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Determinants of Medical Supply Chain Performance in Tanzania: The Roles of Supply Chain Integration and Inventory Control

Stephano Mwashiuya[1*], Alban D. Mchopa[2], France A. Shayo[3]

[1]Department of Mathematics and Statistics

The Mwalimu Nyerere Memorial Academy, Dar es Salaam, Tanzania

https://orcid.org/0009-0009-5473-1566

[2]Department of Procurement and Supply Chain Management, Moshi Co-operative University, Moshi, Tanzania

[3]Deputy Rector (Planning, Finance and Administration), Eastern Africa Statistical Training Centre, Dar es Salaam, Tanzania

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Abstract

Purpose: This study examines persistent inefficiencies in Tanzania's public medical supply chain, such as stockouts, expired medicines, and delivery delays, that undermine healthcare service delivery and the attainment of Sustainable Development Goal 3.

Methodology: A deductive approach and explanatory cross-sectional survey design were employed. The researcher collected data from 289 healthcare workers in Songwe Region's health centres and dispensaries. Partial least squares structural equation modelling (PLS-SEM) was used in assessing the relationships among SCI, INC, and MSCP, drawing on Resource-Based View (RBV) and Institutional Theory (INT) as guiding frameworks.

Findings: Both SCI and INC had statistically significant positive effects on MSCP, with INC ($\beta = .516$, $p < .001$) exerting a more decisive influence than SCI ($\beta = .317$, $p < .001$). The model explained 48.3% of the variance in MSCP, indicating moderate predictive power.

Unique Contribution to Theory, Policy, and Practice: This study contributes to theory by integrating RBV and INT to explain medical supply chain outcomes in low-resource settings. Practically, it highlights the need for policy enforcement, digital infrastructure investment, and targeted training to enhance supply chain performance. The findings provide actionable insights for health policymakers and development partners aiming to improve logistics systems in Tanzania and similar contexts.

Keywords: *Inventory Control, Supply Chain Integration, Medical Supply Chain Performance, Resource-Based View, and Institutional Theory*

JEL Codes: *I18, L14, M11, H51*

Introduction

Access to reliable, affordable, and high-quality medical supplies is fundamental to achieving Sustainable Development Goal (SDG) number three, which aims to ensure healthy lives and promote well-being for all (Nations, 2015). The performance of medical supply chains, especially in low and middle-income countries like Tanzania, is central to this objective, as they directly impact the availability of essential medicines, diagnostic tools, and medical equipment within public health facilities (Nyanchoka et al., 2022; Sweileh, 2021). In Tanzania, the Medical Stores Department (MSD) plays an essential role in managing the procurement, storage, and distribution of medical commodities across the national healthcare system. Despite various reforms and technological investments, persistent inefficiencies such as frequent stockouts, delivery delays, and expired stock continue to compromise the effectiveness of the public medical supply chain (CAG, 2023; Milulu et al., 2024).

These supply chain inefficiencies not only disrupt healthcare service delivery but also weaken public confidence and hinder the country's capacity to meet national health goals. Challenges such as poor demand forecasting, low visibility across supply chain tiers, and delays in order fulfilment are prevalent (Mathias, 2022; Wiedenmayer et al., 2021). While MSD has introduced systems like the Electronic Logistics Management Information System (e-LMIS) to enhance performance, their utility remains limited due to infrastructural constraints, low digital literacy, and underutilisation of ICT tools, particularly in remote regions like Songwe, which are consistently reported to have weak health system performance (CAG, 2023; Kesale et al., 2022).

A range of interrelated factors influences Medical Supply Chain Performance (MSCP)**,** but two operational elements frequently emerge as critical: Supply Chain Integration (SCI) and Inventory Control (INC). SCI refers to the coordination and alignment of activities among supply chain stakeholders, suppliers, warehouses, and service delivery points to promote information sharing, demand synchronisation, and logistical efficiency (Alzoubi et al., 2022; Fernández, 2022). Effective integration enables better planning, real-time tracking, and timely replenishment, all of which are vital in health delivery systems. In contrast, INC encompasses the strategies and practices used to manage stock levels, forecast demand, and minimise waste or expiry through improved monitoring and distribution (George & Elrashid, 2023; Guo et al., 2024). When poorly implemented, weak inventory control can lead to recurrent stockouts, excess storage costs, and a high incidence of expired medical products.

Despite the acknowledged importance of these two constructs, the literature on Tanzania's healthcare system has broadly examined SCI and INC in isolation, failing to explore their combined impact on MSCP. Moreover, many studies do not sufficiently incorporate the contextual challenges, such as institutional constraints, regulatory dynamics, and regional disparities that influence the implementation of these supply chain practices (Kesale et al., 2022; Salema, 2020). Previous interventions like the Prime Vendor System and MSD decentralisation have attempted to address these issues but have not fully bridged the gap between internal operational capacity and external institutional requirements (Githendu et al., 2020).

To address these gaps, this study adopts a dual-theoretical framework, drawing from the Resource-Based View (RBV) and Institutional Theory (INT). The RBV emphasises the role of internal resources, such as integrated supply chain systems and inventory control capabilities, as strategic assets that contribute to organisational performance(Barney, 1991; George & Elrashid, 2023). These theories are particularly relevant in Tanzania, where healthcare facilities vary in internal operational capacity. On the other hand, INT highlights how institutional pressures, such as government policies, donor expectations, and cultural norms, influence organisational behaviours and decision-making (Changwony & Kyiu, 2023; DiMaggio & Powell, 1983). Integrating these perspectives enables a holistic understanding of how internal capabilities interact with external forces to shape MSCP outcomes.

Accordingly, this study aims to evaluate the influence of Supply Chain Integration (SCI) and Inventory Control (INC) on the performance of medical supply chains (MSCP) in Tanzania's public healthcare sector**.** It contributes to the existing literature by examining these variables jointly and within context. It offers practical insights for improving health logistics systems, guiding policy interventions, enhancing digital infrastructure utilisation, and strengthening supply chain governance in resource-limited environments.

2.0 Literature Review

This section is structured into two parts: the theoretical literature review, which explores the underpinning theories guiding this study, and the empirical literature review, which synthesises existing findings related to Supply Chain Integration (SCI), Inventory Control (INC), and Medical Supply Chain Performance (MSCP).

2.1 Theoretical literature reviews

This study adopts an integrated theoretical lens combining the Resource-Based View (RBV) and Institutional Theory (INT) to explain how both internal capabilities and external institutional pressures influence medical supply chain performance (MSCP). These two theories provide a holistic framework for understanding why certain supply chain practices succeed or fail in public healthcare contexts like Tanzania.

2.1.1 Resource-Based View (RBV)

The Resource-Based View (RBV), first conceptualised by Barney (1991), posits that organisational performance depends on the strategic deployment of internal resources that are valuable, rare, inimitable, and non-substitutable (VRIN). Within supply chain management, internal operational capabilities, such as effective inventory systems, skilled personnel, and logistic infrastructure, are considered strategic resources that can improve performance outcomes (Barney, 1991; Salema, 2020).

In this study, Inventory Control (INC) is conceptualised as a core internal capability under the RBV framework when applied to healthcare supply chains. It involves the management of medical commodities through practices such as accurate demand forecasting, optimal stock level maintenance, order replenishment, and reduction of expired or obsolete items. These practices constitute a resource capability that enables public health institutions to reduce wastage, improve service delivery, and respond more effectively to fluctuations in medical demand (Guo et al., 2024; Hezam et al., 2024). Thus, INC is treated in this study as an internal resource whose strategic deployment is expected to influence medical supply chain performance positively.

2.1.2 Institutional Theory (INT)

Institutional Theory (INT**)** offers a complementary perspective to RBV by focusing on the external environment in which organisations operate. According to DiMaggio and Powell (1983), institutional pressures are categorised as coercive (e.g., government regulations), mimetic (e.g., emulation of leading organisations), and normative (e.g., professional expectations) that shape organisational behaviour and decision-making. Public institutions, including those within the health sector, often conform to these institutional pressures to gain legitimacy, secure resources, and ensure survival (Changwony & Kyiu, 2023).

In the context of this study, Supply Chain Integration (SCI) is influenced significantly by institutional forces. Public healthcare facilities in Tanzania are expected to align their procurement, logistics, and information systems with national policies and donor requirements. The adoption of centralised platforms such as e-LMIS, adherence to Prime Vendor System protocols, and harmonisation of reporting structures are examples of coercive and normative pressures influencing integration decisions (Wiedenmayer et al., 2021; Milulu et al., 2024).

Therefore, SCI is conceptualised as a practice shaped by institutional dynamics and external coordination requirements rather than purely internal strategic choices. The integration of RBV and INT thus provides a dual lens: RBV helps to explain how internal capabilities (e.g., INC) drive performance, while INT accounts for how external institutional contexts influence practices such as SCI.

2.2 Empirical Literature Review and Hypothesis Development

Empirical research has confirmed the significant role of supply chain practices in influencing performance outcomes in healthcare systems. However, much of the literature either treats SCI and INC in isolation or fails to contextualise findings within institutional environments characteristic of developing countries. This study addresses these limitations by examining the two constructs jointly and through a dual theoretical lens.

2.2.1 Supply Chain Integration (SCI)

SCI is widely recognised for improving supply chain agility, responsiveness, and visibility. Alzoubi et al. (2022) found that SCI significantly reduces lead time and improves inventory accuracy in healthcare logistics. Similarly, Wiedenmayer et al. (2021) observed that integration facilitates better forecasting and communication, which are essential for ensuring the timely availability of essential medicines.

However, several studies highlight limitations. Fernández (2022) cautioned that the benefits of SCI are not guaranteed, especially in settings lacking internal readiness, supportive governance, or IT infrastructure. Salema (2020) emphasised that in many low-income settings, integration is externally mandated, which often results in implementation gaps due to institutional misalignment. In Tanzania, challenges such as fragmented procurement systems, weak inter-agency coordination, and limited data sharing hinder SCI effectiveness, even with systems like e-LMIS and the Prime Vendor System in place (CAG, 2023; Kesale et al., 2022).

Given this context, the following hypothesis is proposed:

H1: Supply Chain Integration (SCI) has a significant positive effect on medical supply chain performance.

2.2.2 Inventory Control (INC)

Robust inventory control has been shown to enhance supply chain performance by reducing waste, minimizing stockouts, and ensuring timely order fulfillment. Guo et al. (2024) demonstrated that poor inventory systems in healthcare often result in expired stock and unreliable deliveries. Hezam et al. (2023) emphasised that proactive replenishment and accurate forecasting are essential for maintaining supply continuity and improving health outcomes.

In Tanzania, despite investments in electronic inventory tools, many public health facilities still struggle with overstocking, inaccurate records, and inadequate expiry tracking (Milulu et al., 2024). Institutional and human resource challenges, including poor digital literacy, insufficient training, and weak data culture, have been cited as barriers to successful INC, especially in underserved areas such as Songwe (Kesale et al., 2022).

Building on this evidence, the study posits the following hypothesis:

H2: *Inventory Control (INC) has a significant positive effect on medical supply chain performance*

2.3 Research Gap

Although the impact of SCI and INC on supply chain performance is well acknowledged, existing studies often examine them in isolation or overlook the interplay between internal capabilities and external institutional factors. Additionally, much of the prior literature has been conducted in relatively developed or well-resourced settings, limiting its relevance to low-income public healthcare systems like Tanzania's, where contextual and institutional dynamics significantly shape outcomes.

Moreover, the combined application of RBV and INT to explain supply chain outcomes remains underutilised, especially in the East African context. By jointly evaluating SCI and INC through these theoretical lenses, and by focusing on Tanzania's public healthcare sector, including underperforming regions such as Songwe, this study offers a novel contribution to the literature. It not only fills a critical empirical gap but also provides practical insights for improving medical supply chains in resource-constrained environments.

2.4 Conceptual framework

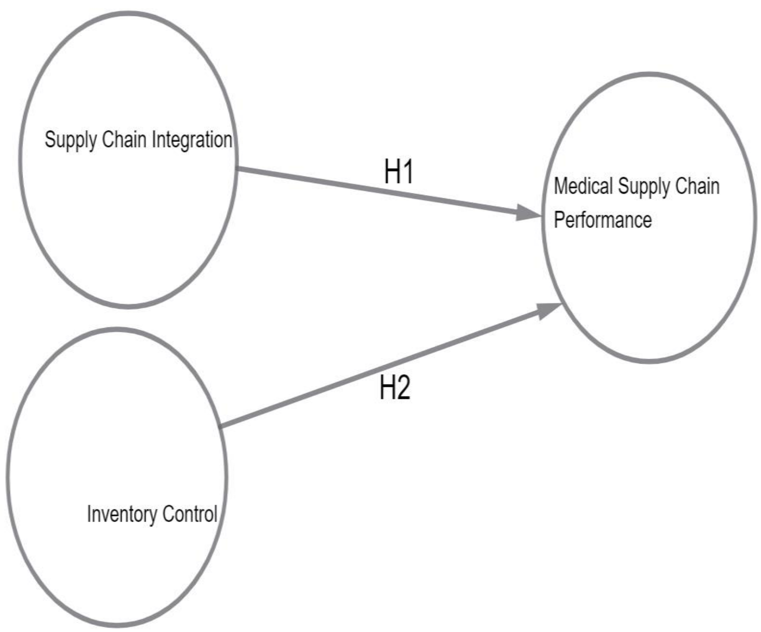

Figure 1: Conceptual framework

3.0 Methods

3.1 Research Philosophy, Design, and Approach

This study was guided by a positivist research philosophy, which emphasises objectivity, empirical observation, and measurable reality. The deductive research approach was applied, enabling the researcher to test hypotheses derived from theoretical constructs, specifically the Resource-Based View (RBV) and Institutional Theory (INT), to explain how internal capabilities (Inventory Control, INC) and institutional influences (Supply Chain Integration, SCI) affect Medical Supply Chain Performance (MSCP) (Firdaus et al., 2021). An explanatory cross-sectional survey design was employed to collect quantitative data at a single point in time. This design was appropriate for examining causal relationships and testing theoretical propositions (Bentouhami et al., 2021;

Mukherji & Albon, 2022). The survey method also allowed for efficient data collection across a dispersed geographical region, consistent with the study's aim of analysing correlations between variables.

3.2 Population, Sampling Techniques, and Sample Size

This study targeted healthcare workers from public health centres and dispensaries in the Songwe region, Tanzania. Although the Medical Stores Department (MSD) serves as the national distributor of medical commodities, MSD personnel were not included in the study. Instead, the unit of analysis was health facilities, specifically health centres and dispensaries that receive and manage medical supplies, making them appropriate subjects for evaluating inventory and supply chain practices.

Songwe region was purposively selected due to its documented weaknesses in health system performance. The 2018 Star Rating Assessment by the Ministry of Health identified low performance in both health facility operations and Health Facility Governing Committees (HFGCs) in the region (Kesale et al., 2022). Additionally, Songwe has been reported to face frequent shortages of essential medicines and medical equipment (Lupondo et al., 2024). National-level assessments further reinforce these findings. Although the 2023 Service Availability and Readiness Assessment (SARA) does not present disaggregated data for Songwe, it highlights widespread disparities in the availability of emergency obstetric care, adolescent health services, and other essential services in rural regions, issues known to affect areas like Songwe (Juma et al., 2024).). Similarly, the Tanzania Demographic and Health Survey and Malaria Indicator Survey (TDHS-MIS, 2022) identified significant regional disparities in skilled birth attendance and health facility deliveries, with underperforming areas like Songwe falling below national benchmarks (Adam & Charles, 2024).

To ensure a representative and unbiased sample, the study employed a multistage probability sampling strategy. First, stratified sampling was used to categorise Songwe Region into five administrative councils: Mbozi District Council**,** Ileje District Council, Momba District Council**,** Tunduma Town Council, and Songwe District Council, ensuring both geographical and administrative representation (Bhandari, 2021). Second, cluster sampling was employed to select health centres and dispensaries within each district. I was provided by a district medical officer a comprehensive list of public health facilities obtained from the respective district medical offices, which are in charge of all health facilities. A researcher used a random selection method, with a computer-generated random number table. Cluster sampling is widely recognised in public health research for its effectiveness in managing data collection across dispersed populations (Lohr, 2021).

In the third stage, simple random sampling was applied within each selected health facility to identify eligible respondents. These included healthcare professionals directly involved in supply chain activities, such as in-charges, pharmacy technicians, and medical officers. This approach ensured that the sampling process was systematic, geographically inclusive, and minimised selection bias (Rahman et al., 2022).

The sample size was determined using Yamane's formula (1967), with a confidence level of 95% and a margin of error of 5%. The calculated sample size was 289 respondents, which is consistent with best practices in Partial Least Squares Structural Equation Modelling (PLS-SEM) for medium-sized samples and hypothesis-driven models.

3.3 Data Collection, Analysis, and Presentation

Data were collected using a structured questionnaire composed of closed-ended questions organised on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The questionnaire was adapted from previously validated instruments used in supply chain management research. Items related to Supply Chain Integration (SCI) were drawn from studies by Alzoubi et al. (2022) and Fernández (2022), focusing on coordination, information sharing, collaboration, and system alignment. Items for Inventory Control (INC) were adapted from Guo et al. (2024) and Hezam et al. (2023), measuring order replenishment efficiency, expired stock control, and inventory carrying cost. Medical Supply Chain Performance (MSCP) was measured using indicators of supply availability, order fulfilment, and delivery accuracy based on Wiedenmayer et al. (2021) and CAG (2023).

To ensure contextual relevance, the questionnaire underwent expert review by healthcare supply chain specialists and was pre-tested in two non-sampled public health facilities. Feedback obtained from the pre-test was used to revise item clarity, sequencing, and language appropriateness for the Tanzanian public sector context. Several measures were taken to reduce potential sources of bias. Standard method bias (CMB) was minimised by using varied scale anchors and randomised question ordering. Anonymity was guaranteed to reduce social desirability bias. Response bias was addressed by clearly communicating the study's purpose and assuring participants that responses would be confidential and would not influence their job performance. Sampling bias was mitigated through the application of a multistage probability sampling approach.

Data were analysed using IBM SPSS version 27 for descriptive statistics and SmartPLS version 4.1 for structural equation modelling. PLS-SEM was selected due to its ability to model complex relationships among latent constructs, manage non-normal data, and handle moderate sample sizes while enabling hypothesis testing and path analysis (Sarstedt et al., 2020). Results were presented using tables and figures for clarity and interpretability.

3.4 Evaluation of models

The study utilised a reflective measurement model for all constructs. The measurement model was assessed using four criteria: reliability, convergent validity, discriminant validity, and multicollinearity. Indicator reliability was ensured by retaining only items with loadings above 0.708. Composite reliability (CR) values between 0.70 and 0.95 indicated satisfactory internal consistency (Hair et al., 2020). Convergent validity was confirmed where Average Variance Extracted (AVE) exceeded 0.50 for each construct. Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT), with values below 0.90 considered acceptable (Hair et al., 2019). Collinearity was examined using Variance Inflation Factor (VIF) values, which were all below 3, indicating no multicollinearity issues.

For the structural model, the significance of path coefficients was assessed using the bootstrapping technique, with a t-value ≥ 1.96 and a p-value ≤ 0.05 considered statistically significant. The R^2 values were interpreted as follows: 0.25 (weak), 0.50 (moderate), and 0.75 (substantial) (Hair et al., 2019). Effect size f^2 was used to determine the contribution of each exogenous construct to the endogenous construct, with thresholds of 0.02 (small), 0.15 (medium), and 0.35 (large). Predictive relevance (Q^2) was determined using the blindfolding procedure, where values above zero indicated acceptable predictive validity (Sarstedt et al., 2021).

Overall, the results confirmed that both the measurement and structural models met the necessary statistical thresholds, thereby validating the study's theoretical framework and hypotheses.

3.4.1 **Evaluation of the Measurement Model Assessment**

3.4.1.1 Reliability and Convergent Validity Analysis Results

When evaluating reliability, Cronbach's alpha and Composite reliability exceeded the necessary cutoff value of 0.7. All items were found to be greater than the 0.5 threshold when convergent validity was evaluated using average variance extracted (AVE), as indicated in Table 1.

Table 1: Reliability and Convergent Validity Analysis Results

	Cronbach's alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
Inventory Control (INC)	0.862	0.886	0.917	0.787
Medical Supply Chain Performance (MSCP)	0.866	0.885	0.907	0.71
Supply Chain Integration (SCI)	0.895	0.919	0.926	0.758

3.4.1.2 Discriminant Validity Analysis (HTMT Results)

For all relationships examined in the research model, HTMT values were less than 0.90. Thus, each component of the proposed research model was empirically distinct from the other elements

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of the structural model (Hair et al., 2019). Using the HTMT measure, the findings of the discriminant validity analysis are shown in Table 2.

Table 2: Discriminant Validity Analysis

	Inventory Control (INC)	Medical Supply Chain Performance (MSCP)	Supply Chain Integration (SCI)
INC			
MSCP	0.704		
SCI	0.388	0.547	

3.4.2 Evaluation of Structural Models Assessment

3.4.2.1 Q^2 Predict Results

Predictive relevance was assessed using Stone-Geisser's Q^2 via the blindfolding procedure. The Q^2 value for Medical Supply Chain Performance (MSCP) was 0.33, indicating medium predictive relevance (Hair et al., 2019). As expected, Q^2 values for the exogenous constructs (INC and SCI) were 0, since predictive relevance is evaluated only for endogenous constructs, as indicated in Table 3

Table 3: Q^2 Predict Results

	SSO	SSE	Q^2 (=1-SSE/SSO)
INC	867	867	0
MSCP	1156	774.215	0.33
SCI	1156	1156	0

3.4.2.2 **Collinearity Statistics by VIF Metric for Inner Model**

Collinearity metrics were analysed in the study using the Variance Inflation Factor (VIF and the results indicated no collinearity concerns, with VIF values for all predictors (INC and SCI) below the conservative threshold of 3.0 (VIF = 1.145 for both paths). This confirms the independence of the constructs in the structural model as indicated in Table 4.

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Table 4: Collinearity Statistics by VIF Metric for Inner Model

	VIF
INC_ -> MSCP_	1.145
SCI_ -> MSCP_	1.145

3.3.4.3 F ^{2} Values Results

Effect size (f^2) values were calculated to assess the relative contribution of each predictor to the explained variance in Medical Supply Chain Performance (MSCP). The results showed that Inventory Control (INC) had a large effect on MSCP ($f^2 = 0.45$), while Supply Chain Integration (SCI) had a medium effect ($f^2 = 0.17$). These findings suggest that both constructs significantly influence MSCP, with INC being the more dominant predictor as depicted in Table 5.

Table 5: Collinearity Statistics by VIF Metric for Inner Model

	f-square
INC_ -> MSCP_	0.45
SCI_ -> MSCP_	0.17

3.4.2.3 Assessing the R^2 Value of the Endogenous Constructs

The model explains 48.3% of the variance in Medical Supply Chain Performance ($R^2 = 0.483$), which indicates a moderate explanatory power**.** The adjusted R^2 value of 0.480 confirms the model's stability. It suggests that both Inventory Control (INC) and Supply Chain Integration (SCI) contribute meaningfully to explaining variations in MSCP (Hair et al., 2019) as shown in Table 6.

Table 6: Assessing the R2 Value of the Endogenous Constructs

	R-square	R-square adjusted
MSCP_	0.483	0.48

4. Findings

92% of respondents answered, which is sufficient for the study's research and reporting and is representative. Kuya and Kalei (2022) define a reasonable response rate as 50%, an excellent response rate as 60%, and a superb response rate as 70% or above. Based on this assertion, the response rate was deemed impressive. The response rate for this study is shown in Table 7. The results (found that more than 70% of respondents responded to their research, "Buyer-supplier integration's influence on supplier logistics performance" are consistent with the response rate of over 70%.

Table 7: 'Respondents' Rate

Type of Respondent	Number of respondents		Per cent
	Expected	Actual	
Workers from Health Centres and Dispensaries in Songwe Region	314	289	92

4.1 Hypothesis Testing and Path Coefficients

Hypotheses were tested using bootstrapping with 5,000 resamples. The results are summarised in Table 8.

Table 8: Hypothesis Testing and Path Coefficients

	Original sample (O)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Interpretation
INC_ -> MSCP_	0.516	0.048	10.668	0.000	Supported
SCI_ -> MSCP_	0.317	0.045	7.019	0.000	supported

Both hypotheses were supported: H1: Supply Chain Integration (SCI) → MSCP, SCI has a positive and statistically significant effect on MSCP ($\beta = 0.317$, $T = 7.019$, $P = 0.000$). This suggests that improved integration, such as better coordination, information sharing, and alignment with national systems, contributes to enhanced supply chain performance. The medium effect size ($f^2 = 0.17$) reinforces the relevance of SCI in the Tanzanian context, though its impact is slightly less pronounced than that of inventory control. H2: Inventory Control (INC) → MSCP, INC showed a stronger and highly significant effect on MSCP ($\beta = 0.516$, $T = 10.668$, P 0 .000).

This indicates that practices like timely replenishment, management of expired stock, and control of inventory costs play a critical role in ensuring the availability and performance of the medical supply chain. The enormous effect size ($f^2 = 0.45$) highlights the importance of internal operational capabilities in determining supply chain effectiveness.

5.0 Discussion

This study examined how Inventory Control (INC) and Supply Chain Integration (SCI) influence Medical Supply Chain Performance (MSCP) in Tanzania's public healthcare system. The results reveal that both INC and SCI significantly and positively affect MSCP, with INC having a comparatively more substantial effect. These findings have broader implications for theory, practice, and future research in healthcare logistics.

5.1 Broader Significance and Practical Applications

The results corroborate previous research, which found that strong inventory control mechanisms improve supply reliability, reduce expiries, and enhance service delivery (Guo et al., 2024; Hezam et al., 2023). In the Tanzanian context, where public healthcare facilities often face medicine shortages, the finding that INC had a strong effect ($\beta = 0.516$, $f^2 = 0.45$) underscores the practical need to prioritise stock-level accuracy, timely replenishment, and waste reduction at the facility level. For example, implementing stock visibility dashboards and training staff in demand forecasting could directly address recurring stockouts in regions like Songwe.

The significance of SCI ($\beta = 0.317$, $f^2 = 0.17$) lies in its confirmation that integration mechanisms, such as standardised ordering systems, feedback loops with suppliers, and national IT tools like **e-**LMIS, can improve coordination and reduce delays. This aligns with findings by Alzoubi et al. (2022) and Fernández (2022), who emphasise the need for inter-organisational alignment in fragmented health systems. In practice, facilities should be incentivised to consistently use centralised systems and share real-time data across tiers to enhance performance.

5.2 Theoretical Integration: Linking Findings to RBV and INT

This study is framed within two complementary theoretical lenses: Resource-Based View (RBV) and Institutional Theory (INT), each of which contributes uniquely to understanding the determinants of MSCP.

According to RBV, internal resources that are valuable, rare, inimitable, and non-substitutable (VRIN) contribute to sustained performance (Barney, 1991). The strong effect of INC on MSCP supports this view: facilities with superior inventory control mechanisms (e.g., efficient replenishment cycles, accurate tracking, and reduced expiry) are leveraging internal capabilities as competitive resources. The empirical evidence thus supports RBV's core tenet that strategic internal practices drive organisational outcomes, even in constrained public sector environments.

On the other hand, INT posits that organisational behaviour is shaped by coercive (e.g., regulatory), mimetic (e.g., best practices), and normative (e.g., professional) pressures (DiMaggio & Powell, 1983). The significant role of SCI in this study reflects these external influences. For example, adherence to e-LMIS, compliance with Prime Vendor System protocols, and alignment with donor expectations represent institutional pressures shaping supply chain behaviours. Facilities are not merely acting based on internal capacity; they are also responding to broader institutional norms and mandates. This validates INT's claim that external pressures influence operational decisions and performance.

5.3 Added Value of Integrating RBV and INT

By jointly applying RBV and INT, this study offers a nuanced understanding of MSCP that neither theory could fully provide alone. RBV helps identify what internal practices (e.g., INC) are worth investing in, while INT explains why those practices are sometimes adopted or resisted depending on external pressures. For example, while INC may be technically efficient, its adoption can be hindered if institutional support (e.g., policy alignment, digital infrastructure) is weak, something RBV alone would not capture. Thus, integrating these frameworks provides a richer understanding of both what drives MSCP and why these drivers succeed or fail in context.

6.0 Conclusion

6.1 Summary of the Study

This study addressed the persistent problem of poor medical supply chain performance in Tanzania's public health system, with a specific focus on health centres and dispensaries in Songwe Region. Drawing on Resource-Based View (RBV) and Institutional Theory (INT), it assessed how internal capabilities (Inventory Control) and institutional coordination mechanisms (Supply Chain Integration) influence MSCP.

The study used a deductive approach and an explanatory cross-sectional design with 289 healthcare workers, applying PLS-SEM to analyse the relationships. The findings revealed that both INC and SCI have statistically significant effects on MSCP, with INC having the more potent effect. These results contribute to the theoretical discourse by affirming the dual importance of internal capabilities and external institutional alignment in shaping healthcare logistics performance.

6.2 Theoretical Contributions

This study contributes to the supply chain literature by being among the first in Tanzania to jointly apply RBV and INT in a public healthcare setting. It provides empirical evidence that inventory practices are not only operational tools but also strategic resources under the RBV. Simultaneously, it confirms that institutional frameworks significantly shape SCI outcomes, validating INT. The integration of these theories allows for a more comprehensive interpretation of performance outcomes by acknowledging both capacity and context. This contributes methodologically to hypothesis testing in low-resource settings where such dual frameworks are underutilised.

The findings of this study carry significant implications for healthcare policy and supply chain management practice in Tanzania and similar low-resource settings. First, the strong influence of Inventory Control (INC) on Medical Supply Chain Performance (MSCP) underscores the need for the government and development partners to invest in strengthening facility-level inventory management. This can be achieved by improving forecasting capacity, implementing expiry tracking systems, and supporting digital tools that enhance order management and visibility of stock levels. Equipping healthcare workers with the necessary skills and tools will enable them to manage inventory more efficiently, reducing the frequency of stockouts and wastage.

Second, although Supply Chain Integration (SCI) has been institutionally mandated through policies such as the Prime Vendor System and the adoption of the electronic Logistics Management Information System (e-LMIS), the study shows that greater institutional support is still needed. Specifically, policy enforcement mechanisms must be strengthened to ensure consistent use of integration tools across all levels of the healthcare system. Infrastructural challenges, particularly in remote regions, must also be addressed to enable effective information sharing and inter-facility coordination in real time.

Third, the findings highlight the need for tailored interventions in underserved regions such as Songwe. As this region consistently lags in key healthcare performance indicators, targeted initiatives are necessary to address both systemic and operational gaps. These may include dedicated capacity-building programs, regional supply chain task forces, and financial incentives tied to improved performance metrics. Such context-specific measures would help uplift struggling regions without applying a one-size-fits-all solution.

Finally, the study emphasises the importance of aligning resource investments with institutional enforcement. Improvements in medical supply chain performance will not be achieved solely through top-down policy reforms or internal capacity building in isolation. Instead, a balanced approach that recognises the mutual dependence between institutional systems and facility-level capabilities is required. Effective performance will be realised only when these two dimensions, resources and regulations, are jointly addressed through coordinated planning, implementation, and accountability frameworks.

Together, these policy implications provide a roadmap for stakeholders aiming to enhance medicine availability, reduce logistical inefficiencies, and strengthen health system resilience in Tanzania and comparable settings.

6.4 Recommendations for Future Research

Future studies should consider longitudinal designs to assess changes in MSCP over time, and expand the theoretical framework to include contingency theory or technology acceptance models for more technology-specific assessments. In addition, qualitative studies could explore how individual staff perceptions and institutional politics affect SCI and INC adoption. Finally, comparative studies across different regions or countries could reveal context-dependent variations in the role of RBV and INT.

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