Linking biodiversity and children's health:

Global relationships

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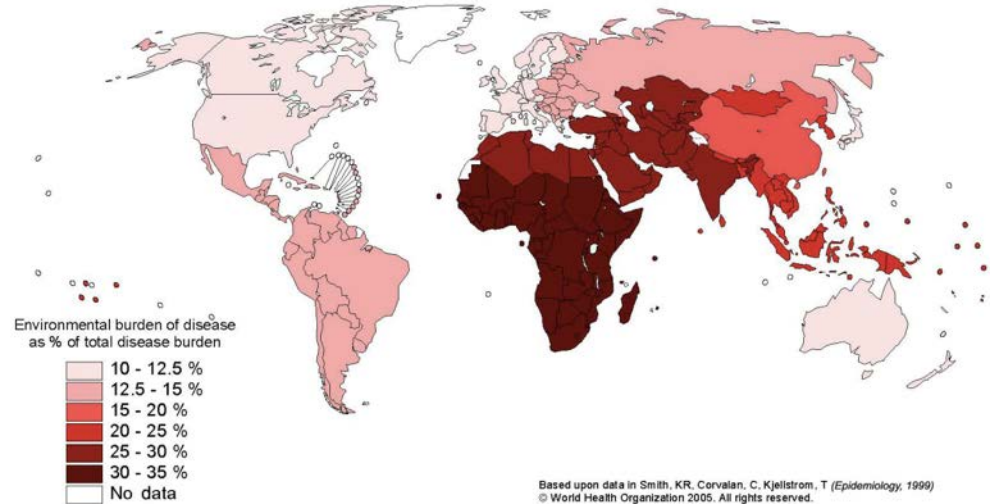University of Vermont

@TaylorHRicketts

Nature and health

Environmental burden of disease globally

Environmental burden of disease as % of total disease burden
- 10 - 12.5 %
- 12.5 - 15 %
- 15 - 20 %
- 20 - 25 %
- 25 - 30 %
- 30 - 35 %
- No data

Based upon data in Smith, KR, Corvalan, C, Kjellstrom, T (Epidemiology, 1999)
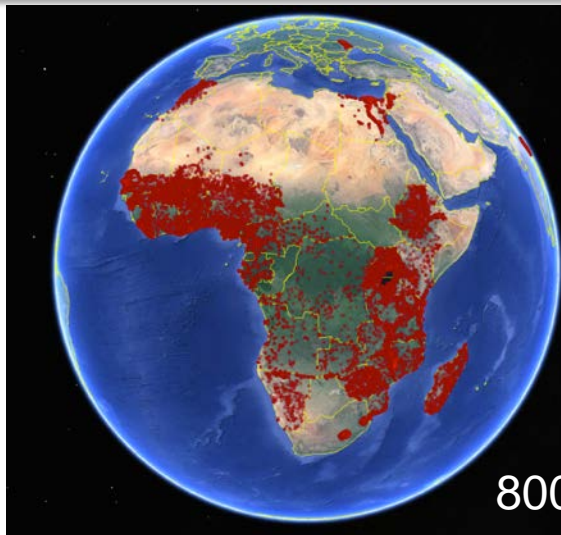© World Health Organization 2005. All rights reserved.

Increasing evidence

- Local and regional studies
- Specific populations and ecosystems

- How general are these relationships?
- Can we inform global efforts?

800K kids   49 countries

- Health outcomes   (stunting, diarrhea, diet, …)
- Social factors   (wealth, education, …)
- Sanitation factors   (water source, toilet type, …)

- Natural features   (climate, land use, …)
- Watershed condition   (<u>upstream</u> human activity, forest cover …)
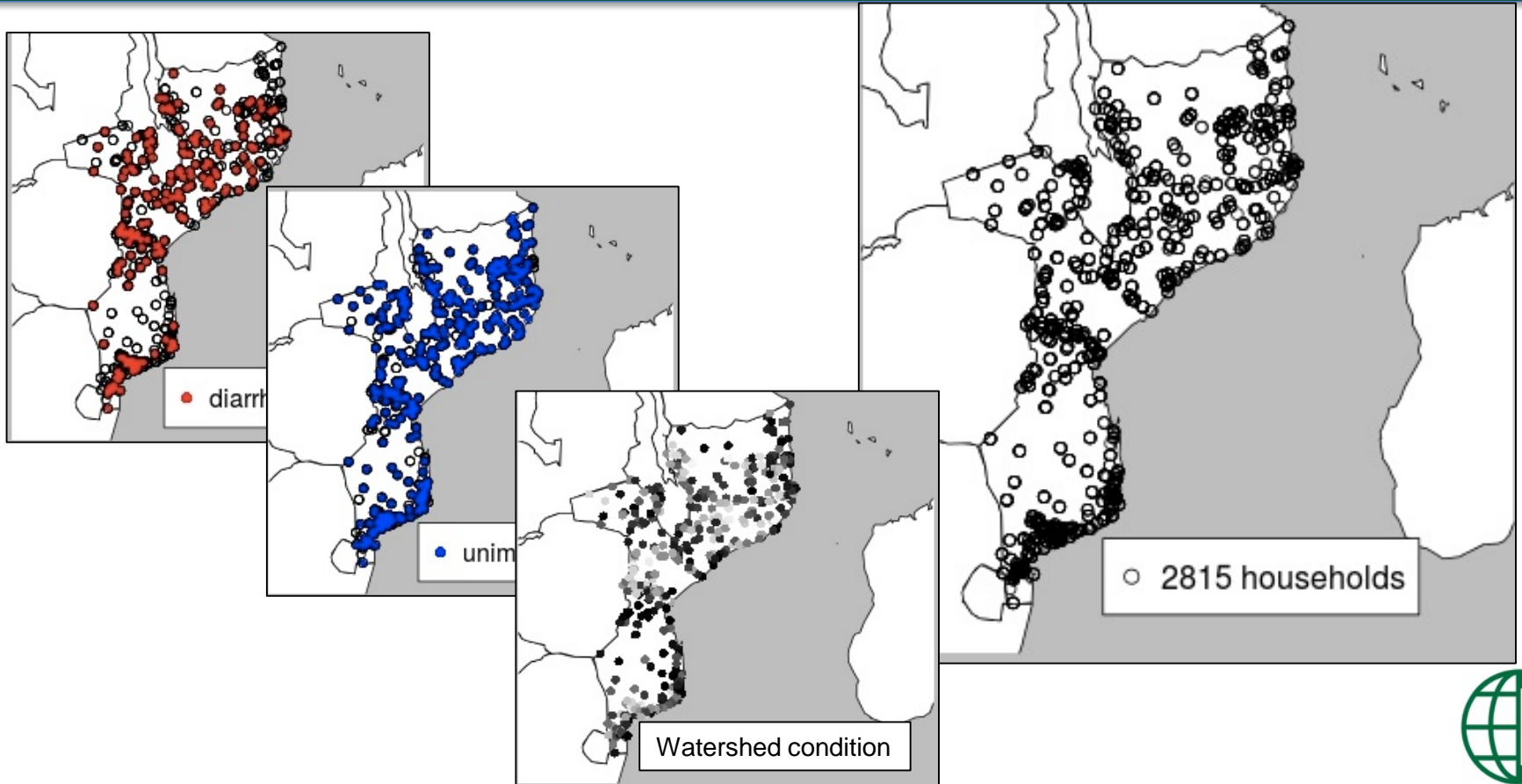
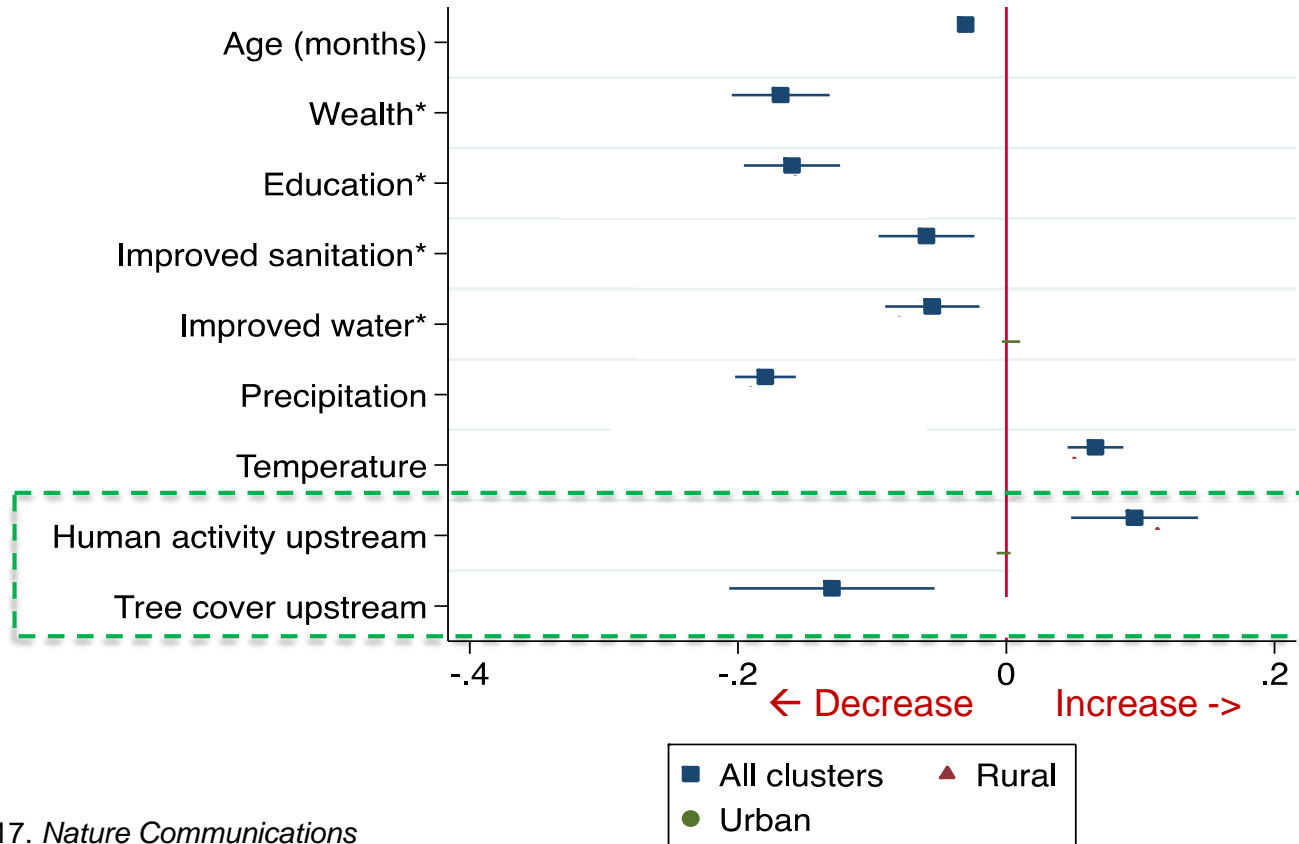How does watershed condition affect downstream diarrheal disease among children?

e.g., Mozambique

diarrh[ea]
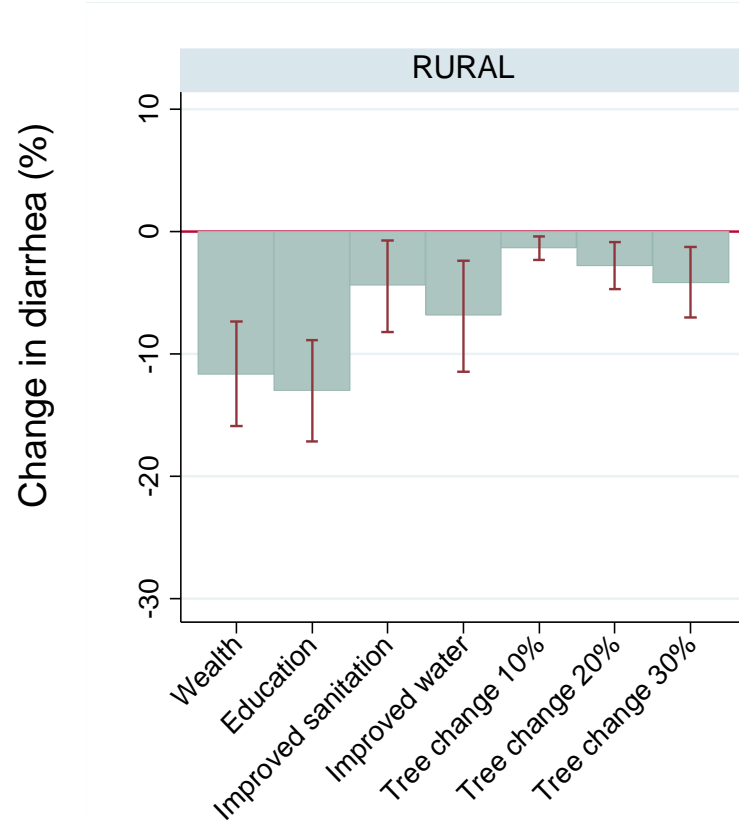
unim[proved]

Watershed condition

2815 households

What impacts childhood diarrhea?

Herrera, et al. 2017. *Nature Communications*

Comparing potential interventions

Herrera, et al. 2017. *Nature Communications*
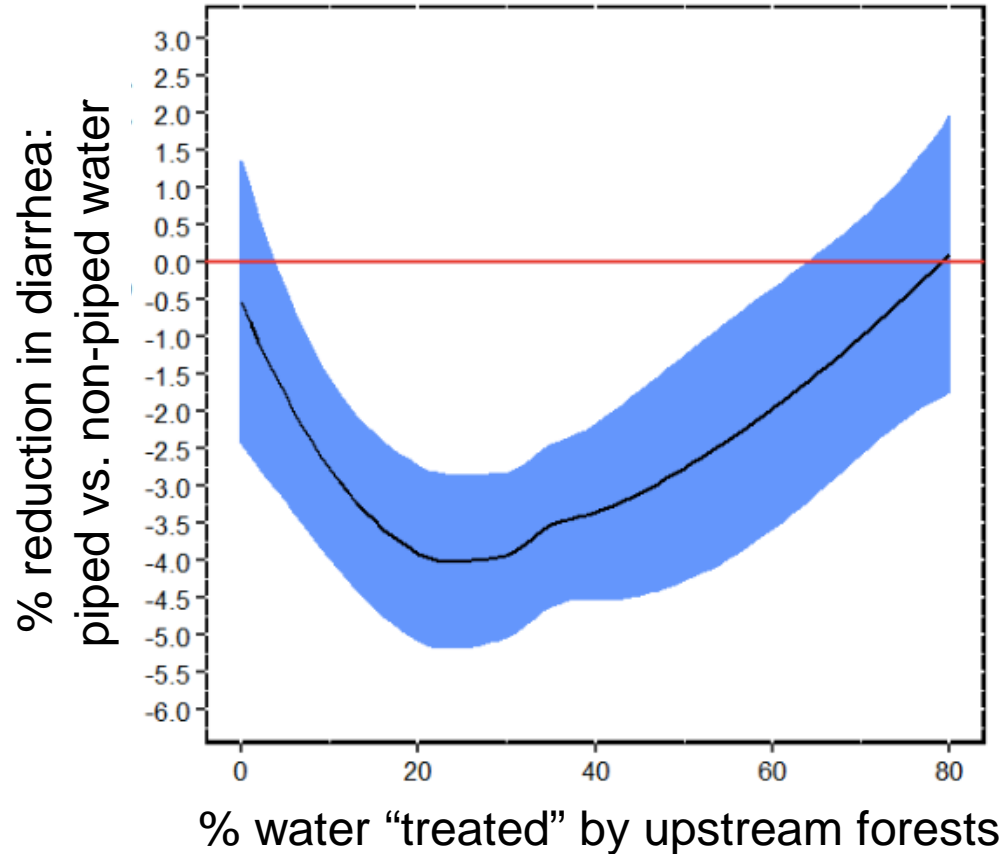
Can deforestation undermine WASH?

- WASH: water, sanitation, hygiene
- Most common intervention for diarrhea
- Billions spent annually: USAID, UNDP, WHO, Gates

Upstream forests & WASH impacts

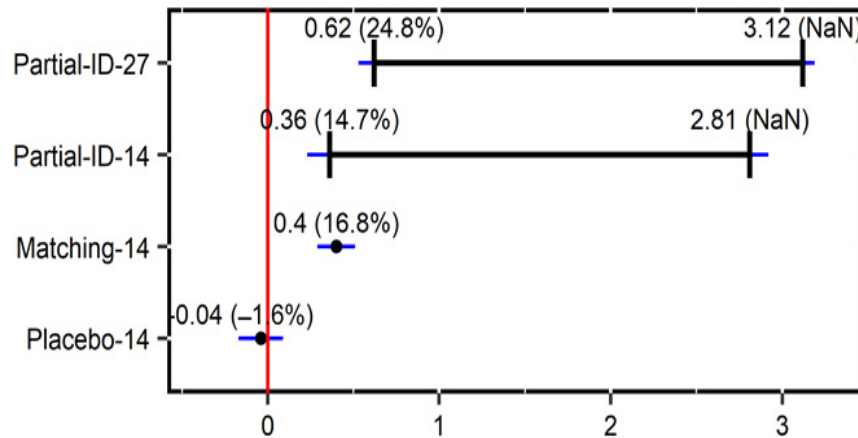% reduction in diarrhea: piped vs. non-piped water

% water "treated" by upstream forests

Rasolofoson, et al. in review.

2. Forests and diet diversity
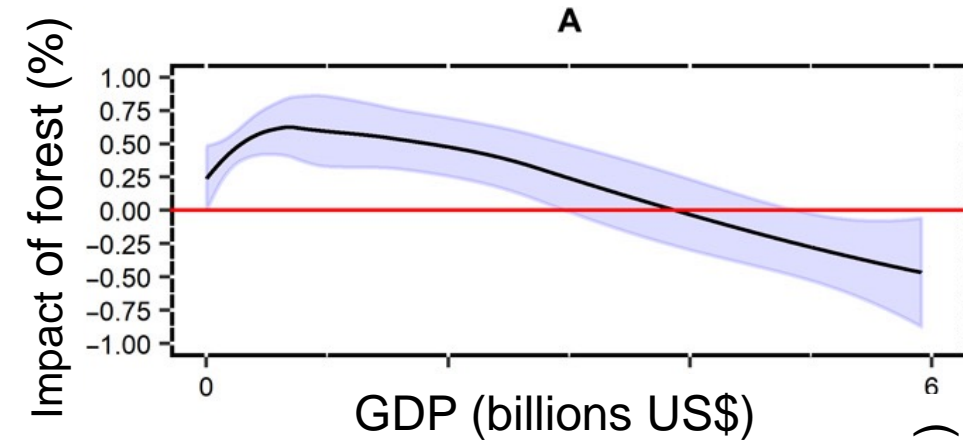
How does nearby forest affect diet diversity in children?
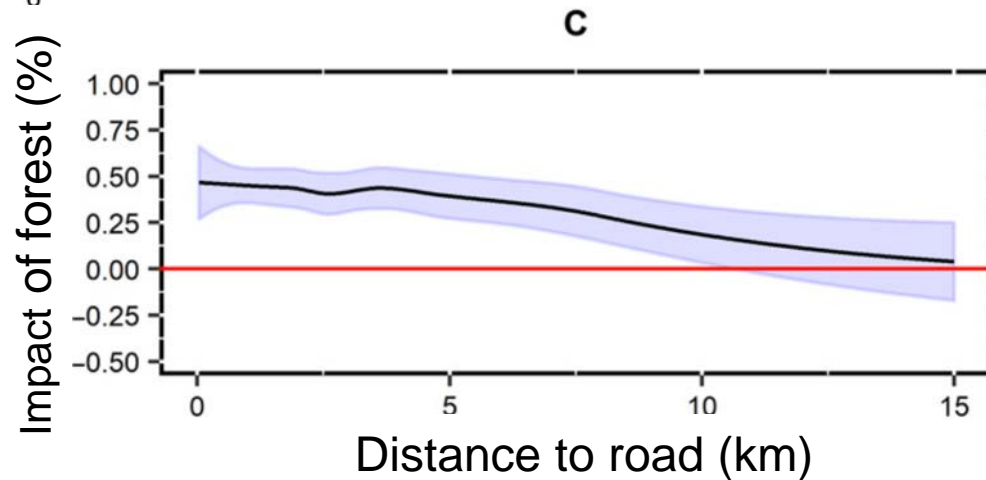
Match households and compare

Forest

3km

8km

0.62 (24.8%)   3.12 (NaN)
Partial-ID-27

0.36 (14.7%)   2.81 (NaN)
Partial-ID-14

0.4 (16.8%)
Matching-14

-0.04 (−1.6%)
Placebo-14

0   1   2   3

Increase in diet diversity:
near vs. far from forest

Rasolofoson, et al. 2018. *Science Advances*

Impacts are heterogeneous

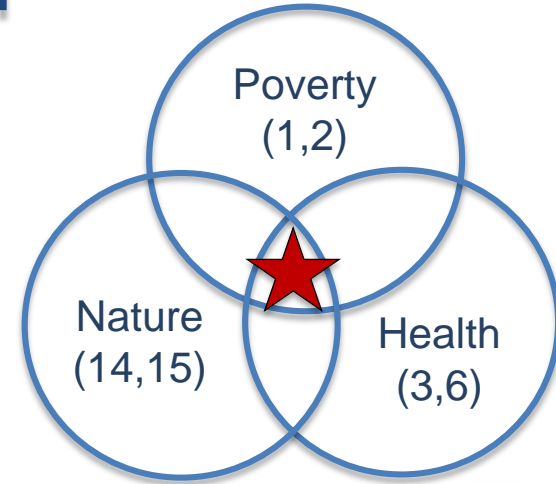Rasolofoson, et al. 2018. *Science Advances*

Take homes

- Forests & conservation affect children's health
  - Even after controlling for many other factors
  - Interacting effects with traditional interventions

- Signal strongest for most vulnerable kids
  - Rural & poor households depend more directly on nature

- Nature investments can be public health investments
  - Important complement to traditional interventions
  - Synergies among conservation, health, development sectors

Sustainable Development Goals

Thanks...

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