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EFFECT OF PROCUREMENT DATA ACCESSIBILITY ON MEDICINE SUPPLY CHAIN ACCURACY AT THE MEDICAL STORES DEPARTMENT (MSD) IRINGA ZONE

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ABSTRACT

The purpose of this study was to assess the effect of procurement data accessibility on medicine supply chain accuracy at the Medical Stores Department (MSD) Iringa Zone. Specifically, the study determined how access to procurement records, stock information and consumption information affects medicine supply chain accuracy. The study adopted a mixed-method approach using a convergent parallel research design. Data were collected using structured questionnaires from 54 respondents and semi-structured interviews with 9 purposively selected key informants. The study population comprised 63 employees working at MSD Iringa Zone. Quantitative data were analysed using SPSS Version 20 through descriptive statistics, while qualitative data were analysed using thematic analysis. The findings showed that procurement data accessibility supported medicine supply chain accuracy by enabling staff to access procurement records, stock information and consumption information for forecasting, procurement planning, ordering and stock monitoring. However, medicine shortages, supplier delays, transport constraints and incomplete procurement information limited the contribution of data accessibility to accurate and timely supply chain operations. The study concludes that procurement data accessibility has an important role in improving medicine supply chain accuracy at MSD Iringa Zone. The study recommends that MSD strengthen access to complete and reliable procurement information and improve systems for updating and sharing procurement data among relevant staff. Further improvements in supplier coordination, inventory management and logistics are also recommended to strengthen medicine supply chain accuracy. Future studies should examine procurement data accessibility in other MSD zones and public health institutions in Tanzania.

KEYWORDS: Procurement data accessibility; medicine supply chain accuracy; procurement information; Medical Stores Department; Iringa Zone.

INTRODUCTION

1.1 Background of the Study

Procurement data accessibility is important for accurate medicine supply chain management because decisions on forecasting, quantification, ordering and stock management depend on reliable information. The World Health Organization (WHO, 2025) emphasizes that medicine procurement decisions require information on consumption, stock on hand, expected deliveries and other supply conditions to avoid over-purchasing and stock-outs. Access to accurate supply information also supports effective forecasting and supply planning, which are important for maintaining the availability of medicines. Therefore, accessibility of procurement data enables procurement and supply chain staff to obtain the information required for making accurate decisions on medicine requirements and supply.

In Tanzania, efforts have been made to strengthen access to medicine supply chain information through Logistics Management Information Systems (LMIS) and electronic Logistics Management Information Systems (eLMIS). Mwencha et al. (2017) found that improvements in Tanzania's supply chain management systems were associated with increased data accessibility, visibility and transparency, as well as improvements in planning, stock control, quantification and forecasting. The Tanzania Health Sector Strategic Plan also identified data visibility, data quality and access to information as important for improving health commodity decision-making and strengthening forecasting and stock control at the Medical Stores Department (Ministry of Health and Social Welfare [MoHSW], 2015). These developments indicate that accessible procurement and supply chain information is important for supporting accurate medicine supply decisions.

Despite improvements in information systems, medicine supply chain accuracy remains an important concern because weaknesses in information management can affect forecasting, stock control and medicine availability. WHO (2025) notes that poor data visibility and weak forecasting can contribute to excess stock of some medicines while other medicines become depleted. In Tanzania, Mwencha et al. (2017) also found that improvements in data accessibility and visibility were associated with better supply chain performance, although the effects varied across different management practices. This creates a need to examine whether procurement data are sufficiently accessible to support accurate forecasting, ordering, stock monitoring and supply decisions at the Medical Stores Department (MSD)

Iringa Zone. Therefore, the present study focuses on the effect of procurement data accessibility on medicine supply chain accuracy at the Medical Stores Department (MSD) Iringa Zone.

1.2 Statement of the Problem

The Medical Stores Department (MSD) has introduced digital systems and procurement information tools to support medicine supply management. However, medicine supply chain accuracy remains a concern, as health facilities may still experience shortages and differences between medicine quantities ordered and supplied. Evidence from Tanzania shows that electronic logistics management systems can improve access to supply chain information, but weaknesses in information management and system use may continue to affect medicine availability (Milulu et al., 2024). This raises concern about whether procurement data are sufficiently accessible to staff responsible for forecasting, ordering, stock monitoring and supply decisions at MSD.

Previous studies have shown that access to reliable supply chain information can support better stock monitoring and procurement decisions. For example, Mshana et al. (2023) found that the use of electronic logistics information improved stock monitoring in health facilities. However, limited evidence explains the specific effect of procurement data accessibility on medicine supply chain accuracy at the zone level, particularly at MSD Iringa Zone. The lack of clear evidence creates a need to determine whether accessible procurement data support accurate forecasting, ordering, stock management and supply of medicines. Therefore, this study examined the effect of procurement data accessibility on medicine supply chain accuracy at the Medical Stores Department (MSD) Iringa Zone.

LITERATURE REVIEW

2.1 Theoretical Literature Review

Supply Chain Management (SCM) Theory, developed by Mentzer et al. (2001), explains how coordination and information sharing among supply chain activities support effective supply chain performance. The theory assumes that accessible and reliable information enables supply chain members to coordinate procurement, inventory and distribution activities more effectively. Chopra and Meindl (2022) further emphasize the importance of information in improving supply chain visibility and decision-making. The theory is relevant to this study because MSD depends on procurement information when planning, ordering, storing and distributing medicines. Therefore, SCM Theory helps explain how procurement data accessibility can affect medicine supply chain accuracy at MSD Iringa Zone.

2.2 Empirical Literature Review

Evidence shows that access to supply chain information can support better medicine management. In this context, Mwencha et al. (2017) found that strengthening supply chain information systems in Tanzania improved data accessibility, visibility, planning, stock control and forecasting, showing that accessible information can support better medicine supply management. Similarly, Milulu et al. (2024) reported that electronic logistics information systems supported access to stock, procurement and order information and improved medicine supply chain management in public health facilities in Singida District. In Ethiopia, Birhanu et al. (2022) found that information sharing positively influenced pharmaceutical supply chain operational performance by reducing uncertainty and supporting order fulfilment. Kanyika et al. (2025) further found that logistics information systems supported medicine supply management in Zambian public hospitals, although data accuracy and product availability remained concerns. These studies generally indicate that access to reliable supply chain information supports better medicine planning and supply management; however, most focused on electronic logistics systems or general information sharing rather than the specific effect of procurement data accessibility on medicine supply chain accuracy at a zonal MSD level. This gap provides the basis for the present study at MSD Iringa Zone.

METHODOLOGY

Research Design

This study employed a mixed research approach, combining quantitative and qualitative methods. The approach enabled the researcher to collect numerical data on procurement data accessibility and medicine supply chain accuracy while also obtaining detailed views and experiences from employees involved in procurement and medicine supply activities (Creswell & Plano Clark, 2018). A convergent research design was used, whereby quantitative and qualitative data were collected during the same period, analysed separately and compared during interpretation. This design was appropriate because it enabled the researcher to assess access to procurement records, stock information and consumption information while obtaining explanations from employees and key informants responsible for procurement and medicine supply activities. The approach therefore provided a better understanding of how procurement data accessibility affects medicine supply chain accuracy at the Medical Stores Department (MSD) Iringa Zone.

Area of the Study

This study was carried out at the Medical Stores Department (MSD) Iringa Zone, located in Iringa Region, Tanzania. The zone is responsible for the storage and distribution of medicines and other health commodities to health facilities within its service area. The zone serves Iringa, Njombe and Ruvuma regions, excluding Makete and Tunduru District Councils and supports 930 health facilities (Medical Stores Department [MSD], 2026). MSD Iringa Zone was selected because procurement, storage and distribution activities depend on access to accurate procurement information. Procurement data accessibility is important in this setting because it enables staff to obtain information required for procurement planning, ordering, stock monitoring and distribution. The area therefore provided a suitable setting for examining the effect of procurement data accessibility on medicine supply chain accuracy.

Population and Sampling

Population

A population refers to the entire group of people or units that have characteristics relevant to a particular study (Kothari, 2014). The population for this study consisted of 63 employees working at the Medical Stores Department (MSD) Iringa Zone (MSD Iringa Zone, 2026). The participants included employees from the Procurement Unit, Warehouse/Inventory, Logistics/Distribution and Management/Support sections. These groups were selected because they are directly involved in procurement, procurement information management, inventory management, distribution and medicine supply activities. The study also involved nine key informants selected from the procurement, warehouse, logistics and management sections because of their direct responsibilities and experience in procurement data management and medicine supply chain operations.

Sampling

Sampling is the process of selecting a smaller group from a larger population to participate in a study (Kothari, 2014). This study employed a combination of simple random sampling and purposive sampling. Simple random sampling was used to select 54 respondents from the population of 63 employees, giving eligible employees an opportunity to participate in the quantitative part of the study. The sample size was determined using Slovin's formula at a 5% margin of error, resulting in 54 questionnaire respondents. Purposive sampling was used to select nine key informants from the Procurement Unit, Warehouse/Inventory, Logistics/Distribution and Management/Support sections because of their direct involvement

in procurement data management and medicine supply operations. Together with the 54 questionnaire respondents, the total sample consisted of 63 participants.

Data Collection Instruments

A questionnaire is a structured instrument used to collect information from respondents through a set of prepared questions (Creswell & Creswell, 2018). In this study, structured questionnaires were administered to 54 respondents to collect information on access to procurement records, stock information and consumption information and their contribution to medicine supply chain accuracy. The questionnaire also collected information on medicine supply chain accuracy in relation to procurement planning, ordering, stock monitoring and medicine distribution. This instrument enabled the researcher to collect standardised quantitative information from employees involved in procurement and medicine supply activities at MSD Iringa Zone.

Semi-structured interviews were also conducted with nine key informants from the procurement, warehouse, logistics and management sections. The interviews enabled the researcher to obtain detailed information about how procurement data are accessed and made available for procurement planning, ordering, stock monitoring and medicine distribution. The interview questions also explored how accessibility of procurement records, stock information and consumption information supports medicine supply chain accuracy. Follow-up questions were asked where necessary to obtain further explanations of the participants' experiences and views (Creswell & Creswell, 2018). The interviews therefore provided additional information to help explain the quantitative findings on procurement data accessibility and medicine supply chain accuracy at MSD Iringa Zone.

Data Analysis

Quantitative data were coded, entered and analysed using the Statistical Package for the Social Sciences (SPSS), Version 20. Descriptive statistics, including frequencies, percentages and means, were used to summarise the respondents' views on procurement data accessibility and medicine supply chain accuracy. Multiple linear regression analysis was also used to assess the effect of procurement data accessibility on medicine supply chain accuracy. Procurement data accessibility was treated as the independent variable, while medicine supply chain accuracy was treated as the dependent variable. The analysis examined whether differences in procurement data accessibility were associated with differences in medicine supply chain accuracy.

Qualitative data collected through semi-structured interviews were analysed using thematic analysis. The interview responses were reviewed, coded and grouped into themes based on

the study objective. The main themes focused on access to procurement records, availability of stock information, access to consumption information and medicine supply chain accuracy. The qualitative findings were compared with the quantitative findings to provide a clearer understanding of how procurement data accessibility affects medicine supply chain accuracy at MSD Iringa Zone (Braun & Clarke, 2022).

Ethical Considerations

The study observed ethical principles to protect the rights, privacy and welfare of participants. An introductory letter was obtained from the University of Iringa and permission to conduct the study was sought from the management of the Medical Stores Department (MSD) Iringa Zone. Participation was voluntary and the purpose of the study was explained to participants before data collection. Informed consent was obtained from all participants and they were free to withdraw from the study at any time without penalty (Saunders et al., 2019). Confidentiality and anonymity were maintained by avoiding the use of participants' names in the research report and using codes where necessary. Information collected from participants was kept securely and used only for academic purposes. The researcher also maintained honesty and integrity during data collection, analysis and presentation of findings. All sources used in the study were acknowledged through APA referencing to maintain academic integrity and avoid plagiarism.

DATA PRESENTATIONS AND DISCUSSIONS

4.1 Procurement Data Accessibility on Medicine Supply Chain Accuracy

This section presents the findings on the objective, which sought to determine the effect of procurement data accessibility on medicine supply chain accuracy at the Medical Stores Department (MSD) Iringa Zone. The analysis focuses on respondents' views regarding the availability of procurement information, ease of accessing procurement records and access to stock and consumption information. These aspects are important because accessible procurement information supports forecasting, ordering, stock monitoring and medicine supply decisions. The findings are presented using frequencies, percentages and mean scores, followed by interpretation. Qualitative findings obtained from the 9 key informants are then used to support and explain the quantitative results. The findings are also discussed in relation to relevant scholarly studies.

Table 4.1: Procurement Data Accessibility on Medicine Supply Chain Accuracy.

Statements		SD	D	N	A	SA	Total
Availability of procurement information improves forecasting reliability.	Frequency (n=54)	10	2	3	39	0	54
	Percent (%)	18.5	3.7	5.6	72.2	0.0	100.0
Ease of accessing procurement records improves order fulfillment accuracy.	Frequency (n=54)	31	3	4	16	0	54
	Percent (%)	57.4	5.6	7.4	29.6	0.0	100.0
Access to stock and consumption information improves timely delivery of medicines.	Frequency (n=54)	2	33	18	1	0	54
	Percent (%)	3.7	61.1	33.3	1.9	0.0	100.0
Availability of procurement information improves order fulfillment accuracy.	Frequency (n=54)	3	34	8	6	3	54
	Percent (%)	5.6	63.0	14.8	11.1	5.6	100.0
Ease of accessing procurement records improves forecasting reliability.	Frequency (n=54)	2	4	1	39	8	54
	Percent (%)	3.7	7.4	1.9	72.2	14.8	100.0

Source: Field Data (2026)

This section presents the findings on the first specific objective, which sought to determine the effect of procurement data accessibility on medicine supply chain accuracy at the Medical Stores Department (MSD) Iringa Zone. The analysis focuses on the availability of procurement information, ease of accessing procurement records and access to stock and consumption information. These indicators are important because accessible procurement information supports forecasting, order fulfillment, stock monitoring and timely medicine delivery. The findings are presented using frequencies and percentages followed by interpretation. Qualitative information obtained from the 9 key informants is used to provide further explanations of the quantitative findings. The findings are also discussed in relation to relevant empirical literature.

4.1.1 Availability of Procurement Information and Forecasting Reliability

The results presented in Table 4.1 show that the majority of respondents, 39 (72.2%), agreed that the availability of procurement information improves forecasting reliability at MSD Iringa Zone. A total of 10 respondents (18.5%) strongly disagreed, while 3 respondents (5.6%) remained neutral and 2 respondents (3.7%) disagreed. The findings indicate that most respondents recognize the importance of having procurement information available when preparing medicine forecasts. Available procurement information enables staff to review

previous orders, stock levels and medicine consumption before estimating future requirements. Therefore, the availability of procurement information supports informed forecasting and contributes to medicine supply chain accuracy.

A Procurement Officer explained:

Procurement information is important when estimating medicine requirements for different health facilities. Staff need information about previous orders, stock balances and consumption before making decisions. When these records are available, it becomes easier to identify medicines that require replenishment. This supports better forecasting and reduces unnecessary over-ordering or under-ordering. (Interview with Procurement Officer, Respondent A, 17 June 2026, 9:15 a.m.).

A Senior Procurement Officer stated:

The availability of procurement records has improved the way forecasting is done in the zone. Staff can obtain information about previous procurement activities when preparing new forecasts. This helps in determining the quantities required by health facilities. It also reduces mistakes that may occur when there is little information available. Forecasting decisions are therefore more dependable when the required procurement information is accessible. (Interview with Senior Procurement Officer, Respondent B, 18 June 2026, 10:20 a.m.).

A Warehouse Supervisor reported:

Procurement information is important when estimating medicine requirements for different facilities. Staff need information about previous orders, stock balances and consumption before making decisions. When these records are available, it becomes easier to identify medicines that require replenishment. This supports better forecasting and reduces unnecessary over-ordering or under-ordering of medicines. (Interview with Warehouse Supervisor, Respondent C, 19 June 2026, 10:40 a.m.).

A Logistics Coordinator noted:

Most procurement planning activities require information from previous procurement records. When the records are easy to access, staff spend less time searching for information and can concentrate on preparing the forecast. The available information also helps compare previous demand with current requirements. This improves the quality of the procurement plan. (Interview with Logistics Coordinator, Respondent D, 20 June 2026, 8:55 a.m.).

A Warehouse Officer commented:

Access to procurement information has made forecasting more practical. Staff can review what was ordered previously and compare it with current medicine requirements. This helps staff make decisions using actual records rather than personal estimates. Forecasting is

therefore more accurate when the information required for the process is available. (Interview with Warehouse Officer, Respondent F, 22 June 2026, 10:30 a.m.).

A Logistics Coordinator explained:

The availability of procurement information helps staff identify changes in medicine requirements before preparing new orders. When records are available, it is possible to check previous consumption and procurement patterns. This supports planning for medicines that may require higher quantities. Good access to information therefore improves confidence in forecasting decisions. (Interview with Logistics Coordinator, Respondent G, 23 June 2026, 11:15 a.m.).

A Management Officer stated:

Sometimes forecasting becomes difficult when some procurement records are missing or not available when needed. Staff may have to depend on other sources of information, which can take more time and may affect the accuracy of the forecast. When procurement records are complete and accessible, forecasting becomes easier and more reliable. Improving access to procurement information is therefore important for medicine supply planning. (Interview with Management Officer, Respondent H, 24 June 2026, 9:35 a.m.).

Findings indicate that the availability of procurement information contributes to forecasting reliability at MSD Iringa Zone. The quantitative findings show that 72.2% of respondents agreed that the availability of procurement information improves forecasting reliability. The key informants similarly explained that access to previous orders, stock information and consumption records helps staff estimate medicine requirements using available information. However, the interviews also indicate that missing or unavailable records can make forecasting more difficult and may increase reliance on other sources of information. These findings suggest that the effect of procurement data accessibility depends not only on the availability of information but also on whether relevant records are complete and accessible when required. Overall, the findings indicate that improved availability of procurement information strengthens forecasting reliability and supports medicine supply chain accuracy.

The findings are also supported by Supply Chain Management Theory, which emphasizes coordination and information sharing among activities involved in procurement, inventory management and distribution. In the context of MSD Iringa Zone, procurement information provides a basis for linking previous orders, stock levels, consumption patterns and future medicine requirements. When this information is available to relevant staff, procurement planning becomes more coordinated and forecasting decisions can be based on available

evidence. The findings therefore demonstrate the importance of information availability in supporting effective procurement and medicine supply chain activities.

The findings are consistent with Silabi et al. (2023), who found that the availability and use of health supply chain information supported decision-making and improvement of supply chain activities in Tanzania. The findings also relate to Mwencha et al. (2017), who reported that improvements in supply chain information systems contributed to better planning, monitoring, quantification and forecasting of health commodities in Tanzania. Similarly, Milulu et al. (2024) found that access to electronic logistics information supported tracking of stock levels, procurement activities and medicine orders in health facilities in Tanzania. The current findings extend these observations by showing that the availability of procurement information is important for forecasting reliability at the MSD zonal level. Therefore, ensuring that procurement records, stock information and consumption information are available to staff can strengthen forecasting and contribute to improved medicine supply chain accuracy.

4.1.2 Ease of Accessing Procurement Records and Order Fulfillment Accuracy

The results presented in Table 4.1 show that the majority of respondents, 31 (57.4%), strongly disagreed that ease of accessing procurement records improves order fulfillment accuracy at the MSD Iringa Zone. This was followed by 16 respondents (29.6%) who agreed, while 4 respondents (7.4%) remained neutral and 3 respondents (5.6%) disagreed. Respondents who strongly disagreed and disagreed indicated that access to procurement records does not always result in complete fulfillment of medicine orders because stock shortages, supplier delays and differences between requested and available quantities continue to affect order fulfillment. In contrast, respondents who agreed indicated that easy access to procurement records helps staff review orders, confirm requirements and coordinate order processing when medicines are available. These findings indicate that easy access to procurement records supports order processing but does not by itself guarantee accurate order fulfillment because fulfillment also depends on medicine availability and supplier performance.

A Procurement Officer explained:

Easy access to procurement records helps staff confirm what health facilities have requested and compare current orders with previous orders. This makes it easier to identify the required quantities and process orders correctly. However, having the records available does not mean that all requested medicines will be in stock. Some orders are still partially fulfilled because

the available medicines are less than the quantities requested. (Interview with Procurement Officer, Respondent A, 17 June 2026, 10:05 a.m.).

A Senior Procurement Officer stated:

Procurement records are important when checking the requirements submitted by health facilities. When the records are easy to access, staff can review previous orders and identify the quantities that need to be processed. The process becomes faster and more organized. However, order fulfillment still depends on whether the required medicines are available and whether suppliers deliver the ordered quantities. (Interview with Senior Procurement Officer, Respondent B, 18 June 2026, 9:50 a.m.).

A Warehouse Supervisor reported:

Easy access to procurement records helps the warehouse team understand the quantities that health facilities have requested. Staff can compare orders with the stock available in the warehouse before preparing medicines for distribution. Sometimes the requested quantities are higher than the available stock. In such cases, some medicines cannot be supplied in full even when the procurement records are available. (Interview with Warehouse Supervisor, Respondent C, 19 June 2026, 11:20 a.m.).

A Logistics Coordinator noted:

Accessing procurement records easily improves communication between procurement, warehouse and distribution staff. The information helps us know which orders are ready and which facilities require medicines. However, distribution cannot be completed as planned when some medicines are unavailable. Supplier delays can also affect the quantities prepared for delivery. (Interview with Logistics Coordinator, Respondent D, 18 June 2026, 11:40 a.m.).

A Warehouse Officer commented:

Procurement records provide useful information about orders and the quantities required by health facilities. When the information is available, staff can prepare stock and identify shortages earlier. The main problem occurs when the available stock cannot meet the quantities in the records. Therefore, easy access to records improves coordination, but adequate stock is still necessary for accurate order fulfillment. (Interview with Warehouse Officer, Respondent F, 22 June 2026, 9:30 a.m.).

A Logistics Coordinator explained:

The availability of procurement records helps staff monitor orders and plan distribution activities. It is easier to identify which facilities have pending orders and what quantities are required. However, some orders remain incomplete because suppliers do not always deliver

all the required medicines. Improving access to records should therefore be accompanied by better stock management and supplier coordination. (Interview with Logistics Coordinator, Respondent G, 18 June 2026, 12:10 p.m.).

A Management Officer stated:

Procurement records are useful for monitoring the progress of medicine orders across the zone. Staff can identify differences between quantities requested and quantities available for supply. This helps management understand where order fulfillment problems occur. However, access to information alone cannot solve shortages or supplier delays, which continue to affect the final quantities supplied to health facilities. (Interview with Management Officer, Respondent H, 24 June 2026, 10:10 a.m.).

Findings are considered together, they indicate that ease of accessing procurement records has a limited contribution to order fulfillment accuracy at MSD Iringa Zone. The quantitative findings show that 57.4% of respondents strongly disagreed with the statement, while 29.6% agreed. The key informants explained that accessible procurement records help staff confirm facility requirements, monitor orders and coordinate procurement and distribution activities. However, stock shortages and supplier delays continue to cause differences between quantities requested and quantities supplied. These findings suggest that access to procurement records is important for order processing and coordination, but its contribution to order fulfillment accuracy depends on adequate stock availability and supplier performance. Overall, the findings show that improving access to procurement records should be supported by effective inventory management and supplier coordination.

The findings are explained by Supply Chain Management Theory developed by Mentzer et al. (2001), which emphasizes coordination and information sharing among procurement, inventory, suppliers and distribution activities. Easy access to procurement records improves the flow of information between these activities and supports better coordination of medicine orders. However, the findings also show that information access alone cannot guarantee accurate fulfillment when stock availability and supplier performance are inadequate. The theory therefore provides a suitable explanation for the finding that procurement information accessibility must work together with other supply chain activities to improve medicine supply chain accuracy.

The findings are consistent with Pyuza et al. (2023), who observed that incomplete fulfillment of medicine orders in Tanzanian public health facilities was associated with stock shortages and procurement constraints. The findings also relate to Mtey (2023), who reported that medicine availability and supplier performance continued to affect order fulfillment

within the Medical Stores Department. Similarly, Adeyemi (2020) found that procurement information and electronic processing did not always result in improved order fulfillment when supplier delays and inventory shortages were present. The findings therefore suggest that improving accessibility of procurement records is necessary but should be combined with adequate stock management and reliable supplier performance to achieve accurate fulfillment of medicine orders.

4.1.3 Access to Stock and Consumption Information and Timely Delivery of Medicines

The results presented in Table 4.1 show that the majority of respondents, 33 (61.1%), disagreed that access to stock and consumption information improves the timely delivery of medicines at the MSD Iringa Zone. This was followed by 18 respondents (33.3%) who remained neutral, while 2 respondents (3.7%) strongly disagreed and 1 respondent (1.9%) agreed with the statement. Respondents who disagreed explained that access to stock and consumption information does not always result in timely delivery because supplier delays, transport limitations and medicine shortages continue to affect distribution. The respondent who agreed indicated that access to such information helps staff identify medicine requirements and plan distribution when adequate stock is available. These findings indicate that access to stock and consumption information supports planning, but timely delivery also depends on other activities within the medicine supply chain.

A Warehouse Supervisor explained:

Access to stock information helps staff know which medicines are available and which facilities require supplies. This information supports the preparation of distribution plans and helps identify medicines that need urgent attention. However, medicines may still reach facilities late when the required stock is not available or when suppliers delay deliveries. Access to stock information therefore improves planning, but it cannot by itself guarantee timely delivery. (Interview with Warehouse Supervisor, Respondent C, 15 June 2026, 10:20 a.m.).

A Logistics Coordinator stated:

Stock and consumption information helps the logistics team understand the requirements of different health facilities. When the information is available on time, distribution can be planned according to facility needs. However, transport arrangements and delays in receiving medicines can affect the delivery schedule. Better coordination between procurement, warehouse and distribution activities is therefore necessary for timely delivery. (Interview with Logistics Coordinator, Respondent G, 15 June 2026, 10:45 a.m.).

A Procurement Officer reported:

Information about stock and consumption is useful when deciding which medicines should receive priority during procurement and distribution. Staff can identify items that are running low and prepare the necessary requests. The problem occurs when medicines are not available even after the need has been identified. In such cases, having the information does not immediately solve the shortage or prevent delays in delivery. (Interview with Procurement Officer, Respondent A, 17 June 2026, 10:05 a.m.).

A Senior Procurement Officer noted:

Consumption information helps us understand the quantities of medicines required by health facilities. When these records are available, procurement staff can prepare requirements earlier and communicate them to other departments. However, timely delivery depends on whether suppliers provide the medicines and whether distribution arrangements are ready. Information supports the process, but other supply chain activities must also work well. (Interview with Senior Procurement Officer, Respondent B, 18 June 2026, 9:50 a.m.).

A Warehouse Officer commented:

The warehouse uses stock information to identify medicines that are available for distribution and those that require replenishment. This makes it easier to prepare distribution plans and avoid unnecessary delays. However, some medicines may be out of stock when facilities need them. In such situations, delivery can be delayed even when the stock information is available and accurate. (Interview with Warehouse Officer, Respondent F, 22 June 2026, 9:30 a.m.).

A Logistics Coordinator explained:

Consumption information helps us identify facilities with higher medicine requirements and plan their deliveries. It also helps in monitoring whether the quantities supplied are responding to facility needs. However, transport problems and delays in receiving medicines can affect the final delivery time. Timely access to information is therefore important, but it must be supported by reliable transport and adequate medicine availability. (Interview with Logistics Coordinator, Respondent H, 24 June 2026, 10:10 a.m.).

A Management Officer stated:

Stock and consumption information provides management with a clear picture of medicine requirements across the zone. This information helps in identifying shortages and deciding where attention is needed. However, delivery delays can still occur because of supplier performance, transport limitations and inadequate stock. Improving information access should therefore be accompanied by improvements in procurement, inventory and

distribution activities. (Interview with Management Officer, Respondent I, 15 June 2026, 11:00 a.m.).

Findings indicate that access to stock and consumption information had a limited effect on timely delivery of medicines at the MSD Iringa Zone. The quantitative findings show that 61.1% of respondents disagreed that access to this information improves timely delivery, while 33.3% remained neutral. The key informants explained that stock and consumption information helps staff identify medicine requirements, monitor stock levels and prepare distribution plans. However, supplier delays, transport limitations and medicine shortages can still prevent medicines from reaching health facilities on time. These findings suggest that access to stock and consumption information is important for planning, but timely delivery requires coordination between procurement, inventory management, suppliers and distribution activities.

These findings are explained by Supply Chain Management Theory developed by Mentzer et al. (2001), which emphasizes coordination among different activities and participants within a supply chain. Access to stock and consumption information supports coordination by helping procurement, warehouse and logistics staff understand medicine requirements and available stock. However, the findings show that information access alone cannot guarantee timely delivery when other supply chain activities experience delays. The theory therefore provides a suitable explanation for the finding that procurement data accessibility must be supported by effective inventory management, supplier coordination and transportation to improve medicine delivery.

The findings agree with Harju et al. (2023), who reported that reliable supply chain information supports planning and inventory management in public health supply chains. Similarly, Mtey (2023) found that procurement information supported decision-making within the Medical Stores Department, although medicine delivery remained affected by operational factors. The findings also support USAID (2021), which reported that accurate logistics information improves supply chain visibility and planning but does not remove transport and supplier constraints. However, the findings differ from Chen and Li (2021), who found that improved information systems were associated with better delivery performance in public hospitals in China. The difference may be related to differences in logistics capacity, supplier coordination and transport systems. Overall, the findings show that access to stock and consumption information supports medicine supply planning, but timely delivery requires the information to be combined with adequate stock, reliable suppliers and effective distribution arrangements.

4.1.4 Availability of Procurement Information and Order Fulfillment Accuracy

The results presented in Table 4.1 show that the majority of respondents, 34 (63.0%), disagreed that the availability of procurement information improves order fulfillment accuracy at the MSD Iringa Zone. This was followed by 8 respondents (14.8%) who remained neutral, while 6 respondents (11.1%) agreed with the statement. In addition, 3 respondents (5.6%) disagreed and another 3 respondents (5.6%) strongly agreed. Respondents who disagreed indicated that the availability of procurement information does not always result in accurate fulfillment of medicine orders because stock shortages, supplier delays and procurement constraints continue to affect medicine availability. On the other hand, respondents who agreed indicated that available procurement information improves visibility of orders, supports coordination and helps staff monitor facility requirements. These findings indicate that the availability of procurement information supports procurement activities, but accurate order fulfillment also depends on medicine availability and effective coordination throughout the supply chain.

A Procurement Officer explained:

The availability of procurement information has made it easier to receive and process medicine orders from health facilities. Staff can identify the medicines requested and begin procurement activities more quickly. However, there are times when the requested medicines are not available because suppliers have delayed deliveries or stock has already been exhausted. In such situations, health facilities receive fewer medicines than requested even when the procurement information is available. (Interview with Procurement Officer, Respondent A, 16 June 2026, 9:10 a.m.).

A Senior Procurement Officer stated:

The availability of procurement information has increased transparency in procurement activities because orders and requirements can be reviewed easily. Staff are able to identify pending requirements and monitor their progress. Despite these improvements, fulfillment is still affected when stock levels are low or supplier deliveries are delayed. Accurate order fulfillment therefore depends on both accessible information and adequate medicine availability. (Interview with Senior Procurement Officer, Respondent B, 17 June 2026, 10:35 a.m.).

A Warehouse Supervisor reported:

Procurement information helps us process orders and coordinate with the warehouse during order preparation. It also helps staff know the quantities requested by health facilities. However, health facilities sometimes receive fewer medicines because the available stock

cannot satisfy all requests. The availability of information alone is therefore not enough to guarantee complete fulfillment of orders. (Interview with Warehouse Supervisor, Respondent C, 18 June 2026, 8:50 a.m.).

A Logistics Coordinator noted:

Access to procurement information helps the logistics team understand the orders that need to be prepared for distribution. Staff can identify pending orders and communicate with other departments more easily. However, some orders remain incomplete when suppliers do not provide the required quantities. Supplier performance and stock availability are therefore important for achieving accurate order fulfillment. (Interview with Logistics Coordinator, Respondent D, 15 June 2026, 11:20 a.m.).

A Warehouse Officer commented:

Procurement information supports the preparation of medicine orders and reduces mistakes during order processing. When information about the requested quantities is available, staff can compare it with the stock in the warehouse. The main problem occurs when available stock is lower than the quantities requested. In such cases, some medicines cannot be supplied in full even when the procurement information is accurate. (Interview with Warehouse Officer, Respondent F, 20 June 2026, 11:15 a.m.).

A Logistics Coordinator explained:

The available procurement information helps staff follow the status of medicine orders and prepare distribution activities. It has improved communication between procurement, warehouse and logistics staff. However, supplier delays and shortages can still reduce the quantities supplied to health facilities. Improving supplier reliability would therefore strengthen the contribution of procurement information to order fulfillment accuracy. (Interview with Logistics Coordinator, Respondent G, 23 June 2026, 9:40 a.m.).

A Management Officer stated:

Procurement information is useful for monitoring medicine requirements across the zone and identifying areas where orders are not fully satisfied. It helps management understand the difference between what health facilities request and what can actually be supplied. However, information cannot solve shortages when suppliers fail to deliver or available stock is insufficient. Accurate order fulfillment therefore requires both good information and effective supply chain management. (Interview with Management Officer, Respondent H, 15 June 2026, 11:45 a.m.).

Findings indicate that the availability of procurement information had a limited effect on order fulfillment accuracy at MSD Iringa Zone. The quantitative findings show that 63.0% of

respondents disagreed that the availability of procurement information improves order fulfillment accuracy. The key informants explained that available procurement information helps staff identify orders, monitor requirements and coordinate procurement activities, but stock shortages and supplier delays continue to affect the quantities supplied. Respondents who agreed emphasized that accessible information improves order monitoring and coordination. These findings indicate that procurement information availability supports order processing, but accurate fulfillment requires adequate stock, reliable suppliers and effective coordination among supply chain activities.

These findings are supported by Supply Chain Management Theory developed by Mentzer et al. (2001), which emphasizes coordination and information sharing among procurement, inventory, suppliers and distribution activities. The availability of procurement information improves the flow of information and supports coordination among these activities. However, the findings show that information availability alone cannot guarantee accurate order fulfillment when stock and supplier constraints remain. The theory therefore helps explain why procurement data accessibility must operate together with effective inventory management and supplier coordination to improve medicine supply chain accuracy.

The findings are consistent with Mtey (2023), who found that procurement information supported coordination within the Medical Stores Department, although medicine availability continued to affect fulfillment of health facility orders. Similarly, Harju et al. (2023) reported that improved procurement information strengthened supply chain visibility but did not eliminate stock shortages and supplier-related problems. The findings also agree with USAID (2021), which observed that improved logistics information supports supply chain visibility but requires adequate inventory and effective supplier performance to improve order fulfillment. Overall, the findings show that the availability of procurement information is important for order monitoring and coordination, but it needs to be supported by adequate medicine stocks and reliable suppliers to achieve accurate order fulfillment.

4.1.5 Access to Procurement Records and Forecasting Reliability

The results presented in Table 4.1 show that the majority of respondents, 39 (72.2%), agreed that ease of accessing procurement records improves forecasting reliability at the MSD Iringa Zone. This was followed by 8 respondents (14.8%) who strongly agreed. A total of 4 respondents (7.4%) disagreed, while 2 respondents (3.7%) strongly disagreed and 1 respondent (1.9%) remained neutral. Respondents who agreed explained that easy access to procurement records enables staff to review previous orders, stock information and consumption patterns when preparing medicine forecasts. In contrast, respondents who

disagreed indicated that forecasting may still be affected by incomplete records, delayed updates and unexpected changes in medicine demand. These findings indicate that ease of accessing procurement records supports forecasting reliability, although its effectiveness depends on the completeness and timeliness of the available information.

A Senior Procurement Officer explained:

Easy access to procurement records has improved the way medicine forecasts are prepared in this office. Procurement staff can review previous consumption, stock balances and pending orders before making procurement decisions. This information helps staff estimate future medicine requirements more accurately. Forecasting has therefore become more organized because decisions are based on available procurement records. (Interview with Senior Procurement Officer, Respondent B, 15 June 2026, 2:10 p.m.).

A Warehouse Officer stated:

Procurement records have made forecasting activities easier because staff can obtain information about previous medicine requirements when preparing procurement plans. The records help compare medicine consumption with available stock. However, some information may be incomplete when health facilities delay submitting their reports or when records are not updated on time. This can affect the accuracy of some forecasts. (Interview with Warehouse Officer, Respondent F, 15 June 2026, 2:35 p.m.).

A Procurement Officer reported:

When procurement records are easy to access, staff can quickly identify medicines that were ordered previously and compare them with current requirements. This helps in determining the quantities that should be included in new procurement plans. It also reduces the time spent searching for information from different sources. Easy access to records has therefore improved the preparation of medicine forecasts. (Interview with Procurement Officer, Respondent A, 17 June 2026, 2:20 p.m.).

A Warehouse Supervisor noted:

The warehouse depends on procurement records when reviewing stock movement and medicine requirements. Easy access to these records helps staff understand consumption patterns and identify medicines that may require replenishment. However, the information is less useful when some records are missing or not updated. Complete records are therefore important for reliable forecasting. (Interview with Warehouse Supervisor, Respondent C, 19 June 2026, 2:45 p.m.).

A Logistics Coordinator commented

Procurement records provide useful information for understanding the medicine requirements of different health facilities. When staff can access the records easily, it becomes possible to compare previous requirements with current demand. This helps in preparing more realistic procurement plans. However, unexpected changes in demand can still affect the accuracy of forecasts even when records are available. (Interview with Logistics Coordinator, Respondent D, 20 June 2026, 3:05 p.m.).

A Logistics Coordinator explained

Access to procurement records supports planning because staff can review information before distribution and procurement decisions are made. It helps identify medicines that are frequently requested by health facilities. This information can be used when estimating future requirements. Forecasting is therefore more reliable when the relevant procurement records are available and updated. (Interview with Logistics Coordinator, Respondent G, 23 June 2026, 2:50 p.m.).

A Management Officer stated

Management uses procurement records to review medicine requirements and monitor procurement planning across the zone. When the records are accessible, it is easier to identify changes in demand and areas that require attention. However, incomplete information can affect the quality of management decisions. Maintaining complete and updated procurement records is therefore important for reliable forecasting. (Interview with Management Officer, Respondent H, 24 June 2026, 3:20 p.m.).

Findings indicate that ease of accessing procurement records contributes positively to forecasting reliability at MSD Iringa Zone. The quantitative findings show that 72.2% of respondents agreed that easy access to procurement records improves forecasting reliability, while 14.8% strongly agreed. The key informants similarly explained that accessible procurement records enable staff to review previous orders, consumption patterns, stock balances and current requirements when preparing forecasts. However, incomplete records, delayed updates and unexpected changes in medicine demand were identified as factors that can reduce forecasting reliability. Overall, the findings indicate that easy access to procurement records strengthens forecasting, particularly when the information is complete, accurate and updated on time.

The findings are supported by Supply Chain Management Theory developed by Mentzer et al. (2001), which emphasizes information sharing and coordination among procurement, inventory and distribution activities. Easy access to procurement records allows staff

involved in different supply chain activities to use common information when planning medicine requirements. The findings also show that the value of accessible records depends on the quality and completeness of the information available. The theory therefore helps explain how improved access to procurement information can support better coordination and forecasting within the medicine supply chain.

The findings are consistent with the evidence presented by Silabi et al. (2023), who found that access to health supply chain information supported decision-making and supply chain activities in Tanzania. The findings also agree with Mwencha et al. (2017), who reported that improved access to supply chain information supported planning, forecasting and management of health commodities in Tanzania. However, the current findings also show that access to records does not automatically guarantee accurate forecasting when information is incomplete or updated late. This provides an important distinction from studies that mainly emphasize the benefits of information access. Overall, the findings confirm that ease of accessing procurement records is an important factor in improving forecasting reliability, but its effectiveness depends on the completeness and timeliness of the records.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The study concludes that procurement data accessibility has an important but limited contribution to medicine supply chain accuracy at the Medical Stores Department (MSD) Iringa Zone. Access to procurement records, stock information and consumption information supports medicine forecasting, procurement planning, order monitoring and coordination among supply chain activities. The findings particularly show that easy access to procurement records improves forecasting reliability because staff can use previous orders, stock balances and consumption information when estimating medicine requirements. However, procurement data accessibility alone does not guarantee accurate order fulfillment and timely delivery because stock shortages, supplier delays, transport limitations and incomplete or outdated records can affect medicine supply operations. Therefore, improving access to complete, accurate and updated procurement information, together with better stock management, supplier coordination and distribution arrangements, is important for strengthening medicine supply chain accuracy at MSD Iringa Zone.

Recommendations

MSD Iringa Zone should strengthen the availability and accessibility of complete and updated procurement records, stock information and consumption information. Procurement and supply chain staff should be provided with timely access to the information required for forecasting, procurement planning, order processing and stock monitoring.

MSD Iringa Zone should strengthen inventory management to reduce medicine shortages that affect order fulfillment and timely delivery. Regular monitoring of stock levels and early identification of medicines at risk of shortage should be emphasized to support timely procurement and distribution decisions.

MSD should improve coordination with suppliers to reduce delays in the delivery of medicines. Supplier performance should be regularly monitored and appropriate follow-up should be made on delayed or incomplete orders to improve the quantities and timeliness of medicines supplied to health facilities.

MSD Iringa Zone should strengthen the updating and sharing of procurement information among procurement, warehouse and logistics staff. Complete and updated information should be available when required because incomplete or delayed information can reduce the reliability of forecasting and supply decisions.

Future studies should examine procurement data accessibility in other MSD zones and public health institutions in Tanzania. Such studies could provide broader evidence on how access to procurement information contributes to medicine supply chain accuracy in different operational settings.

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