

The Question of Quality Ordering of Health Commodities in Tanga Region, IMPACT Approach Becomes Relevant Driver to the Answers

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Abstract: The effective delivery of integrated health services depends on the extent to which the six pillars of a health system as recommended by WHO are adhered to such as adequate human resources for health, service delivery, financing, health system governance, information, quality medicines and technologies. However, to improve supply chain management leading to uninterrupted supply of medicines and other health commodities, the use of data to inform all parts of the health supply chain logistics system, that include product selection, forecasting, quantification, procurement, storage and finally distribution of health commodities, is very important. Previously, Tanga Region had been facing a number of health supply chain issues such as delays in reporting from health facilities, a high number of orders for overstocked and no-demand health commodities, unnecessary higher expenditure on health commodities and a high rejection rate for the same R&R rejection reasons. Soon after the introduction of the IMPACT approach in the region, the IMPACT team at the regional level adopted some innovative data-driven strategies at its regular meetings such as regular data extraction and analysis to review indicators, monitoring timeliness of reporting as well as data quality, monitoring stock orders to avoid expiry dates, and sharing feedback with councils to take action to address identified gaps. These efforts resulted into decrease in the values of reordered overstocked and not in demand health commodities, massive improvement in terms of reporting timeliness from 76% in January 2022 to 99% in January 2023 and slight increase in the availability of essential health commodities. This study found that improving reporting timeliness and supply chain data quality is a cornerstone towards uninterrupted supply of health commodities and reduced health commodities wastages. Since IMPACT Team techniques has been vital in the identified supply chain improvements then it is an approach that can be applied to improve other supply chain indicators and reduce wastages. Despite the marginal improvement in the availability of health commodities, this study recommends the use of facility formulary-based approach in the calculation of health commodities availability to increase the validity of the results.

Keywords: IMPACT Team, Commodity Ordering, Stock out, No Demand Ordering and Over Stock

1. Introduction

In its efforts to address the growing burden of disease, the World Health Organization advocates for integrated service delivery [1] because it enables patients to receive a range of preventive and curative health care services that meets their needs over time and at different levels of the health system [2, 3].

The effective delivery of integrated health services depends on the extent to which the six pillars of a health system as recommended by WHO are adhered such as adequate human resources for health, service delivery, financing, leadership and governance of the health system, information and quality medicines and technologies [4]. However, to improve supply chain management leading to uninterrupted supply of medicines and other health commodities [5], the use of data to inform all parts of the health supply chain logistics system [6], that include product selection, forecasting, quantification, procurement, storage and finally distribution of health commodities, is very important [7].

Recognizing the importance of using data to inform decision-making in Tanzania's health supply chain systems, the Tanzanian government, through the Ministry of Health (MoH) and the President's Office, Regional Administration and Local Government (PORALG), launched the IMPACT (Information Mobilized for Performance Analysis and continuous transformation) approach in 2018 [8, 9]. The sole purpose of scaling up this approach in the country was to promote a culture of data use among health supply chain personnel through the targeted collection of data in all electronic systems such as DHIS2 [10] and e-LMIS (11) used to routinely collect service and logistics data during health care delivery [12].

The IMPACT approach is a people-centered and data-driven initiative based on quality improvement principles to promote a data use culture for informed decision-making [13] in the supply chain [8, 9, 14, 15]. This approach is implemented in multidisciplinary teams at all levels of the supply chain. IMPACT teams should be characterized by having a common goal or vision, performance monitoring, leadership, information management systems, systematic problem solving, action planning, recognition of good performance and effective IMPACT team meetings [14].

The IMPACT approach was rolled out in Tanga Region and all its councils in June 2020. Teams were trained on how to conduct performance monitoring using their routinely collected data, identify challenges using their own data, prioritize challenges, conduct root cause analysis and plan for actions to improve the overall supply chain and health service delivery in the region.

Given the reduced scope of the Ministry of Health's Logistics Management Services component staff, who are based at the Medical Stores Department (MSD) zones and were responsible for reviewing R&R reports from health facilities prior to the introduction of the redesigned logistics system in Tanzania, and the shift of some of their tasks to the

Regional and council Health Management Teams, the IMPACT approach proved to be a very important initiative for the effective delivery of these tasks at regional and councils levels.

Previously, Tanga Region had been facing a number of supply chain issues such as delays in reporting (16) from health facilities, a high number of orders for overstocked and non-demanded health commodities as per the minimum and maximum stock levels in a specific reporting period, unnecessary higher expenditure on health commodities and a high rejection rate for the same R&R rejection reasons. Soon after the introduction of the IMPACT approach in the region, the IMPACT team at the regional level applied some innovative data-driven strategies at their regular meetings to reduce these problems, improve supply chain performance and improve overall health care delivery in the region (17).

The aim of this study was therefore to assess the effect of the use of such mechanisms on the timeliness of health facility reporting, the evolution of the values of overstocked and no demand health commodities reordered during reporting periods, and the rejection rate trends by examining the reasons for R&R rejections at the regional level over a specific period of time.

2. Methods

The IMPACT meeting In December 2021 conducted a baseline assessment of the four national selected supply chain Indicators. The selected Indicators with their baseline performance were; (i) Timeliness submission (76%) (ii) Percentage availability in health commodities (86%) (iii) No demand rate (26%) and (iv) Overstock rate (28%). Based on above baseline assessment indicators, the following approaches were employed.

2.1. Monitoring of Supply Chain Key Indicators Performance Approaches

Periodic data extraction and analysis. In order to ensure a timely monitoring of performance, Supply chain related data were extracted from the e-LMIS on bimonthly basis after R&R submission by facilities and the analysis was conducted by use of Microsoft excel pivot table techniques to establish supply chain indicators performance. The data extraction and analysis tasks covered a period from December 2021 to January 2023. The supply chain data included in this study were from the Redesigned ILS program in 11 District Councils with a total of 359 health facilities reporting through the logistics system.

Conduction of IMPACT team meetings. Results of previous performance were discussed in bimonthly IMPACT meetings and the identified gaps were prioritized based on cost effectiveness and the overall effect of the prioritized gap. Brainstorming and 5why's approach of route cause analysis was applied to the gaps before development of action plan.

2.2. Monitoring of R&R Timeliness Submission and Data Quality Approaches

R&R timeliness submission was monitored by use of reminder messages sent to the councils through *WhatsApp* media Regional Supply Chain group, the media composed of Regional Medical officer, Council Medical officers, Regional Pharmacist, Regional Laboratory Technologist, Regional Health Secretary, Council Pharmacists and Council Laboratory Technologists. The Reminder Messages are sent few days prior to the beginning of the reporting month. During reporting periods daily submission status were shared to the same media to encourage early submission.

In order to ensure quality of data at the point of R&R generation, the team implemented an active R&R review at Regional level. Approval criteria from the e-LMIS (that includes, Data correctness, poor adherence to max-min inventory control, adherence to reported schedules and R&R cost) were translated in a simple *Swahili* language and distributed to the councils for use in approval processes at their level. Using the same criteria, the Regional IMPACT team systematically reviewed prior approval. The R&R with data quality problem issues were rejected for corrections.

Data triangulation between e-LMIS and DHIS. in this case tracer items were identified and used for comparing the consumption data reported in the logistic system to the service data reported. The selected items included MRDT, SD BIOLINE, IMPLANON and IMPLANTS. These items were purposefully selected due to the fact that their consumption data in the DHIS 2 could easily be obtained. The items were used for R&R review to justify consistence and accuracy between reporting systems.

2.3. Control of Stocks to Avoid Expiries

Stock assessment was carried out periodically through analyzed data to ensure that health commodities stock levels were between acceptable Min-Max stock levels. Commodities with stock levels above maximum levels were stopped to be ordered in the next ordering circle and the

consumption of such commodities was periodically monitored to avoid Expiries.

2.4. Feedback to Councils, Information Sharing and Mentorship

The Region IMPACT Team also, provided written feedback observed to the Councils for their prompt actions. Feedbacks were given through *whatsApp*media, emails and official letters to the District Executive Directors and sharing to Regional Implementing Partners so that they could help in the implementation of action plans at council levels such as in the redistribution of health commodities and support of mentorship to identified areas.

The sharing of information was also conducted through biweekly meetings done through zoom media. The meetings attendees were Regional and Council IMPACT teams, staffs of the Medical Stores Department and Regional Implementing partners.

3. Results

The overall results of the implemented strategies are presented under this section according to the parameters of interest which were; values of overstocked and no demand health commodities reordered during reporting periods From March 2022 to January 2023; The trends of R&R timeliness submission from January 2022 to January 2023 and The Trends of Health commodities availability from December 2021 to January 2023.

3.1. Evolution of the Values of Overstocked and No Demand Health Commodities Reordered During Reporting Period

The total Values of health commodities ordered in the six ordering circles (January-February 2022, March-April 2022, May-June 2022, July-August 2022, September-October 2022 and November-December 2022), showed an overall decrease as presented in *Figure 1* Below.

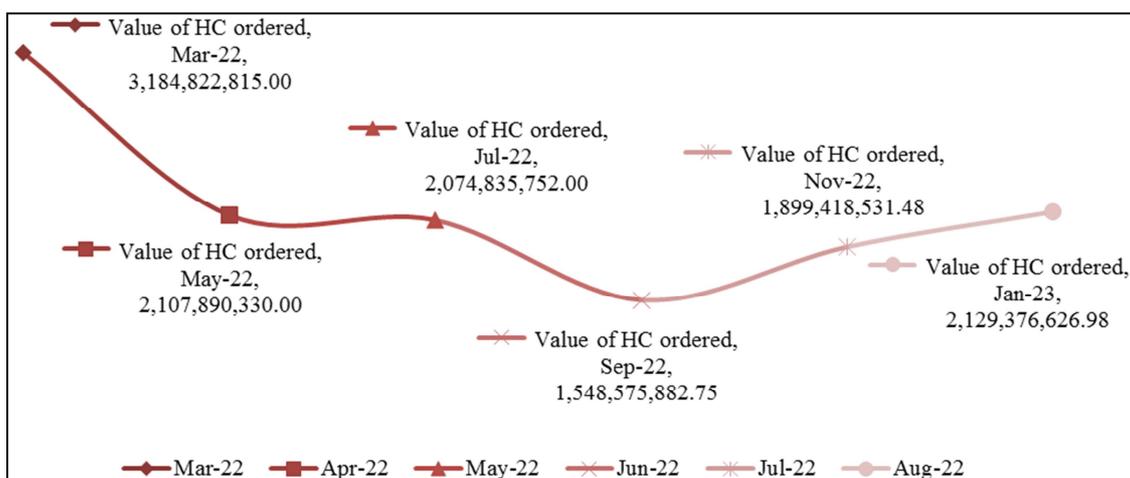


Figure 1. Values of health commodities ordered from March 2022 to January 2023.

3.2. The Trend of Artemether/Lumefantrine Tablets Consumption and Ordering

Artemether/Lumefantrine Tablets in the Region. The trends shows that the quantities of tablets ordered and the stock on Hand both were decreasing overtime.

Figure 2 indicates the trends of stocks and ordering of

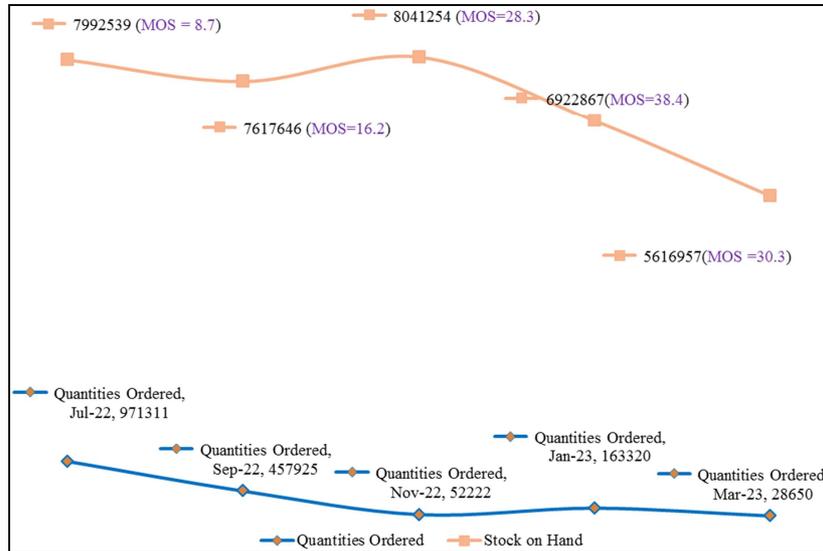


Figure 2. The trend of Artemether/Lumefantrine Tablets Consumption and Ordering from July 2022 to March 2023.

3.3. The Trend of R&R Timeliness Submission

Figure 3 below Presents the percentage of facilities that submitted their R&R timely (before 10th of the ordering month) to Medical Stores Department for seven consecutive ordering circles. From the figure it can be observed that there is a general increase in the percentage of facilities that submitted their R&R timely.

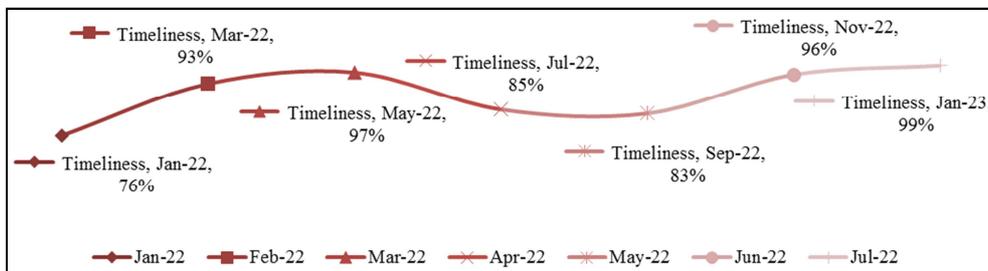


Figure 3. The trend of R&R timeliness submission from January 2022 to January 2023.

3.4. The Trends of Health Commodities Availability

Figure 4 below presents the percentage availability of health commodities in health facilities. the figure indicates a general increase in the availability of health commodities.

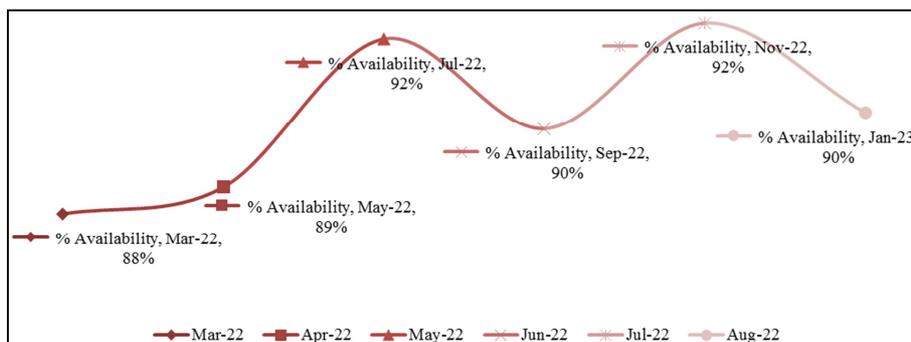


Figure 4. The Trends of Health commodities availability from December 2021 to January 2023.

4. Discussion

4.1. Values and Trends of Reordered Overstocked and No Demand Health Commodities

The overall decrease in the values of reordered overstocked and no-demand health commodities implies a positive effect of prohibiting health facilities from reordering new supplies from all sources during the ordering periods. However, the increase in the values of quantity reordered from November 2022 to January 2023 as shown in figure 1, was a result of the increase in the number of reporting health facilities in the region, the increase in the central government budget for health services including health commodity procurements, the increase in prices as stipulated in the new MSD product catalogue, and the push from the regional level to report all manageable health commodities as per the standard treatment guideline with a purpose of increasing supply chain data visibility.

Moreover, the decline in the stock levels (SOH) and reordered quantities for ALU tablets as shown in Figure 2, underscores the data-driven efforts of the IMPACT team in the Tanga region to curb the reordering of overstocked and no-demand health commodities. However, the interesting scenario is the increase in corresponding Months of Stock (MOS) for ALU tablets despite the progressive decline in stocks over time. This was found to be due to the profound decline in the consumption of ALU tablets, as confirmed by the review of ALU tablets consumption trends in the e-LMIS and the decline by almost half from January (26228) to December 2022 (12355) in the number of positive malaria cases as reported in the DHIS2.

A study conducted by Hakuzimana et al. in Rwanda underpins the practice in Tanga of prohibiting the re-ordering of overstocked and no-demand health commodities in order to combat wastage of health commodities through expiry. This study found that 67% of expired health commodities were due to over-ordering and over-delivery of medicines and medical supplies to health facilities (18).

4.2. The Trend of R&R Timeliness Submission

The results of this study in this category indicate that the timeliness of reporting of health commodities in Tanga region had improved tremendously. Nevertheless, Figure 3 above shows the slight decline in the reporting timeliness from July to November 2022 because at that time health facilities took more time to resubmit the rejected report and request (R&R) forms after making all the necessary corrections. In addition, the launch of the national polio campaign in Tanga coincided with the September 2022 reporting period, resulting in conflicting activities at health facilities, councils and regional level, making it challenging for all levels to complete both tasks while meeting reporting deadlines at the same time. According to Lugada et al, reporting and ordering issues which include timeliness of reporting is one of the key factors that has a direct

implication in the health supply chain management and the availability of essential health commodities at service delivery points (5).

Given the limited resources and inadequate staffing in the health sector, the goal has always been to maximize the available resources to achieve quality health care and improve health outcomes. Thus, considering the tanga scenario where conflicting activities had affected timeliness of reporting, then streamlining work tasks and schedules proves to be very important for health workers to complete each task effectively and achieve the maximum potential for each task completed. Therefore, these results can give a very important clue on how best to plan for multiple tasks such that none affects the performance of the other. Tanga's scenario is consistent with a study conducted by Nyawira et al. in Kenya, which concluded that inadequate and unsatisfactory human resource management in the health sector has serious implications for health system functions, outcomes and technical efficiency (19).

4.3. The Trends of Health Commodities Availability

Availability of essential health commodities is a priority for any supply chain management system as it ensures uninterrupted health service delivery at points of care. This was also one of the main objectives for the Tanga region, so following up on this indicator in January 2023 found a slight increase in the percentage availability of essential health commodities as compared to March 2022 which was the first review period. However, the overall trend in these results raises questions about the methodology used to calculate the availability of health commodities in the country. The use of reported incidences or number of health items may not reflect the accurate or realistic situation regarding the availability of health items, as there are still a large number of items that may not be reported and yet are available at service delivery points. The WHO Health Action International as narrated by Latifa et al suggests the use of established drug references to measure the availability of medicines in order to avoid the complications associated with the process (20).

In addition, the availability of essential health commodities has been shown by Kapologwe et al to be influenced by several other factors, such as the performance of the prime vendor system, prices of medicines and medical supplies, procurement procedures and governance (21).

5. Conclusion

Improving reporting timeliness and supply chain data quality is a cornerstone towards uninterrupted supply of health commodities and reduced health commodities wastages. IMPACT Team techniques in Tanga Region brought together health commodities key players from among RHMTs with the ultimate goal of achieving uninterrupted supply of health commodities. Using the available data decisions are tailored to specific emerging supply chain challenges. This study has shown that

when applied with other existing interventions, IMPACT Approach can help improve supply chain indicators and reduce wastages.

6. Recommendations

- 1) Regarding the reordering of overstocked and no demand commodities, the team recommends to the council IMPACT teams to conduct frequent supply chain related Mentorships and supportive supervision to facilities with health commodities ordering challenges. However, supply chain system strengthening at national level should also consider need assessment for supply chain staffing level and gap filling and improving the use of more sophisticated electronic systems with high wastage control features.
- 2) Timely submission of R&R is a key step towards meeting the defined lead time. Unmet lead time may lead to stock depletion and interruption of effective health Service delivery at the point of care. Given the inadequacy of healthcare staffs we recommend tasks schedules to be streamlined such that maximum performance of each task is archived. However the Ministry of Health should conduct an assessment to the current ordering and distribution schedules to see if they are in line with the National Redesigned Logistics Guidelines. Also, we recommend further studies on the relationship between R&R timeliness submission and R&R data quality.
- 3) The current documented methodology for calculating the availability of health commodities takes into consideration of the number of reported items only as the denominator as described in the IMPACT manual. We recommend to the Ministry of health to develop and disseminated a Facility formulary-based approach in the calculation of health commodities availability.

List of Abbreviations

ALU: Artemether/Lumefantrine
DHIS: District Health Information System
e-LMIS: Electronic Logistics Management Information Systems
GHSC-TA-TZ: Global Health Supply Chain Technical Assistance Tanzania
GIZ: Gesellschaft für Internationale Zusammenarbeit
ILS: Integrated Logistics System
IMPACT: Information Mobilized for Performance Analysis and Continuous Transformation
MoH: Ministry of Health
MOS: Months of Stock
MRDT: Malaria Rapid Diagnostic Test
MSD: Medical Stores Department
PORALG: President's Office, Regional Administration and Local Government
R&R: Reporting and Requesting forms
RHMT: Regional Health Management Team
SOH: Stock on Hand

USAID: United States Agency for International Development

WHO: World Health Organization

Definition of Key Terms

Lead time: In inventory management is the amount of time between when a purchase order is placed to replenish products and when the order is received.

IMPACT Approach: it a people centered and data driven initiative adopted by MOH and PORALG to improve health supply chain performance and availability of essential health commodities in Tanzania.

Overstocked health commodities: Refers to stocking of health commodities above maximum stocking level. According to the Tanzania supply chain guideline, the Maximum stock level is four Months.

No demand health commodities: Commodities that were not consumed in the reporting period. The health commodities reporting period in Tanzania is Bimonthly.

Supply chain management: Is the centralized management of the flow of goods and services and includes all processes that transform raw materials into final product. In this context it refers to purchase, distribution, storage and use of health commodities including Documentations processes as per guidelines.

Timeliness reporting: refers to the lapse of time between the end of a reference date/period and the dissemination of the data. In the Context of this paper, timeliness reporting refers to the 1st to 10th of each month.

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