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Integrating procurement strategies for infectious disease control: Best practices from global programs

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Abstract

This paper explores the procurement strategies utilized by major global programs in controlling infectious diseases, such as the WHO, Global Fund, and GAVI. It analyzes centralized, decentralized, and hybrid models, identifying transparency, efficiency, flexibility, quality assurance, and stakeholder engagement as critical criteria for effective procurement. The paper highlights successful examples and best practices from global programs, emphasizing the need for innovative financing mechanisms and advanced technologies to optimize procurement processes. It provides practical recommendations for integrating and improving procurement strategies to enhance disease control efforts and strengthen health systems globally.

Keywords: Procurement strategies, infectious disease control, global health programs

Introduction

Infectious diseases remain a significant public health challenge globally, necessitating efficient and effective procurement strategies to ensure timely and adequate responses. Procurement, the process of acquiring goods and services, plays a pivotal role in managing and controlling infectious diseases (Olliaro & Torreele, 2022) ^[23]. Effective procurement strategies are essential for securing medical supplies, pharmaceuticals, diagnostics, and equipment to prevent, diagnose, and treat infectious diseases. The importance of these strategies cannot be overstated, as they directly impact the availability and quality of healthcare resources, ultimately influencing disease outcomes and public health safety (Olumade *et al.*, 2020) ^[24].

However, despite their critical importance, current procurement strategies for infectious disease control face numerous challenges. One of the primary issues is the complexity and unpredictability of disease outbreaks, which can lead to sudden spikes in demand for medical supplies. This unpredictability often results in supply chain disruptions, shortages, and delays, undermining response efforts (Wouters *et al.*, 2021) ^[39]. Additionally, procurement processes can be hindered by bureaucratic red tape, lack of transparency, and corruption, leading to inefficiencies and waste of resources. Furthermore, low- and middle-income countries (LMICs) often struggle with inadequate funding, limited infrastructure, and lack of expertise, exacerbating these challenges and impeding their ability to respond effectively to infectious disease threats (Boro & Stoll, 2022; Mudenda *et al.*, 2022) ^[5, 19].

This paper aims to explore and analyze the procurement strategies employed in infectious disease control, with a particular focus on identifying best practices from global programs. By examining various procurement approaches, the paper aims to provide insights into the key components that contribute to successful procurement strategies and how they can be optimized to enhance disease control efforts. The paper also highlights the lessons learned from global programs and offers practical recommendations for policymakers and practitioners involved in infectious disease management.

The scope of this paper includes an in-depth analysis of procurement strategies used in infectious disease control, drawing on examples from major global programs such as the World Health Organization (WHO), the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), and the GAVI Alliance. It will exclude a detailed methodology, literature review, and case studies, focusing instead on providing a comprehensive overview and critical analysis of procurement strategies and their effectiveness. The limitations of this paper include the potential for variability in procurement practices across different regions and programs, which may affect the generalizability of the findings. Additionally, the rapidly evolving nature of infectious disease threats means that procurement strategies must be continually adapted and updated, which this analysis may not fully capture.

1. Procurement Strategies in Infectious Disease Control

Procurement strategies in infectious disease control encompass a range of approaches and mechanisms designed to ensure the timely and efficient acquisition of necessary medical supplies and services. These strategies are crucial in maintaining a robust public health response, as they directly affect the availability and quality of resources required to combat infectious diseases. Various procurement strategies are employed globally, each with unique characteristics and operational frameworks tailored to meet specific needs and contexts (Kotnis *et al.*, 2022)^[13].

One common procurement strategy is centralized procurement, where a single entity, often a government agency or international organization, coordinates the acquisition of medical supplies. This approach can leverage economies of scale, resulting in cost savings and standardized quality across the board. Centralized procurement also facilitates bulk purchasing, reducing the risk of shortages and ensuring a more consistent supply chain. However, centralized systems can be vulnerable to bureaucratic delays and may lack the flexibility to respond swiftly to emerging health threats (Ajayi & Udeh, 2024; Esan, Ajayi, & Olawale, 2024)^[31, 32].

Decentralized procurement, on the other hand, allows individual regions or healthcare facilities to manage their own purchasing processes. This strategy can enhance responsiveness and adaptability, as local entities are better positioned to assess and address their specific needs. However, decentralized procurement may lead to fragmentation and inefficiencies, particularly in settings with limited resources or expertise. Coordination among various entities is essential to mitigate these challenges and ensure a cohesive approach to disease control (Parmaksiz, Pisani, Bal, & Kok, 2022; Petersen, Jensen, & Bhatti, 2022; Wang & Zahur, 2023)^[27, 28, 33].

A hybrid approach, combining centralized and decentralized procurement elements, is also commonly used. This strategy aims to balance the advantages of both systems, leveraging central coordination for large-scale purchases while allowing local flexibility for specific needs. The hybrid model can enhance overall procurement efficiency and responsiveness, particularly in complex and rapidly changing public health environments (Olawale, Ajayi, Udeh, & Odejide, 2024; Scott, Amajuoyi, & Adeusi, 2024)^[31, 32].

Key components of effective procurement strategies include transparency, efficiency, and flexibility. Transparency in procurement processes is vital to ensure accountability and

prevent corruption. Clear and open procedures and regular audits and reporting can build trust and integrity in the system. Efficiency is another critical component, as timely and cost-effective procurement directly impacts the availability of essential medical supplies. Streamlined processes, competitive bidding, and strategic supplier relationships can enhance procurement efficiency. Flexibility is also crucial, allowing procurement systems to adapt to changing circumstances and emerging health threats. Flexible procurement strategies can accommodate urgent needs and facilitate rapid response to disease outbreaks (Chebolu-Subramanian & Sundarraj, 2021; Fazekas & Blum, 2021)^[7, 9].

Procurement strategies contribute significantly to disease prevention, diagnosis, and treatment in infectious disease control. Efficient procurement ensures the availability of vaccines, medications, diagnostics, and protective equipment essential for controlling disease spread and managing outbreaks (Wankmüller & Reiner, 2021)^[34]. For instance, during the COVID-19 pandemic, effective procurement strategies were critical in securing vaccines and personal protective equipment (PPE), enabling timely vaccination campaigns and protecting healthcare workers. Similarly, in the fight against malaria, strategic procurement of insecticide-treated nets and antimalarial drugs has been instrumental in reducing disease incidence and mortality (Adama & Okeke, 2024; Adewusi *et al.*, 2024)^[1, 2]. Moreover, procurement strategies are pivotal in strengthening healthcare infrastructure and capacity. Procurement strategies support the establishment of robust healthcare systems capable of responding to infectious disease threats by ensuring a steady supply of medical commodities. This is particularly important in LMICs, where healthcare resources are often limited. Effective procurement can help bridge resource gaps, enabling these countries to mount more effective responses to disease outbreaks and improve overall public health outcomes (Lysons & Farrington, 2020; Miller & Lehoux, 2020)^[16, 17].

In conclusion, procurement strategies are a cornerstone of infectious disease control, providing the necessary framework for acquiring essential medical supplies and services. Centralized, decentralized, and hybrid procurement models offer unique advantages and challenges, requiring careful consideration and tailored approaches to maximize their effectiveness. Transparency, efficiency, and flexibility are key components of successful procurement strategies, contributing to the timely and cost-effective acquisition of medical supplies. Procurement strategies play a vital role in preventing, diagnosing, and treating infectious diseases by ensuring the availability of critical resources, ultimately safeguarding public health. As global health challenges evolve, ongoing assessment and optimization of procurement strategies will be essential in maintaining effective and resilient health systems.

2. Global Programs and Their Approaches

Global programs dedicated to infectious disease control are pivotal in addressing public health threats worldwide. These programs are often spearheaded by prominent organizations such as the World Health Organization (WHO), the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), and the GAVI Alliance (GAVI). Each of these organizations employs distinct procurement strategies tailored to their specific missions and the needs of their

populations (WHO, 2022, 2023).

The World Health Organization (WHO) is a leading global health authority coordinating international health efforts and setting disease control and prevention standards. WHO's procurement strategies are centrally managed, leveraging its extensive network and partnerships to efficiently procure medical supplies and services. WHO employs a centralized procurement system to ensure the availability of quality-assured vaccines, medications, diagnostics, and medical equipment (WHO, 2020a, 2020b). The organization uses its strategic procurement platforms, such as the Global Drug Facility and the Strategic Advisory Group of Experts on Immunization, to optimize procurement processes and ensure timely responses to disease outbreaks.

The Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) is another significant player in global health. The Global Fund utilizes a unique model that combines centralized and decentralized procurement approaches. It provides financial resources to countries to manage their procurement processes while offering centralized procurement services for high-demand commodities. This hybrid approach allows the Global Fund to leverage economies of scale and ensure quality assurance while providing flexibility to recipient countries. The Global Fund's Procurement and Supply Chain Management (PSM) strategy emphasizes transparency, competitive bidding, and strategic supplier partnerships to enhance procurement efficiency and effectiveness (Chang & Kohler, 2020; Organization, 2022)^[6]. The GAVI Alliance (GAVI) focuses on increasing access to immunization in low- and middle-income countries. GAVI's procurement strategies are designed to ensure the availability of vaccines at affordable prices. The organization employs a centralized procurement model, working closely with manufacturers to negotiate bulk purchase agreements and secure favorable pricing. GAVI's Advance Market Commitment (AMC) mechanism incentivizes vaccine production by guaranteeing a market for manufacturers, thus ensuring a steady supply of essential vaccines. GAVI collaborates with global partners, such as UNICEF and WHO, to streamline procurement processes and optimize supply chain management (Halabi & Gostin, 2023; Lesego *et al.*, 2024)^[10, 15].

When analyzing the procurement strategies of these global programs, several key differences and similarities emerge. WHO's centralized approach ensures standardized quality and consistency across its procurement activities. This model ensures that medical supplies meet international standards and are readily available during emergencies. However, the centralized system may sometimes lack the flexibility to address local-specific needs quickly. In contrast, the Global Fund's hybrid approach combines the strengths of centralized and decentralized procurement. The Global Fund enhances local ownership and responsiveness by allowing recipient countries to manage their procurement processes. At the same time, centralized services for high-demand commodities ensure economies of scale and quality assurance. This approach balances standardization and adaptability, making it effective in diverse contexts (Solomon, Simpa, Adenekan, & Obasi, 2024)^[30].

GAVI's centralized procurement model, particularly its AMC mechanism, is innovative in securing vaccine supply and affordability. GAVI incentivizes production and ensures a steady vaccine supply by guaranteeing a market for manufacturers. This strategy has been particularly effective

in increasing immunization coverage in low-income countries. However, the reliance on centralized procurement may limit the flexibility to address specific local needs and emerging health threats.

Comparatively, WHO, the Global Fund, and GAVI each have distinct strengths in their procurement strategies. WHO's focus on standardization and quality assurance ensures the reliability of medical supplies. The Global Fund's hybrid model offers a flexible and responsive approach, balancing central coordination with local management. GAVI's innovative AMC mechanism effectively secures vaccine supply and affordability. These differences reflect each organization's unique missions and operational contexts, highlighting the importance of tailored procurement strategies in addressing global health challenges (Organization, 2021; WHO, 2020b, 2023).

3. Best Practices in Procurement for Disease Control

Identifying best practices in procurement for disease control involves understanding the key criteria that contribute to effective and efficient procurement processes. These criteria include transparency, efficiency, flexibility, quality assurance, and stakeholder engagement. Best practices are derived from successful examples and strategies implemented by global programs, which can offer valuable insights for improving procurement systems (Ilori, Nwosu, & Naiho, 2024; Nwaimo, Adegbola, Adegbola, & Adeusi, 2024)^[11, 21].

Transparency is a fundamental criterion for best procurement practices. Transparent procurement processes ensure accountability and prevent corruption, essential for maintaining trust and integrity. Clear and open procedures and regular audits and reporting can help build a transparent procurement system. For instance, the Global Fund emphasizes transparency through its PSM strategy, which includes competitive bidding, strategic supplier partnerships, and open access to procurement information (Kohler & Dimancesco, 2020)^[12]. Efficiency in procurement is crucial for the timely and cost-effective acquisition of medical supplies. Streamlined processes, competitive bidding, and strategic supplier relationships can enhance procurement efficiency. The WHO's centralized procurement model leverages its extensive network and partnerships to procure medical supplies efficiently, ensuring the timely availability of quality-assured vaccines, medications, and diagnostics (Ucha, Ajayi, & Olawale, 2024b)^[31].

Flexibility is another critical criterion for best procurement practices. Flexible procurement strategies can adapt to changing circumstances and emerging health threats, accommodating urgent needs and facilitating rapid response. The Global Fund's hybrid approach combines centralized and decentralized procurement, providing flexibility to recipient countries while ensuring quality and efficiency through central coordination (Moshtari, Altay, Heikkilä, & Gonçalves, 2021; Petersen *et al.*, 2022)^[28].

Quality assurance is essential for ensuring that procured medical supplies meet international standards and are safe and effective. Centralized procurement systems, such as those used by WHO and GAVI, emphasize standardized quality and consistency. WHO's strategic procurement platforms, such as the Global Drug Facility, ensures that procured medical supplies meet international quality standards. Stakeholder engagement is a crucial component of effective procurement strategies. Engaging stakeholders,

including governments, manufacturers, and healthcare providers, ensures that procurement processes are responsive to local needs and priorities. GAVI's collaboration with global partners, such as UNICEF and WHO, facilitates stakeholder engagement and optimizes procurement processes (Bohari, Skitmore, Xia, Teo, & Khalil, 2020; Kujala, Sachs, Leinonen, Heikkinen, & Laude, 2022)^[4, 14].

Successful examples of best practices in procurement for disease control can be found in various global programs. During the COVID-19 pandemic, effective procurement strategies were critical in securing vaccines and personal protective equipment (PPE). The COVAX facility, co-led by GAVI, WHO, and the Coalition for Epidemic Preparedness Innovations (CEPI), exemplifies best practices in global procurement. COVAX's centralized procurement model and innovative financing mechanisms ensured equitable access to COVID-19 vaccines for low- and middle-income countries (Nunes, McKee, & Howard, 2024)^[20].

Another example is the Global Fund's use of pooled procurement mechanisms, which allow countries to collaborate on bulk purchasing agreements, reducing costs and ensuring a steady supply of essential commodities. This approach has effectively secured antiretroviral drugs for HIV treatment, insecticide-treated nets for malaria prevention, and tuberculosis medications, contributing to significant reductions in disease incidence and mortality (Ucha, Ajayi, & Olawale, 2024a)^[32].

From these best practices, several key lessons can be drawn. First, transparency and accountability are essential for maintaining trust and integrity in procurement processes. Clear and open procedures, regular audits, and reporting mechanisms can prevent corruption and ensure the effective use of resources. Second, efficiency in procurement is crucial for the timely and cost-effective acquisition of medical supplies. Streamlined processes, competitive bidding, and strategic supplier relationships can enhance procurement efficiency and effectiveness.

Third, flexibility in procurement strategies is vital for adapting to changing circumstances and emerging health threats. Hybrid models, such as the Global Fund's centralized and decentralized procurement combination, provide flexibility while ensuring quality and efficiency. Fourth, quality assurance is essential for ensuring that procured medical supplies meet international standards and are safe and effective. Centralized procurement systems, such as those used by WHO and GAVI, emphasize standardized quality and consistency. Finally, stakeholder engagement is crucial for responsive and effective procurement strategies. Collaborating with governments, manufacturers, and healthcare providers ensures that procurement processes address local needs and priorities. GAVI's collaboration with global partners, such as UNICEF and WHO, exemplifies successful stakeholder engagement in procurement.

4. Conclusion and Recommendations

In summary, this paper has examined the diverse procurement strategies employed by major global programs in the fight against infectious diseases, highlighting the key components and best practices that contribute to their success. Centralized, decentralized, and hybrid procurement models each offer unique advantages, with centralized systems ensuring standardization and quality, decentralized approaches providing flexibility and responsiveness, and hybrid models balancing both aspects. The paper also

identified transparency, efficiency, flexibility, quality assurance, and stakeholder engagement as crucial criteria for effective procurement strategies.

The findings of this paper have significant implications for policymakers and practitioners involved in infectious disease control. For policymakers, the emphasis on transparency and accountability in procurement processes is vital for maintaining trust and ensuring the effective use of resources. Clear policies and regulations that promote competitive bidding and prevent corruption can enhance procurement efficiency and effectiveness. For practitioners, adopting best practices from successful global programs, such as centralized quality assurance mechanisms and strategic supplier partnerships, can improve procurement outcomes and strengthen health systems.

Future research should focus on several areas to further optimize procurement strategies for infectious disease control. One area is the development of innovative financing mechanisms that can enhance procurement efficiency and affordability, particularly in low- and middle-income countries. Another area is the integration of advanced technologies, such as digital supply chain management and predictive analytics, to improve procurement processes and responsiveness. Additionally, research should explore the impact of procurement strategies on health equity, ensuring that vulnerable populations have access to essential medical supplies.

Based on the findings of this paper, several practical recommendations can be made for integrating and improving procurement strategies in global programs. First, global programs should prioritize transparency and accountability in their procurement processes by implementing clear procedures, regular audits, and reporting mechanisms. Second, programs should adopt a hybrid procurement approach combining centralized coordination for bulk purchases and decentralized flexibility to address local needs. Third, strategic partnerships with suppliers and manufacturers should be strengthened to ensure a steady supply of quality-assured medical commodities. Fourth, stakeholder engagement should be enhanced by collaborating with governments, healthcare providers, and local communities to ensure that procurement strategies are responsive to their needs and priorities. Finally, global programs should invest in capacity-building initiatives to improve procurement expertise and infrastructure in low- and middle-income countries, enabling them to manage their procurement processes more effectively.

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