

# Analysis Of Drug Management In The Class C Of Hospitals In East Java Province, Indonesia

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**Abstract:** Drug management in the hospital includes the selection, procurement, distribution and use stages. Preliminary observation shows that a number of problems in the Class C of Regional Hospital in East Java Province such as late payment of invoices, expired drug, dead drug stock, stock out and the long waiting time for patients to receive the drug. The purpose of this study was to determine the picture of the efficiency and effectiveness of drug management in the Class C of Regional Hospital in East Java Province. This research is quantitative descriptive by collecting data retrospectively (tracing documents year of 2018) related to drug management. Concurrent data were obtained at the time of study. All stages of drug management are measured by the efficiency and effectiveness of using World Trade Organization (WHO) indicators, Pudjaningsih, The Ministry of Health of the Republic of Indonesia and Delphi Method. The results of research in Class C of Regional Hospitals in Banyuwangi and Ngawi Regencies for the suitability of drug items with National Formulary were 67.86% and 70.79%, the percentage of funds were 59.44% and 99.64%, allocation of funds for procurement of drugs were 14.45% and 39,10%, the frequency of procurement of each drug items were 4.77 times and 10.08 times, the percentage of invoices error were 0,52%, and 0,86%, late of payments were 107 days and 28 days; warehouse structuring system according to standard; High Allert and LASA (Look Alike and Sound Alike) drugs storage reached 100%; TOR (Term of Reference) were 2.66 times and 9.94 times per year; level of availability of drugs were 12-18 months; the average time for prescription services were (40 minutes for finished drugs, 63 minutes for concoctions) and (35.6 minutes for finished drugs, 65 minutes for concoctions); the percentage of generic drugs were 68.2% and 56.2%; the percentage of antibiotics prescribed were 11.65% and 8.9%; the percentage of injection drugs prescribed were 0.18% and 0.22%; the percentage of drugs prescribed based on 100% formulary. The conclusion of this study is the management of drugs in the Class C of Regional Hospitals in Banyuwangi and Ngawi Regencies at the selection and procurement stages have not been efficient except the allocation of drugs procurement in the Class C of Regional Hospital in Ngawi; the distribution stage was efficient except, the average time of drug vacancy and TOR (Turn Over Ratio) specifically in Class C of Regional Hospital in Banyuwangi Regency; the stage of use has not been effective at the average of time speed of prescription service; total number of drug items per prescription sheet; and the percentage of prescriptions with generic drugs.

**Index Terms:** Drug Management, Indicator, Efficiency, Hospital

## 1. INTRODUCTION

Drug management in the hospital that implemented well will ensure the availability of drugs when they are needed at sufficient total number with ensured quality, so that it is able to support health service in that hospital<sup>1</sup>. Process of planning and procurement are very influential on the drugs availability as well as economic aspect of a hospital. Guaranteed items and sufficient total number of drugs become one of the most important aspects of a hospital to give the best service.<sup>2</sup> Suitability drug items available with National Formulary (Fornas) in Public Health Center, Brebes Regency has not fulfilled the standard (< 75%)<sup>3</sup>, in Kefamenanu Regional Hospital Middle North Timor Regency in year 2017 was as big as 57,24%<sup>4</sup>, in PKU Muhammadiyah hospital Temanggung mentioned that in 2006, 2007 and 2008 showed that the result has not been efficient in using essential drugs in health service.<sup>5</sup> Related to fund allocation of drugs procurement in Karel Sadsuitubun Regional Hospital South East Maluku Regency was only 6.51%<sup>6</sup>.

In Muntlan Madiun Regional Hospital in 2015 was 26.13% and in year 2016 was 27.57%<sup>2</sup>, in Gambiran Kediri Mayor was as big as 16,53%, it showed that it has not in accordance to standard<sup>7</sup>. Distribution stage constitutes the part of drugs system management that plays an important role, even at the storage and distribution process is able to spend very expensive cost component in the budget of the hospital<sup>8</sup>. According to Massawe research (2002)<sup>9</sup> that the insufficient budget constitutes the main factor of stock out in the health service means. The storage of incorrect stock preparation of pharmacy is able to disturb the drugs distribution for the patients, to increase dead stock, out of order drugs up to expired date of drugs<sup>10</sup> This research was done to obtain the efficiency and effectiveness pictures of drugs management in the Class C of Regional Hospitals in East Java Province year 2018. The result of this research hopefully can be used as an evaluation function from International Foundation for Research and Development (IFRS) side and related management, to take decision in drugs management.

## 2. METHOD

The research was conducted in Pharmacy Installation in Class C of Regional Hospitals in Banyuwangi and Ngawi Regencies in October-November 2019. It was a descriptive research that collected retropestively and concurrently. Restrospective data was obtained by searching the documents year 2018 related with drug management such as List of Drugs and European Patent Office (EPO) Report, List of Clinical Practice Guidance; Reports of Drugs Mutation, Financial Reports, Proposal of Drugs Requirement Data, Drugs Acceptance Data, Drugs Stock Cards, along with Stock Opname Data and Reports of the Last Pharmacy Installation Stock. Concurrent data was obtained at the time of research that was conducted to get

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the related value of drugs accuracy storage indicator, arrangement of drugs storage system, storage of High Allert and LASA (Look Alike Sound Alike), accuracy of physical drugs data number with stock card; and the speed average of prescription service. Research variable related some indicators on each selection, procurement, distribution stages, and use in drug management. Data that was obtained in each indicator in the form of qualitative data compared with standard value indicator determined that is The Ministry of Health's indicator (2008)<sup>11</sup>; according to Pudjaningsih's research (1996)<sup>12</sup>; and the modification of Delphi method (2019)<sup>13</sup>; then they were served in table forms.

### 3. RESULT OF RESEARCH AND DISCUSSION

#### 3.1. Selection and Procurement stages

Result of drugs management research selection and procurement stages in Class C of Regional Hospitals in East Java is served on Table 1

**Tabel I.** Indicator of Efficiency and Effectiveness of Selection and Procurement Stages

Stage of	Indicator	Comparative Value	Result	
			Class C of Regional Hospital	
			Ngawi Regency	Banyuwangi Regency
Selection	1. Accuracy of drug items available with National Formulary	100% <sup>7</sup>	70.79%	67.86%
Procurement	2. Percentage of fund available toward the fund required.	100% <sup>12,7</sup>	99.64%	59.44%
	3. Percentage of drugs procurement fund allocation	30%-40% <sup>7</sup>	39.10%	14.40%
	4. Frequency average of each drug item procurement	Low (<12 times/year) Middle (12-24 times/year) High (>24 times/year) <sup>1,2,7</sup>	10.08±3.83 times	4.77±3.45 times
	5. The average of late payment	0% <sup>12,7</sup>	28±10.26 days	107±28.09 days

Source: Secondary data processed

From table I shows that Class C of Regional Hospitals in Ngawi and Banyuwangi Regencies that the percentage of drug items accuracy with Fornas in year 2018 were 70.79% and 67.86 %. These values were under the indicator of 100 %<sup>7</sup>. This matter because of the drugs selection criteria available in Class C of Regional Hospitals in Banyuwangi and Ngawi Regencies other than on the basis of drugs included in Fornas list, also accommodate demand from related doctor with provisions of drugs in accordance with the prescribing pattern written. Procurement stage was analysed by using the percentage of capital/fund indicator available with all fund needed, fund allocation of drugs procurement, frequency of procurement of each drug item, percentage of the error invoices, the average of late payment. Percentage of fund available compared with fund needed for drugs procurement in Class C of Regional Hospital in Banyuwangi Regency was only 59,44 % (less than the standard). As for in Class C of Regional Hospital in Ngawi Regency, the percentage of fund available compared with fund needed for drugs procurement has already reached 99,64 %. This is almost in accordance to the standard (Ministry of Health 2010)<sup>7</sup>. This is because the management in Class C of Regional Hospital in Ngawi Regency paid much attention to the budget of drugs. If we compare with the indicator it was almost efficient. But if we compare with the previous result of research by Wati<sup>6</sup>, it was 100%, so the result of research in Class C of Regional Hospital in Ngawi Regency is smaller. The percentage of fund allocation of drugs procurement in year 2018 in Class C of Regional Hospital in Banyuwangi Regency was 14.14%. This showed that during year of 2018 the percentage of drugs procurement allocation fund for Class C of Regional Hospital in Banyuwangi Regency was still less ideal, because based on the allocation standard of drugs procurement of ideal indicator is 30-40% (The Ministry of Health, 2010)<sup>7</sup>. But if we compare with the result of previous research by Setyawati<sup>14</sup>, it was 13,30%, and Wati<sup>6</sup>, it was 6,51 % so fund allocation in Class C of Regional Hospital in Banyuwangi Regency was bigger. As for in Class C of Regional Hospital in Ngawi Regency the percentage of procurement of drugs fund allocation was 39.10%. This means that during year of 2018 the percentage of drugs procurement fund allocation in Class C of Regional Hospital in Ngawi Regency has been efficient. If it is compared with the previous result of research by Kusumaningrum<sup>15</sup>, it was 16,64% so the value in Class C of Regional Hospital in Ngawi Regency is bigger. The frequency of each drug item procurement average was 4.77 times per year. Class C of Regional Hospital in Banyuwangi Regency has a big risk of the piles of drugs stock in their storage. This value was almost the same with the result of research by <sup>16</sup> RS Kariadi that the frequency of drugs items procurement value was 4.7 times and the result of research by Ulfah M, (2016)<sup>2</sup> the scores were 4.16 and 3.54 times. This happened because one of the aspects of invoice payment was often late so that the risk was a penalty from the distributor who doesn't send the drugs to the Regional Hospital, to avoid stock out, so the pharmacy installation procured the drugs for stock/storage. So if it is compared with the indicator value of standard frequency of procurement of each drug item of Class C of Regional Hospital in Banyuwangi Regency, it included a low category. In Class C of Regional Hospital in Ngawi

Regency with the frequency average of 10.08 times per year still have a risk of the drugs piles in the warehouse. If it is compared with frequency standard indicator of each drugs item procurement in Class C of Regional Hospital in Ngawi Regency it is included a frequency with low category. The average of late payment to the distributor side in Class C of Regional Hospital in Banyuwangi Regency was 107 days from the due date. If it is compared with the previous research by Tri Suyanti (2016)<sup>17</sup> it was 22 days so the value of Class C of Regional Hospital in Banyuwangi Regency was much longer. It was very risky as the distributor didn't give any service to the hospital until the invoice is paid by the them so that it was possible to have an impact of stock out. This possible happens because of several factors among others, the late of distributor to turn over the completed and correct invoice to the Regional Hospital,

also the bureaucracy of invoice completeness that needs the approval from Class C of Regional Hospital by many officials (the Head of Pharmacy Installation, Goods Manager of Medical Aide, Head of Goods Checking, Head of Goods Inspector, Procurement Official, the Director of Class C of Banyuwangi Regency as the authority of budget user). If it is compared with the drug management standard indicator by Pudjaningsih, the result of research of the average of late payment of invoices, it has not been efficient. As for in Class C of Regional Hospital in Ngawi Regency the late of average payment was 28 days, this was near to the standard of 25 days, but if it is compared with research result of the previous standard by Ulfah M (2016)<sup>2</sup> of 16 days so the value of Class C of Regional Hospital in Ngawi Regency was still longer.

**Table II.** The Efficiency and Effectiveness of Drugs Management Distribution Stage Indicator

Stage	Indicator	Comparative Value	Result	
			Class C Regional Hospital	
			Ngawi Regency	Banyuwangi Regency
Distributions	1. Arrangement System of Warehouse Drugs	FIFO/FEFO <sup>12</sup>	FEFO and FIFO	FEFO and FIFO
	2. Drugs Storage of High Alert and LASA	100% <sup>13</sup>	100%	100%
	3. Appropriate Amount of Tangible Drugs with the Stock Card.	100 % <sup>12</sup>	100%	100%
	4. Turn over ratio.	8-12 times /year <sup>12</sup>	9.94 times/year	2.66 times/year
	5. Level of Drugs Availability	12-18 months <sup>18</sup>	12.9±1.16months	14.2±3.15months
	6. The Average of Stock Out	10 days / 2.7% <sup>12</sup>	26..6 days	16.3 days

Source: Secondary Data Processed

FIFO: First in First Out

FEFO: First Expired First Out

LASA: Look Alike and Sound Alike

### 3.2 Distribution Stage

The indicator used in the stage of distribution was warehouse drugs arrangement storage systems of drugs of High Alert and LASA (Look Alike and Sound Alike); the percentage of total number of tangible drugs with stock card; International Transactions in Operational Research (ITOR), level of drugs availability, stock out of drugs time average; speed of prescription service time. System of drugs storage in Pharmacy Installation in Class C of Regional Hospitals in Ngawi and Banyuwangi regencies have already used FEFO/FIFO systems in full (Tabel II), this matter has already been in accordance with the standard (Pudjaningsih, 1996)<sup>12</sup>. This matter is in line with

the research by (Fakhriadi and friends, 2011)<sup>19</sup>. Other than FEFO/FIFO systems, the arrangement of drugs also combined on the basis of alphabetic of drug' names and form of preparations. All of the drug items of High Alert owned by Class C of Regional Hospitals in Ngawi and Banyuwangi Regencies have been stored correctly in accordance to High Alert drugs storage condition (Satibi and friends, 2019)<sup>13</sup>, it was stored in the separate cupboard with the other drugs and would be labelled by a sticker with logo of High Alert to distinguish it with the other drugs. Storage of LASA drugs has also been stored correctly (Table II) in accordance to the standard (Satibi and friends, 2019)<sup>13</sup>, it is put in a rack of drugs storage with partition for 2 items of drugs and marked by special sticker of LASA (green color of sticker read LASA). Each hospital has different list of LASA. The result of research in Table II shows that the percentage of total number of real drugs appropriate with stock card for the two hospitals are 100%, where this value have been appropriated with the determined standard (Pudjaningsih, 1996)<sup>12</sup>. Result of research (Boku and friends, 2019)<sup>20</sup> obtained the same

value for the percentage of appropriate total number of real goods with the stock card was 100%. As included on Table II, the value of Turn Over Ratio (TOR) in Class C of Regional Hospital in Ngawi Regency was 9.94 times per year, this value has fulfilled the standard of good TOR. Standard value of TOR used in accordance to (Pudjaningsih, 1996)<sup>12</sup> is 8-12 times. The value of TOR in Class C of Regional Hospital in Banyuwangi Regency was 2.66 times per year, where the low value of TOR was because of drug piles (over stock) in the warehouse of drugs. Purchasing of drugs in a big total number at the end of year constitutes a trigger factor of those piles occurred. The measurement of the availability level of drugs in Class C of Regional Hospital in Ngawi Regency was 12.9 months and in Class C of Regional Hospital in Banyuwangi Regency was 14,2 months (Table II). This matter shows that International Financial Reporting Standard (IFRS) of both Regional Hospitals have fulfilled the efficiency standard of drugs level availability according to World Health Organization (WHO) (1993)<sup>18</sup>, it was 12-18 bulan.

That score was smaller if it is compared with the other result (Boku and friends, 2019)<sup>20</sup> that obtained result of drugs availability level as big as 28 months. Result of calculation average of stock out time obtained in Class C of Regional Hospital in Ngawi Regency was 26.6 days and in Class C of Regional Hospital in Banyuwangi Regency was 16.3 days. If it is compared with standard value in accordance to Quick and friends (2012)<sup>21</sup>, it was 10 days, so the drugs management of that indicator has not been efficient. A relatively long time of stock out occurred on the drugs ordered through e-catalog, because the long administration process was different with the drugs purchased regularly<sup>22</sup>.

### 3.3. Use Stage

Result of research of drug management in Class C of Regional Hospitals in Ngawi and Banyuwangi Regencies in use stage is served on Table III.

**Tabel III.** Efficiency and Effectiveness of Drugs Management on the Use Stage Indicator

Stage	Indicator	Comparison Value	Result	
			Class C Regional Hospital	
			Ngawi Regency	Banyuwangi Regency
Using	1. Speed time average of prescription service	≤60 minutes for concoction drugs ≥30 minutes for finished drugs <sup>11</sup>	35.6 minutes (finished drugs) 65minutes (concoction drugs)	40 minutes (finished drugs); 63 minutes (concoction drugs)
	2. Total number of drug items on each prescription.	1.8-2.2 items of drug/pieces of prescription <sup>18</sup>	4,67 items of drug/piece of prescription	4.22 items of drug/pieces of prescription
	3. Percentage of prescription with generic drugs.	82%-94% <sup>18</sup>	56.2%	68.2%
	4. Percentage of antibiotic prescribed	<22% <sup>18</sup>	8.9%	11.65%
	5. Percentage of injection drugs prescribed.	As minimal as possible <sup>18</sup>	0.22%	0.18%
	6. Percentage of drugs prescribed on the basis of formulary.	Minimal of 86%-88% <sup>11</sup>	100%	100%

Indicator used in the use stage is the speed average of prescription service, total number of drug items prescribed; percentage of injection drugs prescribed; drugs percentage prescribed on the basis of the hospital's formulary. The average of the longest prescription service for finished drugs and concoction drugs occurred at 10 am up to 1 pm, due to the doctor has already visited the rooms at that time. If it is compared with the expectation by the Ministry of Health of the Republic of Indonesia (2008)<sup>11</sup> for concoction drugs was less than 60 minutes and for finished drugs was less than 30 minutes, so the drugs management in Class C of Regional Hospitals in Ngawi and Banyuwangi regencies at that indicator have not been effective. The total number of drugs item on each prescription in Class C of Regional Hospital in Ngawi Regency was 4.67 items for each piece of prescription; and in Class C of Regional Hospital in Banyuwangi Regency in outpatients was 4.22 drug items per piece of prescription. That value was still bigger from

the standard value determined by WHO (1993)<sup>18</sup>, so the drug management both in Class C of those Regional Hospitals in this indicator have not been effective. The result of research by Dianingati dan Prasetyo (2017)<sup>23</sup> which was obtained related with the total number of drug items of each piece of prescription was 3.2. Result of research on Table III, shows that drugs percentage called generic on the outpatients in Class C of Regional Hospitals in Ngawi and Banyuwangi Regencies were 56,2% and 68,2%. If it is compared with value standard of Word Trade Organization (WHO) (1993)<sup>18</sup> as big as 82-94%, so the drugs management in both Class C of Regional Hospitals in this indicator have not been effective. Because of the low percentage of those drugs called generic in the E-catalog list, so the hospital was forced to procure brand drugs manually to avoid the stock out of drugs. The percentage of antibiotic prescribing in Class C of Regional Hospitals in Ngawi and Banyuwangi Regencies showed that the result

was appropriate with the standard value in accordance to WHO (1993)<sup>18</sup>, it was less than 22%. This value was lower compared with the previous research as in PKU Muhammadiyah Hospital in Temanggung year 2006-2008 was 43,38% (Fakhriadi and friends, 2011)<sup>19</sup>. The existence of Anti-microbial Resistance Control Program (PPRA) that constitutes the government program in the hospital, was very helpful in controlling antibiotic use at the hospital. Support from Pharmacy and Therapy Committee (PFT) along with Medical Committee in Class C of Regional Hospitals in Ngawi and Banyuwangi Regencies, influence of drugs injection prescribing from related doctor for patients. Result of research as listed in Table III, shows that the total number of injection prescription for outpatients in Class C of Regional Hospitals in Ngawi and Banyuwangi Regencies were 0.22% and 0.18%, where the mentioned value have been appropriated with the standard value in accordance to Quick and friends (1997)<sup>21</sup> were as minimal as possible. There were many drugs injection prescribing given to Diabetes Mellitus (DM) patients by giving insulin injection drug. Percentage of drugs prescribed on the basis of formulary in Class C of Regional Hospitals in Ngawi dan Banyuwangi Regencies obtained the value of 100% (Table III), so the drug management in this indicator at both Class C of Regional Hospitals have been effective. because they have been appropriated with the expected value of the Ministry of Health of the Republic of Indonesia (2008)<sup>11</sup>. This matter showed that doctors in both Class C of Regional Hospitals has obeyed and committed toward the use of formulary in the hospitals in writing of prescription for patients.

#### 4. CONCLUSION

On the basis of the research result, drugs management in Class C of Regional Hospitals in Banyuwangi and Ngawi Regencies in the selection and procurement stages have not been efficient except allocation of drugs procurement in Class C of Regional Hospital in Ngawi Regency, distribution phase has been efficient except the average of stock out time of drugs and Turn Over Ratio (TOR) particularly in Class C of Regional Hospital in Banyuwangi Regency; the stage of usage has not been effective in the average of prescription service speed of time; total number of drugs on each prescription; and the percentage of prescription with the generic drugs.

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