D-MOSS: Dengue forecasting MOdel Satellite-based System

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International Partnership Programme (IPP)

The UK Space Agency’s International Partnership Programme is a £150 million multi-year programme launched in 2016. It uses UK organisations' space knowledge, expertise and capability to provide a sustainable, economic or societal benefit to emerging nations and developing economies.

Project themes cover:

- Disaster response
- Early warning
- Health
- Land-use monitoring
- Reducing maritime problems
- Deploying renewable energy
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.
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

Water availability model

Dengue fever model

Probabilistic forecasts of dengue incidence

Water availability forecast

Historical and live Earth Observation data

Probabilistic forecasts of meteorological data up to six months in advance
How the forecasts work on the ground

**Community level warnings**
- Sleep under a mosquito net
- Wear light coloured clothes which cover exposed areas of skin
- Cover water containers
- 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 weeks
- 2 weeks to 2 months
- 5 to 6 months
Why D-MOSS works for me

Name: Dr Pham Ngoc Thanh
Position: Deputy Director of the epidemiology department, Tay Nguyen Institute of Hygiene and Epidemiology (TIHE), Vietnam.
Role description: I plan and direct dengue response activities in the Central Highland region of Vietnam.

How do I use D-MOSS?
We use the D-MOSS dengue forecasts and early warnings to help develop relevant and effective dengue response plans and actions.

How has D-MOSS made a difference?
Reducing cases and mortality
Using D-MOSS to help develop action plans, take dengue response actions, make recommendations and issue warnings has helped to reduce the number of dengue cases and mortality rate.

Usability
The system includes graphics that allow us to track the trends in our area and there is a map to help us to understand the situation in neighbouring provinces.

Taking action
We are beginning to see D-MOSS supporting us to bridge the gap between early warning and early action, D-MOSS helps by engaging health officials and decision makers on a shared platform that is linked to follow-up action.

Integration
We have combined D-MOSS outputs with information collected by our existing procedures for dengue control.

D-MOSS is helping bridge the gap between early warning and early action.

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

D-MOSS’s accurate forecasts have helped us to save resources. It allows us to order the right levels of chemicals and equipment in advance with more certainty and we can now make requests to the Pasteur Institute months in advance.

Communications
We can now be proactive in our management of dengue. We have been able to identify districts and towns with potentially high numbers and increased case monitoring by escalating surveillance in hospitals and communities.

Coordination
D-MOSS improves coordination and timely decision making at regional and provincial level.
Expansion to South Asia
Thank you