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Descriptive Analysis of the Incidence of Acute Respiratory Tract Infection (ARI) Based on Patient Characteristics in the Working Area of the Tlogosari Kulon Health Center in 2025

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Abstract

Acute Respiratory Tract Infections (ARIs) are still one of the major public health problems with high incidence rates, especially in areas with high population density and intense community activity. The Tlogosari Kulon Health Center is one of the first level health service facilities in Semarang City which has a fairly high burden of ISPA cases.

This study aims to describe the incidence of ISPA based on the characteristics of age, gender, area of residence, and type of diagnosis of ISPA in patients in the working area of the Tlogosari Kulon Health Center in 2025. This study uses a quantitative design with a descriptive approach, using secondary data obtained from the medical records of ISPA patients for the period January-June 2025.

Data analysis was carried out descriptively and presented in the form of frequency and percentage distributions. The results showed that out of a total of 4,927 cases of ARI, the adult age group was the group with the highest proportion (43.9%), followed by children (41.4%) and the elderly (14.6%). Based on gender, cases of ISPA were more commonly found in women (58.1%) than men (41.9%). The areas with the highest number of cases are Muktiharjo Kidul Village (52.7%) and Tlogosari Kulon (32.6%). Most cases are diagnosed as upper ARIs (99.5%), with the most diagnoses being J06 (multiple and non-specific acute upper respiratory tract infections).

The incidence of Acute Respiratory Infection (ARI) in the working area of the Tlogosari Kulon Health Center is still dominated by the productive age group and children, with a higher proportion in women and areas with high population density. The majority of cases were upper ISPA of mild to moderate severity, indicating an important role of demographic and environmental factors in the pattern of ISPA occurrence. Therefore, it is necessary to strengthen promotive and preventive efforts through PHBS education, early screening, periodic case monitoring, as well as cross-sector collaboration and community empowerment to reduce the incidence of ISPA in a sustainable manner.

Keywords: Acute Respiratory Tract Infection (ARI), Age, Clear Genitals, Area of Residence, Tlogosari Kulon Health Center

INTRODUCTION

Acute Respiratory Tract Infections (ARI) still make a significant contribution to the number of illnesses, and to date the disease is still a major public health problem, both in developed and developing countries. Susceptibility to Acute Respiratory Infections is further exacerbated by the unification of several risk factors that are global in nature.

Climate change and air pollution have an important influence. *World Health Organization* (WHO) estimates that air pollution from outdoor and household sources simultaneously is responsible for about 7 million premature deaths each year, increasing the risk of respiratory infections (1). Rapid urbanization and high population density facilitate the transmission of respiratory pathogens, as evidenced by the COVID-19 pandemic and influenza outbreaks.

Indonesia as one of the developing countries has a very high number of ISPA cases. Based on the 2023 Indonesian Health Survey (SKI), it appears that provinces with a high number of ISPA cases reflect significant health challenges. Some provinces such as West Java, East Java, and Central Java show very high number of cases, which is caused by population density and environmental factors that affect the spread of the disease (2).

Based on data from the Central Java Data Portal, the proportion of ISPA by age group in 2024 will reach 3,991,408 cases, an increase from 3,360,366 cases in 2023.

The discovery of ISPA cases in Semarang City in 2023 is 252,767 cases, 69,833 of which cases are in toddlers. Data from the Semarang City Health Office shows that throughout 2024 there will be more than 421 thousand cases of Acute Respiratory Infections (ARI). Meanwhile, until mid-2025 the number of cases will reach 154,883 cases, with an average of 5,000 - 8,000 cases per week, which indicates that the transmission of ISPA is still very high and requires cross-sectoral handling. This shows that there is an increase in the incidence of ISPA cases every year in Semarang City.

Tlogosari Kulon Health Center is one of the first level health facilities in Semarang City that has coverage of densely populated areas and high community activities. This area is also included in areas that have the potential to be exposed to air pollution due to transportation activities and residential density. This condition is suspected to be related to the high incidence of ISPA in the work area of the health center. This is supported by case data obtained from the health center. Based on epidemiological data presented in the statistical report on cases of Acute Respiratory Infection (ARI) in the Tlogosari Kulon work area, a comparative analysis of morbidity dynamics between 2024 and 2025 can be conducted. Quantitatively, the average monthly prevalence in 2024 was recorded at 1,282 cases, calculated from a total accumulation of 15,385 cases over twelve months. Meanwhile, in 2025, data shows a monthly average of 1,150 cases with a total accumulation of 13,802 cases. This comparison indicates a fluctuating decrease in the overall trend of disease incidence, where the average monthly case in 2025 will be reduced by about 10.3% compared to the previous year.

In 2024, the peak incidence occurred in March with 1,788 cases, which was then followed by a downward trend until it reached a low point in June. On the other hand, in 2025, although the annual average figure decreased, there was a fairly sharp spike in cases at the beginning of the year, namely in January with 1,494 cases, and there was a more moderate fluctuation in the second to third quarters. This annual average decrease reflects any success in public health management or changes in environmental factors affecting the transmission of infectious agents in the Tlogosari Kulon region, although vigilance against monthly fluctuations remains necessary to mitigate the risk of further transmission. In addition, individual characteristic factors such as age and gender are also thought to play a role in influencing susceptibility to ISPA.

Based on this background, this study aims to describe the characteristics of the incidence of Acute Respiratory Tract Infection (ARI) based on age, gender, area of residence, and type of diagnosis of ISPA in patients in the working area of the Tlogosari Kulon Health Center in 2025.

RESEARCH METHODOLOGY

This study uses a quantitative design with descriptive analysis. The data used is secondary data obtained from the patient's medical records in the working area of the Tlogosari Kulon Health Center in the period from January to June 2025. The data includes patient characteristic information including age, gender, region of residence, and diagnosis of ISPA disease based on the classification of recorded medical diagnoses.

Data analysis was carried out by descriptive analysis with the aim of describing the distribution and pattern of ISPA incidence in patients. The data were analyzed to determine the distribution of patient characteristics by age, gender, and region, as well as the most common types of ISPA diagnoses. The results of the analysis are presented in the form of frequency and percentage distribution tables to facilitate data interpretation.

RESULTS

The results of this study describe the distribution of the incidence of Acute Respiratory Tract Infection (ARI) in patients in the working area of the Tlogosari Kulon Health Center based on age, gender, area of residence, and ISPA diagnosis category.

1. **Characteristics of Respondents by Age**

Age Category	Frequency	Percentage
Children	2041	41.4%
Adult	2165	43.9%
Elderly	721	14.6%
Total	4927	100%

Based on Table 1, the results were obtained that the characteristics of the respondents were dominated by adults with 2165 (43.9%), followed by 2041 (41.4%) children, and 721 (14.6%) elderly people.

2. **Characteristics of Respondents by Gender**

Gender	Frequency	Introduce yourself
Men – men	2065	41.9%
Women	2862	58.1%
Total	4927	100%

Based on Table 2, it was found that the gender characteristics of the respondents were 2862 (58.1%) females (58.1%) and 2065 males (41.9%).

3. **Characteristics of Respondents Based on Region of Residence**

Regional Address	Frequency	Introduce yourself
Mahmud	425	8.6%
Squirt	302	6.1%
Muktiharjo South	2595	52.7%
West Coast Railroad	1605	32.6%
Total	4927	100%

Based on Table 3, it was found that the incidence of ISPA occurred in the most Puskesmas work area in Muktiharjo Kidul with a total of 2595 (52.7%), Tlogosari Kulon as many as 1605 (32.6%), Gemah area 425 (8.6%), and Kalicari as many as 302 (6.1%).

4. **ISPA Diagnosis Distribution**

Categories Diagnostics	Frequency	Introduce yourself
Upper ISPA (J00 – J06)	4903	99.5%
Lower ISPA (J20)	24	0.5%
Total	4927	100%

Based on Table 4, it was found that the most ISPA categories in the Puskesmas work area were 4903 (99.5%) Upper ISPA and 24 (0.5%) Lower ISPA.

Types of ISPA	Frequency	Introduce yourself
J00	657	13.3%
J01	27	0.5%
J02	998	20.3%
J03	130	2.6%
J06	3091	62.7%
J20	24	0.5%
Total	4927	100%

Based on Table 5, it is the classification of Upper ISPA and Lower ISPA in the work area of the Health Center, Upper ISPA which includes J00 – J06 and Lower ISPA which is J20. The results were obtained

in J00 there were 657 (13.3%) cases, J01 cases as many as 27 (0.5%), J02 cases as many as 998 (20.3%), J03 cases as many as 130 (2.6%), J06 cases as many as 3091 (62.7%), and finally J20 cases as many as 24 (0.5%).

DISCUSSION

The results of the study showed that the incidence of ISPA in the working area of the Tlogosari Kulon Health Center was most commonly found in the adult age group and children, with the dominance in adulthood of 43.9%, this condition can be associated with high activity and mobility in the productive age group which increases exposure to environmental risk factors. In line with the Centers for Disease Control and Prevention (CDC) report in the National Trends in COPD in 2024 which shows that the prevalence of respiratory disorders is more common in adulthood. This is because adults of productive age are more exposed to risk factors such as lifestyle (smoking and drinking habits, environmental exposure, and biological factors from the development of congenital diseases (3).

In addition, research conducted by Linder and Singer, stated that adult patients experienced a significant decrease in quality of life. In this phase, although daily activities tend to be high, the body's physiological abilities begin to decline, including immunity, so that the adult age group becomes more susceptible to ISPA.

Children are more susceptible to ISPA because their immature immune system makes them more susceptible to respiratory infections (4). This is in line with research conducted by O'Connor et al. The risk of the occurrence of ISPA in children under 6 years old is higher than in the adult group because because their organs have not been fully developed compared to adults, they are more susceptible to ISPA than adults.

Based on gender, the results of this study show that cases of ISPA are more commonly found in women (58.1%) than men (41.9%). These findings do not necessarily indicate a causal relationship between sex and the incidence of ARI. However, these differences can be attributed to different health-seeking behaviors between men and women. Women tend to be more proactive in checking themselves at health facilities, so cases in this group are more recorded in patients' medical records (5). In addition, according to research from Liez Noor Aulia Mertosono et al., changes in female hormones play a role in influencing lung function and the immune system. In addition, women also have the potential to experience an increased risk of respiratory distress due to exposure to environmental factors such as cigarette smoke and air pollution around them (6).

Judging from the residential area, the high number of ISPA cases in Muktiharjo Kidul and Tlogosari Kulon Villages shows that there is a variation in the distribution of cases between regions which can be influenced by population density and inadequate environmental conditions (7). This is in line with research conducted by Novia Aristatia et al, which stated that there is a significant relationship between house occupancy density and the incidence of ISPA disease. The condition of the house will reduce the data in the room, so that the air exchange that occurs is unhealthy. Housing density will worsen conditions and accelerate disease transmission. The majority of diagnoses found were Upper ARI, which indicates that most cases are still at the upper respiratory infection level and have not progressed to more severe conditions such as Lower ARI. These findings provide a preliminary overview of the pattern of ISPA incidence in the working area of the Tlogosari Kulon Health Center and can be the basis for planning health promotive and preventive efforts.

CONCLUSION

ISPA is a disease that is still a significant challenge due to global risk factors such as air pollution, climate change, population density, and air pollution. At the Tlogosari Kulon Health Center, the incidence of Acute Respiratory Infection (ARI) is dominated by the adult age group and children. In addition, the most cases occur in women and are concentrated in areas with high population density, namely Muktiharjo Kidul and Tlogosari Kulon Villages. The majority of cases are diagnoses of upper ARI, which indicates that most cases are still at mild to moderate levels. These findings illustrate that demographic and environmental factors play an important role in the pattern of ISPA incidence in the health center's work area.

Based on these results, the health center is advised to strengthen promotive and preventive efforts focused on at-risk age groups and areas with high incidence rates through improving PHBS education, early screening, and regular case monitoring. In addition, cross-sector collaboration is needed in improving residential environmental conditions, especially related to home ventilation and air pollution control. The optimization of the role of health cadres and a community-based approach is expected to be able to reduce the incidence of ISPA in a sustainable manner in the work area of the Tlogosari Kulon Health Center.

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