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The Immunization Delivery Cost Catalogue: What it is, what it tells us, and how you can use it

Webinar | November 13, 2024 | 9AM-ET (2pm-UTC)

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Agenda

The Immunization Delivery Cost Catalogue: What it is, what it tells us, and how you can use it

- **Opening remarks**

- **The Immunization Delivery Cost Catalogue**: The status of evidence on immunization delivery costs in low- and middle-income countries

Flavia Moi
Senior Technical Advisor,
ThinkWell

- **Introducing Rotavirus Vaccine in Nigeria:** Immunisation Delivery Costing

Charles Okafor
Research Fellow,
University of Queensland

- **Adult Vaccination in Asia and the Pacific**: Policies, Financial Needs, and Fiscal Impacts

George Gotsadze
President,
Curatio International Foundation

- **Equity Assessment of Childhood Immunization at National and Subnational Levels in Myanmar**: A Benefit Incidence Analysis

Zin Mar Win
Research Specialist,
Community Partners International

- **Q&A**

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Things to note …

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Presentations and the recording will be posted on **Immunization Economics.org** and shared via **email** with you later this week

This webinar will be **recorded**

Please keep yourself **muted** during the presentations

Introduce yourself and **chat** with other participants and panelist using the **chat option** at the bottom of your screen

Ask **questions** using the Q&A function at the bottom of your screen

Flavia Moi

Senior Technical Advisor
ThinkWell

The Immunization Delivery Cost Catalogue:
The status of evidence on immunization delivery costs in low- and middle-income countries

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The Immunization Delivery Cost Catalogue

The status of evidence on immunization delivery costs in low- and middle-income countries

Flavia Moi

November 13th 2024

Outline

1. What is the IDCC?
2. State of the evidence on the cost of delivering immunization
3. What does it cost to deliver immunization in LMICs?
4. How you can use the IDCC

1

What is the Immunization Delivery Cost Catalogue?

What is the Immunization Delivery Cost Catalogue?

The Immunization Delivery Cost Catalogue (IDCC) is the most **comprehensive**, **current**, and **standardized database** on the cost of delivering vaccines in low- and middle-income countries

- First developed in 2017, updated in 2018, 2019 and 2024
- Scope: evidence published between Jan 2005 and May 2024
- Excel database downloadable from **https://immunizationeconomics.org/thinkwell-idcc/**

Systematic review of over 22,000 publications

↓

119 publications included
(only included studies estimating the delivery costs in LMICs based on **primary data**)

↓

1,156 unique unit costs
(cost per dose, per target person, per fully vaccinated person, standardized to 2022 USD)

Contributors**: Kelsey Vaughan, Flavia Moi, Michaela Mallow, Syed Najibullah, Afroja Yesmin, Christina Banks, Colby Wilkason, Juliana Stone, Annette Ozaltin, Laura Boonstoppel, and Logan Brenzel. **This work was funded by the Gates Foundation.

What can you find in the IDCC?

BACKGROUND INFORMATION			UNIT COSTS (2022 USD)				VACCINE DELIVERY				
Year of Publication	Article, Report or Project Title	Country	Cost per dose without vaccine (2022 USD)	Cost per dose with vaccine (2022 USD)	Cost per fully immunized person without vaccine (2022 USD)	Cost per fully immunized person with vaccine (2022 USD)	Routine vs SIA	Delivery Site	Delivery strategy (based on reported delivery site)	Delivery sector	Target delivery population
2022	Projecting the cost of introducing typhoid conjugate vaccine (TCV) in the national immunization program in Malawi using a standardized costing framework	Malawi	$ 0.92	$ 3.42	$ 0.92	$ 3.42	Routine	Static, outreach, and mobile clinics	Multiple strategies	Public	Infants (0-1 year)
2022	The economic impact of the switch from single- to multi-dose PCV13 vial in Benin	Benin	---	$ 5.89	---	---	Routine	Health facilities	Facility-based	Public	Infants (0-1 year)

Cost of delivering immunization by:

- ✓ Location/setting (country, urban/rural)
- ✓ Antigen costed
- ✓ Target population
- ✓ Delivery modality and strategies

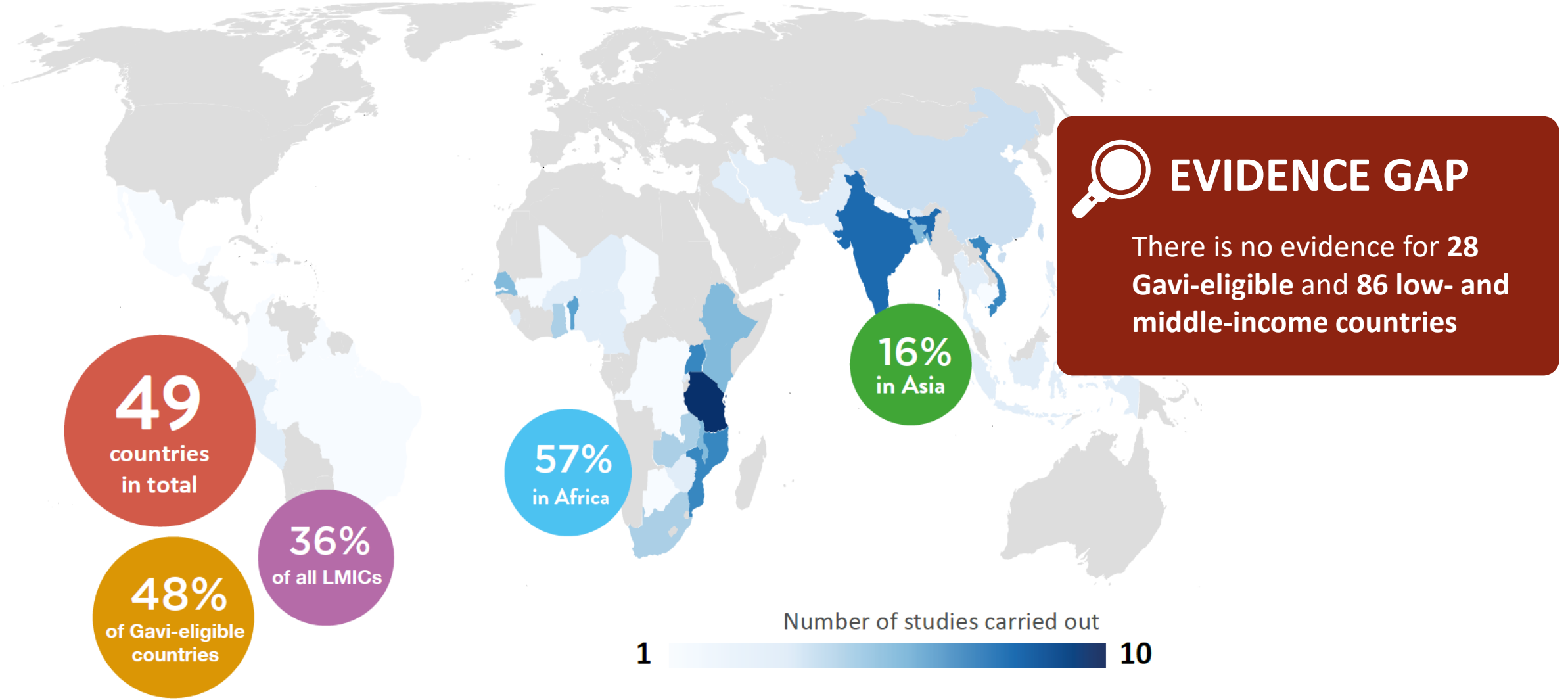
Study-related details:

- ✓ Cost categories included (salaries, cold chain, etc.)
- ✓ Type of costs (fin vs. eco, start up vs. recurrent, full vs. incremental)
- ✓ Study design, objectives, sample, methods
- ✓ Paper/report title, authors, publication date, etc.

2

What is the state of the evidence on the cost of delivering immunization?

For what countries do we have cost evidence?

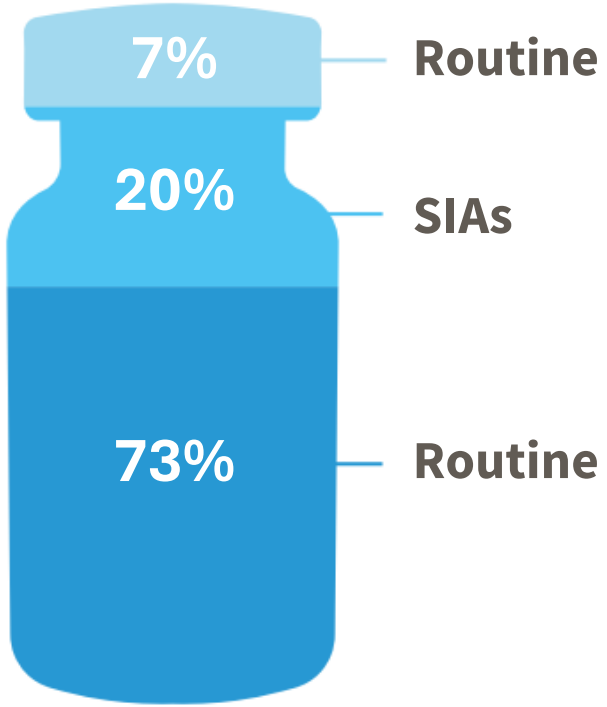


EVIDENCE GAP

There is no evidence for **28 Gavi-eligible** and **86 low- and middle-income countries**

For what delivery modalities do we have cost evidence?

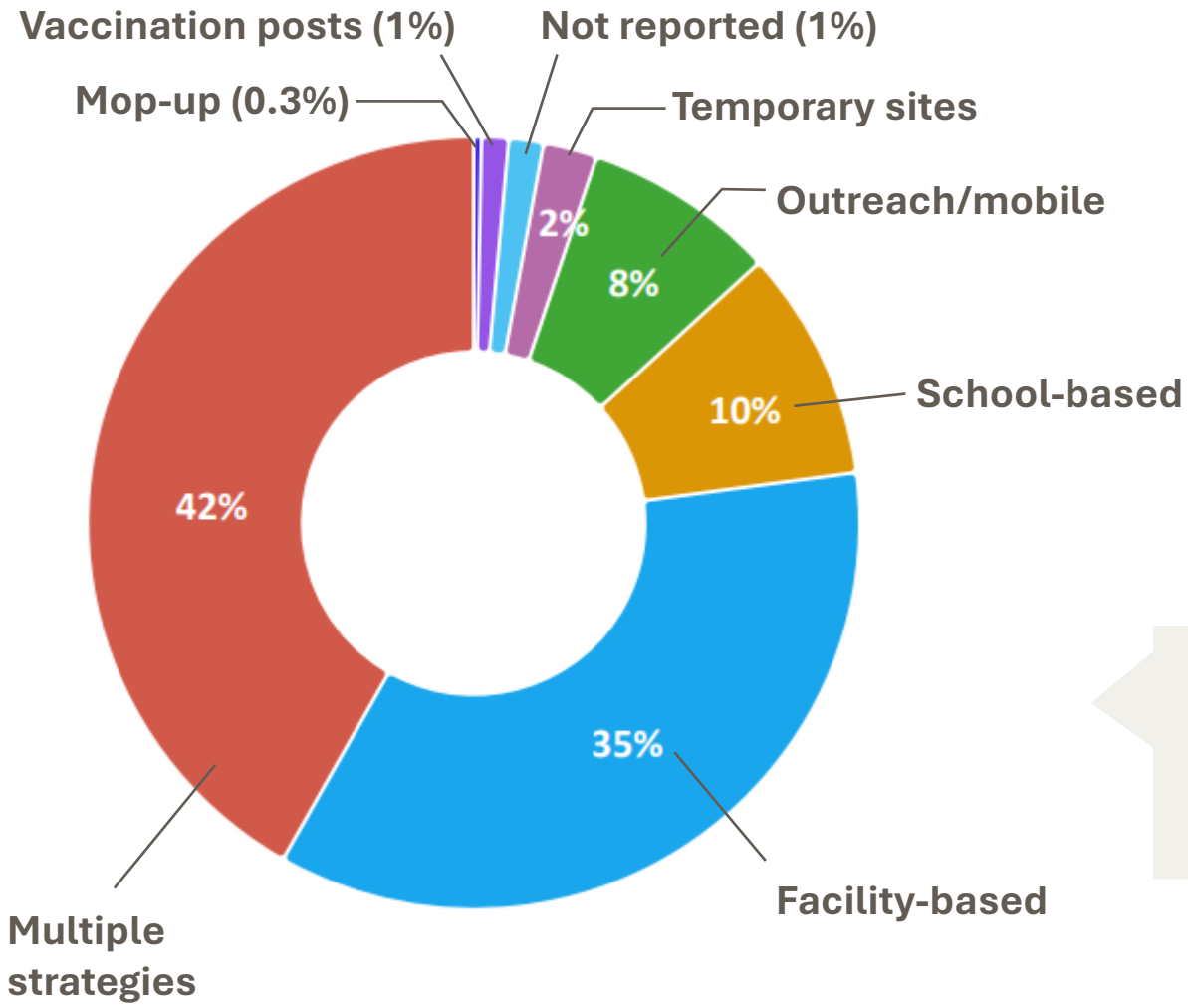
73% of the data points cover **routine delivery**, while **20%** are for **supplementary immunization activities (SIAs)**



EVIDENCE GAP

Little evidence for **different types of SIAs**: subnational campaigns, integrated campaigns, PIRI, local outbreak responses, etc.

For what delivery strategies do we have cost evidence?



EVIDENCE GAP

Only 16% of studies include costs for **more than one strategy**, allowing for a comparison of the **cost-efficiency** of different strategies in the same context

Most evidence is for **facility-based delivery** or **multiple strategies combined** (e.g. one cost estimate for facility-based + routine outreach)

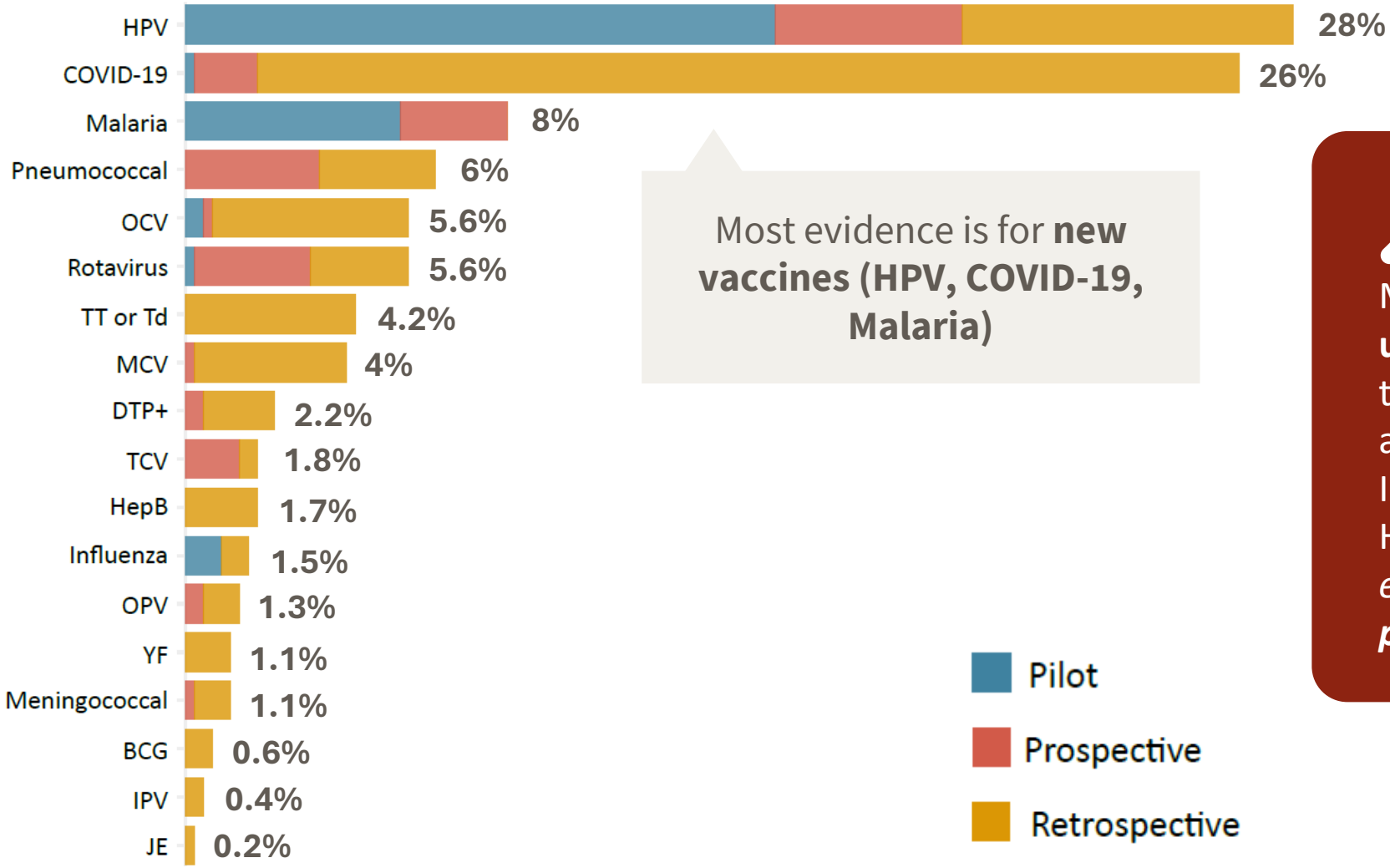
For what target populations do we have cost evidence?

Most evidence is for **childhood vaccination programs** and **pre-teens** (HPV)

EVIDENCE GAP

Very little or no evidence for specific target populations, like **zero-dose** children, elderly, **pregnant women**

What evidence is there for single-antigen vaccine delivery?



Most evidence is for **new vaccines (HPV, COVID-19, Malaria)**

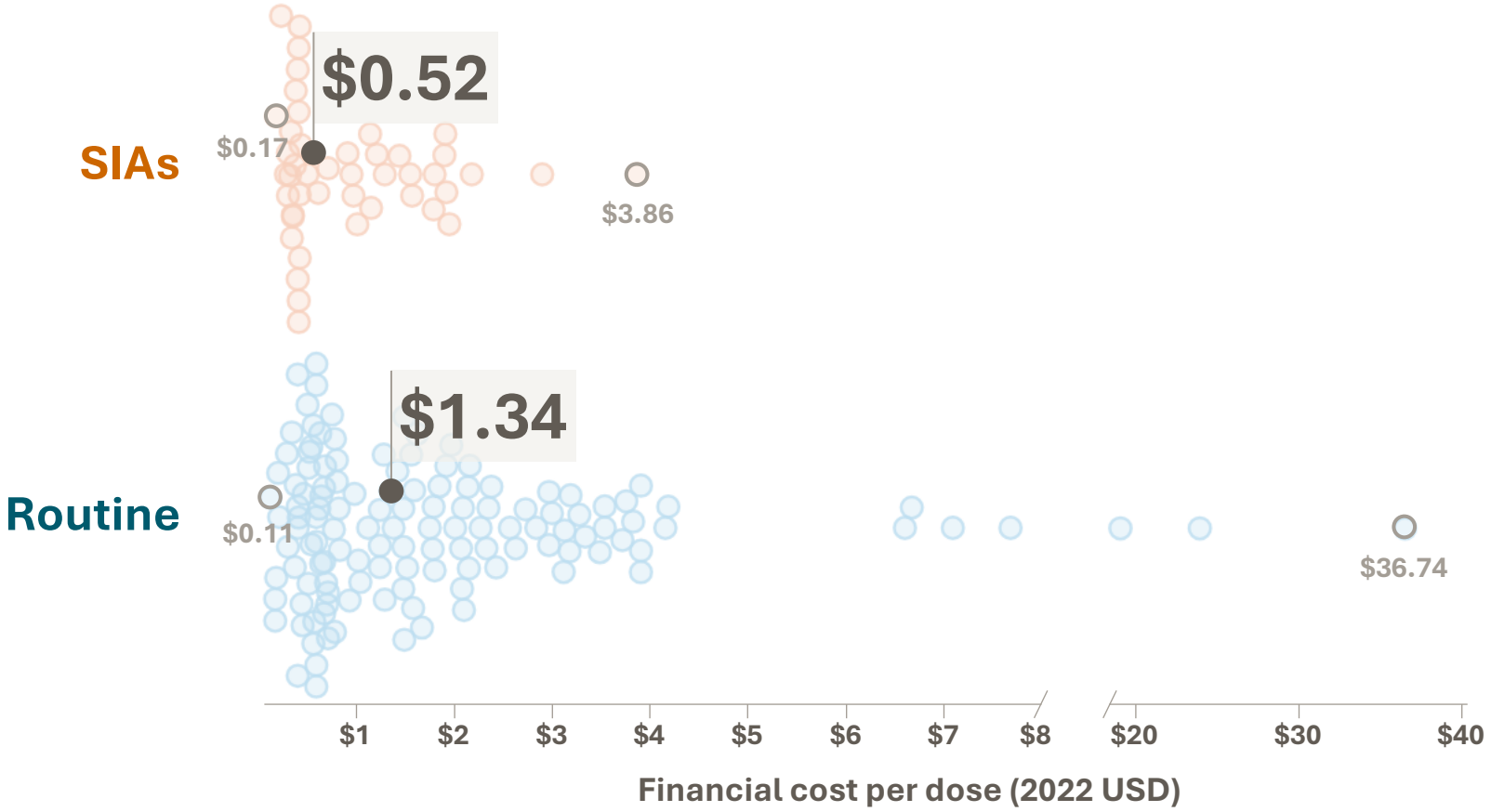
EVIDENCE GAP

More evidence is needed on **scaled up delivery** of malaria, PCV delivery to adults, and new vaccines approved under Gavi's 2024 Vaccine Investment Strategy: mpox, dengue, HepE, GBS. *(For some, modelled cost estimates exist but **none based on primary data**)*

2

What does it cost to deliver immunization in LMICs?

Routine delivery is often more costly per dose supplemental immunization activities (SIAs)



- SIAs include **campaigns**, **outbreak responses**, **child health days**, etc.
- Holds true when looking at economic costs

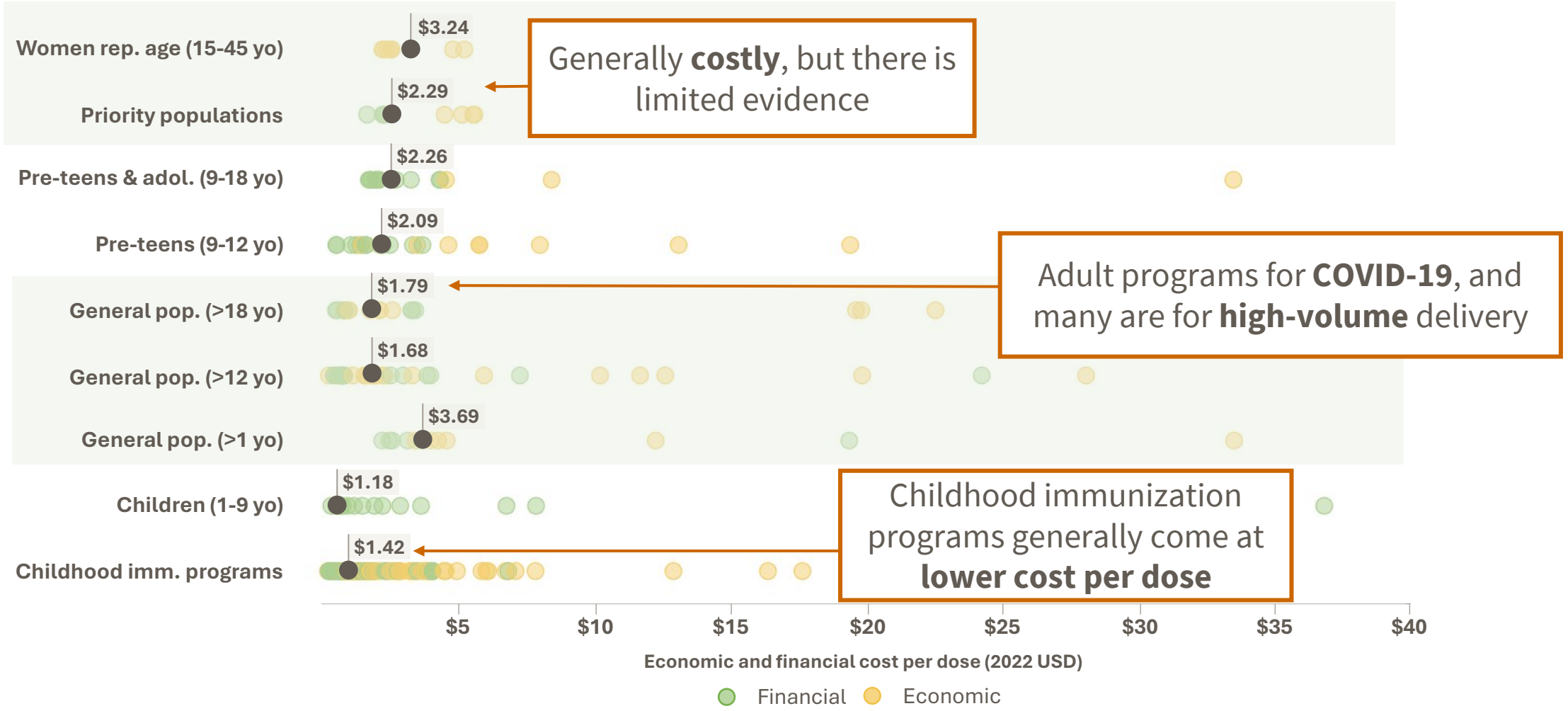
Note: Excludes pilot delivery costs for: HPV, C19, Malaria, OCV and Rotavirus. Methods used and cost components may differ among the studies included. Each dot represents one unit cost in the IDCC, some dots may be from the same study.

Outreach/mobile is the costliest among all delivery strategies

- **Facility-based** delivery tends to be **less costly** per dose
- High degree of **variation** particularly for **outreach/mobile**

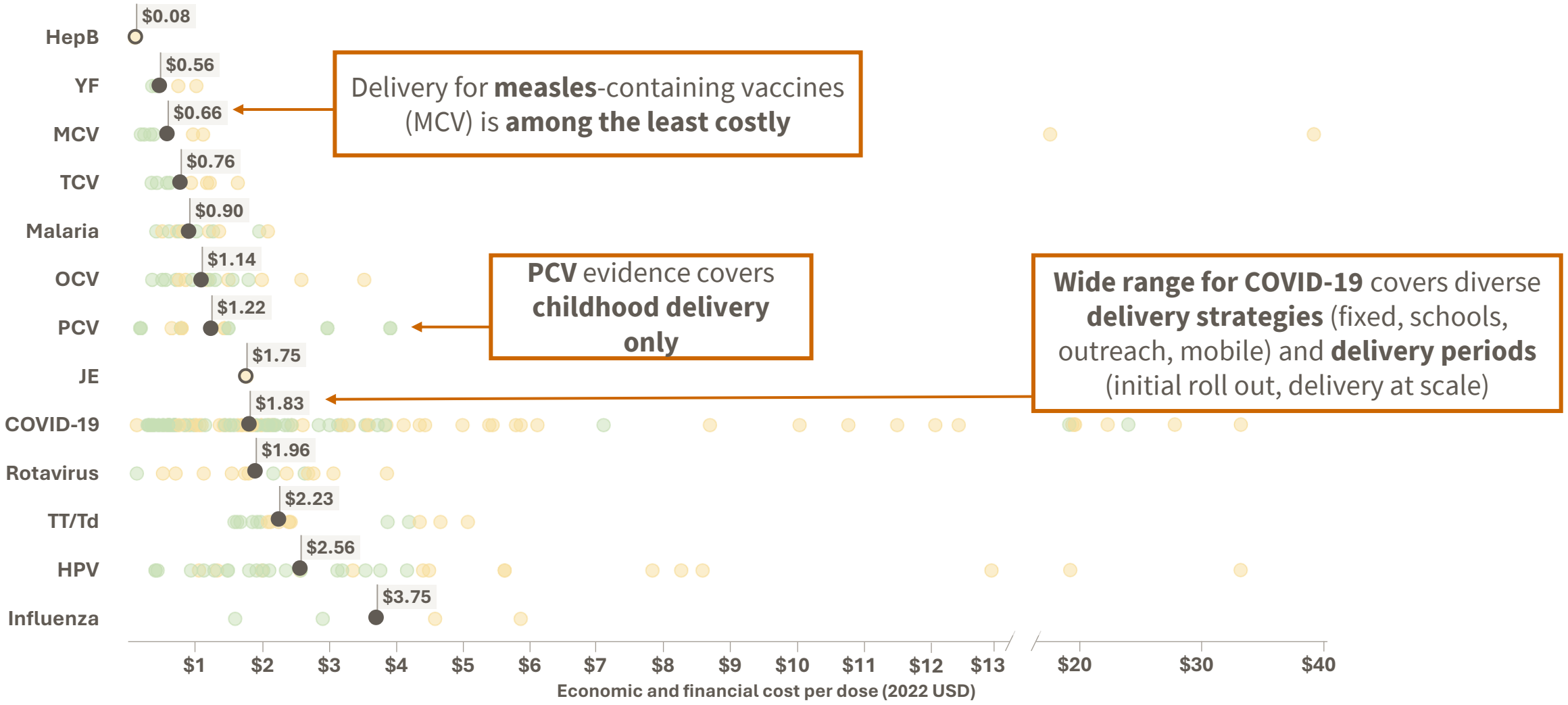
Note: Excludes pilot delivery costs for: HPV, C19, Malaria, OCV and Rotavirus. Methods used and cost components may differ among the studies included. Each dot represents one unit cost in the IDCC, some dots may be from the same study.

Targeting adults through routine delivery is more costly than reaching children



Note: **Only includes routine delivery.** Methods used and cost components may differ among the studies included. Each dot represents one unit cost in the IDCC, some dots may be from the same study.

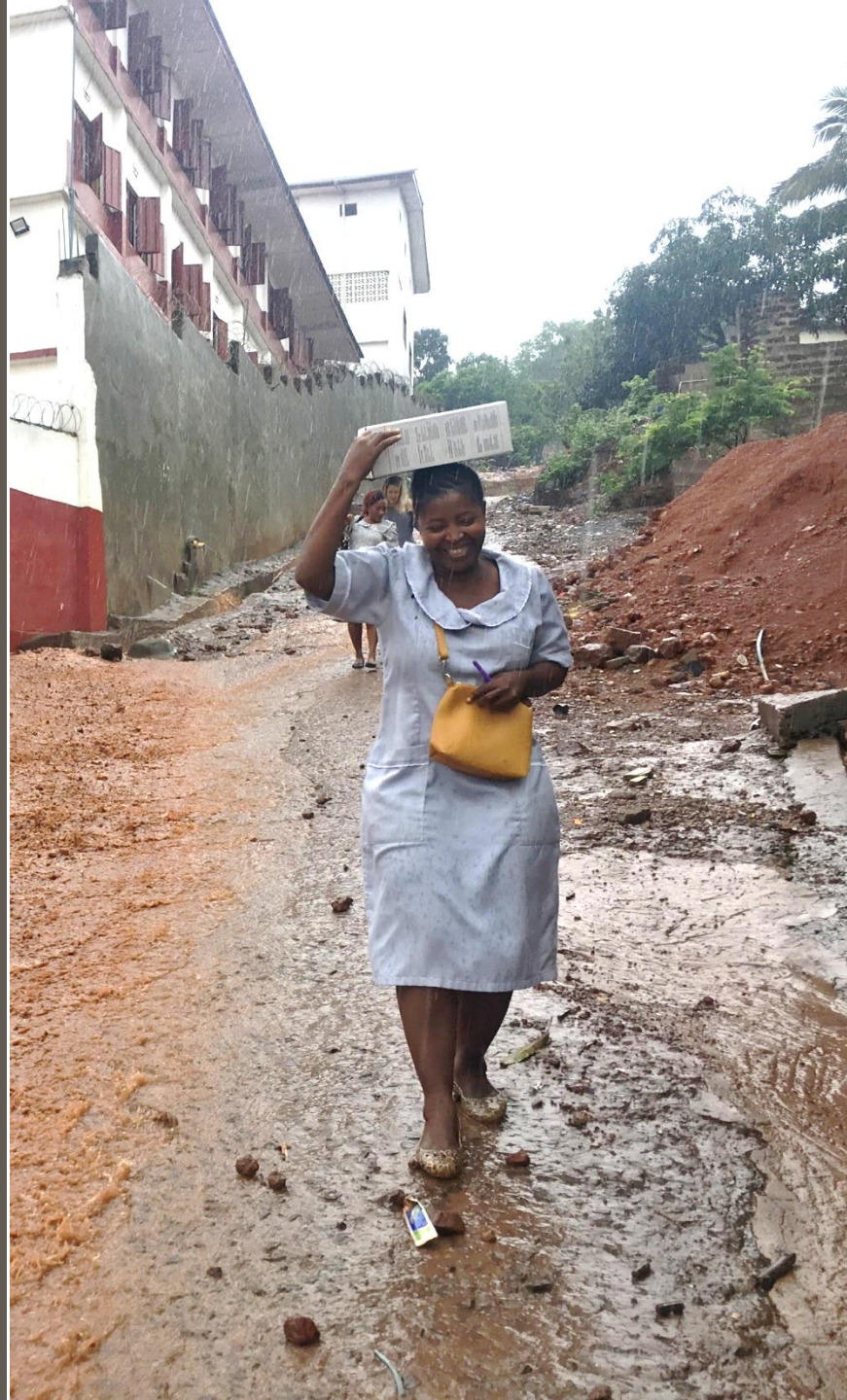
Vaccines targeting adolescents, adults and priority groups are generally costlier to deliver per dose



Note: Includes both routine and SIA delivery. Excludes pilot delivery costs for: Malaria, OCV, Rotavirus, HPV and COVID-19. No MenA data points available for cost per dose estimates. Methods used and cost components may differ among the studies included. Each dot represents one unit cost in the IDCC, some dots may be from the same study.

3

How you can use the Immunization Delivery Cost Catalogue



How can you use the Immunization Delivery Cost Catalogue?

Who can use the IDCC?

- Immunization managers
- CSOs & advocacy groups
- Donors
- Policy makers
- Country, regional and global partners
- Manufacturers
- Researchers

You can use IDCC data to:

- ✓ **Plan and budget** for immunization programs or SIAs
- ✓ Decide on new **vaccine introductions**
- ✓ Develop national **financing strategies** for immunization
- ✓ Develop **investment cases** for vaccines
- ✓ Support **resource mobilization**
- ✓ Identify cost-efficient **delivery strategy** mix and improve **resource allocation**
- ✓ Model delivery costs for new **vaccines in the pipeline**

A few examples of how the IDCC has been used:

- ✓ Generate **standardized estimates for LMICs** for which we don't yet have evidence Portnoy et al (2020)
- ✓ Inform global resource needs for COVID-19 delivery during the pandemic UNICEF (2022)
- ✓ Additional costs of conducting campaign and delivering routine vaccines during the COVID-19 pandemic Banks et al (2021)
- ✓ Cost of immunization programs in LMICs **to estimate global resource needs** Sim et al (2021)
- ✓ Cost of reaching global immunization targets **for global resource mobilization** Sriudomporn et al (2022)
- ✓ **Cost-effectiveness**, **risk-benefit** and **cost-benefit** analyses across **countries** Debellut et al (2021) and Okafor and Ekwunife (2021)

THE IMMUNIZATION DELIVERY COST CATALOGUE

THE STATUS OF EVIDENCE ON IMMUNIZATION DELIVERY COSTS IN LOW- AND MIDDLE-INCOME COUNTRIES

THINK WELL

WHAT IS THE IMMUNIZATION DELIVERY COST CATALOGUE?

The Immunization Delivery Cost Catalogue, or IDCC, is the most comprehensive, current, and standardized database on the cost of delivering vaccines in low- and middle-income countries. The IDCC is based on a systematic review of over 22,000 publications, that present primary data from low- and middle-income countries. It includes 1,156 unique unit costs from 119 publications published between January 2005 and May 2024. More information on the definitions used in this brief can be found on page 9, and details on the methodology used for the IDCC are available here.

WHO IS IT FOR?

National and sub-national planners and policymakers, researchers, and international partners supporting country immunization and health system policy. Data may be useful for budgeting, planning, policymaking, research, advocacy, and beyond.

WHAT IS IN THIS BRIEF?

This brief presents a descriptive analysis of the IDCC, showing what evidence on the cost of immunization delivery is available and what are the current evidence gaps. The brief also illustrates delivery cost per dose for routine and supplementary immunization activities (SIAs), key antigens, delivery strategies, and target populations.

WHAT'S NEW IN THE IDCC

The 2024 update adds 607 unit costs from 62 country studies—including from 12 countries previously not represented in the IDCC—published in 52 resources.

- 15 Studies on delivering HPV vaccines at scale
- 11 Studies on C19 vaccine delivery
- 8 Studies on the new malaria vaccine
- 28 Studies for supplementary immunization activities
- 9 Studies covering more than one delivery strategy

FOR WHAT COUNTRIES DO WE HAVE COST EVIDENCE?

For country specific data, jump to page 9 .

DOWNLOAD THE IDCC DATABASE HERE

IMMUNIZATION ECONOMICS.ORG

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Thank you!

Want to know more?

XLS

Find our **brief**, **methods guide** and download the **IDCC excel** at:
https://immunizationeconomics.org/thinkwell-idcc/

More questions? **fmoi@thinkwell.global**

Charles Okafor

Research Fellow
University of Queensland

Introducing Rotavirus Vaccine in Nigeria: Immunisation Delivery Costing

The Immunization Delivery Cost Catalogue: What it is, what it tells us, and how you can use it

Webinar | November 13, 2024 | 9AM-ET (2pm-UTC)

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Introducing Rotavirus Vaccine in Nigeria: *immunisation delivery costing*

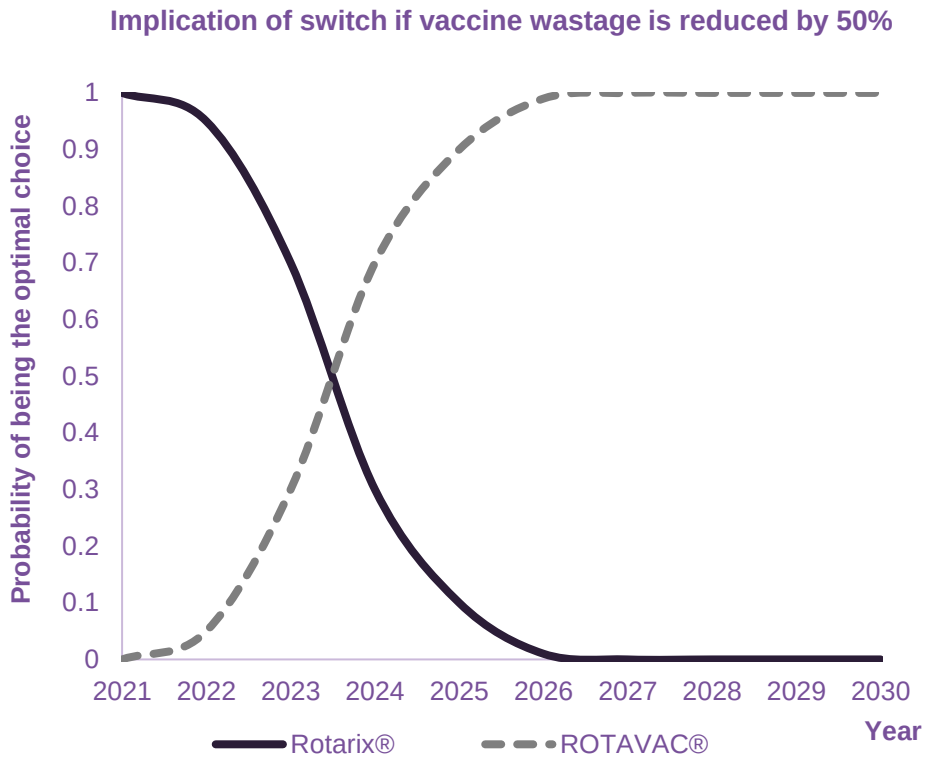
Charles Okafor

Introduction

- This study aimed to inform the decisions of Nigeria's health policymakers on the costs, benefits, and implications of introducing rotavirus vaccine to the National Expanded Program on Routine Immunisation.
- As of 2021, Nigeria was still planning to introduce rotavirus vaccine into routine immunisation schedule. *Introduced in August 2022.*
- Gavi, the Vaccine Alliance has approved the extension of the transition period for the country until 2028.
- This study was an economic evaluation using a Markov model. It compared four approaches: 'no vaccination', vaccination with Rotarix®, ROTAVAC®, and ROTASIIL® over 10 years (2021 – 2030).
- Data were sourced from IHME, IDCC, systematic reviews, clinical trials, WHO and UNICEF.

Key result

Outcome	Rotarix®	ROTAVAC®	ROTASIIL®
Mean cost of vaccine (US$)	**2.66 (2.61 – 2.71)**	**2.03 (1.99 – 2.07)**	**1.89 (1.86 – 1.92)**
Mean immunisation delivery cost (US$)	**2.14 (2.10 – 2.18)**	**2.82 (2.77 – 2.87)**	**3.14 (3.08 – 3.20)**
ICER ($/DALY)	**100 (71 – 130)**	**103 (78 – 126)**	**111 (87 – 134)**
Total vaccination programme cost (US$)	**209,501,772**	**210,526,022**	**216,643,336**
Cost savings for starting with Rotarix and switching to ROTAVAC after year 2027 (US$)	**2,740,365**	**--**	**--**
Total averted cases of RVGE death for 10 years	**194,063**	**189,262**	**182,628**
Net budget impact (US$)	**76,886,069**	**78,934,105**	**86,464,635**
Benefit-cost ratio	**27.00**	**26.10**	**24.30**
Rotarix cost-effective between 2021 – 2027, while ROTAVAC cost-effective from 2028 to 2030			



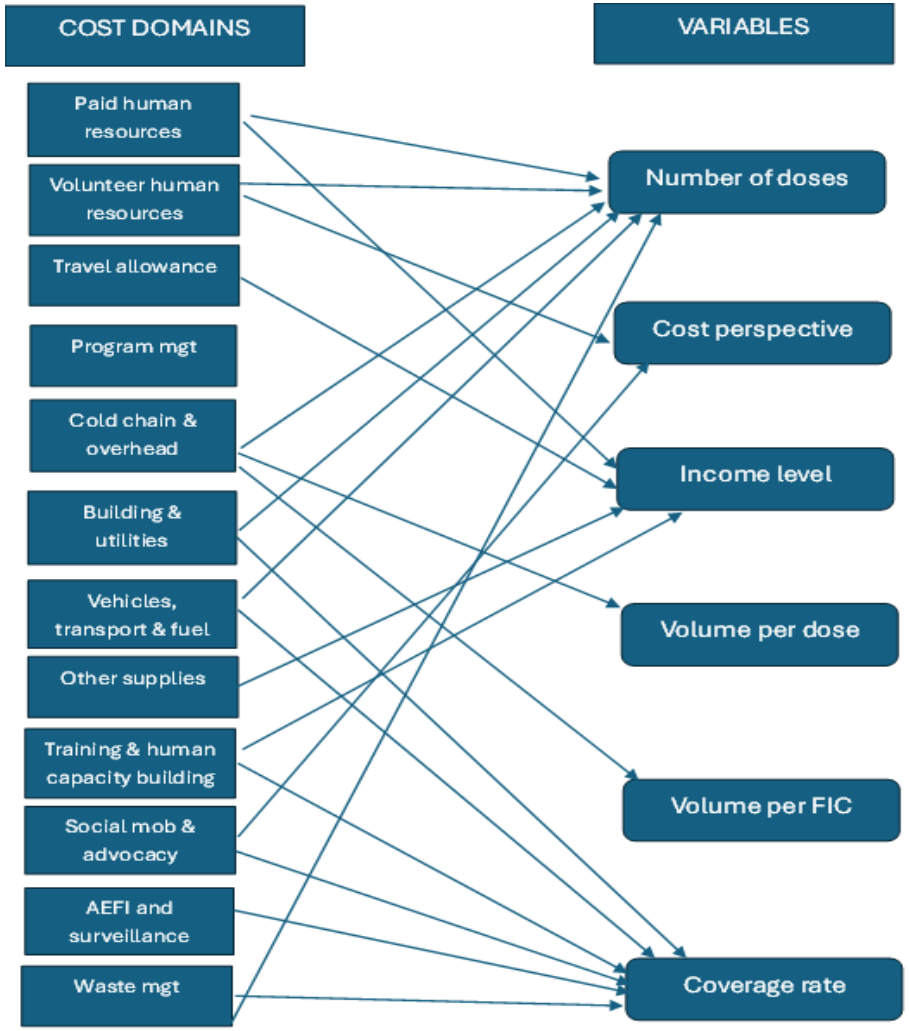
How was the immunisation delivery cost estimated

Estimating the immunisation delivery cost

- Vaccine
  - Volume per dose (e.g., OCV 1.5mL **vs** Rotarix® 1.5mL **vs** ROTAVAC® 0.5mL **vs** ROTASIIL® 2.5mL).
  - Volume per FIC (e.g., 23.5cm3 for Rotarix®; 12.6cm3 for ROTAVAC®; and 31.5cm3 for ROTASIIL®).
  - Number of doses for FIC (e.g., 2 doses or 3 doses)
- Country's income level (e.g., Lower-middle income country).
- Target population or vaccine coverage rate (e.g., 49% for Nigeria **vs** 64% for Ghana **vs** 94% for Bangladesh (DTP3) **vs** 87% for Moldova).
- Cost perspective (e.g., Economic or Financial).
- Example: Cost of the vaccine per FIC = $2.14 or $2.82 in Nigeria **vs** $2.46 in Moldova **vs** $0.90 per dose in Ghana [measles, RV, PCV13]). $2.11 in Bangladesh (OCV).

Estimating the immunisation delivery cost cont'd

Variable	Unit Weight	Levels (unit)	Ref. weight (Ghana)	Ref. weight (Moldova)	Target weight
Volume per dose	0.05	5 (0.5 mL)	0.15	0.15	0.05
Volume per FIC	0.05	3 (15 cm3)	0.078	0.078	0.042
Number of doses	0.3	4 (1 dose)	0.6	0.6	0.9
Income level	0.2	4	0.4	0.4	0.4
Coverage rate	0.3	5 (20%)	0.54	0.09	0.765
Cost perspective	0.1	3	0.3	0.3	0.2
Total weight	**1**	**n/a**	**1.8517**	**1.518**	**2.357; 2.093**
Cost (2019 US$)	**n/a**	**n/a**	**~2.08** (Rotarix®)	**~1.34** (Rotarix®)	**~2.40** (ROTAVAC®) **~2.12** (Rotarix®)



PharmacoEconomics - Open (2021) 5:545–557
https://doi.org/10.1007/s41669-020-00251-6

ORIGINAL RESEARCH ARTICLE

Introducing Rotavirus Vaccination in Nigeria: Economic Evaluation and Implications

Charles Ebuka Okafor[1,2]

Accepted: 20 December 2020 / Published online: 7 January 2021

Introducing rotavirus vaccine in eight sub-Saharan African countries: a cost–benefit analysis

Charles E Okafor, Obinna I Ekwunife

Lancet Glob Health 2021; 9: e1088–100

Summary

Background Stimulated by the economic challenges faced by many sub-Saharan African countries and the changes in the rotavirus burden across these countries, this study aimed to inform the decision of health policy makers of

THANK YOU

Contact

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Adult Vaccination in Asia and the Pacific: policies, financial needs, and Fiscal Impacts

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Adult Vaccination in Asia and the Pacific: policies, financial needs, and Fiscal Impacts

Prof. George Gotsadze

November 13, 2024

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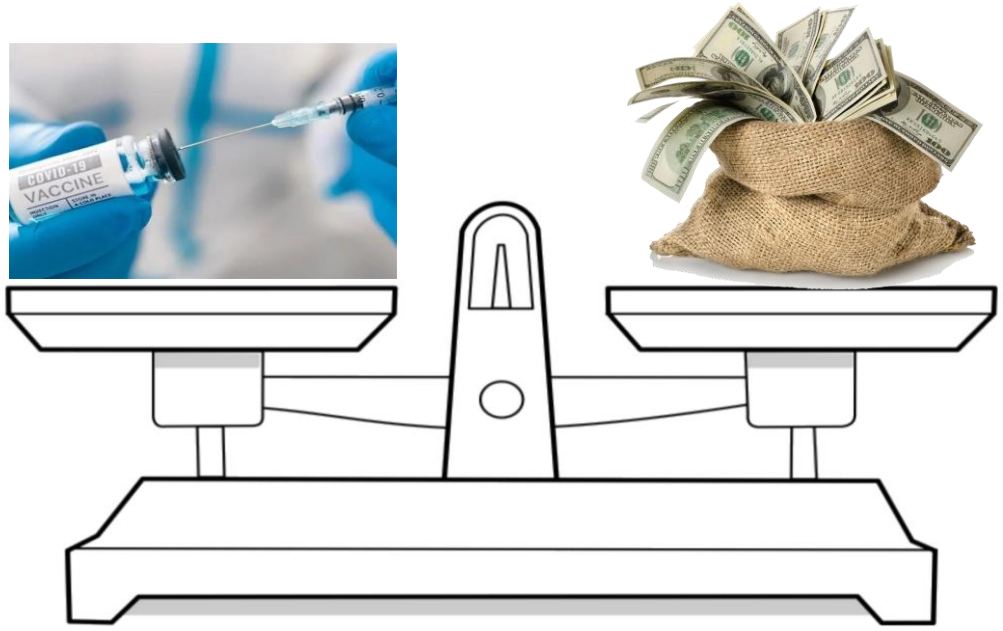
30 Years for Better Health Systems

Study Objectives



Estimate total program costs for COVID-19 and other adult vaccination programs in 40 countries

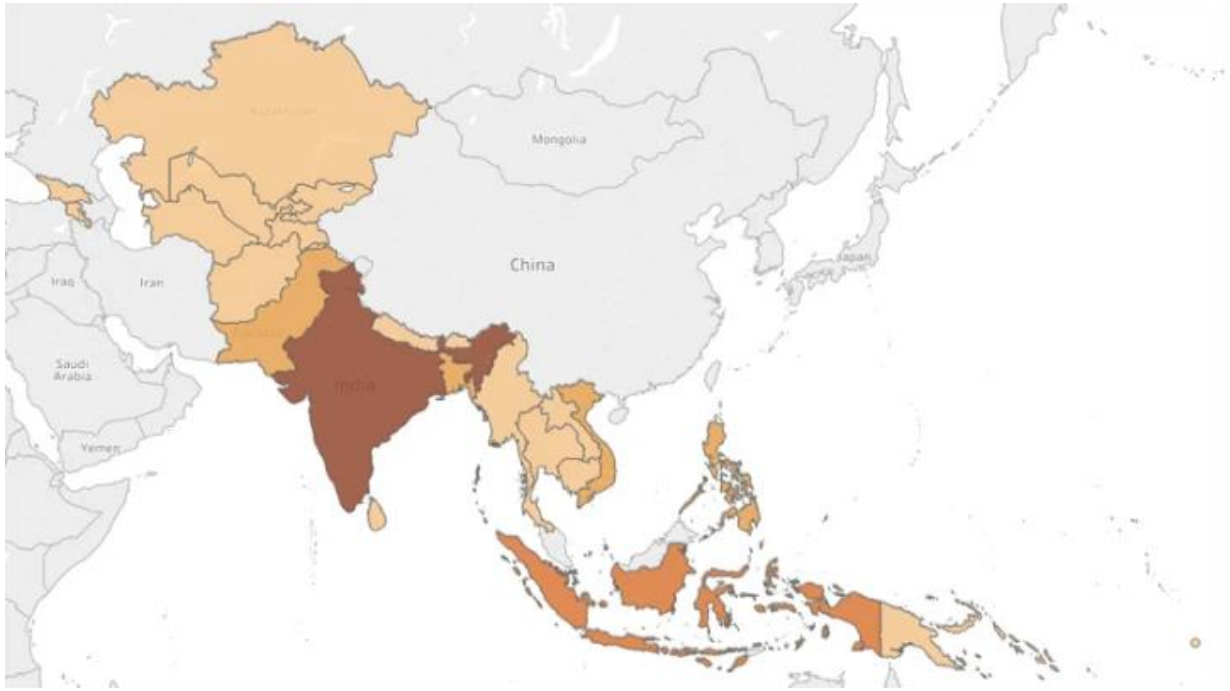
Estimate the expected fiscal impact of COVID-19 and other adult vaccination programs

CURATIO INTERNATIONAL FOUNDATION

30 Years for Better Health Systems

Study Coverage

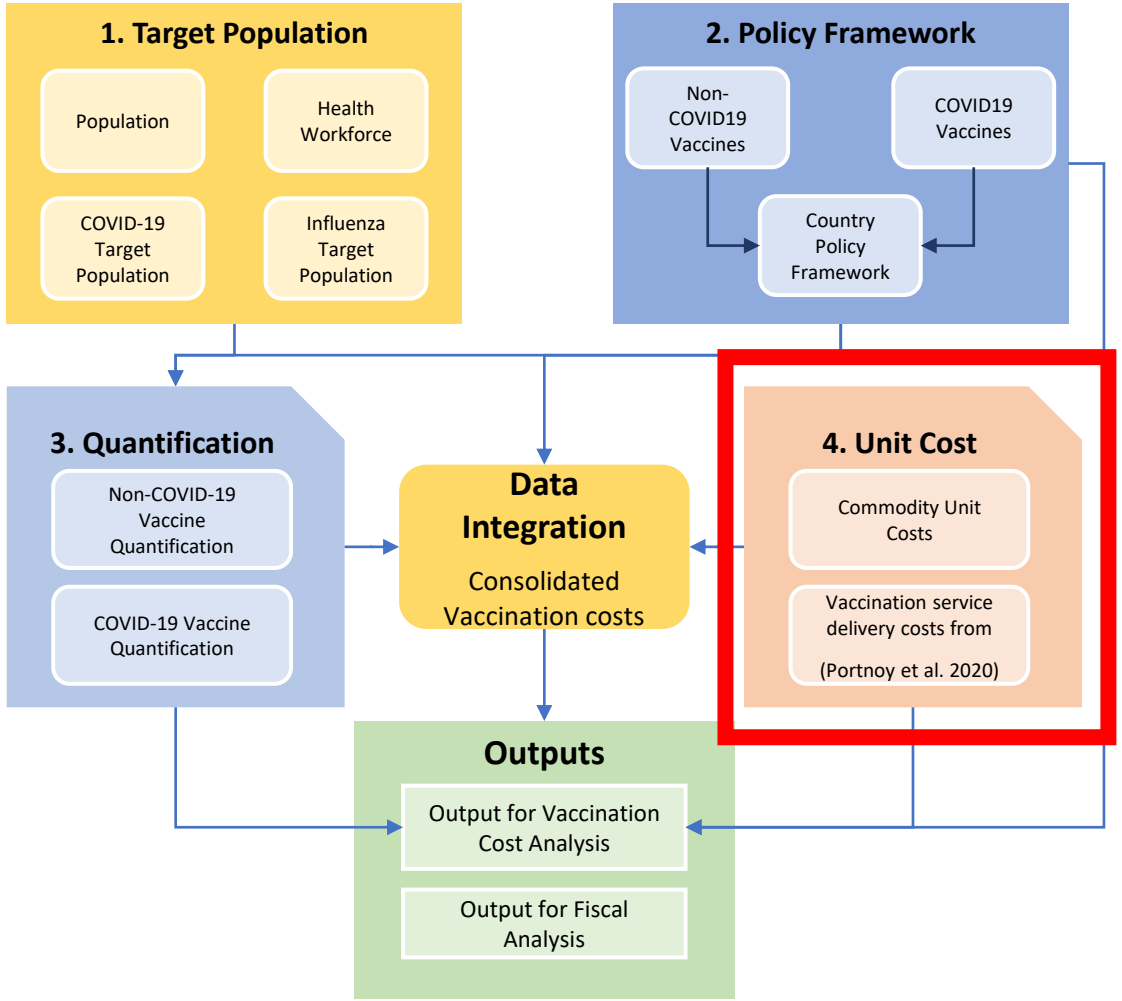
- **Countries:** All 40 Developing Member Countries (DMCs) of the Asian Development Bank
- **Vaccines:** WHO recommended vaccines for >18 years and included or planned for introduction in DMCs' national immunization schedule
- **Estimated costs** included:
  - **Vaccine requirements, inclusive of wastage rates**
  - **Ancillary supply costs**
  - **Vaccine delivery, i.e., health system costs**
- **Temporal Coverage:** 5-year period (2023–2027)
- **Fiscal impact analysis** relative to:
  - General Government expenditure and
  - Government expenditure on health



Developing Member Countries
Source: https://www.devex.com


Results

Estimating Financial Needs



Portnoy A, Vaughan K, Clarke-Deelder E, Suharlim C, Resch SC, Brenzel L, Menzies NA. Producing Standardized Country-Level Immunization Delivery Unit Cost Estimates. Pharmacoeconomics. 2020 Sep;38(9):995-1005. doi: 10.1007/s40273-020-00930-6

More Details on Cost Estimation

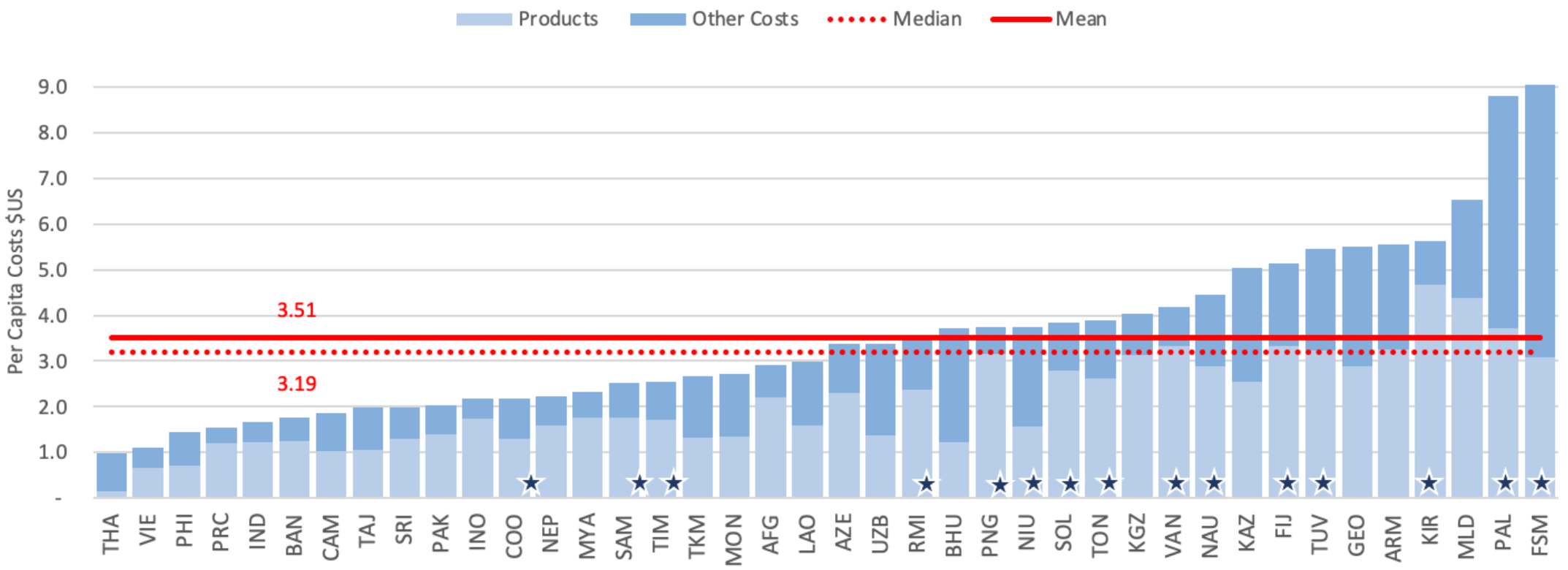
- For vaccine prices, we used **income group-specific mean price** with 95% (CI) generated from the WHO vaccine market intelligence database over the period 2013-2021
- For COVID-19, we analyzed the vaccine price database downloaded from UNICEF, containing 99 records with a price per dose for different types of vaccines. We excluded China and India as the largest consumers of the vaccines produced locally.
- The syringes and safety boxes cost were estimated using UNICEF supply division prices.
- Instead of modeling service delivery costs ourselves, we used standardized country-level immunization delivery unit costs available from www.ImmunizationEconomics.org for selected DMCs.

Final outputs for immunization cost estimates

- Cost of vaccines & injectables
- Cost of Immunization Delivery
- Recurrent Costs
- Capital Costs
- Total annual cost of program with 95CI Lower Bound and 95CI Upper Bound

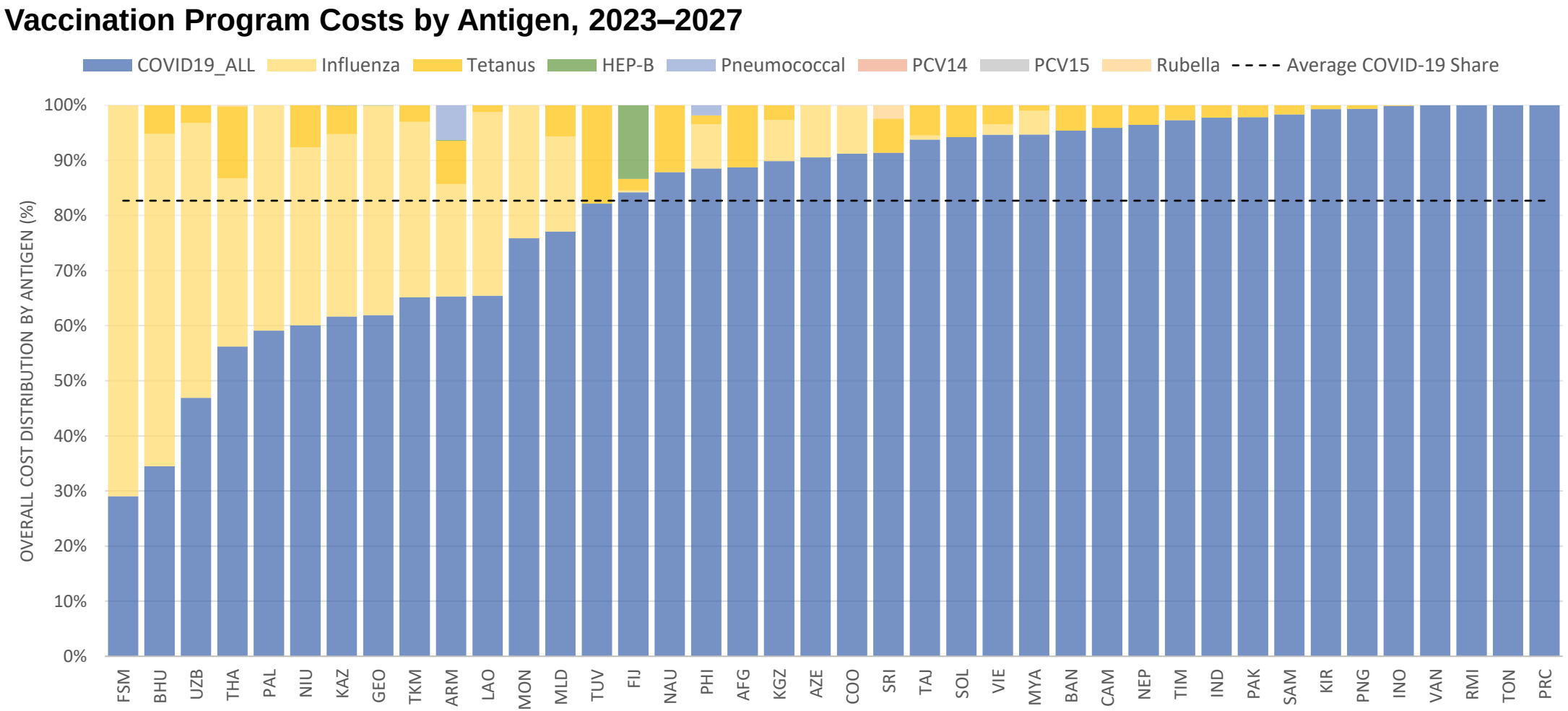
Total Cost of Delivering Adult Immunization

Average per Capita Cost for 2023–2027 ($)



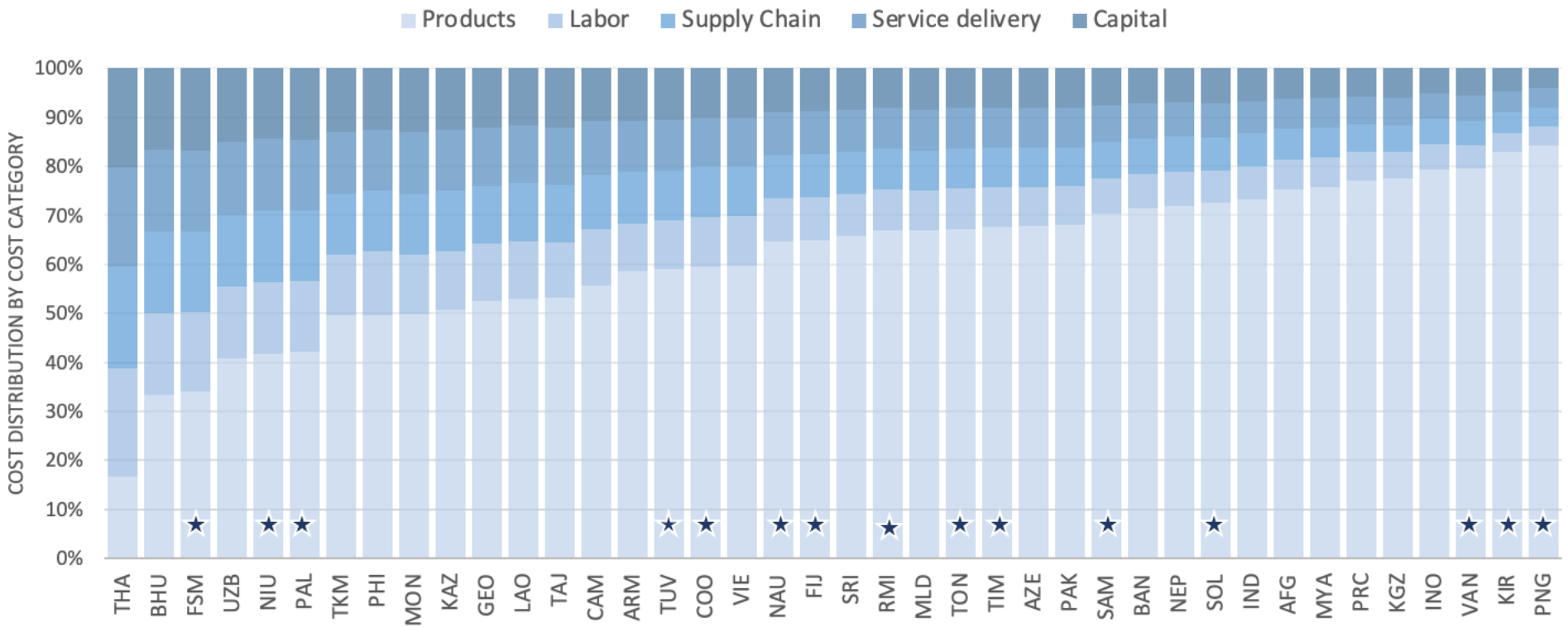
- There is a marked variation in the average cost per capita to deliver COVD-19 and adult immunization programs across developing member countries
- Three factors explain these differences: (i) the desired coverage targets; (ii) COVID-19 vaccine policies related to the target population and coverage targets for primary and booster doses; and (iii) high delivery costs in some DMCs, especially most of the Pacific small island developing states.

Costs by Antigen



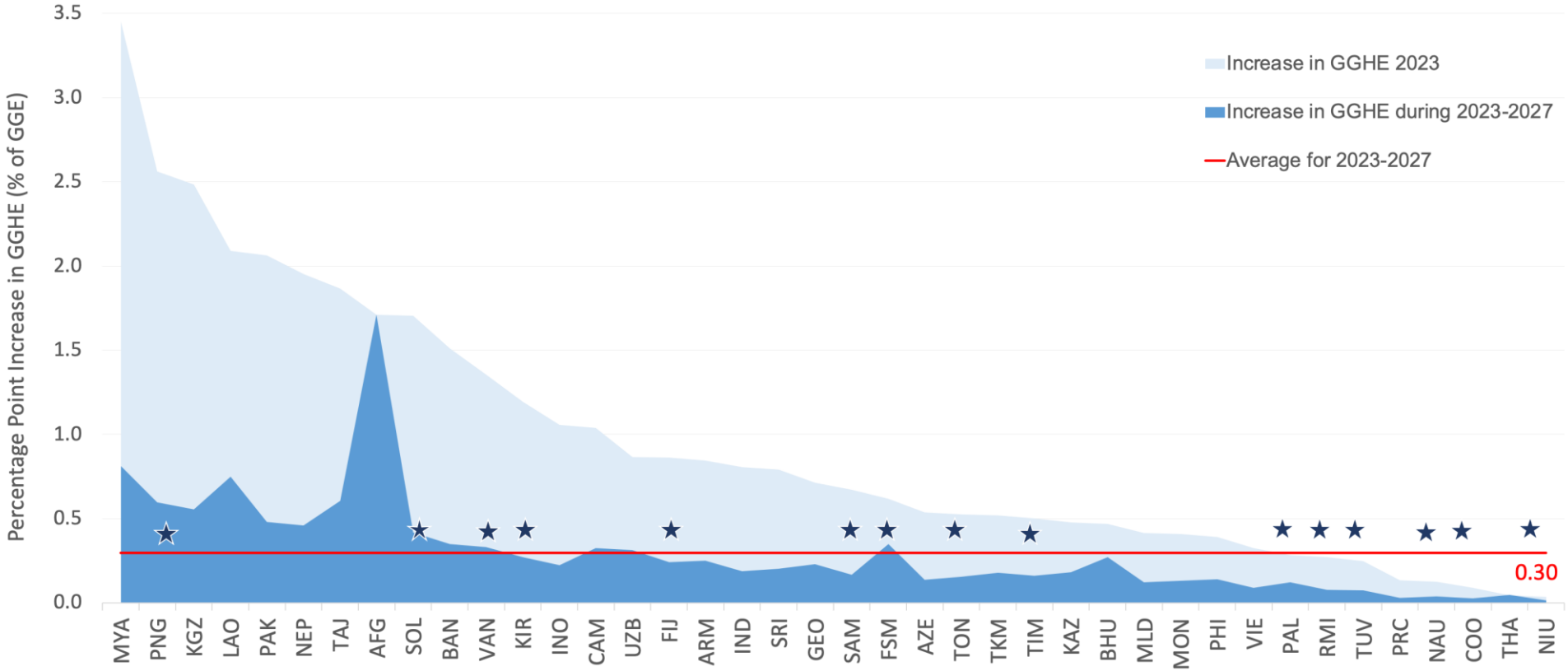
Costs by Cost Categories

Vaccination Program Costs by Categories, 2023–2027



- Vaccines and ancillary supplies constitute the major costs for adult immunization programs.
- In most countries, products (vaccines, supplies) are responsible for over 50% of the immunization program costs
- **COVID-19 vaccines cost more than all the other adult vaccines combined in most countries.**

Expected Fiscal Burden Arising from COVID-19 and Adult Vaccination Programs



- There is a considerable variation across countries in the fiscal burden resulting from COVID-19 and adult immunization programs. Obviously COVID-19 is a major cost driver.
- As a percentage of the GGHE, these programs would constitute a minimum of 0.01% of GGHE in Thailand to a maximum of 1.7% in Myanmar
- Uncertainty in delivery costs and the price of vaccines and consumables, means that there is considerable variability in the estimated fiscal impact.

Thank You

Suggested citation

Gotsadze G, Chikovani I, Gzirishvili D, Zurabishvili N, Coghlan B, Dutta A, Yiengprugsawan VS, Osewe P, Goguadze K. 2023. Adult vaccination in Asia and the Pacific: Policies, Financial Needs, and Fiscal Impacts. Asian Development Bank.

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30 Years for Better Health Systems

Zin Mar Win

Quantitative Research Specialist
Community Partners International

Equity Assessment of Childhood Immunization at National and Subnational Levels in Myanmar: A Benefit Incidence Analysis

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Equity assessment of childhood immunization at national and subnational levels in Myanmar: a benefit incidence analysis

Presented by: Zin Mar Win

Co-authors: Tom Traill, Zarni Lynn Kyaw, Khaing Thandar Hnin, Phway Thinzar Chit, Thazin La, Ashwini Sunil Deshpande, Osondu Ogbuoji, Wenhui Mao

Community Partners International, Myanmar
Center for Policy Impact in Global Health, Duke University

Aim of the study

- Myanmar is a conflict-affected geographically and ethnically diverse lower-middle-income country
- Expanded Program on Immunization (EPI) aims to improve access to immunization services and it is currently funded by donors and government
- We aim to assess if EPI has promoted equitable access to immunization services for children across different socioeconomic groups, and to identify population groups who would be vulnerable to donor exit

Methods

Data collection

Service use: Basic immunization (one dose of BCG & measles, three doses of DPT/pentavalent & polio each) uptake collected from Myanmar Demographic Household Survey (2015-2016)

Unit Cost:

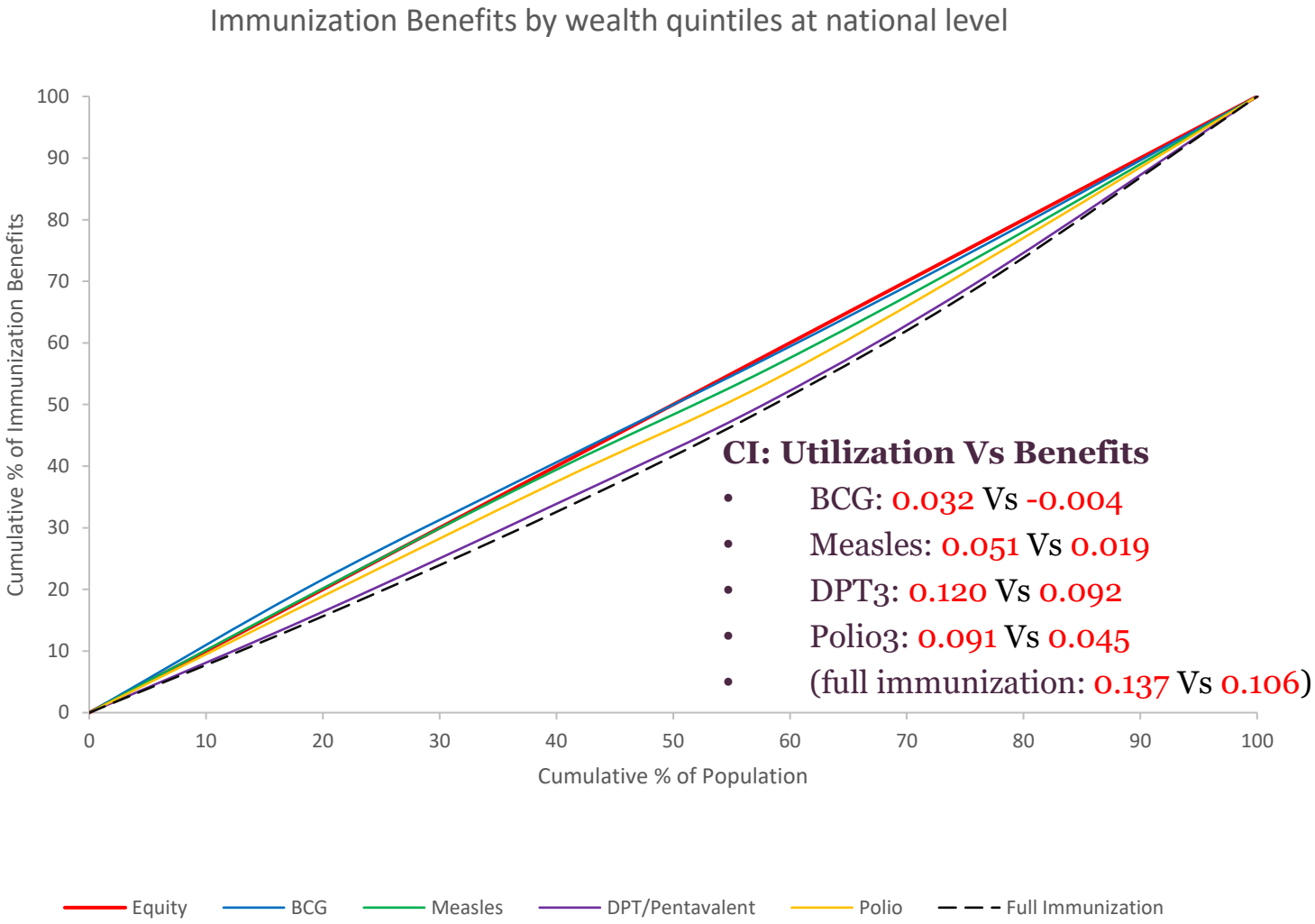
- Vaccines & syringes: 'cost of vaccinating a child' published by UNICEF –same across the country
- Vaccine delivery cost- cost data from IDCC (Immunization delivery cost catalogue) –different by regions (adjusted with regional and rural/urban cost variations for Myanmar)

Data analysis

Benefits: immunization uptake * unit cost per dose of each vaccine, by region & states, urban & rural, social economic groups and mother's education level

Concentration curves & concentration indices to measure distribution of benefits across SE groups

The richer families benefit more from EPI program



- Relatively low coverage (62%-88%) at national level
- The highest coverage for BCG (88%) & the lowest coverage for DPT/pentavalent (62%)
- The almost equal distribution for BCG & the most unequal distribution for DPT3

Discussion

- The **wealthier** households disproportionately benefited more from the publicly financed EPI programme than poorer, mainly because their vaccine uptakes were higher
- IDCC provided robust information on the average delivery cost which we then adjusted with regional, and urban and rural delivery cost variations for Myanmar

Unit cost across different regions & states and rural & urban areas

	BCG			Measles			DPT			OPV			
Regions and States	vaccine & injection supply	delivery cost	Total	vaccine & injection supply	delivery cost	Total	vaccine & injection supply	delivery cost	Total	vaccine cost	delivery cost	Total	Full Immunization cost
Hilly plateau area (Shan)													
Urban	0.37	**2.23**	2.6	0.94	2.23	3.17	2.9	6.69	9.59	0.39	6.69	7.08	**22.44**
Rural	0.37	**2.22**	2.59	0.94	2.22	3.16	2.9	6.66	9.56	0.39	6.66	7.05	**22.36**
Delta area (Ayeyarwady)													
Urban	0.37	**1.44**	1.81	0.94	1.44	2.38	2.9	4.32	7.22	0.39	4.32	4.71	**16.12**
Rural	0.37	**2.79**	3.16	0.94	2.79	3.73	2.9	8.37	11.27	0.39	8.37	8.76	**26.92**
Central plain area (Mandalay, Yangon, Naypyitaw, Sagaing & Magway)													
Urban	0.37	**1.79**	2.16	0.94	1.79	2.73	2.9	5.37	8.27	0.39	5.37	5.76	**18.92**
Rural	0.37	**1.79**	2.16	0.94	1.79	2.73	2.9	5.37	8.27	0.39	5.37	5.76	**18.92**
Coastal area (Tanintharyi, Rakhine & Mon)													
Urban	0.37	**1.6**	1.97	0.94	1.6	2.54	2.9	4.8	7.7	0.39	4.8	5.19	**17.4**
Rural	0.37	**2.54**	2.91	0.94	2.54	3.48	2.9	7.62	10.52	0.39	7.62	8.01	**24.92**
Mountain range area (Kachin, Kayah, Kayin, Chin & Bago)													
Urban	0.37	**1.48**	1.85	0.94	1.48	2.42	2.9	4.44	7.34	0.39	4.44	4.83	**16.44**
Rural	0.37	**1.92**	2.29	0.94	1.92	2.86	2.9	5.76	8.66	0.39	5.76	6.15	**19.96**

Delivery cost calculation: Adjusted with regional and rural/urban delivery cost variations

Geographical areas	Total Operational cost	% adjustment (based on average)	Operational cost (supply chain+service delivery) per dose (IDCC)	Operational cost per dose (adjusted)	Salary (labor cost) per dose (IDCC)	Capital Cost (IDCC)		Total delivery cost per dose (IDCC)	Total delivery cost per dose (adjusted)
Hilly plateau area (Shan)									
Urban	674,250.00	**25.29%**	0.97	**1.2153**	0.78	0.23		1.98	**2.23**
Rural	673,875.00	**25.22%**	0.97	**1.2146**	0.78	0.23		1.98	**2.22**
Delta area (Ayeyarwady)									
Urban	235,875.00	**-56.17%**	0.97	**0.4251**	0.78	0.23		1.98	**1.44**
Rural	990,125.00	**83.98%**	0.97	**1.7846**	0.78	0.23		1.98	**2.79**
Central plain area (Mandalay, Yangon, Naypyitaw, Sagaing & Magway)									
Urban	430,875.00	**-19.94%**	0.97	**0.7766**	0.78	0.23		1.98	**1.79**
Rural	434,700.00	**-19.23%**	0.97	**0.7835**	0.78	0.23		1.98	**1.79**
Coastal area (Tanintharyi, Rakhine & Mon)									
Urban	327,500.00	**-39.15%**	0.97	**0.5903**	0.78	0.23		1.98	**1.60**
Rural	849,125.00	**57.78%**	0.97	**1.5305**	0.78	0.23		1.98	**2.54**
Mountain range area (Kachin, Kayah, Kayin, Chin & Bago)									
Urban	261,525.00	**-51.40%**	0.97	**0.4714**	0.78	0.23		1.98	**1.48**
Rural	503,875.00	**-6.37%**	0.97	**0.9082**	0.78	0.23		1.98	**1.92**
Average	**538,172.50**								

THANK YOU

Questions?

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The Immunization Delivery Cost Catalogue:
The status of evidence on immunization delivery costs in low- and middle-income countries

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