The Role of Impact Approach in Minimizing Wastage During TLE-TLD Transition: A Case of Geita Region

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Abstract: The Tanzanian government, in its quest to improve the health care supply chain and the availability of essential health commodities, has taken several measures over the years, including the development of robust electronic systems to improve data transparency. However, the use of available data for informed decision-making was still very low. This prompted the introduction of IMPACT (Information Mobilized for Performance Analysis and Continuous Transformation) in 23 regions, including Geita Region, to compensate for the underutilization of data. Following the introduction of TLD, which replaced TLE as the standard drug of choice for HIV/AIDS care and treatment in Tanzania, Geita Region faced a higher risk of wasting about 40 000 tins of TLE through expiry, at a cost of 615 million Tanzanian shillings. To mitigate this huge risk, the Geita regional IMPACT team implemented data-driven interventions under the IMPACT team approach. Therefore, this study aimed at assessing the impact of the implemented data-driven IMPACT processes on minimizing TLE wastage during the TLE-TLD transition in the region. Among the notable methods employed by the regional IMPACT team in Geita to mitigate the risks of TLE wastage, were the development of a standardized tool to collect various logistics and service data from all health facilities and then conducting two phases of data analysis to identify the risks of TLE wastage before developing interventions to prevent wastage. Finally, all councils in the region took the agreed data-driven actions to save the available TLEs. The region's collective efforts through the IMPACT teams resulted in the salvage of approximately 1.2 million tabs of TLE valued at US$263,918 by July 2021, representing 99.95% of the stock available in August 2020, the start of the intervention period. These results suggest that the IMPACT approach is very vital in enhancing data-driven decision-making in identifying supply chain issues and finding innovative and appropriate solutions. In addition, effective data use, strong team spirit and leadership support were found to be critical in solving health supply chain problems. Therefore, it is recommended that the IMPACT approach be strengthened and transferred to lower levels of the supply chain to improve data use and supply chain performance.

Keywords: IMPACT Approach, TLE, TLD, Supply Chain Management, Shelf Life, Stock Status, Overstocked, No Demand

1. Introduction

The Ministry of Health (MoH), in collaboration with President's Office, Regional Administration and Local Government (PORALG) and various stakeholders, is committed to improving the availability of health commodities at service delivery points through strong and dynamic supply chain management systems. Over the years, the Ministry has undertaken numerous initiatives to this end, including the integration of most health commodities into a single supply chain logistics system (redesigned ILS), the development and implementation of the National Pharmaceutical Action Plan (NPAP), advocacy for an overall increase in the budget for health commodities [1] and the introduction of robust electronic systems such as electronic Logistics Management Information System (e-LMIS), Government of Tanzania Hospital Management Information System (GOTHOMIS), CTC2 Database, Pharmacy Module Database (PMD), District Health Information System (DHIS2) and Facility Financial Accounting and Reporting System (FFARS). All these efforts have supported the transformation that has taken place in the public health supply chain in Tanzania in recent years [2].

Notwithstanding the above efforts, Tanzania's health supply chain still encountered several challenges in the areas of governance, accountability, and inadequate use of available reported data to make informed decisions in the health commodity supply chain [1, 3]. This has led to stock-outs, wastage, alarming expiries, and pilferage of commodities.

In efforts to strengthen the culture of data use among health supply chain staff, the Ministry of Health, in collaboration with PORALGunder technical assistance of USAID GHSC TA TZ and other stakeholders, introduced the approach namely IMPACT (Information Mobilized for Performance Analysis and Continuous Transformation) in 2018 [4, 5] and has so far trained 23 regional and 16 regional referral hospital teams, including the Geita region. The approach guides health workers how to use data to make informed decision on health commodities managements including for planning, quantification, and procurement.

In an attempt to improve supply chain performance, Geita region has experienced a dynamic health supply chain by implementing various fragmented interventions including but not limited to the Quality Improvement Team approach [6], the Medicines and Therapeutics Committee [7], the 5S-KAIZEN approach [8], quarterly logistics ordering systems implemented through paperwork before 2019 at facility level, and bottom-up quantification approachin the Essential Health Commodities Quantification guideline of July 2018 [9]. However, the region had been experiencing several prominent challenges including inadequate data use to make informed decisions and minimal involvement to the ongoing initiatives among members of RHMT and CHMTs because all those initiatives were mainly implemented at health facility level.

The introduction of the IMPACT approach in June 2019 in Geita Region has become a very important forum for better engagement of more than 70 trained members of the RHMT and CHMTs from six councils in leadership roles in the use of data across the supply chain system. It has further optimized resource allocation and expenditure on health commodities, and has enabled a smooth, data-driven transition of ARV regimens, thereby significantly reducing wastage due to expiries. The IMPACT team approach did not replace all other interventions, but rather improved the smooth coordination of the implicitly linked approaches of the above interventions and expanded the involvement of management teams at all levels with a purpose of improving health supply chain performance.

Following the introduction of TLD, which replaced TLE as default first line drug of choice for HIV/AIDS care and treatment in Tanzania, the Ministry of Health, through the National AIDS Control Program (NACP), issued a letter of instructions to gradual transitioning out of TLE as the default first line regimen and introduce TLD in health facilities to avoid significant wastage of TLE due to expiry. After receiving these instructions from the MoH through PORALG, Geita Region, through the RMO office, instructed the councils to implement the letter in the lower health facilities. However, the situation was different in Nyang'hwale DC, which found itself with a huge stock of TLE exceeding its consumption capacity following a recent supply of TLE by the MSD. The first alert from this council prompted the regional IMPACT team to deploy contingency mechanisms to assess the situation against data. This revealed that there was a higher risk of wasting about 40,000 tins of TLE through expiry, which would cost about 615 million Tanzanian shillings. The Geita team would have suffered accountability problems as a result of expiry of such a huge stock if they had not improvised Ministry's instructions during the transition. Therefore, this study aimed at assessing the effect of the employed data driven IMPACT approachprocesses in minimizing TLE wastage during the TLE-TLD transition in the Geita region.

2. Methods

Methods employed to minimize wastage during TLE-TLD transition.

i.   The regional IMPACT team developed a standardized logistics and service data tool to capture various information such as TLE and TLD stock on hand, the number of clients on the regimens and shelf life of remaining TLE.

ii. The standardized tool was then shared with councils for aggregation of required information/data from health facilities using e-LMIS, CTC2 and pharmacy module databases for the number of clients on TLE and the available stocks of TLE in each health facility.

iii. All the necessary information from the health facilities was finally brought together at the regional level for the subsequent steps of analysis and risk assessment.

iv. The regional IMPACT team conducted a Phase I data analysis to determine the stock status of TLE and TLD

where by the average monthly consumption (AMC) was computed based on the number of clients in respective regimens.

v. The team went one step further and conducted a phase II data analysis to compute the proportion of remaining TLE stocks based on their expiry dates and develop redistribution strategies within the region aimed at avoiding the expiry of TLE stocks with a shorter shelf life.

vi. Finally, based on the analysis results of Phase I and II, data-driven decisions were made to develop mitigation measures to save TLE from expiry in the region.

vii. As part of the decisions taken, the regional level issued a letter of instructions to all six councils to guide all necessary steps that needed to be taken to save the TLE stock from being wasted. As part of the instructions, the letter emphasized the following;

1) Internal redistribution of TLE so that the TLE stocked-out facilities to request from excess stocked facilities.

2) Restricting the ordering of more TLE supplies from the Medical Stores Department (MSD) to avoid further accumulation during the mitigation period.

3) Restriction of early switch of TLE clients to TLD.

4) Initiate TLE to all new PLHIV first until the available supply of TLE is consumed or reduced to safe level.

3. Results

This section presents the overall results of the measures taken and implemented by the Geita region to rescue a significant amount of TLE from deterioration. The results are presented in four main areas; the amount of TLE rescued in the region from August 2020 to July 2021, the evidence of the gradual decline in TLE stocks during the intervention period and the number of clients in TLE and TLD throughout the intervention period to support the trend in the logistics data presented and the key logistics information for the proportions of the most vulnerable TLEs.

3.1. Logistics Information on the Large Proportion of TLE at Expiry Risk

Table 1 below shows some initial analysis results in the Geita region for the TLE, including stock on hand, months of stock and shelf life of most of the stock at risk where by the large quantity of TLE was expiring in July 2021.

Table 1. *Council wise proportions of TLE with respective months of stocks and shelf lives.*

Facility/Council	SOH	MOS	Expiry	Percentage (%)
Regional Status	1213897	2.99	Jul-21	52%
Chato DC	347895	3.44	Jul-21	52%
Geita TC	69990	11.00	Jul-21	3%
Nyang'hwale DC	45540	9.92	Jul-21	96%
Bukombe DC	88020	4.61	Jul-21	11%
Geita DC	593752	2.87	Jul-21	56%
Mbogwe DC	66150	0.98	Jul-21	89%
Geita RRH	2550	Unknown/No demand	Jul-21	100%

3.2. Progressive Decrease of TLE Stocks over Time Since August 2020

This section shows the trend of aggregated regional amount of TLE stocks at expiry risk in different time periods since June 2020 for bimonthly groups A and B in the Geita region.

3.2.1. Trends of TLE Stocks for Bimonthly Group A Councils in Geita Region

Figure 1 below shows a progressive decrease in the amount of at risk to expiry TLE stocks for different sampled periods as reported through the e-LMIS by Geita TC, Geita DC and Nyang'hwale DC in Geita region. All councils highlighted in the figure 1 portrayed the same trend.
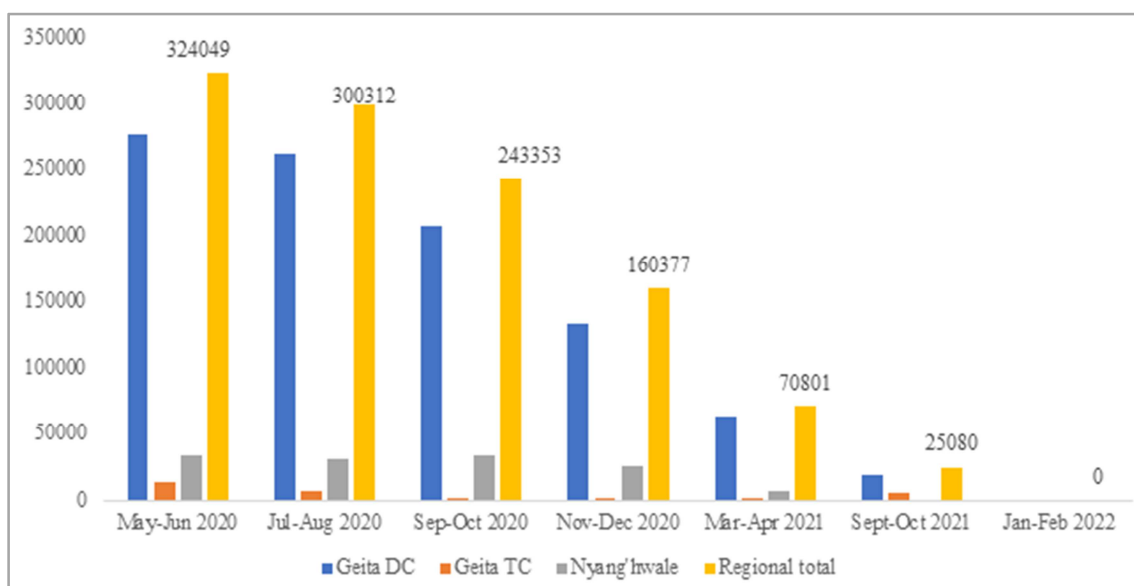

Figure 1. *Trends of TLE stocks available in group A Geita councils during the intervention period.*

3.2.2. Trends of TLE Stocks for Bimonthly Group B Councils in Geita Region

Figure 2 below shows a progressive decrease in the amount of at risk to expiry TLE stocks for different sampled periods as reported through the e-LMIS by Bukombe, Chato and Mbogwe district councils in Geita region. All councils highlighted in the figure 2 again portrayed the same trend.
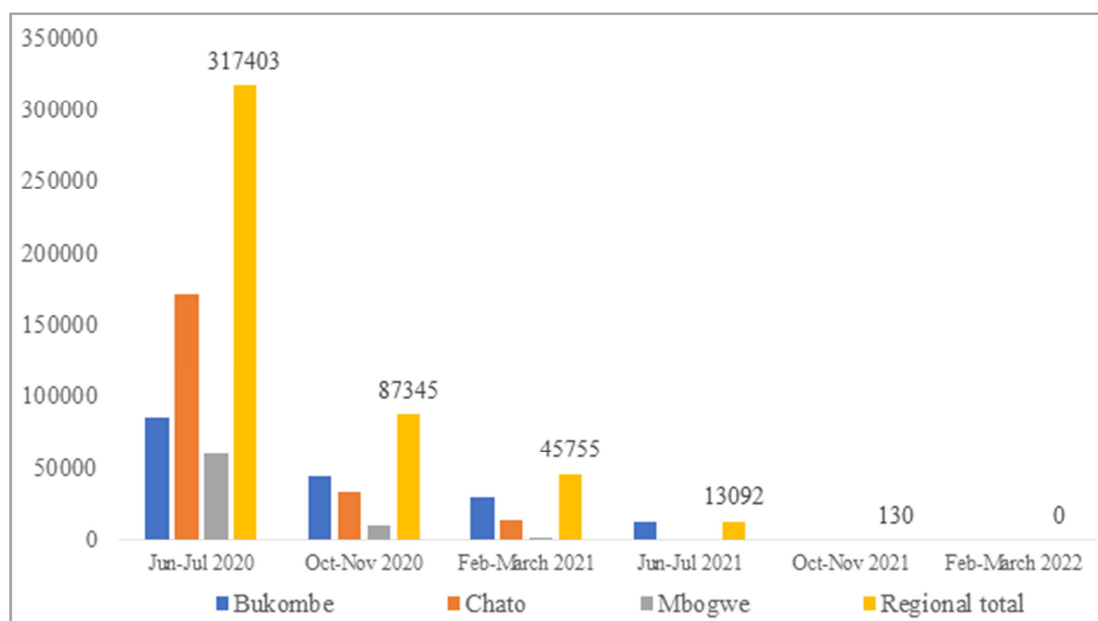

Figure 2. *Trends of TLE stocks available in group B Geita councils during the intervention period.*

3.3. Number of Clients on TLE VS TLD Since AUGUST 2020

As shown in Figure 3, the number of clients in TLE decreased as the number of clients in TLD increased in the region, indicating that the stock of TLE gradually decreased and clients were switched to TLD. There was a sharp decline in the number of clients on TLE from the quarter of Apr-June 2021 towards Jul-Sept 2021.
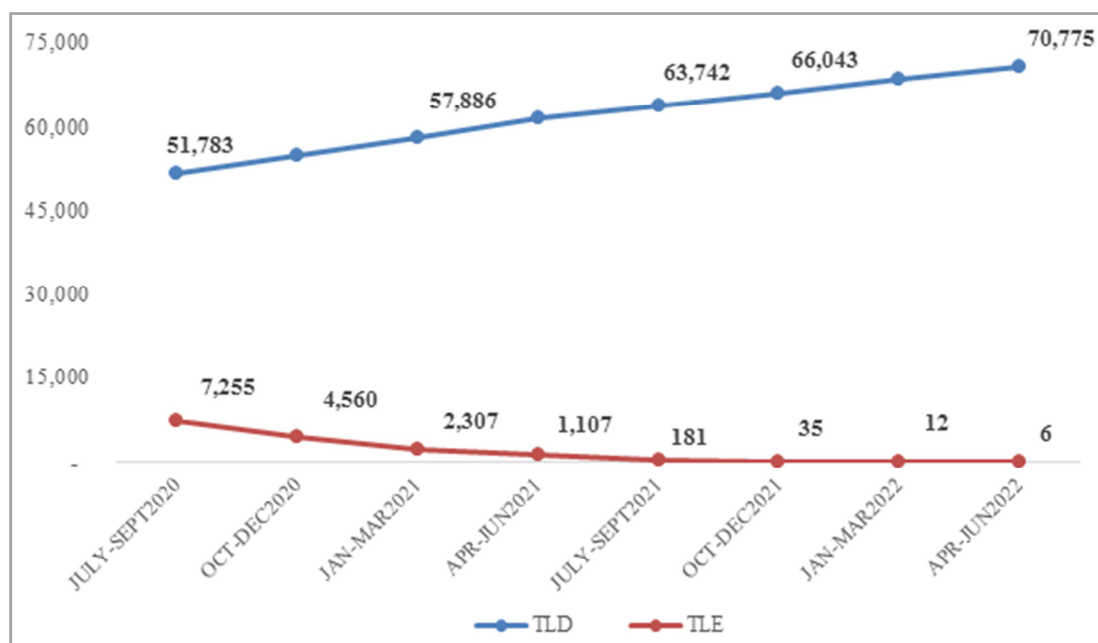

Figure 3. *Trends on the number of clients in TLE and TLD since August 2020.*

3.4. Amount of TLE Rescued in the Region

As shown in the figure 4 below, the collective efforts of the region had resulted in approximately 1.2 million tabs of TLE being saved by July 2021, which is approximately 99.95% of the stock available in August 2020.
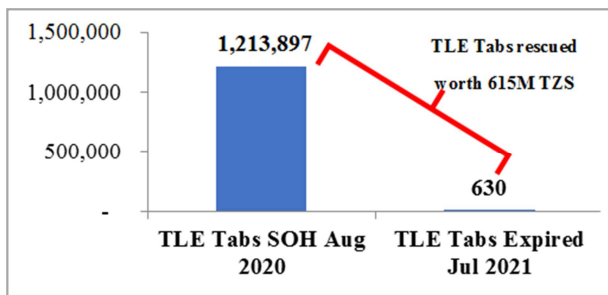
Figure 4. Stocks of TLE which had been rescued by the Geita region after the intervention since August 2020.

4. Discussion

4.1. Logistics Information on the Large Proportion of TLE Stocks at Risk

The preliminary results of the analysis in the region, presented in Table 1, show that a large proportion of the available TLE stocks would expire in July 2021. The overall situation in the region shows that the vulnerable TLE stocks could have been consumed within three (3) months from August 2020 if each plan had been effectively executed. However, Figures 1 and 2 show that Mbogwe DC and Geita TC are the only councils that had reached this milestone.

Nevertheless, the overall success of having saved almost all endangered TLE stocks is in line with the recommendations of a study conducted by Kagashe et al. in Dar es salaam Tanzania, which states that working on excess supply of medicines [10], considering their shelf life [11], can make a huge contribution to reducing drug wastage in the country.

4.2. Periodic Progressive Decrease of TLE Stocks Since August 2020

The analysis results of the e-LMIS data as presented in figures 1 and 2 have shown that TLE stocks in all councils had been gradually declining over time, demonstrating the impact of the measures taken in the Geita region to deplete available stocks before they deteriorate. For example, Nyang'hwale DC which was one of the at-risk councils redistributed about 36,900 TLE tablets among its own facilities and to nearby councils for joint rescue efforts. These findings are consistent with the recommendations of previous studies by Gebremariam et al. in Ethiopia and the USAID Deliver project, which highlighted the importance of data driven exchanging commodities between overstocked and stocked out health facilities as one of the key means of saving health commodities from expiring [12, 13].

4.3. Trends of Clients on TLE Versus TLD

The implementation results in this category show a decline in the number of clients using TLE and a steady rise in the number of clients using TLD from August 2020. These results may have been influenced by the decline in TLE stock across the region, particularly the July 2021 expiring stock, which accounted for the majority of TLE that needed to be consumed

quickly and in a timely manner to avoid expiry. While the trend for TLE was expected to be somehow maintained for at least two quarters before declining, it shows that the regional and council IMPACT teams have been monitoring stocks very well, although some facilities might have defied some instructions by putting new clients to TLD, even though they had been instructed through the letter to initiate all new PLHIV with TLE first before switching them to TLD. Restricting clients already receiving TLD from switching back to TLE as one of the means to achieve a smooth transition during the tapering period and maintaining clients on superior regimen (TLD), as also recommended by Mori et al. in a study conducted in Tanzania [14], was very important to also reduce the risks for emergency HIV strains with drug resistance, as TLE is considered the inferior regimen compared to TLD [15].

4.4. Amount of TLE Rescued in the Region

The overall results in this area show a significant reduction in TLE from 1,213,897 to 630 tablets by July 2021 (Figure 4). This means that 99.95% of the initial stock worth 615 million Tanzania Shillings (Equivalent to approximately 263,918 US Dollars) had been saved. This demonstrates the effectiveness of the actions proposed and taken by the regional IMPACT team in Geita and its councils, which included using data to assess the risky situation and then redistributing TLE from overstocked councils to understocked ones to share the risk and make a concerted effort to minimize TLE stocks to safer levels. These results are much better than those reported by Hakuzimana et al. in previous studies in Rwanda, which found that 53% of HIV/AIDS drugs worth 596,676,478 Rwandan francs (Equivalent to approximately 581000 US Dollars) expired in 2018 due to various factors, including poor supply chain management, poor stock management and interventions to change ARV regimens [11].

Moreover, the analyzed data results in Table 1, shows that Nyang'hwale DC and Geita Referral Regional Hospital were at higher risk of having large amounts of expired TLE stocks after July 2021 compared to other councils or facilities if there were no redistributions of TLE stock within the region.

5. Conclusion

Given the great success of both regional and council IMPACT teams in Geita in rescuing the significant amount of vulnerable TLE stock during the TLE-TLD transition, the IMPACT approach was fundamental to improving data driven rational team decision-making throughout the processes. The use of logistics, service data, strong team spirit, leadership commitment and support are critical to improving health supply chain management, including minimizing health commodity wastage, as in the case of Geita region. Furthermore, the findings in the Geita case provide evidence that it is extremely important for regional, council, and lower health facility levels to exercise innovation and creativity in dealing with higher level directives in order to find local contextual solutions.

Acknowledgements

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