



Case Study

PUBLIC HEALTH

User

The Philippine Department of Health

Challenge

Collecting spatial information on residence locations and travel history of individuals attending clinics

Partners

The ENSURE research project, including partners at the Research Institute for Tropical Medicine (Philippines), Gadjah Madah University (Indonesia), and London School of Hygiene and Tropical Medicine (UK)

Solution

Android tablet-based application GeoODK and offline satellite maps

Results

Development of tablet-based application to collect spatial data on household residences offline, training of staff and use in rural health facilities

ENSURE: Geolocating health facility attendees to map malaria in the Philippines and Indonesia

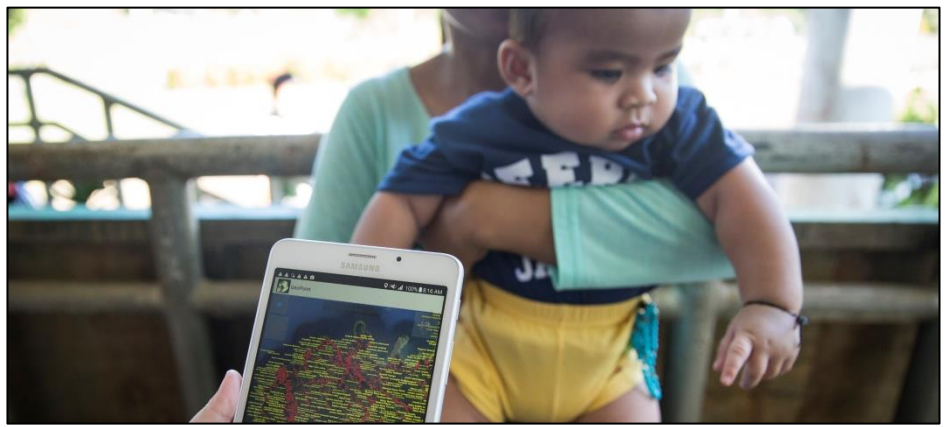
As areas move towards malaria elimination, it is increasingly important to identify the remaining areas of disease transmission. Real time data collection and mapping of malaria cases is needed to develop effective surveillance systems and target malaria control efforts.

To address this need, the ENSURE (enhancing surveillance for malaria elimination) project aims to establish, integrate and evaluate combinations of diagnostic and epidemiological data collected for malaria control programmes. A key component of this solution is developing tablet-based applications to collect spatial data on patient residences so results can be mapped in real time.

The Challenge

Within the malaria endemic rural areas, there are no formal address systems and many of the populations at risk are highly mobile. As visiting all households to locate residences of malaria positive cases is extremely resource intensive, surveys frequently rely on convenience sampling approaches such as health facility surveys.

This study needed to identify data collection tools and sources of spatial information which would allow geolocation of households during the survey interview at the point of care. A core requirement of this approach was the need to work offline due to areas with limited or no internet and phone connectivity and develop a user-friendly system for rural health facility workers, many of whom had not previously used tablets or smart phones.



“Geo-locating health facility usage and location of households gives control programs a better understanding of the extent of its services and which areas are underserved. These are important information for disease control and elimination. “

Department of Health
Philippines



The Partners

This study included a partnership between the Research Institute of Tropical Medicine of the Philippines Department of Health, the London School of Hygiene and Tropical Medicine and other key partners and stakeholders in the Philippines including the Health Geolab Collaborative, Provincial Health Offices and local government units of Palawan, Occidental Mindoro and Bataan.

The Solution

We extended the capabilities of the GeoODK open-source tablet-based application for the health facility attendees to be able to geolocate their place of residence. The application incorporated offline satellite maps including landmarks, available household head names and other points of interest to facilitate this process. Health facility workers were given SOPs (standard operating procedures) and attended workshops to train them to collect spatial information on the location of households and record results from malaria microscopy and rapid diagnostic tests. The approach was applied in three different rural case study areas with different levels of malaria transmission.

The Results

The tablet-based application was successfully rolled out into all three sites. In order to confirm the spatial accuracy of the reported residence locations, fieldworkers independently verified the GPS coordinates of 200 households, finding the spatial location collected by tablet had a median accuracy of 116 metres. This accuracy was sufficient for health workers to locate the households and additionally could be combined with satellite imagery on potential environmental risk factors (resolution 30 – 250 metres per pixel) to develop risk maps. Most fieldworkers were able to use the application effectively and the majority of the data was collected without technical issues and automatically linked to routinely collected demographic data and sample barcodes.

This study demonstrated the utility of tablet-based approaches to collect spatial information on patients attending and other easy access group surveys to provide a better understanding of the distribution of disease. Implementing this tablet-based approach also allows health workers to monitor where infections are most regularly occurring and better target disease control measures. This approach is currently being applied in other health projects in Indonesia and can be implemented in other areas of the Philippines or Southeast Asia lacking formal address networks.