PRIO

CC2C PRIN webinar, 19 Sept. 2024

Does the political context matter for flood impacts?

Paola Vesco, PRIO & Uppsala Uni.

Nina von Uexkull, Uni. Konstanz & Uppsala Uni.

Jonas Vestby, PRIO

Halvard Buhaug, PRIO & NTNU

Peace Research Institute Oslo

Independent • International • Interdisciplinary

Derna, Libya
14 Sept. 2023

Photo credit: Reuters

Framing & objective

- **Impact (risk) = hazard x exposure x vulnerability**
- Socioeconomic development has been found to reduce risk from many types of hazards
- Less evidence on the role of political context

→ This study examines how **political development** moderates flood impacts

Adapted from IPCC AR6

PRIO

How political development reduces risk

Political development

Democracy
Open & inclusive institutions

Institutional quality
Capable & effective institutions

Conflict
Breakdown of peace & social cohesion

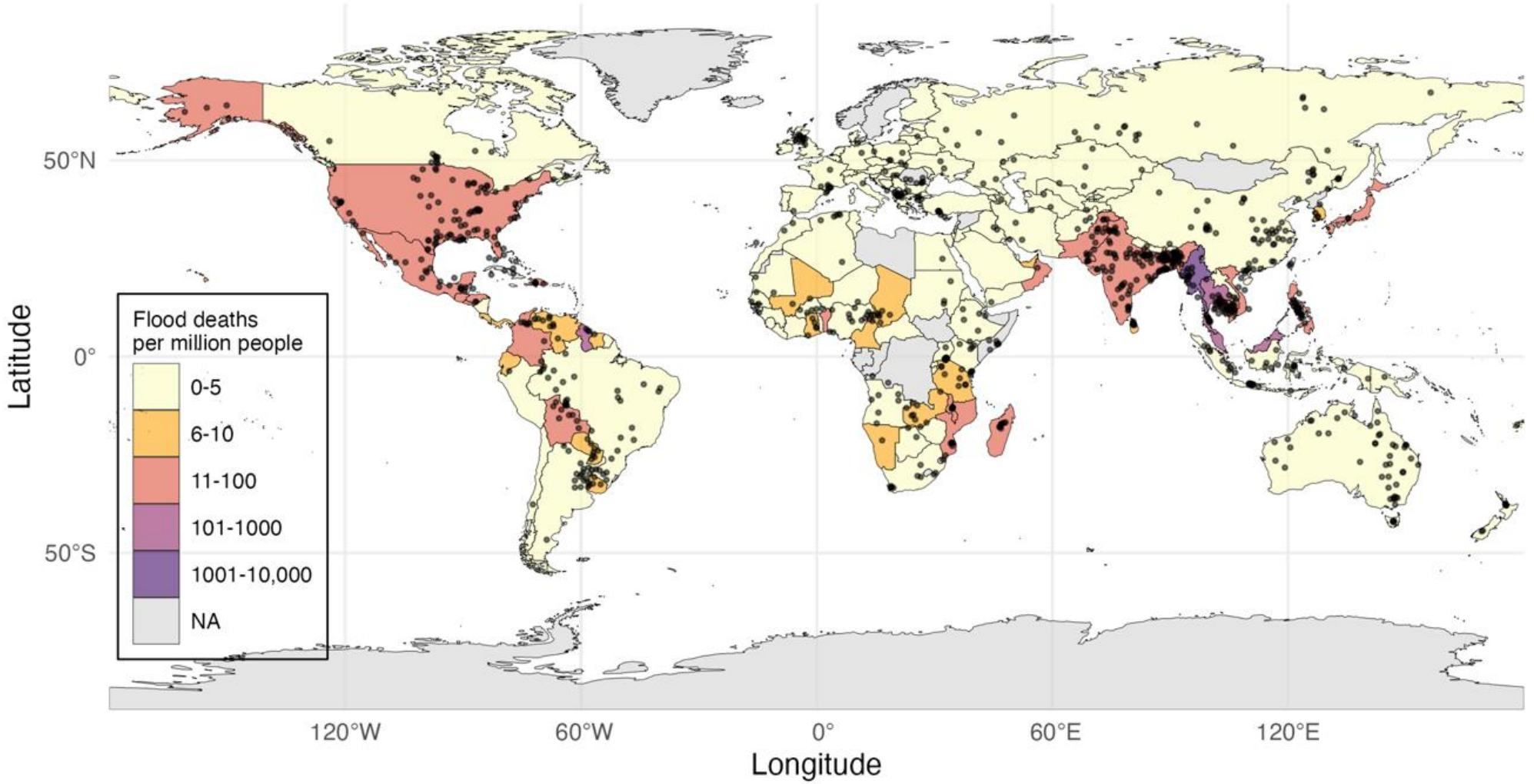
→ *Incentives* to protect and respond

Ability to protect and respond

PRIO

The data

Global Flood Database (2000–18)



Research design

- Unit of analysis: Flood-country event (N=2,225)
- Outcome: Reported deaths in each event
- Method: Bayesian NB Reg with in-sample (2000–14) and OOS (2015–18) validation
  - *Continent-level random effects*
  - *All continuous predictors are logged*
  - *All time-varying predictors are lagged*
- Main setup: Baseline + one political factor per model

Predictors

- Democracy
  - *Voice and accountability (WGI)*
  - *Inclusion of social groups (V-Dem)*
- Institutional quality
  - *Government effectiveness (WGI)*
  - *Rule of law (V-Dem)*
- Conflict (breakdown of peace)
  - *BRD in flooded area last 12 mo.*
  - *Decay of BRD in country last 10 y. (UCDP)*

PRIO

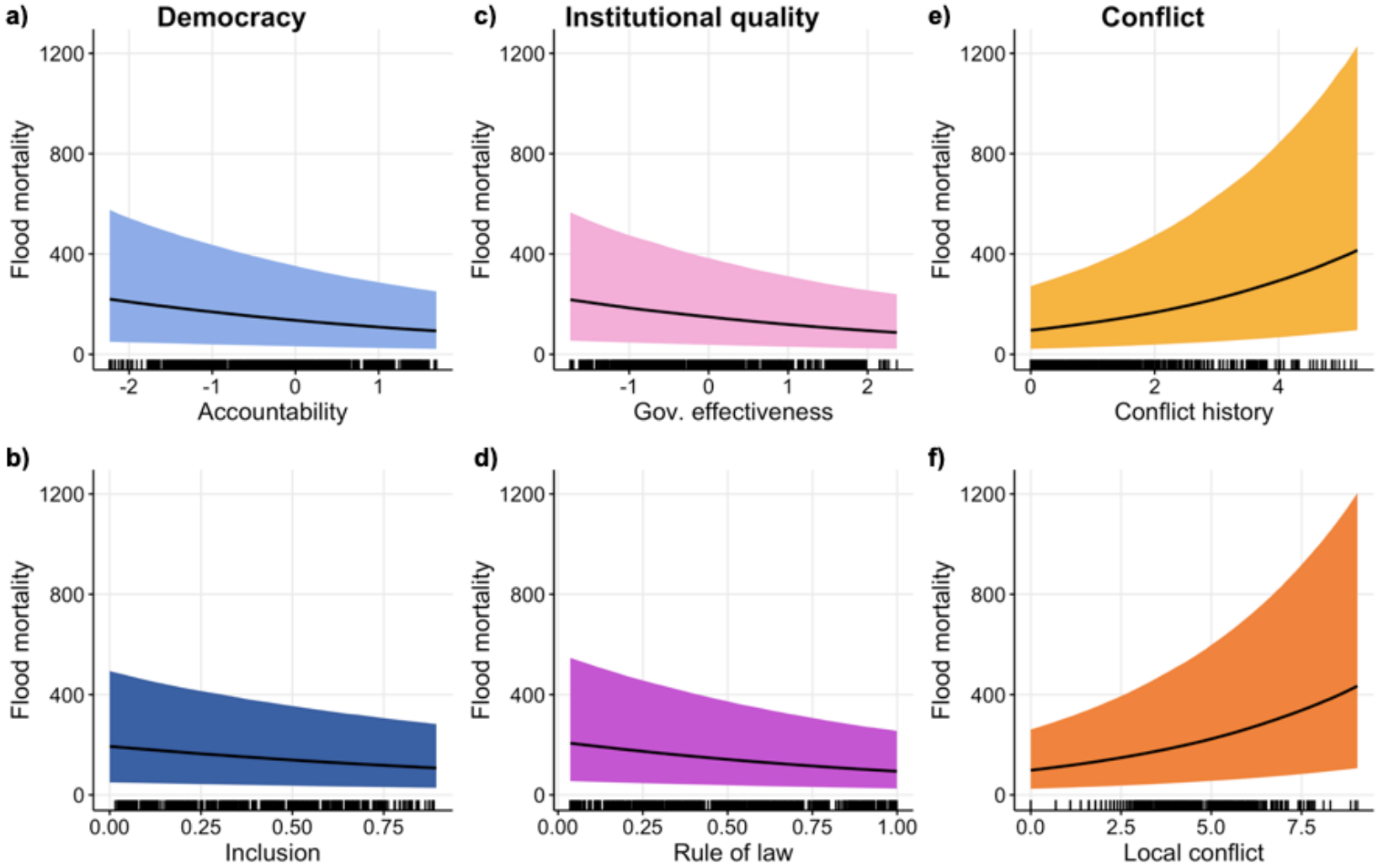
Controls

- Flood hazard + exposure
  - *Hydrological flood severity*
  - *Flood duration*
  - *Tropical storm*
  - *Number of floods in country last 10 y.*
  - *Number of people residing in flooded area*
- Geography
  - *Terrain ruggedness*
- Socioeconomic context
  - *GDP per capita*
  - *HDI in flooded area*

PRIO

In-sample conditional effects

Median posterior prediction & 80% prediction interval



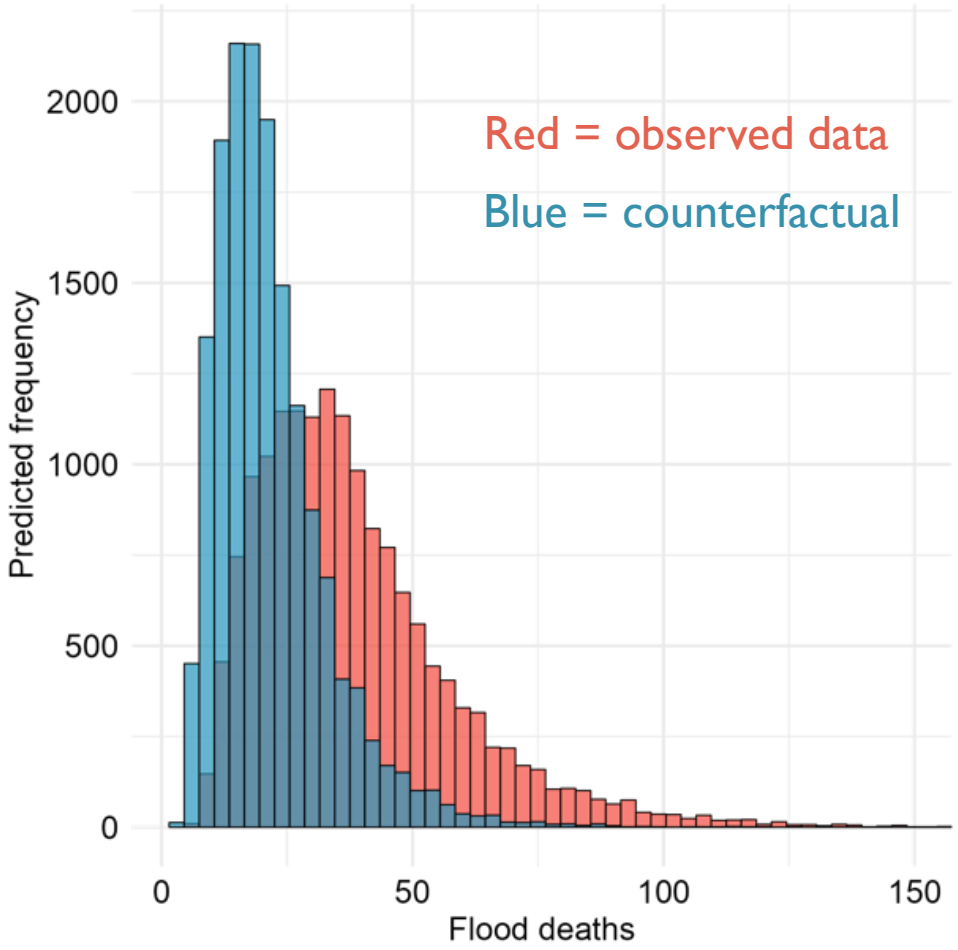
What if the world had achieved SDG 16?

Counterfactual analysis:

(i) Predict mortality for all floods 2015-18 using observed values on predictors

(ii) Predict mortality for same sample assuming ideal-case political context (= New Zealand)

→ Counterfactual model predicts 55% lower flood deaths per event on average



PRIO

Final reflections

- Political factors do matter for climate-driven risk!
- Conflict consistently most influential political predictor

→ Great potential for SDG 16 to lower future disaster mortality

- Findings are important given hard test
  - *Out-of-sample period differs qualitatively from training sample*
  - *Continent-level random effects absorb systematic political variation*
  - *Political factors also likely affect exposure = p(treatment)*
- Better data on DRR mechanisms, local political institutions, and magnitude of immediate response needed

PRIO

Thank you for your attention

halvard@prio.org

PRIO

European Research Council
grant no. 101055133

Funded by
the European Union