

# ABC analysis to medicines inventory control

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**Abstract.** Medicine management is very necessary to prevent medicine shortages. Pharmacy installations as units responsible for the medicine supply need to plan medicine supplies. Inventory medicines management is carried out using ABC analysis. This method tends to profit oriented product because it is based on the funds needed from each medicine. From the results of data processing analysis, the medicines included in group A (Always) were 46 types (10,8%) with an investment of 70,39% of the total cost of medicines procurement, group B (Better) as many as 74 medicines (17,3%) with an investment of 19,99% the total cost of medicines procurement, and group C (Control) as many as 307 types of medicines (71,9%) with an investment of 9,61% the total cost of medicine procurement.

## 1. Introduction

Public awareness of health causes health services to be needed increasingly. Hospitals as media provides health services are increasingly being demanded to serve the community with the best service quality. The quality of services provided is very influential on the hospital image and the satisfaction of patients visiting the hospital [1]. One of the factors plays a role in the hospital quality services is the management of medicines carried out at the hospital. Medicine management needs to be done to prevent medicine shortages. If the patient does not receive proper treatment because of the medicines availability are always absent, it makes the patient feel dissatisfied and has a negative impact on the hospital image.

Pharmacy installations as units responsible for the supply of medicines need to plan medicine supplies. The planning has been carried out is seen based on diseases often occur in hospitals, the quantity of medicine stocks, usage in the previous year, and seasonal outbreaks. However, data on diseases are difficult to obtain with certainty as well as recording and reporting are not good cause the planning of medicine needs currently applied in hospitals to be not good enough. This condition lead to stock out of medicines and medicines are not available must be purchased cito requires other distributors and the purchasing cost medicines increase. For this reason, it is necessary to manage the medicine supply at the hospital.

Inventory management can be done using various methods, one of them Always, Better, and Control (ABC) method. Analysis of ABC, also known as Pareto Analysis is one of the methods used in logistics management to classify a group of Goods into three groups (group A, B and C) [2]. The ABC analysis is the "Inventory categorization method" which requires items to be divided into three categories, A, B and C. A is the most valuable item and C is a less valuable item, whereas B contains items that range between A and C. It aims to focus on a few critical (A-item) and not on many trivial (C-item) [3]. In the ABC analysis, A class items contributed to the majority (70-80%) of the total inventory value of the item. Class B contributes (10-15%) And class C consists of 5% of the total inventory value of the item. However, it is not appropriate for one criterion now one day. The inventory of companies

depends on various criteria, such as unit price, annual demand rate, critical nature, scarcity, endurance etc. [4].

ABC analysis or classification methods are commonly used in supply control for companies have various types of materials in inventories t have different usage values [5]. For example, ABC analysis is used to analyze for inventory management of sponge iron plant [6]. ABC analysis can be implemented in managing inventory spare part in one of printing industry di Pakistan. The result is ABC analysis showed that 15% items were from category A and category Beach, remaining 70% items were from category C accounting for around 66%, 15% and 19% of total annual expenditure of technical store respectively [7].

ABC analysis is also applied in inventory control of consumables in the service industry. This is done to find out the inventory of consumables become groups A, B, and C based on ABC analysis of usage, investment, and critical index. The results obtained indicates that the the inventory control of consumables in one of the study programs is sufficient.

Based on previous research, it is known that the application of ABC analysis can be done on any product, including medicines. This research was conducted to manage medical supplies in hospitals to avoid stock outs. ABC Analysis is used to identify the types of medicines require the greatest cost because of the high level of usage and/or cost by grouping.

## **2. Methodology**

This study was conducted at one of the hospitals in the Medan city, especially in pharmaceutical installations. The object under study is in the form of data on medication needs in the hospital. Research begins with observations directly to the pharmaceutical installation department. Activities carried out at this stage are observing the conditions occur in pharmaceutical installations. After observation, the topic and purpose of the study are determined according to the conditions of the installation. After that, data collection is needed to analyze the supply of medicines in the pharmaceutical installation. Data collection in the data form on medicine needs and the cost of ordering medicines. Based on these data, an analysis of the management of medicine supplies was carried out. The analysis was carried out using ABC Analysis. ABC analysis is a technique for prioritizing the management of inventory [8]. The ABC Inventory Control technique is based on the principle that a fraction of the items may typically represent most of the use of the total material of the total inventory in the process, while a relatively large number of items may be from a fraction of the value of money [9]. Medicine grouping is based on 3 categories, namely:

- a. Group A is a medicine group to absorb 70% of the budget with the quantity of medicines not more than 20%. Medicines belonging to the class A group are very critical medicines group need to be tightly controlled, and continuously monitored. Group A orders can be done with a small quantity but the order frequency is more often and because the investment value is quite large has the potential to provide a large profit for the hospital, this group requires strict medicine monitoring and monitoring, accurate and complete record.
- b. Group B absorbs the budget of 20% with the quantity of medicine around 10-80%. Medicines belonging to group B, inventory control are not too strict as group A, but reports on their usage and the remaining medicines must be reported and inventory control always be controlled.
- c. Group C absorbs the 10% budget with the quantity of medicine around 10-15%. Class C has more medicinal items but has no impact on warehouse and financial activities because

the cost is cheap and usage less. Monitoring of this group can be more relaxed, for example, done six months or once a year.

Inventory management with ABC analysis begins with the total purchase cost determination for each type of medicine. Next will be calculated the cost percentage for each type of medicine. Medicines with a cumulative percentage of 1-70% belong to class A, 71-90% including class B medicine groups and 91-100% including class C medicine groups

### 3. Result and Discussion

This research was conducted by collecting the required data in the form of the medicines quantity, the medicines cost, and the total usage of generic medicines during the months of January-March 2018 as many as 427 types. The medicine price is taken based on the medicine purchase transaction to the distributor and the usage quantity based on the medicine usage for 3 months in one of the hospital in Medan City.

The results recapitulation of the ABC medicines classification in one of the hospital in Medan is as follows:

**Table 1.** ABC Classification Results Based on the Quantity of Medicine Usage

Medicine Group	Usage Quantity		Investment Value	
	Type	Percentage %	IDR	Percentage %
A	46	10,8	1.048.207.800	70,39
B	74	17,3	297.740.400	19,99
C	307	71,9	143.150.500	9,61
Total	427	100	1.489.098.700	100,00

Based on the table above, it can be seen that medicines including group A only accounted for 10, 8% of all medicines type, but this medicine absorbed the largest hospital budget, which was 70, 39% compared to medicines in group B and group C. Medicine group A must have stricter inventory control, more accurate records verification, and stricter physical supervision carried out every month.

The medicines included in category A with the highest investment value must be a concern for the hospital. Group A is a group of medicines need to be controlled carefully, because the quantity cost and the medicine usage in group A is the highest compared to the other groups of medicine, which is 35, 1%, and it needs strict control. Group B and C medicines have a small impact on warehouse and financial activities but must still get good monitoring and control. Pharmacy installations must be able to overcome not to run out of stock for this category A, because this will affects patient satisfaction. This group requires close attention and monitoring in inventory control, by carrying out careful calculations in needs determination, requires a complete and accurate recording system, as well as evaluations carried out every month.

In the medicines management in hospitals not only is the money issue as priority but the urgency of medicines usage. For this reason, this article can be deepened by adding the urgency of the medicine usage in the future.

#### 4. Conclusion

Based on ABC analysis, medicines included group A (Always) were 46 types (10,8%) with an investment of 70,4% of total medicine usage, group B (Better) as many as 74 types of medicines (17,3%) with total investment of 20% of total medicine usage, and group C (Control) as many as 307 types of medicines (71,9%) with an investment of 9,6% of total medicine usage. The results of this study indicates that the application of ABC analysis can help in medicine management supply effectively. This will help to understand the problems occurring due to purchase, inventory and stock safety.

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