

Using economics to inform reaching zero-dose children: Costs & financial sustainability

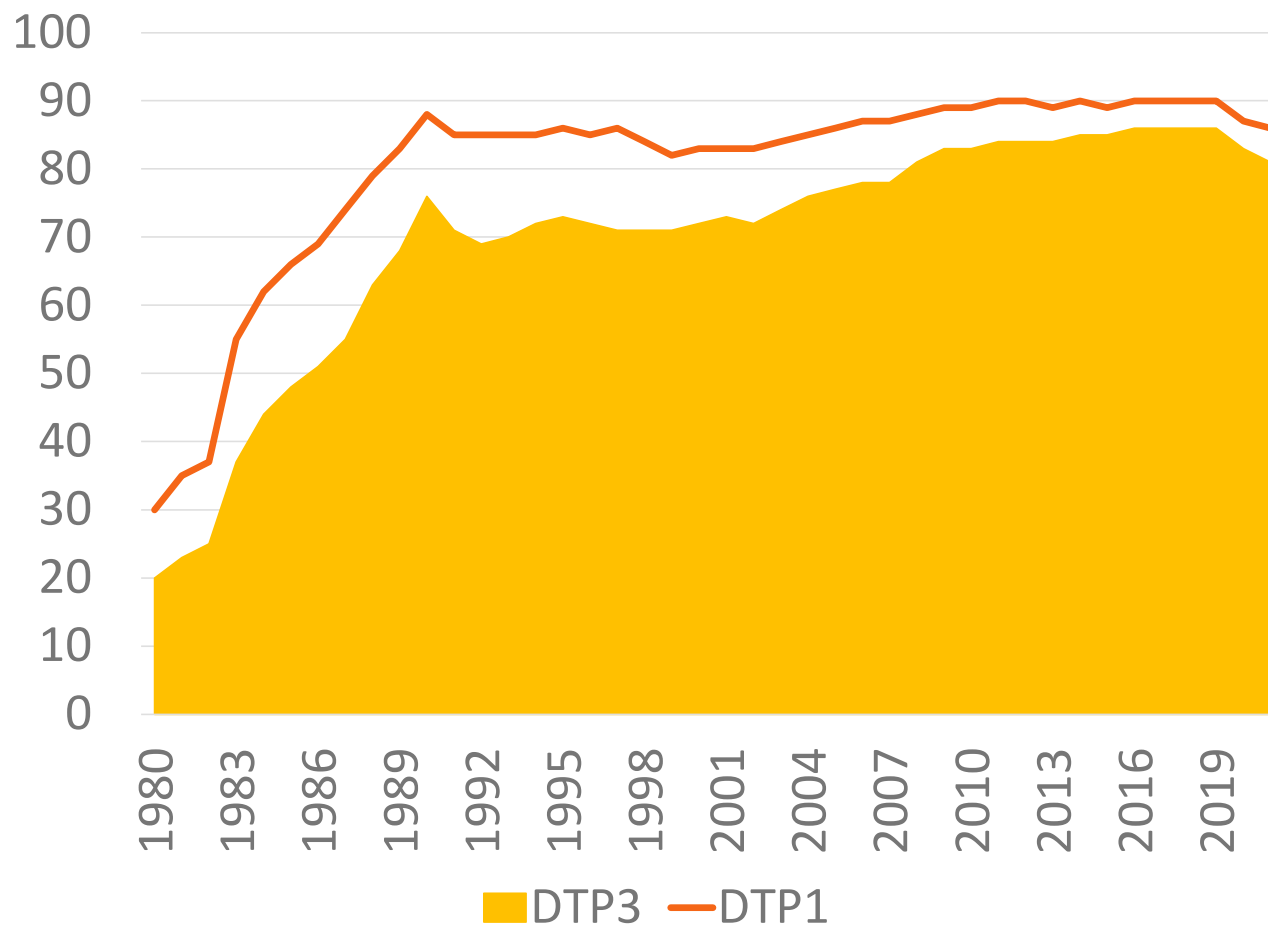


Sarah Tougher, Consultant
stougher@unicef.org

BACKGROUND

Reaching the unreached: Zero-dose children & missed communities

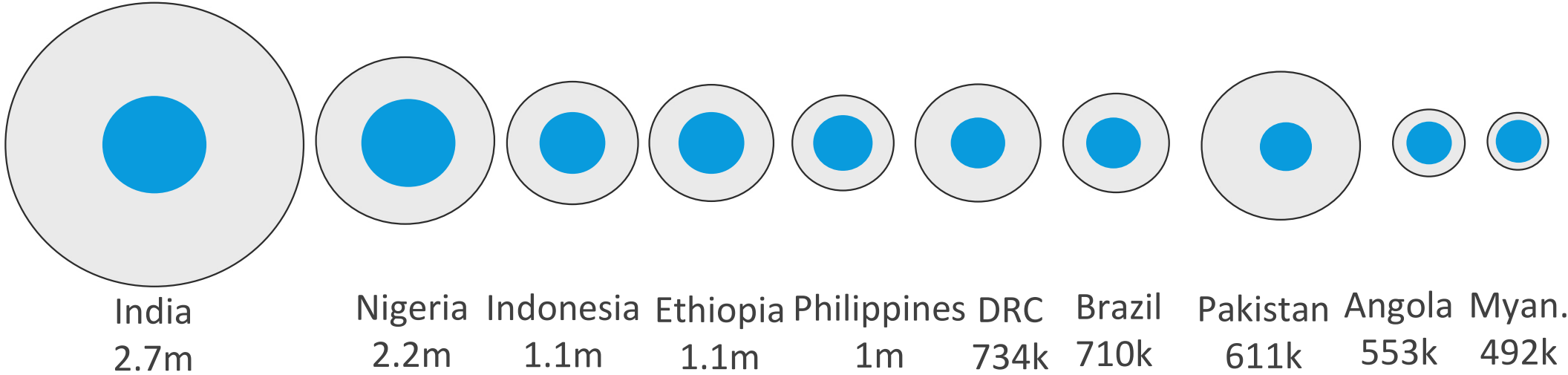
- Long plateau in immunization coverage
- New global focus on 'zero-dose children'
- Zero dose children have not received any vaccines
- 18 million infants received no DTP1 in 2021 birth cohort
- Progress towards targets to reduce # of zero-dose children derailed by COVID-19 pandemic



Source: WUENIC 2021, July 15 2022 release

10 countries account for 62% of zero-dose children globally

- Angola, Brazil, DRC, Ethiopia, India, Indonesia, Myanmar, Nigeria, Pakistan & Philippines have the highest absolute numbers of zero-dose children
- Includes countries with:
 - Higher or moderate coverage but large birth cohorts (e.g. India and Pakistan)
 - Smaller birth cohorts with much lower coverage (e.g. Angola and Myanmar)



Source: WUENIC 2021, July 15 2022 release

Who are zero dose children?

Communities missed due to backsliding:

- Services previously reached these communities, but backsliding due to COVID-19 and other emergencies
- Recovery of health services required
- Fewer household surveys during pandemic; less known about the characteristics of these children

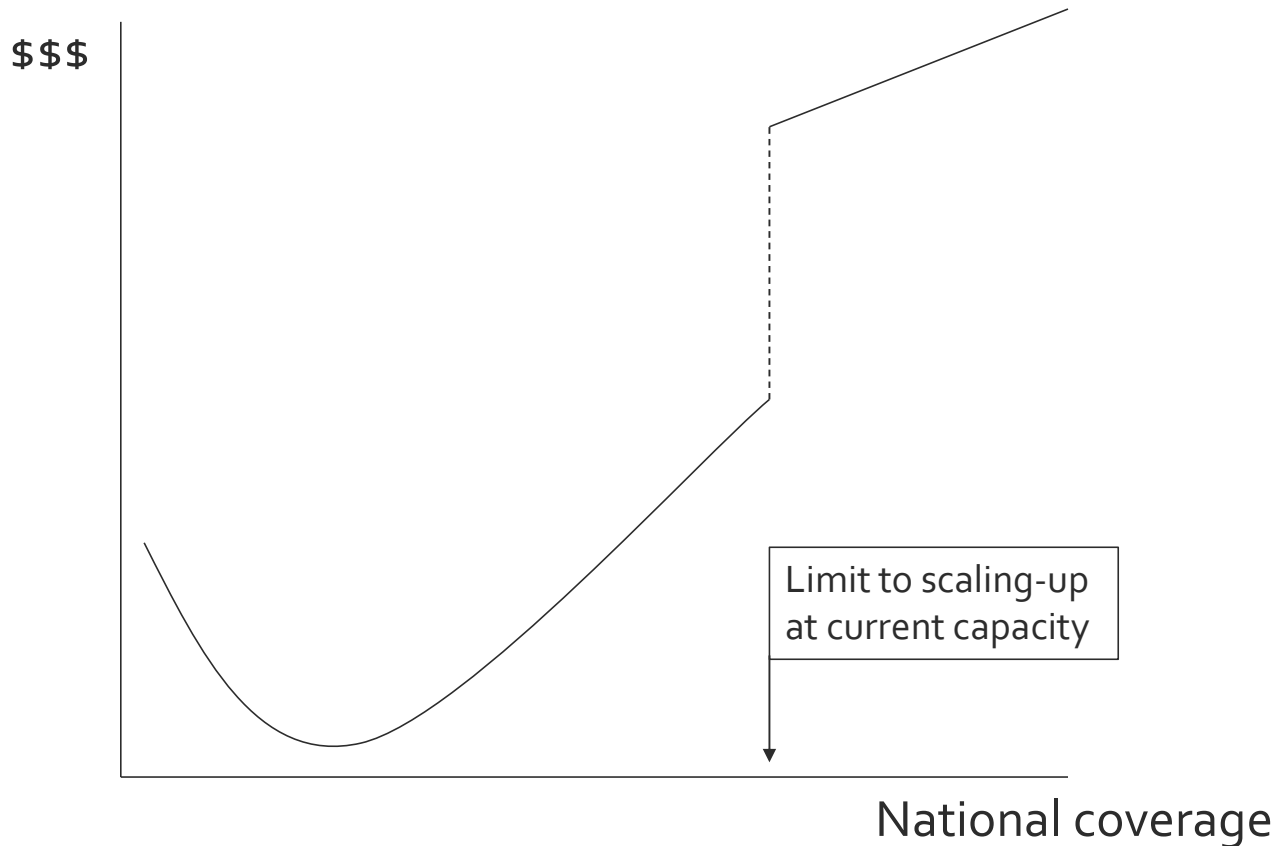
Communities excluded prior to pandemic:

- Primarily live in 3 contexts:
 - Urban poor
 - Remote rural
 - Fragile & conflict affected
- Households often have limited access to other essential services
 - Zero-dose status as a marker for lack of access to PHC
- Zero-dose children and communities often face multiple deprivations
 - Poverty
 - Gender-related barriers

Access to immunization is hindered by multiple barriers

	<u>Rural remote</u>	<u>Urban poor</u>	<u>Conflict-affected</u>
Availability	<ul style="list-style-type: none"> -No facilities located close to households -Lack infrastructure, staff, & commodities at facilities -Complexity of managing supply chains to last mile -Bottlenecks to financing peripheral facilities -Difficulties recruiting and retaining workers -Outreach challenging due to staffing issues, geographic barriers, and incomplete civil registration 	<ul style="list-style-type: none"> -Unequal distribution of health facilities -Planning difficult due to lack of accurate data on population size due to rapid growth, seasonal migration, and insecure status in urban settlements -Limited outreach in urban areas -Sections of urban areas excluded from service plans due to lack of political will combined with overlapping and unclear jurisdictions -Siloed delivery of care leading to MOV 	<ul style="list-style-type: none"> -Disruption to all components of health systems, including supply chains -Damage to facilities and other critical infrastructure -Displacement of healthcare workers -Difficulty planning outreach due to inaccuracy of administrative data, safety concerns, and complex negotiations with many actors
Affordability	<ul style="list-style-type: none"> -High prevalence of poverty -Vulnerability of rural incomes to commodity price fluctuations, weather shocks, seasonality -High direct and opportunity (time) costs of travelling to facilities -Time poverty due to burden of reproductive work to maintain households 	<ul style="list-style-type: none"> -Poor households severely constrained in time and income -Long wait times at urban facilities -Inconvenient clinic hours for caregivers working outside of the home 	<ul style="list-style-type: none"> -Economic crises exacerbate financial hardships -Travel more expensive due to increased direct and indirect costs due to fuel shortages, limited public transportation options, and rerouting due to security -Increases in the number of female-headed households increasing the burdens facing women and the opportunity costs of time -Dislocation of traditional support systems
Acceptability	<ul style="list-style-type: none"> -Lack accountability due to power imbalances between community members, healthcare workers and decision-makers -Marginalised groups in remote areas excluded from service due to negative perceptions or linguistic differences -Low maternal education -Lack of maternal control over decision-making and household resources 	<ul style="list-style-type: none"> -Recent migrants have fewer ties to institutions and lost social networks -Unaware of where to access services -Fear of authorities in informal settlements -Cultural differences, language barriers, and experiences of discrimination can lead to mistrust -Rumors about vaccines can spread rapidly in urban environments 	<ul style="list-style-type: none"> -Safety concerns deter care-seeking -Loss of trust due to mismanagement and weakening of traditional authorities -Lack of trust and suspicion of outsiders, leading to misinformation -Difficulties in care-seeking among mobile and displaced populations

Cost implications of expanding coverage



Higher costs of expanding access to zero-dose children and missed communities due to:

- Lack of existing resources (e.g. infrastructure; HR; etc)
- Need to address multiple barriers to access (multi-faceted interventions)



METHODS

Scoping reviews & frameworks

Costs

- 1) Scoping review:
 - A. Reference lists of systematic reviews on:
 - Interventions to improve immunization coverage
 - Vaccine delivery cost
 - B. Database search
 - Recent & zero-dose focused studies
 - C. Identification of grey literature (subject experts)
- 2) Framework:
 - Methodological considerations for addressing gaps

Sustainability

- 1) Scoping review:
 - B. Database search
 - Financial sustainability of immunization
 - C. Identification of grey literature (subject experts)
- 2) Framework:
 - Measuring financial sustainability



RESULTS

Scoping review on costs: Results

Results synthesized in 3 key areas:

Synthesis area 1: Costs of interventions to improve coverage

- Challenging to apply existing evidence to understand costs of reaching zero-dose communities

Issue 1: Very few studies in priority zero-dose settings

- Best evidence comes from studies that contextualize findings by comparing costs of reaching zero-dose children to costs of reaching 'general' or easy to reach populations.

An example

Periodic Intensification of Routine Immunization: Intensified Mission Indradhanush (Chaterjee et. al 2021)

- High variation across states and districts in incremental costs (economic and financial) per dose and per child
- Incremental costs per dose of PIRI > routine immunization (2.4- 3.6X)
 - Mainly due to few children reached per session
- Weak/inconsistent evidence on whether MI/IMI reduced prevalence of ZD children (Summan et al. 2021; Clarke-Deelder et al. 2021)

Scoping review on costs: Results (Con't)

Issue 2A: Lack of harmonization of immunization outcomes

- Some studies report on full-immunization outcomes only
- Others report on full-immunization + vaccine delivered outside of routine immunization (SIA)
 - Difficult to infer whether the interventions increased uptake of RI among zero-dose children

Issue 2B: Lack of harmonization in reporting of costs

- Financial versus economic costs
- Costs per capita, costs per child reached, cost per dose
 - Difficult to compare across studies

An example: Multifaceted PHC HSS in Madagascar

- Study assesses the effect of PHC health systems strengthening on immunization
- Controlled before & after
- Cannot say whether intervention improved RI among zero-dose children
- Difficult to compare cost per capita of multi-faceted HSS to immunization delivery costs

Original research

BMJ Global Health

Impact of health system strengthening on delivery strategies to improve child immunisation coverage and inequalities in rural Madagascar

Elinambinina Rajonarivara,^{1,2,3} Matthew H Bonds,^{1,4} Ann C Miller,⁴ Felana Angella Inantamalala,² Laura Cordier,² Benedicte Razafinjato,² Feno H Ralencarimalala,² Karen E Finnegan,^{2,4} Rado J L Rakotonanahary,² Giovanna Cowley,² Baofova Ratsimbazafy,² Florent Razafimamonjy,² Marius Randriamanambintsoa,² Estelle M Raza-Fanomezanahary,⁴ Andriamihaja Randrianambinina,¹ C-Jessica Metcalf,^{5,7} Benjamin Roche,^{2,8} Andres Garchitorena^{2,1}

	Full immunization: DPT3			Zero dose: MCV1		
	Before	After	Change	Before	After	Change
Intervention	0.68	0.76	-0.06	0.63	0.73	0.16
Control	0.52	0.66		0.55	0.49	

Cost per capita: \$30.96

Scoping review on costs: Results (Con't)

Synthesis area 2: Costs of routine vaccine delivery

- A. Studies that compare delivery costs for 'general' populations versus 'hard to reach' populations
 - Few examples, but costs consistently higher in the hard to reach population

- B. Determinants of delivery costs
 - Costs are higher with:
 - Lower service volumes
 - Outreach delivery
 - Greater distance to vaccine collection site
 - # days open
 - Dedication index
 - Lower coverage

Scoping review on costs: Results (Con't)

Synthesis area 3: Modelling of costs of scaling-up

- Typically based on average costs from 'reached' areas, or with some assumptions for diseconomies of scale
- Assumptions on diseconomies of scale based on limited evidence

What do we know about costs of reaching zero-dose communities?

What do we know?

- Very, very limited evidence to draw on
- Some evidence that reaching ZD children might be much more expensive than previously thought

What don't we know?

- How do costs vary by setting?
- How do costs vary by delivery modality?
- What works (and how much does it cost)
 - How does this vary by setting?
 - How do interventions interact? What is the optimal mix?

Framework for research on costs of reaching zero-dose children

1. Primary cost data needs to be collected alongside interventions seeking to deliver routine immunization in zero-dose settings

Desirable characteristics:

- Ingredients approach
- Prospective design
- Explore heterogeneity (e.g. sub-groups, determinants of costs, cost functions)
- Evidence from multiple settings and delivery modalities

Framework for research on costs of reaching zero-dose children

2. Data needed on both costs & effect on coverage

Desirable characteristics:

- Could be cost-effectiveness or 'parallel' studies
- Multi-armed interventions
 - To compare different approaches of same 'intervention type'
 - To compare 'limited' vs. 'expanded' package of interventions
- Complex interventions: need to collect a broad array of service delivery outcomes
 - Documentation of process and context
- Equity-informed methods (e.g. equity weighting, sub-group analysis)
- Evidence from multiple settings and delivery modalities

Scoping review on financial sustainability: Results

1. Many indicators for financial sustainability of national immunization programmes:
 - e.x. -Budget line for immunization
 - Vaccine cost per capita
 - Vaccine cost as share of GGHE
2. Very limited evidence of financial sustainability of zero-dose interventions
 - Integrated human and animal vaccination campaign in Chad (Akbar et al 2021)
 - Donor financed
 - Sustainability measured as **impact on district budget for health**
 - Incremental budget impact of 1 campaign: 27% of health district budget
 - District perspective: Excluded human and animal vaccine costs, costs at higher functional levels (province), base salaries.

Framework for measuring financial sustainability of interventions to reach zero-dose children

1. Requires understanding of intervention costs and of sub-national financial flows
2. Programmatic sustainability -> financial sustainability
Key questions related programmatic sustainability:
 - A. Does the intervention support or strengthen health system?
 - B. If supporting, is it addressing barriers?
 - C. If supporting, to what extent are inputs integrated?
2. Broader political economy (global, domestic, subnation) -> financial sustainability of immunization programmes -> financial sustainability of zero-dose interventions

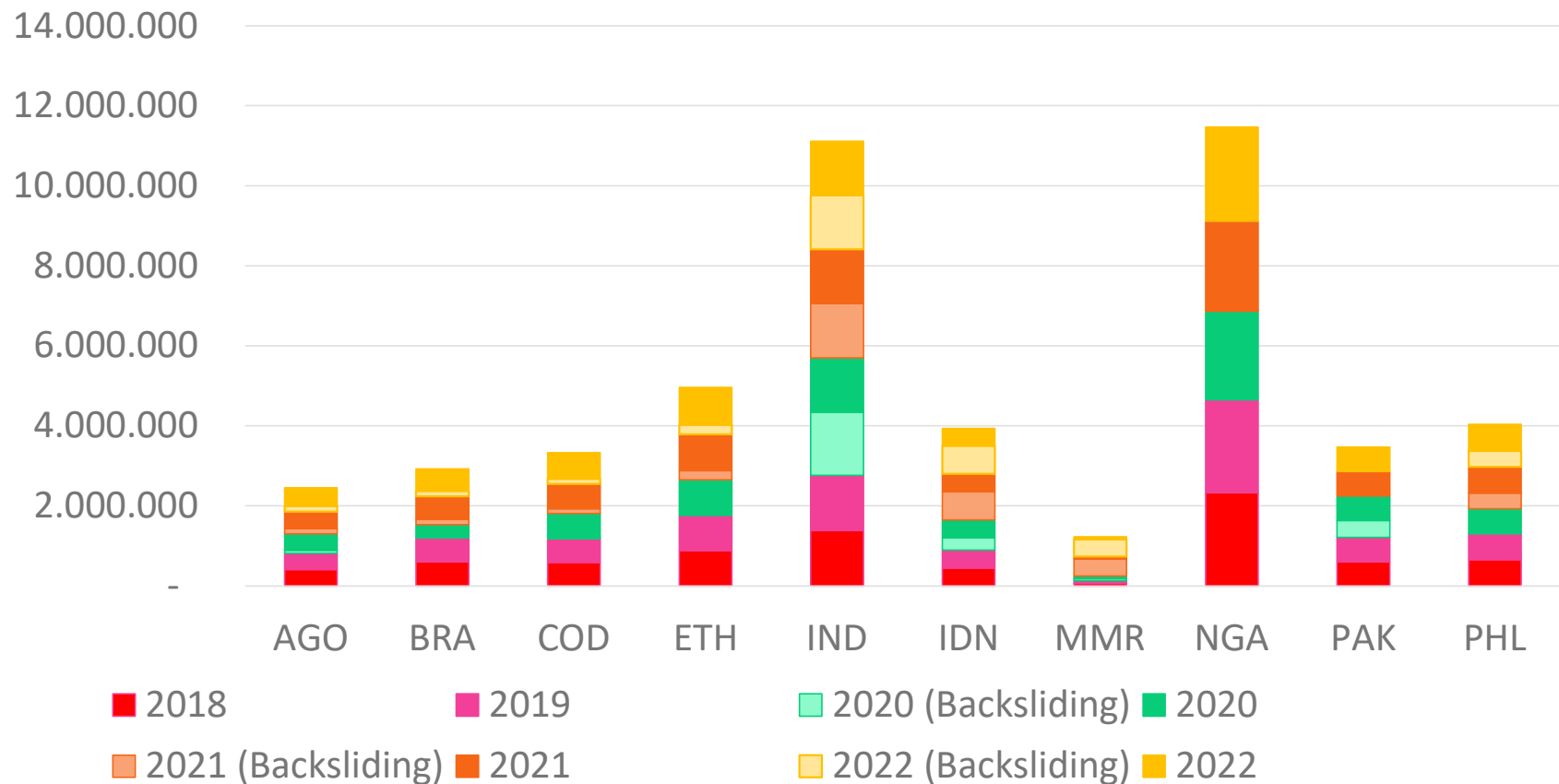
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for every child

Thank you.



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Extent of backsliding has differed across countries



Source: WUENIC 2021, July 15 2022 release; 2022 coverage assumed to be equal to 2021 coverage levels

Slide 23

STO Reorder stacked bars so that covid backsliding "on top"
Sarah Tougher, 2022-10-30T19:09:58.881

Scoping review on costs: Results (Con't)

Issue 3: Synthesising results difficult due to small numbers of studies, inconsistent results

Compare Banerjee demand-side incentives versus IDInsight (Village Reach) demand-side incentives