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

Evidence to Policy and Practice Plan

November 2019

This study was conducted by the Hanoi University of Public Health (HUPH) in Hanoi, Vietnam, in close collaboration with the Ministry of Health National Expanded Programme on Immunization (NEPI) as part of the Immunization Costing Action Network (ICAN). ICAN was facilitated by ThinkWell and John Snow, Inc. (JSI) and supported by the Bill & Melinda Gates Foundation.

Introduction

The Immunization Costing Action Network (ICAN) is a research and learning community working to increase the visibility, availability, understanding, and use of immunization delivery cost information. The ICAN aims to build country capacity to generate cost evidence that is policy relevant and a priority for the immunization program. The ICAN is also working 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. The ICAN is supported by the Bill & Melinda Gates Foundation, with technical facilitation from ThinkWell and JSI.

The Viet Nam study is part of a suite of costing exercises in three countries – Indonesia, Tanzania, and Viet Nam – with teams in each country that include health economist researchers, immunization managers, and planners from Ministries of Health. The country teams have conducted research that explores the cost of delivering vaccines through different delivery strategies to distinct target populations in diverse geographies. The three country teams also came together during two cross-country workshops to help sharpen methods and learn from each other regarding how to use cost evidence to inform immunization program decisions and routine planning and budgeting.

Viet Nam ICAN Study

Viet Nam eliminated maternal and neonatal tetanus in 2005 and has maintained this achievement. Tetanus toxoid (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. Viet Nam has experienced diphtheria outbreaks in some communities in the highland and central regions. Tetanus-Diphtheria (Td) vaccine has been targeted to 5-40-year-olds in outbreak areas through campaigns.

Aligned with global World Health Organization Tetanus guidelines, 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 Td vaccine. Hence, the National Expanded Programme on Immunization (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.

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[1] 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

b) The costs of Td campaign vaccination for diphtheria outbreak control

c) The one-time costs associated with introduction of Td vaccine for 7-year-old children

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

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 study compared the cost of the current TT

[1] Delivery of TT vaccine to pregnant women will continue.

delivery schedule with the cost of introducing Td to 7-year-old children through the three scenarios under NEPI consideration, specified above. 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 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 randomly selected from 23 districts from three large cities and six provinces. The districts represented different geographies and levels of socioeconomic development.

Researchers from the Hanoi University of Public Health (HUPH) designed and conducted the study, with technical support from ThinkWell. The study benefited from strong engagement from NEPI and the MOH Planning & Finance department, starting in 2017 with the joint identification of costing needs, selection of research questions, and elaboration of the methodology. WHO Hanoi was also engaged at this stage, along with global Tetanus experts from UNICEF. Regular meetings between the research team and NEPI took place to clarify plans for Td introduction, determine potential scenarios for delivery, and identify assumptions to guide projections around doses delivered and cost. NEPI and MOH representatives also participated in ICAN cross-country workshops that focused on not only the methodology, but on interpreting the results, and providing input into this Evidence to Policy and Practice Plan.

Key Findings

All findings are presented as fiscal costs[2], presented in 2018 U.S. dollars, and are volume weighted averages. Economic costs are included in the study report.

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 – facility-based delivery, facility-based delivery with outreach, and school-based delivery – as well as the cost of Td vaccination through campaigns. The study found the average unit cost per TT dose 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 (Table 1). Td doses delivered via campaigns cost US$3.56 each. 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. To be expected, rural delivery was more expensive than urban delivery.

Table 1: Cost per dose by delivery strategy and geography (2018 US$)

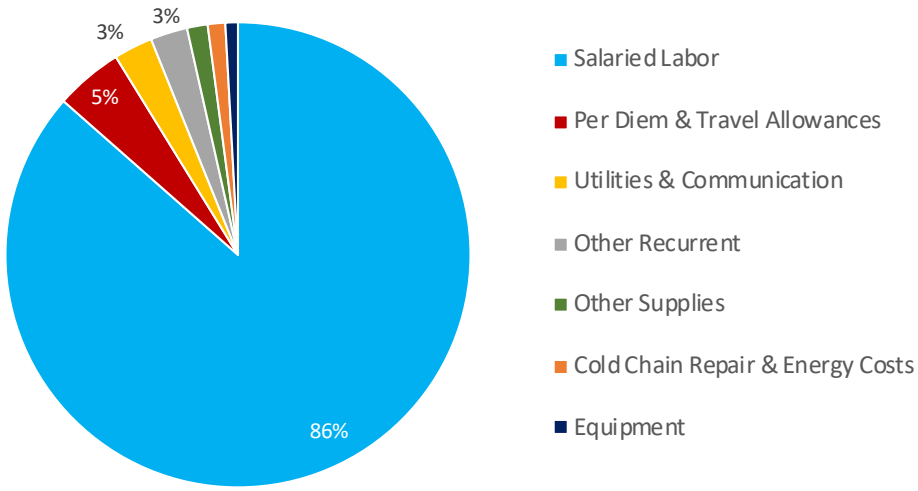
Delivery strategy	Total doses delivered	Cost per dose (fiscal cost)		
		Overall	Urban areas	Rural areas
TT facility-based vaccination	305,723	$1.76	$1.70	$1.79
TT outreach-based vaccination	137,354	$3.86	n/a*	$3.59
TT school-based vaccination	656,923	$1.49	$1.33	$1.40
Td vaccination through campaigns	82,603	$3.56	n/a	n/a

* There was no outreach done in urban areas.

[2] 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).

For TT vaccination, salaries made up 86% of costs at the facility level, followed by per diem and travel allowances (Figure 1). Differences in salaries were the main driver behind variations in cost per dose between regions; higher staff costs in remote and mountainous areas leading to a higher cost per dose.

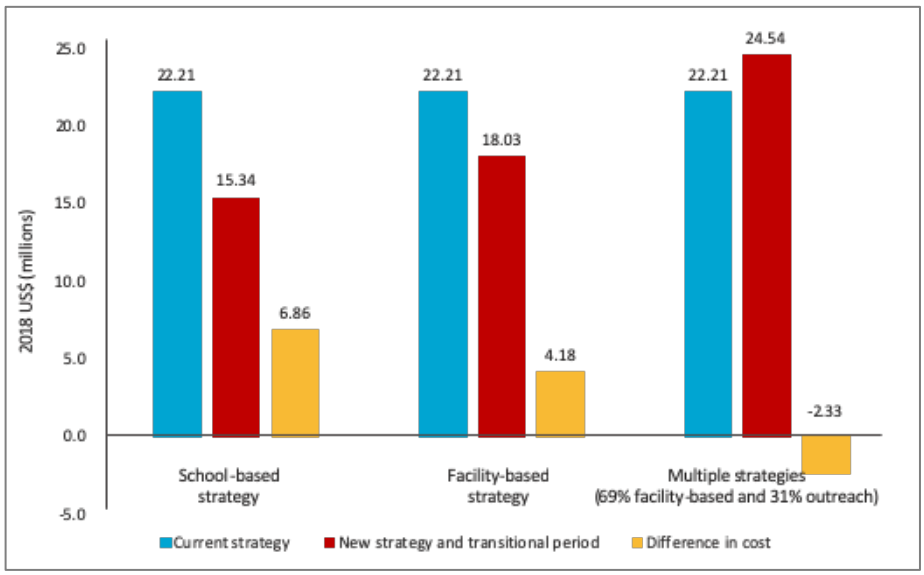
Figure 1: Share of cost at the facility level by line item[3]



Cost of routine delivery of Td vaccine through three potential scenarios

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. The study found that considerable savings could be made if a school or facility-based delivery strategy were selected for Td delivery: over the period 2018-2025, a cost saving of US$6.9 million for school delivery and US$4.2 million for facility delivery could be realized (Figure 2). The study found that an additional US$2.3 million would be incurred over that period if a mixed strategy of facility-based delivery with outreach is used.

Figure 2: Total cost of replacing TT delivery with Td delivery during 2018-2025



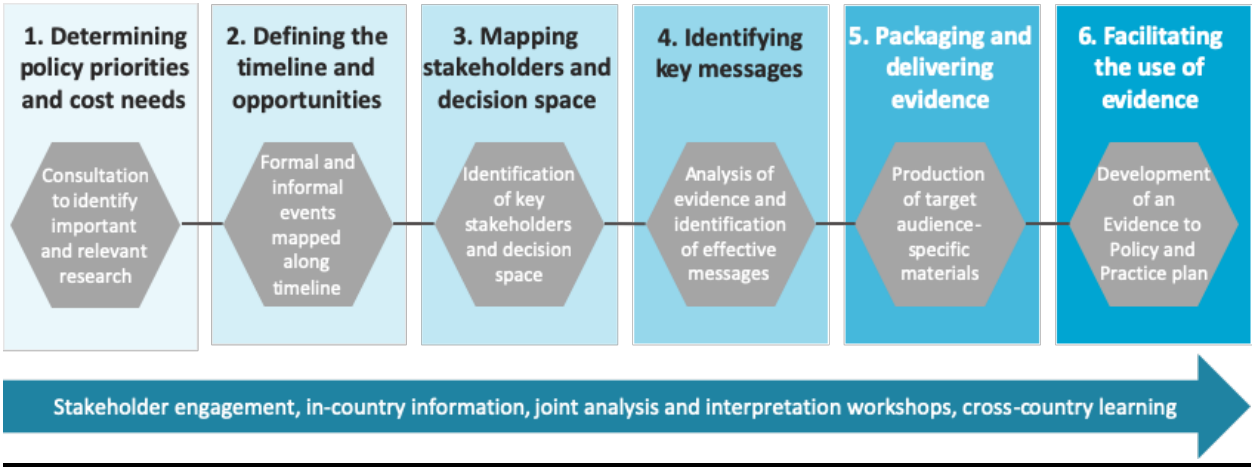
[3] There were no fiscal costs for the following categories: buildings, transport and fuel, vehicles and vehicle maintenance, volunteer labor, and printing.

Evidence to Policy and Practice (EPP) Framework

ICAN developed a 'six-step' Evidence to Policy and Practice (EPP) framework (Figure 3) with the aim of increasing the chances of decision makers understanding and using ICAN evidence for policy making, planning and budgeting. The framework describes the analytical journey that ICAN took with HUPH, NEPI, MOH, and other stakeholders, starting with early engagement to determine policy priorities and cost needs, through to cross-country workshops where key stakeholders as well as planning cycles and timing of decision making around budgets were identified, and finally through to joint analysis and interpretation meetings with NEPI to review findings and identify key messages.

In addition, in 2018 key stakeholders in Viet Nam worked with staff from JSI to devise a questionnaire that was used to gather information from 11[4] identified key informants on the landscape within which immunization budgeting and planning decisions are made. The findings from these interviews with key informants, along with the outputs of the cross-country workshops and joint analysis and interpretation meetings, form the basis of the Viet Nam EPP Plan.

Figure 3: ICAN framework for evidence to policy and practice (EPP)



Viet Nam EPP Plan

1. Policy priorities and costing needs

To ensure the policy relevance of the research question, HUPH worked with NEPI and ThinkWell to jointly identify costing needs, define the research questions around costing TT and Td vaccine delivery strategies, and elaborate the methodology. In fact, the research was requested by NEPI to inform their recommendation to the NITAG regarding Td introduction. This early engagement was followed by regular meetings between the research team and NEPI to clarify plans for Td introduction, determine potential scenarios for delivery, identify assumptions to guide projections around doses delivered and cost, and link the introduction decision to the health planning process.

2. Timeline and opportunities for the use of ICAN evidence

Three key opportunities with potential entry points for the presentation and use of the ICAN evidence have been identified: 1) the Td introduction strategy decision-making process, the annual national and provincial EPI planning cycle, and the development of the 2021-2025 National Health Plan. Other opportunities with potential for ICAN evidence use include: the NEPI Annual Vaccine Introduction Plan,

[4] From national level MoH EPI program, Hanoi Strategy and Policy Institute, PATH, UNICEF, USAID, WHO, and World Bank.

ongoing costing work on delivering essential health packages for the Government's Universal Health Coverage (UHC) and primary health care (PHC) work, and policy discussions around the inclusion of vaccines in the health insurance package. Table 2 shows the key opportunities for the use of ICAN evidence and Table 3 describes dissemination plans.

Table 2: Key opportunities for use of ICAN evidence

Opportunity	July – August 2019	Sept 2019 – March 2020	March – Dec 2020	2021 onward
Td Introduction Decision	Disseminate evidence to sub-national stakeholders while informing about Td introduction pilots	Pilot to prepare further evidence	Include in 5-year plan	Implement 5-year plan
Provincial Annual EPI Plan	Disseminate evidence to sub-national stakeholders to influence provincial annual EPI plan			
5-year National Health Plan	Disseminate evidence to key stakeholders to influence 5-year national health plan	Prepare further evidence	Finalize 5-year plan	Implement 5-year plan

Table 3: Dissemination plan for ICAN study results

Objective	Participants	Presenters
Inform Decision on Td Introduction	ICC members, NITAG members (Mr. H)	GDPM (MoH), NEPI
Inform Decision on Td Introduction – subnational rollout	DOH (Deputy Director), PPMC (Director + EPI), province representatives	NEPI, HUPH
Influence Provincial Annual EPI Plan	DOH (Deputy Director), PPMC (Director + EPI), province representatives	NEPI, HUPH
Influence 5-year National Health Plan	MOH (Mr. P, Mr. S), MOF (Ms. N), MPI (Ms. H), Gov't officials (Mr. T)	GDPM (MoH), NEPI, HUPH

3. Key stakeholders who can use ICAN evidence and their decision space

Figure 3 illustrates stakeholder engagement in the ICAN study, and Table 4 notes key stakeholders in budgeting and planning to be targeted with ICAN evidence. In terms of decision space mapping, there are opportunities when key stakeholders meet to plan and budget for the next cycle and for annual plans. Stakeholders from every province are convened for an annual meeting in Hanoi to review the health plan and budget. This presents an opportunity for broad dissemination. Dissemination will also occur through regional meetings with provincial representatives. Additionally, ICC meetings and meetings between the MOH Department of Planning and Finance and MOF will also be targeted.

Figure 3. Engagement of key stakeholders in the ICAN study

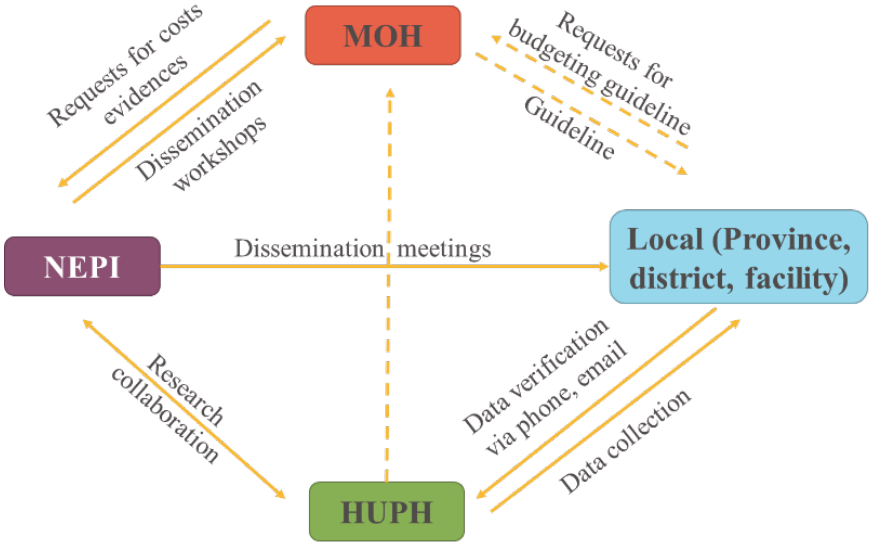


Table 4: Key stakeholders in immunization budgeting and planning in Viet Nam

National level	Sub-national level	Development partners	Potential champions
• Government's office • MOH Department of Planning and Finance • MOH NEPI • MOH Department of MNCH • MOF • Ministry of Planning and Investment (MPI) • NITAG • ICC	• Provincial people's committee • Provincial department of health • Provincial department of finance • Provincial department of planning and investment	• WHO • UNICEF • EU • World Bank • Asian Development Bank • JICA • PATH • CHAI	• National Assembly members involved with social health insurance law reform and PHC program design

4. Key ICAN messages and evidence

Table 5 outlines evidence to be presented, along with key messages, for each key opportunity for use of the cost evidence.

Table 5: Messages and evidence presented

Opportunity	Evidence to be Presented	Key Messages
Td Introduction Decision and 5-Year National Health Plan	1. WHO recommendation on Td delivery 2. Td implementation in the world 3. Disease burden in Vietnam: Tetanus + Diphtheria 4. Evidence on Td strengthening the immunity of both + Diphtheria 1. ICAN cost evidence + Cost-effectiveness Analysis + Budget Impact Analysis	• The new schedule would result in cost savings if a school or facility-based delivery strategy is selected. • A mixed methods approach (facility-based and outreach) may result in increased costs.

Opportunity	Evidence to be Presented	Key Messages
Annual EPI Budget and Plan	2. Range for cost per dose (vaccine, labor, supplies) a. By region and residence area (urban/rural) b. By delivery strategy 3. Comparison of facility-based cost per dose with other countries 4. Structure of delivery cost by line item	• Cost per dose is lowest for school delivery and highest for outreach and campaigns • 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. • Due to the high share of salaries of total costs, there is opportunity to consider PHC integration and deliver other health interventions at the time of Td in schools, stimulating more discussion between the health and education sectors

5. Presenting ICAN evidence and messages effectively

To ensure the use of ICAN cost evidence, it is important to present the evidence in a simple manner, tailored to different audiences. Research findings will not be disseminated solely at the national level, but at the provincial level too. Stakeholders suggested a number of formats for the presentation of ICAN cost evidence, but HUPH and NEPI agreed on a presentation for different audiences (global, national, provincial), a study report detailing the methodology and findings, and an executive summary of the study report.

6. Facilitating the use of evidence

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 will help influence other countries that have not yet introduced Td corresponding with cessation of TT. The global-level materials will support their learning.

Photo 1. Presentation of results at a workshop on immunization planning

Appendix 1: List of Viet Nam Stakeholders that Contributed to the EPP Plan

Name	Organization	Position
Caryn Bredenkamp	World Bank	Senior Economist
Duong Thi Hong	National Institute of Hygiene and Epidemiology, MoH National EPI Program, MoH	Deputy Director Deputy EPI Manager
Makiko Ilijima	WHO	Immunization Officer
Mai Khanh	National EPI Program, MoH	Officer
Vu Quynh Mai	Hanoi University of Public Health	Researcher
Nguyen Minh Hang	General Department of Preventive Medicines, MoH	Deputy Director
Nguyen Minh Hoang	Hanoi University of Public Health	Associate Professor
Hoang Van Minh	Hanoi University of Public Health	Vice Rector and Associate Professor
Phung Nguyen Cuong	Department of Planning and Finance, MoH	Vice-head, Division of Information and Statistics
Hoang Thi Lien	Hanoi University of Public Health	Officer
Tran Thi Mai Oanh	Health Strategy and Policy Institute	Director and Professor
Nguyen Thi My Hanh	Ministry of Health	Officer
Nihal Singh	WHO	Medical Officer, EPI
Momoe Takeuchi	WHO	Technical officer, Health Systems Strengthening
Tran Tuan Anh	Hanoi University of Public Health	Researcher, Center for Population Health Sciences
Nguyen Tuyet Nga	PATH and iCC member	Deputy Country Director
Sarah Bales	Independent consultant	Health Economist