

Interventions for reducing zero-dose and under-immunised children in eight countries in sub-Saharan Africa: A review

McGowan C¹, Venner G¹, Alhaffar M¹, Akande T², Hailemichael Y³, Salaudeen A², Bolarinwa A², Abdissa A³, Ahmar S⁴, Clarke A⁴, Valentine P⁴, Ahmed T⁴, Abdelmagid N¹

¹ London School of Hygiene & Tropical Medicine, ² University of Ilorin, ³ Armauer Hansen Research Institute, ⁴ Save the Children Fund



1 BACKGROUND

Despite the effectiveness of routine immunisation (RI) in reducing child illness and child mortality a significant number of children remain under-immunised (UI) or zero-dose (ZD). There are large vaccine equity gaps globally; however, these gaps are wider in certain settings including, for example, those characterised by high income disparity.

To understand the types of interventions used to reduce the numbers of UI/ZD children we carried out a systematic review of the empirical literature reporting on the design and implementation of interventions to reduce the number of UI/ZD children in eight countries in sub-Saharan Africa. Specifically, we aimed to determine which factors impact the success of these interventions.

2 METHODS

The review included the top three countries characterised by high numbers of ZD children (DRC, Ethiopia, Nigeria), high proportion of UI (Angola, CAR, Somalia), and high numbers of ZD children living in rural/remote areas (CAR, Madagascar, Mauritania) (see **FIGURE 1**).

We searched EMBASE, Global Health, and MEDLINE databases for papers published between 2013 and 2023. We included grey literature.

We used a narrative synthesis to describe challenges and success factors based on a typology of intervention types. We also extracted data about risk factors for UI/ZD.

Finally, we reviewed the included papers in the Gavi Pro-equity Evidence Map (1)

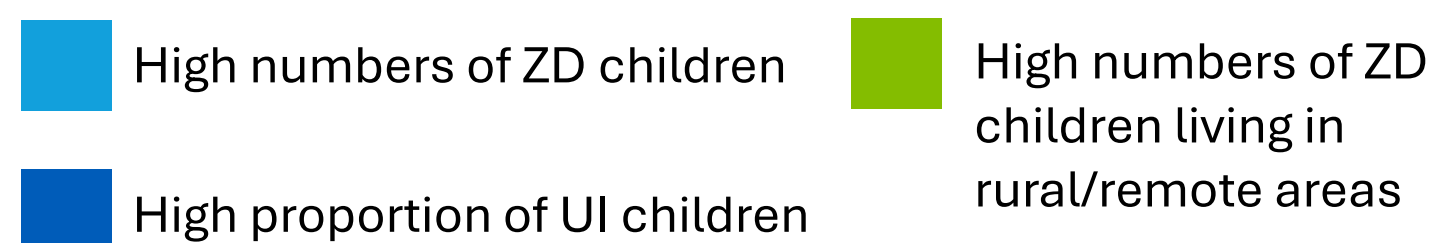


FIGURE 1: Eight countries included in the review: Angola, CAR, DRC, Ethiopia, Madagascar, Mauritania, Nigeria, and Somalia.

3 FINDINGS

A total of 14842 sources were identified. We extracted data from 46 studies. The majority of (85%) the identified studies reported on interventions in Ethiopia (n=11) and Nigeria (n=28). We found only four studies reporting on interventions in Angola, CAR, and Somalia despite high proportions of UI children in those settings.

Intervention design

Interventions fell into one of four types (i.e. supply/provision, demand/uptake, integration, and governance/policy) and 10 sub-types (see **TABLE 1**).

The most common interventions were those aimed at improving service/programme quality (supply), and those aimed at increasing community mobilisation and/or health promotion activities (demand). Proportionately few studies reported on interventions involving reminders (e.g. text/SMS), incentives, increasing reach, or improving policy. Few studies included a thorough description of intervention design.

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TABLE 1: Interventions by country, type/subtype, and antigen (● Routine, ● Measles, ● Penta, ● Polio)

Country	Intervention Type	Intervention Subtype	Intervention Antigen
Angola			● Polio Eradication Initiative (PEI)
CAR		● Post-conflict vaccination campaign	
DRC		● Global Polio Eradication Initiative (GPEI)	● Polio Eradication Initiative (PEI)
Ethiopia	● Enhanced community engagement and defaulter tracing strategy (Fifth Child project) ● Mobile Phone Text Message Reminders	● 10+10+30 radio campaign ● Enhanced community engagement and defaulter tracing strategy ("Fifth Child" project) ● Community volunteers (CVs) the CORE Group Polio Project (CGPP)	● Global Polio Eradication Initiative (GPEI)
Madagascar		● Vaccination weeks ● Health systems strengthening (HHS) intervention	
Mauritania			● Technical assistance services
Nigeria	● A Vaccine Indicator and Reminder (VIR) band ● High-intensity CHW intervention delivering community-based service delivery (CBSD) ● Engaging traditional barbers to identify and refer newborns ● Volunteer community mobilisers (VCMs) COREGroup Polio Project (CGPP) ● Civil society organisations (CSOs) ● Community Theater for Immunization (CT4I) ● Youth Group Engagement	● Directly Observed Oral Polio Vaccination (DOPV) ● Supplementary immunization activities (SIAs) ● Directly Observed Oral Polio Vaccination (DOPV) ● Supplementary immunization activities (SIAs) ● Supplementary immunization activities (SIAs)	● Public-private partnership (PPP) ● Geographic Information System Technology ● Household-based microplanning exercise ● N-STOP ● Microplanning verification process ● Community surveys ● GIS ward maps ● Tracking Vaccination Teams using GIS
Somalia		● Conditional cash transfers and mHealth audio messaging	
	Communications	Community mobilisation	Incentives
			Mass campaigns
			Health system strengthening
			Planning
			Quality
			Reach
			Integration
			Governance/Policy

Success factors

All studies reported positive outcomes. Success factors included, engagement of political leadership, collaborative planning, leveraging existing structures, and uncomplicated intervention design.

Risk factors for ZD/UI

Reviewed papers have frequently (and uncritically) reported factors related to maternal knowledge, maternal literacy, maternal social status, etc. as determinants of immunisation uptake despite a wealth of qualitative studies describing shared-decision making or predominantly male decisional authority in decisions around vaccination of children.

4 RECOMMENDATIONS

Evaluation of integrated interventions is complex and requires careful planning and a clear understanding of limitations. Interventions should be simplified to improve design, implementation, evaluation, and sustainability.

Women's role is key in childhood vaccination; however, isolating these determinants without understanding and analysing how they interact with other determinants will hinder any progress in vaccination. Intervention design should address issues around male decision-making, and risk factor studies should be subject to greater scrutiny of assumptions implicating mothers in the status of children.

5 REFERENCES

1. Gavi (the Vaccine Alliance). Pro-Equity Evidence Map Geneva: Gavi; 2023 [Available from: <https://zdlh.gavi.org/resources/evidence-map#evidencemap>].

Scan the QR code for a list of references of studies included in our review.

