Implementation of electronic-based malaria information system for early case detection and individual case management in provinces along the Thai-Myanmar and Cambodian border

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Abstract:

Problem

The Bureau of Vector-borne Diseases, Ministry of Public Health, Thailand, has implemented an electronic Malaria Information System (eMIS) as part of a strategy to contain artemisinin resistance. The attempt corresponds to the WHO initiative, funded by the Global Fund, to contain anti-malarial drug resistance in Southeast Asia. Originally, malaria surveillance system was paper-based, and only aggregated data were collected from down to top level. Data validation and data analysis based on the paper-based system was time- and labor- consuming. The main objective of this study was to demonstrate the eMIS' functionality and outputs after implementation for use in the Thailand artemisinin-resistance containment project.

Methods used

The eMIS had been designed to cover all villages at risk which located in malaria endemic areas along Thai-Myanmar and Thai-Cambodia border. The eMIS was designed as an evidence-based and near real-time system to capture data for early case detection, intensive case investigation, monitoring drug compliance and on/off-site tracking of malarial patients, as well as GIS mapping of villages where infected patients were located.

Major results

The core functionalities of the eMIS have been utilized by malaria staff at all levels, from local operational units to ministerial management. The eMIS case detection module can capture 1.7 million febrile patients in year 2012. The number of malaria cases detected in the project areas over the years studied was 29,281 cases. The GIS feature within eMIS is capable of displaying the hot spot areas in one single map. At the operational level, users can drill down up to village level to see how many infected cases were detected. It was shown that 52% of Thai patients were infected, while migrants were infected at 48%. The data mapped in the system suggested that *P. falciparum*-infected cases and potential drug-resistant cases were scattered mostly along the border villages. The mobile technology application has been used for data collection during follow-up. Although the follow-up rate was satisfied among Thais, particularly low rates were observed among seasonal and cross-border migrants. Demonstration can be viewed by using Google Chrome, Firefox, or Safari at http://gis.biophics.org.

Conclusion

The eMIS demonstrated that it could capture essential data from individual malaria cases at local operational units, while effectively being used for situation and trend analysis at upper-management levels. The system provides evidence-based information that could contribute to the control and containment of resistant parasites. Currently, the eMIS is in the expanding beyond Thailand to the Greater Mekhong Subregion.