

The Cost of Preparation and Delivery of Td Vaccine to 7-Year-Old Children in Vietnam

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EXECUTIVE SUMMARY

Background

Viet Nam eliminated maternal and neonatal tetanus in 2005 and has maintained this achievement. However, diphtheria outbreaks have occurred in some communities in the highland and central regions. In response, the National Expanded Programme on Immunization (NEPI) provided Td vaccine in those areas through campaign delivery.

Aligned with global World Health Organization Tetanus guidelines (WHO/UNICEF, 2018), the WHO Viet Nam recommended that the Ministry of Health (MOH) now focus on achieving dual protection against tetanus and diphtheria by replacing delivery of the (TT) vaccine with the tetanus-diphtheria (Td) vaccine. Hence, the NEPI is preparing a recommendation to the National Immunization Technical Advisory Group (NITAG) to guide their decision-making regarding Td introduction. To inform their recommendation, NEPI requested evidence on the cost of TT vaccine delivery and the budgetary impact of the potential replacement with Td vaccine.

This study was carried out as part of the Immunization Costing Action Network (ICAN), led by ThinkWell and John Snow Inc. (JSI) and supported by the Bill & Melinda Gates Foundation (BMGF). The ICAN is a research and learning community working to increase the visibility, availability, understanding, and use of immunization delivery cost information. During the period 2016-2019, the ICAN aimed to build country capacity to generate cost evidence that is policy relevant and a priority for the immunization program. The ICAN also worked with countries to improve interpretation and translation of cost evidence so that it is used in country decision-making processes and informs routine planning and budgeting.

Designed and implemented by researchers from the Hanoi University of Public Health (HUPH), with technical support from ThinkWell, the study benefited from strong engagement from the NEPI, the MOH Planning & Finance department, and other key stakeholders.

Box 1. Research Question and Key Findings

Research question:

- What are the total costs, incremental costs and unit costs of Td vaccination provided to 7-year-old children in Vietnam, which includes a program of introduction of Td for 7-year-olds and future cessation of TT vaccination of women of childbearing age (CBAW)? Would the introduction of Td and cessation of TT be cost saving (i.e., have a lower impact on the immunization budget)?

Key findings:

- The cost per dose for current TT vaccination for CBAW was found to be \$1.49 for school-based delivery, US\$1.76 for facility-based delivery and US\$3.86 for delivery via outreach. Td vaccination through campaigns costs US\$3.56 per dose (all fiscal costs). Overall, the total cost of the current schedule for TT for CBAW and Td for outbreak control in 2017 was estimated to be US\$2.4 million.
- Future delivery of Td vaccine is based on cost per dose estimates from current delivery. The budget impact over the period 2018-2025 (compared to the current schedule) depends on choice of delivery strategy:
 - The school-based strategy is estimated to generate savings of nearly US\$7 million.
 - A facility-based delivery strategy is estimated to save over US\$4 million.
 - An *additional* cost of US\$2.3 million would be incurred if a mixed strategy of facility-based delivery with outreach is used.

Use of findings:

- Study results have already informed the National Expanded Program of Immunization (NEPI), who are piloting delivery of Td to 7-year-old children during the last quarter of 2019 using both school- and facility-based strategies.

TT and Td Vaccination in Vietnam

TT vaccine is currently delivered to pregnant women through facility-based delivery and outreach, and to women of childbearing age (i.e., 15-35-year-olds) through facility-based delivery, outreach, and school-based delivery. Meanwhile, diphtheria outbreaks have occurred in some communities in the highland and central regions. In response, NEPI has delivered Td vaccine in those areas through campaigns targeting 5-40-year-olds. Tetanus is an indicator of inequities – particularly affecting ethnic minorities in the northern highlands and the urban poor. The ethnic minorities in the northern highlands have increasingly worse health indicators and the urban pockets of unimmunized are leading to outbreaks for diphtheria.

Study Methods

The Viet Nam ICAN costing study estimates the program costs of introducing Td vaccination of 7-year-old children in Viet Nam, and ceasing the current delivery of TT vaccine to women of childbearing age and the delivery of Td for outbreak control. The study specifically focused on:

- a. The costs of delivery of TT vaccine to women of childbearing age (historical unit and total delivery costs)
- b. The costs of Td campaign vaccination for diphtheria outbreak control (historical unit and total delivery costs)
- c. The one-time costs associated with introduction of Td vaccine for 7-year-old children (projected new vaccine introduction costs and incremental costs)
- d. The costs of routine delivery of Td vaccine to 7-year-old children through three potential scenarios under consideration: routine facility-based delivery, facility-based delivery and outreach, and school-based delivery (projected total costs, incremental costs, and unit delivery costs).

The aim was to determine if the introduction of Td and cessation of TT would be cost saving (i.e., would have a lower impact on the immunization budget). The period under consideration was 2018 to 2025, with complete cessation of TT vaccination of women of childbearing age and a three-year transition period where Td outbreak control campaigns would likely still occur.

The study compared the cost of the current TT delivery schedule with the cost of introducing Td to 7-year-old children through the three scenarios under NEPI consideration, specified above. Current delivery costs were based on one year of actual delivery, in 2017 (historical costing). The costing of Td introduction and future delivery used unit costs from the historical costing combined with planning, assumptions and draft service delivery protocols provided by the NEPI. The costs incurred at all levels of the health system (central, provincial, district and commune levels) were included in the study. Contributions are included from the health system, schools, local government and community organizations. Both economic and fiscal costs were included.¹

The study costed 37 commune health stations (11 urban and 26 rural), which included vaccine delivery at 19 schools, and participation in 4 Td campaigns. The sites were

¹ Fiscal costs represent actual spending in 2017, whereas economic costs include actual time spent, annualized capital costs, and Ministry of Finance regulations for payment of per diems and travel (accommodation and transport).

randomly selected from 23 districts from three large cities and six provinces. The districts represented different geographies and levels of socioeconomic development.

Key Findings

Cost of current TT and Td delivery schedule

The study reviewed the cost of the three strategies currently used for TT vaccination of women of childbearing age (CBAW): facility-based delivery, outreach delivery and school-based delivery, as well as the cost of Td vaccination through campaigns. The study found the average unit cost per TT dose delivered to be lowest for school-based delivery (US\$1.49 per dose) and highest for delivery via outreach (US\$3.86 per dose); facility-based delivery costs US\$1.76 per dose. Td doses delivered via campaigns cost US\$3.56 each (all fiscal costs). The reason for these differences lies in outreach and campaigns being more resource intensive in terms of staff time and travel cost than delivery in schools or at facility fixed sites. Overall, the total fiscal cost of the current schedule for TT for CBAW and Td for outbreak controls in 2017 was estimated to be US\$2.4 million.

For TT vaccination, salaries made up 86% of costs at the facility level. Differences in salaries were the main driver behind variations in cost per dose between regions, with higher staff costs in remote and mountainous areas leading to a higher cost per dose.

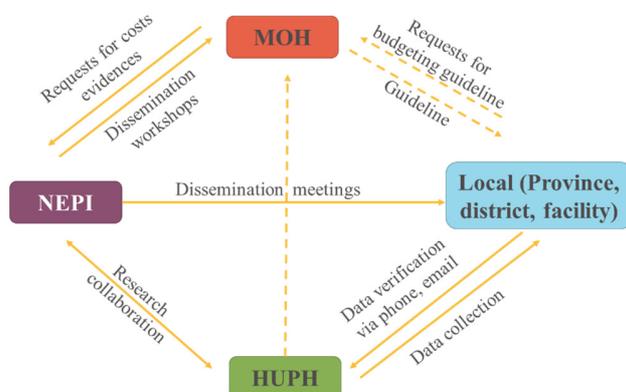
Cost of routine delivery of Td vaccine through three potential scenarios

The study found that considerable savings could be made if a school- or facility-based delivery strategy were to be selected for Td vaccination. In contrast, use of multiple delivery strategies (facility-based and outreach) would result in additional costs compared to current delivery. In comparison to a continuation of the current schedule, a school-based delivery strategy is estimated to generate savings of US\$6.8 million during the period 2018-2025, while a facility-based delivery strategy will save US\$4.2 million. These savings are expected to continue in subsequent years. However, an additional cost of US\$2.3 million would be incurred if multiple delivery strategies (i.e., facility-based and outreach in combination) would be used.

Opportunities for Use of Results

This study has a clear use case, in that the research was requested by the NEPI to inform their recommendation to the NITAG regarding Td introduction. The research team worked closely with the NEPI throughout the study to define the research questions, develop the study protocol, and collect, analyze and interpret the data (Figure 1).

Figure 1. Stakeholder engagement



Study results have already been used by NEPI to prepare for piloting the delivery of Td to 7-year-old children during the last quarter of 2019 using both school- and facility-based strategies. This decision was taken in light of the cost implications of the different strategies, in addition to ensuring those children not attending school are reached. Evidence provided from this study has also been shared with sub-national EPI units in briefings about the Td replacement and pilots. Broader future dissemination will consider the study results as a helpful input for annual budgeting and planning.

In addition to providing helpful evidence for decision making in Vietnam, this study can also help inform other countries that have not yet introduced Td corresponding with cessation of TT.