

# The Influence of IMPACT APPROACH on the Management and Availability of Health Commodities; a Case Study of Handeni Town Council

**Feisal Said<sup>1</sup>, Ally Hamza<sup>1</sup>, Japhet Simeo<sup>2</sup>, Eddom Silabi<sup>6</sup>, Ondo Baraka<sup>3</sup>, Winifrida Emmanuel<sup>4</sup>, Blandina Temba<sup>1</sup>, Martha Kikwale<sup>5</sup>, Abdi Abdallah Mushi<sup>5</sup>, Ali Masoud<sup>1</sup>, Athanas Ntaganyamba<sup>3</sup>, Deusdedith James<sup>2</sup>, Said Ally<sup>2</sup>, Imakulata Mwalulefu<sup>2</sup>, Mathew Mganga<sup>4</sup>**

<sup>1</sup>Council Health Management Team, Handeni Town Council, Tanga, Tanzania

<sup>2</sup>Regional Health Management Team, Regional Secretariat, Tanga, Tanzania

<sup>3</sup>Capacity Building and Data Use, USAID Global Health Supply Chain, Dar es Salaam, Tanzania

<sup>4</sup>Department of Health, Social Welfare and Nutrition Services, President's Office Regional Administration and Local Government, Dodoma, Tanzania

<sup>5</sup>Pharmaceutical Services Unit, Ministry of Health, Dodoma, Tanzania

<sup>6</sup>Pathfinder International, Dar es Salaam, Tanzania

## Email address:

[dr.japhet.simeo@gmail.com](mailto:dr.japhet.simeo@gmail.com) (Japhet Simeo)

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**Abstract:** The health commodity supply chain system is an important component of a well-functioning health system. As the world strives to reduce the global burden of disease, access to medicines needs to be improved, which requires efficient and effective supply chain management for medicines and medical supplies. Handeni TC had been facing a number of supply chain challenges, such as the accumulation of medicines and medical supplies past their expiry dates at health facilities, and the frequent ordering of overstocked and no demand health commodities. Since the introduction of the IMPACT approach, Handeni TC IMPACT team has applied a number of data-driven strategies to improve the supply chain, particularly with regard to commodity management and availability at supply points. The methods used by Handeni TC were to conduct bi-monthly data review meetings of the IMPACT team to review the performance improvement and action plan, and to conduct a thorough review of the reporting and application forms to identify areas of data quality problems and suggest corrective actions to improve data quality before approval at the regional level. The objective of this study was therefore to determine the influence of the implemented data-driven strategies agreed in the IMPACT team meetings on the management and availability of health commodities in Handeni TC. The study found that Handeni TC strategies resulted in a gradual increase in orders from 88% in March 2022 to 100% in February 2023, a declining trend in ordering of surplus health commodities from 16% in April 2022 to 1% in February 2023 and an increase in percentage availability of health commodities from 87% in February 2022 to 94% in February 2023. The implementation of the IMPACT approach has made a remarkable contribution to stock management and improved availability of health commodities during the study period. Data analysis and interpretation has helped to understand and rank the extent of data quality issues in facilities and this has been the basis for targeted supportive supervision in Handeni TC. Therefore, this approach should be extended to the facility level to increase transparency of data and ownership for informed decision making.

**Keywords:** IMPACT Approach, Health Commodities, Overstocked Health Commodities, No Demand Health Commodities, Health Supply Chain Management

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## 1. Introduction

The health commodity supply chain system is an important component of a well-functioning healthcare system [1]. As the world strives to reduce the global burden of disease, there is a need to improve access to medicines, which requires efficient and effective supply chain management for medicines and medical supplies [2]. Inventory management for healthcare is a very important issue as it is directly related to human lives [3]. Effective supply chain management is a challenge in any sector, but in healthcare, additional complexities and risks are added because a compromised healthcare supply chain can have a direct impact on patient safety and health outcomes. [4]

It is argued that decentralization promotes accountability, technical efficiency, and equity in resource management and has been a recurring theme in health system reforms for several decades [5]. However, public sector agencies responsible for procuring essential medicines and health commodities in developing countries often lack the technical capacity to efficiently ensure supply chain security [6].

The lack of an efficient supply chain system in some low- and middle-income countries results in large stocks of medicines that have passed their expiration dates in national warehouses and public health facilities. Many of these stocks are the result of donations. If not properly monitored or regulated, expired medicines may be repackaged, sold as counterfeits, or disposed of without regard to potential environmental damage [7].

Drug wastage occurs when medicines are damaged, outdated, or expired and can no longer be used. It is a burden for many health care facilities and increases costs to the health care system [8]. Public health facilities must manage their drug inventory as best they can to meet the needs of the population. The problem that occurs in public health facilities is overstocking. There is a large gap between the supply and demand of medicines in the population. This can lead to high overall inventory costs [9].

Drug availability is an important strategy in health development. Lack or insufficient availability of medicines affects the quality of health care, while over availability leads to budgetary inefficiency [10].

The aforementioned short routes require the establishment of a well-designed and systematic supply chain system. A well-designed drug supply system ensures that procurement, storage, and transportation are seamlessly integrated to form a network that can deliver requested drugs to health care facilities and pharmacies on time, in the right quantity, and at the lowest possible cost. To ensure that the quality of the distributed medicines is maintained, the distribution system must also ensure that good storage and distribution practices are followed throughout the distribution chain [9].

To address the above challenges, the Tanzanian government has developed electronic logistics systems that have largely improved health supply chain management and data transparency. However, the use of available data for informed decision-making was still very low. This prompted the

government to introduce IMPACT (Information Mobilized for Performance Analysis for Continuous Transformation). IMPACT APPROACH is one of many strategies developed by the Government of Tanzania to ensure effective supply chain performance. The Office of the President, Regional Administration and Local Government (PORALG), in collaboration with the Ministry of Health and other development partners, launched the IMPACT APPROACH initiative in 2018, which is a human-centered, data-driven approach that aims to leverage the principle of quality improvement for supply chain performance and transform the way care managers, health workers, and various stakeholders use logistical data for decision making. [11]

Implementation of the IMPACT approach began with orientation at the regional and council levels. Handeni City Council (TC), one of the councils in the Tanga region, was trained in June 2020, with ten members of the Council Health Management Team (CHMT) trained in the IMPACT APPROACH initiative. The team conducted bi-monthly IMPACT team meetings based on the IMPACT APPROACH manual, which focuses on request and reporting periods in the eLMIS electronic supply chain system.

As mentioned earlier, primary care facilities are piling up drugs and medical supplies that are past their expiration dates. For the period from 2015 to 2022, public facilities have certificates for the destruction of expired medicines worth Tsh. 8,448,159.00 Since the introduction of IMPACT approach in Handeni TC, the team had been a number of data driven strategies in efforts to improves the supply chain most especially on commodity management and availability at service delivery points.

The aim of this study was therefore to determine the influence of implementing the data driven strategies as agreed in the IMPACT team meetings on the management and availability of health commodities in Handeni TC facilities.

## 2. Methodology

In the course of working on the identified gaps, the Handeni TC IMPACT team applied the following approaches to analyze and mitigate the identified challenges:

### 2.1. Impact Team Meetings

The meetings were held every two months and brought the IMPACT team members in the supply chain together and enabled them to use data for informed decision-making in addressing supply chain challenges through data-driven evidence. The agenda included the implementation of the previous action plan, the performance improvement plan, prioritization of issues and the development of a new action plan.

All issues arising from the deliberations and discussions were shared as meeting minutes with the regional IMPACT team; feedback was provided to health facilities on observed data quality issues to eliminate duplication of observed issues to improve the efficiency in the management of health commodities in the supply chain.

## 2.2. R&R Spot Check Before Submission

Handeni TC IMPACT team conducted R&R Spot check to identify areas with data quality issues and suggested corrective measures for data quality improvement before approval to regional level. The focused areas during reviewing were stocked out items and not ordered, overstocked items and ordered, items with no demand and ordered.

The R & R were downloaded and converted from PDF to Excel format to analyze and evaluate the data for decision making. The analysis of the R & R was done using the Microsoft Excel filtering technique.

R&R with data quality issues were rejected and feedback given to health facilities for corrections of observed data quality issues. The feedback mechanism was by letter writing and sharing of the observed abnormalities through WhatsApp group platform.

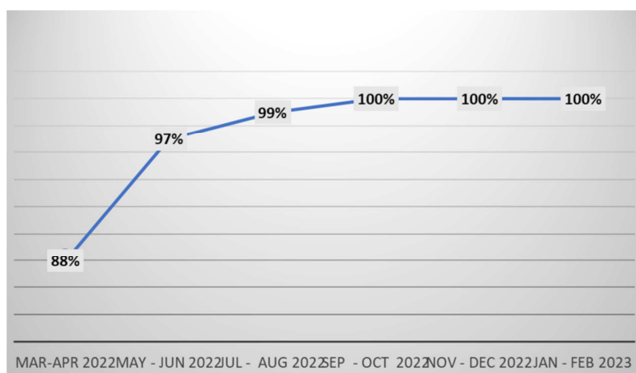
Having worked on observed data quality issues the facilities resubmit R&R to council level for final approval at the regional level.

## 3. Results

This part presents the overall results of the data driven strategies implemented by Handeni Town Council IMPACT team on mitigation of stock imbalances and irrational use of funds on procurement of health commodities. The results are presented in three main areas; the percentage of ordered stocked out health commodities, percentage of ordered overstocked health commodities and percentage availability of health commodities from March 2022 to February 2023.

### 3.1. Trend of Ordering of Stocked out Health Commodities

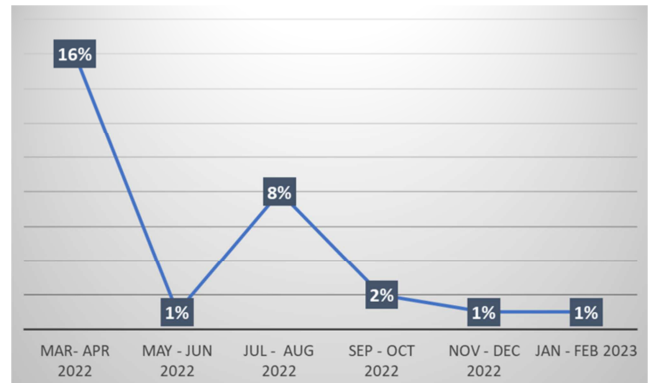
Figure 1 below shows the percentage of health commodity orders on a bi-monthly basis for six ordering periods in Handeni Municipal Council. The results were measured from March-April 2022 to January-February 2023 and show a gradual increase in orders from 88% in March 2022 to 100% in February 2023. From September 2022 to February 2023, the proportion of ordered stocked out commodities was maintained at 100%.



**Figure 1.** Ordering trend for stocked out health commodities from March 2022 to February 2023 in Handeni TC.

### 3.2. Trend of Ordering Overstocked Health Commodities

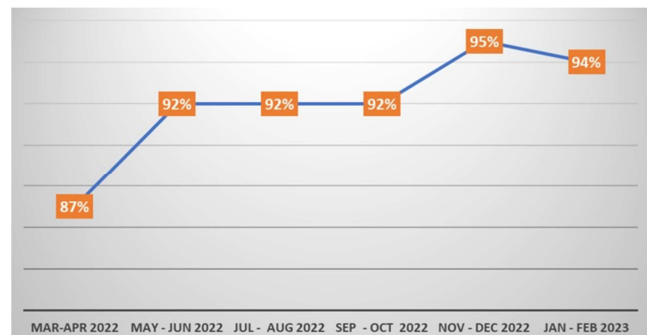
Figure 2 below shows the percentage of health commodity orders on a bi-monthly basis for six ordering periods at Handeni Town Council. The results were measured from March-April 2022 to January-February 2023. The results show that there is a decreasing trend in the ordering of surplus health commodities from 16% in April 2022 to 1% in February 2023.



**Figure 2.** Ordering of overstocked health commodities from March 2022 to February 2023 in Handeni TC.

### 3.3. Trend of Availability of Health Commodities

Trend of Availability of health commodities for Handeni Town council from the period March-April 2022 to January-February, 2023. The trend shows an increase in percentage availability of health commodities from 87% in February 2022 to 94% February 2023.



**Figure 3.** Percentage availability of health commodities from March 2022 to February 2023 in Handeni TC.

## 4. Discussion

### 4.1. Trend of Ordering Stocked out Health Commodities

A twelve-month analysis of the trend in ordering of health commodities from health facilities shows that there is a gradual increase in ordering of out-of-stock health commodities from 88% in March 2022 to 100% in February 2023. With the ordering rate of 100% of stocked out health commodities remaining constant from September 2022 to February 2023, it is an indication that all stocked out items were procured during this period. This trend of effective

ordering of out-of-stock health commodities indicates that the availability of health commodities in the right quantity is gradually being secured in health facilities. In most cases, access to medicine in the public sector is significantly affected by the efficiency of the drug procurement system [10], as procurement is an important component of efficient medicine management for all health supply chain levels.

Githendu et al. emphasized that the importance of an effective procurement and supply chain system to support health care delivery cannot be overstated. It is a critical component for progress toward universal health coverage. [12]

#### **4.2. Trend of Ordering Overstocked Health Commodities**

Analysis during the implementation period of 12 months reveals that there is a general downward trend of overstocked health commodities ordering from 16% in April 2022 to 1% by February 2023. The ordering percentage of less than 3% from September 2022 to February 2023 indicates that the execution of IMPACT approach has a contribution in controlling the ordering of overstocked health commodities since overstocks has become one of the major challenges in the public health facilities. Therefore, the effective control of this parameter is very critical as it can result into budgetary inefficiencies and potential expiries of health commodities at the points of care. An effective supply chain contributes to improved cost effectiveness in all parts of a program, and it can stretch limited resources. [13]

Furthermore, the overall downward trend in this category suggests that the implementation of IMPACT approach has a positive contribution in the management and control of health commodities at health facilities. In addition to that, the upward surge in the ordering of overstocked health commodities during the July-August 2022 period, was a result of adding two new health facilities in the Handeni TC health supply chain system at the beginning of financial year 2022/2023. This had disturbed the ordering parameters by increasing the number of items to be reported while the consumption rates of commodities in the new facilities were still low.

The study conducted by Silabi et al somehow contradicts with the findings identified in this study as the found no statistically significant relationship between implementing the IMPACT team approach and improvement in the percentages of overstocked health commodities [14].

#### **4.3. Trend of Availability of Health Commodities**

Our observation of the availability of health commodities in health facilities over a 12-month review period shows a promising upward trend in the percentage availability of health commodities. Figure 3 above shows that the trend meets the national standards of 90% availability for at least 5 cycles of the observation periods from May 2022 to February 2023.

This shows that the availability of health commodities is gradually increasing as the IMPACT concept is applied. In

March-April 2022, at the start of the monitoring mechanism, availability was 87% and the trend continued at an increasing pace to 94% in January-February 2023.

The period November-December 2022 appears to have the highest percentage availability, which is due to the fact that the procurement of health commodities after the start of the financial year 2022/2023 in the first quarter had a positive effect on the increase in availability in the second quarter.

Literature shows that several factors affect the availability of health commodities. These include poor stock management, late deliveries, ordering system, theft and transport [15]. The use of the IMPACT approach, together with other factors, can play a major role in increasing the percentage availability of health commodities. Lawrence et al. indicated that proper inventory management of medicines is very important in health care systems to avoid stock-outs and overstocking. Poor inventory management systems could increase costs and/or decrease stock availability. In a stock-out, there is not enough inventory of a particular item to fill the customer's order, while in an overstock, the number of items in stock exceeds the customer's demand. [3]

## **5. Conclusion**

The alignment and implementation of the IMPACT approach has resulted in remarkable inventory management and improved availability of health commodities during the study period. In addition, the study found a linear relationship between ordering out-of-stock health commodities and increased availability of essential health commodities. The IMPACT approach has improved effective teamwork and participation of all key supply chain actors in data analysis and decision-making, resulting in increased efficiency, better quality of data management, higher morale and the development of new ideas. In addition, the data analytics platform created during the IMPACT sessions provides deep insights into specific supply chain data challenges by providing a real-time alert to help the team evaluate and develop better solutions. The introduction and implementation of the IMPACT team approach has strengthened the team spirit in meetings, introduced a culture of data use, and promoted the generation and use of quality data for evidence-based decision-making and continuous improvement in the availability of health commodities at the point of service delivery. Data analysis and interpretation has helped to understand and rank facilities according to the extent of data quality problems and this has been the basis for targeted supportive supervision in our Council with limited financial and transport resources.

## **6. Recommendations**

1. Since the IMPACT approach has been shown to influence the improvement in stock status and commodity availability, we recommend extending the approach to the facility level to increase transparency of data and ownership for informed decision making.

2. The focus should be placed on identifying health commodities that are no longer available and ensuring that they are procured to improve commodity availability.
3. Managed and stocked out health commodities not ordered, overstocked and no demand health commodities ordered without genuine reasons should be added on national R&R rejection criteria.
4. Because the study is not sufficiently powered to conclude that the IMPACT approach is the sole factor availability of health commodities, this article urges the need for further studies to examine the factors that contribute to improving the availability of health commodities.

## Abbreviations

CHMT: Council Health Management Teams  
 DHIS: District Health Information System  
 e-LMIS: electronic Logistic Management Information system  
 GHSC-TA-TZ: Global Health Supply Chain Technical Assistance Tanzania  
 IMPACT: Information Mobilized for Performance Analysis for Continuous Transformation  
 MOH: Ministry of Health  
 MSD: Medical Store Department  
 PORALG: President's Office, Regional Administration and Local Government Authorities  
 R&R: Report and Request  
 TC: Town council  
 USAID: United State Agency for Interventional Development

## Definition of Key Terms

### *IMPACT Approach*

It is a people-centered and data-driven initiative adopted by the MoH and PORALG to improve health supply chain performance and availability of essential health commodities in Tanzania. [11]

### *Health Commodities*

Refers to all medicines, medical devices, medical equipment and nutrition supplements reported in redesigned integrated logistics management system

### *Overstocked Health Commodities*

These are available stocks of health commodities which are of above four [4] months of stock. In this study, it was measured by computing the proportion of all reported health commodities with more than four months of stock over all reported items in a specified period.

### *No Demand Health Commodities*

These are available stocks of health commodities which

have zero average month consumption. In this study it was measured by computing the proportion of all reported health commodities which are available but with zero average monthly consumptions over all reported items in a specified period.

### *Health Supply Chain Management*

The management of the flow of products and services that begins with manufacturers and ends with the consumption of the product by the end user. Healthcare supply chain management includes the acquisition of resources, the management of supplies and the delivery of goods and services to providers and patients [15].

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