ENDCast: El Niño Driven Disease Forecasting

ENDCast is a user-friendly platform which communicates the probability of disease outbreaks with a six-month outlook to local, national and regional decision-makers. These early warnings may trigger the necessary epidemic preparation actions needed to save lives.

The initial target diseases for ENDCast include dengue, leptospirosis and malaria, in an initial set of countries or regions including Argentina, Barbados, Brazil, Colombia, Ecuador and Peru. The framework is flexible to permit extension to additional countries and diseases in the future. To calculate the disease incidence rate, the modelling pipeline takes into account climate indicators (e.g. temperature, precipitation, ENSO), and spatial, seasonal and interannual variations (measured either via non-climatic covariates or random effects). The result is monthly infectious disease forecasts with a 1-6 month outlook in each study site.

After generating the forecast, users can explore the results within the web app, focusing on three main visualisation categories: historical data, model verification, and the forecast itself. In the historic data, the user can analyse historical patterns of disease cases and climate variables. Moving on to model verification, users can assess the model's performance by comparing observed cases with predicted cases, gaining insights into how well the model would have performed in the past. Within the forecast section, users can visualise outbreak probabilities for each target month, and, if available, explore spatial differences by region. Additionally, more technical information, such as the credible interval of predictions and information on thresholds, can be visualised.

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