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Logistics Brief

Data Capture at the Community Health Level Yields Logistics Visibility

VillageReach 2012

A district supervisor uses a mobile application to scan, process, and upload APE logistics data to a web database.

"I now realize it is very important to follow up on how the APEs are using medicines… now I realize how important that is."

--Manhiça district APE supervisor

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Mozambique, a developing country with a 2013 population of approximately 24 million, has a relatively high burden of infectious disease. Malaria is transmitted year-round in much of the country, and 100 percent of the population is considered at-risk. As of 2008, malaria killed an estimated 171 people per 100,000 of Mozambique's population every year (PMI 2013).

Since 1978, Mozambique's Ministry of Health (the Portuguese acronym is MISAU) has operated a community healthcare program that provides health education, as well as treatment, for common diseases, at the community level. In 2010, MISAU and its partners began revitalizing the program; as it is currently operates, select districts have 25 community health workers—*Agentes Polivalentes Elementares* (APEs in English)—who are multiuse, elementary agents. The APEs work in rural areas to provide health education, disease prevention, and disease treatment to catchment areas of approximately 500 to 2,000 Mozambiquans (Global Heath Workforce Alliance 2010).

In 2012, the USAID | DELIVER PROJECT, Task Orders 4 and 7, conducted a small-scale test (44 APEs across two districts in Maputo province for six months) of innovative interventions to strengthen the supply chain for commodities that APEs use for their disease prevention and treatment services. APEs receive two nationally standardized kits once a month, which include various essential medicines, male condoms, rapid diagnostic tests for malaria (RDTs), and four presentations of artemether/lumefantrine treatments (AL). Drawing on interactions with stakeholders and an initial survey, the interventions, as implemented, included the following:

- Training APEs to use their resupply process.
- Training APEs to use basic storage best practices and giving select APEs a durable plastic storage box.

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- Training APEs to use a newly designed logistics record and report form that captures opening stock, amount received, amount dispensed, and ending balance; it also reports on whether or not the APE had a stockout for 21 commodities or treatment regimens.
- Training district APE supervisors and giving them mobile hardware that enables rapid electronic data capture of the APE logistics reports through an OpenDataKit (ODK) application. They used an Android smartphone to take a picture of the completed form, transcribe text and numeric data into the software, validate software interpretation of bubble fields, and submit the data to an online database.
- Providing job aids, conducting follow-up trainings, and conducting routine monitoring and supervision to support the other elements of the activity.

The USAID | DELIVER PROJECT's subcontractor, VillageReach, conducted the field implementation of these activities; this included the MISAU staff and partners at the national, provincial, and district levels. It was supported by a Gates Grand Challenges grant.

Evaluation of these activities drew from the data reported and processed through the ODK application, the results of monthly monitoring surveys, qualitative interviews with district staff, and an endline survey comprising site visits and focus groups.

Results

During the six months of this activity, the APEs and their supervisors achieved an average on-time, complete reporting rate of 68 percent; ranging from 39 percent at the beginning of the activity to a high of 87 percent, which surpassed basic thresholds for use in logistics planning. This reporting rate was probably aided by a follow-up training on the form and supervision that targeted non-reporting APEs.

Data quality, as measured by the internal consistency of the stock status calculation on the forms, varied by product. For most of the commodities listed on the form (17 out of 21), internal consistency was above 80 percent, which is considered successful, considering the limited educational levels of the APEs and the short duration of the activity. Data quality could probably be improved if changes were made to the form design before this activity is repeated.

The district supervisors, who used the ODK software to process these forms, successfully maintained the hardware and software—except for phone battery problems during one month, in one district—and they processed all the completed forms they received. On average, it took the district supervisors 10 to 13 minutes to process each form, spread over one to two work days per month.

District APE supervisors and district pharmacists responded that the data collected and reported through this system is valuable; they think it provides a relatively accurate perspective of APE stock status and consumption patterns. Although one supervisor reported using the data to justify redistribution of overstocked commodities, the data itself was used very little during this activity.

As identified in the endline surveys, the training sessions on the APE resupply process and basic storage practices did not show any real differences between the test and control districts. Temperature readings inside the storage boxes given to the APEs showed a possible lower temperature compared to room temperature; but, if the activity is expanded, this should be tested further.

Implications for Mozambique and Beyond

Community health workers in Maputo province in Mozambique can record and report logistics data within a short implementation period. The on-time reporting rates in this activity were achieved without extra incentives and they occurred at a time when APEs were not receiving expected monetary

stipends and commodities. Assuming similar educational levels of APEs and programmatic challenges in other districts across Mozambique, this logistics record and report could probably be repeated.

VillageReach 2013

A mother and child are given a rapid diagnostic test for malaria from an APE in Mozambique.

Further expansion within Mozambique should include more support for data use at the district level, more guidance for APEs facing stockouts, and additional testing of durable boxes for commodities. This activity collected specific recommendations for any potential expansion of this activity into other provinces, including the need for adaptations to the APE logistics report and the need for including supportive supervision for both APEs and district supervisors.

APEs in Maputo province accessed and dispensed commodities despite numerous supply and programmatic challenges. The consumption data captured in this activity show that APEs in the test districts were able to access and dispense commodities, such as AL, even when AL kits for APEs were not packed because of national supply shortages and the promised monthly stipends were late. Although several APEs left the program during this time, this documented activity shows the resilience of the APEs and the confidence the health center and district pharmacy staff placed in them. Unfortunately, a high frequency of stockouts for APE commodities—on average, APEs stocked out of 58 percent of their products once a month—and because of the limited scale of this activity, they were unable to collect data for redesigning current kits. However, the data provide a quantitative snapshot of the consumption patterns of APEs in Maputo province (see table 1). While APEs in the control district also accessed AL during this activity, as shown during endline site visits, the consumption data from the test districts shows a quantitative perspective of the amounts administered to patients.

The ODK application is a demonstrated medium for rapidly achieving near real-time visibility into APE consumption and stock status. After two training sessions and monthly follow-up support, the district supervisors in this activity could scan recently completed forms and submit the data to an online database within several work days. While a permanent national database, or link to the existing MISAU system, was not developed during this activity, this mechanism could support routine data collection and submission from any district headquarters in Mozambique using mobile data service or an Internet connection. For each district, this would require initial trainings; printing of paper forms; a camera-enabled smartphone; technical support for several months; and charge cards to support mobile data submission, including 10 to 13 minutes, per form, per month, of the district supervisor's time. Discussions for scale up within Mozambique are ongoing.

Table 1. Average Monthly Consumption by Commodity for APE Reports without Stockouts, November 2012–May 2013

Commodity	Range	Median
Oral rehydration sachets	0–24	3
Mebendazole (tabs)	1–80	15
Male condoms (pieces)	25–171	74
RDT (tests)	0–85	23
AL 6x1 (treatments)	0–24	3
AL 6x2 (treatments)	0–5	2
AL 6x3 (treatments)	0–26	3
AL 6x4 (treatments)	0–23	4

For any developing country community health worker program, this activity demonstrates the basic viability of a logistics management information system (LMIS) that uses paper at the service delivery–level and mobile data transfer at the supervisor level. It can also be a potential option for comparing to other basic last mile routine data collection approaches, such as short message service (SMS) or full paper-based systems.

For more information, please see the final report for this activity: *Mozambique: Strengthening the Community Health Worker Supply Chain*, which is available at deliver.jsi.com.

References

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