Economic Evaluation of High Impact Interventions to reduce Zero-Dose Numbers in the DRC

April 2024

Background

14.3 million

children globally are considered zero-dose children according to 2022 estimates

753,499

children in DRC are considered zero-dose children according to 2022 estimates

1 in 5 children

aged 12 to 23 months in the DRC are ZD, associated with factors such as low maternal education, young mothers, and lack of civil registration

As one of the countries with the highest number of ZD children globally, the DRC faces a significant public health challenge with these children at risk for vaccine-preventable diseases.

The health system is decentralized into six levels, from national to health facilities. Despite this structure, only 42% of facilities offering vaccinations had the necessary resources and staff to do so (RDC NDP, 2016).

The low vaccination coverage and recurring outbreaks in some areas highlighted the need to improve outbreak responses and the existing vaccine delivery system.

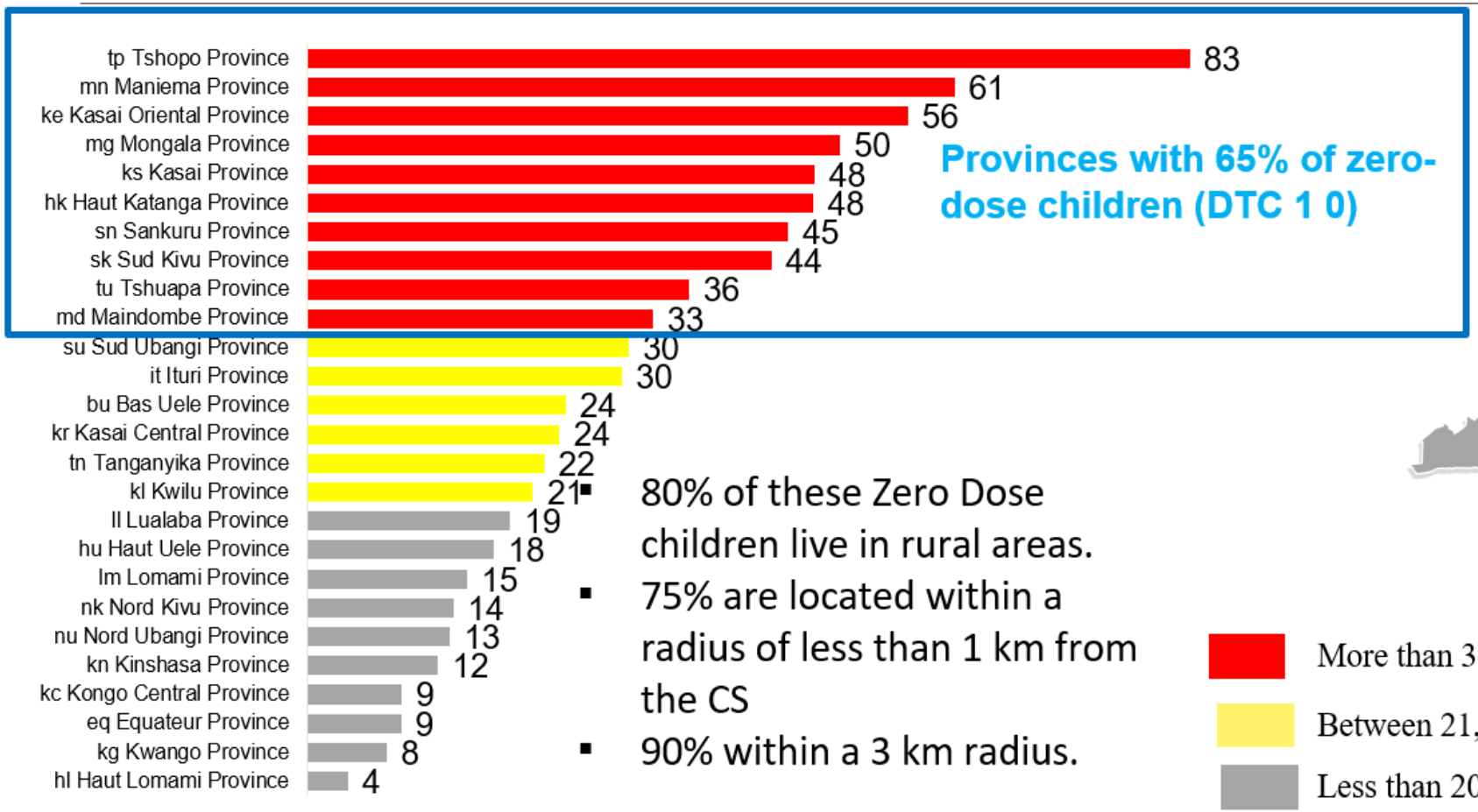
One of the response plans is the Gavi's Equity Accelerator Fund (EAF) which builds on the Mashako Plan 2.0 and funds specific interventions to reach zero dose children.

The fund is focused on reducing the number of zero-dose children by 50% by 2030. In DRC, the funds complement GAVI’s existing support to DRC.

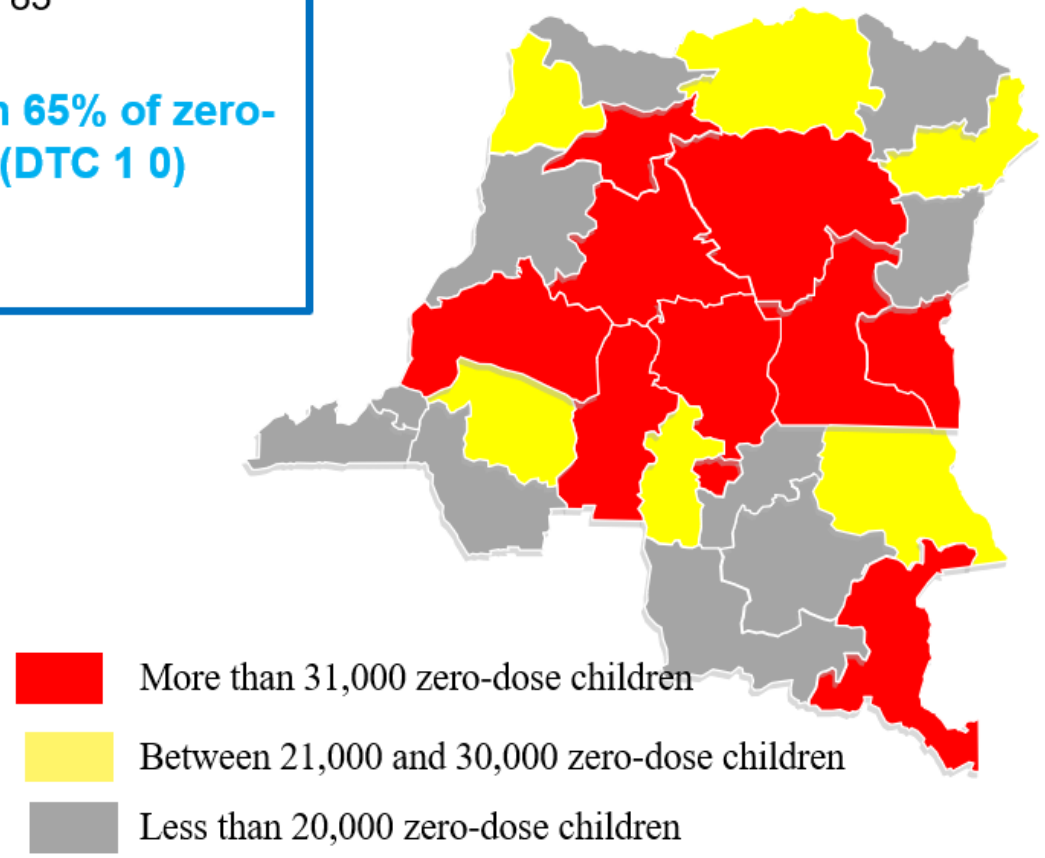
2. Situation analysis of zero doses

2/3 of zero-dose children live in 10 provinces in central and rural regions

Number of zero-dose children (DTP 1 = 0) by province [ECV, 2021, ESPK survey].



- 80% of these Zero Dose children live in rural areas.
- 75% are located within a radius of less than 1 km from the CS
- 90% within a 3 km radius.

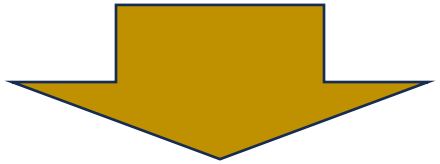


Source: KSPH, DHIS 2

EAF Interventions

5 High-Impact Interventions

1. Mapping, Population Movement Analysis and Geo-referenced Microplans
2. Door-to-door (D2D) vaccination and all-contact vaccination to reduce missed opportunities vaccination (MOV)
3. Collaborations with CSOs to promote right to health through user platforms, gender mainstreaming, and equity, with a view to identifying and reaching Zero Dose Children.
4. Direct Distribution of vaccination inputs with NGCA and establishment of transit storage areas.
5. Setting up a knowledge management center at all levels of the healthcare system.



Study Focus: Interventions 1, 2 & 4

Interventions

Based on the IRMMA framework (Identify - Reach - Monitor - Measure - Advocate), we classified interventions into three categories—demand generation, supply chain, and service delivery to increase equity in routine immunization programs. In DRC, several interventions are being implemented through the EAF.

Demand Generation

Mapping for health

Creation of Mapping for Health Data
Here, administrative base maps are generated through a collaborative process between GIS Mappers and local health teams.

Population Estimation
Population estimation is defined as an independent source of population numbers used to help improve resource allocation/plan appropriate routine immunization strategies as part of the micro and macro-planning process.

Micro-plan Development
Georeferenced health area and zone boundaries are developed to inform and align the management units commonly used in microplans.

Mobility Estimates
Mobility estimates from mobile phone usage data was defined as a system for automated routine capture of mobility estimates from call data records.

Service Delivery

Door to door vaccination and all-contact vaccination to reduce missed vaccination opportunities (MVOs)

Outreach services to ensure children receive the vaccines through door-to-door and at all contacts.

Logistics

Direct distribution (informed PUSH)

Under the Next Generation Supply Chain Initiative (in French, Nouvelle Génération des Chaînes d'Approvisionnement, or NGCA), direct deliveries are made to health facilities with the use of the Informed Push approach. Products are delivered directly from the provincial warehouse to a subset of health centres that have cold chain equipment for vaccines.

Objectives

Primary Objective

Assess the cost effectiveness of the high-impact interventions being implemented in the DRC.

Secondary Objectives

1. To assess the cummulative effectiveness of the high impact interventions in reducing zero-dose numbers.
2. To estimate the direct and indirect costs of each high-impact intervention.
3. To estimate the cost per zero-dose child immunized
4. To identify key factors influencing the cost effectiveness of these interventions

Primary Study Questions

1. What is the impact of implementing the above interventions on reducing zero-dose children in Tshopo, and Haut-Katanga provinces, DRC?
2. What are the costs associated with implementing high-impact zero-dose child reduction interventions in the provinces of Tshopo, and Haut-Katanga, DRC?
3. Are these interventions cost-effective to scale up? What costs need to be budgeted?

Methodology

Study Design

Mixed-methods approach consisting of both primary and secondary data collection at both baseline and endline.

Costing Perspective - The healthcare payer perspective.

Sampling and Sample Size

Stratification

Each study province was subdivided into two strata: urban and rural.

Selection of Health Zones

30% of the total number of health zones for each stratum through simple random sampling.

Selection of Health Areas

30% of the total number of health areas for each health zone. To do this, we will conduct a simple random sampling of Health Areas within the previously randomly selected Health Zones.

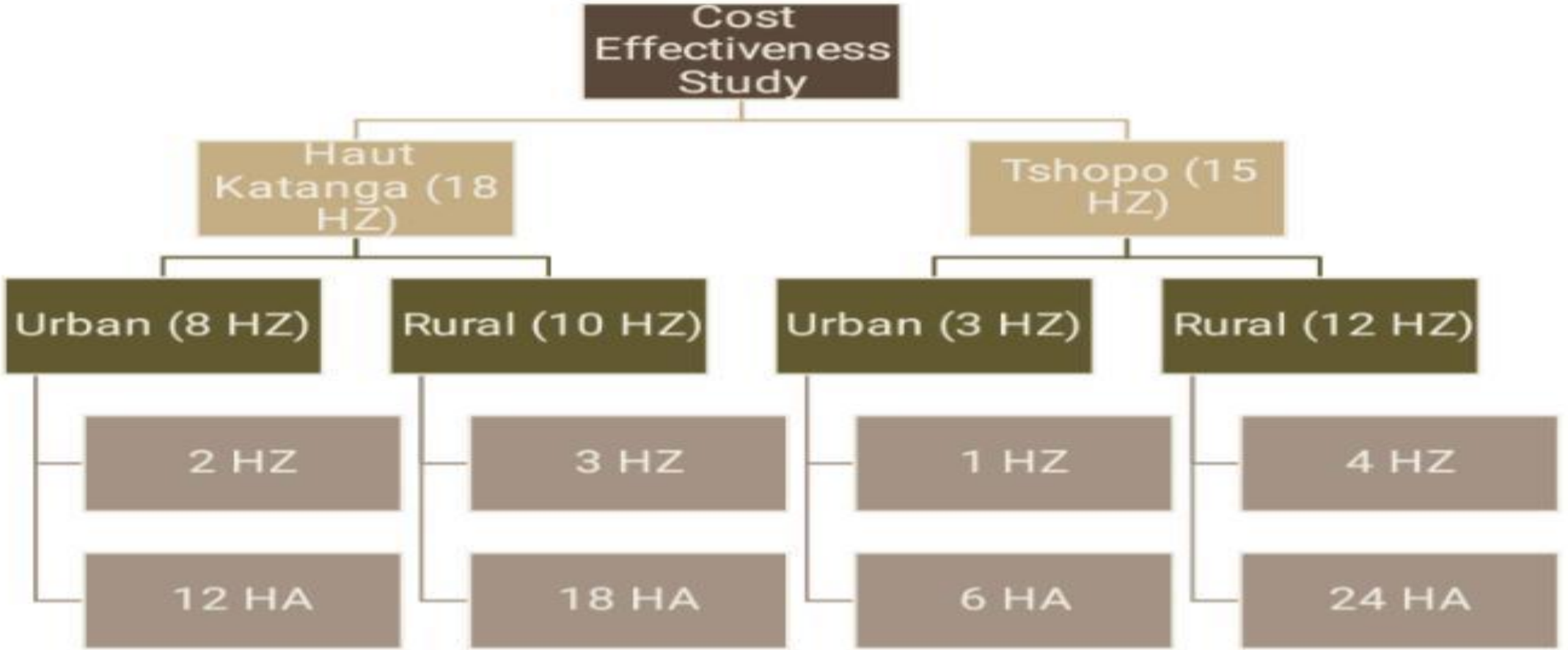
Study Location

The study will be conducted in Tshopo and Haut Katanga. Data will be collected from health facilities in this province as well as the health zone and province levels.

Intervention	Implementing Partner	Haut Katanga	Tshopo
Mapping and geo-referenced micro plans	UNOPS/GRID3		X
Door to door vaccination	CAGF/MSPHP/ OMS	X	X
Direct distribution of vaccination inputs with NGCA and establishment of transit storage sites	UNICEF/ VILLAGEREACH		X

Methodology

Figure 3: Representation of the sampling of health areas.



Methodology: Cost Evaluation

MAPPING POPULATION MOVEMENT ANALYSIS AND GEO-REFERENCED MICRO-PLANS

- For the cost of geo-referenced micro-plans, we will only consider the additional costs that arise from the introduction of geo-referenced mapping and the population movement analysis over traditional micro planning costs.

- We will consider costs at the health zone level

Cost Categories	Inputs
Microplanning (meetings at ward and health facility levels)	Personnel time
	Per diems
	Transportation Stipends
	Meeting materials
	Venue rental
Mapping for Health Microplanning Approach only (additional inputs)	Data mining
	Field data collection (HCW time)
GIS map production and use of maps	Inventory settlements
	Updating/reconciling/estimating
	Population
	Road digitization
	Processing/analysing
	Generating e-maps
	Printing maps
	Personnel cost
	Training to use digital maps

Methodology: Cost Evaluation

DOOR TO DOOR VACCINATION AND ALL-CONTACT VACCINATION TO REDUCE MISSED VACCINATION OPPORTUNITIES (MVOS)

- We intend to capture the full costs of the door-to-door campaigns.
- The costs will be collected at the health zone and health facility levels.
- Shared costs such as the cost of cold-chain equipment will be included as part of the costs of the campaigns.

Cost Categories and Input

Cost Category	Input
HCW Cost	Value of HCW time spent on the campaigns
Transportation Cost	Transportation Stipends – costs to travel from the health facility to communities, Per Diems
Cost of CCE	Share of CCE costs attributable to D2D campaigns

Methodology: Cost Evaluation

DIRECT DISTRIBUTION OF VACCINATION INPUTS WITH NGCA AND ESTABLISHMENT OF TRANSIT STORAGE SITES

In reporting the costs, we will also make use of a functional breakdown into categories.

We propose to collect cost information at all levels of the supply chain that were involved in supporting immunization commodity movement through to the health facilities, including EPI, Health Zone and health facility costs.

The outputs of the costing exercise will include the following costs annualized beyond the study period:

- total annual costs,
- total annual costs by supply chain function and tier,
- and normalized annual costs

Cost Categories	Description
Procurement	Cost category includes labour costs and fees associated with purchasing commodities.
Management	Cost category includes costs related to the administration of the supply chain such as operational costs including supervision and training as well as management labour costs and expenses for program staff located at the province.
Storage	Cost category includes warehousing costs related to storage of commodities including equipment, buildings, labour, and related expenses. Storage costs will cover costs at all levels of the supply chain.
Transportation	Cost category includes costs related to commodity distribution including labour (e.g., facility staff time for collecting commodities), fuel, vehicle depreciation and related expenses.

Methodology: Outcome Metrics

The outcome measure is the Percentage reduction in zero dose numbers.

- To collect data on the health outcomes for the package of interventions, we will review the immunization coverage survey conducted by the Kinshasa School of Public Health at baseline.
- At endline, we will conduct a household survey and triangulate data from health facility immunization registers to estimate number of zero-dose children vaccinated during the study period.
- The cost-effectiveness ratios will be presented as the cost per child immunized in an annual routine immunization microplanning cycle.
- We will benchmark this cost against the earmarked EAF funds for DRC.

Limitations

- Although we are evaluating a package of interventions, not all interventions commence simultaneously. We have selected a baseline period; we anticipate that we will have at least six months of implementation data for all interventions at endline.

- Data quality issues with health facility registers.

Workplan and Schedule

Inception Activities

December 2023 – April 2024

Ethical Approval

May 2024

Baseline Data collection, analysis & findings

June – September 2024

Endline Data collection, analysis & report

December 2024 – February 2025

Dissemination

March – May 2025