# REASON FOR HOSPITAL ADMISSION IN PEDIATRIC WARD OF AN INDONESIAN RURAL HOSPITAL IN 2023

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#### **ARTICLE INFO**

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**Kata kunci:** Anak-anak Masuk rumah sakit Kematian di rumah sakit

Keywords: Children Hospital admission In-hospital death

Original submission: July 09, 2024 Accepted: Agustus 08, 2024 Published: September 30, 2024



Penelitian ini bertujuan untuk mengetahui jumlah pasien anak yang dirawat inap di RSUD Kajen Kabupaten Pekalongan selama tahun 2023. Desain penelitian ini menggunakan deskriptif cohort study dengan pendekatan cros-sectional. Sumber data penelitian berasal dari Electronik Rekam Medis atau E-RM Rumah sakit. Hasil penelitian ini menunjukkan bahwa ada 2.731 anak yang dirawat di RSUD Kajen selama tahun 2023 dengan durasi rawat inap bervariasi dari 1 hingga 20 hari. Alasan rawat inap terbanyak adalah demam, mual muntah, batuk pilek, kejang demam, diare dan sesak nafas. Selama tahun 2023 terdapat 57 kasus kematian dan tiga penyebab kematian tertinggi adalah demam 23 kasus (40%), kejang 13 kasus (23%) serta batuk dan sesak nafas 13kasus (23%). Hasil penelitian ini bisa menjadi masukan untuk menentukan prioritas program kesehatan preventif agar bisa menurunkan angka rawat inap dan angka kematian anak. Kata kunci: anak, rawat inap, kematian di rumah sakit

### ABSTRACT

Reason For Hospital Admission In Pediatric Ward Of An Indonesian Rural Hospital In 2023. This study aims to determine the number of pediatric patients hospitalized at one rural hospital in Pekalongan Regency, Central Java, during 2023. This research design uses a descriptive cohort study with a cross-sectional approach. The research data was obtained from the hospital's Electronic Medical Records or E-RM. This study's results show that 2,731 children were being treated at Kajen Regional Hospital during 2023, with length of stay varying from 1 to 20 days. The most common reasons for hospitalization were fever, nausea, vomiting, cough and cold, febrile seizures, diarrhea, and shortness of breath. During 2023, there were 57 cases of death, and the three highest causes of death were fever: 23(40%) cases, seizures: 13(23%) cases, and shortness of breath and cough: 13(23%) cases. The results of this research can be used to determine priorities for preventive health programs to reduce hospitalization and child mortality rates. The plausible actions to respond to this situation are improving the vaccination program uptake, sanitation, and nutrition education by involving local leaders and community organizations to reduce the detrimental effect of fever, seizure, and respiratory disease on children.



### INTRODUCTION

Child health issues in Indonesia represent a significant challenge. Data from the Indonesian Ministry of Health shows that the under-five mortality rate in 2021 is around 24 per 1,000 live births. The leading causes of child death in Indonesia include respiratory infections, diarrhea, and preventable immunization diseases. The Indonesian Demographic and Health Survey (SDKI) indicates that approximately 90% of all under-five fatalities are attributable to diseases that can be prevented through relevant interventions.<sup>1</sup>

Although there are efforts by the government and non-government organizations to improve the health situation of children through immunization programs, malnutrition, and increasing access to health services, the number of hospitalizations and child deaths in reports from Kajen Regional Hospital needs to be watched with caution. The high number of cases of fever, seizures, and respiratory infections reflects a pattern like the child mortality rate globally and in Indonesia, which shows the need for attention from the government and health authorities to overcome the problem (Ministry of Health of the Republic of Indonesia, 2021).<sup>2</sup>

The increasing number of hospitalizations in children not only affects individual health but also has an impact on productivity and family financial well-being. The length of hospital stay is an important benchmark in understanding the impact of hospitalization on the health service system, social indicators, and family quality of life.<sup>3,4</sup>

Although various studies examine children's length of stay in hospital based on specific medical conditions such as congenital abnormalities or respiratory diseases, there is a significant gap in the literature examining children's hospitalization rates more broadly in caring for sick children. These studies focus on acute and chronic illnesses but rarely dissect variations in reasons for pediatric hospital admission concerning age or the impact of non-medical factors such as systemic hospital policies.

The rate of child hospital admissions is an important indicator for evaluating child health and the effectiveness of the health care system. Understanding the number of children hospitalized can help in more effective planning and appropriate allocation of resources.<sup>5</sup> Therefore, examining these reasons using a cross-sectional cohort study research design based on secondary data from hospital medical records is vital.

Secondary data from medical records offer a rich picture of disease patterns and factors leading to hospitalization in children. With the cross-sectional cohort study method, we can determine the prevalence of cases that occur at a certain moment and identify disease trends that may increase over time. This research will analyze data from various hospitals to gain broader and more representative insights.

In addition, understanding disease incidence rates in certain months is very important to anticipate spikes in hospitalizations. Certain diseases, such as influenza or acute respiratory infections, tend to increase in certain seasons or months.<sup>6</sup> By knowing these patterns, hospitals and health service providers can prepare more effective preventive measures, optimize the availability of medical resources, and improve patient care.<sup>7</sup>

More in-depth knowledge of monthly trends can help in reducing the devastating impact of disease on the pediatric population, as well as preventing deaths that could be avoided with early intervention. Well-planned prevention strategies can reduce the burden on health systems and improve children's quality of life.

Identifying the main reason for hospitalization among children is essential to picture the health problems among children. Understanding why children end up in the hospital is crucial for creating a healthier future for them. This knowledge is essential for two reasons: guiding our efforts to prevent illness and ensuring that resources are used effectively.

Knowing the most common reasons for hospitalization, we can pinpoint the diseases and conditions that pose the greatest threat to children's health. This allows us to focus our prevention efforts on those areas, promoting vaccinations, improving sanitation, and addressing nutritional deficiencies. It also helps us develop targeted interventions based on the root causes of illness, such as educational campaigns about hygiene or initiatives to improve access to clean water and sanitation.<sup>7</sup>

Furthermore, understanding the needs of hospitalized children enables healthcare systems to allocate resources more effectively. If respiratory illnesses are a major cause of hospitalization, investing in respiratory care units, trained personnel, and essential medications will be prioritized. Healthcare systems can also anticipate future requirements and adjust their staffing, infrastructure, and supply chain by analyzing trends in hospitalization reasons. This ensures they are adequately prepared to handle surges in patient volumes and provide timely care.

Beyond effective resource allocation, this knowledge allows healthcare professionals to tailor their treatment plans to each patient's specific needs, leading to more effective treatments and improved patient outcomes. It also helps identify gaps in preventive healthcare services or access to specialized care, allowing for targeted interventions to improve healthcare delivery.

Ultimately, understanding the reasons for hospitalization among children provides valuable information to policymakers for developing effective healthcare policies and resource allocation strategies. It can inform decisions regarding funding for research, disease prevention programs, and public health initiatives. By highlighting the reasons for hospitalization, we can raise awareness about children's health challenges and advocate for increased funding, research, and support for programs that address these issues. With the results of this research, it is expected that policymakers and health practitioners in implementing preventive measures that are better and responsive to the dynamic health needs of children throughout the year.

### METHOD

This research uses a descriptive cohort study design with a cross-sectional approach, which focuses on capturing and describing data at a specific point in time while being part of a larger cohort tracking process. This design offers insights into the prevalence of outcomes while maintaining the temporal tracking aspect of cohort studies. A cohort study is defined as a longitudinal study where a group of individuals (the cohort) is followed over time to observe outcomes, such as the development of a disease, by either following forward the participants or looking at records. At the same time, the cross-sectional approach means an observational study designed to see the data at a single point in time.<sup>8</sup> A cohort cross-sectional study means this observational study combines elements of both cohort and cross-sectional studies.

The research data source of this study was received from the Electronic Medical Record or E-RM from Kajen Regional Hospital, Pekalongan Regency. The data taken were all the patients admitted to the pediatric ward at Kajen Regional Hospital, Pekalongan Regency, from January to December 2023. The statistical analysis done for this study by counting the frequency distribution of the number of pediatric patients based on gender, reasons for hospitalization, length of stay,

reasons for discharge, number of death case pediatric patients in hospital and their causes of death. The data was calculated and simulated into figure using excel program from the Microsoft Office 15.

## RESULT

This study reported 2,731 hospital admission cases in the pediatric ward of Kajen General Hospital Pekalongan region during 2023. Most of the admission cases were boys:1,505(55.2%), and the rest 1,222(44.8%) were girls. Figure 1 explains the number of pediatric inpatients at Kajen Hospital, Pekalongan Regency, during 2023, including 2,731 children. From this data, the number of boys is greater than that of girls. Each month shows variations in the number of patients, with the highest peak in December followed by October and September (more than 250 children treated). The number of children hospitalized was the lowest in April. Starting in July, child admission increased and peaked in December. This increase might be related to seasonal changes or certain health conditions that are more common later in the year.

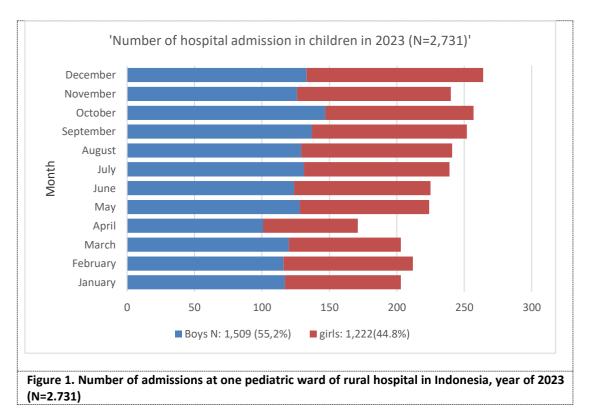


Table 1 provides information regarding the length of stay for pediatric patients at the Kajen Pekalongan Regional Hospital; the minimum duration of hospitalization for children is one day, the most extended duration of hospitalization for children is 20 days, and the average child is treated for between 3 and 4 days.

	Length of stay (day(s))							
Month		Ma						
	Min	х	Average					
January	1	14	3					
February	1	10	3					
March	1	11	3					
April	1	15	4					
May	1	7	4					
June	1	20	3					
July	1	14	3					
August	1	20	3					
Septembe								
r	1	15	3					
October	1	15	3					
November	1	18	3					
December	1	14	3					

Tabel 1. Length of stay of the child hospital admission in one rural hospital in Indonesia, year 2023

Within one year in 2023, the top 10 highest reasons why children were hospitalized were fever, nausea and vomiting, coughs and colds, seizures, diarrhea, shortness of breath, stomach pain, lipoma, injury, anemia, and thalassemia. Table 2 describes why children were hospitalized by showing the number of incidents each month from January to December. The amount stated is calculated from the main reason for the children's hospital admission. The total number exceeding the number of hospitalizations was obtained from information in the E-RM, which listed more than one chief complaint in some pediatric patients. Calculated from the total number of pediatric hospitalizations, which reached 2,731 children, fever was recorded at 1,758 incidents or 64% of the total hospitalization rate for pediatric patients, and the second highest proportion was nausea and vomiting, namely 1,353 incidents (50%), followed by coughs and colds, namely 1,157 (42%), seizures 778 (28%) and next are diarrhea and shortness of breath with a proportion of 16% each.

Reason for admission	Num	Number of admissions by month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Au g	Sep	Oct	No v	Dec	Total	
	13												1.75	
Fever	6	119	112	118	142	157	149	164	163	166	159	173	8	
Nausea &													1.35	
vomiting	64	82	84	68	109	129	129	140	151	144	120	133	3	
													1.15	
Cough & cold	46	71	80	76	85	109	101	120	121	129	112	107	7	
Convulzion	35	49	32	44	50	76	75	95	73	74	88	87	778	
Diarhea	27	40	15	25	38	37	39	34	32	41	49	72	449	
Shortness of														
breath	24	24	28	18	32	48	47	44	47	37	51	41	441	
Abdominal														
pain	32	26	33	27	34	36	28	31	30	23	26	51	377	
Lipoma	7	4	13	6	8	6	14	4	4	13	8	20	107	

Table 2. The reason of hospital admission at one pediatric ward of a rural hospital in Indonesia, year 2023

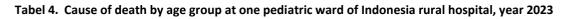
Injury	4	3	6	2	4	6	4	7	6	8	6	7	63
Anemia	1	6	2	1	3	4	8	4	5	6	9	4	53
Thalasemia	1	8	2	1	4	7	9	3	4	3	5	4	51

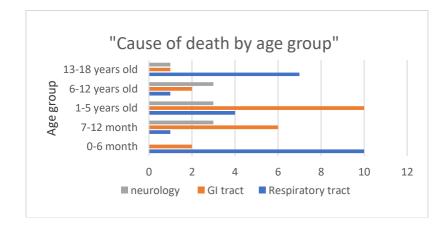
Of the total 2,731 pediatric patients who were hospitalized, the majority of children were discharged from the hospital with the doctor's approval, namely 2,459 (90%), 161 (6%) as they had improved, 27 cases were Discharged Against Medical Advice (DAMA), 57 (2%) patients declared death and the remaining 17 cases without information due to incomplete patient registration status.

Tabel 3. Reason for discharge at one pediatric ward of a rural hospital in Indonesia, year 2023

Reason of Discharged	Numbe r	percentage s
Doctor's approval	2.469	90%
Recovered	161	6%
Discharged againts medical advise	27	1%
Declared death	57	2%
Incomplete data	17	1%
Total number	2.731	100%

A more detailed cause of death is presented in Table 4. The top three causes of death presented in Table 4 were calculated from the main and the second reason for hospital admission among children in Indonesian rural hospitals in 2023. Based on the age groups, there are only two causes of death among infants aged from 0-6 months (N=12); the first leading cause of death is respiratory-related health problems, accounting for 10 infants, and the second is gastrointestinal tract health problems. This situation might be triggered by infants' low immune system and the high prevalence of respiratory infection in the family or environment. While in the age group 7-12 months and 1-5 years old, the leading cause of death was due to gastrointestinal tract health problems, mainly diarrhea. It might be caused by poor food preparation and personal hygiene when the infants receive additional nutrition besides breastfeeding. The first leading cause of death in early adolescence age was related to respiratory tract health problems.

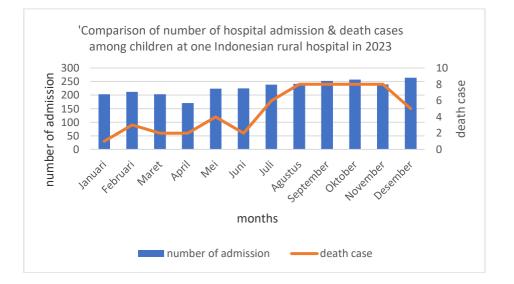




A comparison of the admission rate with the death cases in the pediatric ward is provided in Table 5. The overall trend for hospital admissions is upward from July to December, suggesting a possible correlation with seasonal changes and weather conditions. Death cases follow a similar pattern, though the numbers are much lower (only 2%).

It appears there is a potential correlation between higher admission rates and higher death rates. The peak in deaths occurs during the same month as the peak in admissions (December). This might suggest that when more children are admitted, the chance of a fatal outcome increases.

#### Table 5. Comparison of cause of death by main reason of hospital admission at one pediatric ward in 2023



### DISCUSSION

Most children under five years of age die due to preventable or treatable causes such as complications during birth, pneumonia, diarrhea, neonatal sepsis, and malaria. The results of this study show a clear pattern where fever, vomiting, coughing, and seizures are the most frequent reasons for hospitalization of children. This aligns with the understanding that this is a common childhood illness that requires medical attention if not appropriately treated. There is a seasonal trend in the increasing number of pediatric patient admissions due to respiratory system problems, with the highest number of hospitalizations occurring in the summer months and continuing into the rainy season (July to December). This trend suggests a correlation between increased exposure to viruses and bacteria during summer and winter. Seasons have a significant impact on children's health, especially in terms of infectious diseases. Changes in weather and environmental conditions with the changing seasons can increase children's vulnerability to various diseases. Here are some common illnesses that children often experience and how they are affected by the seasons.

The rainy and transition seasons are usually associated with increased acute respiratory infections. Viruses such as influenza, RSV (Respiratory Syncytial Virus), and rhinovirus become more active and spread quickly in the rainy season. Children, especially toddlers with developing immune systems, are more susceptible to the virus. Research by Harnani et al. (2022) shows that the incidence of pneumonia and respiratory system problems in toddlers increases significantly in certain seasons, especially during the rainy season or winter.<sup>9</sup>

Summer can also increase the risk of gastrointestinal illnesses, such as gastroenteritis, caused by viruses (norovirus, rotavirus) or bacterial infections from food or water. High temperatures and humidity can accelerate the growth of pathogens. Children tend to be more vulnerable and exposed, especially when participating in outdoor activities or camps.

Preventable disease and death among children is an important aspect of public health. According to Karagiannidou et al. (2020), hospital-acquired infections (HAI) have a significant impact on children and neonates, increasing the length of hospital stay, treatment costs, and mortality rates. This research highlights the need for better infection prevention and control efforts to reduce these negative impacts.<sup>10</sup>

Children with congenital abnormalities require more prolonged treatment, thereby increasing the risk of complications that can lead to death. This underscores the importance of early detection and management to reduce the time required for treatment.<sup>11</sup> Environmental factors and previous medical conditions influence the length of stay and complications during respiratory care in children, so preventing respiratory disease is crucial.<sup>12</sup> Although medical care is improving, the length of hospital stays and the number of children's readmissions remain high. This suggests that better approaches are needed to prevent the need for retreatment. On the other hand, many injuries to children are preventable, and injury prevention efforts should be further strengthened to reduce the burden on the health system.<sup>13</sup>

The high prevalence of chronic conditions in children contributes to higher hospitalization rates and significant care costs.<sup>14</sup> Low socio-economic status was associated with longer lengths of stay and complications, highlighting the importance of a social approach in child health care.<sup>15</sup> Additionally, season influences the incidence of pneumonia in children under five, indicating the need for appropriate prevention strategies.<sup>9</sup> The study examined hospitalization patterns among children who experienced childhood adversity, indicating that adverse life experiences can increase care needs and mortality rates.<sup>1617</sup>

It appears there is a potential correlation between higher admission rates and higher death rates. The peak in deaths occurs during the same month as the peak in admissions (December). This might suggest that when more children are admitted, the chance of a fatal outcome increases. Various factors could explain the peaks in admissions and deaths during December.

Seasonal illness: Increased prevalence of respiratory infections like the flu, colds, or pneumonia during the colder months could lead to more hospitalizations and potentially higher fatality rates. This finding supports the previous study, which reports the high rate of child admission to hospital due to respiratory tract infectious disease by Frenkel et al., 2020. The study stated many children worldwide die each year from vaccine-preventable infections. While international efforts have improved immunization rates, challenges still need to be addressed, particularly in developing countries where resources are scarce, and some parents may resist vaccination due to misinformation or fear. The development of more effective vaccines and policies mandating immunizations for school and childcare attendance offer hope. However, the COVID-19 pandemic has disrupted these efforts, causing a decline in immunization rates in developed countries and potentially hindering its progress.<sup>18</sup>

The seasonal pattern and the higher risk of death among the younger population suggest that healthcare providers, starting from the basic first level of healthcare facilities, should improve the prevention promotion program that the government has initiated. The prevention promotion programs currently promoted by the government to reduce child mortality and morbidity include complete basic vaccination for children under 5 years old and promote more additional influenza vaccination for infants under 12 months.

While the older age group from 6 months to 5 years old is a highly affected population by diarrhea, providing education to mothers and family-related food literacy, food hygiene, and personal hygiene is expected to reduce the number of diarrhea cases. The adolescent population, which has the highest number of causes of death due to respiratory health problems, needs to receive health education related to the importance of wearing masks, personal hygiene, influenza vaccination, and promoting a healthy lifestyle. A healthy lifestyle for young adolescents includes consuming a healthy diet and exercising.

Future research recommendations are to conduct deeper descriptive and correlation studies to better understand the relationships between admissions and deaths; analyzing data for specific diseases or conditions would be beneficial. Comparing this data to previous years or data from other regions could provide valuable insights into potential trends and the effectiveness of interventions.

## CONCLUSION

This research emphasizes the importance of disease prevention and community-based interventions to reduce mortality and morbidity in children. Understanding the factors that influence the length of stay, medical conditions, and socio-economic aspects is key to improving child health outcomes and reducing the burden on the health system. Public policies supporting prevention efforts and health education are necessary for better health for future generations. The influence of seasons on children's health cannot be ignored. Good child health management is essential, including vaccination, hygiene and infection prevention education, and seasonal allergy symptoms monitoring. Parents and caregivers must also pay attention to weather conditions and take appropriate precautions to protect children from illnesses that increase during certain times of the year. Health education about seasonal diseases and how to prevent them must also be improved to maintain children's health throughout the year.

This study found that the highest prevalence of diseases among children admitted to Indonesian rural hospitals in this study include fever, nausea and vomiting, cough and cold, convulsion, and diarrhea, which are strongly related to communicable disease, hygiene, and climate change. The most prevalent disease in children found in this study is preventable. Government programs on disease prevention need to be sped up to increase their uptake, including vaccination programs. In addition, the government needs to involve all the sectors of service working with children, like early childhood education, including daycare, early childhood education centers, and schools.

### ACKNOWLEDGEMENT

This study was funded by the Muhammadiyah University of Pekajangan Pekalongan.

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