

# Analysis of the Drug Planning Management System using the ABC Critical Index Method at Pangkalan Kerinci Regional General Hospital, Pelalawan Regency, Riau Province in 2023

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## ABSTRACT

**Objective:** This study aims to analyze the management of pharmaceutical supplies at the Pharmacy Installation of Selasih Regional General Hospital, Pangkalan Kerinci, Pelalawan Regency, Riau Province, in 2023, focusing on human resources, financing, standard operating procedures, drug usage value, investment value, critical value, and critical index value using the ABC analysis method. **Method:** A qualitative research design was employed through in-depth interviews, observations, and document reviews conducted at the hospital's pharmacy installation. **Results:** The findings revealed that drug classification based on annual consumption value placed 80% of total drugs in group A, 15% in group B, and 5% in group C. In terms of investment value, group A absorbed 80% of total investment, group B 15%, and group C 5%. However, group C showed a relatively high investment proportion, leading to stock accumulation and inefficiency. **Novelty:** This study highlights the significance of integrating ABC analysis with a Critical Index approach to optimize pharmaceutical inventory management, enabling more precise procurement planning and resource allocation in hospital pharmacy operations.

## INTRODUCTION

According to Law of the Republic of Indonesia Number 36 of 2009 concerning Health, Article 1 Paragraph (1) states that health is a state of physical, mental, spiritual, and social well-being that enables everyone to live productively socially and economically. In line with current globalization and the dynamics of the free market, improving public health is crucial for Indonesia's competitiveness in various development sectors.

To provide quality healthcare services to the public, hospitals require the availability of medical equipment and materials to support operational services. Based on their function, the supplies that hospitals must manage can be classified into three main groups: pharmaceutical supplies, food supplies, and general and technical logistics supplies. Pharmaceutical supplies include medicines, chemicals, radiological materials, disposable medical devices, medical equipment, and medical gases.

According to Schreyer and Friedman, the largest cost component in hospital operations generally comes from the procurement of pharmaceutical supplies [1]. This is reinforced by World Health Organization (WHO) data, which shows that in developed countries, spending on pharmaceuticals ranges from 10–15% of the total health budget, while in developing countries it reaches 35–66%. For example, the proportion of pharmaceutical costs in Thailand is around 35%, China 45%, the Philippines 66%, and Indonesia around 39% [2].

Recent data from the Indonesian Ministry of Health shows that pharmaceutical spending still accounts for a significant portion of national health financing, accounting for approximately 40–50% of total hospital operating costs [3]. This aligns with the 2023–2027 National Drug Policy (KONAS), which emphasizes the importance of efficient pharmaceutical inventory management to control drug expenditures without compromising service quality.

Therefore, sound pharmaceutical inventory management is a key factor in maintaining the continuity of hospital operations and supporting efforts to improve the quality and efficiency of healthcare services to the public.

The ABC method is an analytical technique used to classify drugs based on annual usage value, thus determining which drug groups absorb the greatest costs [4]. However, the ABC method does not take into account the importance of drugs to healthcare services. Therefore, this method is combined with the Criticality Index, which assesses the level of medical importance of a drug.

Through the combination of ABC and Criticality Index, hospitals can prioritize drug inventory planning and control more precisely and rationally.

Selasih Pangkalan Kerinci Regional General Hospital (RSUD) is a hospital owned by the Pelalawan Regency Government, Riau Province. The operational permit for Selasih RSUD was granted based on Pelalawan Regent Decree No. Kpts.440/Dinkes/I/2005/12.a of 2005 concerning the implementation of regional hospital services. Subsequently, based on Decree of the Minister of Health of the Republic of Indonesia Number 141/MENKES/SK/I/2007 dated January 31, 2007, Selasih Regional General Hospital was designated a Class C Regional General Hospital, meaning it met the requirements to provide basic specialist medical services.

On December 29, 2014, through Decree of the Regent of Pelalawan Number KPTS.445/RSUD/963/2014, Selasih Regional General Hospital was designated a Regional Hospital with a full Regional Public Service Agency (PPK-BLUD) Financial Management System. With the implementation of the BLUD system, the hospital has flexibility in financial management to improve the quality of healthcare services to the community. Until 2023, Selasih Regional General Hospital will continue to serve as a district-level referral center for healthcare services, with a focus on improving management efficiency, service quality, and patient satisfaction [5], [6].

Based on recent interviews and observations at the Pharmacy Unit of Selasih Regional Hospital in 2023, several issues were still identified in the medication planning management system. These issues include a suboptimal drug requirements planning process, orders outside of official schedules, stock shortages in the pharmacy warehouse, and late payments to suppliers, which delay drug deliveries. This situation also leads to frequent backorders for patient prescription services, indicating a weak inventory control system [7], [8].

Furthermore, financial data shows that the drug procurement budget at the Pharmacy Unit accounts for approximately 35–40% of the hospital's total operational

costs, with overstock and dead stock levels remaining quite high. This situation indicates the need for a more efficient and measurable drug planning system [9], [10].

This research was motivated by the researchers' desire to analyze the effectiveness of drug planning and control at the Pharmacy Unit of Selasih Regional Hospital, Pangkalan Kerinci. The primary focus of this study was to evaluate the drug planning management system using the ABC–Critical Index method as a basis for determining procurement priorities [11].

Therefore, this study takes the title: "Analysis of the Drug Planning Management System using the ABC Critical Index Method at the Selasih Pangkalan Kerinci Regional General Hospital, Pelalawan Regency, Riau Province in 2023"

## **RESEARCH METHOD**

### **1. Research Type and Design**

This research is a qualitative study using in-depth interviews, limited observations, and document searches to gather information based on the knowledge and experiences of the informants, as well as reviewing related documents.

### **2. Research Location and Time**

This research was conducted at Selasih General Hospital, Pangkalan Kerinci, Pelalawan Regency, Riau Province, from September to November 2023.

### **3. Population and Sample**

The informants in this study were parties involved in the drug planning process at Selasih Hospital, Pangkalan Kerinci, Pelalawan Regency. Five informants participated in this study: Head of Pharmacy, IFRS Staff, Head of Warehouse, and Warehouse Staff.

### **4. Data Collection Techniques**

Data were obtained through:

Data collection through observation of the research objects, in-depth interviews using interview guidelines, and documentation review. Observations were conducted on drug procurement using the ABC critical index method. This stage involves calculating the use value, calculating the investment value, calculating the critical value of the drug, determining the drug's critical index value, and grouping drugs into groups A, B, and C.

This study conducted in-depth interviews using interview guidelines and documented them by taking notes and recording them using a tape recorder with the Head of the Pharmacy Installation, IFRS Staff, Warehouse Manager, and Warehouse Staff.

Documentation review is a data collection technique for obtaining secondary data. This is done by collecting data or information by reading reports, specific written statements, and other written materials. The instruments used in this study were a research permit, a recorder, stationery (pens, highlighters), a camera, interview guidelines, and observation guidelines.

## 5. Data Analysis Techniques

- a. ABC Analysis: Grouping drugs into groups A, B, and C based on annual usage (A=70%, B=20%, C=10%).
- b. Critical Index Analysis: Classifying drugs based on their level of medical importance (high, medium, low).
- c. ABC-IC combination: the results of both analyses are combined to determine drug planning management priorities (AI, AII, BI, BII, CI, etc.).

## RESULTS AND DISCUSSION

### *Result*

#### 1. Drug Calculation Using the ABC Method

- a. Drug Groups Based on Drug Use Value Analysis in the Pharmacy Unit of Selasih Pangkalan Kerinci Regional Hospital in 2023

The drug use value analysis shows that Group A had a usage percentage of 11,250 of the total usage, consisting of 48 drug items, representing 80% of the total. Group B had a usage percentage of 2,129 of the total usage, consisting of 72 drug items, representing 15% of the total. Group C had a usage percentage of 718 of the total usage, consisting of 153 drug items, representing 5% of the total.

Drug use in the Pharmacy Unit of Selasih Pangkalan Kerinci Regional Hospital, Pelalawan Regency, is still relatively low, as seen in the table above. Group C still lacks the amount of drug use compared to the number of drugs available.

- b. Drug Groups Based on Investment Value Analysis in the Pharmacy Unit of Selasih Pangkalan Kerinci Regional Hospital in 2023

The investment value analysis shows that Group A, with an investment of 258,022,304 units, comprises 79 drugs, representing 80% of the total. Group B, with an investment of 48,100,571 units, comprises 64 drugs, representing 15% of the total. Group C, with an investment of 16,629,357 units, comprises 130 drugs, representing 5% of the total.

The large number of drugs in Group C is available, but the investment value is very low, resulting in insufficient cash flow for these drugs.

- c. Drug Groups Based on Critical Value Analysis at the Pharmacy Unit of Selasih Hospital, Pangkalan Kerinci, Pelalawan Regency, in 2023

All antibiotics in the Pharmacy Unit of Selasih Hospital, Pangkalan Kerinci, Pelalawan Regency, Riau Province, are Group B essential drugs, totaling 273 antibiotics.

The critical value analysis was conducted on these types of drugs. Based on the Decree of the Minister of Health of the Republic of Indonesia Number 312/MENKES/SK/IX/2013 concerning the National List of Essential Drugs, antibiotics are considered essential drugs. This means that all antibiotics in the Pharmacy Unit of Selasih Hospital, Pangkalan Kerinci, Pelalawan Regency, fall into Group B.

d. **Drug Groups Based on ABC Critical Index Analysis Based on Utilization and Investment Value**

To conduct an ABC Critical Index analysis, utilization value, investment value, and critical value are required. The utilization and investment analysis calculations identified 26 drugs with the highest utilization and investment values. Therefore, the hospital must control these drugs, as they contribute the largest financial contribution to the Pharmacy Unit of Selasih Hospital, Pangkalan Kerinci, Pelalawan Regency.

**Discussion**

**1. Human Resource Management (HR)**

Human resources (HR) play a crucial role in the implementation of pharmaceutical activities in the hospital's Pharmacy Unit. Based on interviews and observations, it was discovered that the Pharmacy Unit at Selasih Pangkalan Kerinci Regional Hospital has a total of 18 pharmaceutical and support staff, consisting of: 1 Head of Pharmacy Unit assisted by 1 administrative staff member, 1 Head of Drug Warehouse with 5 staff members, 1 Head of Outpatient Unit with 4 staff members, and 1 Head of Inpatient Unit with 4 staff members [12].

The role of adequate HR is crucial for the success of pharmaceutical supply management. This aligns with research by Sulastris, which confirms that human resources are one of the primary inputs in an organization; the success of an institution depends heavily on the ability, creativity, and work ethic of its employees in carrying out organizational functions [13].

According to the latest provisions of the Indonesian Minister of Health Regulation Number 3 of 2020 concerning Hospital Classification and Licensing, and Ministerial Regulation Number 72 of 2016 concerning Hospital Pharmaceutical Service Standards, a Class C hospital should ideally have a minimum of 20 pharmacy staff, including pharmacists and pharmacy technicians [14]. Based on these provisions, the number of staff in the Pharmacy Unit at Selasih Regional Hospital still does not meet the required minimum standards.

Interviews also revealed that the workload in the Pharmacy Unit is relatively high, while the competency level of some staff still needs to be improved [15]. Some staff do not fully understand the concept of medication inventory management, including the application of the ABC-Critical Index analysis method. Furthermore, it was discovered that pharmacy staff have not received formal training related to medication planning management and evaluation systems in recent years [16].

This situation is inconsistent with the provisions of Ministerial Regulation Number 72 of 2016, which mandates that every pharmacy staff member in a hospital must have the opportunity to develop their knowledge and skills through continuing education and training [17].

Based on the discussion, it can be concluded that human resources significantly influence the effectiveness of drug planning, procurement, and availability in hospitals. Therefore, improved communication and coordination between doctors, pharmacists,

and pharmaceutical technicians is needed to ensure more efficient drug planning, prescription preparation, and patient care and support improved pharmaceutical service quality at Selasih Pangkalan Kerinci Regional Hospital [2].

## **2. SOP Implementation Is Suboptimal**

Research findings indicate that Standard Operating Procedures (SOPs) at the Pharmacy Unit of Selasih Pangkalan Kerinci Regional Hospital, Pelalawan Regency, have been implemented for most pharmaceutical activities. Interviews with informants revealed that routine activities such as receiving, distributing, and recording medications adhere to the applicable SOPs. However, a specific SOP for medication storage is not yet officially available, and the existing SOP document has not been updated [18], [19].

However, implementing SOPs in accordance with SOPs is crucial to ensuring smooth, effective, and consistent operations in the Pharmacy Unit. Without standardized and up-to-date SOPs, service activities can potentially encounter obstacles and compromise the quality of pharmaceutical supply management.

According to Regulation of the Minister of Health of the Republic of Indonesia Number 72 of 2016 concerning Pharmaceutical Service Standards in Hospitals, SOPs are a set of standardized work steps to ensure that every routine procedure is carried out consistently, effectively, and accountably. SOPs serve as technical guidelines that ensure each work unit is able to carry out processes according to established service quality standards [20], [21].

Budiharjo emphasized that consistent implementation of SOPs across all organizational units will improve overall work efficiency and effectiveness. This aligns with Sumini's study, "Data Analysis and Procedure Design for Drug/Medical Device Management in the Pharmacy Unit of Myria Hospital, Palembang," which showed that the absence of written procedures resulted in a lack of clear guidelines for the drug management process, resulting in suboptimal monitoring and evaluation [22], [23].

Recent observations and document reviews at the Pharmacy Unit of Selasih Hospital indicate that although several SOP documents are available, they do not cover all critical activities, particularly those related to the storage and management of drug stocks in the pharmacy warehouse. This situation results in irregular drug storage and the potential risk of stockouts and overstocks.

Therefore, it is necessary to update and refine the SOPs at the Pharmacy Unit of Selasih Hospital to cover all stages of pharmaceutical supply management, from planning and procurement, receipt, storage, distribution, and monitoring of expired drugs. The implementation of complete and up-to-date SOPs is expected to improve work efficiency, the quality of pharmaceutical services, and support the achievement of overall hospital performance indicators.

## **3. Medication Planning**

### **a. Medication planning does not comply with formalin guidelines.**

Based on interviews and field observations, it was discovered that medication planning at Selasih Pangkalan Kerinci Regional Hospital, Pelalawan Regency, is carried

out by the Pharmacy Unit, coordinated by a pharmacist with the support of a pharmacist assistant. Planning activities are carried out routinely every day, beginning with checking available medication stocks, evaluating medication usage for the previous period, and estimating needs and procurement costs.

However, observations indicate that the medication planning process does not fully utilize a scientific approach or standardized methods, such as consumption methods, epidemiological methods, or combination methods. This condition results in a lack of accuracy in estimating pharmaceutical supply needs, resulting in frequent delays in pharmaceutical services and inconsistencies in drug stock in the warehouse [24], [25], [26].

According to the Indonesian Ministry of Health (Ministerial Regulation Number 72 of 2016, updated through Ministerial Regulation Number 26 of 2020 concerning Pharmaceutical Service Standards in Hospitals), pharmaceutical supply planning is a crucial stage in pharmaceutical logistics management, which determines the types and quantities of medications needed according to disease patterns, drug usage data, and the hospital budget. This process should ideally be guided by the National Essential Drug List (DOEN), the Hospital Formulary, the National Formulary (Fornas), and consider the results of ABC analysis, VEN analysis, or a combination of both to determine procurement priorities and budget efficiency.

The ongoing phenomenon of drug shortages in several hospitals, including Selasih Regional Hospital, demonstrates the importance of data-driven pharmaceutical planning and measurable analytical methods. Drug shortages not only disrupt services but can also impact patient safety and undermine public confidence in the quality of healthcare services. As noted by Susilo, failures in drug planning and control can pose legal risks and damage a hospital's reputation [12], [27], [28].

Based on the discussion, the researchers concluded that the current daily drug planning system in the Selasih Regional Hospital Pharmacy Unit is inefficient, creating a high administrative and financial burden for hospital management. Therefore, improvements to the planning period and system are needed, for example by implementing data-driven planning on a monthly, quarterly, or annual basis, coupled with ABC-Critical Index and VEN analysis to prioritize drugs based on their usage value and urgency.

The implementation of systematic planning is expected to increase procurement efficiency, reduce the risk of stock outs, and support the sustainability of optimal pharmaceutical services in hospitals.

#### **b. Drug Financing**

Drug financing at the Selasih Pangkalan Kerinci Regional Hospital Pharmacy is sourced from the internal budget through the Regional Public Service Agency (BLUD), but implementation has not been optimal. Delays in payments to suppliers (PBF) have delayed drug deliveries and impacted drug availability at the hospital. This situation is

exacerbated by the slow processing of BPJS Kesehatan claims and the large number of slow-moving drugs, which hinder fund circulation.

The Selasih Regional Hospital financial system is based on Government Regulation No. 23 of 2005, Government Regulation No. 74 of 2012, and Minister of Home Affairs Regulation No. 79 of 2018, which provide flexibility in financial management for BLUDs to improve efficiency and service quality. According to the Indonesian Ministry of Health, drug financing must be managed rationally and sustainably to maintain service quality and patient satisfaction [18].

Research shows that the daily financing mechanism is inefficient, burdening the hospital's administration and finances. It is recommended that drug ordering and payment be done periodically (weekly or monthly) to maintain cash flow stability. In addition, the pharmacist in charge is required to report monthly drug stock, purchases, and usage as a basis for evaluating financial efficiency and the pharmacy's contribution to hospital revenue.

#### c. Drug Calculation Using the ABC Method

Based on the 2025 analysis, Group A comprised 48 drug items (80% of usage), Group B 72 items (15%), and Group C 153 items (5%) of total antibiotic usage at Selasih Pangkalan Kerinci Regional Hospital. These results indicate that the number of drug items is inversely proportional to their usage value, with a small number of items (Group A) accounting for the majority of drug usage.

The analysis also indicates that Group B contains many low-moving items, necessitating drug re-selection to prevent stockpiling and expiration. The Pharmacy Unit is advised to conduct regular evaluations and calculate buffer stock to maintain a balanced and efficient stock.

In terms of investment, Group A absorbed IDR 258 million (80%), Group B IDR 48 million (15%), and Group C IDR 16 million (5%). Although Group C has the largest number of items, its investment value is small, but it still incurs high storage costs if not managed properly.

The majority of antibiotics at Selasih Regional Hospital are classified as category B essential drugs according to Ministry of Health Regulation No. HK.01.07/MENKES/312/2023, totaling 273 items. Of all the drugs analyzed, 26 antibiotics had the highest usage and investment values, which require close monitoring as they contribute the most to hospital pharmaceutical costs.

## CONCLUSION

**Fundamental Finding :** The study concludes that pharmaceutical management at RSUD Selasih Pangkalan Kerinci in 2023 has not yet achieved optimal efficiency due to inadequate human resources, inconsistent implementation of standard operating procedures, and non-formulary-based drug planning. The ABC analysis revealed that most drugs fall within the slow-moving category, with Group C absorbing a disproportionately high investment value despite low usage, leading to stock accumulation and inefficiency. **Implication :** These findings underscore the urgent need

for hospitals to strengthen pharmaceutical human resource capacity, digitize SOP implementation, and adopt integrated analytical methods—such as ABC combined with Critical Index analysis—to optimize inventory control and ensure cost-effective drug procurement. **Limitation** : The study was limited to one hospital and relied mainly on qualitative data, which may restrict broader applicability and quantitative validation of findings. **Future Research** : Subsequent studies should incorporate multi-site analyses, mixed-method approaches, and system-based evaluations to explore the long-term impact of integrated inventory management models on financial efficiency and service quality in hospital pharmacy operations.

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