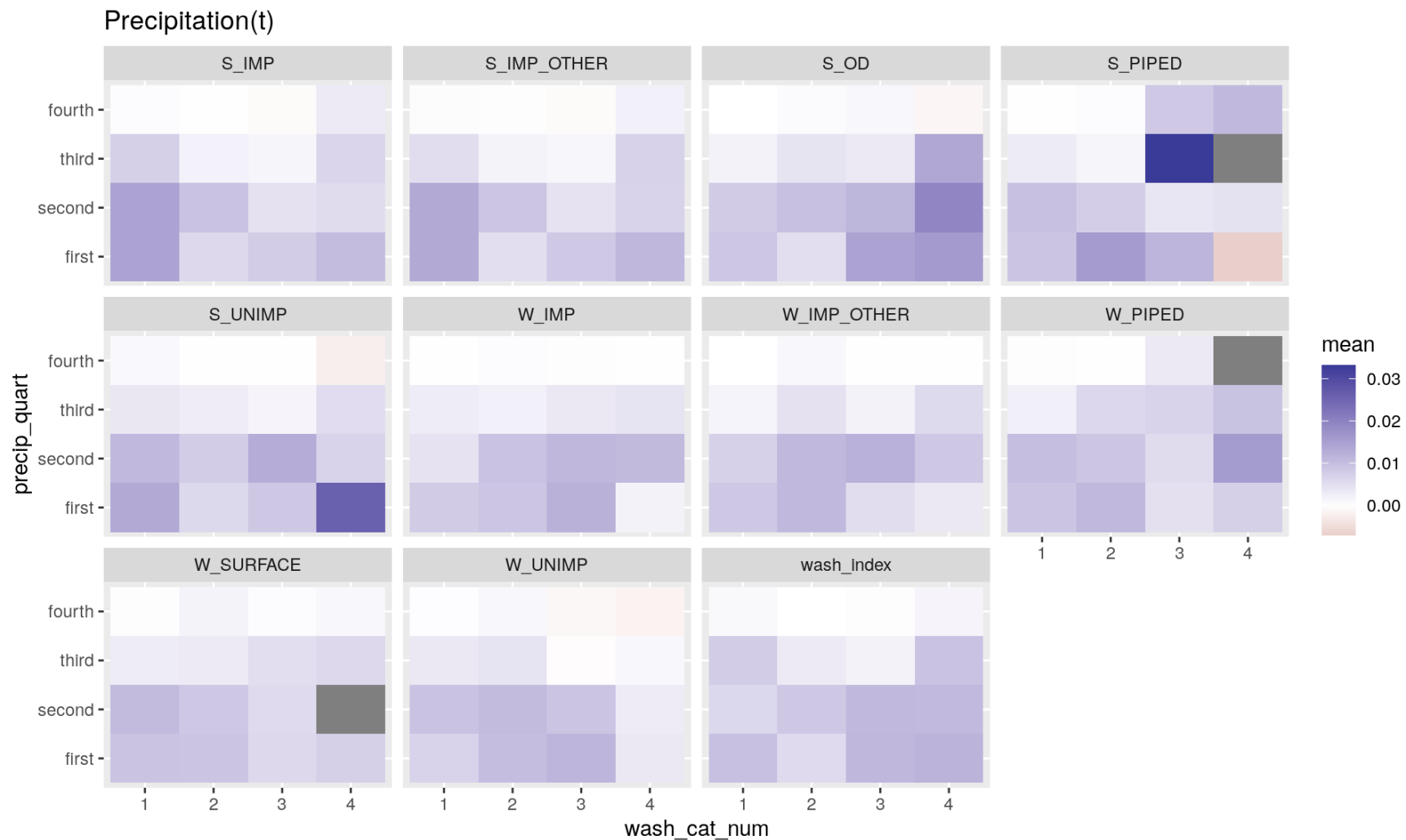Modeled estimate of monthly seasonality in suspect cholera occurrence from 2015-2019. Colors represent geographic groupings (map with similar monthly seasonal patterns (line chart).
Source: Johns Hopkins Infectious Disease Dynamics Group

CAUSAL INFERENCE

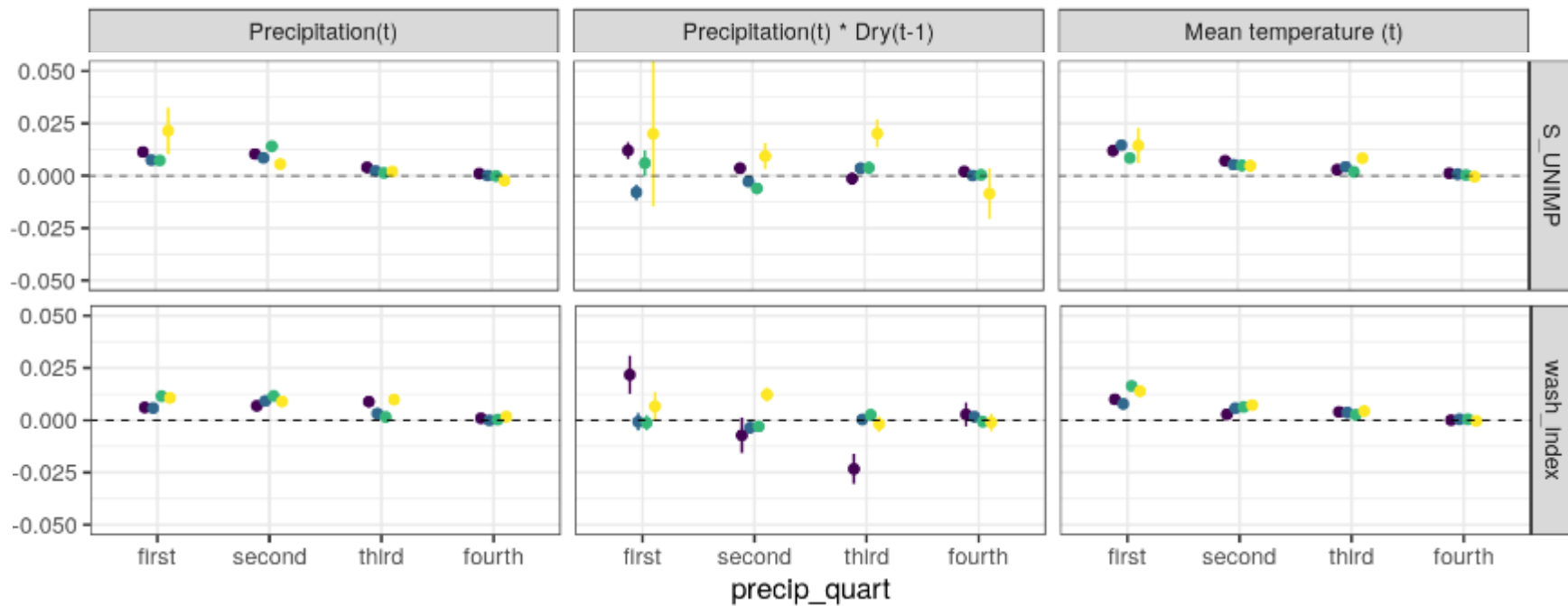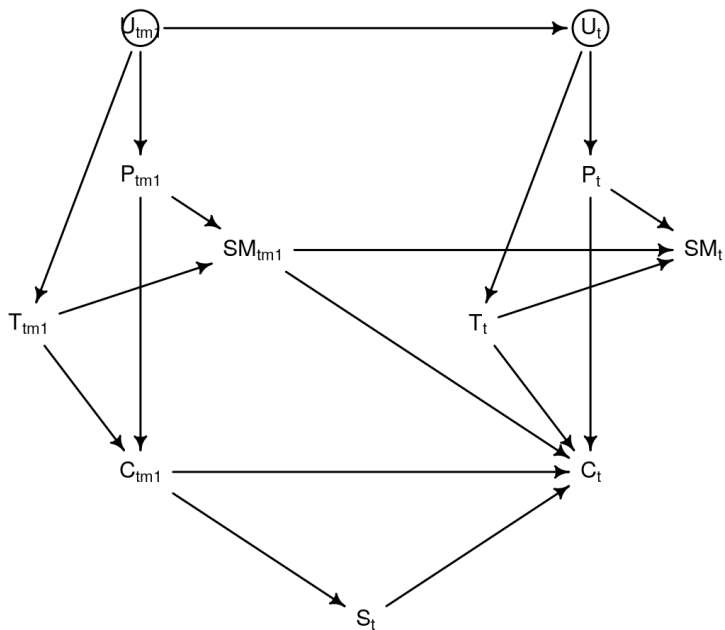Perez-Saez et al. (*In Prep*)
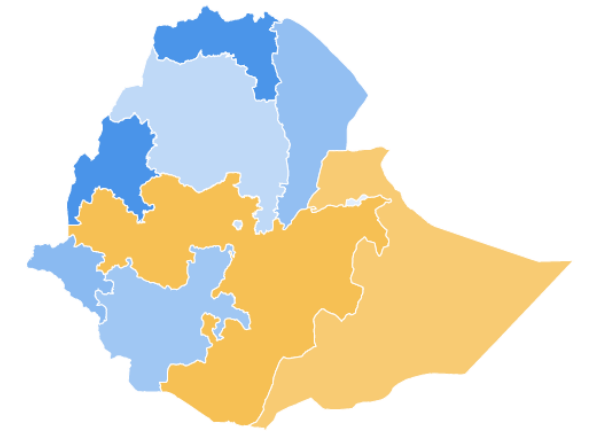
INTERACTIONS WITH WASH

PRECIPITATION FOLLOWING DRY CONDITIONS?

PUBLICATIONS

Perez-Saez, J., et al. "The seasonality of cholera in sub-Saharan Africa: a statistical modelling study." *The Lancet Global Health* 10.6 (2022): e831-e839.

Shade, R. "The Role of Weather and Climate in Cholera: A Systematic Review." Master's Thesis, Johns Hopkins University. (2022)

Perez-Saez, J., et al. "Meteorological Drivers of Cholera Patterns Across Africa." *In Prep.*

Costello, A. et al. "Satellite-informed cholera risk analysis in the eastern Democratic Republic of Congo." *In Prep.*

NEXT STEPS

GTFCC: Has expressed appreciation for the new tool to inform seasonal optimization of cholera vaccine campaigns . . . but turnover in leadership means we need a new round of engagement

Time-varying climate conditions are not yet incorporated to this decision path. This is the subject of a new Gates Foundation supplement to integrate climate predictors to vaccination decision making