OVERVIEW OF ANTIBIOTIC PRESCRIBING BASED ON AWARE CATEGORY AT FATMAWATI HOSPITAL IN THE PERIOD OF MAY 2024 - NOVEMBER 2024

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ABSTRACT

WHO issued AWaRe guidelines to optimize the use of antibiotics to prevent resistance. This guideline is also used in Indonesia, including hospitals. Fatmawati is one of the government hospitals in DKI Jakarta that has the most patient visits. To describe the prescribing of antibiotics in hospitals. Fatmawati based on the AwaRe category. The design of this study uses a qualitative description with a total sampling method and then analyzed using Microsoft Excel. The most prescribing of antibiotics at Fatmawati Hospital as many as 86,833 were in the watch (61.5%), access (30.7%) and last reserve (7.8%) categories. The most prescribed antibiotics in the access group are metronidazole (25.655%), ampicillin (20.835%), gentamicin (12.273%) with the most prescribed dosage forms being tablets (35.064%), sterile powder (30.123%), infusion (22.154%). In the watch group, the most prescribed are ceftriaxone (26.887%), cefixime (22.363%), levoflosacin (17.492%) with the most prescribed dosage forms being sterile powder (47.992%), capsules (21.463%), infusions (14.232%). In the reserve group, the most prescribed are meropenem (62.405%), cefepime (8.705%), ampiscillin/sulbactam (7.919%) with the most prescribed dosage forms being sterile powder (90.93%), tablets (5.695%), and infusions (4.197%). The results showed that the most antibiotic prescriptions were in the watch group compared to the access category. These findings show that it is necessary to re-evaluate PPAB at the hospital. Fatmawati

| KEYWORDS | antibiotic, hospital, overview |

INTRODUCTION

Some antibiotics have experienced resistance above 50% of their total use, namely ampisillin, co-amoxiclav, tetracycline, sulfonamides, ciprofloxacin, clindamycin and erythromycin (Rahmadi et al., 2024). Drug resistance is estimated to cause 700,000 deaths per year globally, which will reach 10 million by 2050, higher than cancer (8.2 million) and diabetes (1.5 million) (Pauwels, Versporten, Vermeulen, et al., 2021) .The use of newer antibiotics as first-line therapy, where other antibiotics are still effective for use, is one of the most important causes of antibiotic resistance and the emergence of superbug bacteria (Zhang et al., 2018).

In response to the public health crisis arising from AMR, WHO has launched a global action plan, including strategies for monitoring and mitigating the overuse of antimicrobials (Chukwu et al., 2021; Indonesia, 2022). In optimizing the crisis management, the WHO (*World Health Organization*) issued *AWaRe guidelines*, namely *access*, *awareness* and *reserve* (Gaba et al., 2014; Hsia et al., 2019). Antibiotics in the access category are the first or second choice in infection therapy that are easily available at low prices, the watch category is antibiotics that must be applied to a limited group that has a high risk of antibiotic synthesis and the reserve category is the last choice of antibiotics prescribed by a specialist doctor with special monitoring (Lekok et al., 2021; Limato et al., 2021). The guidelines are also used to manage and monitor antibiotic use in many countries including Indonesia (Abdelsalam Elshenawy et al., 2023; Rahmadi et al., 2024).

Indonesia is a middle-income country with a population of 281 million, and it is known that 36.76 million people are receiving outpatient treatment at DKI Jakarta government hospitals and hospitals. Fatmawati is one of the government hospitals in DKI Jakarta (Badan Pusat Statistik, 2024(Mugada et al., 2021)).

RSUP Fatmawati uses the AWaRe guideline as a PPAB to monitor and evaluate the use of antibiotics (Allel et al., 2023; Vikesland et al., 2019). The study was conducted with the aim of describing antibiotic prescribing patterns using AWaRe guidelines (Pauwels, Versporten, Drapier, et al., 2021).

RESEARCH METHODS

Research Design and Population

This study includes a qualitative description with a total sampling research design, namely collecting data on all antibiotic prescriptions in hospitals. Fatmawati.

The data collected is secondary data that aims to decrypt the antibiotics prescribed at Fatmawati Hospital according to the *AWaRe category* in the period May 2024 – November 2024.

Data Analysis

The data were analyzed using Microsoft Excel and univariate and bivariate analyses focused on depicting antibiotic prescribing.

Antibiotics Access Category

Antibiotics in the access category are the first or second choice in infection therapy which are easily available at low prices. The antibiotic grouping in the access category is grouped based on the pattern of antibiotic use used at Fatmawati Hospital issued in 2023.

Table 1. Number of AWaRe Category Recipes

Category	Number of Recipes	%
Access	26.677	30,7
Reserve	6.743	7,8
Watch	53.413	61,5
Total	**86.833**	**100**

The use of antibiotics in the access category at Fatmawati Hospital is 30.77% with a total of 26,677 prescriptions (Table 1). The five most prescribed types of antibiotics are metronidazole (25.655%), ampicillin (20.835%), gentamicin (12.273%), isoniazid (6.106%) and rifampicin (5.945%) (Table 3) and the most widely used types of preparations are tablets (35.064%), sterile powders (30.123%), infusions (22.154%) and capsules (6.552%) with a total of 9,354 prescriptions (Table 2).

Table 2. Types of Prescribed Preparations

Types of Preparations	Access	%Access	Watch	%Watch	Reserve	%Reserve	Total	%Total
Ampoule	989	3,707	2.222	4,160			3.211	3,698
Cream	50	0,187					50	0,058
Infusion	5.910	22,154	7.602	14,232	283	4,197	13.795	15,887
Caplets	7	0,026	516	0,966			523	0,602
Kapsul	1.748	6,552	11.464	21,463			13.212	15,215
Salep	88	0,330					88	0,101
Eye Ointment	324	1,215					324	0,373
Sterile Powder	8.036	30,123	25.634	47,992	6.075	90,093	39.745	45,772
Dry Syrup	140	0,525	429	0,803			569	0,655
Tablet	9.354	35,064	3.206	6,002	384	5,695	12.944	14,907
Eye drops	29	0,109	1.999	3,743	1	0,015	2.029	2,337
Ear Drops	2	0,007	341	0,638			343	0,395
Grand Total	**26.677**	**100**	**53.413**	**100**	**6.743**	**100**	**86.833**	**100**

Table 3. Percentage of Antibiotic Use in Access Category

No	Types of Antibiotics	% Access
1	Metronidazole	25,655
2	Ampisilin	20,834
3	Gentamicin	12,273

4	Isoniazid	6,106
5	Rifampicin	5,945
6	Ciprofloxacin	5,885
7	Etambutol	5,814
8	Trimethoprim/Sulfamethoxazole	3,074
9	Pyrazinamide	2,841
10	Amoxicillin	2,605
11	Clindamycin	2,568
12	Cefadroksil	1,799
13	Erythromycin	1,612
14	Sulfadiazine	0,828
15	Chloramfenikol	0,581
16	Procain Benzil Penisilin	0,420
17	Doxycycline	0,379
18	Streptomycin	0,206
19	Rifampicin/Isoniazid/Pyrazinamide/Ethambutol	0,127
20	Ethambutol	0,105

Antibiotics Watch Categories

Antibiotics in the watch category are antibiotics that should be applied to a limited group that has a high risk of antibiotic synthesis (Van den Bosch et al., 2016) and its use under strict supervision The antibiotic grouping in the watch category is grouped based on the pattern of antibiotic use used at Fatmawati Hospital issued in 2023.

Table 4. Percentage of Antibiotic Use in the Watch Category

No	Types of Antibiotics	%watch
1	Ceftriaxone	26,887
2	Cefixime	22,363
3	Levofloxacin	17,492
4	Sefazolin	8,427
5	Cefoperazon	5,703
6	Amikacin	4,160
7	Amkoxycillin-Asam Clavulanate	4,156
8	Cefotaxime	3,368
9	Azithromisin	2,913
10	Ciprofloxacin	1,846
11	Tobromycin	1,402
12	Ofloksas	0,625
13	Cefuroxime	0,275
14	Neomisin Sulfate/Polymixin Sulfate	0,227
15	Neomisin Sulfate	0,103

16	Fosfomycin	0,026
17	Cefazoline	0,017
18	Clarithromycin	0,004
19	Neomisin Sulfate/Polymixin Sulfate/Gramicidin	0,004
20	Clindamycin	0,002

The use of antibiotics in the watch category at Fatmawati Hospital was 61.5% with a total of 53,413 prescriptions (Table 1) with the most prescribed type of antibiotic being ceftriaxone at 26.887% (Table 4) and the most widely used type of preparation was sterile powder (25.634%), capsules (21.463%), infusions (14.232%), tablets (6.002%) and ampoules (4.160%) with a total of 26,634 prescriptions (Table 2).

Reserve Category Antibiotics

Reserve antibiotics are the antibiotics of last resort prescribed by a specialist with special monitoring. This category selection is given to patients who are suspected or confirmed to be infected with bacteria that are already resistant to many antibiotics when all other antibiotic alternatives have failed or are not in accordance with the patient's clinical condition. The grouping of antibiotics in the reserve category is grouped based on the pattern of antibiotic use used at Fatmawati Hospital issued in 2023. and given to patients must be through PPRA permission.

The use of antibiotics in the watch category at Fatmawati Hospital was 7.8% with a total of 6,743 prescriptions (Table 1) with the most prescribed type of antibiotic being meropenem at 62.405% (Table 5) and the most widely used type of preparation was sterile powder (45.772%), tablets (5.695%), infusions (4.197%) and eye drops (0.015%) with a total of 39,745 prescriptions (Table 2).

Table 5. Percentage of Antibiotic Use in the Reserve Category

No	Types of Antibiotics	%Reserve
1	Meropenem	62,405
2	Cefepime	8,705
3	Ampicillin/Sulbactam	7,919
4	Moxifloxacin	4,820
5	Vancomycin	4,716
6	Linezolid	4,672
7	Ceftazidime	2,996
8	Tigecycline	1,691
9	Fosfomycin	0,979
10	Piperacillin-Tazobactam	0,638
11	Azetronam	0,326
12	Cefoperazone-Sulbactam	0,059
13	Imipenem-Cilastazine	0,059
14	Azithromisin	0,015

Discussion

Based on a survey in major hospitals in the world on the prescription of antibiotics in the access category is below 28% and not in accordance with the WHO target adopted in Indonesia at least 60% of prescriptions while in Indonesia in 2022, the prescription of antibiotics in the Access category (66.82%) is in accordance with the prescription target, Watch 33.13% and Reserved 0.05%.

Antibiotic prescriptions at Fatmawati Hospital in the period May 2024 - November 2024 are 88,833. Percentage of prescribing antibiotic use in hospitals. Fatmawati in the period of May 2024 – November 2024 found that the most prescribed watch category was 53,413 (61.5%), the access category was 26,677 (35.7%), and finally the reserve category was 6,743 (7.8%). This is because ceftriaxone is used the most because it is used in almost all major indications in Indonesia such as CAI, HAI, surgical prophylaxis, first-line and second-line therapy in bacterial infections. Likewise, at Fatmawati Hospital, it is known that the most prescribed is ceftriaxone (can be seen in graph 1) at 16.539% and the prescribed form of ceftriaxone preparation is sterile powder at 36.133% (can be seen in table 7). At the hospital. Fatmawati, ceftriaxone given parentally is a watch.
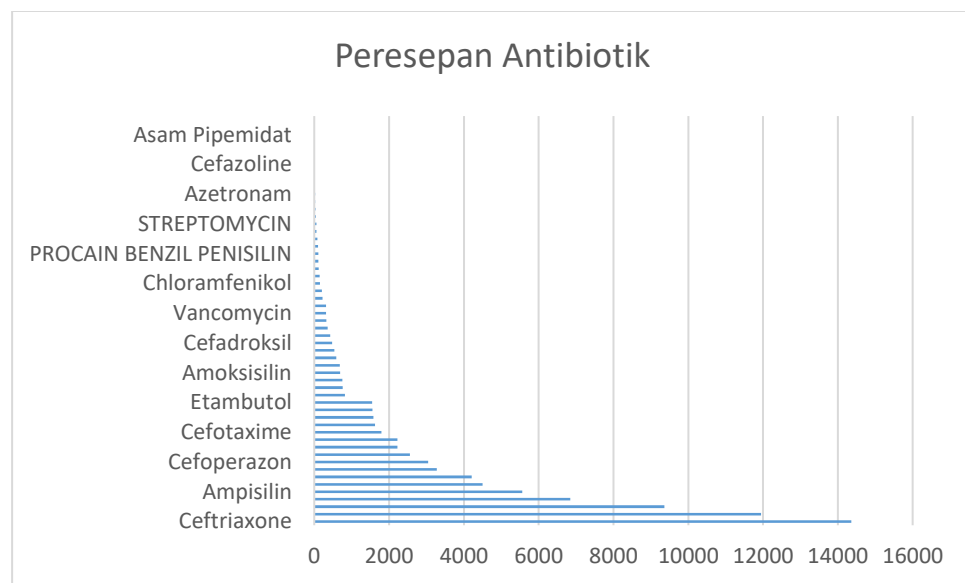
Graphic 1. Prescribing the 20 Most Prescribed Types of Antibiotics

The second most prescribed antibiotics were cefixime which was a watch category of 13.756% with capsule preparations 86.762%; dry syrup 70.299% and caplet 15.679%. The third most prescribed antibiotic prescription is levofloxacin (10.785%) with eye drops 53.376%, infusion 47.959%; tablets 12.701% and sterile powder 0.055%.

Antibiotics in the watch category are prescribed by a specialist doctor, the specialist dentist is then reviewed by a pharmacist and approved by a member of the Antimicrobial Resistance Control Committee (KPRA) set by the hospital leadership.

Table 6. Top 20 Most Prescribed Types of Antibiotics

No	Types of Antibiotics	%Access	%Watch	%Reserve	% Total
1	Ceftriaxone		26,887		16,539
2	Cefixime		22,363		13,756
3	Levofloxacin		17,492		10,785
4	Metronidazole	25,655			7,882
5	Ampisilin	20,834			6,401
6	Sefazolin		8,427		5,184
7	Meropenem			62,405	4,846
8	Gentamicin	12,273			3,770
9	Cefoperazon		5,703		3,508
10	Ciprofloxacin	5,885	1,846		2,944
11	Amikacin		4,160		2,559
12	Amkoxycillin-Asam Clavulanate		4,156		2,557
13	Cefotaxime		3,368		2,072
14	Isoniazid	6,106			1,876
15	Rifampicin	5,945			1,826
16	Azithromisin		2,913		1,793
17	Etambutol	5,814			1,786
18	Trimethoprim/Sulfamethoxazole	3,074			0,944
19	Pyrazinamide	2,841			0,873
20	Tobromycin		1,402		0,863

The fourth most prescribed antibiotic prescription is metronidazole which is in the access category of 7.882% with an infusion preparation type of 42.842% and tablets 7.216%. The fifth most prescribed antibiotic prescription is ampicillin (6.401%) with a sterile powder preparation type of 11.325%. Cefixime and levofloxacin antibiotics are antibiotics in the watch category at RSUP. Fatmawati.

Antibiotics in the access category are prescribed based on clinical practice guidelines and applicable antibiotic use guidelines. The prescription of antibiotics in the reserve category is meropenem 62.405% with a sterile powder preparation type of 10.587%. Reserve category antibiotics are prescribed to treat bacterial infections caused by MDRO and are the last option in severe, life-threatening and closely monitored infections.

Table 7. Percentage of the 20 most prescribed antibiotics

No	Jenis Antibiotik	% Bulb	% Infusion	% Caplets	% Kapsul	% Salep	% Eye Ointment	% Sterile Powder	% Dry Syrup	% Tablet	% Eye drops	% Ear Drops
1	Ceftriaxone							36,133				

No	Antibiotic										
2	Cefixime			15,679	86,762				70,299		
3	Levofloxacin		47,959					0,055		12,701	53,376
4	Metronidazole		42,842							7,216	
5	Ampisilin							13,984			
6	Sefazolin							11,325			
7	Meropenem							10,587			
8	Gentamicin	30,8				35,227	2,469	5,651			
9	Cefoperazon							7,664			
10	Ciprofloxacin		7,148	1,338							0,583
11	Amikacin	69,2									
12	Amcoxisilin-That's how it's in Klavula.			82,983				4,421	5,097		
13	Cefotaxime							4,526			
14	Isoniazid									12,585	
15	Rifampicin									12,253	
16	Azithromisin									12,029	
17	Etambutol									11,982	
18	Trimetoprim/ Sulfamethoxazole									6,335	
19	Pyrazinamide									5,856	
20	Tobromycin										36,915

Non-compliance with the target of prescribing access categories can be affected by many factors, such as the mixture of patient cases, the prevalence of different types of infections, AMR patterns, and external factors such as insurance. In addition, Indonesia is a low-middle income country with significant challenges related to lack of basic infrastructure and equipment, large number of patients, and shortage of health workers with high staff turnover and poor job satisfaction.

CONCLUSION

The prescription of antibiotics at RSUP Fatmawati follows the AWaRe guidelines, with the majority falling into the "Watch" category (53,413; 61.5%), followed by the "Access" category (26,677; 35.7%) and the "Reserve" category (6,743; 7.8%). Ceftriaxone was the most prescribed antibiotic (16.539%), and the most commonly used dosage form was sterile powder (45.772%). It is recommended that the antibiotic usage guidelines, particularly for AWaRe categories, be evaluated, as the prescriptions in the "Watch" category exceed those in the "Access" category. This study received ethical approval from the RSUP

Fatmawati ethics committee, was self-funded, and includes no transparency declarations.

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