



Original Article

## Control of Families at Risk of Stunting through Demographic Approach and Information Dissemination

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### ABSTRACT

Stunting prevention in high-risk families, particularly regarding environmental factors, remains a significant issue in Bengkulu Province as an area characterized by limited access to safe drinking water and adequate sanitation, both key indicators of stunting risk. This study aimed to identify factors associated with the risk of stunting among families in Bengkulu Province, Indonesia. A cross-sectional approach was employed using secondary data from the 2021 Population Survey (PK21) of Bengkulu Province, which included 436,490 families. Univariate, bivariate (chi-square), and multivariate logistic regression analyses were conducted. The results showed that 83.1% of families in Bengkulu Province were not at risk of stunting. Factors significantly associated with stunting risk included the occupation and educational level of the head of household, health insurance status, household income adequacy, housing ownership status, and exposure to information through media and health officers ( $p < 0.001$ ). Families with heads of household working as farmers and those with heads who did not complete elementary school had the highest prevalence of stunting risk. Families without health insurance, inadequate income, rent-free housing, and no exposure to the Bangsa Kencana program through media or officers also exhibited a higher prevalence of stunting risk. Logistic regression analysis revealed that families not receiving Bangsa Kencana information from officers were 1.08 times more likely to be at risk of stunting (95% CI = 1.05–11). In conclusion, demographic factors and information exposure were identified as critical risk factors for stunting among families in Bengkulu Province. These findings highlight the importance of targeted interventions and information dissemination in reducing stunting risk.



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## INTRODUCTION

Stunting becomes one of the world's child health problems. This incidence has been decreasing since 2000, but hard work is needed to achieve the 2030 Sustainable Development Goals (SDGs) target. Globally, the prevalence of stunting has decreased by 13.1% over the past two decades, with current rates at 22%. In Southeast Asia, stunting prevalence stands at 15.3%, while in Indonesia, it declined slightly from 24.4% in 2021 to 21.6%.<sup>1,2</sup>

The prevalence of stunting in Bengkulu Province is 22.1%. Although this rate seems

relatively low among Indonesia's 34 provinces, concerted efforts are needed to reach the national target of 14% by 2024. Key risk factors for stunting include lack of exclusive breastfeeding, low economic status, premature birth, short birth length, short maternal height, low maternal education, inadequate latrines or sanitation, poor drinking water management, and limited access to health services.<sup>3</sup>

There is a significant interaction between household latrine facilities and water treatment practices ( $P$  for interaction = 0.007). The odds of child stunting were three times higher if the household used an unhealthy latrine (adjusted odds ratio 3.47, 95% confidence interval 1.73-7.28,  $P < 0.001$ ).<sup>4</sup> A review of stunting risk factors in Bengkulu Province highlights maternal knowledge, access to clean water, environmental sanitation, history of infectious disease, exclusive breastfeeding, poor sanitation hygiene, and education as major influences.<sup>5-8</sup>

In an effort to unify population data, the National Population and Family Planning Agency (BKKBN) launched Family Data Collection in 2021 (PK21) to centralize population data collection from national to village levels. Based on the Indonesian Nutrition Status Survey (SSGI), the national prevalence of stunting was 24.45%, with the highest rates observed among children aged 36 – 47 months (6%) and 24 – 35 months (5.6%). In Bengkulu province, stunting prevalence is targeted to decrease from 22.1% to 12.55% by 2024. PK21 (Family Data Collection 2021) data reveals that 264.391 families in Bengkulu Province at risk of stunting.

Bengkulu Province ranks the lowest in Indonesia<sup>9</sup> regarding access to safe drinking water, with only 49.6% of household having adequate access, leaving 50.4% without.<sup>10,11</sup> In addition, access to proper sanitation facilities ranks fourth lowest in the province. Inadequate drinking water and poor sanitation are risk factors for infection.<sup>12,13,14</sup> Consequently, this study examines factors associated with families at risk of stunting based on 2021 Family Data Collection (PK21) data.

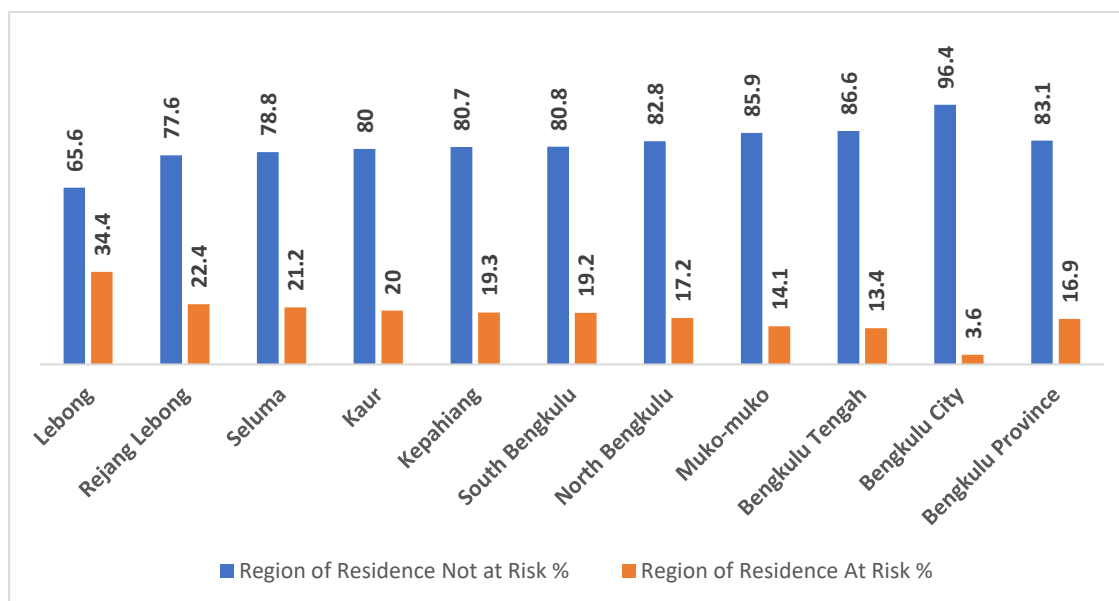
## METHODS

In this study, secondary data analysis was used as a quantitative research. The 2021 Family Data Collection was taken using the Cross-Sectional method. The 2021 Family Data Collection program was carried out for two months, namely in the period 1 April to 31 May 2021. In this study, the population involved the heads of families in Bengkulu Province with a total of 516.748, the sample in this study was taken using the total population technique and found as many as 436.490 families who met the inclusion and exclusion criteria.

In this study, families at risk of stunting were identified based on environmental health conditions, specifically the main drinking water source and the availability of healthy latrines. Independent variables examined in this study were selected based on the availability of existing data. The employment variable refers to the type of work performed by the head of the family to fulfil the family's need (type of work are detailed in Table 2). Education levels refers to formal academic attainment completed by the head of the family (further details are available in Table 3). Health insurance status was categorized based on the type of insurance used by the family, consisting of BPJS/Private/Jamkesda/none. For family income, participation to family planning programs, exposure to online media, and exposure to information from officers, the results were according to the answers given by respondents (Yes/No). The housing ownership status occupied by the respondent was rent-free, hitchhiking, owned, contract/rent, provided by an institution/Dinas, and others. Data were analyzed using univariate and bivariate *Chi square* tests, with multivariate analysis using logistic regression.

## RESULTS

Based on the research findings, most families in Bengkulu Province are not at risk of stunting, with a percentage of 83.1%. Families at risk of stunting based on Kabupaten Lebong residence area has the highest number of families at risk of stunting, while the lowest number of families at risk is in Bengkulu City. As presented in the figure below:



**Figure 1. Families at Risk of Stunting by District/city Area**

The occupation of the head of the family as a farmer has the highest prevalence of stunting risk, while the prevalence of the occupation of the head of the family as a Civil Servant/National Army/Indonesian Police has the lowest stunting risk. There is a correlation between the occupation of the family head and families at risk of stunting in Bengkulu Province. The results of the analysis indicate that there is a correlation between the occupation of the family head and families at risk of stunting  $p\text{-value} = 0.000$  ( $p\text{-value} < 0.05$ ). Table 1 shows the bivariate analysis table of families at risk of stunting as follows:

**Table 1. Families at Risk of Stunting Based on Bivariate Analysis**

Variables	Families at Risk of Stunting				Total		P-value	
	Not at Risk		At Risk		n	%		
	n	%	n	%				
<b>Family Head Occupation</b>								
State Officials	1277	90.6	133	9.4	1410	100	<0.001	
Civil Servant/Indonesian Army/ Indonesian Police	26225	96.7	893	3.3	27118	100		
Private Employee	27983	94.3	1696	5.7	29679	100		
Self-employed	78746	90.3	8479	9.7	87225	100		
Retired	7761	95.6	353	4.4	8114	100		
Merchants	14415	89.9	1612	10.1	16027	100		
Farmers	168829	75.4	55105	24.6	223934	100		
Fisherman	4371	88.1	588	11.9	4959	100		
Freelancers	29620	87.3	4301	12.7	33921	100		
Not yet employed	3424	83.5	679	16.5	4103	100		
<b>Family Head Education</b>								
University/Academy graduates	45001	95.5	2109	4.5	47110	100		<0.001
Still PT/Academy	986	90.8	100	9.2	1086	100		
Graduated from high school/equivalent	117933	88.5	15378	11.5	133311	100		
Still in high school/equivalent	2690	83.9	516	16.1	3206	100		
Graduated from junior high school/equivalent	68557	81.3	15795	18.7	84352	100		
Still in secondary school	1553	77.5	451	22.5	2004	100		

Variables	Families at Risk of Stunting				Total		P-value
	Not at Risk		At Risk		n	%	
	n	%	n	%			
Graduated elementary school/equivalent	102795	76.5	31594	23.5	134389	100	
Still in primary school	713	74.4	245	25.6	958	100	
Not graduated from elementary school/equivalent	17486	73.5	6307	26.5	23793	100	
Not yet in school	4937	78.6	1344	21.4	6281	100	
<b>Health Insurance Ownership Status</b>							
BPJS-non PBI (Health Insurance)	108240	92.1	9292	7.9	117532	100	<0.001
Private	133043	81.2	1126	7.8	14430	100	
BPJS-PBI/Jamkesmas/Jamkesda (Health Insurance)	140431	79.9	35372	20.1	175803	100	
None	100676	78.1	28049	21.8	128725	100	
<b>Ownership Source of Income</b>							
Yes	354938	83.4	70769	16.6	425707	100	<0.001
No	7713	71.5	3070	28.5	10783	100	
<b>Exposure to the Bangsa Kencana Program</b>							
Yes	299897	84.6	54709	15.4	354606	100	<0.001
No	62754	76.6	19130	23.4	81884	100	
<b>Home Ownership Status</b>							
Rent Free	4471	76.8	1353	23.2	5824	100	<0.001
Hitchhiking	30466	78.9	8170	21.2	38636	100	
Owned	309331	83.4	61718	16.6	371049	100	
Contract/Rent	14771	88.2	1970	11.8	167411	100	
Service	2444	89.6	284	10.4	2728	100	
More	1168	77.2	334	22.8	1512	100	
<b>Information Exposure through Media</b>							
Yes	305884	85.4	52173	16.6	358057	100	<0.001
No	56767	72.4	21666	27.6	78433	100	
<b>Exposure to Bangsa Kencana Information through Officers</b>							
Yes	310514	83.7	60351	16.3	370865	100	<0.001
No	52137	79.4	13488	20.6	65625	100	

The highest prevalence of stunting risk is observed among families where the head did not complete elementary school/equivalent education, while the lowest risk is among families where the head completed college or academy. There is a significant correlation between family head education and families at risk of stunting in Bengkulu Province with a p-value = <0.001 (p-value <0.05).

Families without health insurance have the highest prevalence of stunting risk, while those with private health insurance exhibit the lowest risk. A significant correlation exists between health insurance status and stunting risk among families in Bengkulu Province with a p-value = <0.001 (p-value <0.05).

Families with a source of income in the past six months show a higher prevalence of stunting risk than those with a stable income during this period. A significant correlation between family income sources and families at risk of stunting in Bengkulu Province with a p-value = < 0.001 (p-value <0.05).

Families that have not received, heard, or seen information related to the Bangsa Kencana Program through media channels show a higher prevalence of stunting risk compared to those exposed to such information. There is a significant correlation between media exposure to the Bangsa Kencana Program and stunting risk in Bengkulu Province (p-value = <0.001, p < 0.05).

Families with rent-free housing have a higher prevalence of stunting risk than those with official ownership status. A significant correlation exists between home ownership status and stunting risk among families in Bengkulu Province (p-value = <0.001, p < 0.05).

Families with no exposure to information through online media (internet) have a higher prevalence of stunting risk than those who have accessed such information. A significant correlation was observed between online media exposure and stunting risk among families in Bengkulu Province (p-value = <0.001, p < 0.05).

Families that have not received, heard, or seen information about the Bangsa Kencana Program from officers exhibit a higher prevalence of stunting risk compared to those who have. There is a significant correlation between exposure to the Bangsa Kencana Program through officers and stunting risk in Bengkulu Province (p-value = <0.001, p < 0.05).

Further multivariate logistic regression analysis on stunting risk among families, incorporating demographic factors and information dissemination, is detailed in Table 2.

**Table 2. Families at Risk of Stunting by Demographic Approach and Information Dissemination**

<b>Variables</b>	<b>B</b>	<b>OR</b>	<b>P Value</b>	<b>OR (95% CI)</b>
<b>Occupation</b>				
Non-working				
Working	0.12	0.87	<0.001	(0.87-0.88)
<b>Education</b>				
Low				
High	0.12	0.88	<0.001	(0.88-0.89)
<b>Health Insurance Ownership Status</b>				
Have	0.02	1.02	<0.001	(1.02-1.03)
Do not have				
<b>Ownership Source of Income</b>				
Yes	0.33	0.71	<0.001	(0.68-0.75)
No				
<b>Exposure to the Bangsa Kencana Program from the Media</b>				
Yes	0.19	0.82	<0.001	(0.80-0.84)
No				
<b>Exposure to Bangsa Kencana Information through Officers</b>				
Yes	0.07	1.08	<0.001	(1.05-1.11)
No				

The odds ratio in Table 2 indicates the impact of receiving Bangsa Kencana information through officers on the likelihood of families being at risk of stunting. After adjusting for variables such as exposure to the Bangsa Kencana program through media, source of income, health insurance status, education, and employment, families that do not receive Bangsa Kencana information from officers are 1.08 times more likely to be at risk of stunting compared to families who receive this information (95% CI = 1.05 – 11).

## DISCUSSION

### Families at Risk of Stunting based on Family Head Occupation Condition

There is a correlation between families at risk of stunting and the occupation of the family head in Bengkulu Province. The research findings showed that most of the families at risk of stunting came from family heads who worked as farmers, which was 24.6%. Families with limited income are more likely to be less able to fulfil family food needs in terms of quality and quantity. Conversely, adequate family income will support children's growth and development because parents can provide for their children's needs.<sup>15</sup> Fathers who do not work or unemployed have a 4.043 times greater chance of being stunted compared to toddlers whose fathers work.<sup>16</sup>

Previous research<sup>17,18</sup> stated a significant correlation between parental employment and stunting incidence (p-value = 0.018). employment level within a family impacts child growth substantially, as family labor and income affect nutrition. Low-income families may struggle to afford nutritious food, which can hinder infant growth. Limited income restricts access to

adequate nutrition.<sup>19</sup>

Employment serves as a daily activity to secure a livelihood and meet basic needs. Besides the father's role as the primary financial provider, the mother's role as a caregiver and manager of household food consumption is also crucial. Mothers play an important role in family nutrition improvement efforts, particularly in enhancing the nutritional status of infants and children.<sup>20</sup>

### **Families at Risk of Stunting based on Family Head Education Condition**

There is a correlation between families at risk of stunting and the education of the family head in Bengkulu Province. The research findings showed that most of the families at risk of stunting came from family heads who did not graduate from primary school as much as 26.5%. Parental education can affect nutritional status, one of which is the incidence of stunting. This is reinforced by research conducted by that low parental education increases the likelihood of children experiencing nutritional problems compared to parents with high education levels. The level of education can affect the incidence of stunting but does not occur significantly. This may be influenced by the ability of each parent to access information because there are parents who have good sources of information from health services related to nutritional needs in children but with low education levels.<sup>21</sup>

Fathers' education has an important role in explaining their involvement in Infant and Young Child Feeding procedures. When a father is actively involved in his child's education, it was found that the child tends to be better educated the higher the father's education level.<sup>22</sup> Ahmad's (2018) study in Aceh, Indonesia, found a strong correlation between father's education level and children's dietary needs and habits. Research conducted by Abedi<sup>23</sup> stated that father's education affects family food safety. Parents with good education can provide more opportunities to receive information about caring for and maintaining children's health and educating good children.<sup>24</sup> Parents must have nutrition-conscious family behaviour (kadarzi) so that toddlers get varied and appropriate food ingredients and menus according to their needs.<sup>25</sup>

### **Families at Risk of Stunting based on Health Insurance Ownership Condition**

Health insurance coverage in Indonesia has been on the rise, although it remains relatively low. Previous research showed that out of 47 respondents without health insurance, 81.6% had underweight toddlers, while among 29 respondents with health insurance, 57.9% had toddlers with good nutritional status. This finding reflects a significant correlation between health insurance ownership and underweight incidence (p-value <0.001). Health insurance ownership affects LBW, prematurity, and stunting. The incidence of illness in toddlers influences nutritional status, as infectious diseases can decrease appetite, resulting in insufficient food intake and subsequently lower nutritional status.<sup>26</sup>

There is a correlation between families at risk of stunting and health insurance ownership in Bengkulu Province, consistent with previous research showing a significant correlation between health insurance ownership and stunting in toddlers.<sup>27</sup>

### **Families at Risk of Stunting based on Income of Family Members Condition in Meeting Monthly Needs**

Low income of family members becomes one of the dimensions of poverty. These factors are associated with limited access to adequate food and environmental sanitation and low access to basic health services.<sup>28</sup> Stunting is commonly associated with low overall socioeconomic conditions, the socioeconomic level of the family can be seen from their income. This is the basic capital towards a prosperous family so that all families expect to get the maximum income to support the needs of their family members.<sup>29</sup>

There is a correlation between families at risk of stunting and the income of family members in Bengkulu Province. In line with previous research<sup>30</sup> that low household income has an influence on the incidence of stunting. Further research also shows the same thing that low family income gives a tendency to have toddlers who are stunted.<sup>31-34</sup>

Household food expenditure is significantly associated with stunting. Children from households with low food expenditure had a 3.8 times greater risk of being stunted compared to

children from households with high food expenditure. This suggests that economic status has the correlation with the incidence of stunting in children aged 6-23 months. Household expenditure is also associated with higher dietary diversity among children under five. This identifies the household's ability to obtain the food needed by its family members in general.<sup>35</sup>

### **Families at Risk of Stunting with the Bangsa Kencana Program**

Stunting reduction is one of the most important programs as it is related to the development of a more competitive Indonesian human in the future. Thus, BKKBN's move to oversee the accountability of the Bangsa Kencana Program. Besides, the acceleration of stunting reduction is a strategic and appropriate step. In order to ensure that the program has an impact and the use of the budget is accountable, the approach should no longer be *money follow function*, but must be *money follow program*, and the *program must follow impact/result*.

There is a correlation between families at risk of stunting and exposure to the Bangsa Kencana program in Bengkulu Province. The research findings showed that most of the families at risk of stunting came from families who were not exposed to the Bangsa Kencana program, which was 23.4%. The Bangsa Kencana program, as an acronym for Family Development, Population and Family Planning, is one of the flagship program of the BKKBN. Bangsa Kencana makes the family the backbone of development and focuses on realizing a quality family. Therefore, it is important to have strong cooperation and coordination among ministries, institutions, and local governments to implement the National Strategy in an effort to accelerate the reduction of stunting prevalence in Indonesia.<sup>36</sup>

### **Families at Risk of Stunting based on Home Ownership Status Condition**

Home ownership has a significant correlation with stunting. Families whose home ownership status is renting have a 0.127 times chance of having stunted toddlers compared to families whose home ownership status is owned.<sup>27</sup> The allocation of income for house rental costs affects the fulfilment of family nutritional needs. This explains that home ownership indirectly has implications for the fulfilment of family nutritional needs, which increases the risk of stunting in toddlers.<sup>37</sup>

A correlation between families at risk of stunting and home ownership status in Bengkulu Province was found. In line with previous research, home ownership status is related to the incidence of stunting in toddlers. Most socio-economic influences also affect the status of home ownership, such as in urban areas that most people who have income in the lower middle category are still renting houses, while those with middle and upper income have private homes or official houses. In addition, the state of the house also has a significant effect on the nutritional status of toddlers. Besides, the state of the physical environment sanitation around the house greatly affects the health of the occupants of the house.<sup>38</sup>

### **Families at Risk of Stunting with Online Media Exposure**

People with a low level of education will maintain traditions related to food, making it difficult to accept new information in the nutrition aspect. The higher the level of education, the easier it is for a person to receive nutrition information. Prevention and health promotion efforts have been made to prevent and reduce the incidence of stunting. The prevention and health promotion are focused on overcoming the direct causes and indirect causes of stunting, one of which uses health education media.<sup>39</sup>

There is a correlation between families at risk of stunting and exposure to information through the media in Bengkulu Province. In the current digital era, along with the growth of internet users, various health information has been widely promoted either through the websites of official organizations and institutions or voluntarily by people interested in improving public health through the use of social media. According to <sup>40</sup>, a study on the utilization of social media for health information search and communication stated that social media can support the search and communication of health information. Based on this, Instagram becomes one of the most frequently used social media for search and communication of health information.

## Families at Risk of Stunting based on Exposure to Information through Media Officers

Stunting is a linear growth disorder caused by malnutrition and chronic infectious diseases. Based on WHO standards, the recurrent occurrence is indicated by a height-for-age (TB/U) Z-Score value of less than -2 standard deviations (SD). The problem of stunting becomes a nutritional problem that needs more attention as it can affect the quality of human resources. Many factors can influence the incidence of stunting, one of which is the location of residence. Limited access to food sources due to distance from residential areas can hinder food availability, complicating adequate nutrition acquisition.<sup>41</sup> In Bengkulu Province, there is an observed correlation between stunting risk and exposure to information through officers in Bengkulu Province. In 2018, the government initiated a targeted stunting prevention program in 100 regencies/cities began, including the Supplementary Feeding Program (PMT) in high-stunting areas.<sup>42</sup> Enhancing accessibility to health services in rural areas remains a priority of the Indonesian Ministry of Health's stunting intervention efforts.<sup>43</sup>

Children living in rural areas significantly reported a 1.29 times higher risk of stunting than those in urban areas.<sup>44</sup> However, other studies show different results that children in urban areas have a 1 times higher risk of being stunted than children in rural areas.<sup>45</sup> Place of residence as the domicile of toddlers has a significant correlation with the incidence of stunting. Families living in rural areas have a 1.32 times higher chance of experiencing stunting than families living in cities.<sup>46</sup> Previous research suggests that protein adequacy in rural areas is associated with stunting in children under five.<sup>47</sup>

## CONCLUSIONS

In Bengkulu Province, 83.1% of families are at risk of stunting. Factors significantly associated with this risk include the occupation and education level of family head, health insurance ownership status, monthly household income sufficiency, home ownership status, and exposure to information through both media and health officers. These findings highlight the importance of targeted interventions and information dissemination in reducing stunting risk

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