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Analysis of Declining Trends and Spatial Distribution of Stunting Cases among Children Under Five in 2025

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Abstract: Stunting remains a major public health problem that affects the quality of human capital and sustainable development. This study aimed to analyze trends in stunting cases among children under five and the spatial distribution of stunting across four hamlets in Kerumut Village, East Lombok Regency, during the period from January to August 2025. A descriptive quantitative approach with a cross-sectional design was employed. Data were obtained from the 2025 Kerumut Village Stunting Data Document and analyzed using descriptive statistics, temporal trend analysis, and simple spatial distribution analysis. The results showed that the number of stunting cases fluctuated but generally exhibited a declining trend, decreasing from a peak of 90 cases in February to 46 cases in August 2025. Overall, the number of cases declined by 44 cases, or 48.9%. Spatial analysis revealed that stunting cases were concentrated in Toron Hamlet (30.4%), followed by Benteng Hamlet (26.1%), Gubuk Daya Hamlet (23.9%), and Dasan Lendang Hamlet (19.6%). Male children accounted for the majority of stunting cases (58.7%). In conclusion, although a substantial reduction in stunting cases was observed, area-based interventions remain necessary in hamlets with the highest case concentrations to support the sustainable acceleration of stunting reduction efforts.

Keywords: stunting, children under five, case trends, spatial distribution, public health.

1. Introduction

Stunting remains one of the public health problems receiving global attention because it affects the quality of human resources, economic productivity, and national development. According to the World Health Organization (WHO), stunting is a growth failure condition in children marked by a height-for-age (HAZ) value below minus two standard deviations (<-2 SD) from the WHO child growth standards. This condition indicates chronic malnutrition that occurs over a long period and is often exacerbated by recurrent infectious diseases, poor sanitation, and limited access to health services.

Indonesia remains one of the countries facing major challenges in reducing stunting. Although the national prevalence of stunting has shown a downward trend in recent years, the figure remains above the threshold set by WHO. Therefore, the Indonesian government has made

the acceleration of stunting reduction one of its national priority programs through various nutrition-specific and nutrition-sensitive interventions implemented from the central level down to the village level.

At the local level, regular monitoring of stunting cases is an important instrument for measuring the effectiveness of intervention programs that have been implemented. Kerumut Village is one area that actively carries out stunting prevention and control programs through several activities, such as integrated health post (posyandu) activities, growth monitoring for children under five, family nutrition education, and assistance for families at risk of stunting. Data from 2025 show that the number of children under five affected by stunting changed quite dynamically each month. In January 2025, 80 stunting cases were recorded, increasing to 90 cases in February, and then gradually declining to 46 cases in August 2025. The 48.9% decrease over seven months, from January to August, indicates positive progress that needs to be analyzed further to understand the pattern of changes in stunting cases at the village level.

In addition to the temporal aspect, the distribution of stunting cases across areas must also become an important concern in public health intervention planning. Kerumut Village data show that the decline in stunting cases was not evenly distributed across all hamlets. Toron Hamlet recorded the highest number of cases at 30.4%, followed by Benteng Hamlet at 26.1%, Gubuk Daya Hamlet at 23.9%, and Dasan Lendang Hamlet at 19.6%. This unequal distribution indicates variations in risk factors across areas. Such disparities may be related to socioeconomic conditions, environmental sanitation, parental education, parenting practices, and access to health services.

Previous studies have examined various elements that influence stunting. Vaivada et al. (2020), through a systematic review, identified maternal education, household economic conditions, environmental hygiene, and exclusive breastfeeding as key factors in stunting among children under five. A study conducted by Aguayo et al. (2021) indicated that the environment and child feeding practices contribute significantly to the prevalence of stunting in Asia. Furthermore, Akombi et al. (2022) found that household characteristics and socioeconomic conditions are strongly associated with the risk of stunting among children under five. Danaei et al. (2022)

reported that the geographic distribution of stunting often forms clusters in areas with limited access to development and health services. Meanwhile, Beal et al. (2023) and Headey et al. (2023) showed that a combination of nutrition-specific and nutrition-sensitive interventions can accelerate the reduction of stunting prevalence at the community level.

Although various studies have identified the determinants of stunting and the effectiveness of intervention programs, most research still focuses on prevalence analysis and individual risk factors. Studies that integrate temporal trend analysis of declining stunting cases with spatial distribution at the village level remain relatively limited, particularly in rural areas of East Lombok Regency. Therefore, the novelty of this study lies in its simultaneous analysis of changes in the number of stunting cases over time and the mapping of case distribution by hamlet at the village level. This approach is expected to provide a more comprehensive picture of stunting dynamics and priority areas for intervention.

Theoretically, this study uses the UNICEF Framework for Malnutrition, which explains that stunting results from the interaction of various direct and indirect causal factors. Direct factors include inadequate nutrition and infectious diseases. Indirect factors include household food availability, child caregiving practices, environmental sanitation, family education level, and access to health services. This framework can serve as a foundation for understanding how changes in social and public health conditions may affect stunting trends in a given area.

This study aims to examine the trend in stunting cases among children under five from January to August 2025 and to analyze the spatial distribution pattern of stunting cases in the four hamlets of Kerumut Village, East Lombok Regency. The findings are expected to provide useful empirical information as a basis for formulating more effective and targeted policies and intervention strategies, thereby supporting efforts to accelerate the reduction of stunting prevalence at the village level.

This study used a descriptive quantitative approach with a cross-sectional design. Data were obtained from the 2025 Kerumut Village Stunting Data Document, consisting of monthly stunting case data, characteristics of stunted children under five, and case distribution by hamlet. The analysis was conducted using descriptive statistics, including frequency distribution,

percentages, trend analysis, and simple spatial analysis to describe the distribution pattern of stunting cases in the study area.

2. Research Findings

Trends in Stunting Cases among Children Under Five in Kerumut Village in 2025

The analysis shows that the number of stunting cases among children under five in Kerumut Village fluctuated during the January-August 2025 period but generally demonstrated a declining trend. In January, 80 stunting cases were recorded, increasing to 90 cases in February, or a 12.5% increase. The increase at the beginning of the year may have been caused by repeated data collection on children under five and by the increased coverage of anthropometric measurements conducted by health workers and posyandu cadres.

Table 1. Stunting Case Reduction Index (February as the Peak Case Month)

Month	Number of Cases	Index (%)
February	90	100.0
March	70	77.8
April	75	83.3
May	60	66.7
June	55	61.1
August	46	51.1

Source: Processed from Kerumut Village data, 2025

After reaching its peak in February, the number of stunting cases decreased significantly to 70 cases in March (-22.2%). Although there was a slight increase in April to 75 cases (+7.1%), the subsequent trend showed a consistent decline until August 2025. In May, the number of cases fell to 60, then to 55 in June, and reached 46 cases in August. Based on the case reduction index,

the number of stunted children under five in August was only 51.1% of the peak number of cases in February. Thus, there was a 48.9% decrease during the observation period.

Overall, there was a decrease of 44 cases from the February peak (90 cases) to August (46 cases). Thus, the percentage decrease in stunting cases reached:

Reduction = (90 - 46) / 90 x 100% = 48.9%

The following table and graph present the trend in the decline of stunting cases in Kerumut Village in 2025:

Table 2. Trend in the Number of Stunting Cases among Children Under Five in Kerumut Village in 2025

Month	**Number of Stunted Children**	**Change from Previous Month**	**Percentage Change (%)**
January	80	-	-
February	90	+10	+12.5
March	70	-20	-22.2
April	75	+5	+7.1
May	60	-15	-20.0
June	55	-5	-8.3
August	46	-9	-16.4

Source: Processed from Kerumut Village data, 2025

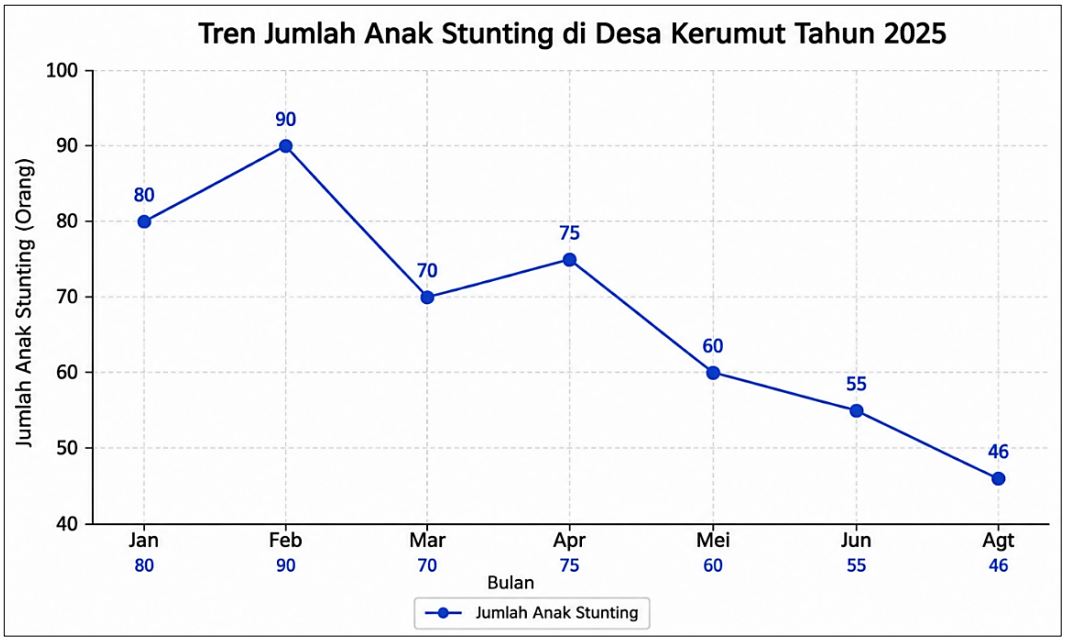

Figure 1. Trend in the Number of Stunted Children in Kerumut Village in 2025

This finding indicates that the stunting reduction acceleration program implemented at the village level may have had a positive impact on improving the nutritional status of children under five. Interventions carried out through regular growth monitoring, provision of supplementary nutrition, nutrition training for families, supplementation for pregnant women, and improved access to health services may have contributed to the decline in cases.

The findings of this study are in line with Beal et al. (2023), who showed that combining nutrition-specific and nutrition-sensitive interventions can accelerate the reduction of stunting rates at the community level. Similar findings were also reported by Headey et al. (2023), who argued that improved access to basic health services and better sanitation play an important role in reducing stunting in developing countries.

A decline of nearly 50% within seven months represents a fairly impressive achievement compared with several other rural areas in Indonesia. However, this achievement should be interpreted with caution, because a decrease in the number of cases does not always indicate a permanent improvement in nutritional status. WHO emphasizes the importance of continuous monitoring to improve stunting status, given that stunting reflects chronic malnutrition that occurs over a relatively long period.

According to the UNICEF conceptual framework (2023), stunting is influenced by direct factors such as inadequate nutritional intake and recurrent infections, as well as indirect factors that include household food security, child caregiving practices, sanitation, and access to health services. The decline in the number of stunting cases in Kerumut Village indicates that some risk factors may have improved in 2025.

A systematic review by Vaivada et al. (2020) found that factors such as maternal education, family economic conditions, maternal height, exclusive breastfeeding, and sanitation are the main determinants of stunting among children under five. Therefore, the success of case reduction in Kerumut Village cannot be attributed solely to nutrition interventions, but may also indicate increased community awareness of health practices and child caregiving.

The findings of this study also support Prendergast et al. (2021), who stated that regular growth monitoring for children under five is an effective strategy for detecting the risk of growth disorders at an early stage. Through posyandu activities, children who experience growth faltering can immediately receive appropriate interventions, thereby preventing more severe stunting.

Nevertheless, the presence of 46 stunting cases in August 2025 shows that stunting remains a public health challenge in Kerumut Village. According to WHO standards, stunting remains a crucial indicator of the quality of human resource development because it is strongly associated with cognitive ability, educational achievement, economic productivity, and health in adulthood.

Overall, the findings of this study show that Kerumut Village has made progress in reducing stunting, but a strategy that focuses more on areas with high case numbers is still needed. A spatially based approach and strengthened interventions during the first 1,000 days of life are important steps toward achieving the national target for accelerating stunting reduction.

Spatial Distribution of Stunting Cases by Hamlet

The spatial distribution analysis shows that stunting cases were not evenly distributed across all areas of Kerumut Village. Toron Hamlet had the highest number of cases, with 14 children (30.4%), followed by Benteng Hamlet with 12 children (26.1%), Gubuk Daya Hamlet with

11 children (23.9%), and Dasan Lendang Hamlet with 9 children (19.6%). The following table presents the distribution of stunting cases by hamlet:

Table 3. Distribution of Stunting Cases by Hamlet (August 2025)

Hamlet	Children (n)	Percentage (%)
Toron	14	30.4
Benteng	12	26.1
Gubuk Daya	11	23.9
Dasan Lendang	9	19.6
Total	46	100

Source: Processed from Kerumut Village stunting data, 2025

The higher concentration of cases in Toron Hamlet indicates the presence of more dominant risk factors compared with other hamlets. From the perspective of spatial epidemiology, the aggregation of incidents in a particular location is usually related to household socioeconomic conditions, maternal education level, access to health services, availability of clean water, environmental sanitation, and child caregiving practices.

This finding is consistent with the study by Danaei et al. (2022), which showed that geographic differences in stunting are strongly influenced by socioeconomic inequality and access to health services. The study by Mutisya et al. (2021) also found that the spatial distribution of stunting often forms clusters in areas with more limited access to development.

In the context of Kerumut Village, this finding indicates the need for interventions that focus on specific areas. Toron and Benteng Hamlets can be designated as priority areas in programs to accelerate stunting reduction by strengthening posyandu services, improving family nutrition education, and conducting more intensive monitoring of at-risk children under five.

Distribution of Stunted Children Under Five by Sex

The results show that of the 46 stunted children under five identified in Kerumut Village in August 2025, 27 children (58.7%) were male and 19 children (41.3%) were female. This finding

shows that the proportion of stunting was higher among male children under five than among female children under five.

Table 4. Distribution of Stunted Children Under Five by Sex

Sex	Number	Percentage (%)
Male	27	58.7
Female	19	41.3
Total	46	100

Source: Processed from Kerumut Village stunting data, 2025

The predominance of stunting cases among male children under five in this study is consistent with various national and international studies showing that boys have a higher risk of growth disorders than girls. Biologically, boys tend to have higher energy and protein requirements to support body growth. When these needs are not optimally met, the risk of chronic growth disorders becomes greater than among girls.

A systematic review conducted by Vaivada et al. (2020) across various low- and middle-income countries found that male sex is one factor consistently associated with an increased risk of stunting. Boys were reported to have a higher likelihood of experiencing growth disorders than girls because of greater biological vulnerability to infections and metabolic disorders early in life.

Similar findings were reported by Beal et al. (2023), who showed that the global prevalence of stunting among boys tends to be higher than among girls. The study noted that hormonal differences, faster growth rates, and vulnerability to infectious diseases contribute to the higher prevalence of stunting among boys.

In Indonesia, Titaley et al. (2023) found that male children under five had a 1.3- to 1.5-times greater likelihood of being stunted than female children under five after controlling for socioeconomic factors and household characteristics. The study explained that boys are generally more vulnerable to respiratory infections and diarrhea, which can inhibit nutrient absorption and affect linear growth.

The findings of this study also support Akombi et al. (2022), who conducted a multilevel analysis in several developing countries. That study found that male sex was a significant predictor of stunting, particularly among children under five. According to the researchers, boys tend to experience growth faltering earlier than girls because of a combination of biological and environmental factors.

Research by Aguayo et al. (2021) in South and Southeast Asia also showed a similar pattern. Boys showed a significantly higher level of stunting because they are more easily affected by recurrent infections and environmental health problems that have long-term impacts on nutritional status.

Not only biological factors, but also social elements and caregiving practices may influence differences in stunting rates by sex. According to Yaya et al. (2022), differences in access to food, family attention, and feeding practices in various communities can cause differences in nutritional status between boys and girls. Nevertheless, biological factors remain the most dominant explanation in many epidemiological studies of stunting.

The findings from Kerumut Village are also consistent with the analysis by Hossain et al. (2021), which showed that male children under five are the group most in need of regular growth monitoring because they have a greater risk of experiencing growth faltering at an early age.

Based on the UNICEF Framework (2023), stunting results from a complex interaction between direct causal factors, such as inadequate nutritional intake and infectious diseases, and indirect causal factors, such as household food security, access to health services, environmental sanitation, and caregiving practices. The high number of stunting cases among male children under five in Kerumut Village indicates the need for greater attention to this group through more intensive growth monitoring, nutrition education for families, and strengthened interventions during the first 1,000 days of life.

Overall, the findings of this study affirm that male children under five are a group at higher risk of stunting than female children under five. Therefore, stunting prevention programs in Kerumut Village should adopt an approach that considers at-risk groups by giving additional

attention to male children under five, especially those from families with weak socioeconomic conditions and limited access to health services.

3. Conclusion

This study shows that stunting cases among children under five in Kerumut Village experienced a fairly significant downward trend during the January-August 2025 period. The number of stunting cases, initially recorded at 80 in January, increased to 90 in February as the peak, and then gradually decreased to 46 cases in August 2025. Overall, there was a decline of 44 cases, or 48.9%, compared with the number of cases in February. This study shows that several initiatives to accelerate stunting reduction implemented at the village level, including child growth monitoring, posyandu activities, family nutrition counseling, distribution of supplementary food, and improved access to health services, have the potential to positively affect the nutritional status of children under five.

The spatial distribution analysis shows that stunting cases remain concentrated in certain areas. Toron Hamlet had the highest proportion of cases at 30.4%, followed by Benteng Hamlet at 26.1%, Gubuk Daya Hamlet at 23.9%, and Dasan Lendang Hamlet at 19.6%. This finding shows that the distribution of stunting in Kerumut Village is uneven and indicates differences in risk factors across areas, which may be related to socioeconomic conditions, access to health services, environmental sanitation, and child caregiving practices.

Based on sex characteristics, male children under five were the group most affected by stunting, with a proportion of 58.7%, while female children under five accounted for 41.3%. This result strengthens the findings of various previous studies showing that boys have greater biological vulnerability to growth disorders than girls.

Overall, this study confirms that Kerumut Village has shown fairly good progress in efforts to reduce stunting in 2025. Nevertheless, the presence of 46 stunting cases at the end of the study period indicates that stunting remains a public health problem requiring sustained attention. Therefore, strategies to accelerate stunting reduction should focus on hamlets with the highest

number of cases, especially Toron and Benteng Hamlets, through an area-based approach, strengthening programs for the first 1,000 days of life, improving the quality of posyandu services, improving environmental sanitation, and empowering families to meet children's nutritional needs. An integrated and sustainable approach is expected to support the achievement of national targets for accelerating stunting reduction and improving the quality of human resources at the village level.

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Conflict of Interest: The authors declare that there is no conflict of interest in the conduct of the research, the preparation of the manuscript, or the publication of this article. The study was conducted independently using secondary data obtained from the 2025 Kerumut Village Stunting Data Document, without any influence from sponsors, funding agencies, or other organizations that could affect the results or interpretation of the study.

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