HR Wallingford
Working with water

D-MOSS

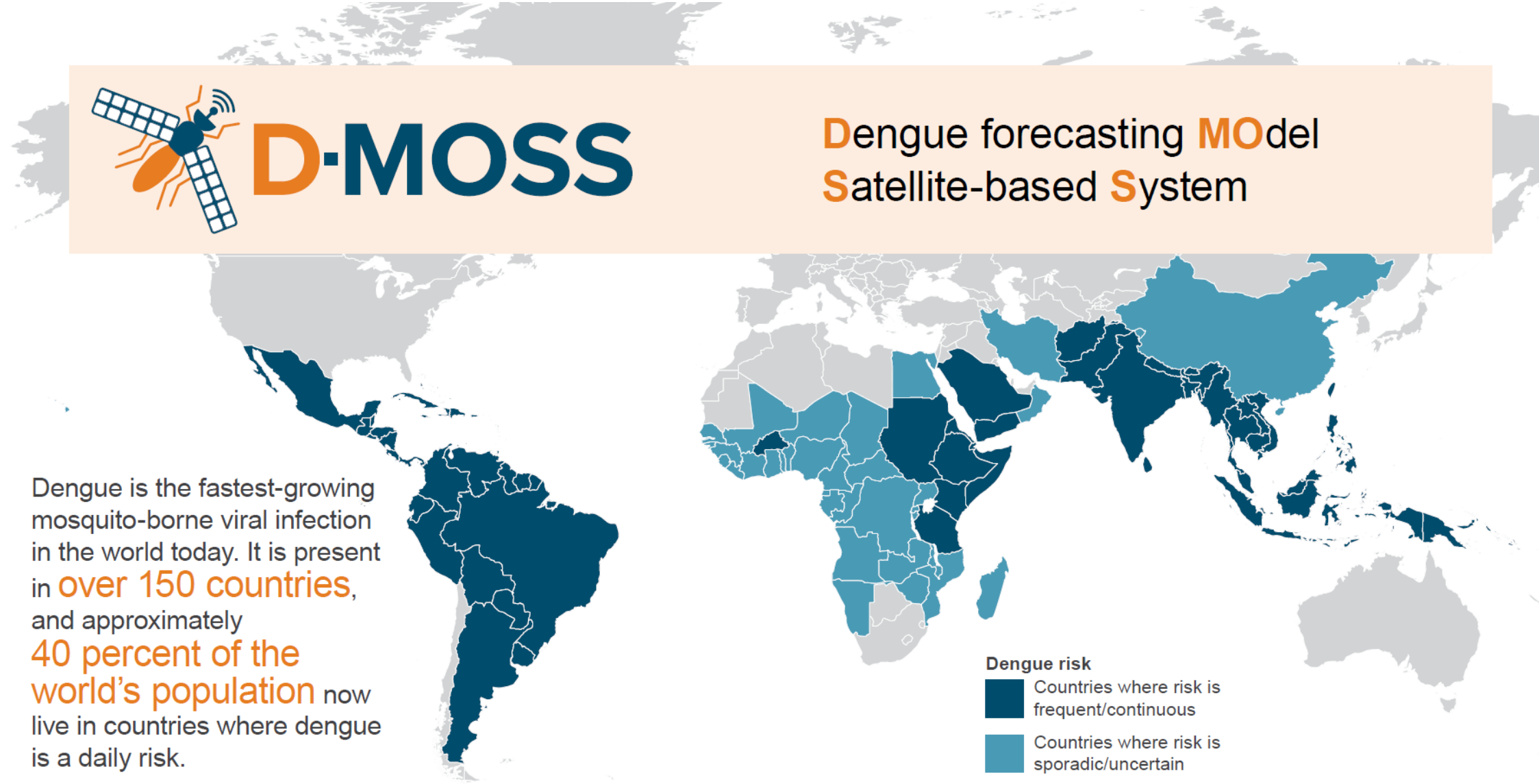
UK SPACE AGENCY

D-MOSS: Dengue forecasting MOdel Satellite-based System

June 2021

D-MOSS

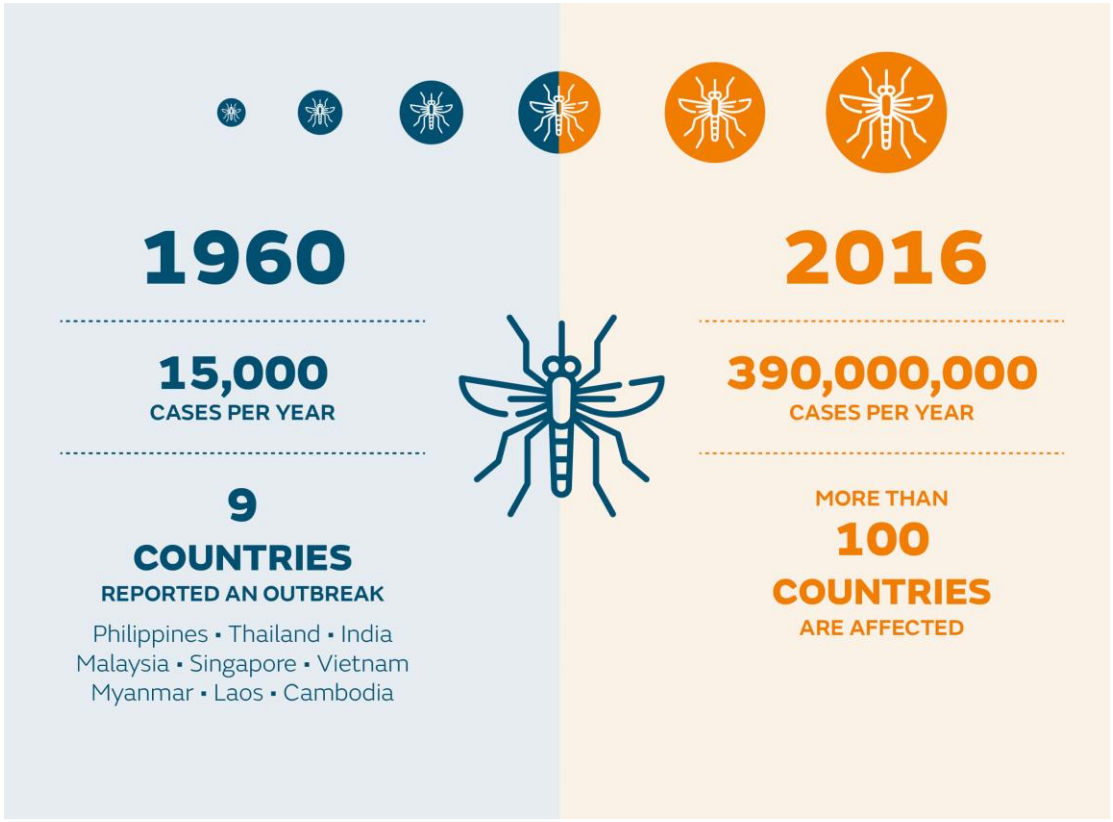
Dengue forecasting **MO**del
Satellite-based **S**ystem

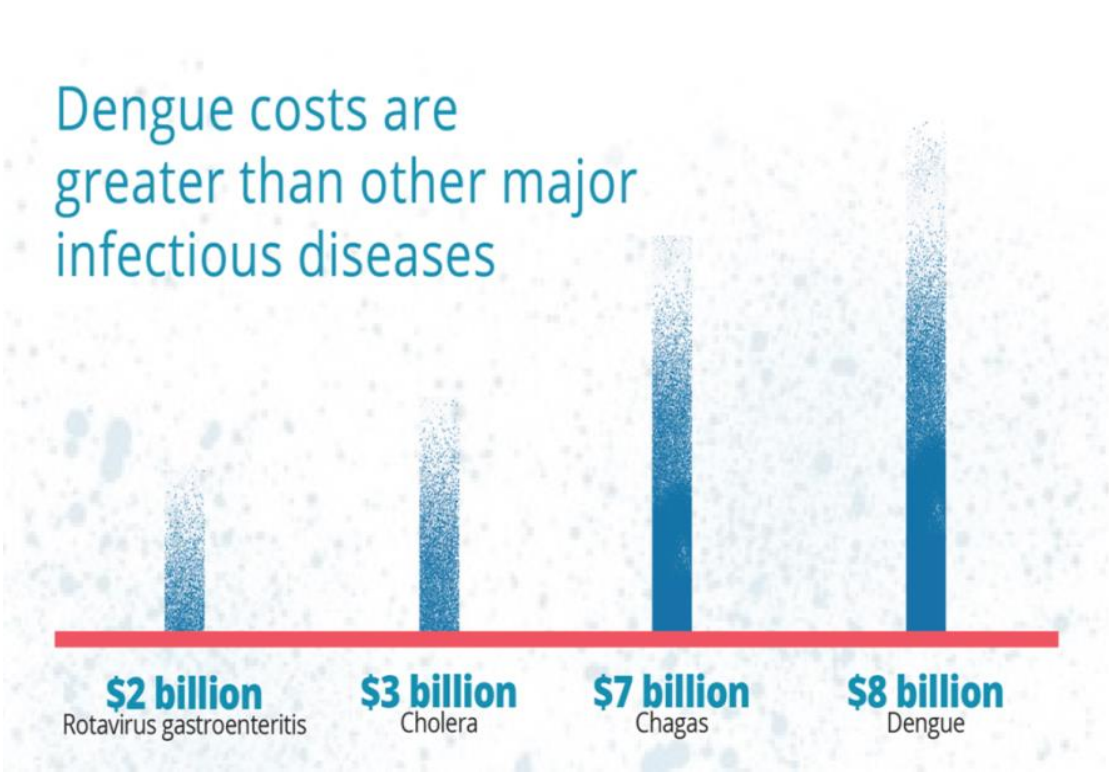


Dengue is the fastest-growing mosquito-borne viral infection in the world today. It is present in over 150 countries, and approximately 40 percent of the world's population now live in countries where dengue is a daily risk.

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

The Impact of Dengue Fever



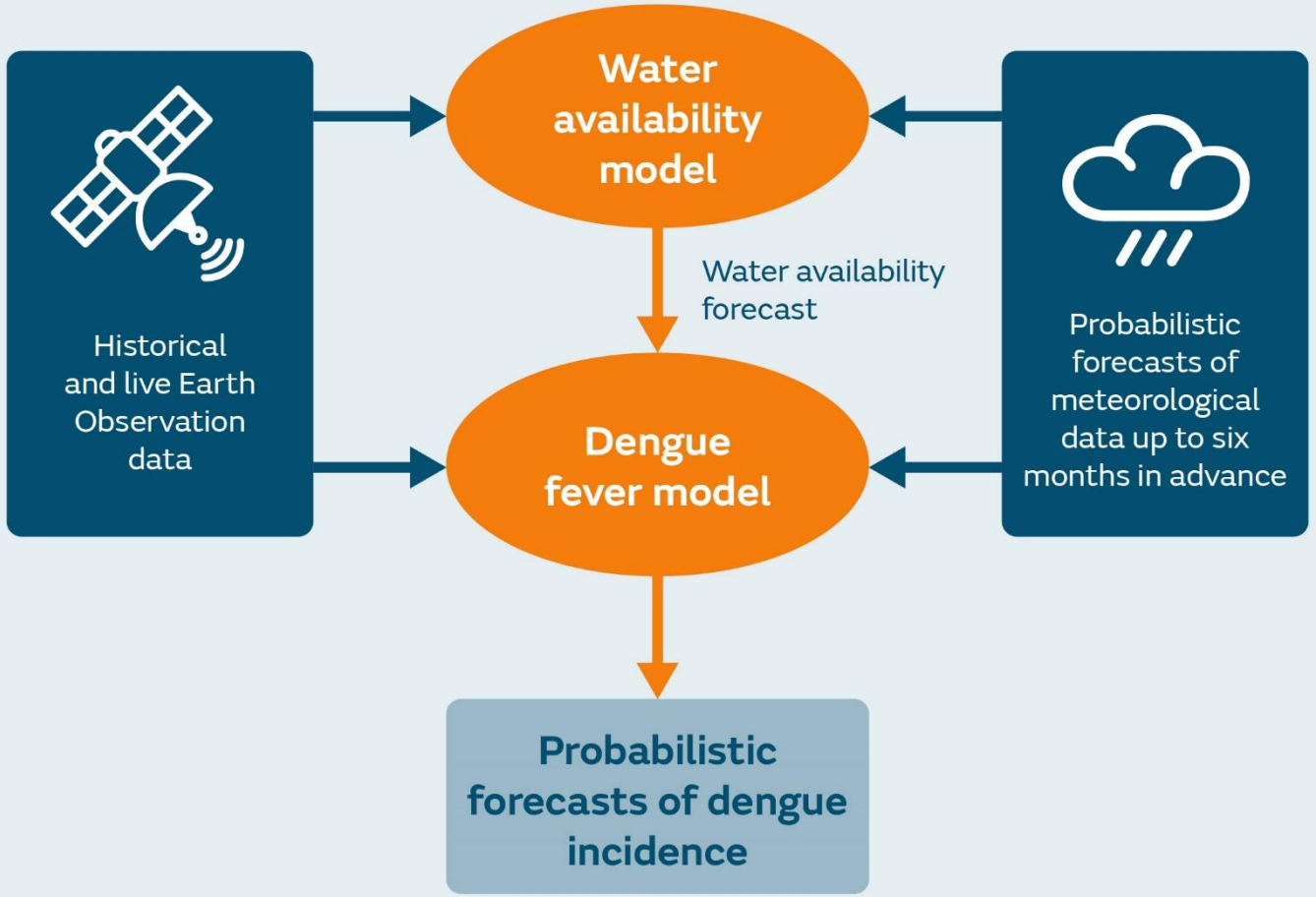


Source: Shepard et al., 2016

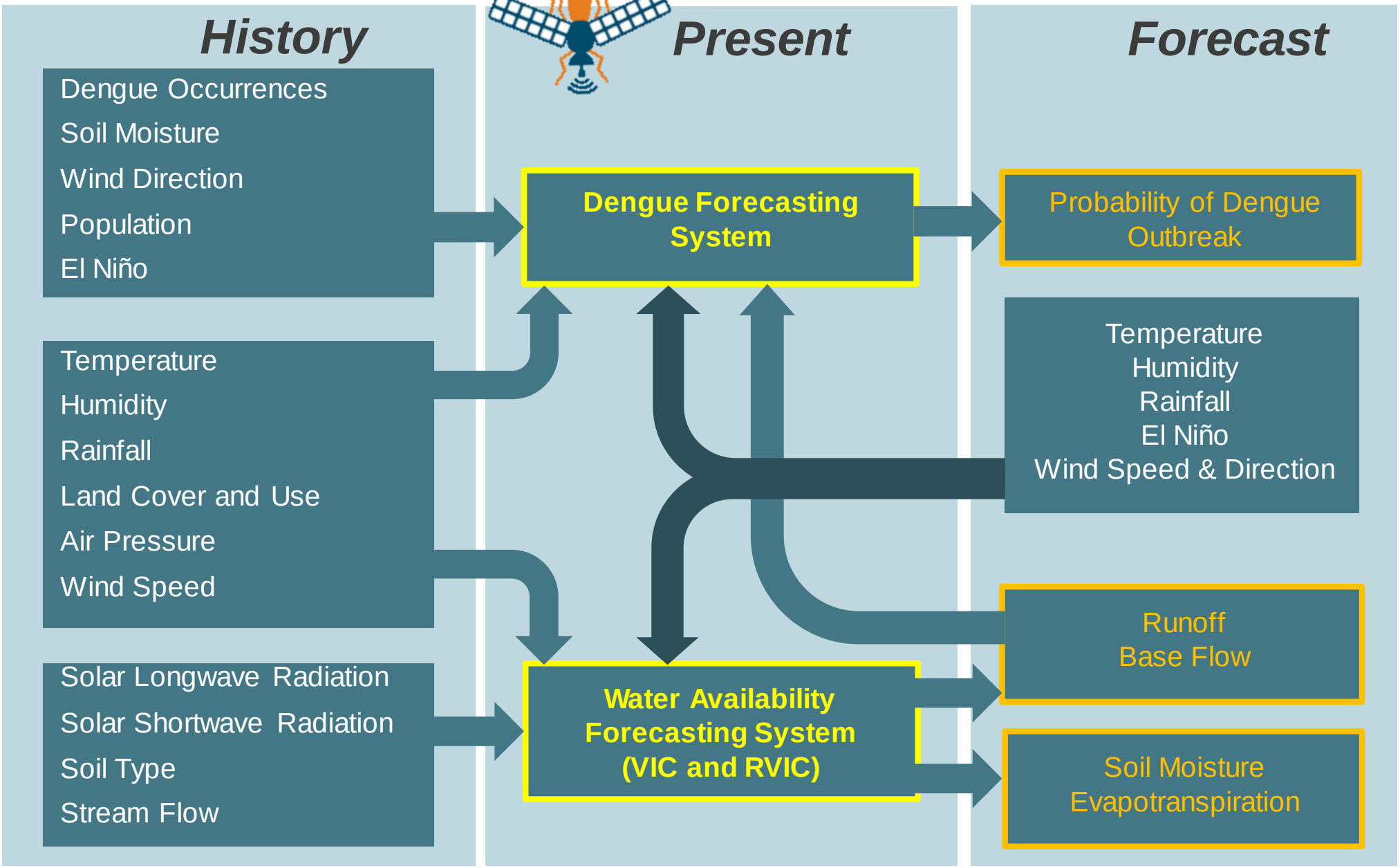
Objective:

- To produce the first fully integrated dengue fever forecasting system incorporating EO data and seasonal climate forecasts to issue warnings on a routine basis.

Overview



High Level Information Flow



Website

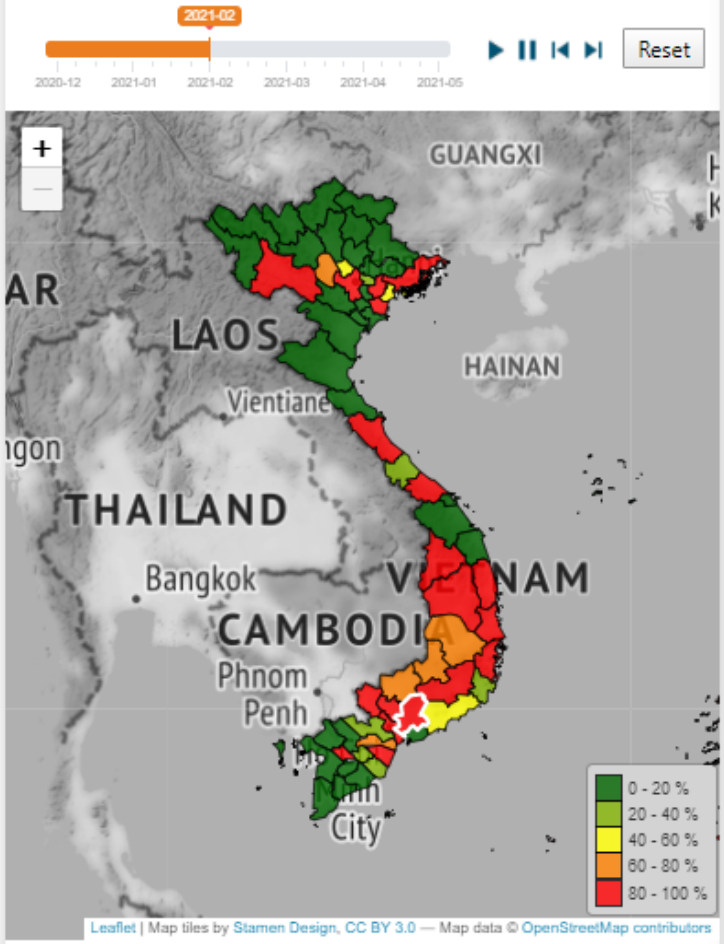
Dengue forecasting MOdel Satellite-based System for Vietnam

Last update: 2020-12-07 Status:
Logged in as: hrw | Log Out
User guide
Tiếng Việt | English

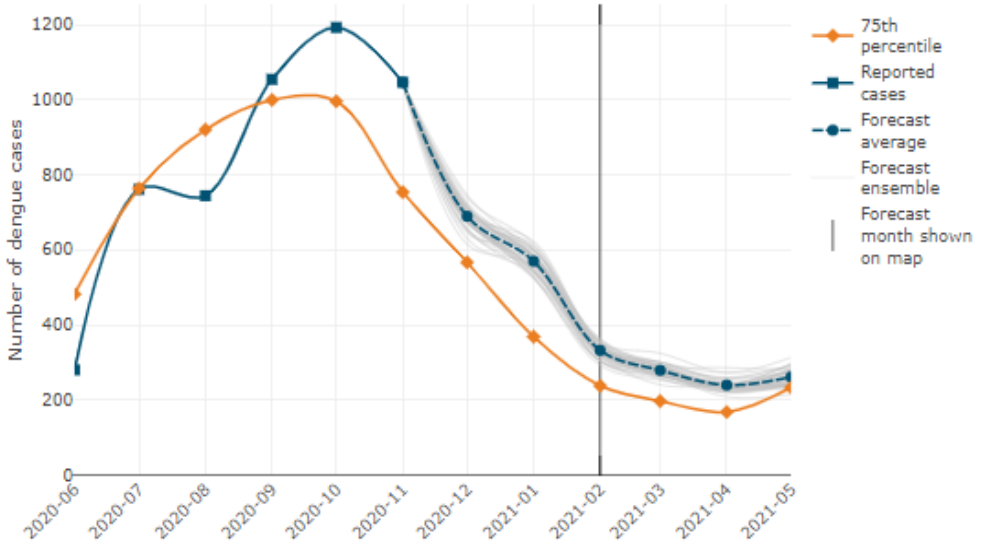
Dengue | Weather | Contact us | Technical information | About D-MOSS

Variable: 75th percentile | Province: Dong Nai | Greyscale | Print | Technical information

Monthly probability of exceeding: 75th percentile



Forecast number of dengue cases: Dong Nai province

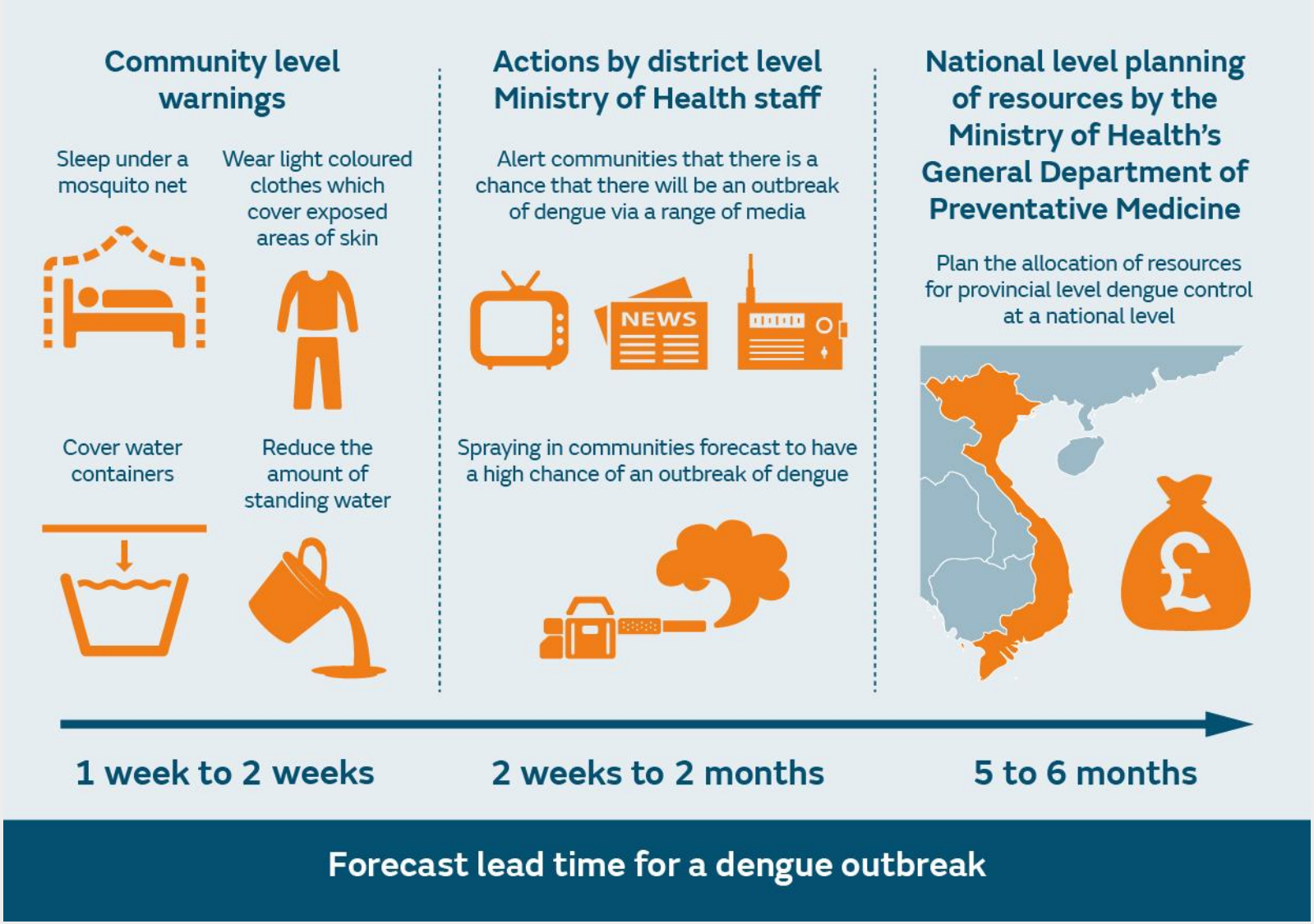


Forecasted probability of exceeding 75th percentile threshold

Show lower and upper bound probabilities

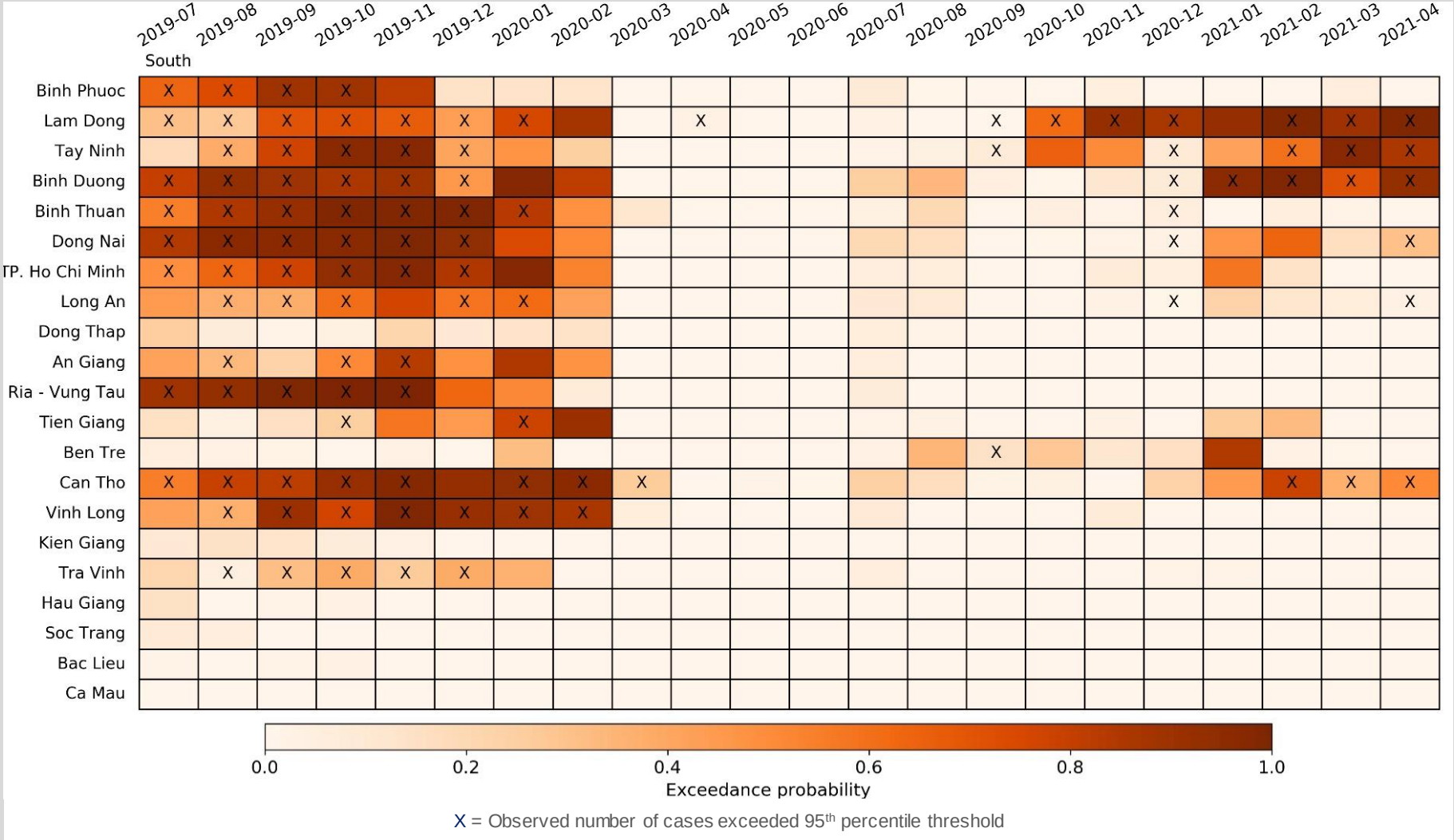
Forecast months	2020-12	2021-01	2021-02	2021-03	2021-04	2021-05
75th percentile threshold value (Cases)	566.3	368.5	237.5	197.0	167.5	233.0
Probability of exceeding 75th percentile	77%	95%	88%	89%	90%	66%

How the forecasts work on the ground



Does it work? Can it predict outbreaks?

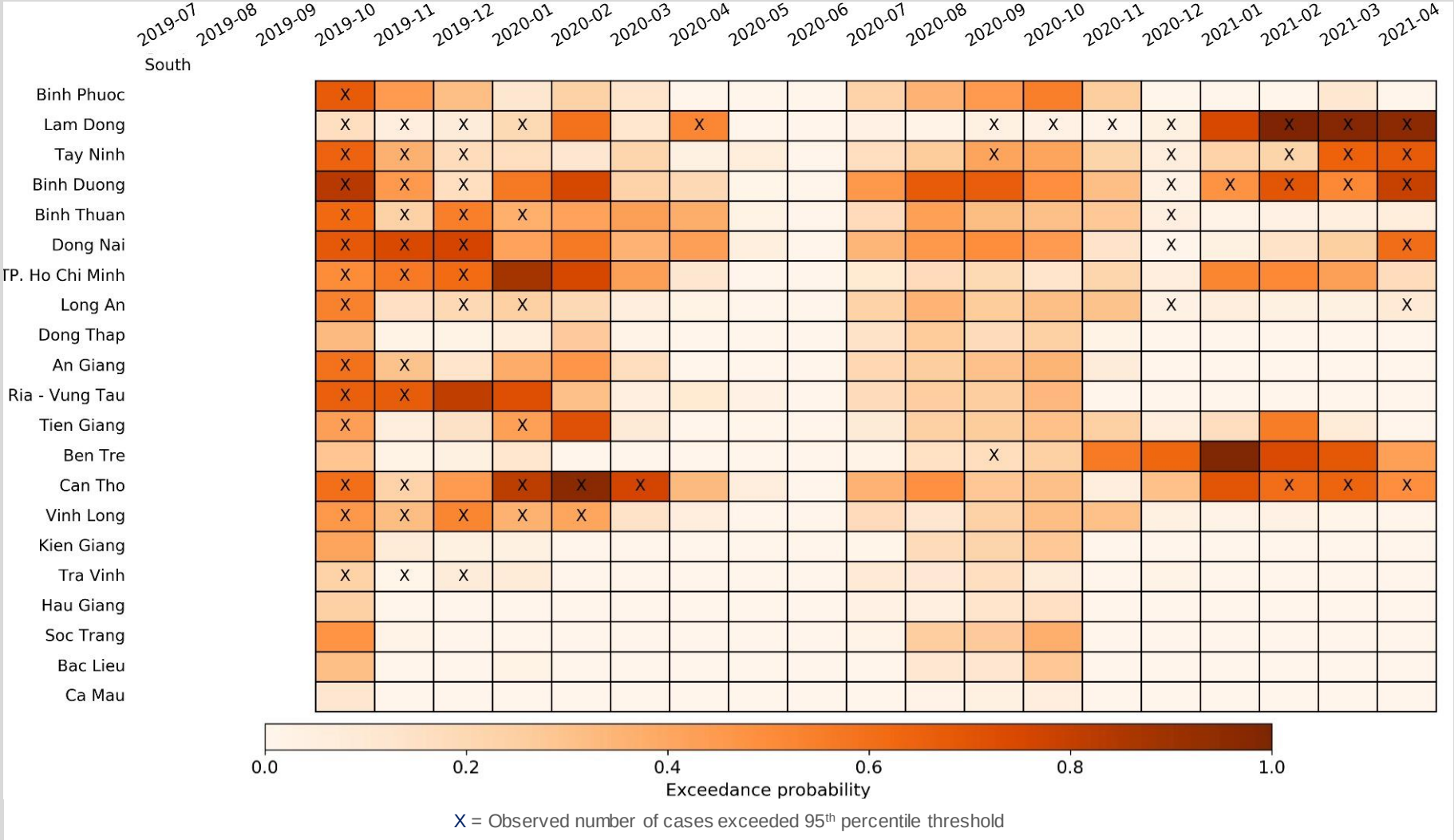
Visualising recent forecasts (1 month lead time)



D-MOSS forecasts for South provinces (**1 month lead time**, using outbreak threshold of 95th percentile) plotted against observed outbreaks (using outbreak threshold of 95th percentile)

Does it work? Can it predict outbreaks?

Visualising recent forecasts (4 month lead time)



D-MOSS forecasts for South provinces (**4 month lead time**, using outbreak threshold of 95th percentile) plotted against observed outbreaks (using outbreak threshold of 95th percentile)

Does it work? Is it useful?

"D-MOSS has helped policy-making officials to develop dengue prevention and control strategies in advance of an outbreak."

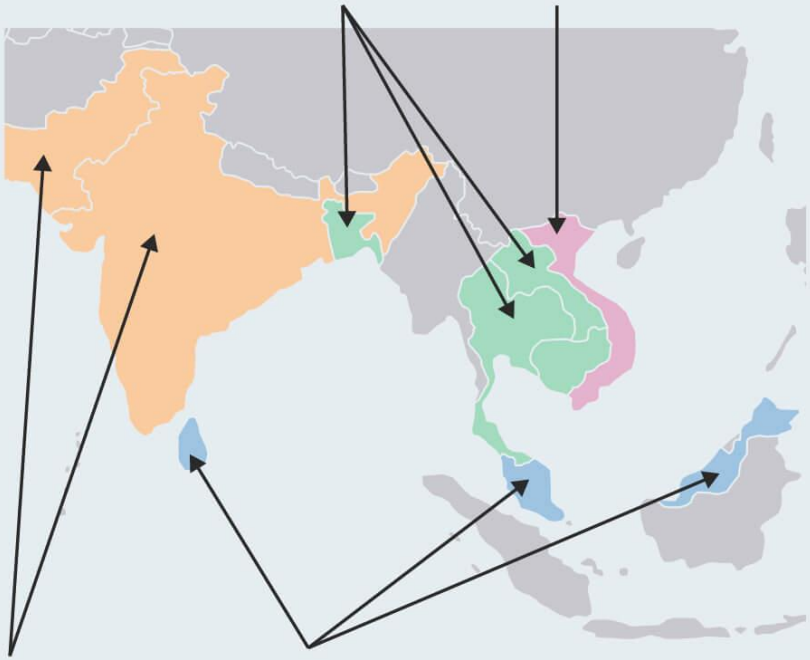
"D-MOSS's accurate forecasts have helped us to save resources."

"D-MOSS enables provinces to proactively prepare comprehensive and meaningful actions, responses and interventions."

Progress made in scaling up and replicating D-MOSS in South and South-East Asia

Bangladesh, Cambodia, Laos, Philippines, Thailand:
Workshops held with stakeholders regarding the implementation of D-MOSS

Vietnam:
Prototype D-MOSS system operational since June 2019

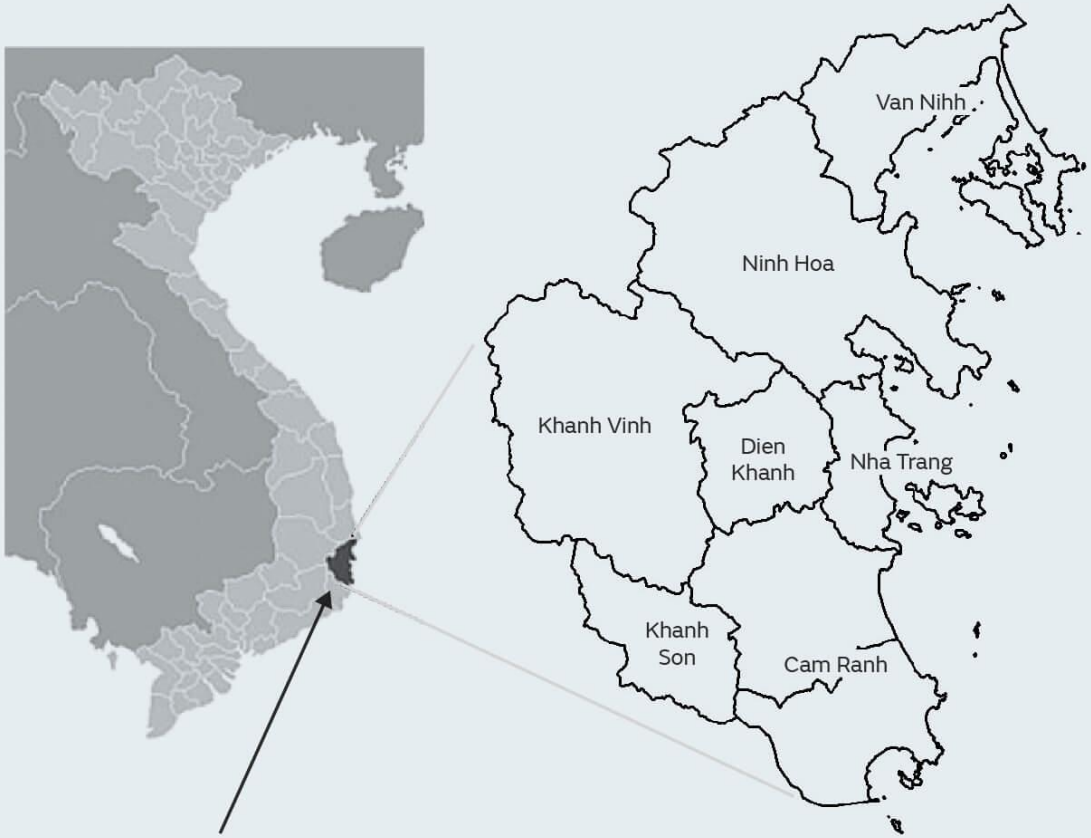


India, Pakistan:
Stakeholders have expressed an interest in DMOSS being implemented

Malaysia, Sri Lanka:
Prototype D-MOSS systems currently being implemented

Prototype D-MOSS in Vietnam providing dengue forecasts for each of the 63 provinces since June 2019

Progress made in increasing the spatial resolution of dengue forecasts from provincial to district level



Khanh Hoa one of the four pilot provinces

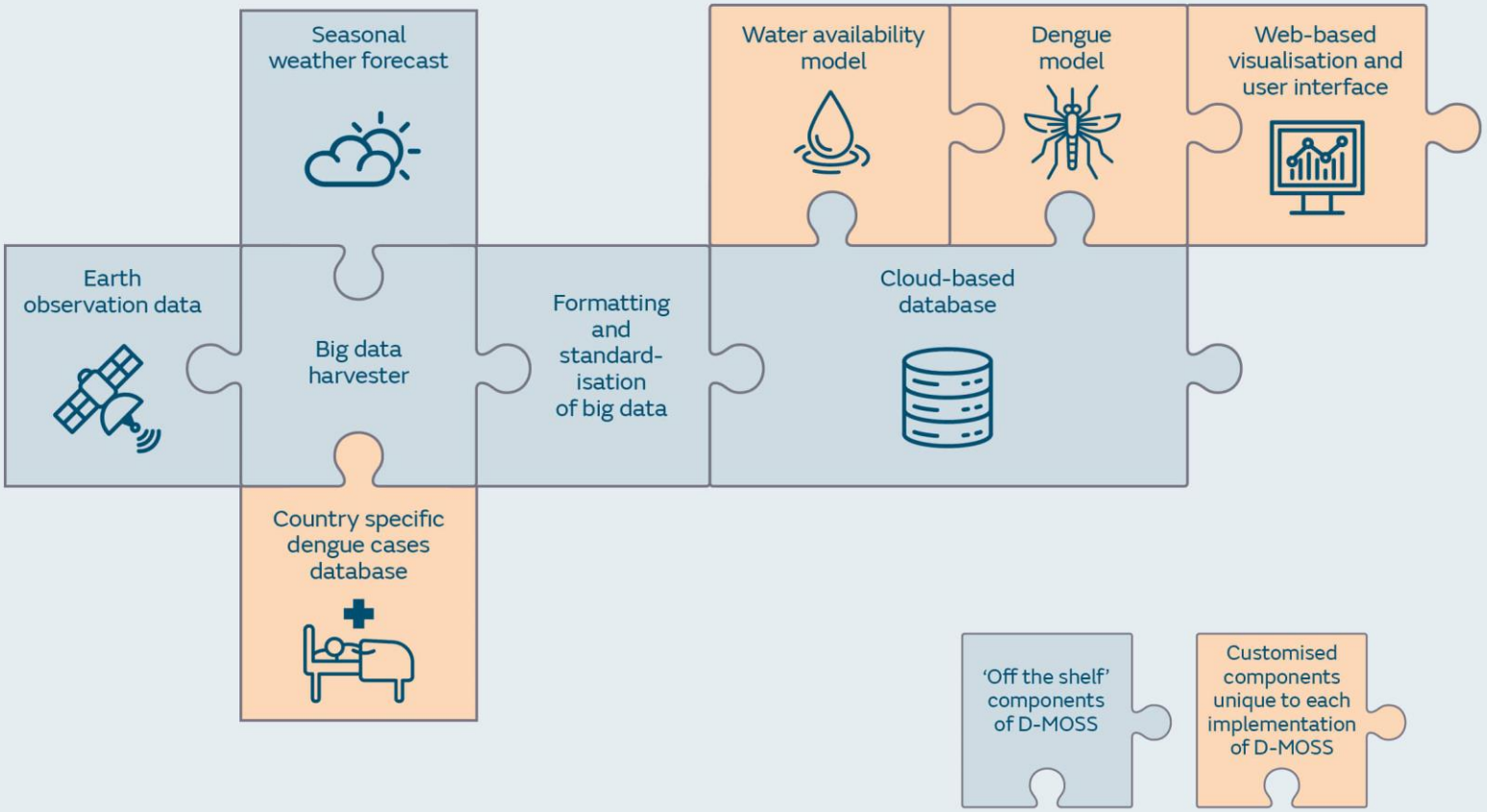
Khanh Hoa comprises seven districts

Vietnam comprises 63 provinces and around 700 districts. Research is currently being undertaken so that D-MOSS can provide dengue forecasts at a district level

Implementation of D-MOSS in other countries

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.**



Sustainability challenges

Sustainability is resolved by addressing a problem in a way which is relevant to the local community

- Ensure end-users are involved early in the process
- Focus on capacity building activities
- Co-designing of methods and tools
- International partners play a key part
- Strong presence in the country

Multidisciplinary team

Early warning systems experts

Health experts

Meteorologists

Software developers

Governments

Satellite data experts

UN organisations

NGOs

Development Agencies

Funding Agencies

D-MOSS

Project team

Funded by the UK Space Agency's International Partnership Programme

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

World Health Organization

UNDP
Empowered lives.
Resilient nations.

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Thank you