

**Case Report** 

International Journal of Health Policy Planning

# Case Study Report: Last Mile Delivery Initiative for Health Commodities in Adama Branch

Degefa Uma Banti\*

MSc in Health Supply Chain Management, Ethiopian Pharmaceutical Supply Service, Addis Ababa University, Ethiopia

#### \*Corresponding Author

Degefa Uma Banti, MSc in Health Supply Chain Management, Ethiopian Pharmaceutical Supply Service, Addis Ababa University, Ethiopia.

Submitted: 2025, Apr 22; Accepted: 2025, May 20; Published: 2025, May 26

**Citation:** Banti, D. U. (2025). Case Study Report: Last Mile Delivery Initiative for Health Commodities in Adama Branch. *Int J Health Policy Plann*, *4*(2), 01-04.

# **1. Introduction**

#### 1.1. Background

The Last Mile Delivery (LMD) initiative is a critical component of the healthcare supply chain, ensuring that essential health commodities such as vaccines, Antiretroviral Therapy (ART), Prevention of Mother-To-Child Transmission (PMTCT) drugs, TB/Malaria medications, and Reproductive, Maternal, Neonatal, and Child Health (RMNCH) supplies reach health facilities in a timely and efficient manner. The Adama Branch, serving 404 health facilities, plays a pivotal role in delivering these life-saving commodities to both urban and remote areas. However, the branch faces significant operational challenges that hinder its ability to meet distribution demands effectively.

# 1.2. Rationale

This case study examines the identified gaps in the LMD initiative, proposes actionable solutions, and provides recommendations to enhance the efficiency, coverage, and reliability of health commodity delivery in the Adama Branch catchment area. The study draws on global and regional best practices, as well as insights from similar contexts, to provide a comprehensive analysis of the challenges and opportunities in LMD.

# **1.3. Literature Review**

• Last Mile Delivery Challenges in Healthcare: The World Health Organization identifies global issues in Last Mile Delivery (LMD), including vehicle shortages, inefficiencies in routing, and constraints on operational costs [1]. The USAID | DELIVER PROJECT highlights best practices such as route optimization and collaboration with local stakeholders for effective implementation of direct delivery of health commodities [2].

• Route Optimization and Technology: Kumar & Singh illustrate the benefits of route optimization software and GPS tracking in reducing travel time and fuel expenses [3]. GAVI examines the use of supply chain technology to improve vaccine delivery in remote communities [4]. • Vehicle Fleet Management and Partnerships: UNICEF emphasizes the significance of public-private partnerships in expanding LMD coverage, especially in low- and middle-income countries [5]. Africa CDC (2022) discusses strategies for deploying procured vehicles and strengthening partnerships to enhance accessibility and availability of health products at service delivery points in African countries [6].

• Reverse Logistics and Emergency Stock Management: The World Bank provides guidelines for managing returned medical equipment and redistributing excess stock to optimize operational costs associated with LMD initiatives [7]. The World Food Programme offers insights into emergency stock management during crises, addressing the difficulties in delivering health products for humanitarian supply chains, including product recalls and transfers [8].

• Case Studies on LMD in Ethiopia: The Ethiopian Pharmaceuticals Supply Service reports on LMD challenges and initiatives in Ethiopia, including routing and scheduling plans, weak distribution planning, and vehicle assignment [9,10]. Mengesha & Gebremedhin analyze LMD performance in the Adama Branch, identifying challenges impeding full implementation, such as vehicle shortages, vehicle types, and operational costs [11,12].

• **Performance Metrics and KPIs:** The Global Fund and WHO provide frameworks for monitoring LMD performance using key performance indicators (KPIs) for capital and operational costs [13,14].

• **Comparative Studies:** Mwangi & Kamau and PATH compare LMD performance across Sub-Saharan Africa, highlighting common challenges and innovative solutions [15,16].

# 1.4. Objective

• General Objective: The objective of the study is to pinpoint operational deficiencies and recommend practical solutions to enhance the efficiency of delivering health commodities to health facilities within the catchment area

#### • Specific Objective

> To evaluate the current state of Last Mile Delivery (LMD) coverage for health program commodities delivered through direct delivery and Woreda Pass Through methods.

➤ To identify operational challenges and their impact on last-mile delivery performance.

To propose practical solutions and strategies to improve delivery efficiency and enhance direct delivery access based on the findings.
 To provide recommendations for future actions to enhance LMD reach and sustainability.

#### 2. Methodology

The methodology section outlines the systematic approach employed for collecting, analyzing, and interpreting data for the case study on the Last Mile Delivery (LMD) initiative for health commodities in the Adama Branch. A mixed-methods approach is utilized, combining qualitative and quantitative data collection techniques to ensure a comprehensive understanding of the challenges, gaps, and opportunities in LMD operations

#### 2.1. Study Design

A descriptive and exploratory design is adopted to assess the current state of LMD coverage and operational performance, identify gaps and challenges in the LMD initiative, and propose actionable solutions and recommendations for improvement.

#### **2.2. Data Collection Methods**

Multiple data collection methods are employed to ensure triangulation and enhance the validity of findings.

• **Desk Review:** Secondary data on LMD operations, challenges, and best practices has been gathered. Reports from the Ethiopian Pharmaceuticals Supply Service (EPSS), global and regional studies on LMD (e.g., WHO, UNICEF, GAVI, Africa CDC), policy documents, guidelines, and frameworks related to healthcare supply chains, as well as performance reports from the Adama Branch and other relevant stakeholders, have been included as sources. From these sources, a comprehensive understanding of the LMD landscape, including global best practices and local challenges, has been derived.

• **Document Review:** Operational records, delivery logs, and performance metrics have been analyzed to gain insights into inefficiencies in routing, scheduling, and resource allocation. Delivery schedules and routing plans, vehicle utilization and maintenance records, stock management and redistribution logs, and financial reports on operational costs (e.g., fuel, maintenance, driver allowances) have been reviewed.

• **Interviews:** Firsthand information has been gathered from key stakeholders involved in LMD operations. Participants have included Adama Branch managers and staff, drivers and delivery personnel, and representatives from partner organizations (e.g., GAVI, TGF, USAID). Semi-structured interviews with open-ended questions have been conducted, focusing on challenges, operational gaps, and potential solutions. Qualitative data on operational challenges, stakeholder perspectives, and proposed solutions have been obtained.

• **Observation:** The practical implementation of LMD operations

has been assessed through field observations. Delivery processes at health facilities and distribution hubs have been monitored, vehicle utilization and routing practices have been observed, and the condition of vehicles and their suitability for last-mile delivery has been evaluated. Practical challenges and inefficiencies in LMD operations have been identified.

• Literature Review: Findings are contextualized within global and regional best practices through a review of peer-reviewed journals on supply chain management and LMD, case studies from similar contexts in Sub-Saharan Africa, and reports from international organizations (e.g., WHO, UNICEF, World Bank). Evidence-based recommendations for improving LMD operations are derive Global and regional best practices have been reviewed to contextualize findings. Peer-reviewed journals on supply chain management and Last Mile Delivery (LMD), case studies from similar contexts in Sub-Saharan Africa and reports from international organizations (e.g., WHO, UNICEF, World Bank) have been examined. Evidence-based recommendations for improving LMD operations have been derived.

# 2.3. Data Collection Tools

• Interview Guides: Semi-structured questionnaires are used for key stakeholders.

• **Observation Checklists:** Tools are utilized to systematically record observations during field visits.

• **Data Extraction Forms:** Templates are employed for extracting relevant information from documents and reports.

• Literature Review Matrix: A framework is developed for organizing and synthesizing findings from secondary sources.

#### 2.4. Data Analysis

• **Quantitative Analysis:** Descriptive statistics are used to analyze LMD coverage, including the number and percentage of facilities served and facilities delivered through Woreda Health Bureaus.

• Qualitative Analysis: Thematic analysis is conducted on interview transcripts and observational notes. Recurring themes related to challenges, gaps, and opportunities are identified.

• **Triangulation:** Findings from multiple data sources are combined to validate results and ensure reliability.

# **2.5. Ethical Considerations**

• **Informed Consent:** Consent is obtained from the Hub management team and all participants before interviews and observations are conducted.

• **Confidentiality:** All data are anonymized and stored securely to protect participant identities.

• **Transparency:** The purpose of the study and how the data will be used are clearly communicated to all stakeholders.

# 2.6. Reporting

• A comprehensive report is prepared, detailing findings, proposed solutions, and recommendations.

• Findings are validated with officers from the Hub through feedback sessions.

• The case study report is finalized for submission and presentation

#### 3. Result and Discussion

#### 3.1. Identified Gaps

# **3.1.1. Last Mile Delivery Initiative**

• **Shortage of Vehicles:** Insufficient vehicles to meet the distribution demands of 404 health facilities.

• **Inadequate Vehicle Types:** Vehicles are not suited for lastmile delivery, especially in hard-to-reach areas with challenging terrains.

• **Operational Cost Shortages:** Lack of funding for operational costs, including fuel, maintenance, and driver allowances.

#### 3.1.2. Routing and Scheduling

Optimization Gaps: Inefficiencies in routing and scheduling plans lead to delays, increased fuel consumption, and higher costs.
Weak Distribution Planning: Poor planning in assigning vehicles to specific distribution activities, resulting in mismatched resources.

• Assignment of Vehicles: Challenges in matching the right vehicle to the right delivery task, particularly for specialized health commodities.

# 3.1.3. Reverse Logistics

• Medical Equipment: Difficulty in determining the appropriate use of returned medical equipment.

• Redistribution of Stock: Lack of guidelines for redistributing

excess stock from high-stock facilities to stock-out facilities.

• **Product Recalls and Transfers:** Gaps in processes for recalling products and transferring items between branch warehouses.

# **3.1.4. Handling Emergencies**

• Emergency Stock Orders: Challenges in managing emergency stock orders and replenishing inventory during crises.

• **Stock Replenishment:** Gaps in ensuring timely delivery and maintaining optimal stock levels, particularly for critical items.

# 3.2. Health Program Delivery Coverage

# 3.2.1. Vaccine LMD Coverage

• **Direct Delivery:** 84.4% coverage (218 health centers and 25 hospitals).

• Woreda Pass Through: 15.6.3% coverage (45 health facilities).

#### 3.2.2. ART and PMTCT LMD Coverage

- ART: 100% coverage (83 health centers and 37 hospitals).
- PMTCT: 100% coverage (226 health centers).

#### 3.2.3. TB/Malaria and RMNCH LMD Coverage

• **Direct Delivery:** 81.8% coverage (286 health centers and 37 hospitals).

• Woreda Pass Through: 19.2% coverage (72 health centers).



Figure: Direct Deliver Coverage at Adama Hub Catchment Health Facilities for Health Program

#### **3.3. Challenges and Opportunities 3.3.1. Challenges**

• Limited availability of vehicles and unsuitable vehicle types hinder efficient delivery.

• High operational costs strain the budget and limit the scalability of the LMD initiative.

• Inefficient routing and scheduling lead to delays, increased costs, and reduced delivery reliability.

• Lack of standardized guidelines for reverse logistics and emergency stock management.

# **3.3.2. Opportunities**

• Advanced technology, such as route optimization software and GPS tracking, can significantly improve delivery efficiency.

• Partnerships with local transportation services and private entities can enhance reach and reduce operational costs.

• Standardized protocols and training can improve delivery consistency and reliability.

• Early deployment of procured trucks can address vehicle shortages and support the LMD initiative.

# 3.4. Proposed Solutions

# **3.4.1. Route Optimization**

• Implement advanced route optimization software to reduce travel time, fuel costs, and vehicle wear and tear.

• Utilize GPS tracking to monitor vehicle locations in real-time and adjust routes dynamically for efficiency.

• Schedule deliveries during off-peak hours to avoid traffic congestion and ensure timely deliveries.

# **3.4.2. Direct Delivery Access**

• Ensure all health facilities are accessible by appropriate vehicles, including those designed for challenging terrains and rural roads.

• Pilot and scale up medical drops to reach remote and hard-to-reach areas.

• Develop partnerships with local transportation services to

enhance reach and reduce costs.

• Standardize delivery protocols to ensure consistency and reliability across all delivery operations.

• Cultivate strategic partnerships with private entities to support health commodities delivery.

• Deploy trucks procured for LMD through GAVI, TGF, and Africa CDC to address vehicle shortages and support the initiative.

# 4. Conclusion

The Last Mile Delivery initiative is essential for ensuring that health commodities reach all 404 health facilities in the Adama Branch catchment area. Despite significant challenges, the proposed solutions and recommendations provide a clear roadmap for improving LMD coverage, efficiency, and effectiveness. By leveraging technology, fostering partnerships, and enhancing coordination among health programs, the Adama Branch can overcome its current limitations and achieve its goal of delivering life-saving health commodities to all communities, including those in hard-to-reach areas. This will ultimately improve healthcare outcomes and strengthen the overall healthcare system in the region.

# **Recommendations for Future Action**

• Implement route optimization software and GPS tracking systems to improve delivery efficiency and reduce costs.

• Acquire and deploy vehicles specifically designed for last-mile delivery, particularly in challenging terrains and remote areas.

• Partner with local transportation services and private entities to expand reach and lower operational costs.

• Establish standardized protocols for reverse logistics, stock redistribution, and emergency stock management to ensure consistency and reliability.

• Prioritize areas with low LMD coverage by allocating additional resources and vehicles.

• Perform regular assessments to identify and promptly address coverage gaps.

• Train delivery personnel on best practices for handling health commodities, especially in remote and challenging environments.

• Promote collaboration among different health programs (e.g., HIV, TB/Malaria, RMNCH) to streamline delivery efforts and prevent duplication.

• Set up Key Performance Indicators (KPIs) and conduct regular evaluations to assess the impact of implemented solutions and ensure continuous improvement in LMD operations.

# **Ethics Approval and Consent to Participate**

The research was conducted after approval of ethics from Institutional Review Board of Addis Ababa University, School of Pharmacy. All procedures are according to the guideline.

# Availability of Data and Materials

The datasets used and/or analyzed during the current study available from author on reasonable request

# **Author Contributions**

Degefa Uma Banti is author this research article, designed the study, performed the data collection and the statistical analysis, wrote and revised the final manuscript.

# Acknowledgements

I would also like to thank people who were involved in this case study.

# References

- 1. WHO. (2019). Optimizing Supply Chains for Last Mile Delivery of Health Commodities.
- 2. USAID | DELIVER PROJECT. (2011). Last Mile Supply Chain: Best Practices in Distribution and Warehousing.
- 3. Kumar, S., & Singh, R. (2020). Application of Route Optimization Software in Healthcare Supply Chains.
- 4. GAVI. (2021). Innovations in Last Mile Vaccine Delivery: Lessons from the Field.
- 5. GHSC\_PSM Last Mile Report FINAL.pdf [Internet]. [cited 2025 Feb 24].
- 6. UNICEF. (2020). Improving Last Mile Delivery of Health Commodities through Public-Private Partnerships.
- 7. Africa CDC. (2022). Strengthening Health Supply Chains in Africa: Challenges and Opportunities.
- 8. World Bank. (2018). Reverse Logistics in Healthcare Supply Chains: A Framework for LMICs.
- 9. WFP. (2021). Emergency Stock Management in Health Supply Chains: Lessons from Humanitarian Logistics.
- 10. EPSA. (2023). Annual Report on Last Mile Delivery Performance.
- 11. Mengesha, A., & Gebremedhin, T. (2022). Challenges and Opportunities in Last Mile Delivery of Health Commodities in Ethiopia.
- 12. The Global Fund. (2020). Monitoring and Evaluation of Last Mile Delivery Performance.
- 13. WHO. (2022). Key Performance Indicators for Health Supply Chains: A Global Perspective.
- 14. Mwangi, J., & Kamau, P. (2021). Comparative Analysis of Last Mile Delivery Performance in Sub-Saharan Africa.
- 15. Path. (2020). Last Mile Delivery of Vaccines in Africa: A Comparative Study.
- 16. Mogire, E., Kilbourn, P., & Luke, R. (2024). A comparative analysis of last mile delivery in Ken-ya's online retail subsector. *The Retail and Marketing Review*, 20(1), 12-30.

**Copyright:** ©2025 Degefa Uma Banti. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.