



17th TechNet Conference

Panama City, Panama | October 16-19, 2023

Immunization Programmes That Leave No One Behind

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Increasing stock visibility for improved decision making and access to health

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Evaluating the impact of electronic Logistics Management Information Systems (eLMIS) and electronic Immunization Registries (eIR) in low- and middle-income countries

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Overview

- **Topic:** Impact of electronic immunization registries (eIR) and electronic logistic management systems (eLMIS) in low and middle-income countries.
- **Project duration:** June 2020 – December 2022
- **Countries evaluated:** Guinea, Honduras, Rwanda, Tanzania
- **Data collection:**
 - October/November 2021 (Tanzania)
 - Feb/March 2022 (Rwanda)
 - April 2022 (Guinea)
 - September 2022 (Honduras)
- **Goal:** *To generate actionable evidence for the Ministries of Health of Guinea, Honduras, Rwanda and Tanzania to support future decisions on the management of the digital technologies, and contributing to global learnings on introducing and scaling up eIR and eLMIS in low-resource settings*

• Sponsors:

BILL & MELINDA
GATES *foundation*



• Evaluation team:

SDA Bocconi
School of Management



Edith Rodriguez &
Luis Castillo

Research Questions

- Has the implementation of the eIR and/or eLMIS **improved immunization service delivery processes and outcomes?**
- What is the short- and medium-term **economic and financial impact** of implementing and scaling up these systems in the whole country? How **affordable and sustainable** are the systems?
- How **interoperable** are the systems with the national health management information and civil registration systems?
- How can new evidence on tools and technologies, modalities, and governance of these systems **inform further investments** from domestic sources, health financing institutions and technical partners for the sustained implementation of these systems?









Methodology: Programmatic impact evaluation

- A **mixed methods** approach involving quantitative and qualitative methods and primary and secondary data collection
- **Purposive sampling** of regions/provinces, districts and health facilities.
- **Impact assessed in terms of input, process and output indicators** related to service delivery, including factors critical for the successful implementation and scale up of eIR and eLMIS
- Specific data collection **tools** used to gather information on:
 - Use of the electronic tools
 - Infrastructure and workforce requirements
 - Technical competency of users
 - Data quality, accuracy and data use for decision-making
 - Impact on immunization program performance
 - User experience and perception by HWs and their clients

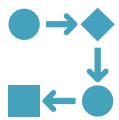






List of data collection tools* & sample size				
	Guinea	Honduras	Rwanda	Tanzania
Interview guide				
Health facility	43	80	24	61
District	7	-	12	30
Region	-	8	-	10
Economic interview guide				
Health facility	43	80	24	61
District	7	-	12	30
Region	-	8	-	10
Competency assessment				
Health facility	43	80	49	25
District	-	-	16	-
Region	-	-	-	-
On-site accuracy check				
Health facility	43	80	24	62
District	7	-	-	-
Region	-	-	-	-
Health worker survey				
Health facility	43	80	44	60
Caregiver interview guide				
Health facility	-	80	95	81
Total # of HF	444	1,516	505	5,497

* The programmatic data collection instruments were adapted from pre-existing and validated tools including: the Modular Data Quality Assessment Protocol with Electronic Immunization Registry Component (PAHO, 2017); a range of data instruments used in the Evaluation of the Better Immunization Data Initiative (Mott MacDonald, 2019); and the eIR Readiness Assessment.

Cross country findings

-  Donors and partners **expectations** often not aligned with national objectives
-  Funding and overreliance on **external support** generated dependencies and distortion of priorities
-  Constraints in access to **infrastructure** hindered sustained use
-  **Technical limitations and design choices** resulted in significant barriers for wider use
-  **User satisfaction** generally high, users eager to adopt; training perceived as inadequate
-  **Supportive supervision** and direct assistance improved likelihood of adoption and increased attention on data quality

Cross country findings (continued)

-  A **phased roll-out strategy** supported adoption of the tools; **policies** for the shift to fully electronic systems are needed at the outset
-  Perceived **data quality improvements** resulted from the use of the tools
-  **Data for decision-making** was limited at the service delivery level
-  Use of an eIR positively impacted **service delivery processes**
-  Use of an eLMIS positively impacted **vaccine management**
-  Mixed evidence on **cost-saving** potential of the electronic tools
-  **Affordability and sustainability** increased with higher level of use of the electronic tools

Ecosystem



Insight: Donor and partner expectations were often not aligned with national objectives

- **Mismatched expectations** between country stakeholders, technical partners and donors on the intended use, technical potential and **expected impact of the tools**
- National strategies in all countries promoted digitalization, with **various models of digital health governance and policies** and differing approaches to integration and interoperability.
- **Integrated/interoperable tools for the daily work of frontline HWs** were not the primary focus of decisions on digitalization.

Insight: Overreliance on external support was perceived to potentially distort national priorities

- Wide spectrum of governance and policy environment, funding sources, and political support structures
- **Overreliance and dependence on external partners** (i.e., funding, and technical assistance) perceived to potentially distort priorities and hamper long term financial and operational sustainability of systems.

Ecosystem

Insight: Constraints in access to infrastructure significantly impeded adoption and sustained use of electronic tools

- **Digital literacy** appeared not to be a problem (data clerks or clinical staff)
- Better **access to infrastructure** facilitated better use of the tool.
- Poor access to internet, electricity and sufficient hardware hindered tool adoption – irrespective of rural or urban location.
- **Internet access** was a bigger concern than electricity and hardware, and considered a challenge in all countries



“Very often we had to buy data package ourselves to continue using eSIGL”

– Health centre, Guinea

	Rwanda	Tanzania	Guinea	Honduras
Non-User	67	52	29	15
Rural	60	56		12
Urban	70	49		18
User	81	84	39	27
Rural	80	79		28
Urban	82	88		26

Figure: % of users with sufficient access to infrastructure (internet, electricity, and hardware). *Non-users includes non-frequent users in Rwanda, and those ‘no longer’ using the tool in Tanzania. Guinea did not have an eLMIS in rural facilities.*

Insight: Technical limitations and design choices were significant barriers for wider use

- **Technical limitations in tool design and functionality** caused significant barriers to using them.
- Two main design approaches were:
 - Adaptation of existing open-source platforms
 - Development of bespoke solutions.
- Regardless of the platform used, **almost no data entry happened directly at the service delivery level** in any of the four countries.
- Only front-line health workers in the vaccination room allow for real-time data entry and immediate data use



“When TImR was working stock management was easier and takes short time to accomplish everything.”
– Health Facility, Tanzania

Insight: Mixed evidence on cost-saving potential of the electronic tools

- **Upfront investments** for design, development and roll-out were:
 - mostly covered by external donors
 - driven by hardware and training costs
- Design and development costs were higher for bespoke or highly customized tools than for off-the-shelf solutions
- Operating costs were driven by labor costs across all countries
- **Mixed evidence on cost impact** compared to sole use of paper registries:
 - Higher costs of managing data with eIR/eLMIS vs. paper in Honduras and Rwanda, lower costs in Tanzania and almost negligible impact in Guinea (integrated system)
 - Duplication of processes resulted in higher costs for data recording compared to paper (except Tanzania)

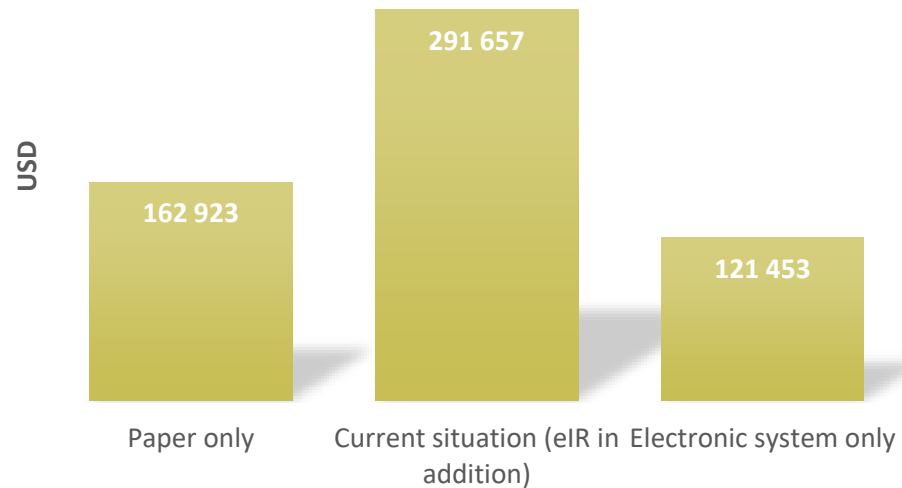


Cost impact and potential of systems to generate cost savings linked to:

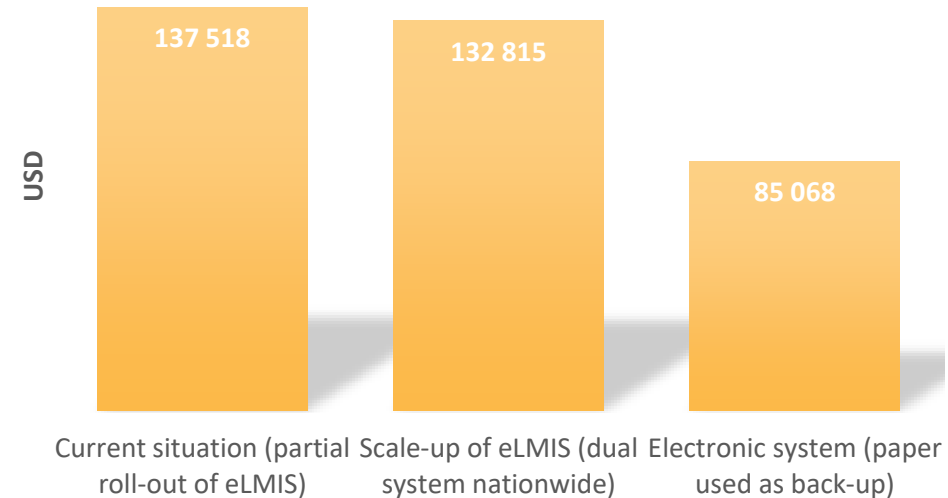
1. Whether paper-based processes were maintained in parallel with electronic processes;
2. The extent to which eIR/eLMIS data were used to support daily activities of HWs.

Transition to fully digital, based on process-related assumptions, hints at cost-savings but still requires investments in the enabling environment

Rwanda total annual costs for immunization data management



Guinea total annual incremental costs for vaccine stock data management



Transition of ownership

- Insufficient financial planning for transition to domestic ownership and maintenance of the system
- Government monitoring of use of tools mostly insufficient (except GN)
- Costs should ideally be borne across MoH departments (integrated systems) and budgeted centrally
- If funded through immunization budget, opportunity costs and cost-effectiveness shall be considered

Conclusions



eTools support decision-making, particularly at the service delivery point, only if **designed to meet programmatic needs** and to transition to a **fully digital setup**.



To allow sustainable and sustained use, design and implementation of the eTools should adopt an **integrated approach with other PHC programs**.



A functioning **IT ecosystem** and **local capacity** are two pre-conditions for success of the eTools. Without these, investments in the tools might be at risk of not delivering the expected results.



Implementation research is needed to understand the impact of the eTools, and their use contributes to improved immunization outputs such as vaccination timeliness, coverage, and stock-levels.



Monitoring and evaluation should be planned at the onset of implementation, and continued once the systems are fully scaled inform those course corrections necessary to ensure continues use of the eTools.



Thank You!

Logistics Management Information System (LoMIS) for Improved Supply Chain Management in Low-Resource Settings

Mohammed-Faosy Adeniran, eHealth Africa



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Logistics Management Information System (LoMIS) for Improved Supply Chain Management in Low-Resource Settings

Mohammed-Faasy Adeniran, eHealth Africa



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About LoMIS Suite



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What LoMIS Suite was Developed to Address

1

Low visibility on stock availability at the Last mile health facilities

2

Manually aggregated reports, that are a heavy burden on staff, result in delays of info for decision making

3

Low accountability on stock utilization and wastage during fixed and outreach sessions

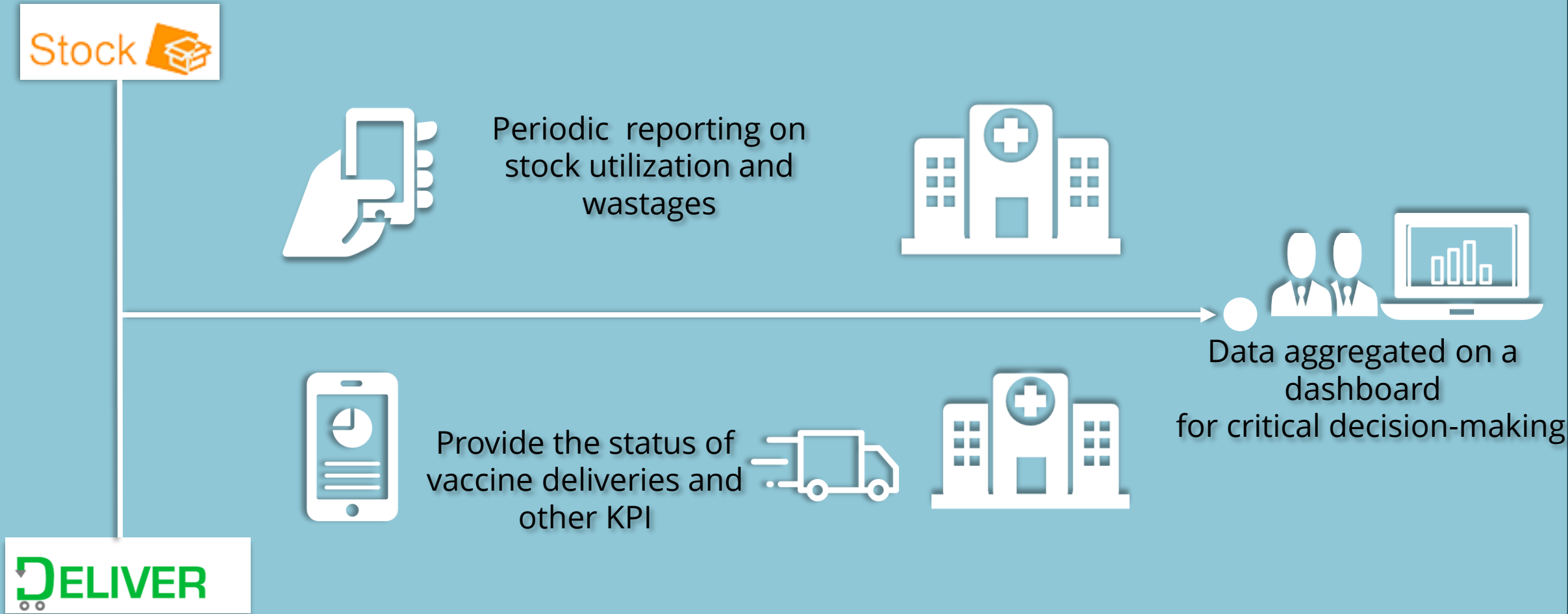
4

High rate of data collection errors

5

Substantial degrees of stockouts at last mile health facilities

How It Works

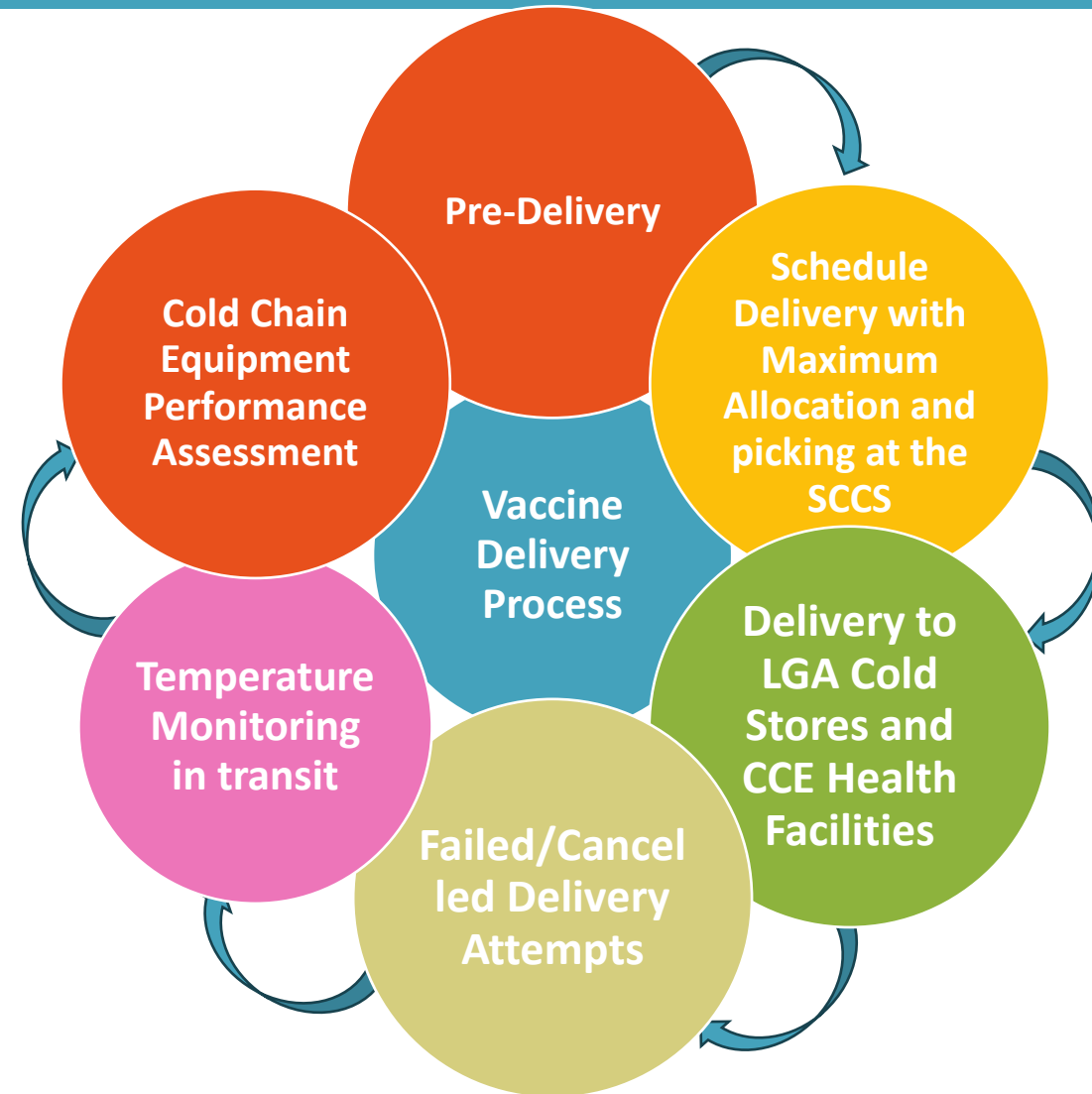
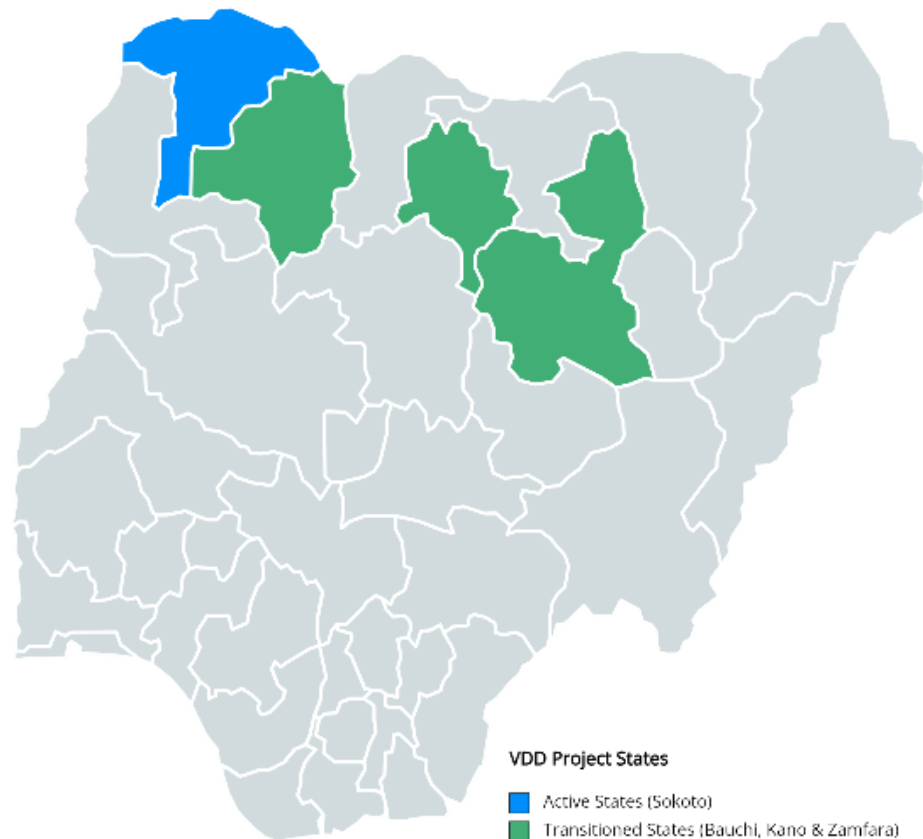


Use Cases in Supply Chain



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Use Case of LoMIS on The Vaccine Direct Delivery Project



Benefits and Potential Impact



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Benefits and Potential Impact



21M+
Total Antigens
Delivered



23M+
Total Dry Goods
Delivered



17k
Total Successful
Deliveries



Resulting in
reduced stock
out rate, from
61% to
8%

Benefits and Potential Impact



**Over 8,400,000
Number of
Children
Reported
Immunized**

Image Source: <https://photos.hq.who.int/galleries/150>

Conclusion



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Conclusion

In conclusion, the use of the LoMIS Suite can significantly contribute to medical and vaccine commodities last-mile visibility, thereby increasing access to healthcare services in hard-to-reach (Low Resource Settings) and ultimately achieving the goal of universal healthcare coverage.

However, the issue of sustainability remains a major challenge.

Scan to download eHealth Africa's Profile and Project Briefs



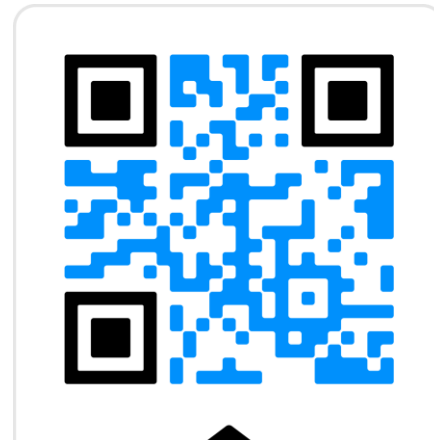
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 BISKIT



 EMID



LOMIS SUITE



 eHA Impact 2022



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Thank You!

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Q & A



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