Implementing C19 vaccine costing studies:
METHODOLOGICAL CHALLENGES

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Why COVID-19 vaccine delivery costing studies?

- New program with unprecedented challenges: delivery volume, reaching new target populations, and delivery strategies
- What it costs to deliver these vaccines is highly uncertain.

To address this gap, generating evidence **to estimate the cost of delivering COVID-19 vaccines**:

- Support budgeting and planning in countries where the studies are implemented
- Provide concrete evidence to feed into global models
- Generate estimates that can be used for further modelling

Estimating the cost of delivering COVID-19 vaccines

Implementing 6 costing studies to estimate:

i. Delivery costs at different levels of delivery volume
ii. Costs for different delivery strategies
iii. Delivery costs of reaching different target populations
iv. Resource requirements of different delivery strategies (# of health workers, cold chain equipment, etc.)
v. [Bangladesh only] Direct financial expenditures incurred by beneficiaries to reach the different types of vaccination

General methodology

- Ingredient-based, bottom-up **costing component**
  - **Financial** and **economic** costs
  - Payer perspective (MOH, partners, private sector if relevant)
  - Purposive sampling of **25-35 facilities** incl. all immunization sites below them, as well as intermediary levels (districts/provinces/regions), MOH and partners
  - Results disaggregated by **activity** (e.g. training, social mobilization, service delivery, etc.) and **cost item** (e.g. paid labor, vehicles and transport, per diem, etc.)
- **Qualitative component** to contextualize the cost findings and illustrate operational challenges and funding flows
- Retrospective primary data collection with structured in-person interviews with key informants at all levels

General protocol can be found here: https://thinkwell.global/wp-content/uploads/2021/12/General-research-protocol-17-Nov-2021.pdf

Overview by country

	 Bangladesh	 Mozambique	 Cote d'Ivoire	 Vietnam	 DRC	 Philippines
Implementation	Continuous delivery + campaigns	Phase I + Continuous delivery	Continuous delivery + monthly intensification	100+ rounds varying in duration/intensity	"Continuous" delivery + campaign(s)	Continuous + temporary mass sites + NIDs
Doses delivered *	317.6 M	23.6 M	14.5 M	151 M	3.8 M	162.1 M
Coverage level *	> 70%	> 65%	> 30%	>85%	< 1%	>70%
Sample	~37 health facilities	27 health facilities	30 health facilities	26 health facilities	26 health facilities	~30 sites (facilities, outreach, shopping malls)
Research partners	Institute for Health Economics	Eduardo Mondlane University	Genesis Analytics & University Felix Houphouet Boigny Cocody	Hanoi School of Public Health	University of Kinshasa	Ateneo de Manila University

* As of date of data collection (approx. April to September 2022)

Challenging context, challenging methods

- Unprecedented effort, involving several entities
- Massive changes in volume delivered over time
- New and not clearly defined delivery strategies
- Delivery strategies were introduced and discontinued
- Unclear where the program is headed
- Detailed recordkeeping not a priority

Key methodological challenges - 1

For what period of time should we estimate the costs of delivering COVID-19 vaccines?

- **Classic immunization costing studies**:
  - New routine vaccine introduction: short campaign followed by continuous routine administration delivering consistent volume
  - Preventive or outbreak response campaigns: usually a clearly defined target group, implementation period and delivery strategy
- **C19 vaccinations**:
  - On and off implementation of different delivery strategies
  - Recurrent campaigns with changing target populations
  - Dramatic changes in volume delivered

Key methodological challenges - 1

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OUR APPROACH

1. **In depth costing of selected periods of interests to generate costs at different levels of volume delivered**
   - Mozambique: lower volume phase I (March-April 2021) + three months from a higher volume phase (December 2021 to February 2022)

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   - Mozambique: lower volume phase I (March-April 2021) + three months from a higher volume phase (December 2021 to February 2022)
2. **In addition, for key recurrent costs, also collect data for longer periods of time, to analyse how costs have evolved over the entire implementation**
   - Bangladesh: in depth costing of April to June 2022 & the last campaign implemented + capture overall HR costs from the first vaccinations (Feb 2021) to the time of data collection

Key methodological challenges - 2

What is the 'right' denominator to calculate results?

- **Classic immunization costing studies**:
  - Cost per dose delivered
  - Cost per fully vaccinated child/person
  - Cost per targeted child/person
- **C19 vaccinations**:
  - Fluctuating volume
  - Very low volume delivered
  - Mix of vaccine schedules at many sites
  - Changing target population
  - A mix of campaigns and routine-style delivery

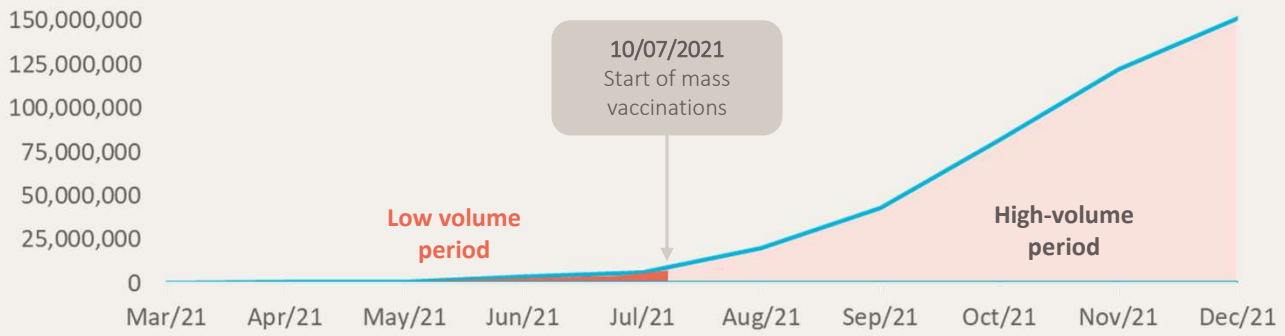
Key methodological challenges - 2

What is the 'right' denominator to calculate results?

OUR APPROACH

1. **Cost per dose delivered in each period of interest to show how costs evolve as at different levels of volume**
   - In Vietnam we generated separate cost per dose for the first four months (low volume period) and for the remaining 6 months of 2021 (high volume period)

Fig 1. COVID-19 vaccine doses delivered in Vietnam in 2021



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2. **Present separate cost per dose for campaigns vs routine-style delivery**
   - In the Philippines we separate out the costs per dose of National Immunization Days

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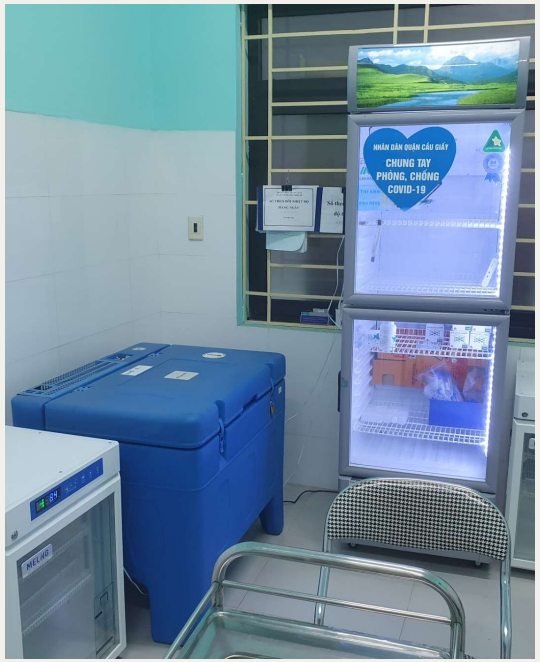
   - In the Philippines we separate out the costs per dose of National Immunization Days
3. **Model costs at different levels of delivery volume to better inform planning for future phases**
   - In DRC, where overall delivery volume is very low, simply estimating a cost per dose delivered may not accurately reflect the cost of implementing the program moving forward

Key methodological challenges - 3

How should we treat initial investments ('start-up costs')?

- **Childhood routine vaccine introduction**:
  - Initial investments before and around time of introduction
  - Investments and capital costs allocated to predictable annual delivery volume
  - Recurrent investments such as training have a clear cadence
- **C19 vaccination**:
  - Initial start up period not clearly defined
  - Some investments took place before the scale up
  - Potentially different useful lives (e.g. training)
  - Unclear program duration and unpredictable delivery volume
  - Very low volume delivered in some countries



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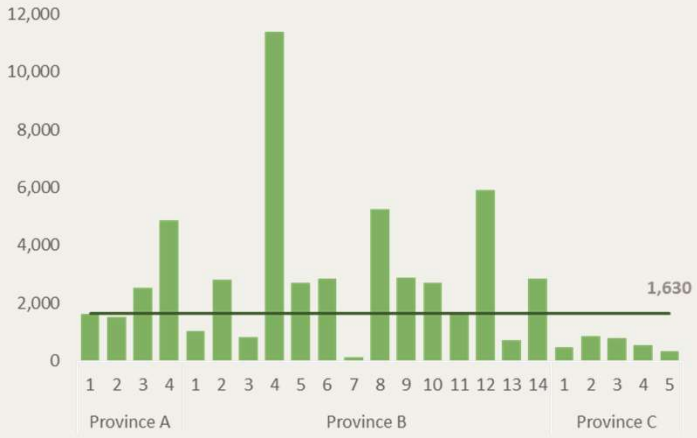
2. **Present results in two ways:**
    1. Single out start-up costs and present them as lump sum to show the impact on the budget while avoiding to overestimate cost of running the program
        - In DRC where the volume delivered is extremely low allocating initial investments across doses delivered would significantly overestimate costs (if coverage eventually picks up)

Fig 2. Total COVID-19 vax doses delivered at sampled facilities in DRC



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      - In DRC where the volume delivered is extremely low allocating initial investments across doses delivered would significantly overestimate costs (if coverage eventually picks up)
   2. Annualize start up costs and include them in cost per dose for each delivery period to enhance comparability across countries
      - In Vietnam where high coverage was achieved, initial investments were annualized and allocated to the low-volume and the high-volume periods to show full costs

Next steps

1. **Wrapping up our COVID-19 vaccine delivery costing studies**
   - Final results for all studies by the end of this year or early next year
   - Cross-country analysis to tease out cost learnings for global audience
   - Document lessons learned on methods
   - Results will be published on: www.immunizationeconomics.org
2. **Starting 2023: more costing studies on the horizon**
   - Working with 3 countries (TBD) to develop capacity to generate cost evidence
   - Theme: what does it cost to reach zero dose children?

Thank You
Merci
Asante
Terima kasih
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Salamat