

# ANALYSIS OF ANTIBIOTIC DRUG INVENTORY CONTROL USING THE ALWAYS BETTER CONTROL (ABC) CONTROL PROCEDURE AT PHARMACY X TUBAN DISTRICT

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## Abstract

**Introduction:** Good management of pharmaceutical supplies in pharmacies will result in drug supplies with the right amount, time, and type, as well as produce drugs in good quality conditions and the costs incurred can be as low as possible. The purpose of this study is to classify antibiotic drugs at Pharmacy X using the ABC analysis method to determine which antibiotic drugs are prioritized for control. **Method:** This research is descriptive research through a cross sectional approach. The data needed is secondary data which will be processed using Microsoft Excel. The number of samples in this study were 19 problematic antibiotic drugs. **Result:** Of the 19 problematic antibiotic drugs consisted of 1 drug with stagnant conditions or 5.26% and as many as 18 with stock out conditions or 94.74%. Grouping results using the ABC method, Group A has a total investment of Rp5,795,000 with a total usage of 2076 items. Group B has a medium total investment of Rp1,145,000 or with a total usage of 117 items. While group C has the most total investment of Rp534,000 with a total usage of 239 items. **Conclusion:** Control procedures for each drug group as a way to control the supply of antibiotic drugs at Pharmacy X must be carried out to overcome problematic drug conditions.

**Keywords :** antibiotic, drug, group, pharmacy, stock out.

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## 1. Introduction

According to Regulation of the Minister of Health of the Republic of Indonesia Number 9 of 2017, a pharmacy is a pharmaceutical service facility where pharmaceutical practice is carried out by pharmacists. Pharmacies carry out the function of managing pharmaceutical supplies, medical devices, and consumable medical materials. Inventory is an important thing in conducting business entity operations, including pharmacies. Controlling drug supplies in pharmacies is necessary to prevent losses. Effective management of drug supplies is carried out to prevent excess drugs (overstock) which risk drugs reaching expiration and prevent drug shortages (stock out) (Nisa, 2019). Stock out is the empty pharmaceutical inventory needed so that customer demand cannot be fulfilled.

In controlling pharmaceutical supplies, pharmacies will implement pharmaceutical service standards in pharmacies. The management of pharmaceutical supplies consists of planning, receipt, procurement, storage, destruction, control, and recording and reporting (Ministry of Health, 2016). Good management of pharmaceutical supplies in pharmacies will result in a supply of drugs with the right amount and type, the right time, the drugs are in good quality condition, and the costs incurred are as low as possible.

Drug inventory management can use the ABC analysis method, which is by grouping types of drugs according to their investment value. Drug grouping will be divided into three, namely group A (60% - 80% of

inventory cost), group B (25% - 35% of inventory cost), and group C (5% - 15% of inventory cost). The ABC analysis method is useful for focusing on determining the types of goods that are most important and need to be prioritized in inventory (Nisa, 2019). According to Gaspersz (2006) in Chairani (2020), ABC classification or often also called ABC Analysis is the classification of a group of items (activities) in descending order based on the cost of using the item (activity) per period of time (price per unit of item multiplied by the volume of item usage during a certain period) or the total cost of the activity.

This research was conducted at Pharmacy X in Tuban Regency. Pharmacy X can return drugs but each supplier has their own requirements, such as intact packaging, six months before expiration date, three months before expiration date, or one month before expiration date. Therefore, it is necessary to control the drugs. Based on the 2022 stock card report, there were 19 (26.76%) of 71 antibiotic drugs at Pharmacy X that had problems. Therefore, one way to control the supply of antibiotic drugs at Pharmacy X is to use the ABC analysis method to determine which antibiotic drugs are prioritized for control.

## 2. METHODS

### 2.1 Research Design

This type of research is descriptive research through a cross sectional approach. In this study researchers collected data from many different samples of antibiotic drugs at one point in time, observing variables without being able to influence them.

### 2.2 Research Sample

The sample of this study was all antibiotic drugs that were problematic in Pharmacy X Tuban Regency as many as 19 types of drugs.

### 2.3 Data Collection Technique

This study uses data collection techniques, including secondary data and primary data. Secondary data was obtained from a document review of the stock card report at Pharmacy X Tuban Regency in 2022. Meanwhile, primary data was obtained from the results of an interview with one of the pharmacists at Pharmacy X.

### 2.4 Measures

The ABC analysis method requires the amount of drug usage and drug prices obtained from documents. Meanwhile, how to measure the ABC analysis method, namely:

1. Arrange the order of antibiotic drug names based on revenue value from the largest value to the smallest.
2. Total cumulative annual dollar value
3. Determine the cumulative percentage
4. Categorization into groups A, B, and C

### 2.5 Statistical Analysis

The data in this study will be analyzed descriptively and statistically (ms. Excel). This research begins by collecting and inputting data regarding the list of antibiotic drug names, antibiotic drug sales stocks, and antibiotic drug prices during 2022 (January-December) using Microsoft Excel. Then the drugs are grouped based on their investment value to determine the drug control procedure. Drug grouping is done as follows:

1. Group A with a cumulative percentage of 0-70%
2. Group B with a cumulative percentage of 71-90%
3. Group C with a cumulative percentage of 91-100%

### 3. Results

The total number of problematic antibiotic drug uses in 2022 was 2432 of 19 types of drugs. The following is a stock card report data containing the initial amount, number in, number out, and final stock of antibiotic drugs in 2022:

Table 1 Stock Card Report at Pharmacy X in 2022

No	Name of Medicine	Initial Quantity	Quantity In	Quantity Out	Last Stock	Medicine Condition
1.	Amoxicillin Dry Syrup	1	1	1	1	Stagnant
2.	Intermoxil 500 Mg	20	0	20	0	Stock out
3.	Ofloxasin 400 Mg	40	0	40	0	Stock out
4.	Gentamisin Injeksi	0	25	25	0	Stock out
5.	Dexymox 500 Mg-10t	100	0	100	0	Stock out
6.	Etamox 500	170	600	770	0	Stock out
7.	Etamox Dry Syrup	8	0	8	0	Stock out
8.	Omeproxyl 500 Mg	210	0	210	0	Stock out
9.	Zemoxyl Dry Syr	1	10	11	0	Stock out
10.	Zeniclor Syr	5	0	1	4	Stagnant
11.	Urotractin 400 Kap	66	170	236	0	Stock out
12.	Lincomycin 500 Mg	10	0	10	0	Stock out
13.	Oxytetrasikline Salep Mata	23	0	23	0	Stock out
14.	Omamox Dry Sirup	8	0	8	0	Stock out
15.	Erythromycin 500	40	0	40	0	Stock out
16.	Cefotaxim Injeksi	20	0	20	0	Stock out
17.	Ceftriaxon Injeksi	20	0	20	0	Stock out
18.	Erelamicetin Tetes Mata	14	15	29	0	Stock out
19.	Cefixim 200 Mg	850	12	860	2	Stock out

Source: Secondary data processing results

Table 1 shows that from the sales data taken at Pharmacy X during the period 2022, it is known that several types of drugs with the highest and lowest sales with different prices. Of the 19 problematic antibiotic drugs consisting of 1 drug with stagnant conditions or 5.26% of all problematic antibiotic drugs. A total of 18 with stock out conditions or 94.74% of all problematic antibiotic drugs.

ABC analysis is a drug calculation by placing the types of drugs into an order, starting with the type that consumes the most budget. The following are the results of antibiotic drug processing that has used ABC analysis:

Table 2 ABC Method Analysis on Antibiotic Drugs at Pharmacy X

No.	Name of medicine	Unit	Quantity Used	Medicine Price	Income Value	Cumulative (Rupiah)	Cumulative (Percentage)	Group
1	Cefixim 200 Mg	Pcs	860	Rp3.000	Rp2.580.000	Rp2.580.000	35%	A

No.	Name of medicine	Unit	Quantity Used	Medicine Price	Income Value	Cumulative (Rupiah)	Cumulative (Percentage)	Group
2	Urotractin 400 Kap	Pcs	236	Rp6.000	Rp1.416.000	Rp3.996.000	53%	A
3	Omeproxyl 500 Mg	Tablet	210	Rp6.000	Rp1.260.000	Rp5.256.000	70%	A
4	Etamox 500	Tablet	770	Rp700	Rp539.000	Rp5.795.000	78%	A
5	Erelamicetin Tetes Mata	Pcs	29	Rp13.000	Rp377.000	Rp6.172.000	83%	B
6	Ceftriaxon Injeksi	Vial	20	Rp13.000	Rp260.000	Rp6.432.000	86%	B
7	Cefotaxim Injeksi	Vial	20	Rp11.000	Rp220.000	Rp6.652.000	89%	B
8	Gentamisin Injeksi	Pcs	25	Rp6.000	Rp150.000	Rp6.802.000	91%	B
9	Oxytetrasikline Salep Mata	Pcs	23	Rp6.000	Rp138.000	Rp6.940.000	93%	B
10	Zemoxyl Dry Syr	Botol	11	Rp12.000	Rp132.000	Rp7.072.000	95%	C
11	Intermoxil 500 Mg	Pcs	20	Rp5.000	Rp100.000	Rp7.172.000	96%	C
12	Erythromycin 500	Tablet	40	Rp1.700	Rp68.000	Rp7.240.000	97%	C
13	Dexymox 500 Mg-10t	Pcs	100	Rp650	Rp65.000	Rp7.305.000	98%	C
14	Omemox Dry Sirup	Botol	8	Rp6.000	Rp48.000	Rp7.353.000	98%	C
15	Ofloxasin 400 Mg	Pcs	40	Rp1.000	Rp40.000	Rp7.393.000	99%	C
16	Etamox Dry Syrup	Botol	8	Rp5.000	Rp40.000	Rp7.433.000	99%	C
17	Lincomycin 500 Mg	Pcs	10	Rp2.000	Rp20.000	Rp7.453.000	100%	C
18	Zeniclor Syr	Pcs	1	Rp11.000	Rp11.000	Rp7.464.000	100%	C
19	Amoxicillin Dry Syrup	Botol	1	Rp10.000	Rp10.000	Rp7.474.000	100%	C

No.	Name of medicine	Unit	Quantity Used	Medicine Price	Income Value	Cumulative (Rupiah)	Cumulative (Percentage)	Group
	Total		2432		Rp7.474.000			

Source: Secondary Data Processing Results

From the results of table 2 above, the classification of each item is based on the percentage value. Group A has a presentation between 0-70%, group B has a percentage of 71-90%, and group C has a percentage of 91-100%. Based on table 2, there are 4 types of antibiotic drugs classified as group A, 5 types of antibiotic drugs classified as group B, and 10 types of antibiotic drugs classified as group C. The results of drug grouping based on ABC Investment analysis can be seen in the following table:

Table 3 ABC Analysis Results Based on Percentage (%) Investment

Group	Total Usage (items)	Investment	Investment (%)
A	2076	Rp5.795.000	78%
B	117	Rp1.145.000	15%
C	239	Rp534.000	7%
Total	2432	Rp7.474.000	100%

Source: Secondary Data Processing Results

Based on table 3, it can be seen that grouping based on usage, namely into group A, group B, and group C. Group A is an item that has the highest total investment among others, which is Rp5,795,000 or 78% of the total investment. With a total usage of 2076 items out of 2432 items during 2022. In group B is an item that has a medium total investment among others, which is IDR 1,145,000 or 15% of the total investment. With a total usage of 117 items out of 2432 items during 2022. While group C is an item that has the lowest total investment among others, which is Rp534,000 or 7% of the total investment. With a total usage of 239 items out of 2432 items during 2022.

#### 4. Discussion

The characteristics of each type of drug vary from the price and amount of use which will determine the value of the investment (Chairani, 2020). From the differences in these characteristics, the treatment of drugs is not treated equally. If each drug is given the same treatment, it will result in losses for the company. Therefore, drugs that have high investments require special treatment, so it is necessary to classify types of drugs based on their investment value to determine control procedures and inventory priorities. To classify drugs, you can use the ABC analysis method.

Currently, the drug grouping carried out at Pharmacy X is carried out alphabetically, as in accordance with the results of an interview with the Pharmacist at Pharmacy X, namely Mrs. Wiwin:

"In the arrangement of drug display cases, it is done alphabetically. However, the front display case is for over-the-counter drugs, while the back display case is for hard drugs."

Pharmacy X is one of the private pharmacies in Tuban Regency. Drug grouping is carried out to make it easier for pharmacies to control drugs. Antibiotic drug supply services at Pharmacy X can be said to not meet all customer needs or requests. As a private pharmacy, Pharmacy X also experiences obstacles in drug control. This is in accordance with the results of an interview with the Pharmacist at Pharmacy X, namely Mrs. Wiwin:

"There have been stock over or stock out in this pharmacy. If there is over stock, the medicine will be sold or returned if it meets the requirements for return to the supplier. However, if it does not meet the return requirements, it will be included in the company's losses."

"First, the needs of the Pharmacy are uncertain because the Pharmacy does not cooperate with outside doctors and does not have a practicing doctor. So, many varied prescriptions come in and the pharmacy meets the needs of a heterogeneous community. So there is difficulty in predicting drugs. Secondly, there was a case of a syrup ban. So, the syrup drug inventory accumulates and cannot be sold and is only waiting for the expiration date."

Therefore, researchers grouped antibiotic drugs at Pharmacy X using the ABC analysis method, so that the drug control procedures for each drug could be determined.

Table 4 ABC Analysis Method Control Procedure

Control Procedure	Group A	Group B	Group C
Control and authority type	Very tight control. Controller is top level management.	Controllers can come from middle management	Loose control. The controller can come from the user department
Ordering	Ordered with more frequency.	Orders can be placed monthly or every 3 months.	Ordered in bulk every 6 months or annually to take advantage of discounts when ordering in bulk.
Consumption control	Control every day or every week.	Control every month.	Control every 3 months.
planning	Planning must be accurate and the database must be up to date.	Can use past usage as a basis for planning.	A rough estimate can be used as a basis for planning.
Number of suppliers	Increase the number of suppliers. Lead time must be reduced.	2-4 suppliers. Moderate effort to reduce lead time.	1-2 suppliers.

Source: Reddy, 2008

Based on table 4, it can be determined the control procedure for each drug based on group A, group B, or group C. In group A, namely the drugs Cefixim 200 Mg, Urotractin 400 Kap, Omeproxyl 500 Mg, and Etamox 500 require very strict control. Control is carried out every day or every week by top level management. Planning must also be accurate and up to date. Drug orders in group A are ordered in greater frequency so that they can increase the number of suppliers.

Group B, which consists of the drugs Erelamicetin Eye Drops, Ceftriaxon Injection, Cefotaxim Injection, Gentamicin Injection, and Oxytetracycline Eye Ointment, requires moderate control which is carried out every month by middle management. Drug orders can be placed once every 1 or 3 months. The number of suppliers is between 2 to 4 suppliers to reduce lead time.

Meanwhile, group C which consists of Zemoxyl Dry Syr, Intermoxil 500 Mg, Erythromycin 500, Dexymox 500 Mg-10t, Omemox Dry Syrup, Ofloxacin 400 Mg, Etamox Dry Syrup, Lincomycin 500 Mg,

Zeniclор Syr, and Amoxicillin Dry Syrup can be given loose control every three months. Control can be done from the user department and rough estimates can be used for planning. Drug orders can be placed every 6 months or 1 year, and discounts can be availed for bulk orders.

## 5. Conclusion

Based on ABC analysis of antibiotic drugs at Pharmacy X, Tuban Regency, there are 4 types of antibiotic drugs classified as Group A which have a total investment of 78% of the total investment, 5 types of antibiotic drugs classified as group B with a total investment of 15% of the total investment, and 10 types of antibiotic drugs classified as group C with the lowest total investment of 7% of the total. Control procedures for each drug group as a way to control the supply of antibiotic drugs at Pharmacy X must be carried out to overcome problematic drug conditions.

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