Linking biodiversity and children’s health: Global relationships

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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, K., Carvalho, C., Kjellstrom, T. (Epidemiology, 1998)
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Increasing evidence

- Local and regional studies
- Specific populations and ecosystems
- How general are these relationships?
- Can we inform global efforts?
Global relationships

- Health outcomes (stunting, diarrhea, diet, …)
- Social factors (wealth, education, …)
- Sanitation factors (water source, toilet type, …)
- Natural features (climate, land use, …)
- Watershed condition (upstream human activity, forest cover …)

800K kids 49 countries
1. Watersheds & waterborne disease

How does watershed condition affect downstream diarrheal disease among children?
e.g., Mozambique
What impacts childhood diarrhea?

Comparing potential interventions

Wealth
Education
Improved sanitation
Improved water
Tree change 10%
Tree change 20%
Tree change 30%

Can deforestation undermine WASH?

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

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

Increase in diet diversity: near vs. far from forest

Impacts are heterogeneous


**Graph A:**
- Y-axis: Impact of forest (%)
- X-axis: GDP (billions US$)

**Graph C:**
- Y-axis: Impact of forest (%)
- X-axis: Distance to road (km)
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

1. NO POVERTY
2. ZERO HUNGER
3. GOOD HEALTH AND WELL-BEING
4. QUALITY EDUCATION
5. GENDER EQUALITY
6. CLEAN WATER AND SANITATION
7. AFFORDABLE AND CLEAN ENERGY
8. DECENT WORK AND ECONOMIC GROWTH
9. INDUSTRY, INNOVATION AND INFRASTRUCTURE
10. REDUCED INEQUALITIES
11. SUSTAINABLE CITIES AND COMMUNITIES
12. RESPONSIBLE CONSUMPTION AND PRODUCTION
13. CLIMATE ACTION
14. LIFE BELOW WATER
15. LIFE ON LAND
16. PEACE, JUSTICE AND STRONG INSTITUTIONS
17. PARTNERSHIPS FOR THE GOALS

Poverty (1,2)
Nature (14,15)
Health (3,6)
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