ISSN: 2958-2326

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Publisher's Home Page: https://ijcsacademia.com/

AFRICAN JOURNAL OF COMMERCIAL STUDIES

Research Paper | Peer Reviewed | Open Access

The Effect of Procurement Planning and Implementation on Cost Reduction in the Health Sector

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Article Info

Volume 7, Issue 3

Publication history:
Accepted on 29 April 2026;
Published: 21 May 2026

Key Words:
Purchasing Strategy, Execution, Expense Minimization, Sourcing Efficiency, Health Sector

Article Doi:
10.59413/ajocs/v7.i3.39

Abstract

Public procurement in the health sector represents a critical lever for cost containment and service delivery efficiency. Yet, despite formal planning frameworks, developing countries persistently face budget overruns, emergency procurement, and supply chain disruptions. This study examined the effect of procurement planning and implementation on cost reduction at the Ministry of Health Headquarters in Zambia, addressing a significant empirical gap in understanding how planning translates into financial outcomes. A convergent parallel mixed-methods design was employed, collecting quantitative data from 65 respondents (85% response rate) using structured questionnaires and qualitative data through semi-structured interviews with 15 key informants. Descriptive statistics, correlation analysis, and multiple regression were used to analyze quantitative data, while thematic analysis was applied to qualitative data. The findings reveal a pronounced planning-implementation gap: while 78.4% of respondents confirmed documented procurement processes exist, 69.0% reported frequent emergency procurement and 65.5% confirmed common budget overruns. Regression analysis demonstrated that procurement planning factors collectively explain 50% of variance in budget overruns (R^2=0.50, F=20.62, p<0.001), with accurate demand forecasting emerging as the strongest unique predictor (Beta=-0.46, p=0.001). Four interconnected systemic challenges were identified: fiscal and budgetary constraints (86.2%), bureaucratic inefficiencies (65.5%), human capital gaps (62.1%), and technological deficits (58.6%). The study concludes that procurement planning significantly influences cost reduction, but effectiveness is contingent upon addressing systemic implementation barriers through integrated reforms targeting fiscal predictability, process simplification, capacity building, and technological integration. Therefore, the study recommends deliberate development of strategic procurement capabilities grounded in accurate demand forecasting, supported by stable fiscal resources, enabled by streamlined processes, and enhanced by skilled personnel and integrated technological systems.

1. Introduction

1.1 Background and Context

Public procurement plays a central role in the efficient functioning of government institutions, particularly in the health sector where timely access to medicines, medical supplies, and equipment is critical to service delivery and public welfare (Thai, 2009). In developing countries, procurement expenditure constitutes a substantial proportion of public sector budgets, making it a key lever for cost containment and financial sustainability. Procurement planning and implementation are therefore not merely administrative functions but strategic processes that determine whether public resources are translated into tangible health outcomes in an efficient and economical manner (Ambe & Badenhorst-Weiss, 2012).

In Zambia, the Ministry of Health (MOH) is responsible for procuring a wide range of health commodities, including essential medicines, medical equipment, and public health supplies. The Ministry operates within a complex procurement environment governed by the Public Procurement Act No. 8 of 2020, the Public Procurement (Amendment) Act No. 17 of 2023, and the Public Procurement Regulations 2022 (Statutory Instrument No. 30 of 2022). Despite the existence of procurement regulations and formal planning mechanisms, the Ministry has continued to face challenges related to budget overruns, procurement delays, stock-outs, and heavy reliance on emergency procurement.

The effectiveness of a national healthcare system is closely linked to its ability to manage financial and material resources efficiently. In resource-constrained environments such as Zambia, escalating healthcare costs and limited public budgets place immense pressure on health institutions to maximize value for money. Procurement, which often accounts for a significant share of recurrent health expenditure, represents one of the most critical areas for achieving cost savings and operational efficiency (Ambe & Badenhorst-Weiss, 2012).

1.2 Research Gap

Despite the growing body of international literature on procurement planning, implementation, and cost efficiency, there remains a notable lack of empirical evidence within the Zambian health sector that jointly examines planning and implementation as determinants of cost reduction. Most existing studies and audit reports focus either on procedural compliance or on descriptive accounts of procurement challenges, without quantitatively linking planning and execution practices to cost outcomes (Office of the Auditor General, 2021; Zambia Public Procurement Authority, 2021).

Two critical research gaps persist.

Firstly, there is a Zambian cost-specific evidence gap, marked by the absence of empirical studies that quantify the relationship between procurement planning quality and measurable cost indicators.

Secondly, there is an integrated analysis gap, reflecting the lack of mixed-methods research that connects cost data with institutional and behavioral explanations grounded in theory. Addressing these gaps is essential for generating actionable, context-specific evidence to inform procurement reforms in Zambia's public health sector.

Oversight reports from the Office of the Auditor General (2021) and Transparency International Zambia (2020) consistently highlight procurement-related inefficiencies, including delayed tender processes, weak demand forecasting, non-adherence to procurement plans, and excessive use of emergency procurement procedures. The Zambia Public Procurement Authority (2021) reported procurement-related cost overruns exceeding ZMW 500 million between 2018 and 2021, a significant portion attributed to non-competitive emergency procurement.

Concurrently, an Auditor General's report (2021) revealed that approximately 30% of procurement contracts faced substantial delays, directly causing stock-outs of essential medicines and forcing the Ministry into costly last-minute acquisitions.

1.3 Aim and Objectives

This study aimed to generate empirical evidence and propose actionable recommendations for strengthening procurement planning and implementation, ultimately contributing to enhanced cost reduction at the Ministry of Health Headquarters in Zambia.

The study was guided by the following specific objectives:

- To determine the effectiveness of procurement planning and implementation processes at the Ministry of Health Headquarters.
- To analyze the existing relationship between procurement planning and cost control.
- To establish the factors affecting procurement planning, implementation, and cost control.

1.4 Research Questions

The study sought to answer the following research questions:

- What is the effectiveness of procurement planning processes at the Ministry of Health Headquarters?
- How does the effectiveness of procurement planning and implementation influence cost reduction within the Ministry of Health?
- What are the factors affecting procurement planning, implementation, and cost control?

1.5 Significance of the Study

This study is significant because it directly addresses a persistent operational problem at the Ministry of Health Headquarters: the failure to translate procurement plans into cost-effective outcomes. By investigating the gap between planning and implementation, the research generates practical insights that can be used to reduce the high incidence of budget overruns, emergency procurement, and supply delays. For management and procurement staff at the Ministry, the findings provide evidence-based, actionable recommendations for improving internal processes, from demand forecasting to contract management, thereby enhancing the reliability of the medicine supply chain and ensuring that limited public funds are used more efficiently. Ultimately, this study contributes to a more resilient and financially sustainable procurement system that directly supports the Ministry's core mission of delivering quality healthcare to the people of Zambia.

2 Literature Review

2.1 Theoretical Framework

This study is anchored primarily on the Resource-Based View (RBV) of the firm, formalized by Barney (1995). The RBV posits that an organization's sustained competitive advantage is derived from its internal resources and capabilities that are valuable, rare, inimitable, and organization (the VRIO Framework). According to this theory, organizations achieve and sustain competitive advantage through the effective deployment of their internal resources and capabilities, including financial capital, skilled personnel, information systems, and established relationships (Grant, 1991).

In the context of this study, the Ministry of Health is conceptualized through the RBV as an organization that must strategically leverage its internal resources to achieve cost efficiency. The persistent procurement challenges at the Ministry, including budget overruns and emergency procurement, suggest underlying weaknesses in internal capabilities rather than merely external constraints. The RBV framework allows this study to move beyond describing these inefficiencies toward analyzing how the Ministry's internal resources, such as procurement expertise, planning systems, and data management practices, can be developed into strategic capabilities for cost reduction.

2.2 Procurement Planning Concept

Procurement planning is a strategic process that determines what goods and services are required, when they are needed, how they will be acquired, and at what cost. In the public sector, procurement planning plays a critical role in ensuring value for money, efficient resource utilization, and fiscal discipline. Thai (2017) defines procurement planning as the systematic identification, scheduling, and budgeting of procurement requirements to support organizational objectives while minimizing costs. Similarly, Basheka (2019) views procurement planning as a proactive mechanism that aligns organizational needs with available financial resources to prevent inefficiencies and unplanned expenditures.

In the health sector, procurement planning is particularly significant due to the high cost, complexity, and critical nature of medical supplies, pharmaceuticals, and equipment. Poor procurement planning has been associated with stock-outs, emergency purchases, price escalations, and wastage, all of which increase operational costs (Ambe & Badenhorst-Weiss, 2018). Conversely, effective procurement planning enhances cost control by promoting bulk purchasing, timely supplier engagement, and competitive sourcing (OECD, 2020).

The concept of procurement planning emerged as part of broader public financial management reforms aimed at improving transparency, accountability, and cost efficiency in government spending. Arrowsmith (2010) argues that procurement planning evolved as a response to inefficiencies associated with reactive and fragmented procurement systems. In developing countries, including Zambia, procurement planning has been emphasized as a key tool for reducing public expenditure inefficiencies and improving service delivery outcomes, particularly in the health sector (World Bank, 2021).

2.3 Components of Procurement Planning

Procurement planning consists of several interrelated components that collectively influence cost reduction outcomes. These components include needs assessment, demand forecasting, budgeting and scheduling, specification development, supplier market analysis, and procurement method selection (PPA Zambia, 2022; Thai, 2017).

Needs Assessment refers to the systematic identification of required goods and services based on organizational objectives and service delivery demands. In the health sector, needs assessment ensures that procurement decisions are based on actual consumption patterns, disease burden, and service capacity rather than assumptions (WHO, 2020). According to Ambe and Badenhorst-Weiss (2018), inaccurate needs assessment leads to over-procurement or under-procurement, both of which result in increased costs through wastage, expiries, or emergency purchases.

Demand Forecasting involves estimating future procurement requirements based on historical data, consumption trends, and anticipated service needs. Lyson's and Farrington (2020) define demand forecasting as a predictive process that enables organizations to plan procurement activities efficiently and reduce uncertainty-related costs. In the Ministry of Health context, weak forecasting systems have been linked to frequent stock-outs and unplanned procurements at higher prices (World Bank, 2021). Accurate forecasting enables bulk purchasing, framework contracting, and long-term supplier agreements, which significantly reduce procurement costs (OECD, 2020).

Budgeting and Procurement Scheduling are central to procurement planning, as they align procurement activities with available financial resources and timelines. According to Basheka (2019), procurement plans that are not synchronized with budgets often result in delayed procurements, contract variations, and inflated costs. In public sector health institutions, delayed fund releases and poor scheduling frequently lead to emergency procurement, which undermines competitive bidding and increases costs (PPA Zambia, 2022).

2.4 Procurement Planning and Cost Management Outcomes

Empirical literature establishes a strong association between procurement planning quality and cost outcomes. Bulk purchasing and aggregation consistently generate cost savings, while emergency procurement is associated with substantial price premiums (Aminu, 2019; World Bank, 2020). Quantitative studies demonstrate that facilities using data-driven forecasting models experience significantly fewer stock-outs and lower emergency procurement expenditures than those relying on historical consumption alone (Nzayikorera & Mutisya, 2021; WHO, 2019).

Strategic sourcing represents a shift from transactional purchasing to proactive market engagement aimed at maximizing value for money. Empirical evidence from African health systems shows that procurement aggregation and centralized contracting can reduce unit prices by 10 to 20 percent through economies of scale and improved bargaining power (Osei-Tutu, 2019; OECD, 2021). However, the literature cautions that strategic sourcing requires stable financing, skilled personnel, and reliable data systems. Without these enabling conditions, procurement entities remain locked into fragmented, high-cost purchasing patterns (World Bank, 2022).

2.5 Empirical Review from African Contexts

Studies in other African contexts have shown that when procurement plans are not implemented as intended, organizations experience higher transaction costs, inflated prices, and supply disruptions (Olusola et al., 2018; Nzayikorera & Mutisya, 2021). Research on public procurement in Kenya established that procurement planning significantly affects value for money in state corporations, yet implementation challenges often prevent the realization of anticipated benefits (Waci, Kariuki, & Mwirigi, 2024). Similarly, studies in Nigeria's public universities found that while procurement planning exerts a positive effect on cost reduction, its effectiveness is contingent upon the presence of supporting systems and skilled personnel (Olusola et al., 2018).

E-procurement and integrated logistics management information systems have been shown to enhance transparency, reduce lead times, and improve planning accuracy (OECD, 2021; Nsengimana & Musinguzi, 2018). Rwanda's experience illustrates how digital platforms can reduce corruption risks and support evidence-based forecasting. In contrast, limited digital integration in Zambia constrains analytical capacity and reinforces reactive procurement behavior (Chileshe & Phiri, 2022).

2.6 Challenges Affecting Procurement Planning

Despite its importance, effective procurement planning in public sector institutions faces numerous challenges that can be broadly categorized into external and internal factors. External challenges include supplier-related constraints, government policies and regulatory framework complexity, and

market conditions with price fluctuations (Lyson's & Farrington, 2020; OECD, 2020). Internal challenges include management support and commitment, organizational capacity and skills gaps, information systems and data quality deficiencies, financial constraints, and resistance to change (Basheka, 2019; Thai, 2017; World Bank, 2021).

Empirical studies identify persistent capacity gaps, bureaucratic rigidity, funding volatility, and political interference as mutually reinforcing barriers to effective planning (ZIPAR, 2019; Transparency International, 2020; ZPPA, 2021). Skills shortages limit analytical capability, while unpredictable funding undermines long-term contracting and aggregation strategies. These constraints explain why procurement reforms often fail to translate into measurable cost savings despite formal compliance with regulatory frameworks.

3 Methodology

3.1 Research Design

The study employed a convergent parallel mixed-methods design, in which quantitative and qualitative data were collected concurrently, analyzed separately, and integrated at the interpretation stage. This design was appropriate as it facilitated triangulation, enabled qualitative findings to explain quantitative results, and accorded equal priority to both data strands, consistent with the pragmatic research philosophy adopted for this study (Creswell & Creswell, 2018; Saunders et al., 2019).

Quantitative data were collected using structured questionnaires administered to officers from procurement, finance, stores, and administrative departments. The data captured key variables related to procurement forecasting, procurement processes, implementation, budget accuracy, and cost outcomes. Qualitative data were generated through semi-structured interviews with senior managers and key decision-makers to obtain in-depth insights into institutional, contextual, and operational factors influencing procurement planning and implementation.

3.2 Study Population and Sampling

The target population comprised key personnel involved in procurement planning, budgeting, and supply management within the Ministry of Health Headquarters in Lusaka, Zambia. According to records from the Ministry, the target population was estimated at 78 officers drawn from procurement, finance, stores, and administrative departments.

Stratified random sampling was employed to select respondents, ensuring that key functional departments involved in procurement planning and financial management were adequately represented. Using the Yamane (1967) formula at a 5% margin of error, a sample size of 65 respondents was determined for the quantitative survey. Additionally, 15 key informants were purposively selected for qualitative interviews based on their roles in procurement oversight and decision-making.

3.3 Data Collection Methods

Quantitative data were collected using a structured research questionnaire comprising closed-ended questions structured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The items focused on key aspects of procurement planning, including demand forecasting, procurement procedures, budget alignment, supplier coordination, and cost control outcomes. The questionnaire was pilot-tested with 10 respondents from the Ministry of Health who were not included in the final sample. Reliability analysis yielded Cronbach's Alpha coefficients of 0.84 for procurement planning, 0.81 for procurement implementation, and 0.79 for cost reduction, all exceeding the recommended threshold of 0.70 (Nunnally & Bernstein, 1994).

Qualitative data were collected using semi-structured interview guides designed to explore institutional constraints, policy-related issues, and practical experiences influencing procurement planning and cost management. Interviews were conducted with 15 key informants occupying senior procurement, finance, and management positions at the Ministry of Health Headquarters.

3.4 Data Analysis

Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistical techniques (frequencies, percentages, means, and standard deviations) were employed to summarize the data. Inferential statistical techniques, including correlation analysis and multiple regression analysis, were used to examine relationships between procurement planning variables and cost reduction outcomes.

Qualitative data from interviews were analyzed using thematic analysis, following the procedures outlined by Braun and Clarke (2006). Transcripts were coded to identify emergent themes, which were then organized and interpreted in relation to the research objectives. Integration of quantitative and qualitative findings occurred during the interpretation phase, where convergence and divergence between the two data sets were examined.

3.5 Ethical Considerations

Ethical approval was obtained from the University of Zambia before data collection. All participants were provided with written informed consent after receiving a comprehensive explanation of the research aims, procedures, and potential risks. Participation was entirely voluntary, and respondents were assured of their right to withdraw at any point without consequence. Confidentiality was maintained by removing all personal identifiers and utilizing anonymized codes in all data records. The study was conducted with integrity and transparency, ensuring accurate and honest reporting of findings without data fabrication or misrepresentation.

4 Results

4.1 Demographic Profile of Respondents

A total of 65 respondents completed the survey, representing an 85% response rate. Table 1 presents the demographic characteristics of the sample.

Table 1: Demographic Characteristics of Respondents (N=65)

Characteristic	Category	Frequency	Percentage
Age	20-30 years	15	23.1%
	31-40 years	22	33.8%
	41-50 years	20	30.8%
	Over 50 years	8	12.3%
Sex	Male	40	61.5%
	Female	25	38.5%
Education	Diploma	14	21.5%
	Degree	44	67.7%
	Master's Degree	7	10.8%
Experience	Less than 2 Years	2	6.9%
	2 to 5 Years	7	24.1%
	6 to 10 Years	9	31.0%
	More than 10 Years	11	37.9%

Source: (Author, 2026)

The demographic data indicate that most respondents were male (61.5%), while female respondents accounted for 38.5%. In terms of educational attainment, the majority held a bachelor's degree (67.7%), followed by a diploma (21.5%) and a master's degree (10.8%). Regarding professional experience, 67.7% had more than six years of work experience, including 37.9% with over ten years of experience, suggesting that findings are grounded in substantial professional experience and institutional knowledge.

4.2 Current State of Procurement Planning Processes

The first objective assessed the current state of procurement planning processes. Table 2 presents respondents' perceptions regarding adherence to documented procurement processes.

Table 2: Adherence to a Documented Procurement Process

Response	Frequency	Percentage
Strongly Agree	24	36.9%
Agree	27	41.5%
Neutral	7	10.8%
Disagree	5	7.7%
Strongly Disagree	2	3.1%
Total	65	100%

Source: (Author, 2026)

A substantial majority of respondents either strongly agreed (36.9%) or agreed (41.5%) that procurement activities follow documented procedures, representing a combined 78.4% positive response rate. This suggests that formal procurement guidelines and procedures are largely observed within the institution.

Regarding demand forecasting, there was overwhelming agreement (86.2%) that accurate forecasting is critical for cost control, with a mean score of 4.24 (SD=0.85) on a 5-point scale. However, qualitative interviews revealed that actual forecasting practices remain inadequate. A Finance Officer explained: "Our forecasting is largely historical. We look at what we bought last year and add a small percentage. We rarely have the data or time to do a proper needs-based forecast linked to new health programs or population data."

Table 3 presents the prevalence of key procurement challenges.

Table 3: Prevalence of Planning Deficiencies

Challenge	Mean Score	% Agree/Strongly Agree
Delays in procurement are common	3.48	62.1%
Budget overruns caused by poor planning	3.66	65.5%
Emergency procurement frequently used	3.79	69.0%

Source: (Author, 2026)

The data reveal that most respondents confirm that delays (62.1%), cost-inducing planning errors (65.5%), and reactive emergency purchases (69.0%) are common features of the current procurement environment.

Qualitative findings identified three interconnected themes explaining these statistics.

Theme 1: Bureaucratic and Fiscal Uncertainty

A Procurement Officer elaborated: "*A request can sit on a desk for weeks waiting for a signature. If it's queried at any stage, it's sent back to the beginning. There is no sense of urgency, and no one is held accountable for the delay.*"

Theme 2: Poor Forecasting and Price Misalignment

A Finance Manager explained: "*The budget is passed by parliament mid-year, based on price data that is already 9-12 months old. By the time we go to tender, inflation*

and global supply chain issues have driven prices up by 15-20%."

Theme 3: Costly Spiral to Emergency Procurement

A Stores Officer shared: "*When a health center runs out of vaccines... we pay a premium because they know we are desperate. That one emergency order can wipe out the cost savings we carefully built from three other planned procurements.*"

4.3 Relationship Between Procurement Planning and Cost Management

The second objective analyzed the relationship between procurement planning and cost management outcomes. Table 4 presents the prevalence of cost management outcomes.

Table 4: Prevalence of Poor Cost Management Outcomes

Cost Management Outcome	Mean Score	% Agree/Strongly Agree
Budget overruns are common	3.41	58.6%
Emergency procurement is frequent	3.21	51.7%
Bulk purchasing saves costs	3.28	48.3%

Source: (Author, 2026)

A majority of respondents (58.6%) confirm that budget overruns are a common occurrence, and over half (51.7%) agree that emergency procurement is a frequent practice. Less than half (48.3%) affirm that bulk purchasing strategies are effectively utilized to save costs.

Correlation Analysis

Table 5 presents the correlation matrix examining relationships between planning variables and cost outcomes.

Table 5: Correlation Matrix: Planning vs. Cost Management

	Budget Overruns	Emergency Procurement	Bulk Purchasing
Accurate Demand	-0.58**	-0.52**	0.37*
Supplier Coordination	-0.49**	-0.45**	0.45**
Bulk Purchasing	-0.41*	-0.38*	1

Note: *p < 0.05, *p < 0.01

Source: (Author, 2026)

Accurate demand forecasting is strongly negatively correlated with both budget overruns ($r = -0.58$, $p < 0.01$) and emergency procurement ($r = -0.52$, $p < 0.01$). Supplier coordination similarly shows significant negative relationships with overruns ($r = -0.49$) and emergency purchases ($r = -0.45$).

Regression Analysis

A multiple linear regression was performed with budget overruns as the dependent variable. Table 6 presents the model summary.

Table 6: Regression Model Summary for Budget Overruns

Model	R	R-squared	Adjusted R-squared
1	0.71	0.50	0.44

Source: (Author, 2026)

The regression model demonstrates substantial explanatory power, with the three procurement planning factors (demand forecasting, bulk purchasing, and supplier coordination) collectively explaining 50% of the variance in budget overruns.

Table 7: ANOVA for Regression Model on Budget Overruns

Model	R	R-squared	Adjusted R-squared	Sig.
1	0.71	0.50	0.44	0.000
Residual	22.07	0.36		
Total	44.22			

Source: (Author, 2026)

The F-statistic of 20.62 with a significance value of 0.000 indicates that the overall regression model is highly significant ($p < 0.001$).

Table 8: Regression Coefficients for Budget Overruns

Variable	Standardized Beta	T	Sig.
(Constant)		6.19	0.000
Accurate Demand	-0.46	-3.61	0.001
Bulk Purchasing	-0.22	-1.75	0.093
Supplier Coordination	-0.29	-2.00	0.057

Source: (Author, 2026)

Accurate demand forecasting is the strongest and only statistically significant unique predictor of budget overruns (Beta = -0.46, p = 0.001), indicating that improving forecasting accuracy is the single most powerful direct lever for reducing budget variances.

Qualitative findings provided causal depth to these statistical relationships. A Finance Officer stated: "If we don't know what we need, we can't budget for it. When the need suddenly appears, the money has to come from elsewhere, breaking the budget." A Senior Manager explicitly mapped the pathway: *"It's a direct line: a bad forecast leads to a stock out. A stock out triggers an emergency purchase. An emergency purchase carries a 40-50% price premium. That premium creates a budget overrun."*

4.4 Challenges Impeding Procurement Planning and Cost Control

The third objective identified key challenges impeding effective procurement planning and cost control. Table 9 presents the prevalence and severity of key challenges.

Table 9: Prevalence and Severity of Key Challenges

Challenge	Mean Score	% Agree/Strongly Agree
Budget Limitations	4.31	86.2%
Administrative Approvals	3.55	65.5%
Inadequate Staff Skills	3.52	62.1%
Limited Use of Technology	3.45	58.6%

Source: (Author, 2026)

Budgetary constraints stand out as the most pervasive challenge, with an overwhelming 86.2% of respondents identifying it as a major barrier.

Thematic Analysis of Qualitative Challenges

Analysis of interview data revealed four dominant themes, summarized in Table 10.

Table 10: Thematic Analysis of Challenges from Interview Data

Theme	Frequency	Illustrative Quote
Fiscal and Budgetary Constraints	12/15	*"The budget is our biggest enemy. It is released late and is always insufficient. How can you plan when you don't know if or when the money will come?" (Procurement Manager)*
Bureaucratic Inefficiencies	11/15	*"A simple purchase can require 7 signatures across 3 different departments. If one person is on leave, the entire process stops for weeks." (Procurement Officer)*
Human Capital and Skills Gap	10/15	*"Many of our officers are good at following the manual, but they lack training in strategic sourcing, data analysis for forecasting, or modern supplier management techniques." (Senior Finance Officer)*
Technological Deficits	9/15	*"We still rely heavily on paper files and Excel. We don't have a system that talks to the warehouses or the finance department, so we are always working with outdated information." (Stores Officer)*

Source: (Author, 2026)

Regression Analysis of Challenges

A regression analysis was conducted with budget overruns as the dependent variable to determine which challenges have the most severe impact on financial performance. Table 11 presents the results.

Table 11: Regression of Challenges on Budget Overruns

Predictor (Challenge)	Standardized Beta	t	Sig.
(Constant)		5.42	0.000
Budget Limitation	0.47	3.69	0.001
Administrative Approval	0.28	2.38	0.025
Inadequate Procurement Skills	0.21	1.89	0.071
Limited Use of Technology	0.18	1.61	0.120
Predictor (Challenge)	Standardized Beta	t	Sig.

Source: (Author, 2026)

Budget limitation is confirmed as the strongest direct predictor of cost overruns (Beta = 0.47, p = 0.001), with administrative approvals also showing a significant direct effect (Beta = 0.28, p = 0.025).

A Procurement Officer described the self-reinforcing cycle of challenges: "We have a skilled officer who develops a good plan, but the budget is cut, so they can't execute it. They try to make a smaller purchase, but it gets stuck in approvals because it's now a non-standard request. They can't track it easily, and by the time it's approved, the funds are gone and a stock out forces an emergency purchase, which blows the budget."

4.5 Discussion

Interpretation of Results

The findings of this study provide robust empirical evidence that procurement planning and implementation significantly influence cost reduction at the Ministry of Health Headquarters in Zambia, with accurate demand forecasting emerging as the critical mediating capability. The results reveal a pronounced planning-implementation gap: while formal procurement frameworks exist and are widely acknowledged, their execution is systematically undermined by bureaucratic inefficiencies, fiscal uncertainty, and capacity constraints.

Current State of Procurement Planning

The finding that 78.4% of respondents confirmed the existence of documented procurement processes while 69.0% reported frequent emergency procurement illustrates a fundamental disconnect between policy and practice. This aligns with the predictions of Institutional Theory (DiMaggio & Powell, 1983), which suggests that complex bureaucratic procedures are often maintained primarily to demonstrate compliance and accountability to oversight bodies rather than to achieve operational efficiency. The Ministry exhibits a classic case of "coercive isomorphism," where the system is optimized for audit compliance and risk aversion rather than for the efficient acquisition of medical supplies.

The qualitative finding that multi-layered approval processes create operational paralysis where procurement files "sit on a desk for weeks" awaiting signatures directly corresponds with research from Kenya, where Muturi and Wambua (2018) found that long approval chains undermine planning and increase costs. Similarly, studies in Botswana by Kuruneri (2025) identified institutional barriers including policy constraints and cultural resistance as dominant factors explaining procurement implementation failures.

Relationship Between Planning and Cost Management

The regression analysis demonstrating that procurement planning factors explain 50% of variance in budget overruns (R^2=0.50, F=20.62, $p<0.001$) provides strong quantitative evidence for the relationship between planning quality and financial outcomes. The finding that accurate demand forecasting is the strongest unique predictor (Beta = -0.46, p=0.001) empirically corroborates the assertions of global studies on the cost-saving potential of robust planning (Kiprotich & Lubega, 2020; Mekuria et al., 2019).

The identified causal chain poor forecasting leading to stock-outs, emergency procurement at premium prices, and subsequent budget overruns, is a textbook example of Transaction Cost Economics (Williamson, 1985). The Ministry, by failing to invest in ex-ante planning (relatively low transaction costs), incurs ex-post market failure characterized by high transaction costs including the documented 40-50% price premium for emergency purchases. This finding aligns with Aminu's (2014) research in Nigeria, which found emergency procurement costs up to 40% higher than planned procurement.

The finding that bulk purchasing and supplier coordination did not achieve statistical significance as unique predictors in the multivariate model, despite strong bivariate correlations, reveals an important nuance. Their impact is likely indirect and mediated through foundational factors such as accurate demand aggregation and stable funding. This finding provides a critical caveat to the international literature: while strategies like bulk purchasing have generated savings of up to 20% in contexts like Ghana (Osei-Tutu, 2012), they are not standalone solutions but depend on underlying resource capabilities. This aligns with the Resource-Based View (Barney, 1991), which posits that strategic tools are only effective when underpinned by valuable and rare internal resources.

Challenges Impeding Effectiveness

The identification of four interconnected systemic challenges fiscal constraints (86.2%), bureaucratic inefficiencies (65.5%), human capital gaps (62.1%), and technological deficits (58.6%) aligns with findings from other African contexts. Research in Nigeria by Olusola et al. (2018) found that procurement planning effectiveness is contingent upon supporting systems and skilled personnel. The Zambia Institute for Policy Analysis and Research (2019) similarly identified human resource capacity as a critical constraint in Zambian public procurement.

The finding that these challenges form a self-reinforcing cycle of failure is particularly significant. Budget volatility makes strategic planning impossible, complex approvals make execution slow, skills gaps limit strategic potential, and technological deficits ensure information poverty. This systemic interaction implies that piecemeal interventions targeting individual challenges in isolation, such as training staff without addressing budget volatility or streamlining approvals, are unlikely to succeed.

Comparison with Literature

The findings of this study resonate strongly with empirical evidence from other developing countries. Waci, Kariuki, and Mwirigi (2024) demonstrated in Kenya that procurement planning positively and significantly affects value for money in state corporations. The consistency of findings across different national contexts strengthens the validity of the conclusion that procurement planning is a fundamental driver of cost performance in developing country public sectors.

Research on collaborative procurement models in developed health systems provides further validation. The NHS Supply Chain in the United Kingdom has demonstrated that collaborative approaches to forecasting and standardization can generate substantial savings, with one integrated care system achieving annual savings of £196,000 through consolidated purchasing and improved demand visibility (NHS England, 2023). Similarly, collaborative procurement models in Australia have identified millions in savings through enhanced spend visibility and improved forecasting capabilities (Victorian Government, 2022). These international examples suggest that the principles linking forecasting accuracy to cost reduction transcend national boundaries.

The study's findings on bureaucratic inefficiencies as a barrier to procurement effectiveness correspond with research from Botswana, where Kuruneri (2025) revealed that institutional barriers including policy constraints, monitoring and evaluation gaps, and cultural resistance dominate over resource-related barriers in explaining procurement implementation failures. This cross-national validation enhances the credibility of the findings and suggests that the lessons learned at Zambia's Ministry of Health have relevance for public procurement reform efforts throughout the developing world.

Theoretical Implications

This study makes several contributions to the theoretical understanding of procurement planning and cost reduction. First, it provides empirical support for the application of the Resource-Based View to public sector procurement contexts. The RBV's emphasis on internal resources and capabilities explains why the Ministry's formal planning framework, while necessary, is insufficient for achieving cost reduction. The missing elements are the organizational capabilities accurate forecasting, strategic sourcing, and supplier management that transform resources into sustained cost advantage.

Second, the findings demonstrate the utility of Transaction Cost Economics in understanding procurement failures. The study empirically documents how failures in ex-ante planning (low transaction costs) lead to ex-post market transactions characterized by high premium prices and administrative costs (high transaction costs). This provides a theoretical framework for quantifying the financial impact of poor planning.

Third, the study extends Institutional Theory by showing how "coercive isomorphism" the adoption of complex procedures to demonstrate compliance can paradoxically undermine operational effectiveness. The Ministry's procurement system is optimized for audit compliance rather than for efficient acquisition, creating a decoupling between formal procedures and actual practices.

5.4 Practical and Policy Implications

The findings have significant practical implications for the Ministry of Health and similar public sector procuring entities in Zambia. First, the identification of accurate demand forecasting as the strongest predictor of cost reduction suggests that investments in forecasting capabilities should be the highest priority. This includes developing integrated Logistics Management Information Systems (LMIS) that provide real-time consumption data, training staff in data analysis and forecasting techniques, and strengthening coordination between procurement units and health program managers.

Second, the finding that budget limitation is the strongest direct predictor of cost overruns (Beta = 0.47, p = 0.001) indicates that fiscal reforms are essential. Moving towards forward funding and ring-fenced health procurement budgets would provide the fiscal stability necessary for strategic planning and bulk contracting. Without addressing budget volatility, improvements in planning capabilities will have limited impact.

Third, the identification of bureaucratic inefficiencies as a significant barrier suggests that procurement approval chains should be reviewed and simplified, with strict service-level agreements for turnaround times at each stage. The current system, which can require seven signatures across three departments, prioritizes control at the expense of timeliness.

Fourth, the findings on technological deficits indicate that investment in e-procurement and integrated inventory management platforms is essential. Such systems would provide real-time data for accurate forecasting, enable tracking of supplier performance, and support evidence-based decision-making.

Limitations of the Study

Several limitations should be acknowledged. First, the study was confined to the Ministry of Health Headquarters in Lusaka, which limits generalizability to other government ministries, provincial and district health offices, or non-health contexts. Second, the moderate sample size (N=65) increases the risk of Type II errors, which likely explains why variables such as bulk purchasing and supplier coordination did not achieve conventional statistical significance in the multivariate model despite strong bivariate correlations.

Third, the study relied on self-reported perceptions rather than independently verified financial data, which may be subject to social desirability bias and recall bias. Fourth, the cross-sectional design captures associations but cannot definitively establish causality; a longitudinal design tracking procurement practices and cost outcomes over multiple years would be required to conclusively demonstrate causal relationships.

5 Conclusion and Recommendations

5.1 Summary of Key Findings

This study examined the effect of procurement planning and implementation on cost reduction at the Ministry of Health Headquarters in Zambia. The findings demonstrate that while the Ministry possesses formally documented procurement procedures, a significant policy-practice gap persists. A substantial majority of respondents (78.4%) confirmed the existence of documented processes, yet high prevalence rates of procurement delays (62.1%), budget overruns (65.5%), and emergency procurement (69.0%) indicate that formal structures are not translating into operational effectiveness.

The study established robust empirical evidence of a strong relationship between procurement planning and cost outcomes. Correlation analysis revealed that accurate demand forecasting is strongly correlated with fewer budget overruns ($r = -0.58$, $p < 0.01$) and less emergency procurement ($r = -0.52$, $p < 0.01$). Regression analysis demonstrated that procurement planning factors collectively explain 50% of variance in budget overruns, with accurate demand forecasting emerging as the strongest unique predictor (Beta = -0.46, p = 0.001). Qualitative findings illuminated the causal mechanism: poor forecasting triggers stock-outs, necessitating emergency procurement at premium prices (often 40-50% higher), which creates budget overruns.

Four interconnected systemic challenges were identified: fiscal and budgetary constraints (86.2%), bureaucratic inefficiencies (65.5%), human capital gaps (62.1%), and technological deficits (58.6%). Regression analysis confirmed budget limitation as the strongest direct predictor of cost overruns (Beta = 0.47, p = 0.001). These challenges do not operate in isolation but form a self-reinforcing cycle of failure, where fiscal uncertainty, bureaucratic delays, skills deficits, and technological gaps interact to perpetuate reactive procurement practices and cost overruns.

5.2 Study Contribution

This study makes several important contributions. First, it addresses the Zambian cost-specific evidence gap by providing the first quantitative analysis linking procurement planning quality to measurable cost indicators within the Ministry of Health. Second, it addresses the integrated analysis gap by employing a mixed-methods design that connects cost data with institutional and behavioral explanations grounded in theory. Third, the study provides empirical validation for the application of the Resource-Based View, Transaction Cost Economics, and Institutional Theory to public sector procurement contexts in developing countries.

5.3 Recommendations

Based on the findings, the following recommendations are proposed:

- Fiscal Reforms: Move towards forward funding and ring-fenced health procurement budgets to provide the fiscal stability necessary for strategic planning and bulk contracting.
- Process Simplification: Mandate a review and simplification of procurement approval chains, implementing strict service-level agreements for turnaround times at each stage to reduce bureaucratic delays.
- Technological Investment: Prioritize the acquisition and implementation of an e-procurement and inventory management platform to provide real-time data for accurate forecasting and decision-making.
- Capacity Building: Develop a continuous, mandatory training program for procurement staff focused on advanced skills in data analysis, strategic sourcing, demand forecasting, and supplier relationship management.
- Cross-functional Coordination: Proactively collaborate with health program managers to base procurement plans on service delivery targets and epidemiological data rather than solely on historical consumption.
- Supplier Performance Management: Implement a systematic process for evaluating supplier performance against key metrics such as on-time delivery, as demonstrated to reduce hidden costs in similar contexts (Kamanga, 2016).

5.4 Final Take-Home Message

Procurement planning has the potential to significantly improve cost efficiency within the Ministry of Health, but its effectiveness is heavily dependent on the institutional environment in which it operates. Meaningful cost reduction requires not merely procedural compliance but the deliberate development of strategic procurement capabilities grounded in accurate demand forecasting, supported by stable fiscal resources, enabled by streamlined processes, and enhanced by skilled personnel and integrated technological systems. The convergence of evidence from Zambia with findings from Kenya, Nigeria, Botswana, and developed country health systems validates the broader applicability of these conclusions and suggests that the lessons learned have relevance for public procurement reform efforts throughout the developing world.

Declaration of Competing Interests

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for profit sectors.

Acknowledgements

The author extends sincere gratitude to Prof. Bupe Getrude Mutolo Mwanza for her invaluable guidance, insightful critiques, and steadfast encouragement throughout this research. Sincere appreciation also goes to the management and staff of the Ministry of Health, Zambia, for their gracious participation, time, and data. The author is indebted to the faculty and staff of the University of Zambia for the foundational knowledge imparted. Finally, thanks to colleagues and friends for their support and stimulating discussions. Any shortcomings remain the sole responsibility of the author.

Ethical considerations

The article followed all ethical standards appropriate for this kind of research.

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