

Antibiotic Utilization Patterns at Sidorejo Kidul Community Health Center, Salatiga City in April 2025

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ABSTRACT

Inappropriate antibiotic use remains a serious public health problem, contributing to increasing rates of bacterial resistance, including multidrug resistance. Although the government has issued official guidelines through Minister of Health Regulation No. 28 of 2021, approximately 60% of Indonesians do not use antibiotics rationally (Yunivita et al., 2024). This study aims to determine the pattern of antibiotic use among outpatients at the Sidorejo Kidul Community Health Center during April 2025. The population in this study was all outpatients receiving antibiotics, with a sample consisting of total patient data that met the criteria. The variables studied included the name of the antibiotic, dosage form, dosage strength, dosage instructions, number of doses administered, and diagnosis or indication for antibiotic use. This study is a descriptive quantitative study with retrospective data collection, namely analysis using a data collection method based on antibiotic use data among patients at the Sidorejo Kidul Community Health Center. Based on the results of the study, it was found that the use of antibiotics was more in female patients than in male patients, namely 60.9%, then for the age group that received the most antibiotics was > 41 years with a percentage of 39.9%, the most widely used antibiotic group was the penicillin group, especially amoxicillin, followed by the fluoroquinolone and cephalosporin groups, the most widely used dosage form was tablets. Thus, it can be concluded that the Pattern of Antibiotic Use at the Sidorejo Kidul Community Health Center is dominated by amoxicillin in tablet form in adult patients and is in accordance with the reference and diagnosis of the disease.

Keywords: Antibiotics, Infection, Community Health Center

INTRODUCTION

Inappropriate antibiotic use remains a serious public problem, contributing to rising rates of bacterial resistance, including multidrug resistance. Although the government has issued official guidelines through Minister of Health Regulation No. 28 of 2021, the reality is that approximately 60% of Indonesians do not use antibiotics rationally (Yunivita et al., 2024). This demonstrates the importance of evaluating antibiotic use patterns in primary healthcare facilities, particularly community health centers (Puskesmas). Antibiotics are drugs used to prevent and treat infections. Infections are caused by bacteria. Infectious diseases are diseases caused by microorganisms as a response to stimulation of the immune system (Emelda et al., 2023).

Antibiotics are the primary treatment for infectious diseases. While the benefits of antibiotics are undeniable, excessive use can quickly lead to the emergence of antibiotic-resistant bacteria, diminishing their effectiveness. Antibiotic resistance, especially multidrug resistance, is a challenging problem to overcome in patient care. This occurs as a result of inappropriate antibiotic use, including inappropriate dosage, type, and duration, leading to bacterial resistance. (Rista et al., 2022).

More detailed information on antibiotic selection in specific cases is contained in the Antibiotic Use Guidelines. These guidelines are expected to support health services in

achieving antimicrobial resistance control, appropriate, effective, efficient, and safe antibiotic use in public health services, and rational use in Indonesia (Permenkes 2021).

Based on a WHO (*World Health Organization*) survey, bacterial resistance has a high rate in the Southeast Asia region, such as infections caused by *Staphylococcus aureus* bacteria that are resistant to the antibiotic methicillin, therefore its function is reduced. Antibiotic resistance occurs when bacteria can no longer respond to drugs to kill them, so it becomes a specific challenge for global public health, which requires good methods to eradicate the spread of organisms that cause infections that are resistant to existing antibiotics. Such as the occurrence of problems with morbidity and mortality rates increased, costs and length of treatment, side effects from the use of more than one drug increased, and high doses. The spread of inappropriate use of antibiotics and minimal public insight so that the use of antibiotics is assumed for all diseases even though caused by viruses, such as flu, cough, and fever, thus expanding the occurrence of antibiotic resistance. (Sumberagung, 2023).

The overall incidence of antibiotic resistance for primary care use in children with urinary tract infections caused by *E. coli* was higher in OECD (Organization for Economic Cooperation and Development) countries: ampicillin 79.8%, co-amoxiclav 60.3%, ciprofloxacin 26.8%, and nitrofurantoin 17.0%. The incidence of macrolide resistance was higher than azithromycin compared with the placebo group, namely 7.4 times higher at 36 months and 7.5 times higher at 48 months (Putri et al., 2023).

The 2023 SKI results show that 22.1% of the population still used oral antibiotics in the past year, with 41.0% of them obtaining them without a prescription. Eighteen provinces in Indonesia (mostly in central and eastern Indonesia) had a proportion of oral antibiotics obtained without a prescription above the national average (41.0%). Meanwhile, the Special Region of Yogyakarta (DIY) province had the lowest proportion of oral antibiotics obtained without a prescription. (KEMENKES, 2023).

Acute apical periodontitis is an inflammatory condition that occurs in the teeth, alveolar bone, cementum, and ligaments. Acute apical periodontitis is caused by a microbial infection and is one of the most prevalent dental and oral diseases worldwide. Acute conjunctivitis is inflammation of the conjunctiva or swelling of blood vessels that causes pain, itching, and discharge from the eyes. Acute nasopharyngitis, or respiratory tract infection, is a disease that includes rhinitis, sinusitis, pharyngitis, laryngitis, epiglottitis, tonsillitis, and otitis media. If the infection is not treated properly, the infection can progress and cause lower respiratory tract infections. Acute pyoderma is a disease caused by *Staphylococcus aureus* and *Streptococcus* bacteria. Pharyngitis is classified as an acute respiratory infection that causes inflammation or infection in the pharynx (throat). Common symptoms of pharyngitis include fever, accumulation of exudate in the tonsils, painful swelling of the lymph nodes in the neck, and difficulty swallowing (Untari et al., 2024).

Coughing is a defense mechanism of the body, but it can also be a symptom of an illness or a reaction to irritation in the throat caused by mucus, food, dust, smoke, and so on. Coughs are generally divided into two types: phlegmy coughs and dry coughs. Phlegmy coughs are caused by infections by microorganisms or viruses (Walujo et al., 2023). Acute pharyngitis is an acute infection or inflammation of the pharyngeal mucosa, generally extending to the surrounding tissue. Acute pharyngitis is generally caused by viruses (40–60%) and bacteria (5–40%) (Yuniar et al., 2017).

A furuncle (boil) is a bacterial infection involving the perifollicular tissue that usually arises from pre-existing folliculitis. It appears as a painful, red swelling around the follicle opening and can develop into an abscess. Cystitis, commonly known as a bladder infection,

primarily affects the bladder. It is common in young, sexually active women, with *Escherichia coli* being the most common causative pathogen..

Upper Respiratory Tract Infection (URTI) or commonly known as Acute Upper Respiratory Tract Infection (URTI) is an infection of the respiratory tract above the larynx, which is the main cause of morbidity and mortality in children under five years of age (Maharani et al., 2017) .

Dyspepsia is a collection of symptoms that indicate disease/disorders of the upper digestive tract (Yonata et al., 2025) While acute nasopharyngitis, or inflammation of the nose and throat, the main cause of nasopharyngitis in most patients is viral infection and bacterial infection (Fadhila et al., 2020).

Hordeolum is an acute bacterial infection most often by *Staphylococcus aureus* that occurs on the eyelid (Cahyana et al., 2023). Chalazion is a lipogranuloma or chronic non-infectious inflammation of the eyelid, in the form of a nodule that forms due to inflammation and obstruction of the meibomian glands (Nabila Rahmat et al., 2024).

Mumps, or epidemic parotitis, is a common disease of the salivary glands. This disease is self-limiting, causing swelling and pain in the parotid glands, submandibular glands, and sometimes other salivary glands. Swelling in the parotid glands can be unilateral or bilateral. The clinical picture of mumps is swelling in the salivary glands accompanied by pain (parotitis). Parotid gland swelling is generally bilateral, but in the early stages of mumps, the swelling occurs unilaterally. In about 10% of cases, swelling occurs in the submandibular glands. Generally, swelling occurs around 7 days and will gradually subside. In addition to salivary gland swelling, sufferers also experience fever, lethargy, headache, and sometimes trismus. (Mersil & Dhia, 2023).

METHOD

Types of Research

This research is included in the type of quantitative descriptive research with retrospective data collection, namely analysis with a data collection method based on data on antibiotic use in patients at the Sidorejo Kidul Community Health Center.

Place and Research

Research Location

The research was conducted at the Sidorejo Kidul Community Health Center

Research Time

The research was conducted on April 7-28, 2025

Population and sample

Population, All patients at Sidorejo Kidul Community Health Center in Salatiga City who received antibiotic therapy.

Sample , All patients at Sidorejo Kidul Community Health Center who received antibiotic therapy during the period April 7-28, 2025.

Research Variables

The research variable is a single variable of antibiotic use patterns, which describes the use of antibiotics in all patients in the April period at the Sidorejo Kidul Community Health Center, including the name of the antibiotic, dosage form, dosage strength, rules of use and the amount of administration.

Inclusion criteria for the study include:

- a. Patient Type :All Outpatients at Sidorejo Kidul Community Health Center
- b. Drug Therap : Patients receiving Antibiotic therapy
- c. Time Period : Patient data in the research period from April 2025

- d. Exclusion Criteria for the Study Include:
- e. Patient Type : Data on patients who are not outpatients at the Sidorejo Kidul Community Health Center
- f. Drug Therapy : Data on patients who did not receive antibiotics
- g. Time Period : Data on patients outside the study period of April 2025

RESULTS AND DISCUSSION

Based on Table 1, the results of a study at the Sidorejo Kidul Community Health Center on 243 patients with antibiotic usage data, the following patient characteristics were obtained. The number of female patients was found to be higher than male patients, with a total of 60.9% compared to 39.0% of patients. Judging from the age group data on antibiotic use, it is known that the highest antibiotic use was found in patients over 41 years old with a percentage of 39.9%, while the lowest use was in the 21-30 year age group with a percentage of 25%. In general, the method of use of antibiotics prescribed was a single-use antibiotic used by patients with a percentage of 100%. The most commonly prescribed antibiotic class was penicillin with a percentage of 67.0% followed by the cephalosporin group at 44%, the fluoroquinolone group at 33% and sulfonamides with a percentage of 3% of total use. This indicates that the penicillin group, especially amoxicillin antibiotics, is the main therapeutic choice used at the Sidorejo Kidul Community Health Center.

Table 1 Demographic Characteristics, antibiotic use patterns based on class and route of administration in patients at Sidorejo Kidul Community Health Center

Patient Characteristics	Total (N=243)	Percentage (%)
Gender		
Male	95	39,0
Female	148	60,9
Age (years)		
0-10	53	21,8
11-20	35	14,4
21-30	25	10,2
31-40	29	11,9
>41	97	39,9
Route of Administration		
Single	243	100%
Combination		
Antibiotic Classes		
Penicillin	163	67,0
Cephalosporin	44	18,1
Floroquinolone	33	13,5
Sulfonamide	3	1,2

Table 2 shows the analysis of antibiotic suitability compared to the guidelines used, namely PERMENKES and DIH. It is known that most diagnoses such as acute apical periodontitis, acute pyodermitis, allergic contact dermatitis, atopic dermatitis, bitten or stung by non-venous insects, chronic periodontitis, diseases of the upper respiratory tract, dyspepsia, acute nasopharyngitis, acute pharyngitis, impetiginization of other dermatoses, dermatitis infections, injury of a specified body region, received therapy according to standards with a compliance rate of 100%. However, there were diagnoses that did not meet the standards in the antibiotic use guidelines, such as in cases with a diagnosis of acute conjunctivitis should use chloramphenicol eye drops or eye ointment, but was given orally with a different antibiotic

class, so the compliance rate with the guidelines was 0%. Several other cases such as acute nasopharyngitis showed compliance of 81% and cutaneous abscess furuncle and carbuncle at 40%, this shows a percentage below 100%.

Overall, the results of this study show that the majority of antibiotic use at the Sidorejo Kidul Community Health Center met applicable standards. However, there were still several diagnoses where antibiotic use was clearly inappropriate. This serves as a guideline for evaluation to improve antibiotic prescribing accuracy in primary healthcare practices.

Table 2 antibiotic appropriateness based on the Guideline of PERMENKES No. 5 of 2014 (Clinical Practice Guidelines for Doctors in Primary Health Care) and Drug Information Handbook

Diagnosis	Antibiotic	A Standard Antibiotics of PERMENKES and DIH	Percentage
Acute Apical Peridentitis	Amoxicillin	Amoxicillin, Ciprofloxacin	100%
Acute Conjunctivitis	Amoxicillin syrup	Chloramphenicol eye drops and Chloramphenicol eye ointment	0%
Acute Lymphadenitis	Amoxicillin syrup and Ciprofloxacin	Amoxicillin, Erythromycin, Cephalexin, Flucloxacillin	100%
Acute Nasopharyngitis	Amoxicillin, Cefadroxil, Ciprofloxacin	Amoxicillin, Erythromycin, Cefadroxil	81%
Acute Peridontitis	Amoxicillin	Amoxicillin, Ciprofloxacin	100%
Acute Pharyngitis	Amoxicillin syrup	Amoxicillin, Erythromycin,	93%
Acute Pyodermitis	Amoxicillin	Amoxicillin, Ciprofloxacin	100%
Acute Sinusitis	Amoxicillin	Cefadroxil	0%
Acute Tonsillitis	Cefadroxil	Amoxicillin, Erythromycin, Cefadroxil	100%
Acute Upper Respiratory Infection	Amoxicillin syrup	Amoxicillin, Erythromycin	100%
Allergic Contact Dermatitis	Amoxicillin	Amoxicillin, Ciprofloxacin	100%
Atopic Dermatitis	Amoxicillin	Amoxicillin, Ciprofloxacin	100%
Bitten Or Stung by non Venous Insect	Amoxicillin	Amoxicillin	100%
Common Cold	Amoxicillin syrup	Amoxicillin, Erythromycin, Cefadroxil	100%
Conjunctivitis	Cefadroxil, Ciprofloxacin	Chloramphenicol eye drops and	0%

Diagnosis	Antibiotic	A Standard Antibiotics of PERMENKES and DIH	Percentage
		Chloramphenicol eye ointment	
Cough	Cefadroxil, Amoxicillin	Do not use antibiotics	0%
Cough Pharyngitis	Acute Cefadroxil	Amoxicillin, Erythromycin, Cephalosporin	0%
Cronic Periodentitis	Amoxicillin	Amoxicillin, Ciprofloxacin	100%
Cutaneous Furuncle Curbuncle	Abses and Cefadroxil, Ciprofloxacin	Amoxicillin, Erythromycin, Cephalosporins	40%
Cystitis	Amoxicillin	Ciprofloxacin	0%
Disaese of Upper Respiratory Tract	Amoxicillin,	Beta-Lactam, Amoxicillin, Ampicillin	100%
Dispepsia nasopharyngitis	acute Amoxicillin syrup	Amoxicillin, Erythromycin	100%
Fever other anknow Origin	and Amoxicillin, Cefadroxil, Ciprofloxacin, Co-trimoxazole	Do not use antibiotics	0%
Hordeolum Calazion	and Cefadroxil	Erythromycin	0%
Acute pharyngitis	Amoxicillin	Amoxicillin, Erythromycin	100%
Impetriginalzation of other dermatoses	Amoxicillin	Amoxicillin, Erythromycin, Cephalosporins	100%
Dermatitis infection	Amoxicillin	Amoxicillin, Erythromycin, Cefadroxil	100%
Injury of anspesified bodyregion	Amoxicillin	Amoxicillin, Ceftriaxone, Metronidazole	100%
Mumps	Amoxicillin	Amoxicillin, Chloramphenicol, Doxycycline	100%
Nail Disorder	Cefadroxil, Ciprofloxacin	Topical Co-trimoxazole	0%

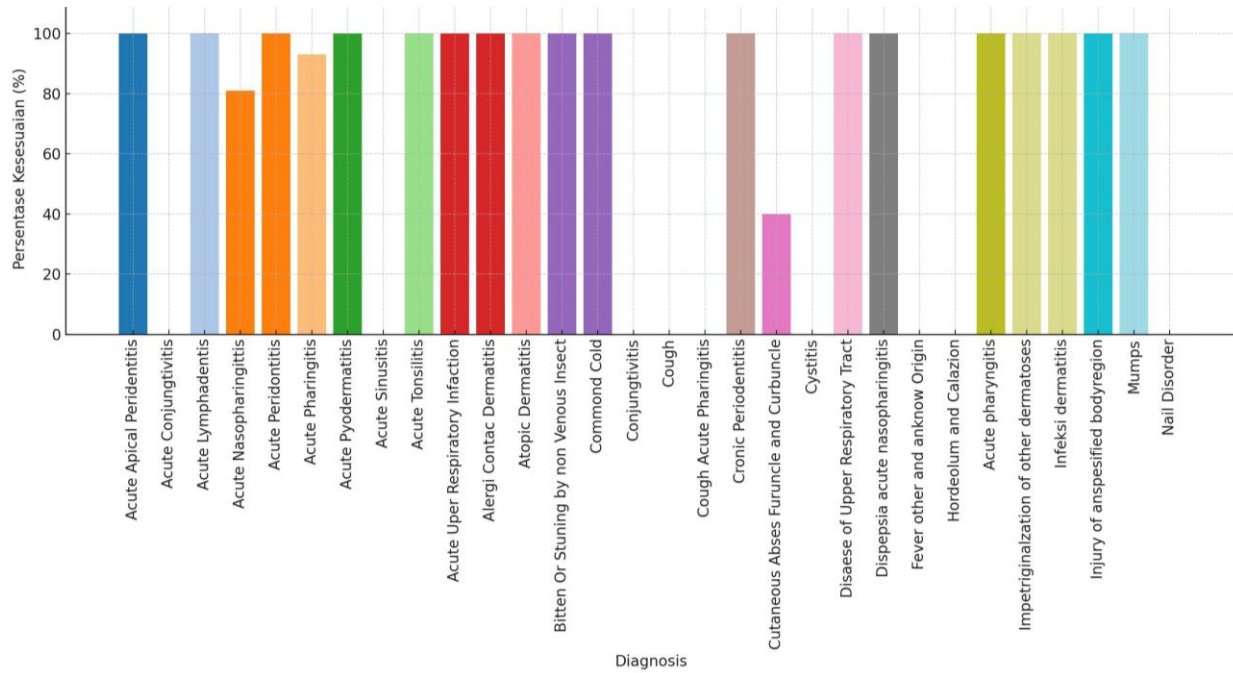


Figure 1 Bar Diagram of Antibiotic Accuracy Based on Guideline

In cases of acute apical periodontitis, antibiotic compliance reached 100%. This is consistent with the literature, which states that amoxicillin is the first-line therapy, while ciprofloxacin can be used as an alternative, especially in cases with gram-negative bacterial infections. (Prakasam et al., 2012). These results indicate that health workers at the Community Health Center have followed the guidelines well for this diagnosis.

In contrast, in cases of acute conjunctivitis, antibiotic compliance was only 0%. All patients were given systemic antibiotics (amoxicillin or ciprofloxacin), even though national guidelines recommend the use of topical antibiotics such as eye drops or chloramphenicol ointment. (Putri Dewi et al., 2023). This irrationality not only risks increasing systemic side effects but can also accelerate the emergence of antibiotic resistance.

The diagnosis of acute nasopharyngitis showed an 81% concordance rate. The antibiotics used were mostly amoxicillin and cefadroxil, in accordance with the Ministry of Health's recommendations. However, ciprofloxacin was also used, which is not recommended. These results indicate that while most practices are appropriate, there is still variation in antibiotic selection that can potentially lead to resistance.

For acute pharyngitis, antibiotic compliance reached 93%, with amoxicillin as the primary therapy. However, a small proportion of cases still used ciprofloxacin, which should not be first-line therapy. Similar findings were observed for several other infectious diseases, such as furuncles, hordeola, chalazia, cystitis, and otitis externa, where deviations from guidelines were found, both in the form of inappropriate antibiotic use and the use of antibiotics for conditions that do not require antibiotic therapy.

One significant finding was that in the diagnosis of cough and fever of unknown origin (FUO), all patients were still prescribed antibiotics despite guidelines stating that these conditions do not require antibiotic therapy. This reflects irrational overprescribing and may contribute to increasing rates of antibiotic resistance.

Several other diagnoses, such as the common cold, upper respiratory tract infection (URTI), chronic periodontitis, pneumonia, and cellulitis, demonstrated 100% compliance with

guidelines. This indicates that antibiotic administration at the community health center (Puskesmas) for these clearly bacterial infections is in accordance with standard therapy..

However, in some conditions such as scabies, atopic dermatitis, vulvitis, and soft tissue disorders, antibiotics are still used even though guidelines do not recommend their use. Inappropriate antibiotic administration for these non-bacterial conditions has the potential to increase resistance rates and burden patients with the risk of unnecessary side effects.

CONCLUSION

Based on the results of research on the Pattern of Appropriateness of Antibiotic Use at Sidorejo Kidul Health Center in the Period of April 7-28, 2025 on 243 patients, it can be concluded that the use of antibiotics is more in female patients than male, namely 60.9%, then for the age group that received the most antibiotics was > 41 years with a percentage of 39.9%, the most widely used antibiotic group is the penicillin group, especially amoxicillin followed by the fluoroquinolone and cephalosporin groups, the most widely used dosage form is tablets. Thus, it can be concluded that the Pattern of Appropriateness of Antibiotic Use at Sidorejo Kidul Health Center is dominated by amoxicillin in tablet form in adult patients and is in accordance with the reference and diagnosis of the disease.

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