



EVIDENCE BRIEF

Vietnam's Immunization Registries Go Online

Project Optimize is a collaboration between the World Health Organization and PATH working to demonstrate innovations in the supply chain that can help to meet the demands of an increasingly large and costly portfolio of vaccines. In Vietnam, project Optimize worked with government and software partners to help introduce a digital immunization registry. This registry allowed the health system to better track children due for vaccination and shortened the time required for recording and reporting immunizations compared to the existing paper-based registry.

Need for an electronic immunization registry

At every commune health center in Vietnam, health workers record vaccination-related information about each child in their community by hand. Every month, when the health workers need to determine which children are due for vaccinations, they refer to this paper ledger. Monthly reports on the number of immunizations delivered are also prepared from this ledger. These data are delivered to the district health centers, where they are compiled and sent on to the province center, where they are compiled again, eventually reaching the office of the national immunization program.

An evaluation conducted in 2009 by Vietnam's National Institute of Hygiene and Epidemiology, National Expanded Programme on Immunization and Optimize indicated a high work burden associated with reporting these data, often delayed submission of reports, and sometimes unreliable or inaccurate data. However, the assessment also indicated that more and more commune health centers have access to the Internet, and most staff are regular mobile-phone users. These conditions provided a ripe environment to explore the potential benefits of a digital immunization registry.



PATH/ Nguyen Phu Cuong

The Optimize team developed an easy-to-use software program with mobile-phone and computer-based applications with the following goals in mind:

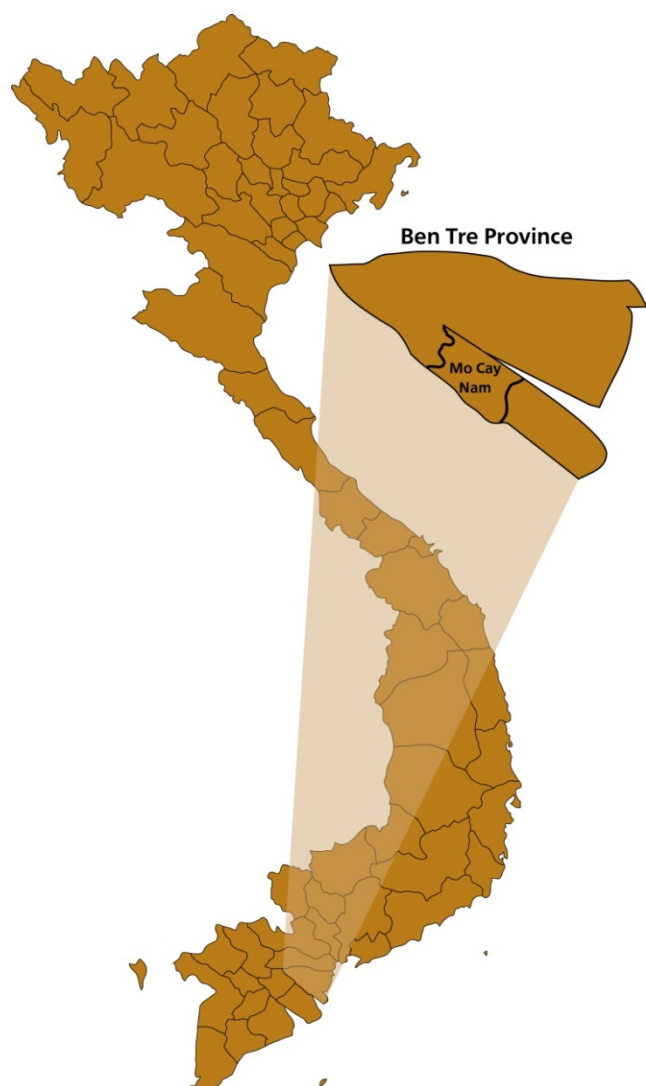
- Increasing accuracy and timeliness of immunization records.
- Improving the rate of on-time immunization.
- Reducing the amount of time needed for reporting.

Meeting the challenge: Creating a new system

The team piloted the digital immunization registry software in Mo Cay Nam district in the southern province of Ben Tre (see Figure 1). This district has 17 communes.

In January 2012, Nokia C3 mobile phones were distributed to commune health workers, and they were trained on how to use the phone- and computer-based software. After the training, health workers began using the software to track and report immunizations. Newborn children are registered in the system. The software then generates a monthly list of children due for immunization and automatically sends reminders to parents by short message service (SMS) a few days before immunization day. After immunization, the health care worker updates the system record for each child vaccinated. As soon as information is uploaded to the database, authorized users from the commune to the national level can access it.

Figure 1. Mo Cay Nam district, Ben Tre Province, Vietnam



The digital immunization registry in action

Project Optimize monitored the use of the immunization registry system from January through August 2012 in order to measure the impact the software had on the time burden of immunization reporting and on-time delivery of vaccines.

The team found that the time spent to enter data after every immunization session during the intervention was similar to the amount of time needed to enter data into the paper-based registry (1–4 hours, depending on the size of the commune). However, the time for generating the monthly immunization report was greatly reduced from about 30 minutes without the software to 2 minutes with the software.

To evaluate the effect on the timely delivery of vaccines, the team compared the rate of on-time delivery of bacillus Calmette-Guérin (BCG) and pentavalent DTP-hepatitis B-*Haemophilus influenzae* type b vaccine before and after the intervention. The on-time vaccination rates for all the doses increased (Table 1).

These data show that the SMS reminder to parents may be helping more children receive their vaccines on time. In addition to reducing the time to generate reports and increasing on-time vaccination rates, there are several advantages of having immunization registry data in an electronic format:

- Lists of children due for immunization in a given month can be quickly generated.
- Automatically generated SMS reminders to parents can replace time-consuming handwritten appointment forms for each child, as practiced in some communes.

Table 1. On-time delivery of BCG and pentavalent vaccine

Vaccine dose (Due date for vaccination)	Rate of on-time delivery			
	Before intervention (June 1, 2009–May 30, 2010)		After intervention (Jan. 1, 2012–Aug. 31, 2012)	
	N	%	N	%
BCG (within 30 days of birth)	1,048	44%	806	49%
Pentavalent dose #1 (between 60 to 89 days of birth)	1,252	54%	880	75%
Pentavalent dose #2 (29 to 30 days after previous dose)	1,316	61%	719	86%
Pentavalent dose #3 (29 to 30 days after previous dose)	1,178	58%	458	87%

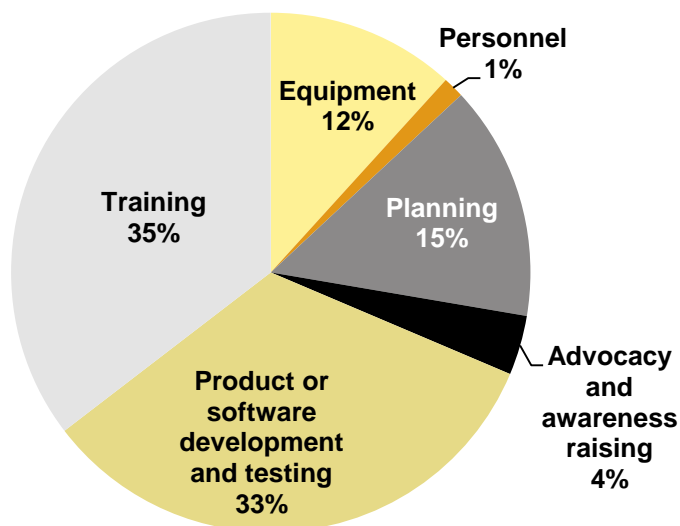
- Workers at the district and the province level can access the data any time they have Internet access; they do not need to wait for the reports.
- If a child from another commune appears on immunization day, health workers can easily look up the child's immunization history and see what vaccines the child needs.

Despite these improvements, there were some challenges. For example, experience using mobile phones and computers varied among users, and health workers with limited experience faced a steep learning curve, some never reaching a comfortable level of skill during the pilot period. Sustained technical support for commune workers is needed to ensure success with new software technologies.

How much did it cost?

The immunization registry intervention was implemented at all 17 commune health centers and the district center in Mo Cay Nam at the cost of approximately \$1,500 per facility. Training accounted for 35% of the investment, and product or software development accounted for 33% (Figure 2). Project monitoring costs were not included in these investment costs.

Figure 2. Investment cost profile for the digital immunization registry system



Next steps

The Vietnam Ministry of Health has recently begun to build a strategy around electronic health information management. The software developed through project Optimize has potential application in other health areas—it can track women in antenatal care; children in the nutrition program; and patients on long-term care regimens, such as tuberculosis and HIV treatment. Lessons learned from this pilot can help improve the chances for success of other software introduction projects and pave the way for evidence-based health planning and management. In the meantime, users in Mo Cay Nam district continue to use the system, and immunization program leaders in Ben Tre Province are looking for ways to fund the expansion of the system to the rest of the districts.

FOR MORE INFORMATION

Contact Joanie Robertson at jrobertson@path.org, or visit www.path.org/projects/project-optimize.php or www.who.int/immunization_delivery/optimize/.

January 2013