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 2015. It uses UK organisations' space knowledge, expertise and capability to provide a sustainable, economic or societal benefit to low income countries.

Project themes cover:

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

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Global incidence of dengue fever

Up to 58 million symptomatic dengue cases in 141 countries

- 18% patients hospitalized
- 48% patients treated in an ambulatory setting
- 34% patients treated in a non-medical setting

- 7,748 deaths occurring among adults
- 13,586 fatal cases
- 5,838 deaths occurring among children

Source: Booth, 2016; Shepard et al, 2016
Objective:
- To produce the first fully integrated dengue fever forecasting system incorporating Earth Observation (EO) data and seasonal climate forecasts to issue warnings on a routine basis.

Vision:
- To see D-MOSS become a key factor in reducing dengue and other mosquito-borne diseases worldwide.
Seven month forecast of climate variables using Met Office models

Forecast issued

Predicted occurrence of dengue

Eight month lead time

January 2019
Dengue forecast map for Vietnam

The colours shown on the map give two pieces of information about the dengue forecast: the forecast result (dengue cases or incidence) and the degree of certainty that the forecast result is correct. The three colours red, orange and green group the forecasted cases or incidence into three categories. Green indicates a lower number of cases/incidence; orange a medium number; and red a higher number. The shade of each of the colours gives an indication of the certainty that the forecast result is correct. This is also divided into three categories. A lighter shade of green, orange or red indicates a lower degree of certainty that the forecast result is correct; a medium shade indicates a medium degree of certainty; and a darker shade indicates a higher degree of certainty.

For example, an area shaded in the darkest green indicates that a lower number of cases/incidence is forecast and that there is a higher degree of certainty that this forecast is correct. An area shaded in the lightest red indicates that a higher number of cases/incidence is forecast and that there is a lower degree of certainty that this forecast is correct.

For more details about the calculations and thresholds which define these categories please click...
Khanh Hoa province - Dengue forecasts and historical data

Forecast number of dengue cases
Show ensemble mean
Show ensemble members

Historical number of observed cases
Show recorded number of dengue cases to date
Show recorded number of dengue cases for forecast months only
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

- Health experts
- Meteorologists
- Early warning systems experts
- Governments
- Satellite data experts
- NGOs
- Software developers
- UN organisations
- Development Agencies
- Funding Agencies
• New types of collaborations between stakeholders who may not be familiar with each other.

• These are all very distinct communities: We all have a key role to play in bridging existing gaps.

• Some countries have historically produced data for themselves, without seeing the value of collaborating on a global level, but this is changing.
Expansion to South Asia and elsewhere?
Questions

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