



RESEARCH ARTICLE

# Mitigating Child Stunting: Community-Based Strategies in Maibo Village, Sorong Regency, Indonesia

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## Abstract

Stunting significantly impairs cognitive development, potentially leading to long-term intellectual disabilities, compromised learning abilities, and an elevated risk of chronic illnesses. This study investigates the prevalence and determinants of stunting among toddlers in Maibo Village, Aimas District, Sorong Regency, employing a descriptive quantitative approach. Data were sourced from the 2024 Sorong District Health Office report covering 19 public health centers, focusing specifically on Malawili Health Center. Spatial-temporal analyses revealed high stunting prevalence rates in Seget (44.1%), Makbon (37.4%), and Maudus (36.6%) health centers, whereas Maibo Village had a lower prevalence rate of 17.22%. A concerning increase in stunting cases was observed at Malawili Health Center from 92 in 2021 to 261 cases in 2024. Key local determinants identified include limited nutritional access, inadequate sanitation, and socioeconomic challenges. The findings highlight the necessity of targeted nutritional education, particularly regarding balanced diets, exclusive breastfeeding, and appropriate complementary feeding, to be delivered through community-based programs and healthcare services. These interventions, supported by strengthened cross-sectoral collaboration between local governments, private entities, and communities, are critical for mitigating stunting prevalence. Future qualitative research is recommended to deepen the understanding of community-specific nutritional practices and enhance the effectiveness of intervention strategies.

**Keywords:** Stunting, Prevalence, Toddlers, Nutritional Education, Community Intervention

## Abstrak

Stunting secara signifikan menghambat perkembangan kognitif, yang berpotensi menyebabkan gangguan kecerdasan jangka panjang, kemampuan belajar yang rendah, serta meningkatkan risiko penyakit kronis di kemudian hari. Penelitian ini bertujuan untuk mengkaji prevalensi dan faktor determinan stunting pada balita di Kampung Maibo, Distrik Aimas, Kabupaten Sorong, menggunakan pendekatan kuantitatif deskriptif. Data diperoleh dari laporan Dinas Kesehatan Kabupaten Sorong tahun 2024 yang mencakup 19 puskesmas, dengan fokus utama pada Puskesmas Malawili. Hasil analisis spasial-temporal menunjukkan prevalensi stunting tertinggi ditemukan di Puskesmas Seget (44,1%), Makbon (37,4%), dan Maudus (36,6%), sementara Kampung Maibo memiliki prevalensi yang lebih rendah yaitu 17,22%. Terjadi peningkatan kasus stunting yang mengkhawatirkan di Puskesmas Malawili dari 92 kasus pada tahun 2021 menjadi 261 kasus pada tahun 2024. Faktor determinan utama lokal yang teridentifikasi meliputi keterbatasan akses nutrisi, sanitasi yang tidak memadai, dan tantangan sosial ekonomi. Temuan penelitian ini menekankan pentingnya edukasi gizi yang tepat sasaran, terutama tentang pola makan seimbang, pemberian ASI eksklusif, dan pemberian makanan pendamping ASI yang tepat melalui program berbasis komunitas dan layanan kesehatan. Penelitian kualitatif lanjutan direkomendasikan untuk memperdalam pemahaman mengenai praktik nutrisi spesifik komunitas demi meningkatkan efektivitas strategi intervensi.

**Kata Kunci:** Stunting, Prevalensi, Balita, Edukasi Gizi, Intervensi Komunitas

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## INTRODUCTION

The phenomenon of stunting remains a critical public health issue worldwide, especially in developing countries, where it significantly affects child health and development. Stunting in toddlers is characterized by impaired growth and development due to chronic nutritional deficiencies and recurrent infections, leading to height or length measurements below the standard for age (UNICEF, 2023).

Globally, around 148 million children under five were stunted as of 2022, with the highest prevalence reported in South Asia and Sub-Saharan Africa (WHO, 2023). In Southeast Asia, Indonesia ranks among the top countries with substantial stunting prevalence, with the eastern regions, including West Papua, showing alarming figures. Recent data highlight that West Papua Province recorded a stunting prevalence of 30% in 2022, positioning it among provinces with the highest stunting rates nationally (Kementerian Kesehatan RI, 2023).

Conducting this study specifically in Sorong Regency, West Papua, is of considerable importance given the region's distinctive sociocultural, economic, and geographic characteristics, which potentially exacerbate stunting incidence. Sorong Regency presents unique challenges such as limited access to nutritious food, inadequate sanitation facilities, and restricted healthcare services, contributing to higher risks of chronic malnutrition and stunting among children (BPS Papua Barat, 2023). Thus, understanding the stunting phenomenon in this particular context is critical to formulating targeted and effective interventions, which may differ substantially from strategies employed in other parts of Indonesia.

A clear research gap exists regarding comprehensive and up-to-date assessments of stunting determinants and their impact on long-term human capital development specifically in Sorong Regency. Prior studies predominantly focus on national-level analyses or general regional assessments without providing sufficient attention to localized contexts (Saputri & Tumangger, 2019; Chandra et al., 2023). Recent evidence indicates that regional and local variations significantly affect stunting prevalence and intervention effectiveness (Kementerian Kesehatan RI, 2023; UNICEF, 2023). For instance, studies by Dewey and Begum (2011) and Bhutta et al. (2008) underscore the importance of community-specific interventions, highlighting that generalized strategies may not adequately address localized determinants such as cultural practices, geographical accessibility, and unique socioeconomic barriers. This study aims to fill this gap by closely examining the local determinants and prevalence of stunting within Maibo Village, Aimas District, thus providing valuable insights tailored specifically to local policy needs and interventions.

Furthermore, it is crucial to address the significant long-term impacts of stunting on human resource development, particularly within the context of West Papua. Children affected by stunting face lifelong consequences, including reduced cognitive function, diminished educational achievement, lower economic productivity, and heightened susceptibility to chronic diseases in adulthood (Victoria et al., 2021). Additional studies have demonstrated that stunted children are likely to experience reduced earnings as adults, perpetuating cycles of poverty and inequality (Black et al., 2013; Prendergast & Humphrey, 2014). In the local context, these consequences are particularly detrimental given West Papua's ongoing development challenges, such as limited infrastructure and healthcare resources, which further exacerbate the impact of stunting (BPS Papua Barat, 2023; TNP2K, 2017). Reducing stunting prevalence is essential not only to improve individual health outcomes but also to enhance regional human capital, fostering economic and social development in the long term (Dewey & Begum, 2011; Bhutta et al., 2008).

Given these circumstances, this study seeks to investigate the phenomenon of stunting, focusing specifically on its prevalence and local determinants in Maibo Village, Aimas District, Sorong Regency. This research aims to inform policymakers and health practitioners to

develop precise, evidence-based interventions designed specifically for the unique needs of communities within West Papua, ultimately contributing to national and global targets for stunting reduction.

## METHOD

This study utilized a descriptive quantitative research design to assess the prevalence and determinants of stunting among toddlers in Sorong Regency, specifically focusing on Maibo Village within the service area of Malawili Public Health Center. A descriptive quantitative approach was selected to provide a systematic and objective depiction of the phenomenon, enabling clear numerical representation and measurable outcomes (Creswell & Creswell, 2018). The methodological choice aligns well with the primary objective of identifying prevalence patterns and specific contributing factors to stunting within a defined geographic and temporal context.

Data for this research were primarily sourced from the official 2024 annual report published by the Sorong District Health Office, which included detailed records from 19 public health centers (Puskesmas) within the district. Malawili Public Health Center was specifically chosen as the focal point for detailed examination due to a marked upward trend in reported stunting cases over the previous four-year period (2021–2024), highlighting the urgency of addressing this issue through a localized investigation.

The sample for the study comprised 24 toddlers identified as stunted based on anthropometric measurements conducted in June 2024. These toddlers were selected using a purposive sampling technique, which involved setting specific inclusion criteria to ensure the relevance and representativeness of the sample for the intended analysis. The inclusion criteria included: (1) toddlers aged between 0–59 months, (2) registered as permanent residents of Maibo Village, and (3) classified as stunted according to the World Health Organization (WHO) child growth standards (WHO, 2023). This sampling method ensured targeted data collection that accurately reflects the stunting situation within the specified community context.

Anthropometric data collection followed standardized protocols recommended by the WHO to ensure accuracy and reliability. Measurements of length or height were taken using calibrated infantometers or stadiometers, instruments regularly checked for accuracy to maintain data validity. Healthcare professionals specifically trained in anthropometric measurement conducted all data collection procedures, minimizing potential measurement errors and ensuring consistency across data collection activities (Cogill, 2023). Each child underwent at least two separate measurements by different trained personnel. If discrepancies exceeding 0.5 centimeters arose between these two measurements, a third measurement was conducted to resolve the inconsistency and establish final values for analysis.

Spatial and temporal analyses were performed to provide deeper insights into the distribution and progression of stunting cases across Sorong Regency. Spatial analysis was conducted using Geographic Information System (GIS) technology, specifically ArcGIS software version 10.8 (ESRI, 2023). This approach enabled the researchers to visualize and analyze the geographical distribution of stunting prevalence, identifying high-risk areas such as Seget, Makbon, and Maudus Health Centers. Temporal analysis complemented the spatial approach by examining longitudinal data to capture trends over the four-

year period, identifying annual changes and highlighting significant growth in stunting cases. The combination of spatial-temporal analytical techniques enhanced the precision of identifying areas that required prioritized intervention based on patterns of prevalence and dynamic changes over time (Franch-Pardo et al., 2020).

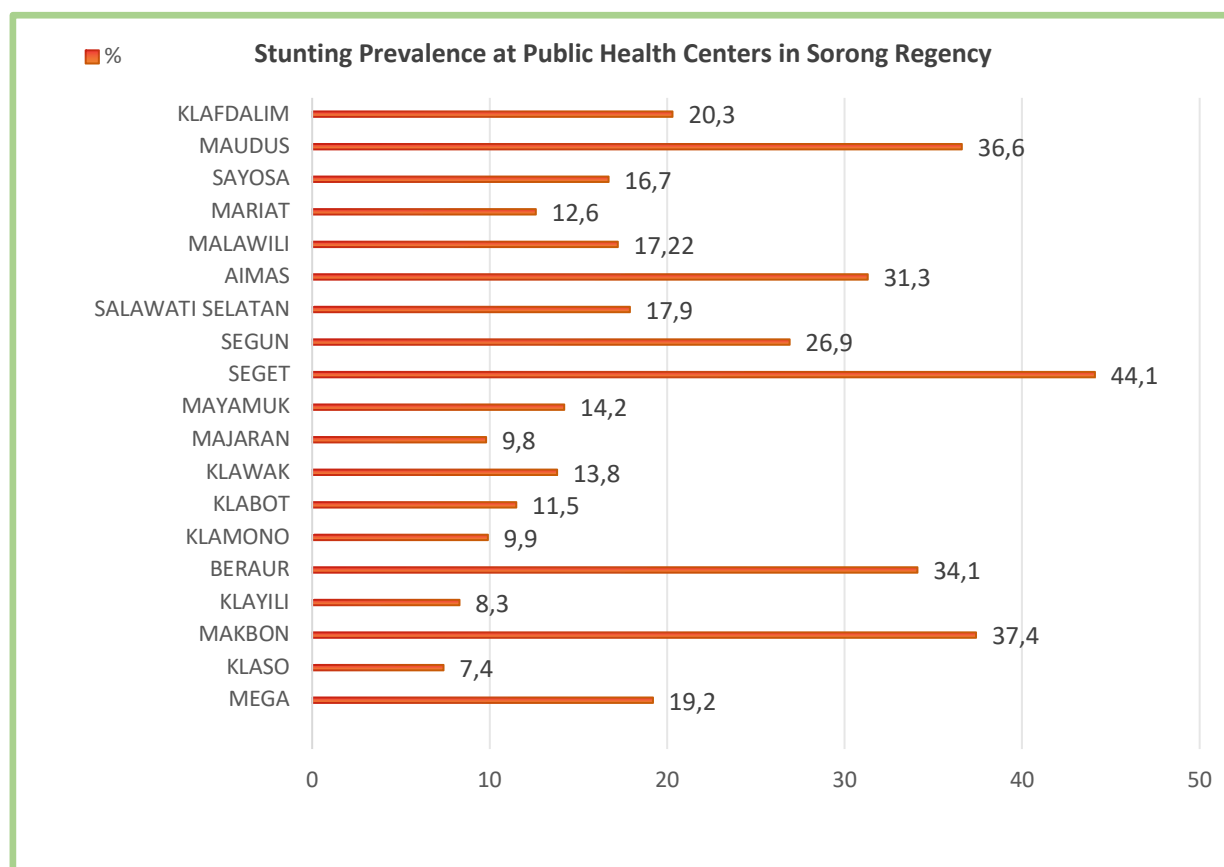
Data analysis involved calculating the prevalence of stunting by summing the total number of existing and newly identified stunting cases, dividing this by the total toddler population in the area within a specified period, and multiplying the result by 100%. This calculation provided a standardized measure of stunting prevalence, facilitating comparisons across different geographical areas within Sorong Regency and across different years. Descriptive statistical methods were further employed to interpret and present the data in an accessible and informative manner, aiding stakeholders in decision-making processes related to public health interventions.

## RESULTS

The results of this study indicated significant variations in the prevalence of stunting among toddlers across the

Sorong Regency, with noticeable differences among the 19 public health centers. According to the monitoring data from the Sorong District Health Office (2024), the highest prevalence of stunting was recorded at Seget Health Center, with 44.1% of toddlers affected, followed by Makbon Health Center at 37.4%, and Maudus Health Center at 36.6%. Conversely, Maibo Village, within the jurisdiction of Malawili Health Center, exhibited a comparatively lower prevalence of 17.22%. The prevalence was calculated clearly by adding both existing and newly identified stunting cases, dividing by the total number of toddlers in the respective area, and then multiplying by 100%. This calculation provides an easily interpretable measure that highlights the proportion of affected toddlers relative to the total toddler population.

The graphical presentation (Figure 1) illustrates the stunting prevalence among the public health centers in Sorong Regency for the year 2024. To enhance reader comprehension and facilitate better interpretation, the graph includes a clear legend, descriptive chart title, and additional explanatory notes. These elements assist in accurately interpreting and comparing prevalence rates between health centers, making it easier for readers unfamiliar with quantitative data to quickly grasp the central message and implications of the data.



**Figure 1.** Stunting Prevalence at Public Health Centers in Sorong Regency, Southwest Papua Province, 2024.

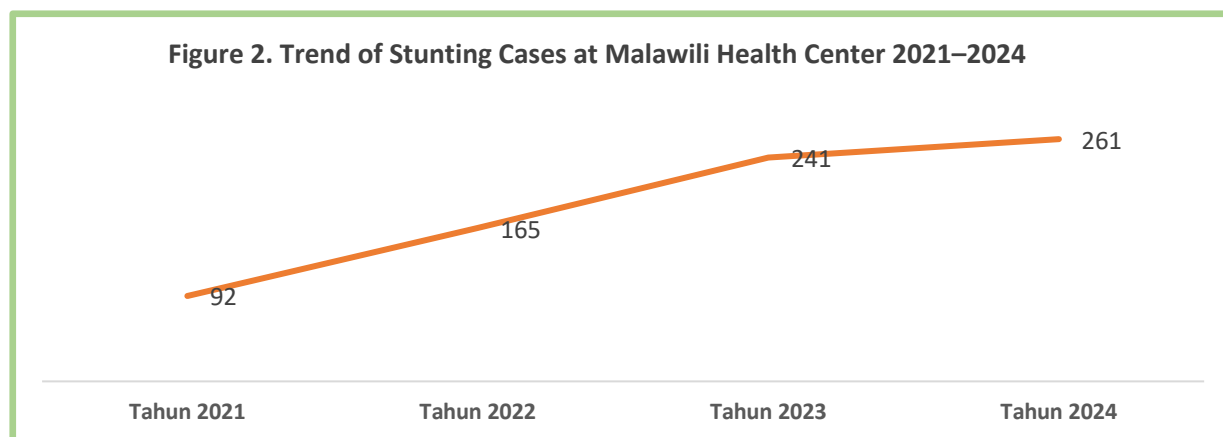
Figure 2 depicts the trend in stunting cases at Malawili Health Center from 2021 to 2024, clearly showing a consistent increase over this period. Specifically, the number of stunting cases rose from 92 in 2021 to 165 in 2022, subsequently increasing to 241 in 2023, and finally reaching 261 cases in 2024. The graphical presentation effectively demonstrates this upward trend, reinforced by descriptive labels and annotations that clearly highlight the

annual increments, facilitating a straightforward understanding of the worsening situation over recent years.

In addition to presenting prevalence data, this study briefly analyzed local contextual determinants contributing to the high prevalence of stunting observed in Maibo Village. Key factors identified include limited access to nutritious foods, inadequate sanitation, restricted healthcare services, and socioeconomic barriers such as low household income

and limited maternal education on nutritional practices. These factors create an environment conducive to chronic malnutrition among toddlers, thereby perpetuating the high rates of stunting observed in the study area. Addressing these determinants through targeted interventions such as

improved nutrition education, enhanced sanitation facilities, and increased access to healthcare services would likely reduce the prevalence of stunting significantly in Maibo Village and similar communities.



**Figure 2.** Trend of Stunting Cases at Malawili Health Center (2021–2024)

## DISCUSSION

The findings of this study highlight notable disparities in stunting prevalence across public health centers in Sorong Regency, with particularly high rates recorded at Seget, Makbon, and Maudus Health Centers, contrasted by a relatively lower prevalence in Maibo Village, serviced by Malawili Health Center. This variation underscores the importance of localized assessments and tailored interventions, aligning with previous research emphasizing that stunting prevalence is influenced by multifaceted factors including nutritional intake, socioeconomic status, maternal education, healthcare access, and environmental conditions such as sanitation and clean water availability (Victora et al., 2021; Bhutta et al., 2008; Black et al., 2013; Prendergast & Humphrey, 2014).

The increasing trend of stunting cases at Malawili Health Center over the last four years indicates a pressing public health concern requiring immediate and targeted interventions. One notable intervention implemented by the Sorong District Government is the SISAGU program (Sayang Ibu, Sayang Anak, Gizi Utama Dalam Keluarga - "Caring for Mothers and Children, Prioritizing Family Nutrition"), conducted in collaboration with local stakeholders such as PT. Petro Gas Basin, Ltd. This collaboration has significantly benefited the local community by improving access to nutritional education, healthcare services, and supplemental feeding programs. Specifically, PT. Petro Gas Basin, Ltd. has contributed resources and logistical support, enabling the effective dissemination of nutritional knowledge and practices among mothers and caregivers, thus directly influencing community-level nutritional outcomes (Kementerian Kesehatan RI, 2023; Saputri & Tumangger, 2019).

To further elucidate how the SISAGU program practically contributes to reducing stunting prevalence, it integrates community-based activities including regular nutrition counseling sessions, exclusive breastfeeding campaigns, and demonstrations of appropriate complementary feeding practices. These activities enhance maternal and caregiver knowledge regarding balanced diets and child healthcare practices, thereby fostering improved nutritional behaviors within households. Studies have

indicated that interventions centered around maternal education and community empowerment significantly reduce stunting rates by enabling mothers and families to adopt beneficial nutritional practices that directly affect child growth outcomes (Dewey & Begum, 2011; Black et al., 2013; Franch-Pardo et al., 2020; UNICEF, 2023). Despite these promising initiatives, several limitations and challenges have been encountered during the implementation of intervention programs within the study area. Major obstacles include infrastructural constraints such as inadequate transportation and logistical issues, limited healthcare personnel to conduct consistent outreach programs, and persistent cultural practices and beliefs that hinder the adoption of recommended nutritional practices. Overcoming these barriers requires continuous engagement with community leaders and influential local figures to build trust and foster acceptance of interventions. Effective capacity-building for local health workers and regular follow-ups on community practices are also essential to ensure sustainability and success (Franch-Pardo et al., 2020).

In terms of policy implications, the findings of this study strongly suggest the need for concrete action at both district and provincial levels. Policymakers should prioritize interventions that address specific local determinants identified in this study, such as enhancing household access to nutritious food, improving sanitation facilities, and increasing healthcare service coverage in remote areas. Policies aimed at poverty alleviation and socioeconomic empowerment are equally important, as financial barriers significantly limit the ability of households to consistently secure nutritious food supplies. Furthermore, integrated multi-sectoral strategies involving collaborations between health, education, agriculture, and infrastructure sectors are recommended to comprehensively tackle the determinants of stunting, creating lasting improvements in child health and development across Sorong Regency and beyond (UNICEF, 2023; Bhutta et al., 2008).

The outcomes of this research provide a valuable foundation for developing evidence-based, locally-tailored interventions that can be effectively scaled to other regions with similar characteristics. Continuous monitoring, evaluation, and research will be critical to assess

intervention effectiveness and guide future policy adjustments, ultimately contributing to broader national and global efforts in stunting reduction.

## CONCLUSIONS AND RECOMMENDATION

The findings of this study clearly demonstrate significant variability in the prevalence of stunting across different public health centers in Sorong Regency. Specifically, high stunting rates were observed at Seget Health Center (44.1%), Makbon Health Center (37.4%), and Maudus Health Center (36.6%), whereas Maibo Village, within the jurisdiction of Malawili Health Center, showed a relatively lower prevalence of 17.22%. These findings underline the importance of geographically targeted interventions that take into account local conditions and determinants of stunting.

The observed increasing trend in stunting cases at Malawili Health Center from 92 cases in 2021 to 261 cases in 2024 signals an urgent public health issue that requires targeted and immediate action. Effective measures to reduce stunting prevalence must encompass comprehensive nutritional education targeting pregnant women and mothers of young children, focusing specifically on promoting balanced nutrition intake, exclusive breastfeeding practices, and appropriate complementary feeding practices. These efforts should be integrated into regular health education programs conducted at community health centers and Posyandu (integrated health service posts).

Practical policy recommendations to strengthen local interventions include enhancing collaboration between governmental and non-governmental stakeholders. Local governments should actively collaborate with private sector entities, such as PT. Petro Gas Basin, Ltd., to leverage additional resources and support for ongoing community-based nutritional programs. Specific mechanisms include establishing dedicated cross-sectoral committees to ensure coordinated implementation, consistent monitoring, and regular evaluation of nutrition-focused interventions, thereby facilitating continuous improvement and sustainability of these efforts.

Additionally, it is crucial to address infrastructural and systemic barriers that currently impede the effective delivery of nutritional interventions. These include improving sanitation facilities and ensuring sustainable access to clean water, which are foundational for promoting better health and nutritional outcomes. Policymakers at district and provincial levels should therefore prioritize infrastructure development and allocate sufficient funding towards improving the sanitation and healthcare infrastructure.

Moreover, this study highlights the need for continued research employing qualitative methodologies to complement the existing quantitative data. Future qualitative research should explore deeper insights into community perceptions, cultural practices, and barriers related to child nutrition and health-seeking behaviors. Such qualitative studies would provide rich, context-specific information crucial for designing culturally sensitive and more effective community-based interventions. Understanding these qualitative dimensions can significantly enhance the relevance and acceptance of public health strategies aimed at reducing stunting.

In conclusion, tackling stunting effectively in Sorong Regency requires multi-layered interventions combining education, infrastructure improvement, cross-sectoral

collaboration, and qualitative insights to ensure strategies are appropriately tailored to local contexts. The ongoing evaluation of implemented interventions is critical to adapting policies and practices to achieve sustainable reductions in stunting prevalence, contributing positively to regional human resource development and overall public health improvement.

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