

## Analysis of drug inventory management at the Cinquantenaire Hospital in Kisangani, The Democratic Republic of Congo

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World Journal of Advanced Research and Reviews, 2025, 27(01), 170-179

Publication history: Received on 04 April 2025; revised on 12 June 2025; accepted on 14 June 2025

Article DOI: <https://doi.org/10.30574/wjarr.2025.27.1.1862>

### Abstract

**Introduction:** Drugs management in healthcare facilities is a major challenge for ensuring patient safety and treatment effectiveness. This study highlighted the analysis of the drugs inventory management policy at the Cinquantenaire Hospital in Kisangani, identified the major challenges in drugs management, and determined how this policy is evaluated to ensure the stability of essential drugs.

**Methods:** We used a descriptive cross-sectional method based on the survey technique conducted at the Cinquantenaire Hospital in Kisangani from January 1 to March 31, 2025, during which 30 hospital staff members were selected to participate in the survey. This was a non-probability, purposive sample.

**Results:** Based on the evaluation of the drugs management policy, 40.0% of study participants believe that drugs management at the Cinquantenaire Hospital in Kisangani is ineffective, followed by 60.0% who believe that the facility experiences drugs stockouts as a management challenge. Problems related to drugs supply include stockouts (40.0%), lack of partner support (27.0%), insufficient financial resources (20.0%), and a lack of cold chain equipment (13.0%).

**Conclusion:** To improve drugs management in a healthcare facility, it is essential to implement the drugs management policy in force in our country, organize and increase training sessions for providers and other users of drugs in healthcare facilities, and ensure compliance with the inventory and verification period for drugs.

**Keywords:** Analysis; Management; Drug Inventory; Health

### 1. Introduction

Health is a fundamental human right. Access to healthcare, which includes access to essential drugs, is a prerequisite for the enjoyment of this right. Essential drugs save lives and improve health; they play a vital role in many aspects of healthcare by providing a simple and effective response. To this end, they should be available at all times within a functioning healthcare system, in sufficient quantity, in an appropriate form, with assured quality, accompanied by adequate information, and at an affordable price for individuals and communities [1].

Globally, medicine management is a complex issue that involves various policies and practices to ensure access to essential drugs while guaranteeing their quality, safety, and efficacy. In recent years, all countries around the world have experienced supply tensions for certain drugs. In pharmacies, pharmacists sometimes spend hours finding solutions [2]. In France, for example, health, and in particular access to drugs and health products, is a major concern.

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For millions of our fellow French citizens, it is a daily issue, sometimes a source of anxiety and difficulties, to which public policies must provide concrete and effective responses [3].

In Africa, drugs play a central role in the functioning of health services. They represent up to 50% of household health expenditures and between 20 and 30% of the total operating costs of public and private health facilities [4]. Thus, with a view to ensuring the availability of drugs at the level of health facilities and coverage of the population's needs for drugs, the WHO has adopted the concept of essential drugs, which it defends as an integral part of national health policies, and has made access to essential drugs the 8th component of primary health care [5].

In the Democratic Republic of Congo, drugs, which are an essential pillar of the development of the health system, face problems related to availability, accessibility (financial and geographical), quality, management and rational use, thus weakening the health system. Furthermore, the lack of a coherent information system in logistics management only aggravates this situation and constitutes one of the causes of poor management of drugs in health establishments [6].

Medicine is not a consumer product like any other. Its hoped-for effects address the most intimate human concerns by affecting quality of life, well-being, but also illness, death, and recovery. Consequently, it is often considered a quasi-public good, as evidenced by the position of public authorities who integrate it into their health policy and establish bodies to control the supply and demand of drugs [7]. The pharmaceutical policy of the Democratic Republic of Congo recommends the establishment of Pharmaceutical and Therapeutic Committees (CPT) in General Reference Hospitals to provide a framework that allows all hospital staff to work together to improve healthcare [8].

Evaluating the drugs management policy is one of the strategies identified to contribute to improving the current situation of drugs management in our healthcare facilities. Ongoing institutional reforms in the health sector are focused on decentralizing and integrating health services and programs at the operational level of the health pyramid [9].

Drugs inventory management in hospital pharmacies plays a crucial role in the quality of care received by patients. In an environment where therapies are increasingly expensive, drug stockouts are reported, and pressures are felt, rational inventory management is essential [10].

However, managing drug stockouts remains the greatest challenge facing healthcare facilities. The lack of quality personnel in wards and within the pharmacy itself makes it difficult to maintain optimal stock levels. Add to this the difficulty of managing the flow of unadministered drug returns, as well as monitoring drug expiration dates [11].

To improve drug inventory management in hospitals, there is a need to distribute certain inventory management tasks and automate pharmacists' work. Improved communication between the pharmacy and the wards also appears to alleviate some of these difficulties. In the specific context of healthcare, various long-term or short-term solutions can be considered to optimize the critical task of inventory management in the drug supply chain [12]. Despite the implementation of pharmaceutical product management tools and the reporting system, the challenge of balancing stocks is difficult to win, the estimation of needs still suffers from the insufficiency of basic information on the up-to-date stock situation, orders and consumption and/or distribution data in good time.

In Tshopo Province, drugs play a vital role in many aspects of healthcare, providing a simple and effective solution. However, certain challenges still persist, including quantification errors, inadequacies in accounting and management procedures, inappropriate use of drugs, stock outs, and/or shortages of certain essential drugs, which hinder the effective fulfillment of hospital pharmacies' missions. With this in mind, this study aims to evaluate the drugs management policy at the Cinquantenaire Hospital in Kisangani.

Based on the above, the study's primary objective is to evaluate the drugs management policy at the Cinquantenaire Hospital in Kisangani, with a view to promoting sound drugs management policies. Specifically, this involves analyzing the drug stock management policy at the Cinquantenaire Hospital in Kisangani, identifying the major challenges to be addressed in drug management, listing the problems related to drug supply and determining how this policy is evaluated.

## **2. Methods**

### **2.1. Materials**

#### *2.1.1. Description of the Study Setting*

The study was conducted in Tshopo Province, Kisangani City, specifically at the Cinquantenaire Hospital in Kisangani. The fieldwork period extended from July to December 2023.

The Cinquantenaire Hospital in Kisangani is located within the Public Works Agency's concession, located in the Commercial District, Makiso Commune, Tshopo Province, Democratic Republic of Congo. The Cinquantenaire Hospital in Kisangani is bordered to the east by the DRC Roads Office garage and the residential buildings on First Avenue in Kabondo Commune; to the west by the Zheng Wei Technical Cooperation Company facilities; to the north by the TP Road and the Military Police Camp; and to the south by the Faculty of Sciences of the University of Kisangani.

#### *2.1.2. Population and Sample*

The population of our study consisted of the entire staff of the Cinquantenaire Hospital, which numbered 127 active and serving staff members across all departments.

From this population, we selected a sample of 30 staff members from the Cinquantenaire Hospital in Kisangani. This allowed us to interview individuals with sufficient experience and a comprehensive knowledge of the department.

#### *2.1.3. Sampling Technique*

To select our sample, we used the non-probability purposive sampling technique. According to Bathelot, B. [13], purposive sampling is a technique in which the researcher relies on their judgment to select the members who will be part of the study. This is a type of non-probability sample, also called a judgment sample or expert sample.

#### *2.1.4. Sample Selection Criteria*

The selection criteria for our study are as follows:

- Be an agent at the Cinquantenaire Hospital in Kisangani;
- Be a doctor, pharmacist, manager, and accountant at the Cinquantenaire Hospital in Kisangani;
- Have a minimum of 3 years of experience in the department.

### **2.2. Methods**

#### *2.2.1. Study Type*

In line with the objectives of this study, we used a cross-sectional descriptive method, conducted at the Cinquantenaire Hospital in Kisangani, to collect information on drugs inventory management in a healthcare facility. The study period was three months, from January 1 to March 31, 2025.

#### *2.2.2. Data Collection Technique*

To collect our data, we used a survey technique, which allowed us to obtain information related to the drugs management policy at the Cinquantenaire Hospital in Kisangani.

Indeed, as Dufour et al. [14] state, a survey is "the set of practical interventions by a researcher in a given social environment intended to empirically grasp the subject of their study." It is a research technique that aims to collect information from the beneficiaries.

To do this, we organized an interview, which is a technique for extracting information from an individual (individual interview) or a group of individuals (group interview), based on standardized facilitation procedures.

#### *2.2.3. Data Processing*

The collected data were grouped into absolute frequency tables and then transformed into percentages for statistical analysis.

### 2.3. Ethical Aspects

The respondents' participation in this study was voluntary. Consent was free and informed, but only verbal. The subjects were informed that if they agreed to participate in this study, they would be administered a questionnaire. Respondents who freely agreed to be recruited could withdraw from the study at any time without prejudice.

### 2.4. Limitations of the Study

Due to the time constraints and insufficient financial resources, we were unable to use the Student t-test to compare the means of the indicators used to determine the significance level of the results. Also, given that this study was conducted in a single health facility, it would be desirable to generalize the research to the entire township of Kisangani.

## 3. Results

### 3.1. Identification of Respondents

**Table 1** Distribution of Study Subjects by Identification

Identification Variables	Effectives (n=30)	Percentage (%)
<b>Age (years)</b>		
25 – 35	7	23
36 – 46	7	23
47 – 57	10	34
58 – 68	6	20
<b>Gender</b>		
Male	22	73
Female	8	27
<b>Professional Category</b>		
Medical Staff	26	87
Administrative Staff	3	10
Paramedical Staff	1	3
<b>Seniority in the Organization</b>		
1 – 5	5	17
6 – 11	14	26
11 – 16	5	17
16 years and over	6	20

This table shows that most of the study subjects were between 47 and 57 years old, representing 34.0%, with a male predominance (73.0%). The most represented professional category was medical staff (87.0%), and 26.0% of the study subjects had between 6 and 11 years of service within the organization.

### 3.2. Drugs Management Policy in the Healthcare Facility

#### 3.2.1. Implementation of the Drugs Management Policy

**Table 2** Distribution of Study Subjects According to the Implementation of the Drugs Management Policy in the Healthcare Facility

Implementation Variables	Effectives (n=30)	Percentage (%)
Training received on drugs management		
Yes	16	53
No	14	47
Knowledge of drugs management policy in the DRC		
Yes	19	63
No	11	37
Frequency of participation in drugs management training		
Sometimes	16	54
Never	7	23
Rarely	7	23

This table shows that most of the study subjects received training on drugs management at the Cinquantenaire Hospital in Kisangani, i.e., 53.0%, and that 63.0% are aware of the drugs management policy in the Democratic Republic of Congo, and 54.0% have sometimes participated in the drugs management training organized by the Makiso/Kisangani Health Zone Management Team.

#### 3.2.2. Management of Essential Drugs in the Health Facility

**Table 3** Distribution of Study Subjects According to the Management of Essential Drugs in the Facility

Essential Medicine Management Variables in the Facility	Effectives (n=30)	Percentage (%)
<b>Availability of essential drugs in the facility</b>		
Satisfactory	14	47
Unsatisfactory	6	20
Very Unsatisfactory	3	10
Undecided	7	23
<b>Access to clear protocols for prescribing and dispensing drugs</b>		
Yes	26	87
No	4	13
<b>Evaluation of the medicine management policy</b>		
Effective	9	30
Efficient	6	20
Ineffective	12	40
Undecided	3	10
<b>Reported medicine stockouts</b>		
Yes	18	60

No	12	40
Causes of medicine stockouts	n=18	%
Elastic delivery time	6	33
Unforeseen demand	5	28
Medical prescription problem	4	22
Negative physical inventory discrepancy	2	11
Too low safety stock	1	6
<b>Consequences of medicine stockouts</b>		
Decrease in patient attendance	7	39
Opportunity costs	5	27
Impacts on medical prescriptions and patients	4	22
Loss of sales	1	6
High mortality rate	1	6
<b>Reported medicine stockouts</b>		
Yes	18	60
No	12	40
Cause of medicine stockouts	n=18	%
Excessive prices High	6	33
Medical prescriptions directed outward	5	28
Very high safety stock (positive inventory variance)	4	22
Decrease in demand	2	11
High supply quantity	1	6
<b>Consequences of excess drug inventory</b>		
Staff demotivation	8	44
Storage costs	4	22
Balance	3	17
Presence of dead stock	3	17
<b>Problems related to drug supply</b>		
Stock shortages	12	40
Lack of partner support	8	27
Lack of funds	6	20
Lack of cold chain equipment	4	13

Analysis of this table shows that 47.0% of study subjects believe that the availability of essential drugs at the Cinquantenaire Hospital in Kisangani is satisfactory, and that 87.0% consider that this hospital has access to clear protocols for prescribing and dispensing drugs.

As for the evaluation of the drugs management policy, 40.0% of study subjects believe that drugs management at the Cinquantenaire Hospital in Kisangani is ineffective, followed by 60.0% who believe that the facility experiences drugs stockouts, with flexible delivery times (33.0%) and unforeseen demand (28.0%) being the main causes of drugs stockouts. Furthermore, the main consequences of drugs stockouts are a decrease in patient attendance (39.0%) and

opportunity costs (27.0%). Regarding excess drug inventory, 60.0% of the study participants stated that it is reported, with the main causes being: excessive drug prices (33.0%) and externally oriented medical prescriptions (28.0%); the consequences of this excess drug inventory include staff demotivation (44.0%) and storage costs (22.0%).

Finally, it should be noted that problems related to drug supply include stockouts (40.0%), lack of partner support (27.0%), insufficient financial resources (20.0%), and a lack of cold chain equipment (13.0%).

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## 4. Discussion

To better understand the issue of drugs management policy in healthcare facilities, we presented two factors: the implementation of the drugs management policy and the management of essential drugs in healthcare facilities.

### 4.1. Implementation of the Drugs Management Policy

We observed that the majority of study subjects had received drugs management training at the Cinquantenaire Hospital in Kisangani, i.e., 53.0%. 63.0% were familiar with the drugs management policy in the Democratic Republic of Congo, and 54.0% had sometimes attended drugs management training organized by the Makiso/Kisangani Health Zone Management Team. Regarding the knowledge of the availability of drugs at the hospital pharmacy by the staff of the medical-clinical services, Gansou JTS [1] reports that all of the people surveyed, including majors and heads of medical-clinical services as well as midwives, stated that they were not involved in the selection of drugs.

All pharmacy staff received training on drug inventory management, i.e. 100% [1]. This result is comparable to that of Sidibe, S, in 2018 concerning the evaluation of the inventory management and supply system for drugs in the basket: the case of 30 CSCs in the Bamako district, which found that more than half of the people surveyed, i.e. 93.33%, had received training on drug management. Training on the supply and distribution master plan was carried out by only 3 members of the hospital pharmacy staff [21].

In Mali, the Directorate of Pharmacy and Drugs (DPM) is involved in the smooth running of the Essential Drug Supply and Distribution Master Plan (SDADME). This is achieved through the development of a SDADME guide dated 2000; the implementation of this plan is monitored through supervision [22]. According to the World Health Organization [17], all first-level health facilities, i.e., primary health care centers or outpatient departments of district hospitals need drugs and pharmaceutical products. Managing these products requires teamwork and involves all staff members: doctors, nurses, health workers and drug store managers. This is especially true for small health centers where only one or two health workers work. Each staff member must know how to properly manage all the facility's stocks. Each staff member has an important role to play.

According to Pouye C [15], drugs management training is a comprehensive program that aims to train healthcare professionals in proper drugs management in a clinical setting. This training covers the basic principles of inventory management, drugs dispensing, drugs safety, and current regulations.

After their training, healthcare workers returning to their facilities must explain standard drugs supply management procedures to their teams. Whenever possible, all staff members should take turns visiting the pharmacy and dispensing room to learn these procedures so that inventory is properly managed.

Inventory management of drugs and medical products is crucial for healthcare professionals because it aims to maintain resource availability while avoiding surpluses. Continuity of care, prevention of expired products, cost reduction, and responsiveness to health crises are all major challenges. This training provides healthcare logisticians with the tools and techniques needed to effectively manage inventories of medical products and drugs. It addresses specific constraints related to conservation, the cold chain, expiry dates and replenishment processes [16].

We believe this training provides healthcare professionals with an overview of the various activities of a hospital pharmacy, highlights their specificities, and emphasizes their importance in the context of overall patient care within a hospital. Participants will acquire the skills necessary to ensure effective and safe drugs management, thus contributing to improving the quality of care provided.

### 4.2. Management of Essential Drugs in the Healthcare Facility

Our analysis reveals that 47.0% of study participants believe that the availability of essential drugs at the Cinquantenaire Hospital in Kisangani is satisfactory, and that 87.0% consider that this hospital has access to clear protocols for prescribing and dispensing drugs. According to Gansou JTS [1], the majority of patients stated that the

prescribed prescriptions were filled by the pharmacy with 76% and a result similar to that of Pouye, C. [15] who obtained a percentage of available products at 84%. But our result is totally different from that of Traoré, M, in 2018 on the managerial study of the under-attendance of hospital pharmacies: CHU point G case, which found 79.5% of patients stating that the drugs prescribed to them were not available at the pharmacy [18].

Regarding prescription fulfillment by medical-clinical staff, only 52.4% of staff reported being satisfied with the prescriptions given to patients. This result is similar to that of Pouye, C [15] in 2010, who obtained a prescription fulfillment rate of 50.64%.

As for the evaluation of the drugs management policy, 40.0% of study subjects believed that drugs management at the Cinquantenaire Hospital in Kisangani is ineffective. This result corroborates the literature, which states that "regular evaluation and continuous improvement of drugs management practices are essential. It is important to explore methods to measure the quality of practices and their impact on the care provided [17].

Regular evaluation and continuous improvement of drugs management practices are essential." It is therefore important to explore methods to measure the quality of practices and their impact on the care provided, such as drugs management performance indicators, audits of practices and feedback, continuous improvement initiatives, and interprofessional collaborations for service improvement [18].

Regular evaluation and continuous improvement of drugs management practices are essential. Pharmacies play a crucial role in drugs management. Effective drugs inventory management is essential; finally, drugs management is essential to ensure patient safety and the effectiveness of their treatment.

Next, 60.0% believe that the facility experiences drugs stockouts, with flexible delivery times (33.0%) and unforeseen demand (28.0%) being the main causes of drugs stockouts. Furthermore, the main consequences of drugs stockouts are a decrease in patient attendance (39.0%) and opportunity costs (27.0%).

Drugs stockouts in a healthcare facility can have significant consequences on several levels. For the patient, these include treatment delays or interruptions that can worsen their condition, the use of less effective, more toxic, or unsuitable alternative drugs, an increased risk of drugs errors during substitutions or dosage changes, stress, and a loss of confidence in the healthcare system. For the caregiver, there is an increased workload to find alternatives, adapt prescriptions, and inform patients, and for the institution, there is disruption to the organization of care, the higher financial cost of purchasing more expensive alternatives or imports, and a degraded image among patients and partners [16].

Regarding excess drug stocks, 60.0% of the study subjects stated that it is reported, the main causes of which are: excessively high drug prices (33.0%) and externally oriented medical prescriptions (28.0%); the consequences of this excess drug stock include, among other things, staff demotivation (44.0%) and storage costs (22.0%).

Drugs management is an essential component of healthcare, aimed at ensuring the safety and effectiveness of treatments. Medical prescriptions are a key element of drugs management.

We also noted that problems related to drugs supply include stockouts (40.0%), lack of partner support (27.0%), insufficient financial resources (20.0%), and a lack of cold chain equipment (13.0%).

A drugs stockout in a healthcare facility occurs when a drugs necessary for patient care is no longer available, and no equivalent therapeutic alternative (form, dosage, molecule) is immediately accessible [23]. In Bejaia, Touloum AM. and Yousfi MR. Gestion reported problems related to drugs stockouts at a rate of 53.4% [20].

Drugs stockouts are a recurring problem in healthcare facilities due to poor drugs management policies. Drug stockouts are due to poor control over drug delivery and receipt times. Proper drugs management contributes to improved health outcomes and patient safety in healthcare settings.

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## 5. Conclusion

Drugs management poses a significant challenge, as irrational drugs management has an economic impact on pharmaceutical facilities and the social security system. Despite efforts to train inventory management and logistics staff, it is clear that problems with proper drugs management exist in referral health centers.



Drugs management practices pose a significant challenge for providers, with multiple steps between ordering and administering drugs. These challenges highlight the need for seamless integration of systems to ensure a safe and efficient environment.

This study provided an analysis of the drugs inventory management policy at the Cinquantenaire Hospital in Kisangani, identified the major challenges in drugs management, listed the issues related to drugs supply, and determined how this policy is evaluated to ensure the stability of essential drugs. In order to improve the management of drugs in a health structure, it is therefore essential to implement the medicine management policy in force in our country, to organize and increase training sessions for providers and other users of drugs in health structures on the digitalization and digitization of data, and to ensure compliance with the period of inventories and verification of drugs.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

The authors declare that there is no conflict of interest in the conduct of this study.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

### *Author Contributions*

Jean-Trésor LITONGA MOSUNGA designed and collected the data; the other authors contributed to data review and processing.

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