

# From paper to e-records: Vietnam's digital immunization registry

## How a pilot idea grew into the National Immunization Information System

### TRACKING IMMUNIZATION IN VIETNAM

Vaccinations have saved the lives of more children than any other medical intervention in the past 50 years, and an effective immunization approach is a critical factor in the eradication of disease. However, to be effective, doses must be administered at the appropriate intervals. In Vietnam, paper-based systems for tracking immunization were making it difficult to ensure children and pregnant women were getting the timely protection they needed to protect them from dangerous but preventable diseases.

In 2012, PATH began collaborating with Vietnam's National Expanded Immunization Program (NEPI) under the Optimize project, funded by the Bill and Melinda Gates Foundation, to find innovative ways to improve immunization coverage for women and children. Together they developed and tested ImmReg, a digital database that houses and tracks immunization records, in Ben Tre province.

The success of this pilot caught the attention of national-level decision-makers, and in just five years, it evolved into Vietnam's National Immunization Information System (NIIS). Another Optimize-supported solution for tracking vaccine stocks and distribution was also integrated into the NIIS.

The evolution of ImmReg into the NIIS is a prime example of PATH's ability to use digital health solutions to address public health challenges, and to work with governments to take these innovations to scale.

### MODERNIZING 21<sup>ST</sup> CENTURY IMMUNIZATION SYSTEMS

Prior to 2012, all immunization records and reporting systems in Vietnam were entirely paper-based. This system was inefficient and prone to errors. Staff at local Commune Health Centers (CHCs) had to spend hours entering patient data, manually searching large ledgers to identify the children due for vaccination each month, and collating data to report to higher-level officials. Data inaccuracies could result in vaccine shortages or waste, and missed or delayed vaccinations, leaving children and pregnant women at risk.



*Previous paper-based immunization record system in Vietnam. PATH*

ImmReg solved these issues and improved on-time immunization coverage by digitizing records, streamlining processes, and easing communication between CHCs and clients via automated SMS vaccination reminders.

### HOW IT WORKED

- Data on newborns is entered into the system upon birth by neonatal units at hospitals or CHCs.
- ImmReg generates lists of people due for vaccinations on immunization day and automatically sends them SMS text reminders.
- Health center workers enter data on doses delivered on immunization day.
- ImmReg automatically generates immunization reports, which higher-level managers can access in real time.

### KEY BENEFITS OF IMMREG

- **Efficiency**  
ImmReg streamlined the documentation process by automatically generating reports, liberating staff from cumbersome paperwork and allowing them to spend more time on patient care.
- **Accuracy**  
ImmReg reduced human error by eliminating the need for handwritten lists and manual calculations.
- **Effectiveness**  
The 2015 evaluation of the pilot in Ben Tre illustrated an up to 20 percent increase in on-time delivery of measles vaccine, oral polio vaccine and Quinvaxem (a 5-in-1 vaccine for diphtheria, tetanus, whooping cough, hepatitis B, and *Haemophilus influenzae* type b).

## SCALE-UP: FROM PILOT TO NATIONAL SYSTEM

Results from the pilot proved that ImmReg:

- Reduced the time needed to generate immunization reports.
- Improved on-time vaccination rates.
- Increased immunization coverage in the first year of life.

Given the pilot's quantifiable successes, Vietnam's Ministry of Health (MOH) requested that PATH use this experience to support the development of a comprehensive nationwide immunization database and reporting system. In late 2015, PATH was awarded the prestigious GSK and Save the Children Healthcare Innovation Award to support this work.

Since 2016, PATH has been working with the General Department of Preventive Medicine (GDPM) at the MOH and Viettel Center for Information Technology Solutions and Telecommunications (Viettel ICT) to build the National Immunization Information System (NIIS).

The government-owned system was launched by Deputy Prime Minister Vu Duc Dam and the MOH in March 2017. Since then, PATH has been supporting the MOH to roll out the system nationwide, from provinces down to communes. To ensure effective use of the NIIS, PATH led training for provincial-level health workers from each province to learn both how to operate the system and how to train others. They in turn trained their district- and commune-level staff in the software. Six months after launching, the NIIS was in use in over 90 percent of CHCs across the country.

In response to the growing private health care market, the NIIS is also being used by fee-based neonatal units and immunization facilities, like private clinics. With this reach, the NIIS aims to eventually be able to track the immunization of any Vietnamese citizen from birth until the end of life.

## FORWARD THINKING: MOBILIZING HEALTH

An important feature of ImmReg was its application of mobile technology. Within the last decade, mobile phone access in Vietnam has rapidly increased. Today, nearly all Vietnamese adults have a mobile phone, an increasing proportion of which are smartphones.

Before ImmReg and the NIIS, it was common practice for CHCs to hand deliver immunization day invitations to pregnant women and caregivers in their area.

This was quite labor intensive, and sometimes the invitation was lost or not received.

With the NIIS, CHCs can quickly and easily send SMS reminders about vaccinations, saving health workers time and money, and making it easier for families to manage their health.



*NIIS enables parents and caregivers to receive vaccination reminders on their mobile devices. WHO/Mark Leong*

As of 2016, PATH has also been working with the GDPM and Viettel ICT to develop a public-facing portal. This will build on the SMS system and further capitalize on increased smartphone use, eventually enabling people to use smartphones or computers to schedule vaccination appointments online and access their own and their children's immunization records.

## A CASE FOR GLOBAL LEARNING

ImmReg was able to grow from a pilot into the NIIS because it was designed for scale from the very beginning. Local end-users and decision-makers were engaged from the start, and the use of mobile technology and integration of fee-based facilities demonstrates an understanding of the future of Vietnam's health care system. Finally, the data produced during the pilot spoke for itself and concretely showed that the system works.

Now PATH is looking to share this success story, and provide support for replication elsewhere. The advantages of a digital immunization database are not lost on other countries facing similar immunization coverage challenges. PATH has already begun exploring the possibility of rolling out similar systems with neighboring nations, while strengthening data use and data quality to maximize the impact of the system in Vietnam.



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