

# ISDS Public Health Practice Problem Definition

## USE- CASE/PROBLEM TITLE

Evaluation of Forecast Models for Dengue

## CONTACT INFORMATION

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## PROBLEM DESCRIPTION

### Summarize the problem:

New efforts are underway to design and evaluate forecasting models for diseases such as dengue and influenza. Critically, these are common diseases with ample data to both design and test models. The interagency Dengue Forecasting Project was designed to use forecasts to address critical healthcare system decision-making associated with dengue epidemics. While clear definitions for comparing models have been implemented, it remains unclear how to measure their utility for decision-makers. Essentially, how good does a forecast have to be to be useful for decision-makers? And how can that be quantified? This is both a specific question for the Dengue Forecasting project, but also a more broad effort to set objective bars for forecasting implementation. Using dengue as an example, there will now be numerous forecasts and metrics to determine which is "best". However, it will not be clear if any of these should be implemented for public health use, nor how good they would need to be for that to happen.

## SOLUTION REQUIREMENTS

### Describe the type of solution you are seeking (e.g., anomaly detection, signal validation, data quality characterization):

Following the Dengue Forecasting Project, we will have, for the first time, a broad set of forecasts for dengue epidemics. We will convene a workgroup to develop metrics to assess these models specifically for public-health use, address two specific questions. How good does a forecast need to be useful and how can that be measured?

### Describe what type of solution would enable you to implement it in your practice setting (e.g., Do you need an algorithm? Do you need code? If you need code, does it have to be written in any particular programming language?).

Existing research partners can develop code, but we need to develop an algorithm and metrics to implement.

### Describe who will use the solution. For example, how many users will there be and what level of skill do the users have? Are the users all within a single jurisdiction/organization?

Users for the Dengue Forecasting Project include public health officials in Puerto Rico and Iquitos, Peru. The former is more likely a better focus point for this exercise since they work within the US. The decisions faced however are very similar to those for flu and other diseases. We expect the outcomes to be broadly applicable and would thus encourage the inclusion of some people dealing with similar challenges in other diseases.

### Note any other constraints:

## VALIDATION

### Does a gold standard exist with which to validate the proposed solutions?

- Gold standard exists within the provided data set (e.g., an outbreak signal nested within baseline data)
- Gold standard exists in a separate data set, which can be provided to the workgroup (e.g., laboratory data to validate ED data)
- Gold standard exists but cannot be furnished
- Gold standard does not exist

**INPUT DATA****List the minimum data elements that can be provided to address the problem:**

Federal agencies have made epidemiological and environmental data publicly available for the Dengue Forecasting Project: <http://dengueforecasting.noaa.gov/>. Additionally, once participants have submitted their forecasts (due September 2, 2015), those models also will be available for use within the ISDS consultancy.

**How much historical data can be provided?****Describe any restrictions for sharing the data:****Note any other relevant data characteristics:****NOTES**