



mSPRAY

An Indoor Residual Spray mapping, monitoring and feedback tool for malaria control in Zambia

SERVICE DELIVERY

Implementation date: October 2014 (Piloted in 2011/2012)

Indoor residual spraying (IRS) along with long-lasting insecticide treated nets (LLINs) form the mainstay of malaria control in Zambia. The country now boasts IRS coverage levels in excess of 35 percent in urban / peri-urban settings. National malaria parasitemia has fallen from 22 percent in 2006 to 14.9 percent in 2012. However, IRS implementation is expensive and requires operations to be as efficient and effective as possible.

Historically, IRS operators recorded spray activities on a paper form, which was then manually aggregated each day before entry into an Excel worksheet, followed by manual cut-and-paste aggregation. This system is labor intensive, error-prone, and too slow to provide data for managers above field level. Akros and partners developed mSpray to provide collection of electronic data in the field, giving spray teams and managers a real-time visual display of spray coverage overlaid on satellite images of target areas. mSpray improves the efficiency of operations and helps teams and managers to monitor whether they achieve desired spray coverage. mSpray is being used during the 2014/2015 spray season by 253 IRS staff across seven high malaria-burden districts in Zambia to guide their operations and monitor their progress in real-time.

About mSpray

mSpray is an IRS tool, primarily accessed through a web browser-based interface, which displays the areas targeted for spraying and identifies the houses within the target areas, all overlaid on satellite maps. These target areas depict the precise number and location of houses to be sprayed. Houses were mapped using satellite imagery, which was far less costly, more accurate and more extensive than the previous ground-based mapping exercises. The target areas encompassing houses were defined by taking malaria burden, operational efficiency and local knowledge into account.

mSpray streamlines, simplifies and increases quantity and quality of data collected. During the spray operations, Team Leaders (TLs) each manage three Spray Operators (SOPs). TLs enter data on their tablets while standing with the SOP at each house, which is sent to the cloud server as soon as a data connection is established. The forms are built in ODK

Collect which uses formhub as the data backend service. The spatially-integrated spray data is then visualized on the tablet by the TL showing the location and type of spray point. The spray coverage indicators are updated immediately to reflect the latest form submissions. This immediate feedback of indicators and spray points allow TLs to accurately understand their spray data and make near real-time or in-field operational decisions on spray progress. Additionally, the tool allows for improvements in operational efficiencies by enabling IRS commodities to be delivered to houses targeted for spray activities and by informing planning improvements through more granular data.



Evaluation and Results

While mSpray is currently being implemented for the 2014/2015 spray season, initial evaluation and results from the 2011/2012 spray season pilot are also available. The initial mSpray pilot in Chibombo involved 40 spray operators who visited 15,929 structures over a period of two months. During this trial, mSpray was able to provide feedback on overall spray performance. Initially, feedback was provided around day 30. At this stage it was clear that National Malaria Control Centre (NMCC)-set spray operator targets of 10 to 15 structures per day were not being met. As a result, mSpray was able to identify this issue and highlight the fact that teams were beginning operations late each day. Based on this data, operational changes were made and coverage was dramatically improved (see Figure). mSpray also identified areas missed during spraying that were originally targeted, again allowing spray teams to revisit these overlooked areas. The current mSpray tool has made significant improvements since the pilot.

Lessons Learned

- It is key to understand the importance of spray data feedback during the spray season, instead of post season, as it greatly improves the spray operator performance in reaching their targets
- Operational efficiencies are gained through monitoring spray operator start and end times and by knowing exactly how many structures need to be sprayed and where
- Providing more granular spatially-integrated spray data allows program managers to assess whether high-burden malaria areas that were targeted are actually the areas being sprayed
- Minor challenges were encountered during the rollout of mSpray including unfamiliarity with digital technologies and the need for regular unit recharging; Most of these issues could be addressed through additional training or selection of operators with higher educational background, both issues being pushed by Akros for the upcoming 2014/2015 spray season

Geographic Coverage: Seven Districts in Luapula Province, Zambia

Implementation Partners: African Indoor Residual Spray Program, Government of Zambia Ministry of Community Development Mother and Child Health, and Ministry of Health & Akros

Funder: Africa Indoor Residual Spray Program

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See References on page 89.

Conclusion

mSpray is the first Geographic Information System (GIS)-integrated smartphone data management system for IRS. It is capable of delivering precise, real-time data on spray operator activity, automatically aggregated throughout the reporting hierarchy in easy-to-use maps, charts and graphs. Through rapid reporting, in-field data validation, identification of areas requiring focal spraying, spatially referenced spraying, and data feedback, the application is able to provide valuable results to help improve the implementation and supervision of costly IRS operations, ultimately contributing to a greater reduction in the overall burden of malaria.