Enhancing ADDO Regulation and Reporting Through Use of Mobile Technology

ADDO owners and dispensers are trained to keep records related to business and sales. Dispensers track who buys medicines (including select demographic information) and for what conditions the medicines were purchased. They also keep a log of adverse drug events as reported by their customers. The availability of such records at ADDOs has allowed supervision and inspection teams to review and assess ADDO dispensers' performance and the shops' compliance with regulations.

The records provide a wealth of information that could not only help health officials quickly identify problems, such as epidemics, but could also provide surveillance information on common conditions in the community. However, these data are not easily communicated and are therefore not routinely reported to district, regional, or central health authorities. In addition, the ADDO regulatory authority, the Pharmacy Council (PC)[1], does not have an efficient way to track activities related to ADDOs and pharmacies, such as inspection dates, license renewal, and accreditation status.

To improve information access, MSH is working with the PC and a local contractor, Invention and Technological Ideas Development Organization (ITIDO), to put a two-way communication system in that will allow PC to send updates to ADDOs and give ADDOs the ability to transmit health information to the PC, and potentially to the Ministry of Health and Social Welfare.

ITIDO conducted a situational analysis to explore the feasibility of using mobile technology to strengthen ADDO services and assess what kind of mobile technology ADDO owners and dispensers already use. With the findings, ITIDO developed an options analysis and proposed a mobile technology strategy for PC and ADDOs. This system incorporates geographic information systems (GIS) to map locations of ADDOs and other health facilities that the PC can use to enforce geographic licensing restrictions and incentivize new shop openings in underserved areas. The mobile application will synch with PC's web-based database to make data transfer easy, safe, and accurate.

Database and Mobile Technology Components

Working with PC and MSH, ITIDO developed a web-based database of private sector drug outlets' facilities and personnel, including information on facility registration, personnel qualifications and certifications, inspections, and personnel and premises fees payment. ITIDO also developed mobile technology applications compatible with basic mobile phones, which is what ADDO personnel already use. The applications mesh with the database and include a mobile payment component for payment of facility and personnel fees, an SMS-based ADDO and pharmacy indicator reporting module, and an SMS-based information request and response module, which will allow ADDO and pharmacy personnel to send and receive information, for example, on

[1] Until 2011, TFDA was the regulatory authority responsible for ADDOs; however, a regulatory change placed the responsibility with the Pharmacy Council.

premises requirements or drug recalls. As the first step in a phased process, ITIDO has trained PC, pharmacy, and ADDO staff in Dar es Salaam and Pwani regions on how to use the applications.

PC database

PC's web-based database includes profiles of each individual or facility including contact and registration information, educational background, a unique identification number, and store location. Facility profiles will include their geocode location so that PC can map the facilities through Google Earth and perform basic geospatial analysis. PC can use the profiles to complete relevant tasks related to the personnel or facilities, such as submitting operations and inspection reports, reviewing their fees payment history, and filing legal complaints.

In addition to storing basic information about ADDOs and pharmacies, the database increases the transparency of a number of regular PC processes. For example, personnel and facility registration, intern applications, disbursement of funds from PC headquarters to regional or district offices, and resolution of legal complaints will be captured electronically through the database. Moving these processes to an electronic platform improves documentation and efficiency. Furthermore, the database is programmed to regularly produce summary reports on indicators of interest to PC to inform their decision-making.

The database is linked to the mobile applications described below, so while PC will need to manually enter some information into the database, other pieces of information will automatically populate through the mobile tools. Furthermore, the mobile applications will facilitate PC's communication; for instance, the mobile money application will update the database on ADDO annual renewal fees. PC will then be able to query the database to determine which ADDO facilities have not paid their fees and then send an SMS reminder message to this group of facilities.

PC field offices and representatives will have easy access because the database is web-based. In the future, login information and restricted access levels will be provided to district pharmacists who oversee ADDOs, so that they can update premises information in their respective districts. PC staff will have access according to their position and areas of responsibility. This will allow field teams to input data directly into the database, which should improve timeliness and accuracy of data entry and allow PC headquarters staff to easily access updated information from across the country. Additionally, the field teams can query the database to follow-up on action items, such as status of inspections, to better manage field activities. Finally, parts of the database will feed into PC's public website to make select data publically available and increase transparency.

Mobile money

ADDO and pharmacy personnel will now be able to pay their annual renewal fees (personal and premises) via Vodacom's mobile money system initially, with other mobile companies integrated later. Users will input a unique PC account number and then enter the fee amount. PC's database will automatically record the payments and communicate with users if any problems arise. Users will also receive SMS messages that confirm payment, remind them of outstanding payments, and notify them of penalties if payment is late. The mobile money system will eventually allow PC to disburse funds to PC district offices.

Data reporting

A reporting module will facilitate data exchange between private drug outlets and PC and between PC headquarters and PC field offices. ADDO personnel will now send reports quarterly on select indicators relating to service and supervision. Those users will submit data with a predefined reporting syntax, including personnel and facility unique identification numbers, so that the information will

automatically feed into the PC database. PC field officers will also submit inspection summary reports to PC headquarters via the mobile application.

Information exchange

ADDO and pharmacy personnel can now request specific information from PC, and PC can issue alerts and reminders to personnel via mobile phone SMS exchange. PC selected a few types of communication as a trial. If the application is successful during the pilot, the information available via SMS will be expanded. The pilot information categories include—

- Prospective ADDO owners can enter key words into an SMS message to request information on ADDO premises requirements and registration procedures.
- Pharmacy interns will be able to request information on pharmacist registration requirements.
- PC will push important information to pharmacy personnel, ADDO dispensers, and premises owners related to updates on fees, acknowledgement of mobile money payments, late payment reminders, and regulatory information such as contaminated products, withdrawal of products from the market, and new treatment guidelines.

In addition to specific questions that ADDO owners and dispensers can request from PC via predefined SMS syntax, they can also SMS or email questions, comments, or complaints to PC. After being filed in the database, a PC manager will assign a person to respond to the query via SMS, phone call, or email. This module aims to further improve information- sharing between PC and ADDOs.

Current Status

The system has been designed to help ensure sustainability and scalability. The technology was developed using JAVA-based open source software to ensure affordability and adaptability. The mobile applications work with the basic mobile phones, which prevents having to purchase smartphones. PC actively participated in the system design, development, and rollout and has ensured that the system meets its needs. Moreover, by using open source technology and installing the necessary hardware, PC now has the infrastructure in place to maintain the system after the launch.

The technology package was introduced in Dar es Salaam and Pwani regions in May 2014. ADDO dispensers report that they like using their mobile phones to access the helpline and updates—a direct communication channel with PC—and being able to use mobile money to pay license fees. In Pwani, 76%, 65%, and 85% of the 142 ADDOs successfully submitted service reports during the first three reporting periods, respectively. More results will be available in August 2014.

PC has collected and entered into the system basic information on most of the ADDOs and pharmacies in the country, including their GIS coordinates, in preparation for nationwide scale-up of the technology. Drug shop regulatory agencies in other countries have already expressed interest in adapting and implementing the technology.