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Evaluating procurement strategies for multi-disease programs: Lessons from global initiatives

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Abstract

Procurement strategies are vital for the success of multi-disease programs, ensuring the availability and quality of medical supplies necessary to address multiple health conditions simultaneously. This paper evaluates various procurement strategies used in global initiatives, analyzing their effectiveness, challenges, and outcomes. Key lessons include balancing centralized procurement with local flexibility, robust quality control, cost management, and stakeholder engagement. The best practices include bulk purchasing, framework agreements, and integrating procurement with local health systems. Future directions for optimizing procurement strategies include exploring innovative financing mechanisms, leveraging digital technologies, fostering public-private partnerships, and enhancing capacity building. By adopting these strategies, multi-disease programs can improve efficiency, sustainability, and overall health outcomes.

Keywords: Procurement strategies, multi-disease programs, global health initiatives, cost management, quality control

Introduction

Procurement strategies play a pivotal role in the success of multi-disease programs, which aim to tackle multiple health challenges simultaneously. These programs are particularly significant in low- and middle-income countries, with limited resources and a high disease burden (WHO, 2023) ^[21]. Effective procurement strategies ensure that essential medicines and medical supplies are available, affordable, and high-quality. This is crucial for achieving global health goals, reducing morbidity and mortality, and improving overall health outcomes (Yenet, Nibret, & Tegegne, 2023) ^[34].

The significance of procurement strategies in multi-disease programs cannot be overstated. In the context of global health, procurement encompasses the processes of selecting, acquiring, and managing pharmaceuticals and medical supplies. This involves complex logistical and financial considerations, navigating regulatory frameworks and ensuring compliance with international standards (Modisakeng, Matlala, Godman, & Meyer, 2020) ^[18]. The effectiveness of these strategies directly impacts the ability of health systems to respond to multiple health threats, from infectious diseases like HIV/AIDS, tuberculosis, and malaria to non-communicable diseases such as diabetes and cardiovascular conditions.

The primary objective of this paper is to evaluate the procurement strategies employed in multi-disease programs, drawing lessons from global initiatives. By analyzing the successes and challenges of these initiatives, the paper aims to identify best practices and provide recommendations for optimizing procurement processes. Specifically, the paper seeks to:

- Examine different procurement approaches in multi-disease programs, including centralized and decentralized models, bulk purchasing, and framework agreements.
 - Assess the effectiveness of these strategies in terms of cost-efficiency, accessibility, and quality of medical supplies.
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- Highlight the key lessons from successful global initiatives and outline best practices that can be replicated in other contexts.
- Offer practical recommendations for improving procurement strategies in multi-disease programs to enhance their impact and sustainability.

The scope of this paper is focused on evaluating procurement strategies specifically within the context of multi-disease programs. It will cover global initiatives that address a combination of diseases rather than those targeting a single disease. This includes programs managed by international organizations, governments, and non-governmental organizations that aim to provide comprehensive healthcare solutions in resource-limited settings. By maintaining a clear and focused scope, this paper aims to provide valuable insights into the procurement strategies that can enhance the effectiveness and efficiency of multi-disease programs, ultimately contributing to better health outcomes globally.

2. Overview of Multi-Disease Programs

2.1 Definition and Scope

Multi-disease programs are integrated health initiatives designed to address multiple health conditions simultaneously. These programs are particularly important in low- and middle-income countries, where the burden of various diseases can overwhelm health systems (Mremi *et al.*, 2021) ^[19]. Unlike single-disease programs focusing on one specific condition, multi-disease programs aim to provide comprehensive care by tackling various interconnected health issues. This integrated approach is essential for optimizing resource utilization, improving patient outcomes, and strengthening health systems.

The scope of multi-disease programs is broad and can include various health conditions. For instance, a program might address both infectious diseases such as HIV/AIDS, tuberculosis, and malaria, as well as non-communicable diseases like diabetes and hypertension. By addressing multiple diseases concurrently, these programs can leverage synergies between different health interventions, enhance patient care, and achieve greater efficiencies in service delivery (Formenti *et al.*, 2022; Wroe *et al.*, 2020) ^[8, 33].

2.2 Global Initiatives

Several global initiatives exemplify implementing multi-disease programs, showcasing various strategies and approaches to managing multiple health conditions.

- **The Global Fund to Fight AIDS, Tuberculosis, and Malaria:** One of the most prominent multi-disease programs, the Global Fund, aims to combat these three major infectious diseases. By pooling resources from various donors, the Global Fund supports countries in strengthening their health systems, improving access to essential medicines, and implementing integrated care approaches. Its procurement strategies include bulk purchasing and framework agreements to ensure a cost-effective and timely supply of medical products (Engels & Zhou, 2020; WHO, 2023) ^[7, 21].
- **The President's Emergency Plan for AIDS Relief (PEPFAR):** While primarily focused on HIV/AIDS, PEPFAR has increasingly integrated other health services, including tuberculosis and cervical cancer screening and treatment. This integrated approach helps

address co-infections and related health issues, thereby improving overall patient health outcomes (Brault *et al.*, 2021; Goldstein, Salvatore, Ferris, Phelps, & Minior, 2023) ^[5, 9].

- **The World Health Organization's Integrated Management of Childhood Illness (IMCI):** This initiative targets multiple conditions affecting children, including pneumonia, diarrhea, malaria, and malnutrition. IMCI aims to reduce child mortality and improve the quality of pediatric care in low-resource settings by training healthcare workers to diagnose and treat several conditions simultaneously (Kilov *et al.*, 2021) ^[15].
- **Gavi, the Vaccine Alliance:** Gavi supports immunization programs that address multiple infectious diseases, such as measles, rubella, and HPV. Gavi helps countries implement comprehensive vaccination campaigns that protect children from various preventable diseases by providing funding and technical assistance (Mantel & Cherian, 2020) ^[17].

2.3 Challenges

Implementing multi-disease programs has unique challenges that can impact their effectiveness and sustainability.

- **Resource Allocation:** One of the primary challenges is allocating limited resources across multiple health priorities. Ensuring that all diseases receive adequate attention and funding can be difficult, particularly in resource-constrained environments. This requires careful planning and prioritization to balance competing needs (Adachi *et al.*, 2023) ^[2].
- **Supply Chain Management:** Effective procurement and supply chain management are critical for multi-disease programs. However, managing the supply chains for multiple health products can be complex, involving coordination with various suppliers, regulatory compliance, and logistics. Ensuring the timely and reliable delivery of medical supplies is essential for the success of these programs (Taymaz, Iyigun, Bayindir, & Dellaert, 2020) ^[29].
- **Health System Integration:** Integrating multiple disease interventions into existing health systems can be challenging. It requires coordination between different levels of care, training of healthcare workers, and adaptation of health infrastructure. Resistance to change and limited capacity within health systems can hinder the seamless integration of multi-disease programs (Bardhan, Chen, & Karahanna, 2020; Malakoane, Heunis, Chikobvu, Kigozi, & Kruger, 2020) ^[3, 16].
- **Monitoring and Evaluation:** Assessing the impact of multi-disease programs involves monitoring a wide range of indicators and outcomes. This requires robust data collection and analysis systems, which may be lacking in low-resource settings. Ensuring accurate and timely data is essential for evaluating program effectiveness and making informed decisions (Mremi *et al.*, 2021) ^[19].
- **Community Engagement:** Engaging communities and ensuring their participation in multi-disease programs is crucial for their success. However, raising awareness and promoting behavior change across multiple health issues can be challenging. Effective communication strategies and community involvement are necessary to overcome

these barriers (Simões *et al.*, 2021) ^[28].

Despite these challenges, multi-disease programs offer significant advantages by providing comprehensive and integrated healthcare solutions. By addressing multiple health issues simultaneously, these programs can improve overall health outcomes, enhance the efficiency of health systems, and optimize the use of limited resources. The lessons learned from successful global initiatives can inform the design and implementation of future multi-disease programs, ultimately contributing to better health and well-being for populations worldwide.

3. Procurement Strategies in Multi-Disease Programs

2.4 Types of Strategies

Procurement strategies in multi-disease programs are critical for ensuring medical supplies' availability, affordability, and quality. Several procurement approaches are used globally, each with its advantages and challenges.

- **Centralized Procurement:** This strategy involves a single entity, often a government or a central health agency, purchasing medical supplies for multiple health facilities or programs. The main advantage of centralized procurement is the potential for bulk purchasing, which can lead to significant cost savings through economies of scale. Centralized procurement can also streamline supplier selection and quality control processes. However, it can be less flexible and slower to respond to local needs and changes in demand (Sahoo, Goswami, & Halder, 2024) ^[24].
- **Decentralized Procurement:** Unlike centralized procurement, decentralized procurement allows individual health facilities or regional health authorities to manage their procurement processes. This approach can be more responsive to local needs and preferences, potentially improving the relevance and timeliness of medical supplies. However, it may result in higher costs due to smaller purchase volumes and complicate quality control and supplier management (Petersen, Jensen, & Bhatti, 2022) ^[23].
- **Bulk Purchasing:** Bulk purchasing is a strategy that involves buying large quantities of medical supplies to obtain discounts from suppliers. This strategy is often used in centralized procurement systems but can also be coordinated among decentralized entities. Bulk purchasing can lead to significant cost savings and improved supplier bargaining power. However, it requires substantial upfront capital and effective inventory management to avoid overstocking or wastage (Chebolu-Subramanian & Sundarraj, 2021; Greer, Klasa, & Van Ginneken, 2020) ^[6, 10].
- **Framework Agreements:** Framework agreements are long-term contracts with suppliers that specify the terms and conditions for future purchases over a set period. These agreements provide flexibility in procurement by allowing health programs to order supplies as needed without negotiating new contracts each time. Framework agreements can ensure stable prices and reliable supply chains but require careful negotiation and management to ensure the terms remain favourable over time (Groschopf, Dobrovnik, & Herneth, 2021; John, Gurumurthy, Mateen, & Narayanamurthy, 2022) ^[11, 13].

2.5 Key Components

Effective procurement strategies in multi-disease programs depend on several critical components that collectively ensure the efficient, cost-effective, and high-quality supply of medical products. Supplier selection is paramount, as it involves evaluating potential suppliers based on product quality, cost-effectiveness, delivery reliability, and compliance with regulatory standards. Utilizing competitive bidding processes and transparent evaluation criteria aids in selecting the most suitable suppliers while fostering long-term relationships with reputable suppliers enhances supply chain stability (WHO, 2022, 2023) ^[21].

Quality control plays a pivotal role in the success of multi-disease programs by ensuring the safety and efficacy of medical supplies. This component includes rigorous testing, Good Manufacturing Practices (GMP) adherence, and regular supplier audits to maintain high standards. Effective quality assurance systems are crucial for promptly detecting and addressing any issues that may compromise product quality, along with monitoring medical supplies' shelf life and storage conditions to preserve their efficacy (Ackley, Elsheikh, & Zaman, 2021) ^[11].

Cost management is vital for optimizing resource allocation within multi-disease programs. It encompasses negotiating favourable terms with suppliers, leveraging bulk purchasing discounts, and conducting cost-benefit analyses to inform procurement decisions. Transparent financial management practices enhance accountability and ensure efficient fund utilization, maximizing limited resources' impact (Jia, 2022; Organization, 2021b).

Efficient inventory management ensures that medical supplies are readily available without incurring unnecessary storage costs or risking stockouts. Key aspects include accurate demand forecasting, optimal stock levels maintenance, and streamlined distribution systems. Real-time inventory management systems offer visibility into stock levels and facilitate tracking throughout the supply chain, minimizing wastage due to expired products and enhancing operational efficiency. Compliance with regulatory standards and international guidelines is essential to guarantee the safety and reliability of medical supplies procured in multi-disease programs (Organization, 2021a; WHO, 2022) ^[21]. Adhering to stringent regulations governing importation, storage, and distribution, including obtaining necessary licenses and ensuring GMP compliance, ensures that products meet required quality standards. Adherence to cold chain requirements for temperature-sensitive products further safeguards their efficacy during transport and storage (Pajic, Andrejic, & Chatterjee, 2024) ^[22].

Effective risk management strategies are critical in mitigating potential disruptions to procurement processes. This involves identifying and assessing risks such as supply chain disruptions, price fluctuations, and supplier reliability. Developing contingency plans, diversifying suppliers, and maintaining buffer stocks are proactive measures that enhance the resilience of procurement operations. Regular risk assessments and scenario planning strengthen preparedness and responsiveness to unforeseen challenges (Kartoglu & Ames, 2022) ^[14].

Stakeholder engagement is pivotal in aligning procurement strategies with program goals and ensuring success. Engaging with government agencies, healthcare providers, patients, and donor organizations fosters collaboration, transparency, and knowledge sharing. Effective

communication channels facilitate addressing challenges promptly, leveraging best practices, and incorporating lessons learned into ongoing procurement strategies. Ultimately, robust stakeholder engagement enhances the sustainability and effectiveness of procurement efforts in multi-disease programs by fostering a shared commitment to improving health outcomes globally.

3. Evaluation of Current Strategies

2.6 Criteria for Evaluation

Evaluating procurement strategies in multi-disease programs requires a comprehensive framework that considers multiple factors. The primary criteria for evaluation include cost-effectiveness, efficiency, accessibility, quality, and sustainability.

- **Cost-Effectiveness:** This criterion assesses whether the procurement strategy achieves the desired outcomes at the lowest possible cost. It involves analyzing the total cost of ownership, including purchase prices, transportation, storage, and wastage. Cost-effectiveness also considers the economic benefits of improved health outcomes resulting from a timely and adequate supply of medical products.
- **Efficiency:** Efficiency evaluates the ability of the procurement process to deliver medical supplies in a timely and resource-effective manner. This includes the speed of procurement cycles, the accuracy of demand forecasting, the reliability of supply chains, and the minimization of delays and bottlenecks. Efficient procurement processes maximize the use of available resources and enhance the responsiveness of health programs.
- **Accessibility:** Accessibility measures the extent to which medical supplies are available to the target populations when needed. This criterion considers geographic distribution, the affordability of products for patients, and the availability of necessary infrastructure for storage and distribution. Accessibility is crucial for ensuring that health programs can reach all population segments, particularly in remote and underserved areas.
- **Quality:** The quality criterion assesses the adherence to regulatory standards and the effectiveness of quality control measures. It involves evaluating the safety, efficacy, and durability of medical products. High-quality supplies are essential for achieving positive health outcomes and maintaining patient trust in health programs.
- **Sustainability:** Sustainability evaluates the long-term viability of procurement strategies. This includes maintaining stable supply chains, securing funding, and adapting to changing conditions and demands. Sustainable procurement strategies ensure that health programs can continue operating effectively over the long term, even when facing funding fluctuations or supply chain disruptions.

2.7 Assessment of Global Initiatives

Several global initiatives provide valuable insights into the effectiveness of various procurement strategies in multi-disease programs. The Global Fund to Fight AIDS, Tuberculosis, and Malaria employs a centralized procurement strategy that integrates elements of bulk purchasing and framework agreements. This approach has

yielded significant cost savings and improved the availability of essential medicines critical for combating these diseases worldwide. The Global Fund's rigorous focus on quality control and supplier management ensures that procured products meet stringent international standards. However, the centralized model sometimes challenges responsiveness to local needs, underscoring the importance of balancing central oversight and flexibility at regional and local levels (Shen & Chen, 2020) [27].

Similarly, Gavi, the Vaccine Alliance, adopts a hybrid approach to procurement, utilizing both centralized and decentralized strategies based on specific contexts. By leveraging bulk purchasing and establishing long-term contracts with suppliers, Gavi secures vaccines at reduced costs while maintaining stable supply chains. The alliance's commitment to regulatory compliance and stringent quality assurance measures ensures the safety and efficacy of vaccines distributed through its programs. Moreover, Gavi's robust stakeholder engagement and sustainable funding mechanisms are pivotal in supporting the continuity and scalability of its immunization initiatives across low-income countries (Samal *et al.*, 2021) [25].

PEPFAR (The President's Emergency Plan for AIDS Relief) focuses its procurement strategy on centralized purchasing, emphasizing quality control and robust supply chain management. This strategic emphasis has facilitated the cost-effective and efficient delivery of antiretroviral drugs and other essential medical supplies critical for HIV/AIDS treatment and prevention efforts (Zou, 2020). PEPFAR's integration of procurement processes with local health systems enhances accessibility to life-saving medications while bolstering program sustainability. However, the program's dependency on donor funding presents ongoing challenges in maintaining long-term financial stability and operational continuity (Sciences, Division, Health, & Relief, 2020) [26].

UNICEF's Supply Division operates with a centralized procurement model emphasizing bulk purchasing and framework agreements to optimize cost efficiencies and ensure the timely delivery of diverse medical supplies globally (Berenguer & Rashkova, 2021) [4]. This approach enables UNICEF to save substantial costs while upholding stringent quality standards through rigorous quality control measures and comprehensive risk management practices. UNICEF's extensive network and strategic partnerships with local entities further enhance the accessibility and sustainability of its supply chain operations, thereby supporting effective responses to health emergencies and ongoing healthcare needs in resource-constrained settings (Wang & Zahur, 2023) [30].

These global initiatives exemplify diverse approaches to procurement in multi-disease programs, each with unique strengths and challenges. By learning from their experiences and adopting best practices, stakeholders can enhance procurement strategies' effectiveness, efficiency, and sustainability to improve global health outcomes and reduce health disparities worldwide.

2.8 Outcomes and Impact

The outcomes and impact of these procurement strategies on multi-disease programs are significant and multifaceted. Effective procurement practices have resulted in the timely and sufficient provision of essential medicines, vaccines, and medical supplies, directly correlating with improved health

outcomes across diverse global health initiatives. For instance, through initiatives like PEPFAR, the availability of antiretroviral drugs has markedly reduced AIDS-related mortality rates, underscoring the critical role of reliable procurement in managing chronic diseases on a global scale. Similarly, Gavi's extensive vaccination programs have substantially lowered the incidence of vaccine-preventable diseases, illustrating how strategic procurement can translate into tangible health benefits for populations worldwide.

Cost savings have been another pivotal outcome of streamlined procurement strategies, notably through mechanisms such as bulk purchasing and framework agreements. These approaches have generated substantial financial efficiencies for global health initiatives, enabling them to redirect resources towards essential areas like healthcare infrastructure development and community health programs. The centralized procurement model employed by initiatives like The Global Fund has proven particularly effective in achieving significant cost reductions across key health commodities, illustrating the fiscal advantages of coordinated procurement efforts on a global scale.

Furthermore, robust procurement strategies have bolstered supply chain resilience, enhancing the ability of health systems to respond swiftly and effectively to public health crises. During the COVID-19 pandemic, for instance, proactive adjustments in procurement practices ensured uninterrupted access to critical medical supplies, highlighting the adaptability and responsiveness of centralized procurement frameworks in mitigating supply chain disruptions during emergencies.

Effective procurement strategies have profoundly influenced accessibility and equity in healthcare provisioning. By prioritizing accessibility, these strategies have ensured that essential health products reach marginalized and underserved populations, bridging gaps in healthcare access and promoting health equity globally. Gavi's commitment to equitable vaccine distribution, for example, has narrowed disparities in immunization coverage between high-income and low-income countries, advancing broader goals of global health equity and social justice through strategic procurement interventions.

4. Lessons Learned and Recommendations

2.9 Key Lessons

Evaluating procurement strategies in multi-disease programs reveals several key lessons crucial for enhancing the effectiveness and sustainability of these initiatives. Firstly, centralized procurement can achieve significant cost savings through economies of scale and streamlined processes, yet it must be balanced with local flexibility to address specific needs and contexts effectively. Supplier selection and quality control are pivotal; selecting reliable suppliers and maintaining rigorous quality standards are essential for ensuring the safety and efficacy of medical supplies. Cost management strategies, including bulk purchasing and framework agreements, can reduce expenses while maintaining high-quality standards. Additionally, stakeholder engagement is vital; involving all relevant parties, from government agencies to local communities, ensures better alignment with program goals and enhances the sustainability of procurement processes.

Several best practices emerge from successful multi-disease programs that other initiatives can adopt. Bulk purchasing and framework agreements consistently demonstrate their

value in reducing costs and securing reliable supplies. Programs should invest in robust quality control systems to ensure that all medical supplies meet the required standards. Building long-term relationships with reputable suppliers can enhance supply chain stability and reliability. Effective inventory management systems are crucial for maintaining optimal stock levels and minimizing wastage. Furthermore, integrating procurement processes with local health systems enhances the responsiveness and relevance of the supplies, ensuring they meet the specific needs of the populations served. Transparent and accountable financial practices are essential for maintaining donor trust and ensuring funds are used efficiently.

2.10 Future Directions

Several areas warrant further research and implementation to optimize procurement strategies for multi-disease programs. Innovative financing mechanisms, such as pooled procurement funds and advanced market commitments, could provide more stable funding sources and incentivize supplier investment in quality improvements. Digital technologies offer promising solutions for improving inventory management, supply chain transparency, and real-time data collection, which can enhance decision-making processes. Research should also explore the potential of public-private partnerships in leveraging the strengths of both sectors to improve procurement outcomes. Additionally, capacity building for local procurement officials is essential to ensure they have the skills and knowledge to manage procurement processes effectively. Finally, there should be a focus on developing adaptive procurement strategies that can respond quickly to changing health needs and market conditions, ensuring multi-disease programs' continued effectiveness and sustainability.

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