D-MOSS: Dengue forecasting MOdel Satellite-based System
Dengue is the fastest-growing mosquito-borne viral infection in the world today. It is present in over 150 countries, and approximately 40 percent of the world’s population now live in countries where dengue is a daily risk.

Our Vision: To see D-MOSS become a key factor in reducing dengue fever worldwide.
The impact of dengue fever

Dengue costs are greater than other major infectious diseases

Source: Shepard et al., 2016
Objective:

- To produce the first fully integrated dengue fever forecasting system incorporating Earth Observation data and seasonal climate forecasts to issue warnings on a routine basis with up to a six month lead time.
Overview of the system and the flow of information

- **Water availability model**
  - Historical and live Earth Observation data
  - Water availability forecast

- **Dengue fever model**
  - Probabilistic forecasts of meteorological data up to six months in advance

- **Probabilistic forecasts of dengue incidence**
Traffic-light text:

Likelihood of a dengue outbreak

- September: Very unlikely
- October: Unlikely
- November: Likely
- December: Very likely
- January: Likely

Maps:

Likelihood of a dengue outbreak

Graphs:

Photos from workshops with end users:
How do the forecasts work on the ground?

**Community level warnings**
- Sleep under a mosquito net
- Cover water containers
- Wear light coloured clothes which cover exposed areas of skin
- Reduce the amount of standing water

**Actions by district level Ministry of Health staff**
- Alert communities that there is a chance that there will be an outbreak of dengue via a range of media
- Spraying in communities forecast to have a high chance of an outbreak of dengue

**National level planning of resources by the Ministry of Health's General Department of Preventative Medicine**
- Plan the allocation of resources for provincial level dengue control at a national level

**Forecast lead time for a dengue outbreak**
- 1 week to 2 months
- 2 weeks to 2 months
- 5 to 6 months
Requirements:

1. Availability of historical dengue case data, ideally spanning more than a decade.
2. Strong stakeholder engagement with policy makers and beneficiaries who are in a position to work in partnership with the development team.
Challenges

- cost of new technology
- data not relevant in local context
- changes of political agendas
- time needed to incorporate new technologies
- unclear regulations
- lack of understanding
- miss-match between user expectations and reality
What next for D-MOSS?

- Offering and implementing D-MOSS systems in new countries
- Incorporate new data streams
- Improve the spatial resolution of the dengue forecasts
- Make technical refinements incorporating new innovations
- Forge new partnerships with public and private sector stakeholders