BMJ Open

Determination of appropriate policy targets to reduce the prevalence of stunting in children under five years of age in urban-poor communities in Indonesia: a secondary data analysis of the 2022 Indonesian national nutritional status survey

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To cite: Laksono AD, Izza N, Trisnani T, *et al*. Determination of appropriate policy targets to reduce the prevalence of stunting in children under five years of age in urban-poor communities in Indonesia: a secondary data analysis of the 2022 Indonesian national nutritional status survey. *BMJ Open* 2024;**14**:e089531. doi:10.1136/bmjopen-2024-089531

► Prepublication history for this paper is available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2024-089531).

Received 02 June 2024
Accepted 05 September 2024

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ABSTRACT

Objective Based on previous studies, urban-poor societies are very vulnerable to stunted children under five. The study aims to determine the appropriate policy targets to reduce the prevalence of stunted under-five children in urban-poor communities in Indonesia.

Design A study was conducted using a secondary data analysis. The study analysed existing data from the 2022 Indonesian National Nutritional Status Survey.

Setting and participants At the national level, Indonesia encompassed 43 284 toddlers.

Interventions Non-intervention study.

Primary and secondary outcomes The study's eight independent factors were the mother's age, education, marital status, employment, wealth, antenatal care (ANC), children's age and sex, with nutritional status as the dependent variable. We employed a binary logistic regression test for the most recent exam.

Results Maternal age was related to stunted toddlers in communities of urban poor in Indonesia. The lower the education, the higher the possibility of having stunted kids. Unemployed mothers were 1.153 times more likely than employed mothers to have stunted under-five children (95% CI 1.145 to 1.160). The poorest were 1.235 times more likely to get stunted under-five than the poorer (95% CI 1.227 to 1.242). Mothers without ANC during pregnancy were 1.212 times more likely to get stunted kids than those with ANC during pregnancy (95% CI 1.186 to 1.240). All kids' ages were more probable than 0–11 to be stunted. Boys were 1.099 times more likely to be stunted than girls (AOR 1.099; 95% CI 1.093 to 1.105).

Conclusion The appropriate policy targets to reduce the prevalence of stunted under-five children in urban-poor communities in Indonesia were younger mothers, those with poor education, those unemployed, the most impoverished, those without ANC, those with older under-five and those with boy kids.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The study's primary method of drawing findings on Indonesia's poor urban neighbourhoods is extensive data analysis.
⇒ The study found that the appropriate policy targets to reduce the prevalence of stunted under-five children in urban-poor communities in Indonesia were younger mothers, those with poor education, those unemployed, the most impoverished, those without ANC, those with older under-five and those with boy kids.
⇒ This research only uses the factors in the survey as secondary data, thereby ignoring several other important variables that have been studied in previous research.
⇒ This quantitative research technique does not encompass other facets prevalent in Indonesian culture; therefore, additional investigation is necessary concerning children's values, food taboos, parenting patterns and eating habits that influence the relevant findings.

INTRODUCTION

Stunting, a developmental condition in children under five years caused by prolonged malnutrition, indicates a nutritional state other than wasting and underweight.[1] Stunting has long-term effects on human resources, including a decline in earnings in the working world and a slowdown in cognitive development of about 7% compared with children who do not experience stunting. Stunted children have a more challenging time competing in the job market, which means they earn less money overall.[2]

In 2022, the WHO predicted that stunting will affect roughly 22.3% of children under five years. The Southeast Asia region has the highest proportion of stunting episodes among the six WHO intervention zones, at approximately 30.1%. This region nearly surpasses the African region, which has an estimated ratio of 31.0%.[3] When we examine the stunting condition in the Southeast Asia region over the last 3 years, from 2020 to 2022, we may observe a decline of about 0.9% from 2020 (31.8%) to 2021 (30.9%) and then another drop of 0.9%.8% from 2021 (30.9%) to 2022 (30.1%). The WHO has set a target of reducing the incidence of stunting in children by 40% by 2030; therefore, this rate is still far more significant than that.[4] Considering these goals, the stunting incidence in the Southeast Asia region is still significantly lower than anticipated, highlighting the necessity for joint efforts and collaboration across sectors to reach the established objectives.

The Indonesian government previously released the National Strategy for Accelerating Stunting Prevention 2018–2024. This national strategy aims to ensure that all resources are directed and allocated to support and finance priority activities, significantly increasing the coverage and quality of nutrition services for households in the first 1000 days of life (pregnant women and children aged 0–2 years). The strategy document includes preventing stunting with specific and sensitive nutritional interventions.[5]

With a prevalence of 24.4% in 2021 and 21.6% in 2022, Indonesia is one of the SEA Region member nations with a relatively high stunting rate.[6] A closer inspection of these numbers reveals that stunting has dropped by about 3.3% in Indonesia in just 1 year. Nevertheless, the performance falls short of the national target established by the Indonesian government to reduce stunting to 14% by 2024; therefore, this does not augur well for the nation.[7] In reality, the prevalence of stunting only decreased by 0.1% and became 21.5% in 2023. The government argues that the COVID-19 pandemic is causing slow efforts to prevent stunting.[8]

According to UNICEF's Conceptual Framework for Determinants of Maternal and Child Nutrition, multiple causes of stunting in children younger than five exist. Human and familial resources, such as a stable family unit, are one aspect that might affect a child's nutritional status.[9] In Bosnia, researchers found that children whose parents did not live together, as well as those whose grandparents did not have dads, were more likely to suffer from stunting. Stunting is more common in these youngsters than in complete-family households.[10] Children are more likely to thrive when their families are financially secure and when the parent–child bond is strong. The health of everyone in the family, particularly children, is impacted by how stable the family is.[11 12]

Problems with stunting can develop in homes with poor parenting practices, low socioeconomic status and limited food availability. The situation is much more dire when children are raised alone by their mothers without any support from other family members.[13] Cameroon, the Republic of the Congo and Nigeria are among the countries where studies have shown that children whose mothers raise them alone are more likely to suffer from stunting. The level of care provided by single mothers to their children affects the economic resources available to those families and the likelihood of stunting. In fact, in these three countries, children cared for by a single mother have a higher risk of child mortality compared with children in complete families.[14] Stunting and malnutrition are interrelated issues, and one contributing factor is food availability in the home. This study's results provide more evidence that children from low-income homes are at increased risk of stunting.[15]

Poverty is a problem for around 7% of Indonesia's urban population.[16] In heavily populated metropolitan regions, even the most essential urban life, such as living near open gutters and water puddles, is constantly exposed to harmful trash. Poor sanitation can lead to the spread of intestinal parasites, such as worms. People living in poverty in metropolitan areas often struggle to afford nutrient-dense meals because of their limited budgets and the high cost of food. Contaminated settings and food usually prepared in an unclean way might cause stunting.[17] Disease and nutritional status problems harm the limited resources, means of subsistence and savings of low-income urban residents.[16]

Urban problems in low-income nations stem from two interconnected systems: the environmental system, which includes things like water, land and air pollution as well as waste management, water scarcity, settlements and the social system, which includes unemployment, inadequate sanitation and health services. The healthcare needs of low-income urban communities are often unfulfilled because these communities have a more challenging time gaining access to public services.[18] According to a previous survey, residents of urban slum areas said that at least one family member had been sick in the last 2 weeks. Other research has found that older people, toddlers, small children and individuals with compromised immune systems are the most susceptible groups in urban informal settlements.[19] Based on the background context, the study aims to determine the appropriate policy targets to reduce the prevalence of stunted children under five in urban-poor communities in Indonesia.

MATERIALS AND METHODS

Study design and data source

The study used secondary data from the 2022 Indonesian Nutrition Status Survey, which the Indonesian Ministry of Health analysed nationwide. Previously, the Indonesian Ministry of Health had conducted a similar survey in 2019 and 2021. The 2022 Indonesian Nutrition Status Survey provides an overview of the nutritional status of children under five (stunting, wasting, underweight, overweight) and its determinants including specific nutritional intervention indicators and sensitive nutritional interventions

using a cross-sectional two-stage stratified sampling method. The total sample was 334 848 under five—data were collected from 486 regencies/cities in 33 provinces in Indonesia.

Data were collected through anthropometric measurements (body weight, length/height of under-five, upper arm circumference of young women, women of childbearing age and pregnant women). Data collection uses standardised tools and interviews. At the end of the implementation, the survey recorded a response rate of 91.4%.

Setting

The study's population consisted of all Indonesian children under five who lived in urban-poor communities in Indonesia. Mothers were the survey respondents, while children under five (those younger than 59 months) were the analysis unit. The study selected 43 284 under-five children from urban poor societies through a multi-stage cluster random sampling survey to create a weighted sample for the experiment. We examined a nationwide study among urban poor societies in Indonesia. The survey determines urban–rural criteria based on Indonesian Statistics.

In the 2022 Indonesian National Nutritional Survey, a household's wealth level was ascertained by dividing its possessions into quintiles. One of the factors considered while grading families is the amount and variety of objects owned by the family. The study also used a range of objects to ascertain the residents' wealth status, including televisions, bicycles, vehicles and personal lifestyles. During inspection, drinking water supplies, bathroom facilities and primary floor building components were all considered. The survey used principal component analysis to determine the score. The national wealth quintiles were created by and comprised 20% of the population. The survey further divided them into the same five groups. By applying household scores for each household member, the survey established the national wealth quintiles, which were further divided into the same five groups and represented 20% of the population. The poll divided respondents' wealth status into five categories: Quintile 1 (poorest), Quintile 2 (poorer), Quintile 3 (middle), Quintile 4 (richer) and Quintile 5 (richest).[20] Quintiles 1 and 2 were considered impoverished households in this study.

Dependent variable

The dependent variable in this study was stunting, which measures a child's nutritional condition based on age or height at a certain period. We used WHO growth standards to generate the height indicator, often known as the z-score or height departure from average size. The study separated stunting into two groups: standard and stunting. The maximum limit height/age index for the nutritional status category is represented by average (≥ −2.0 SD) and stunting (< −2.0 SD).[21]

Independent variables

The study selected independent variables based on previous studies and the availability of variables from the analysed survey. We examined eight independent characteristics: mother's age, educational level, work position, ANC, wealth, marital status, age and sex of the children. The study selected seven age groups of mothers: ≤19, 20–24, 25–29, 30–34, 35–39, 40–44 and ≥45. The marital status categories in the study are widowed, divorced and married. On the other hand, maternal employment status includes both employment and unemployment. Furthermore, the research identified four maternal education levels: elementary, junior high, senior high and college.

Furthermore, ANC during pregnancy includes both conducted and non-performed ANC. For the study, we divided the children into five age groups (measured in months): 0–11, 12–23, 24–35, 36–47 and 48–59. Nonetheless, the study made a distinction between boys and girls.

Data analysis

We used theX^2 test first. Next, we performed a co-linearity test to see if there was a significant link between the independent variables. A binary logistic regression test was then employed. In the interim, we used IBM SPSS Statistics 26 to conduct the statistical computations for the analysis. Additionally, we used ArcGIS 10.3 (ESRI Inc., Redlands, CA, USA) to construct a distribution map of stunted children with poverty homes by province in Indonesia. Indonesian Statistics provided a shapefile including administrative border polygons for the investigation.

Patient and public involvement

Patients or the public were not involved in our research's design, conduct, reporting or dissemination plans.

RESULTS

The result showed that 23.4% of children under five in urban-poor communities in Indonesia are stunted. Meanwhile, figure 1 provides a distribution map of stunted children among Indonesia's impoverished urban families. The prevalence of stunted children is not trended on the map.

Table 1 included descriptive data on the nutritional condition of under-five in Indonesia's urban poor groups. Regarding maternal age, ≥45 has the highest proportion of stunted under-five. According to maternal education, the results indicate that the lower the education, the higher the stunted toddler proportion. Moreover, based on maternal marital status, divorced/widowed mothers have a slightly higher stunted toddler ratio than married mothers.

Table 1 shows that unemployed mothers have a higher prevalence of stunted kids than employed mothers. Regarding the wealth status, the poorest have a higher stunted kids' ratio than the more inadequate. Meanwhile, according to ANC performance during pregnancy, mothers without ANC have a higher stunted under-five

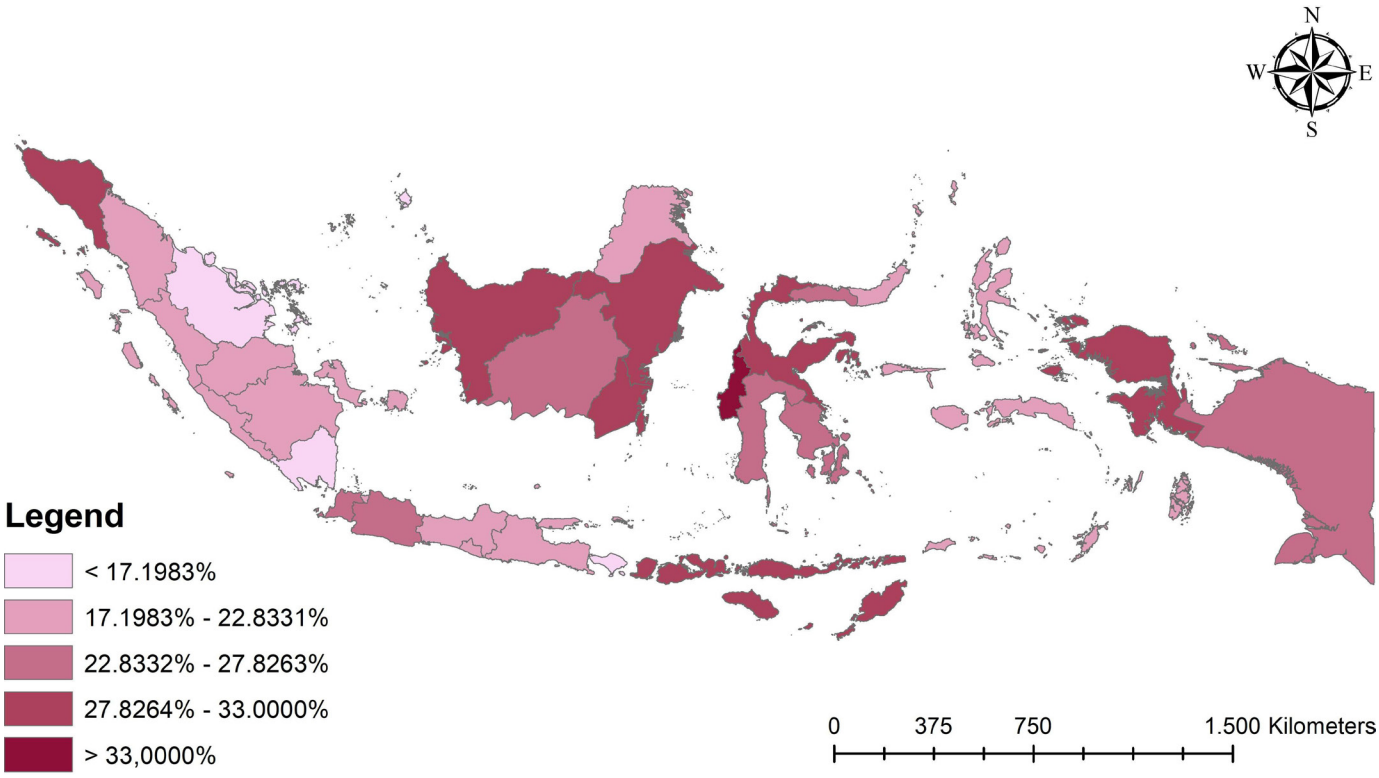

Figure 1 The Distribution Map of Stunted Toddler Prevalence in Urban-Poor Communities by Province in Indonesia . Source: Figure visualisation by researchers.

prevalence. On the other hand, based on kids' age, 24–35 months have the highest ratio of stunted kids. Moreover, according to kids' gender, boys have a higher proportion of stunted under-five.

The study conducted a co-linearity test on the query described above. The experiment demonstrated the non-collinearity of the independent variables. The findings reveal that all variable variance inflation factor values are less than 10.00 concurrently, and all variable average tolerance values are more significant than 0.10. The study examined the regression model and found no meaningful link among two or more independent variables using the multicollinearity test as a decision-making tool.

Based on maternal education, table 2 shows that the higher the educational level, the lower the probability of stunting under five. Meanwhile, regarding maternal marital status, married mothers are 1.027 times more likely to have stunted under five than divorced/widowed mothers (AOR 1.027; 95% CI 1.015 to 1.039). Moreover, according to ANC, during pregnancy, mothers without ANC are 1.458 times more likely than those with ANC (AOR 1.458; 95% CI 1.442 to 1.474).

Table 2 shows that, regarding toddler age, all under-five are more likely to be stunted than those aged 0–11 months. Furthermore, according to toddler gender, boys are 3.295 times more likely to get stunted than girls (AOR 3.295; 95% CI 3.273 to 3.317).

DISCUSSION

The following five objectives are intended to be achieved by the National Strategy for Accelerating Decline Stunting, as specified in the Regulation of the President of the Republic of Indonesia Number 72 of 2021: the first recommendation is to increase food and nutritional security at the family, individual and community levels; second, to improve behavioural change communication and community empowerment; third, to increase the convergence of specific interventions and sensitive interventions in ministries/agencies, provincial, regional governments, regional governments, district/city and village governments; fourth, rising food and nutritional security at the family, individual and community levels; and *lastly*, to strengthen leadership commitment and vision in these entities.[7]

Findings show that 23.4% of under-five in Indonesia's urban-poor groups were stunted. This number exceeds the 21.6% national average for the same year. Meanwhile, the study found that maternal age was related to stunted kids in urban-poor communities in Indonesia. The results of this study did not show a trend pattern like some previous studies. Some cross-sectional studies provide information that there is a greater risk of child stunting in the maternal age group under 20 years old than in the age group more than 20 years.[22] A systematic review study also indicated a decreased risk of stunting as the maternal age increases.[23] The difference between the results of this study and several previous studies is shown by the

Table 1 Descriptive statistic of nutritional status of under-five in urban-poor communities in Indonesia (n=43 284)

Variables	Nutritional status				P value
	Normal (n=33 771)		Stunted (n=10 053)		
	n	%	n	%	
Maternal age (in years)					< 0.001
≤ 19	473	79.5%	140	20.5%	
20–24	4435	76.6%	1293	23.4%	
25–29	8723	76.9%	2495	23.1%	
30–34	8879	77.5%	2578	22.5%	
35–39	6829	76.0%	2133	24.0%	
40–44	3605	75.4%	1115	24.6%	
≥ 45	827	73.8%	299	26.2%	
Maternal education					< 0.001
Primary school	8482	72.4%	3046	27.6%	
Junior high school	9435	76.3%	2964	23.7%	
Senior high school	14 021	79.6%	3625	20.4%	
College	1833	81.5%	418	18.5%	
Maternal marital status					< 0.001
Married	32 863	76.7%	9775	23.3%	
Divorced/widowed	908	75.9%	278	24.1%	
Maternal employment status					< 0.001
Unemployed	24 083	76.1%	7425	23.9%	
Employed	9688	78.5%	2628	21.5%	
Wealth status					< 0.001
Poorest	10 621	73.5%	3694	26.5%	
Poorer	23 150	78.1%	6359	21.9%	
Perform ANC during pregnancy					< 0.001
No	19 607	73.2%	6968	26.8%	
Yes	14 164	81.9%	3085	18.1%	
Under five's age (in months)					< 0.001
0–11	8059	90.6%	819	9.4%	
12–23	6918	73.6%	2512	26.4%	
24–35	6904	70.1%	2732	29.9%	
36–47	6389	73.4%	2314	26.6%	
48–59	5501	76.4%	1676	23.6%	
Under five's gender					< 0.001
Boy	16 966	75.8%	5397	24.2%	
Girl	16 805	77.5%	4656	22.5%	

object of the study, which is more specific to the poor in urban areas. This means that the risk of stunting in poor urban communities is not only in the young maternal age group (less than equal to 19 years). Economic conditions determine household availability, food security and child growth. Children from poor families have limited access to food and maternal health services, which risks child growth failure.[24]

According to maternal education, this study found that lower education is associated with a higher possibility of having stunted children, which agrees with previous studies. The meta-analysis study informed that the lower the mother's education, the more influential it is on the occurrence of stunting in children under five. Education plays an essential role in improving the growth of poor children.[25] Mothers with low education are less likely to know about nutritional intake before, during and after childbirth, which affects their decision-making about choosing the best nutrition and health services for their children.[12 26]

Table 2 Under-five nutritional status in urban-poor communities in Indonesian: a binary logistic regression (n=43 284)

	Stunting			
			95% CI	
Predictors	P value	AOR	Lower bound	Upper bound
Maternal age: ≤ 19 (ref.)	–	–	–	–
Maternal age: 20–24	0.057	1.027	0.999	1.056
Maternal age: 25–29	0.628	1.007	0.980	1.035
Maternal age: 30–34	**0.003	0.960	0.934	0.986
Maternal age: 35–39	0.932	1.001	0.974	1.029
Maternal age: 40–44	*0.028	0.969	0.942	0.997
Maternal age: ≥ 45	0.260	1.019	0.986	1.052
Maternal education: primary school	***<0.001	1.516	1.491	1.542
Maternal education: junior high school	***<0.001	1.253	1.232	1.274
Maternal education: senior high school	***<0.001	1.052	1.035	1.070
Maternal education: college (ref.)	–	–	–	–
Maternal marital status: married	0.195	0.989	0.972	1.006
Maternal marital status: divorced/widowed (ref.)	–	–	–	–
Maternal employment: unemployed	***<0.001	1.153	1.145	1.160
Maternal employment: employed (ref.)	–	–	–	–
Wealth: poorest	***<0.001	1.235	1.227	1.242
Wealth: poorer (ref.)	–	–	–	–
Perform ANC during pregnancy: no	***<0.001	1.212	1.186	1.240
Perform ANC during pregnancy: yes (ref.)	–	–	–	–
Under five's age: 0–11 (ref.)	–	–	–	–
Under five's age: 12–23	***<0.001	3.492	3.456	3.529
Under five's age: 24–35	***<0.001	3.503	3.422	3.586
Under five's age: 36–47	***<0.001	2.967	2.898	3.037
Under five's age: 48–59	***<0.001	2.503	2.445	2.563
Under two's gender: boy	***<0.001	1.099	1.093	1.105
Under two's gender: girl (ref.)	–	–	–	–

*p<0.050; **p<0.010; ***p<0.001.

Based on maternal employment, unemployed mothers were more likely than employed mothers to have stunted kids. This indicates that unemployed mothers have a higher risk of having stunted under-five. Unemployed mothers may experience more significant financial stress, affecting their access to nutritious food, healthcare and other resources essential for their children's optimal growth and development. For women with young children, financial stress results in disrupted parenting practices and even self-blame, which contribute to significant mental health problems.[27] In addition, the stress associated with unemployment can also affect the health of the mother and, in turn, the health of the fetus she is carrying. However, non-working mothers have better parenting patterns than working mothers, especially mothers with children aged 6–23 months.[28] This is possible with more time and energy available for parenting. However, education and teaching about child health are the most essential things that mothers must master so that the parenting carried out by the child is more appropriate.

Regarding the wealth status, the poorest were more likely to get stunted under-five than the poorer. This shows that the poorest groups of society have a higher risk of stunting compared with groups of people who are generally considered poor. This highlights the fact that stunting is not only associated with low levels of poverty but also with extreme levels of poverty or the so-called poorest. In poor families, access to quality healthy food will likely be limited. Nutrient-rich foods are needed to ensure that proteins, vitamins and minerals are used to catch up with the growth left behind.[29] Poverty drives mothers to provide limited amounts and quality of unbalanced diets that affect their growth. In addition, mothers in these conditions of poverty lose various types of abilities, including spatial, temporal, qualitative and affective aspects.[30]

Mothers without ANC during pregnancy were found to be more likely to have stunted children compared with mothers who received ANC. Stunting is a chronic process that begins during pregnancy and continues throughout the infant's early life, involving prenatal, birth conditions and postnatal factors.[31] ANC ensures that any potential issues are identified and addressed early on by informing mothers of proper nutrition, prenatal vitamins and other factors that can impact their child's growth and development. A previous study has revealed that one of the reasons poor people do not use health facilities for ANC is restricted access, costs, ignorance about accessible health insurance and lack of knowledge and awareness of the importance of ANC.[32]

Regarding kids' age, all age groups were more likely than 0–11 to be stunted. The most rapid weight gain should occur between 0 and 12 months when metabolic changes encourage the baby's growth and development. Meanwhile, 6–11 months of age is a critical phase since babies are beginning to be exposed to foods other than breast milk. The challenge is providing nutritious meals in adequate quantities while maintaining appropriate hygiene. This knowledge and previous research show that stunting occurs most frequently after 12 months.[33 34]

Furthermore, according to kids' gender, boys were more likely to be stunted than girls. These findings align with other research suggesting that boys are more susceptible to stunting. Males may exhibit a higher susceptibility to health inequalities than females, maybe due to discrepancies in dietary habits or other contributing factors.[35] Another hypothesis suggests that boys demonstrate a greater level of biological susceptibility. Boys often undergo accelerated growth, although nutritional deficiencies or health problems may impede their development.[36]

This study was conducted by analysing secondary data from the 2022 National Nutritional Status Survey, a national-scale cross-sectional survey. Based on the survey method, we cannot analyse the cause-and-effect relationship between the dependent and independent variables. We can only state that there is a relationship or association between these variables.

Conclusions

The study concluded that seven variables were associated with stunted under-five in urban-poor communities in Indonesia: maternal age, education, employment, wealth, ANC, children's age and sex. The appropriate policy targets to reduce the prevalence of stunted under-five in urban-poor communities in Indonesia are younger mothers, those with poor education, those unemployed, the most impoverished, those without ANC, those with older under-five and those with boy kids.

From the research findings, some recommendations that can be proposed include that intervention policies should give priority to young mothers and those with low levels of education because they are at a higher risk of having stunted under-five. This could include reproductive health, nutrition, parenting education programmes for young mothers and increased access to reproductive and antenatal health services. Policies should also pay attention to unemployed mothers, as these conditions can affect their access to resources necessary for child growth and development, including nutritious food and health services. Economic support programmes and skills training to increase employment opportunities for unemployed mothers can help reduce the risk of stunting in their children.

The next thing that is no less important is to make efforts to expand ANC. ANC during pregnancy is influential in reducing the risk of stunting in children. Therefore, policies should promote and improve access to ANC services for pregnant women, especially in poor urban communities. The study's findings also emphasise the importance of developing evidence-based policies to address stunting in the urban poor. Intervention policies and programmes should be designed based on solid empirical data and consider the risk factors identified in the study.

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Acknowledgements The Institute of Social Sciences and Humanities of the National Research and Innovation Agency of the Republic of Indonesia (IPSH BRIN) funded the study in 2022. The author would like to thank the Ministry of Health of the Republic of Indonesia for providing the 2022 Indonesian National Nutrition Status Survey data.

Contributors ADL developed the proposal and analysed and interpreted the patient data. NI, TT and AP were significant contributors to conducting the study, interpreting the data and writing the manuscript. HHS, PA, KR and RDW contributed substantially to the research and writing of the manuscript. All authors read and approved the final manuscript. The guarantor of the study is ADL; he accepts full responsibility for the finished work and the conduct of the study, has access to the data and controls the decision to publish.

Funding This research received a grant from the Institute of Social Sciences and Humanities of the National Research and Innovation Agency (IPSH BRIN), Republic of Indonesia (Grant No. 7/III.7/HK/2024).

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval We used the Indonesian National Nutritional Status Survey from 2022 as secondary data for the study. The National Ethics Commission classified this study as exempted. The Indonesian Ministry of Health collected information for the National Nutritional Status Survey 2022 with signed informed permission. Participants signed an informed consent form to emphasise the voluntary and private nature of the data collection process. The following information was distributed to academics via the internet by the Indonesian Ministry of Health: https://layanandata.kemkes.go.id/.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data may be obtained from a third party and are not publicly available. The author cannot publicly disclose the data due to restrictions imposed by a third party and the Ministry of Health of the Republic of Indonesia, who are the rightful owners of the data. The Indonesian National Nutritional Status Survey 2022 dataset can be accessed through https://layanandata.kemkes.go.id/. Access to the sensitive data is restricted to researchers who match the specified conditions.

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REFERENCES

1 FAO, IFAD, UNICEF, WFP, WHO. The State of Food Security and Nutrition in the World 2022. The State of Food Security and Nutrition in the World 2022. 2022.
2 Akseer N, Tasic H, Nnachebe Onah M, *et al*. Economic costs of childhood stunting to the private sector in low- and middle-income countries. *EClinMed* 2022;45:101320.
3 World Health Organization. Stunting Prevalence among Children Under 5 Years of Age (%) (model-based estimates). Geneva, 2023. Available: https://www.who.int/data/gho/data/indicators/indicator-details/GHO/gho-jme-stunting-prevalence
4 WHO. Global Nutrition Targets 2025: Policy Brief Series. WHO. Geneva. 2014. Available: https://www.who.int/publications/i/item/WHO-NMH-NHD-14.2
5 National Team for the Acceleration of Poverty Reduction, Indonesia (TNP2K). National Strategy for Accelerating Stunting Prevention 2018-2024 (Strategi Nasional Percepatan Pencegahan Stunting 2018-2024). Jakarta, 2018. Available: https://www.tnp2k.go.id/filemanager/files/Rakornis
6 Health Development Policy Agency of Indonesian Ministry of Health. POCKET BOOK Results of the 2022 Indonesia Nutrition Status Survey (BUKU SAKU Hasil Survei Status Gizi Indonesia 2022), Jakarta, 2022. Available: https://kesmas.kemkes.go.id/assets/uploads/contents/attachments/09fb5b8ccfdf088080f2521ff0b4374f.pdf
7 President of the Republic of Indonesia. Presidential Regulation of the Republic of Indonesia Number 72 of 2021 concerning Accelerating the Reduction of Stunting (Peraturan Presiden Republik Indonesia Nomor 72 tahun 2021 tentang Percepatan Penurunan Stunting). 72/2021 Jakarta, Indonesia; 2021, 2021. Available: https://peraturan.bpk.go.id/Download/168225/PerpresNomor72Tahun2021.pdf
8 The Ministry of Health of the Republic of Indonesia. The 2023 Indonesian Health Survey. Jakarta. 2024.
9 UNICEF. UNICEF Conceptual Framework on Maternal and Child Nutrition. 2020;1–77. Available: https://www.unicef.org/documents/conceptual-framework-nutrition
10 Ntshebe O, Channon AA, Hosegood V. Household composition and child health in Botswana. *BMC Public Health* 2019;19:1621.
11 Megatsari H, Laksono AD, Herwanto YT, *et al*. Does husband/partner matter in reduce women's risk of worries?: Study of psychosocial burden of covid-19 in indonesia. *Ind J Forensic Med Toxicol* 2021;15:1101–6.
12 Laksono AD, Wulandari RD, Susianti N, *et al*. Stunting Among Wealthy Indonesian Families: A Cross-Sectional Study of Children Under the Age of Two. *JPSS* 2024;32:384–98.
13 Mwamba MS, Gerrior S, Taylor R. Relationship Between Single Motherhood Status and Stunting Among Children Under 5 in Kgatleng, Botswana. *JSBHS* 2022;16:40–7.
14 Mulu E, Mengistie B. Household food insecurity and its association with nutritional status of under five children in Sekela District, Western Ethiopia: a comparative cross-sectional study. *BMC Nutr* 2017;3:35:35:.
15 Yuliasih Y, Ipa M, Laksono AD, *et al*. Low Birth Weight among Single Mothers in Indonesia: What's The Matter? Southeast Asian. *J Trop Med Public Health* 2022;53:328.
16 Asian Development Bank. Building Resilience of the Urban Poor in Indonesia, 2022. Available: http://dx.doi.org/10.22617/TCS210404-2
17 Laksono AD, Rukmini R, Tumaji T, *et al*. National Health Insurance Membership among Urban Poor Societies in Indonesia in 2019: Are They Protected? *Econ* 2022;10:196.
18 Wulandari RD, Laksono AD, Mubasyiroh R, *et al*. Hospital utilization among urban poor in Indonesia in 2018: is government-run insurance effective? *BMC Public Health* 2023;23:92.
19 Zerbo A, Delgado RC, González PA. Vulnerability and everyday health risks of urban informal settlements in Sub-Saharan Africa. *Glob Health J* 2020;4:46–50.
20 Wulandari RD, Laksono AD, Prasetyo YB, *et al*. Socioeconomic Disparities in Hospital Utilization Among Female Workers in Indonesia: A Cross-Sectional Study. *J Prim Care Community Health* 2022;13:21501319211072679.
21 Wulandari RD, Laksono AD, Kusrini I, *et al*. The Targets for Stunting Prevention Policies in Papua, Indonesia: What Mothers' Characteristics Matter? *Nutrients* 2022;14:549.
22 Laksono AD, Sukoco NEW, Rachmawati T, *et al*. Factors Related to Stunting Incidence in Toddlers with Working Mothers in Indonesia. *Int J Environ Res Public Health* 2022;19:10654.
23 Astuti FD, Azka A, Rokhmayanti R. Maternal Age Correlates with Stunting in Children: Systematics Review. *J Matern Child Health* 2022;7:479–448.
24 Chowdhury MRK, Rahman MS, Khan MMH, *et al*. Risk Factors for Child Malnutrition in Bangladesh: A Multilevel Analysis of a Nationwide Population-Based Survey. *J Pediatr* 2016;172:194–201.
25 Javid N, Pu C. Institute of Public Health, National Yang-Ming University, Taiwan. *AIMS Public Health* 2020;7:380–92.
26 Khan S, Zaheer S, Safdar NFFNF. Determinants of stunting, underweight and wasting among children. *BMC Public Health* 2019;19:1–15.
27 Marcil LE, Campbell JI, Silva KE, *et al*. Women's Experiences of the Effect of Financial Strain on Parenting and Mental Health. *J Obstet Gynecol Neonatal Nurs* 2020;49:581–92.
28 Ketema B, Bosha T, Feleke FW. Effect of maternal employment on child nutritional status in Bale Robe Town, Ethiopia: a comparative cross-sectional analysis. *J Nutr Sci* 2022;11:e28.
29 De Sanctis V, Soliman A, Alaaraj N, *et al*. Early and Long-term Consequences of Nutritional Stunting: From Childhood to Adulthood. *Acta Biomed* 2021;92:e2021168.
30 Ueda H. Multidimensional Food Poverty: Evidence from Low-Income Single Mothers in Contemporary Japan. *F E* 2023;8:13.
31 Svefors P, Sysoev O, Ekstrom E-C, *et al*. Relative importance of prenatal and postnatal determinants of stunting: data mining approaches to the MINIMat cohort, Bangladesh. *BMJ Open* 2019;9:e025154.
32 Ashar H, Laksono AD, Supadmi S, *et al*. Factors related to stunting in children under 2 years old in the Papua, Indonesia: Does the type of residence matter? *Saudi Med J* 2024;45:273–8.
33 Supadmi S, Laksono AD, Kusumawardani HD, *et al*. Factor related to stunting of children under two years with working mothers in Indonesia. *Clin Epidemiol Glob Health* 2024;26:101538.
34 Kusumawardani HD, Laksono AD, Hidayat T, *et al*. Stunting Among Children Under Two Years in the Islands Areas: A Cross-sectional Study of the Maluku Region in Indonesia, 2021. *J Res Health Sci* 2023;23:e00597.
35 Wamani H, Astrøm AN, Peterson S, *et al*. Boys are more stunted than girls in sub-Saharan Africa: a meta-analysis of 16 demographic and health surveys. *BMC Pediatr* 2007;7:1–10.
36 Condo JU, Gage A, Mock N, *et al*. Sex differences in nutritional status of HIV -exposed children in Rwanda: a longitudinal study . *Tropical Med Int Health* 2015;20:17–23.