

# Environmental Determinants of Enteric Infectious Disease

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# Mortality & Morbidity

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**Globally, diarrhea kills 2,195 children every day**

This is 1 out of 9 child deaths, worldwide

It is more than AIDS, malaria, and measles combined

It is the second leading cause of death in children less than five years old

EID-related diarrhea also leads to **impaired cognitive development, stunting** and **reduced vaccine response**

# EID are preventable and treatable

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In some cases, **vaccines** are available  
Improved Water, Sanitation and Hygiene  
(**WASH**) infrastructure and behavior is  
critical

Those suffering from diarrhea can be  
treated with **oral rehydration therapy**



*Hector Retamal/AFP/Getty Images*

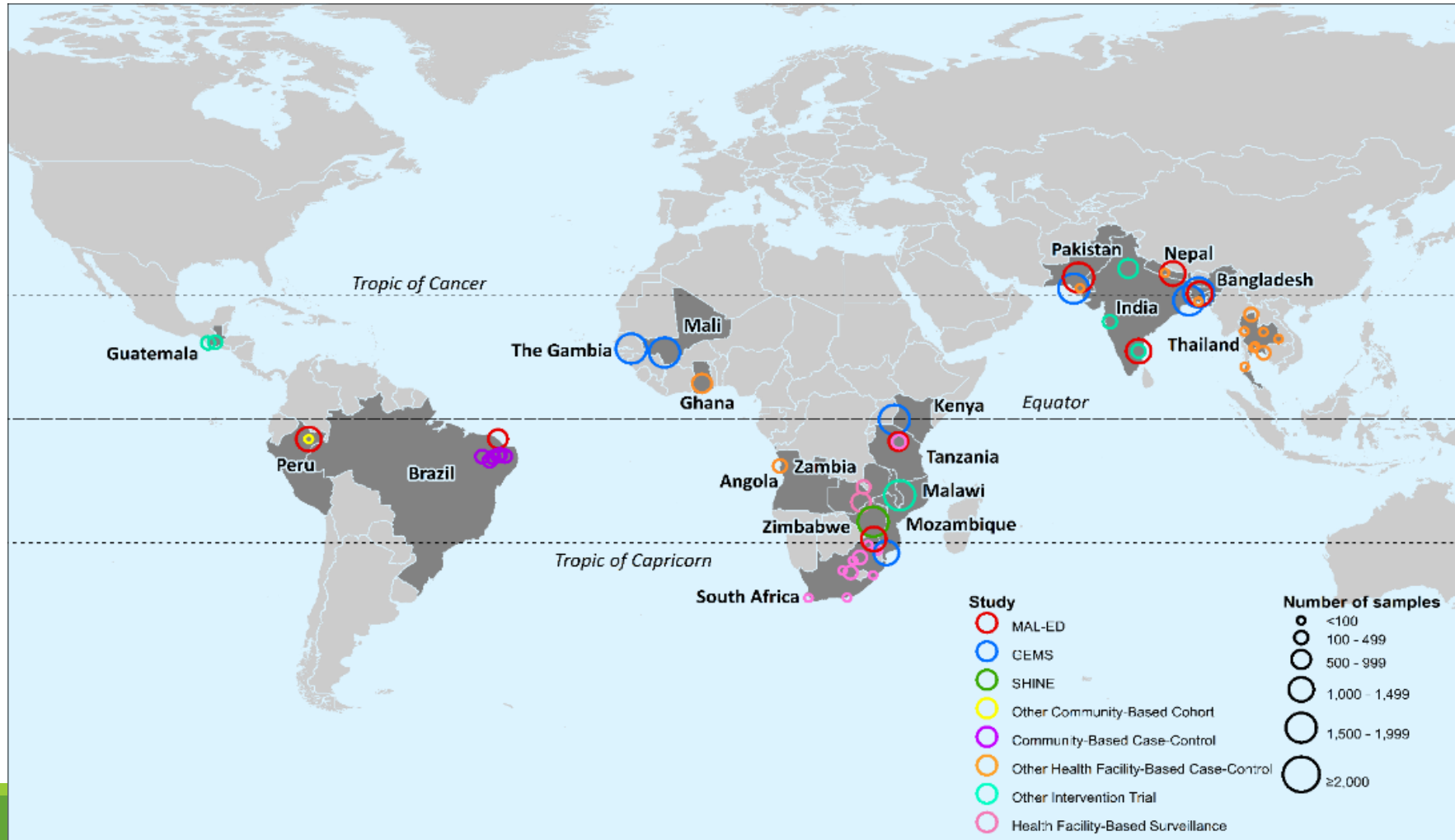
# Project goal

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Establish the feasibility of Earth Observation-informed EID risk mapping, monitoring, and prediction systems

We are doing this through collaboration with multiple EID studies performed at sites around the world

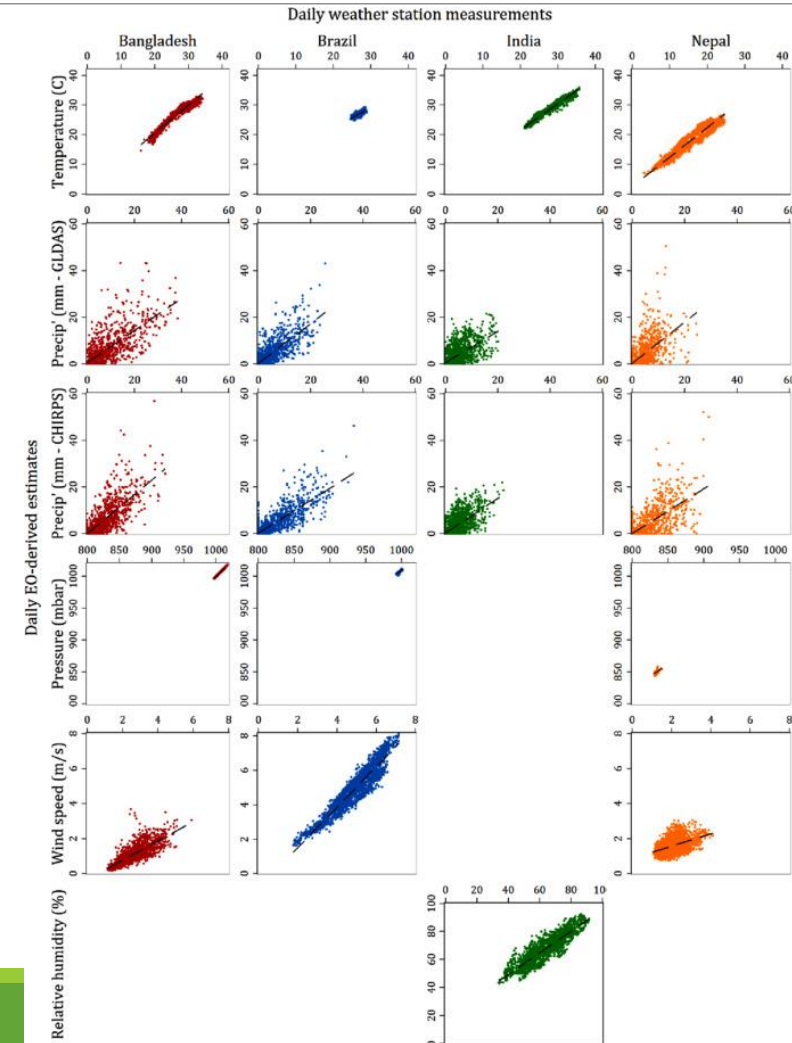
# Current list of collaborating studies



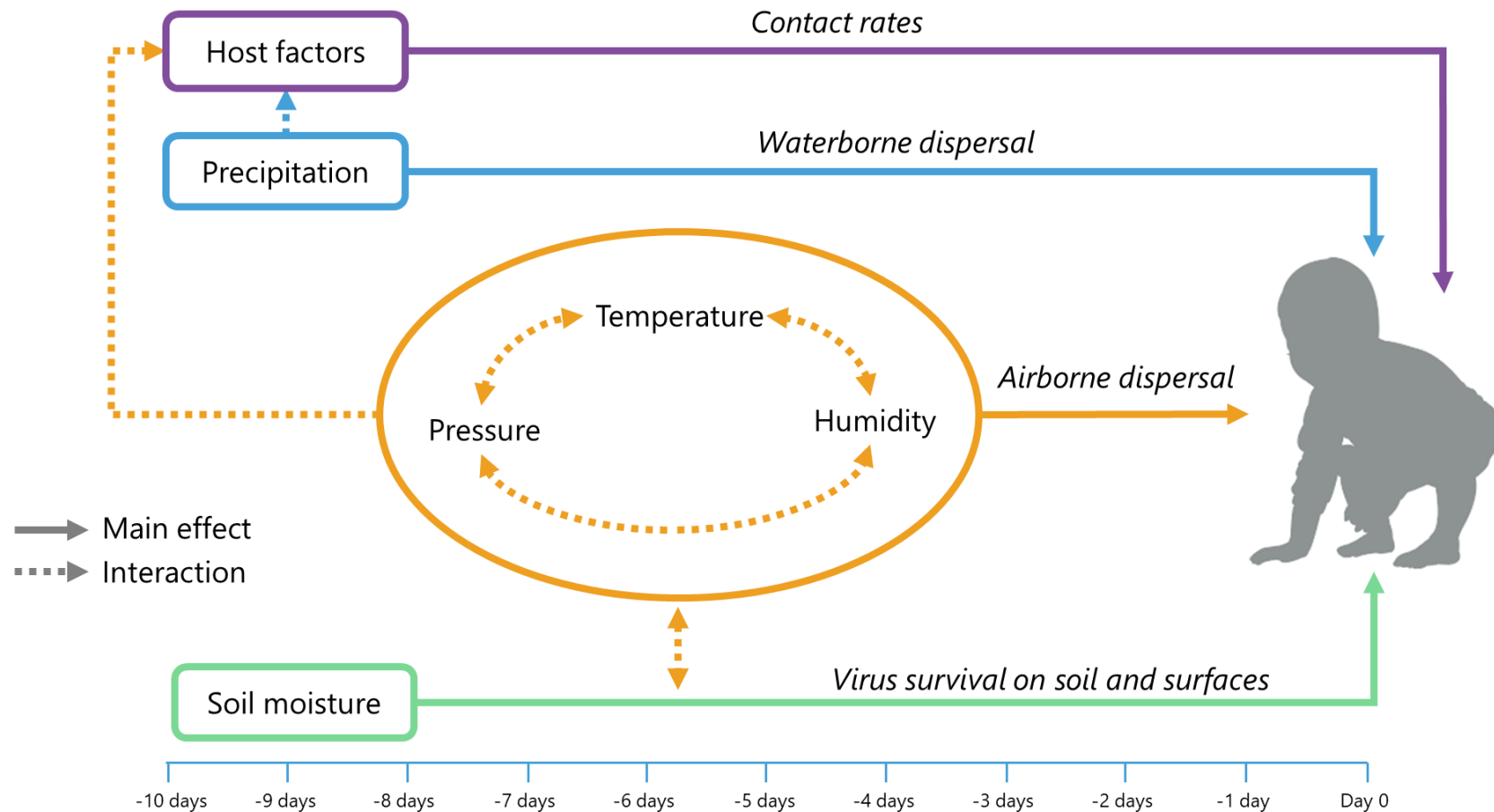
# Earth Observation data

None of these infection studies included collection of data on climate or environment.

Earth Observations offer an opportunity to fill this gap.



# For Example: Rotavirus transmission

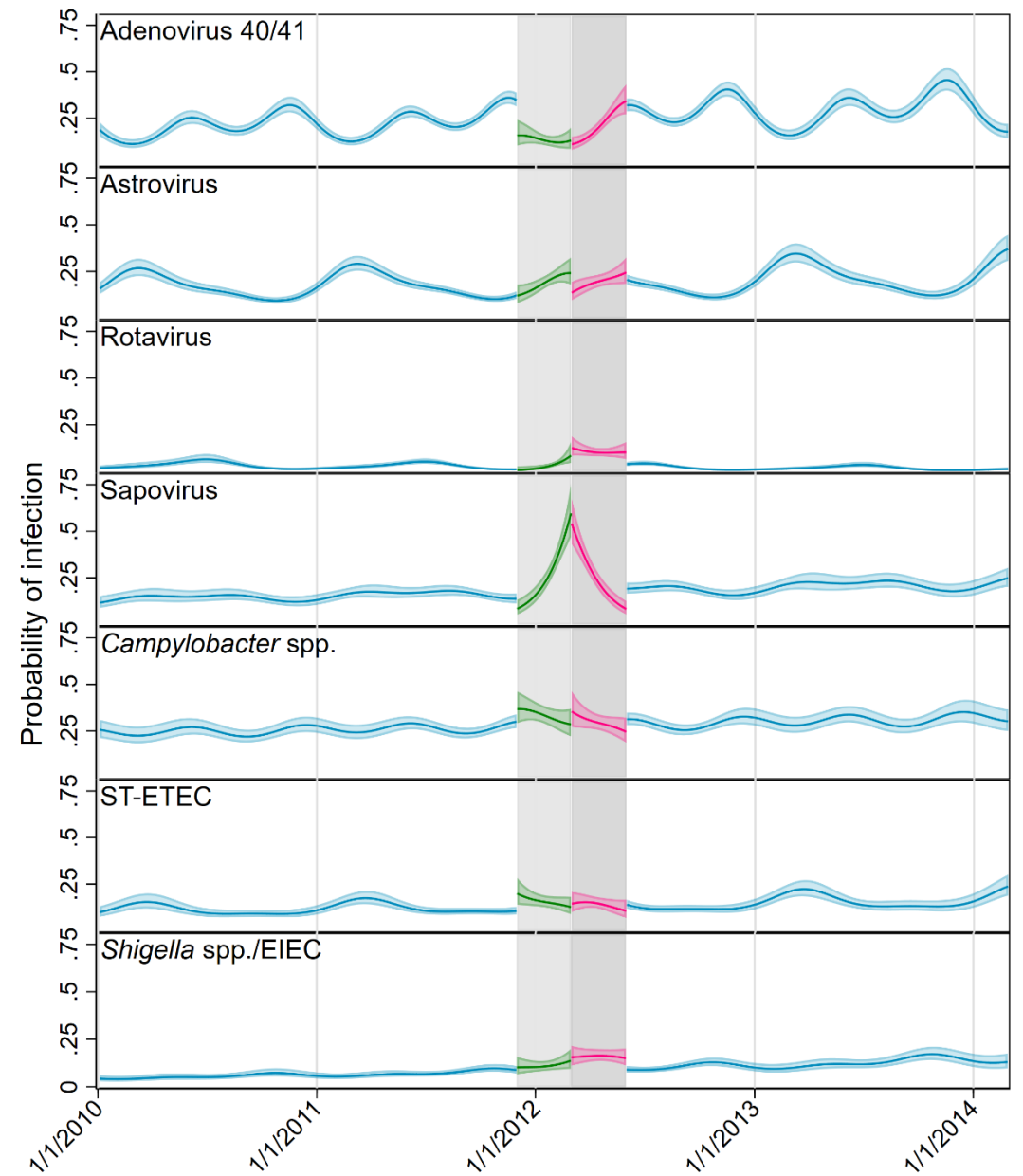


# Recent Results

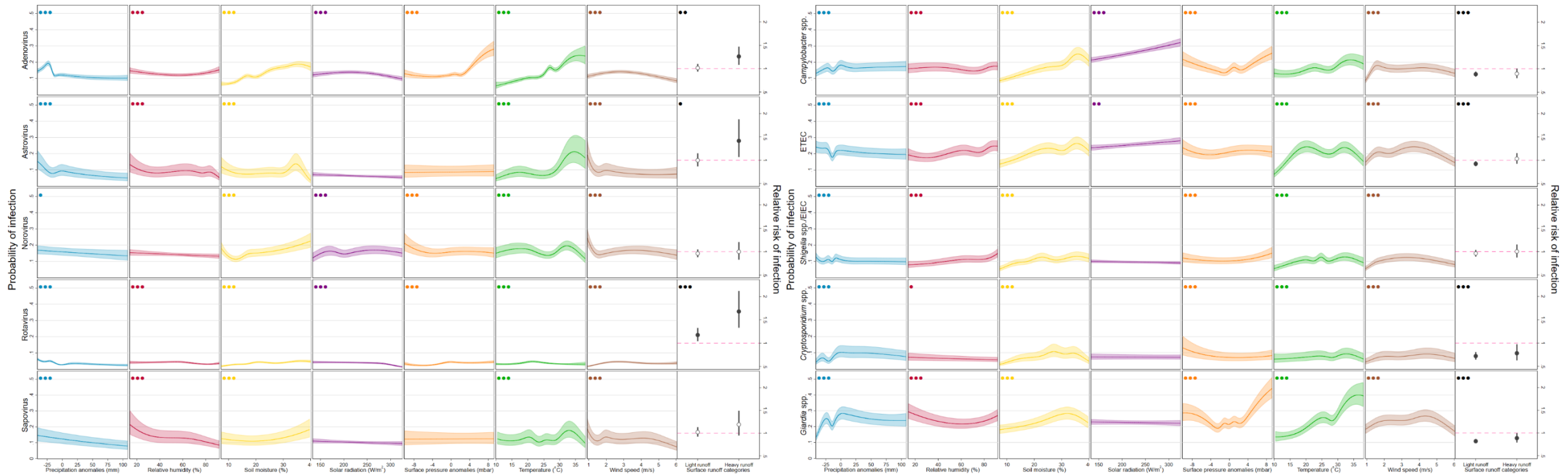
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# Impacts of the 2011-2012 on enteric infections in



# Multiple pathogen analysis

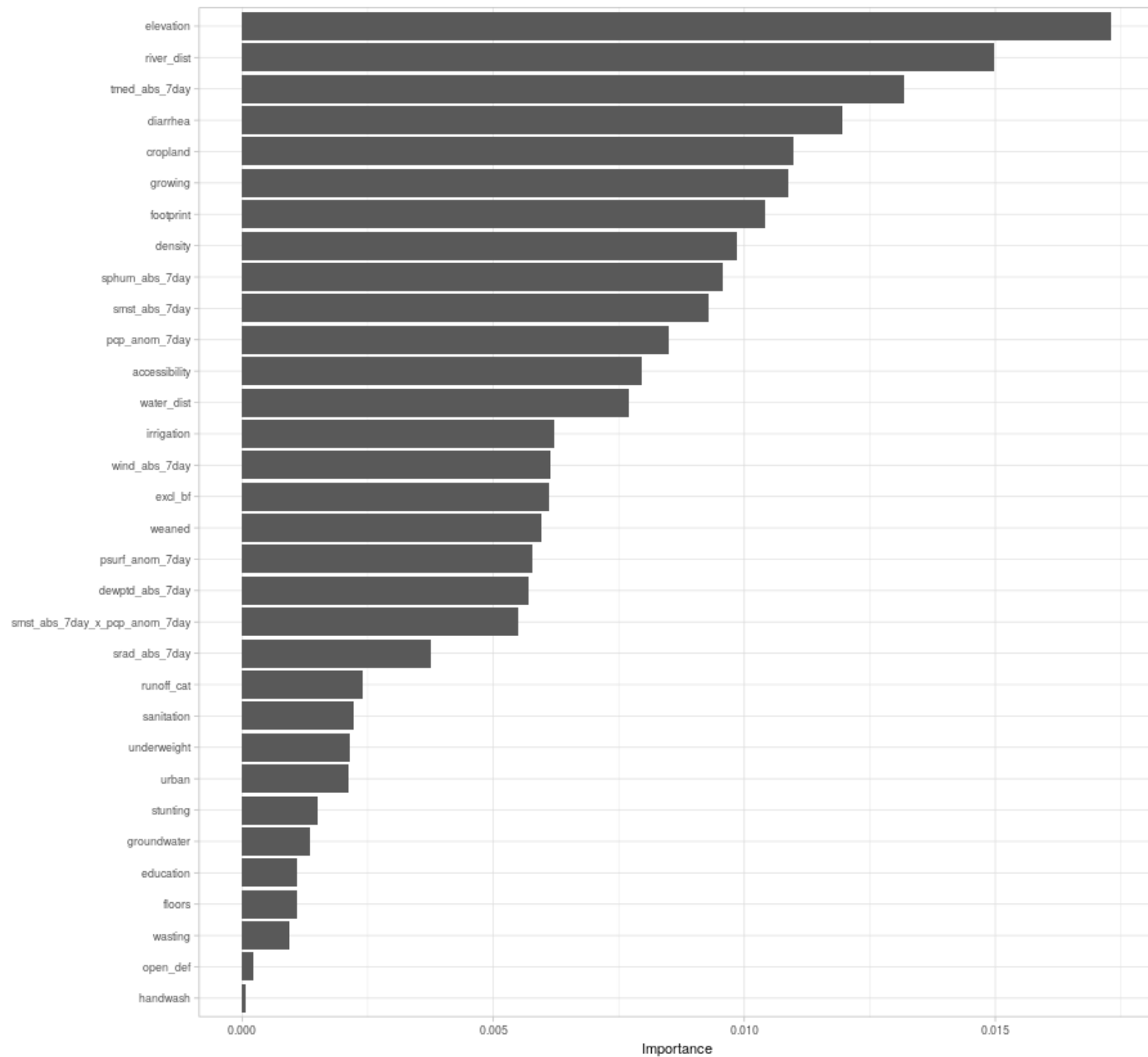


# Shigella

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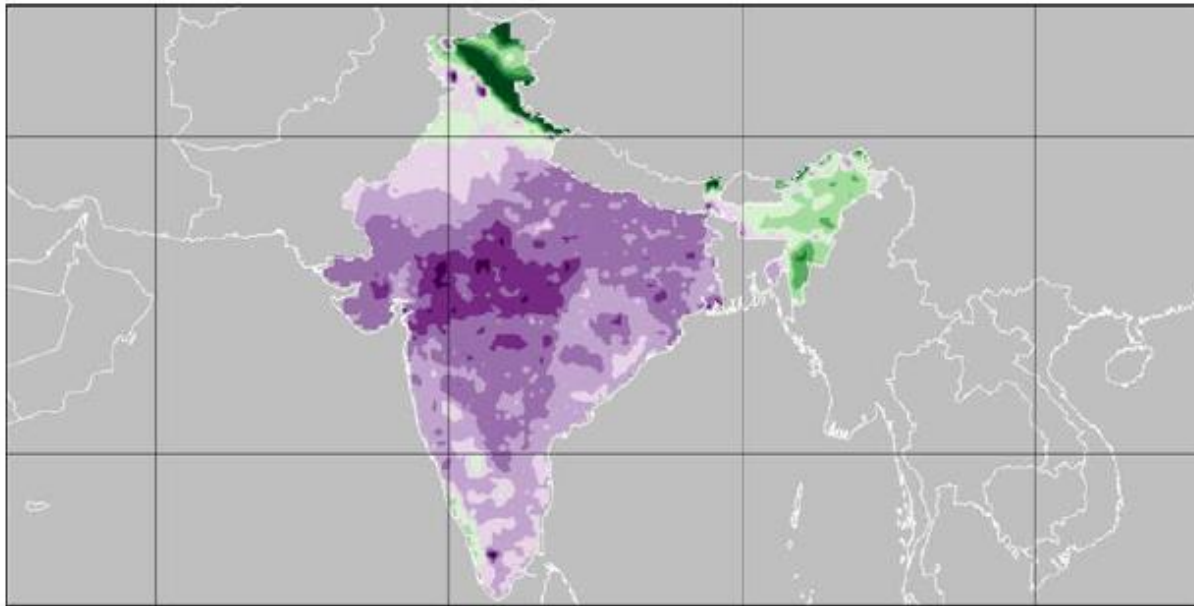
## Variable Importance Plot

Impurity-corrected Random Forest;  
Unconditional permutation scheme;  
cross-validated results

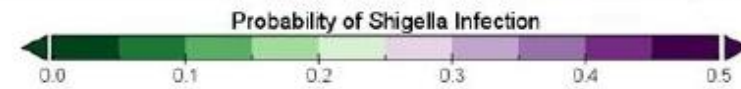
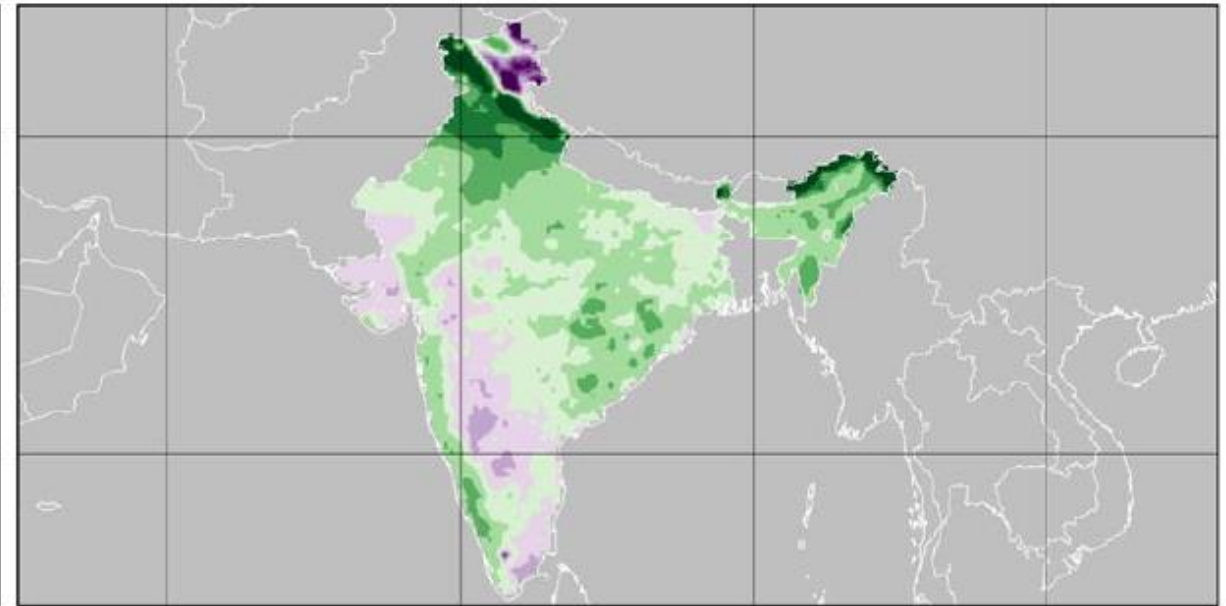


# Shigella risk maps

August



February



# Next steps

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Shift to a Bayesian modeling framework

Multi-pathogen risk maps, disseminated through the Tethys App

# Thank You

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