What do we know about the economics of reaching zero-dose children?

A synthesis of existing evidence as of August 2025

KEY TAKEAWAYS

Multiple studies have examined the cost, cost-effectiveness, and sustainability of interventions designed to reduce zero-dose prevalence. In July 2025, the Immunization Economics Community of Practice convened to share initial results from the zero-dose economics body of work. Preliminary findings across 13 studies from 5 countries (Figure 1) found that:

- **Reaching more zero-dose children per session drives affordability, but there is a trade-off between cost and leaving children off-schedule.** Delivery strategies that reach more zero-dose children per session come at the lowest cost per dose. Where access is the key barrier, campaign-like strategies such as periodic intensification of routine immunization (PIRI) can reach many children at a lower cost per dose, but do not minimize the time a child remains off-schedule.
- **Integrated strategies can be effective at reaching zero-dose children at a low cost per service delivered while delivering greater health benefits.** Co-delivery strategies like Mobile Health and Nutrition Teams (MHNTs) can be effective at reaching zero-dose children, as offering other health services (e.g. nutrition) increases demand for immunization. As they link up zero-dose children with multiple essential health services, these strategies offer greater benefits at relatively low incremental cost per zero-dose child vaccinated and at a low cost per service delivered.
- **What is cost-efficient in one location may not be in another.** Several studies showed a high degree of variation in costs across districts and health facilities, indicating that the unit cost of an intervention is high when it does not adequately target the root cause of zero-dose prevalence. This is particularly evident in urban settings, where context-specific barriers required tailored interventions.
- **Design costs may go down over time but likely will not decrease with scale.** Design-intensive interventions can be effective at tackling persistent demand-side barriers but come at a high cost. While design costs may go down during the life of an intervention as more children are reached, they likely will not decrease when the intervention is scaled up to different geographies, as different contexts require re-design.
- **Targeted financial incentives can help reduce financial barriers to vaccination.** Targeted financial incentives like conditional cash transfers represent a promising solution to easing the financial burden incurred by beneficiaries and help reduce zero-dose prevalence, particularly when embedded into a pre-existing and well-functioning social protection program.

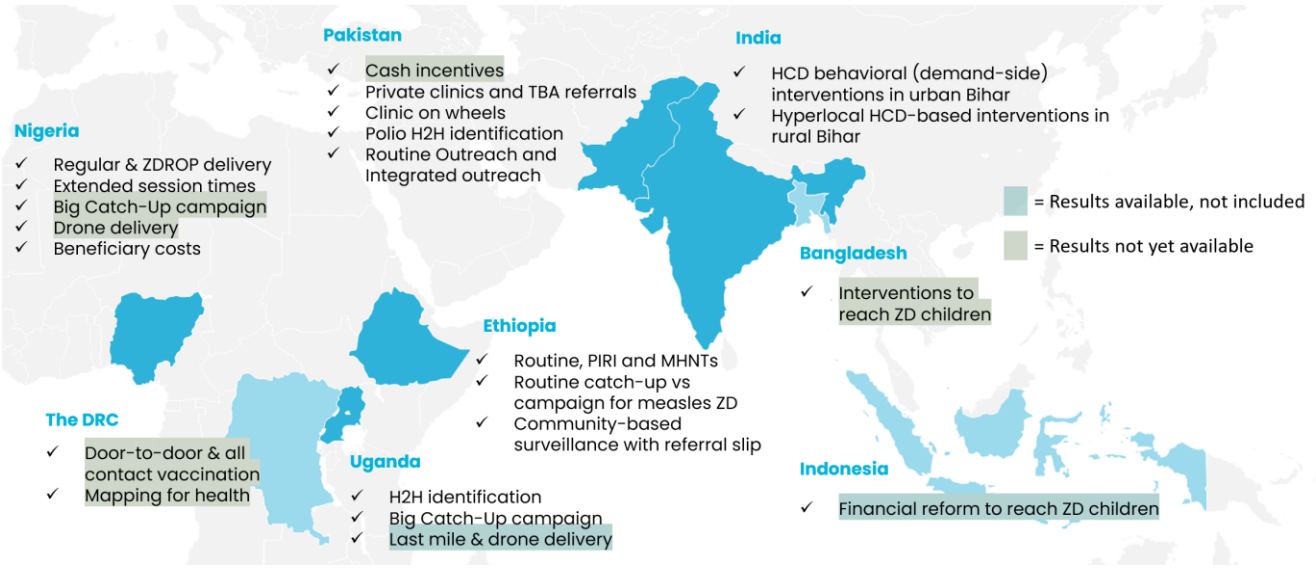
BACKGROUND

As reaching zero-dose children is a key pillar of the Immunization Agenda 2030 (IA2030) and Gavi 5.1 strategy, multiple studies have examined the cost, cost-effectiveness, and sustainability of interventions designed to reduce zero-dose prevalence. On July 19–20, 2025 the **Immunization Economics** community of practice convened a pre-congress meeting at the **International Health Economics Association (IHEA) World Congress**, to share preliminary findings from the zero-dose economics work and distil initial takeaways. Fifteen studies on the economics of reaching zero-dose children were presented during this meeting. These studies were selected from 32 submissions received through a call for abstracts, based on quality criteria as well as whether they would have results available to present by the time of the congress. This brief summarizes the evidence on the cost of reaching zero-dose children available as of August 2025, including some evidence that could not be presented at the pre-congress meeting.

OVERVIEW OF THE EVIDENCE

Preliminary findings outlined in this brief illustrate results from studies presenting the cost per zero dose child reached or identified in five countries: **Nigeria, Uganda, Ethiopia, Pakistan** and **India**. Findings include economic evidence from a wide range of supply- and demand-side interventions, as shown in Figure 1. Two studies, respectively on financial reform in **Indonesia** and last mile delivery in **Uganda**, were excluded from this brief as they don't include comparable unit costs. Additional evidence from the **Democratic Republic of the Congo**, **Nigeria**, **Bangladesh**, will become available in the following months, providing further insights on the cost of reaching zero-dose children through a big catch-up campaign in Nigeria, the cost of door-to-door and all contact vaccination in the DRC, and the cost of reaching zero-dose children through drone delivery of vaccines in remote Nigeria. As of August 2025, there was no evidence on the cost of reaching zero-dose children in conflict or fragile settings.

Figure 1. Overview of the evidence on the economics of reaching zero dose children



VACCINATING ZERO-DOSE CHILDREN IN RURAL AND HARD-TO-REACH AREAS

In rural and sparsely populated areas, constrained access to immunization services is the main driver of zero-dose prevalence. Catch-up campaign-style delivery strategies, such as periodic intensification of routine immunization (PIRI) reach more zero-dose children per session and come at a lower cost per zero-dose child reached. However, while they are more cost-efficient, these leave children off-schedule for longer, highlighting a trade-off between cost and immunization timeliness. If implemented more frequently, the cost per child reached would likely increase. One the other hand, integrated delivery strategies, like mobile health and nutrition teams (MHNTs), can reach zero-dose communities with multiple essential health services, including immunization, in a timely manner and at low financial incremental cost.

Table 1. Cost per zero-dose child reached in rural and hard-to-reach areas

Country	Intervention	Cost per zero-dose child reached (USD)	ZD children reached	Notes	Source
Ethiopia	Measles routine catch-up	$0.89	809 (per campaign)	Financial cost for measle zero-dose	[1]
Ethiopia	Measles campaign	$1.08	790 (per campaign)	Financial cost for measle zero-dose	[1]
Ethiopia	Measles campaign	$1.73	790 (per campaign)	Economic cost for measle zero-dose	[1]
Ethiopia	Measles routine catch-up	$1.78	809 (per campaign)	Economic cost for measle zero-dose	[1]
Ethiopia	MHNT	$3.50	96 (per year)	Incremental financial cost. Afar and Somali regions	[3]
Nigeria	Facility-based	$4.14	13 (per month)	Financial cost, supported routine sessions, Jigawa state	[2]
Ethiopia	PIRI	$4.22	646 (per year)	Financial cost, Afar and Somali regions	[3]
Nigeria	Additional outreach sessions	$4.28	18 (per month)	Financial cost, Kaduna state	[2]
Ethiopia	PIRI	$6.65	646 (per year)	Economic cost, Afar and Somali regions	[3]
Ethiopia	Health post	$8.59	384 (per year)	Financial cost, Afar and Somali regions	[3]

Uganda	BCU	$12.53	23,716 (per campaign)	Economic costs. Mubende, Wakiso and Kesese districts	[4]
Ethiopia	Health center	$19.30	144 (per year)	Financial cost, Afar and Somali regions	[3]
Nigeria	Outreach	$25.67	5 (per month)	Financial cost, supported routine sessions, Jigawa state	[2]
Ethiopia	MHNTs	$31.41	96 (per year)	Financial cost; includes cost of delivering non-immunization services. Afar and Somali regions	[3]
Ethiopia	Health post	$52.47	384 (per year)	Economic cost, Afar and Somali regions	[3]
Ethiopia	Health center	$90.40	144 (per year)	Economic cost, Afar and Somali regions	[3]
Ethiopia	MHNTs	$129.26	96 (per year)	Economic cost; includes cost of delivering non-immunization services. Afar and Somali regions	[3]

REACHING ZERO-DOSE CHILDREN IN URBAN SETTINGS

In urban settings, studies have found a wider range of drivers of zero-dose prevalence, which require highly context-specific interventions. In areas where access is the key barrier for children to get immunized, supply-side interventions like additional outreach or extended health facility hours can be cost effective. However, increased resources to boost service delivery will likely not translate into better reach in settings where barriers are mostly demand-side. When barriers are demand-driven, finding cost-efficient solutions in urban settings requires tailored community engagement and context-specific behavioral interventions.

Table 2. Cost per zero-dose child reached in urban settings

Country	Intervention	Cost per zero-dose child reached (USD)	ZD children reached	Notes	Source
Nigeria	Facility-based	$0.82	63 (per month)	Financial cost per Penta 1, facility part of ZDROP, Lagos state	[5]
Pakistan	Fixed site delivery	$0.97	0.3 per day	Financial cost. Sindh and Punjab	[6]
Nigeria	Facility-based	$1.09	36 (per month)	Financial cost per Penta 1, facility not part of ZDROP, Lagos state	[5]

Nigeria	Regular outreach	$1.52	21 (per month)	Financial cost per Penta 1, facility part of ZDROP, Lagos state	[5]
Nigeria	Regular outreach	$3.06	17 (per month)	Financial cost per Penta 1, facility not part of ZDROP, Lagos state	[5]
Nigeria	Extended hours	$4.23	n.a.	Incremental cost. Per Penta 1, Lagos state	[7]
Pakistan	Routine outreach	$5.17	0.7 per day	Financial cost. Sindh and Punjab	[6]
Ethiopia	Outreach optimization	*Updated results forthcoming*	*n.a.*	Financial cost, excluding TA. ZD: penta1 > 12 months old. Addis Abeba, high coverage setting (87%) with ZD prevalence of 2.5%	[8]
Nigeria	Regular outreach	$7.90	6 (per month)	Financial cost per zero-dose child reached, facility not part of ZDROP, Lagos state	[5]
Nigeria	ZDROP outreach	$8.78	19 (per month)	Financial cost per Penta 1, facility part of ZDROP, Lagos state	[5]
India	Routine	*Updated results forthcoming*	*n.a.*	Urban Bihar state	[9]
Pakistan	Existing approaches	*Updated results forthcoming*	*n.a.*	Karachi state, super high-risk urban councils	[10]
Nigeria	ZDROP outreach	$12.22	23 (per month)	Financial cost per zero-dose child reached, Lagos state	[5]
Pakistan	Integrated outreach	$15.26	1.3 per day	Financial cost. Sindh and Punjab	[6]
Pakistan	Clinics on wheels	$19.19	0.7 per day	Financial cost. Sindh and Punjab	[6]
Ethiopia	Outreach optimization	*Updated results forthcoming*	*n.a.*	Economic cost, excluding TA. ZD: penta1 > 12 months old. Addis Abeba, high coverage setting (87%) with ZD prevalence of 2.5%	[8]
Nigeria	Facility-based	$22.45	2 (per month)	Financial cost per zero-dose child reached, facility not part of ZDROP, Lagos state	
Pakistan	Routine outreach	$39.85	0.7 per day	Economic cost. Sindh and Punjab	[6]

Pakistan	Integrated outreach	$47.13	1.3 per day	Economic cost. Sindh and Punjab	[6]
Ethiopia	Outreach optimization *with TA*	*Updated results forthcoming*	*n.a.*	Economic cost. ZD: penta1 > 12 months old. Addis Abeba, high coverage setting (87%) with ZD prevalence of 2.5%	[8]
Pakistan	Clinics on wheels	$54.36	0.7 per day	Economic cost. Sindh and Punjab	[6]
Pakistan	Fixed site delivery	$58.68	0.3 per day	Economic cost. Sindh and Punjab	[6]

COMMUNITY-BASED INTERVENTIONS TO INCREASE DEMAND

Community-based interventions can be effective at tackling deep-rooted demand-side barriers to vaccination. However, as they require a deep understanding to ensure interventions are tailored to the specific barriers, these interventions might have very high design costs, which can lead to high costs per zero-dose child reached. As interventions are implemented for longer and design costs are amortized, the cost per zero-dose children reached would likely go down. However, re-design is likely needed to scale behavioral interventions, as addressing deep-rooted hesitancy requires highly context-specific solutions.

Table 3. Cost per zero-dose child reached with community-based interventions

Country	Intervention	Cost per zero-dose child reached (USD)	Outcome	Notes	Source
Pakistan	Referral from traditional birth attendants (TBAs)	*Updated results forthcoming*	*n.a.*	Karachi state, super high-risk urban councils	[10]
India	Bundle of interventions—excl. design costs	*Updated results forthcoming*	*n.a.*	Urban Bihar and Uttar Pradesh states	[9]
Pakistan	Referral from private clinics	*Updated results forthcoming*	*n.a.*	Karachi state, super high-risk urban councils	[10]
India	Bundle of interventions[1]—incl. design costs	*Updated results forthcoming*	*n.a.*	Urban Bihar and Uttar Pradesh states	[9]

[1] The bundle of interventions includes: a flyer to enhance caregivers' awareness and risk perception to non- vaccination, a chequebook to share the economic value of vaccines, father's meeting to promote male involvement in children's immunization and post-vaccination care package.

Ethiopia	Community volunteer with referral slip	$70.63-$173.70	12-31% reduction in ZD prevalence	Pastoralist areas	[11]
India	Bundle of HCD interventions *excl. TA*	*Updated results forthcoming*	*n.a.*	Incremental economic cost, without TA. Rural Bihar state	[12]
India	Bundle of HCD interventions *incl. TA*	*Updated results forthcoming*	*n.a.*	Incremental economic cost, with TA. Rural Bihar state	[12]

FINANCIAL BARRIERS TO IMMUNIZATION

Financial barriers incurred by caregivers to get children vaccinated can be significant, representing a large share of their monthly income. As potential costs to access immunization services may be even greater for caregivers of zero-dose children, financial incentives like conditional cash transfers, represent a promising solution to easing the financial burden incurred by beneficiaries and help reduce zero-dose prevalence.

Table 4. Cost per visit incurred by beneficiaries to get children vaccinated

Country	Cost incurred by beneficiaries (USD)	Notes	Source
Nigeria	$0.78 / visit *or* ~21% of monthly income	Economic cost. Kano state	[13]

HOUSE-TO-HOUSE IDENTIFICATION OF ZERO-DOSE CHILDREN

House-to-house (H2H) identification and registration is labor-intensive but effective at identifying zero-dose children. When added on to existing campaigns, this can be done at little or no additional financial cost. However, this strategy is only effective at reducing zero-dose prevalence if coupled with good data systems and with effective follow-up by the routine system to convert identifications into completed vaccinations.

Table 5. Cost per zero-dose child identified

Country	Intervention	Cost per ZD child identified (USD)	Notes	Source
Uganda	H2H identification and registration ahead of the Big-Catch-Up campaign	$3.07	Economic costs. Mubende, Wakiso and Kesese districts	[4]

Pakistan	H2H identification during polio campaigns	$9.24- $17.21	Opportunity costs. Sindh and Punjab. Range for the Nov 2023 and the Oct 2024 campaigns respectively	[6]

LIMITATIONS

This brief presents preliminary findings available as of August 2025, and results may change as further analyses are conducted. Methods varied across studies, including which costs were included and the types of costs estimated. In addition, countries applied different definitions of "zero-dose child", further limiting comparability. Finally, interventions were costed at different stages of implementation, some at maturity while others were newly designed or recently implemented. Findings should therefore be interpreted with caution.

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