
FACTORS CAUSING STUNTING AND THE VALUE OF ECONOMIC LOSSES DUE TO STUNTING IN KETAPANG REGENCY

Albertin Tri Kurniasih¹, Rosyadi², Nurul Bariyah³

Universitas Tanjungpura, Kalimantan Barat, Indonesia

albertinrikurniasih@gmail.com¹, rosyadi@ekonomi.untan.ac.id²,
nurul.bariyah@ekonomi.untan.ac.id³

ABSTRACT

This research aims to examine the influence of the factors that cause stunting and the value of economic losses due to stunting in Ketapang Regency by using the factors that cause stunting that are studied, namely food security, social environment, health environment, and residential environment. The method used in this research is descriptive quantitative research. The population used was 88 people with stunted children and 30 people with non-stunted children. The data analysis technique used is the chi-square test statistical analysis program facility using SPSS. The results of this study show that there is a significant relationship between the social environment, social environment, and health environment in the incidence of stunting in the Ketapang district. However, the residential environment has an insignificant relationship with stunting in Ketapang Regency. Moreover, the economic loss caused by stunting, assuming a decrease in productivity of 2 percent to 9 percent, is estimated to range from 1 percent to 10.8 percent of Ketapang's GRDP, or approximately 200 billion rupiah to 1.8 trillion rupiah, thereby underlining the urgency for targeted interventions and policy initiatives to address this issue effectively.

Keywords: Food Security, Social Environment, Health Environment, Residential Environment, Economic Loss, Stunting.

Corresponding Author: Albertin Tri Kurniasih

Email: albertinrikurniasih@gmail.com



INTRODUCTION

Stunting is a condition where children under the age of five fail to grow due to chronic malnutrition, especially in the first 1,000 days of life (HPK). Stunting in children under five is caused by long-term malnutrition and the development of recurrent infections; both of these causal factors are influenced by inadequate parenting patterns, especially in children under 1,000 HPK (PPN, 2018). Stunting is a problem suffered by children under five years of age as a result of problematic nutritional intake over a long period of time, and this problem can occur from the beginning of pregnancy until the child is two years old (Transmigration, 2017).

Based on data from the World Health Organization (WHO), Stunting in Indonesia is ranked 5th in the world and 2nd in Southeast Asia (United et al.'s Fund, 2022). To overcome this, the government announced Presidential Regulation Number 72 of 2022 concerning the Acceleration of Reducing stunting. The 2020-2024 RPJMN targets that by 2024, the prevalence of Stunting in Indonesia will be 14 percent.

Table 1. National Stunting Data, West Kalimantan Province and Ketapang Regency 2018-2022.

No.	Area	Stunting Prevalence (Percent)			
		2018	2019	2021	2022
1	Ketapang	42.68	21.79	23.6	22.3
2	West Kalimantan	33.3	31.46	29.8	27.8
3	Indonesia	30.8	27.7	24.4	21.6

Source: Ministry of Health 2019-2022

Based on the Indonesian Nutrition Status Survey (SSGI), the incidence of stunting decreased in 2019 in Indonesia by 3.1 percent, in West Kalimantan Province by 1.84 percent, and in Ketapang Regency by 20.89 percent. In 2020, there is no data regarding the COVID-19 pandemic.

Measuring the prevalence of stunting will start again in 2021, where nationally and provincially, there is a decrease of 3.3 percent and 1.66 percent, but for Ketapang Regency, there is an increase of 1.81 percent. Then, in 2022, there will be a decline of 2.8 percent for Indonesia, 2 percent for West Kalimantan Province, and 1.3 percent for Ketapang Regency, so based on these results, it is still far from the national target (RI, 2022). West Kalimantan Province ranks eighth in the number of stunting cases in Indonesia. Ketapang Regency is ranked third lowest out of fourteen districts/cities in West Kalimantan Province. However, this figure is still far above the 20 percent limit set by the World Health Organization (WHO).

Average data on toddlers with stunting in Ketapang Regency from the results of Community-Based Electronic Nutrition Recording and Reporting (EPPGM) can be seen in Figure 1.

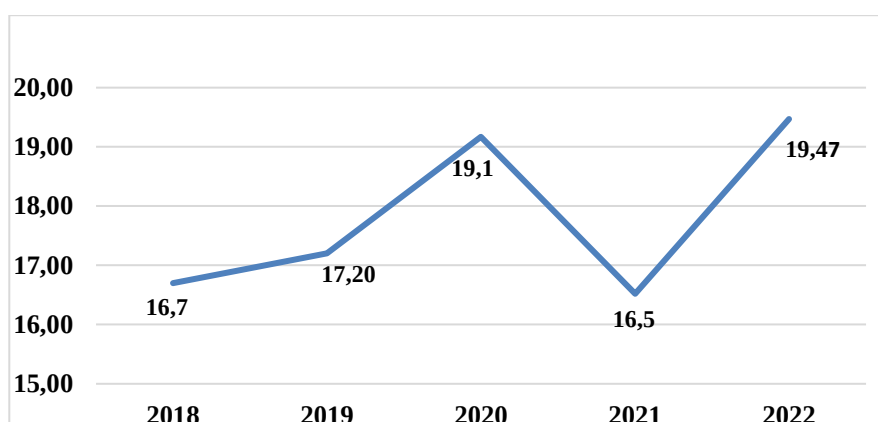


Figure 1. Percentage of Stunting Toddlers (TB/U) of Toddlers considered in Ketapang Regency 2018 – 2022

Source: Profile of the Ketapang District Health Service (processed data)

Figure 1 shows that according to data from the Health Service, the stunting rate continues to increase every year. From 2018 to 2019, the percentage of short and very short toddlers in Ketapang Regency continued to increase from 19.70 percent in 2018, 17.20 percent in 2019, 19.17 percent in 2020, 16.7 percent in 2021, and 19.38 percent in 2022. The average from 2018 – 2022, the percentage of short and concise children under five is 18.54 percent (DKK Ketapang, 2022).

According to WHO, Stunting is a condition of chronic malnutrition that is characterized by short stature in children under the age of five. When a child turns two years old, stunted growth becomes apparent. A child is said to be stunted if his height and body length are minus 2 to minus 3 of the Multicentre Growth Reference Study standard or the median standard deviation of the child's

growth standards or the ratio of height (cm)/child's age (months). This is because the nutritional intake given over a long period does not meet needs. Stunting has the potential to slow down brain development, with long-term impacts in the form of mental retardation, poor learning abilities, and the risk of developing chronic diseases such as diabetes, hypertension, and obesity. Children who experience stunting tend to have lower intelligence, which will impact their productivity. This statement is strengthened by research results (Woldehanna et al., 2017), which show that the cognitive achievement of children in low-income countries such as Ethiopia is lower due to malnutrition and stunting. This condition is in line with the results of research (Dimiati & Hajar, 2019) in Idi Rayeuk, Aceh Regency, where children aged 9-12 years who experienced stunting caused children's cognitive abilities and their ability to comprehend at school to be low, thus affecting their learning achievement.

The United Nations Development Program (UNDP) determines the indicators that determine the Human Development Index (HDI), namely education, health, and the economy as benchmarks for the quality of human resources in a country. Indonesia's HDI in 2022 is 72.91, an increase of 0.62 from the previous year, but still below other ASEAN countries such as Singapore, Brunei Darussalam, Malaysia, and Thailand. In line with previous research conducted in 14 districts/cities in West Kalimantan Province regarding the relationship between stunting and HDI, the following results were obtained: an increase in per capita income (X1) by 1 percent, then the incidence of Stunting (Y) in West Kalimantan Province will increase by 18.16 percent. For every increase in the average length of school (X2) by one year, the incidence of Stunting (Y) in West Kalimantan Province will decrease by 10.42 percent. For every 1 unit increase in the number of health facilities (X3), the incidence of Stunting (Y) in West Kalimantan Province will decrease by 1.23 percent.

The United Nations (UN) projects that in 2035, Indonesia will experience a peak in productive population growth called the demographic bonus, at which time the population of productive age will constitute the most significant proportion of the total population. With this productive population growth, Indonesia has the potential for high human resource competitiveness if supported by quality human resources. The problem of stunting is a world problem that continues to be addressed in order to create quality human resources. Likewise, Indonesia has made stunting a national priority program so that stunting reduction can be accelerated.

Stunting is a chronic nutritional problem that occurs due to a lack of nutritional intake over a long period due to the provision of food that does not meet nutritional needs. Stunting occurs when the fetus is in the womb and is only seen in children aged two years. Malnutrition/undernutrition at a young age increases infant mortality rates and makes patients more susceptible to disease and less able to maintain optimal body posture as adults. The problem of high stunting rates is also a problem for the Ketapang Regency Government, which, of course, has a serious impact on the quality of human resources. As a result of stunting, sufferers' cognitive abilities are reduced, and as a result, their productivity is reduced. Therefore, it causes long-term economic losses. (RI, 2019) .

The prevalence of stunting is obtained from Riskesdas and SSGI data; stunting data is also obtained based on Electronic Community-Based Nutrition Recording and Reporting (EPPGBM) data, where you can see data on the number of stunted children in Ketapang Regency per sub-district as follows:

Table 2. Data on the Number of Stunted Children per District for 2018-2022

NO.	Subdistrict	Year				
		2018	2019	2020	2021	2022
1	Delta Pawan	78	16	25	131	245
2	Kayong Continent	54	41	169	176	143
3	Muara Pawan	57	28	99	126	116
4	Matan Hilir Utara	30	22	32	104	41
5	Matan Hilir Selatan	72	49	131	279	151
6	Kendawangan	22	94	117	485	380
7	Malay River	80	56	150	17	16
8	chew	13	67	133	58	69
9	Tumbangtiti	3	19	209	73	96
10	Jelaihulu	27	80	115	65	115
11	Marau	78	3	3	46	100
12	shovel	109	2	11	12	17
13	Upas Water	19	22	159	42	57
14	Sweet Eyes	51	32	176	156	96
15	Nanga Tayap	81	97	159	458	610
16	Sandai	80	70	178	106	128
17	Upstream	45	105	30	137	11
18	Junction Two	36	96	72	9	3
19	Laur River	78	112	211	255	351
20	Simpang Hulu	24	46	78	104	100
		1037	1057	2257	2839	2845

Source: ePPGBM in the 2018-2022 Health Service Profile

According to the data above, stunting cases in each sub-district fluctuate a lot. From the data above, it can be seen that Nanga Tayap District has experienced an increase in the number of stunted children every year since 2018, and in 2022, it will have the highest number of stunting cases in Ketapang Regency, namely 614 cases.

Stunting is a form of growth failure, namely chronic malnutrition. In contrast to acute malnutrition, chronic malnutrition is a condition that occurs over a long period. Even though stunted children appear to have regular and proportional bodies, they are actually shorter than normal children their age. Stunting is a cumulative process and can be caused by malnutrition, recurrent infectious diseases, or both. Stunting may occur before birth, and growth may be stunted during pregnancy due to poor nutrition, inferior eating habits, consumption of low-quality foods, and frequent infections (United et al.'s Fund, 2009).

In the Long Term Development Plan (RPJP), it is mandated that Indonesia's human development is directed at improving the quality of life so as to produce superior Indonesian people. Human development is essential because the success of a nation depends on the nation's ability to prepare quality, healthy, intelligent, and productive human resources. These human resources will play an essential role in utilizing available natural resources to develop the country. Therefore, stunting must be handled well so that Indonesia's human resources are superior. According to Bappenas, Stunting can be caused by the following factors: the social environment, social environment, economy, health environment, and residential environment. In line with research results (Febriyanti et al., 2022), stunting is a complex problem caused by many factors. Until now, stunting has become a global priority problem that must be addressed (De Onis & Branca, 2016).

In the short term, stunting causes growth disorders, cognitive and motor development disorders, suboptimal body size, and metabolic disorders. In the long term, stunting causes a

decrease in intellectual abilities. The average intellectual quotient (IQ) score of children with stunted growth is 11 points lower than that of normal children (United et al.'s Fund, 2009).

The head of BAPPENAS said in 2018 that in the long term, stunting could result in economic losses of 2-3 percent of Gross Domestic Product (GDP). Economic losses due to stunting will continue to increase every year if stunting is not seriously intervened. Based on a descriptive study conducted by (Suryana & Azis, 2023), stunting reduces productivity, thereby reducing GDP (gross domestic product) by 11 percent and reducing the income of adult workers by up to 20 percent. Therefore, researchers see the importance of conducting this research so that they can see what factors cause stunting in Ketapang Regency and calculate the amount of economic losses that the local government will bear due to stunting. This research was also carried out so that research on stunting would be more complete because most previous research still needed to be completed.

Referring to the background above, stunting conditions in children will reduce their productivity in the future. Considering that the prevalence of Stunting in Ketapang Regency is higher than the prevalence recommended by the World Health Organization (WHO), the incidence of Stunting in Nanga Tayap District continues to increase. Based on previous research, the research carried out was partial. Therefore, this research aims to find out and analyze the influence of the factors that cause stunting and the value of economic losses due to stunting in Ketapang Regency by using the factors that cause stunting that are studied, namely food security, social environment, health environment, and residential environment.

METHOD

The research method used in this study is descriptive quantitative research. To find out the factors that cause stunting, research will be carried out in the Nanga Tayap District, Ketapang Regency, which is the most significant contributor to stunting in Ketapang Regency. Primary research was carried out within a period of one month. Research on economic losses was carried out in Ketapang Regency. Secondary data used in this research uses data from 2018 to 2022. For primary data, the population taken was parents who have children under five in the Nanga Tayap District area, with the number of respondents based on the Slovin formula being 88 people with stunted children and 30 people with a child who is not stunted. The data analysis technique used is the chi-square test statistical analysis program facility using SPSS.

RESULTS AND DISCUSSION

This research uses two data sources, namely primary data and secondary data. Research for primary data was carried out in July 2023 with respondents who were residents of Nanga Tayap District, which has a high prevalence with the highest number of stunting cases in Ketapang Regency. One hundred eighteen people were respondents, with details of 88 people having stunted children and 30 people having non-stunted children, and determining the number of respondents using the Slovin formula with an estimated error of 10 percent and a confidence level of 90 percent. Meanwhile, secondary data was obtained from the Ministry of Health and the Central Statistics Agency. Based on the primary data obtained, the characteristics of the respondents can be identified, such as age, education, knowledge, and income.

Table 3. Maternal Age Categories for Stunting Cases

Information	Maternal Age Category						Total	
	Young age		Ideal Age		Old Age			
	N	%	N	%	N	%	N	%
Stunting	3	3,4	76	86.4	9	10.2	88	75
Not Stunting	0	0	26	86.7	4	13.3	30	25
Amount	3	2.5	102	86.4	13	11	118	100

Source: Primary data processed by SPSS 25

Based on the table above, it can be seen that mothers who are young or under 18 years old have three stunted children (2.5 percent). Based on health science, the reproductive organs are not yet fully developed, so pregnant women under the age of 18 are not ready to get pregnant. At risk of giving birth to a baby with a low birth weight, namely under 2500 grams, and having a child with stunting. Mothers who have the ideal age for starting a family, namely 16-35 years, have almost the same percentage of stunting incidents, namely 76 people (86.4 percent) and 26 people without stunting (86 percent). It turns out that mothers of the ideal age who should be better prepared to get pregnant and have children do not guarantee that their children will not be stunted. Meanwhile, mothers older than 36 years have a lower percentage of having stunted children, 9 (10.2 percent) than those who are not stunted, 4 (13.3 percent). Likewise, for mothers over 36 years of age who have a high risk of becoming pregnant and having children, it turns out there are also those who have children who are not stunted. In Table 4, the characteristics of maternal education and maternal knowledge regarding stunting can be seen as follows:

Table 4. Maternal Education Category and Maternal Knowledge of Stunting

Information	Have family members ever received counseling about stunting?				Mother's Education Category				Total	
	Yes		No		Low education		higher education		N	%
	N	%	N	%	N	%	N	%		
Stunting	34	38.6	54	61.4	62	70.5	26	29.5	88	75
Not Stunting	10	33.3	20	66.7	20	66.7	10	33.3	30	25
Amount	44	37.3	74	62.7	82	69.5	36	30.5	118	100

Source: Primary data processed by SPSS 25

From the table above, it can be seen that the education category is divided into 2, namely low education for mothers who do not attend school, elementary school, or equivalent to junior high school or equivalent and higher education for mothers who have received high school or higher education. as many as 82 people (69.5 percent) had a low level of education or. From this table, it can be seen that mothers who have a low level of education have 62 stunted children (70.5 percent) and 20 who are not stunted (66.7 percent). Likewise, with knowledge about stunting, as many as 74 people (62.7 percent). However, there is a phenomenon where mothers who have higher education are accompanied by good knowledge regarding stunting but have 26 children who are indicated to be stunted (29.5 percent).

In Table 5, you can see the characteristics of family income. From this table, 35 people (30 percent) received social assistance, which was distributed to families with 17 stunted children (20 percent) and 18 people who were not stunted (60 percent). For family income below the UMR, namely under 3 million rupiah, based on data on the value of the Regional Minimum Wage (UMR) for Ketapang Regency in 2023, it is IDR 3,085,615 which has been determined in accordance with the

Decree of the Governor of West Kalimantan Number: 1359/Nakestrans/2022 concerning Minimum Wages West Kalimantan Province in 2023. Income below the UMR is the most significant percentage, namely 92 percent, with a total of 108 respondents, of which 82 families with stunted children (94 percent) and 26 families with non-stunted children (87 percent).

Table 5. Family Income Categories and Recipients of Social Assistance from the Government

Stunting Description	Recipients of Social Assistance from the Government				Family Income Category				Total	
	Yes		No		Above UMR		Below UMR		N	%
	N	%	N	%	N	%	N	%		
Stunting	17	20	71	80	6	6	82	94	88	75
Not Stunting	18	60	12	40	4	13	26	87	30	25
Amount	35	30	83	70	10	8	108	92	118	100

Source: Primary data processed by SPSS 25

In the following table, you can see the distribution of participation and utilization of health insurance in stunted and non-stunting families. In stunted families, only 61 families (69 percent) have health insurance; this is very different from non-stunted families, where all respondents already have health insurance and take advantage of this health insurance when giving birth.

Table 6. BPJS Membership and Place of Delivery

Stunting Category	Does the family have health insurance?				Maternity Category								Total	
	Yes		No		Giving birth at home with the help of a shaman		Giving birth at home, assisted by a shaman and midwife		Giving birth in a health facility		Giving birth with BPJS		N	%
	N	%	N	%	N	%	N	%	N	%	N	%		
Stunting	61	69	27	31	7	8	11	13	14	16	56	64	88	5
Not Stunting	30	10	0	0	0	0	0	0	0	0	30	100	30	9
Amount	91	77	27	22	7	6	11	9	14	12	86	73	118	100

Source: Primary data processed by SPSS 25

In the table above, it can be seen that families with stunted children still gave birth at home with the help of 7 traditional birth attendants (8 percent) and 11 people (13 percent) assisted traditional birth attendants and midwives. However, most of them have used health service facilities when giving birth.

Discussion

The prevalence and number of stunting cases in Ketapang Regency fluctuated in the first three years. They tended to decrease in the last two years. However, the prevalence of the Ketapang Regency is still high, yet to be in line with the Ketapang Regency RPJMD target of 20.1 percent in 2022, 16.7 percent in 2023, and 13.34 percent in 2024. Meanwhile, Indonesia's target is to reduce stunting rates in children by 14 percent in 2024. According to WHO, stunting in an area is considered good enough if it is below 20 percent.

Based on the research results in Table 3, it is known that maternal age characteristics range from 15-47 years. Three mothers are 18 years old and should still be children in accordance with Law

Number 17 of 2016, which states that a child is someone who is not yet 18 (eighteen) years old, including children who are still in the womb. So you are at an age where you are not ready to get married, let alone give birth to children. Of the three mothers, the children were known to have stunted children.

This research is in line with research (Yu et al., 2016) conducted in 12 countries in Africa, Asia, and Latin America. Young mothers have an influence on height restrictions for children from 0 to 11 months, which occurs in half of the countries studied. Continued poorer growth after 24 months in children of younger mothers was observed in all regions, but further research is needed to determine the cause. The effect is about double (in terms of stunting prevalence) in Africa, where there is a 10 percent increase in stunting prevalence for children of young mothers.

However, the chi-square test carried out stated that maternal age had no relationship with the incidence of stunting in Ketapang Regency. Based on the results of this research, there are still many mothers who have the ideal age to marry and have children who actually have stunted children.

The results of this study are in line with the results of research (Sihite et al., 2021) at Puskesmas 11 Ilir Palembang, which showed that the maternal age variable did not affect the incidence of stunting. The results of this research are in line with the results of this study, where the majority of mothers were at the ideal age to get married and have children. However, it turned out that their children were also stunted. Likewise, for older mothers who are, of course, at high risk when giving birth to children, it turns out there are also those who have children who are not stunted.

Based on the research results in Table 4, it is known that mothers with low education and minimal knowledge about stunting dominate stunting families. However, based on the results of the chi-square test carried out, maternal education has no relationship to stunting cases in Ketapang Regency. This low maternal education will be closely related to social environmental factors, namely in terms of child care, where mothers have an essential role in raising children. The level of parents' education certainly has an impact on their children's health. This is because parents are the first family for children where optimal growth and development occurs through good nutrition. Parental education level is one of the factors that influences the nutritional status of the family. Parents with a lower level of education are more likely to experience nutritional problems in their children compared to parents with a higher level of education. Parents who are highly educated have a better understanding of healthy lifestyles, know how to maintain a healthy body and adopt healthy lifestyles, including consuming nutritious food. The level of education can influence each parent's ability to obtain good information from health services regarding their child's nutritional needs. The level of parental education has been proven to have a good effect on children, preventing the possibility of stunting. In areas with higher levels of education, the incidence of stunting in children under five tends to be lower than in areas with lower levels of education. To minimize the incidence of stunting in young children, the quality of parental education must be the primary concern (Ngaisyah, 2015) (Pangaribuan & Wau, 2019) (Nurmawati et al., 2022).

Although the findings in this study contradict the results of research (Ngaisyah, 2015) in Kanigoro Village, Saptosari, Gunung Kidul, (Pangaribuan & Wau, 2019) at the Medan Deli Community Health Center (Pertiwi et al., 2019) in Martapura Kota District, Regency Banjar, South Kalimantan, (Sari & Suhardin, 2020) with a systematic review of five databases (Scopus et al., EBSCO, ProQuest,

and PubMed) were explored to find relevant articles published from 2015 to 2020 and (Nurmawati et al., 2022) Ramung Community Health Center, Permata District, Bener Meriah Regency. Previous research also found that the level of education also has a significant influence on the incidence of stunting in toddlers. However, the level of education must be increased, considering that the government has launched a 12-year compulsory education program, meaning compulsory education up to high school level and equivalent.

The family income in this study, as shown in Table 5, is mostly below the minimum wage and is distributed between families with stunted and non-stunted children. So, based on the results of the chi-square test, income has no relationship with the incidence of stunting in Ketapang Regency. However, families with children who are not stunted receive more social assistance than families with children who are stunted. This social assistance apparently helps families whose income is below the minimum wage to increase their family's food security. Apart from that, there are still families with incomes above the minimum wage that have stunted children. This means that the income they have is not necessarily used to maintain their family's resilience. Community income is an economic indicator that plays a vital role in economic growth in addition to supporting economic growth. The increase in per capita income is also reflected in the increase in regional gross income per capita (GRDP). As people's income increases, people's ability to meet their daily needs will also increase. This is because an increase in income is accompanied by an increase in consumption, including an increase in purchasing power and consumption of nutritious food.

Income is the result of income or paid wages earned or generated by each person in a family. When people experience an increase in income, it is hoped that family needs can also be adequately met. Many factors influence the consumption expenditure patterns of residents in an area, including income, consumer tastes, prices of goods, education level, etc. Income is used for two purposes, namely consumption and savings. The amount of income a person receives will influence his consumption patterns. Price of goods, where if the price of an item increases, then consumption of that item will decrease.

Conversely, if the price of an expenditure item decreases, then consumption of that item will increase. Education level is where the level of education influences behavior, attitudes, and consumption needs. Number of families, where the size of the family will influence consumption patterns. Environment, where environmental habits will also influence the consumption behavior of people in the area (BPSK Ketapang, 2022). Based on BPS data in 2022, 55.93 percent of income in Ketapang Regency was spent on food consumption. In the grouping of people's food consumption, five foods are classified as healthy foods, namely fish, shrimp, squid, meat, eggs, milk, vegetables, and fruit. Meanwhile, the types of food that are included in the unhealthy consumption group are ready-made food and drinks, beverage ingredients, cigarettes, and tobacco.

Income is the ability of parents to produce resources. At the same time, stunting is a health problem in toddlers caused by nutritional factors entering the body. This means that high income is only sometimes allocated well to provide nutrition for children. The demands of a lifestyle that tends to be dynamic are often the main concern for families today.

The results of this research show new developments. In a similar study that examined the impact of income on the incidence of stunting, the results showed that it was different from previous research that found that income had a significant influence on the incidence of stunting. The

influence between per capita income and the number of babies affected by stunting has a significant influence (Ngaisyah, 2015) (Pangaribuan & Wau, 2019).

From this research, the results also showed that families with children who were not stunted received social assistance from the government, which was given to families with incomes below the minimum wage. This government policy is in order to reduce extreme poverty in Indonesia for families at risk of stunting. However, very few families with stunted children receive social assistance from the government. This will relate to the use of health facilities during childbirth and when the child is sick because there are still families with stunted children who do not have health insurance. In fact, health insurance is a form of social assistance for people in need.

The results in Table 6 show that BPJS participation for families who are not stunted is 100 percent, and the place of delivery is at a local health facility. This shows that births carried out in health facilities are monitored for health and development, thereby preventing cases of stunting. This is different from families with stunted children; there are still those who give birth at home with the help of a traditional healer because of local habits or customs, which are traditions that have been passed down from generation to generation. Although some respondents, after giving birth by a dukun, asked for help from a midwife, health workers were not fully involved in health monitoring. There are several cases where health workers are called if difficulties occur during childbirth. Apart from that, some give birth in health facilities but do not use BPJS because they are lazy about taking care of the administration.

Factors Causing Stunting

Food Security Factors

Table 4. Food Security Factors Against Stunting

Food Security Score Category	Stunting				Total		p-value
	Stunting		Not Stunting				
	N	%	N	%	N	%	
Not good	62	95	3	5	65	55	0,000
Good	26	49	27	51	53	45	
Amount	88	74	30	36	118	100	

Source: Primary data processed by SPSS 25

From the results of data analysis tests through statistical tests with a significance level of 5 percent, a p-value of 0.000 is obtained, which is smaller than the value of $\alpha = 0.05$, so H_0 is rejected, and H_a is accepted. This shows that there is a significant relationship between food security and the incidence of stunting in Ketapang Regency.

In Table 4, it is known that food security factors have a significant relationship to the incidence of stunting. Family food security is the continuous provision of sufficient food in both quality and quantity for a family. Food security will affect the amount of nutrients consumed if they are not appropriately eaten, which will have an impact on the poor health of low-income families. According to (National, 2022), there are three pillars that form food security, namely: physical food availability, household access to food in obtaining sufficient food, whether from own production, purchases, bartering, gifts, loans, assistance, food absorption or use. Food by family members and nutritional status are outcomes of food security, which is a reflection of a person's quality of life, good or bad. Nutritional status is calculated based on life expectancy, under-five nutritional levels, and infant mortality (National, 2022).

Food access is related to the resources the family has, such as:

1. Economic access includes income, employment opportunities, and prices.
2. Physical access refers to the level of regional isolation (distribution facilities and infrastructure).
3. A social approach regarding food preferences.

This research is in line with the results of research (Sudargo & Armawi, 2019) at the Bandarharjo Community Health Center, Tanjung Mas Village, North Semarang District, Semarang Municipality, Central Java Province. The incidence of stunting in children under five is influenced by low access to food both in terms of quantity and quality, in line with research results (Widyaningsih et al., 2018) in Bayat District, Klaten Regency, (Walrod et al., 2018) in four Andean traditional communities in Ecuador, (Saraswati et al., 2021) in Karanganyar Village, Kawalu District, Tasikmalaya City, (Weatherspoon et al., 2019) in rural Rwanda, (Beckmann et al., 2021) cross-sectional study of South African elementary school children, (Sihite et al., 2021) at Puskesmas 11 Ilir Palembang, (Irm, 2022) in Langkat Regency, North Sumatra Province, and (Harper et al., 2023) longitudinal study in South Africa.

Social Environmental Factors

Table 7. Social Environmental Factors Against Stunting

Social Environment Score Category	Stunting						p-value
	Stunting		Not Stunting		Total		
	N	%	N	%	N	%	
Not good	43	94	3	6	46	38	0,000
Good	45	62	27	38	72	62	
Amount	88	74	30	36	118	100	

Source: Primary data processed by SPSS 25

From the results of data analysis tests using statistical tests with a significance level of 5 percent, a p-value of 0.000 is obtained, which is smaller than the value of $\alpha = 0.05$, so H_0 is rejected, and H_a is accepted. This shows that there is a significant relationship between the social environment and the incidence of stunting in Ketapang Regency.

The research results are presented in Table 7, where social-environmental factors show significant results in the incidence of stunting. The family is the smallest unit of society. According to the National Population and Family Planning Agency (BKKBN), a family is two or more people formed based on a legal marriage bond, capable of meeting the spiritual and material needs of a decent life, devoted to God, having a harmonious and balanced relationship between family members and society as well as the environment.

A person's social environment is first formed by the family environment, which is the first medium that influences a person's behavior, especially children. In the family environment, we are given a variety of education so that children become independent. Not only independence, but we can also guide children in making their own decisions to develop their mental, social, emotional, and physical abilities to live a healthy and productive life. For the atmosphere within the family environment, we must create a conducive atmosphere, namely an atmosphere that is open to each other, love each other, and trust each other. The family environment is a provision for us to carry out socialization in a social environment that has a broad scope, not only at home but we can also use it outside the home. Therefore, the family has a responsibility in raising children.

Social and environmental factors are related to family parenting patterns, which are strongly influenced by local customs. Good parenting is affectionate, providing a safe, comfortable, and

enjoyable environment for the child's growth and development, providing continuous and non-violent care, and providing a good example. Parenting patterns receive less attention from parents because parents are busy working, so they cannot pay attention to their children at home and provide nutritious food. They can only provide ready-to-eat food without paying attention to the nutritional value needed by children, which can result in stunting. This research is in line with the results of previous research conducted by (Rahmawati & Rasni, 2019) in Arjasa District, Jember and (Saraswati et al., 2021) in Karanganyar Village, Kawalu District, Tasikmalaya City, which confirmed that the role of the family in caring for children helps prevent stunting in the family (Rahmawati & Rasni, 2019).

Health Environmental Factors

Table 8. Health Environmental Factors Against Stunting

Health Environment Score Category	Stunting				Total		p-value
	Stunting		Not Stunting		N	%	
	N	%	N	%	N	%	
Not good	39	90	4	10	43	36	0.002
Good	49	65	26	35	75	64	
Amount	88	74	30	36	118	100	

Source: Primary data processed by SPSS 25

From the results of data analysis tests through statistical tests with a significance level of 5 percent, a p-value of 0.002 is obtained, which is smaller than the value of $\alpha = 0.05$, so H_0 is rejected, and H_a is accepted. This shows that there is a significant relationship between the health environment and the prevalence of stunting in Ketapang Regency.

The results of this study are presented in Table 8, showing that health and environmental factors also have a significant influence on stunting rates. According to WHO, a healthy environment is "a state that includes physical, mental, and social health but does not mean free from disease and disability." The health environment influences the child from before pregnancy until the child is two years old. According to the Ministry of Health, the first thousand days of a child's life (1,000 HPK) are the most critical period in a child's growth and development. The 1,000 HPK period covers 270 days of pregnancy and 730 days of the first two years of life. Where at this time, a balanced nutritional intake must be met, followed by exclusive breastfeeding and complementary foods for breast milk (MPASI), which meet the child's nutritional needs. During this period, the mother must maintain her health so that she is able to give birth to a child with a minimum weight of 2.5 kg and a baby length of at least 48 cm. It is recommended that childbirth be carried out in a health facility so that health workers supervise the mother and baby and meet post-natal needs so that the mother can receive vitamin A and the baby can receive immunizations.

After the baby is born, growth and development must constantly be monitored by taking the child to the posyandu to determine growth according to age and receive immunizations. However, from the results of this research, it is also known that mothers take their children to the posyandu only until the child has received immunizations; after that, they are no longer taken to the posyandu so that health workers or posyandu cadres do not monitor the child's growth.

This research is in line with previous research, namely research (Cruz et al., 2017) in the central region of Mozambique (Hayati et al., 2019), (Nurmawati et al., 2022) Ramung Community Health Center, Permata District, Bener Meriah Regency, (Titaley et al., 2019) using data from the 2013 Indonesian Basic Health Survey (SDKI). However, the results of this study contradict the results of

research from (Pangaribuan & Wau, 2019) at the Medan Deli Health Center, where the health environment, especially the use of health facilities, did not show a significant relationship to the incidence of stunting.

Residential Environmental Factors

Table 9 . Residential Environmental Factors Against Stunting

Residential Environment Score Category	Stunting						p-value
	Stunting		Not Stunting		Total		
	N	%	N	%	N	%	
Not good	80	68	25	21	105	89	0.311
Good	8	7	5	4	13	11	
Amount	88	75	30	25	118	100	

Source: Primary data processed by SPSS 25

From the results of data analysis tests through statistical tests with a significance level of 5 percent, a p-value of 0.311 was obtained, which was greater than the value of $\alpha = 0.05$, so H_0 was accepted, and H_a was rejected. This shows that there is no significant relationship between the residential environment and the incidence of stunting in the Ketapang district.

The research results presented in Table 9 show that the residential environment does not have a significant relationship with stunting rates. According to HAKLI (Indonesian Association of Environmental Health Professionals), "environmental conditions can support a dynamic ecological balance between humans and their environment to support the achievement of a healthy, strong, strong and happy quality of human life." Modifying the environment to achieve ecological balance and increase the level of human well-being. The results of this research look at environmental sanitation and the availability of clean water. The majority of respondents have private latrines, with ownership of a protected source of clean water originating from springs channeled by the village to residents' homes or wells made by residents independently. Poor living conditions have a significant negative impact on children's growth and development due to continued exposure to enteric pathogens.

This research is not in line with research from (Cumming & Cairncross, 2016), which was conducted in South Asian and Sub-Saharan African countries; it is known that the potential of water, cleanliness, and sanitation to reduce stunting requires twice the effort to achieve universal access to services. Even though this access is a Sustainable Development Goal. There needs to be a new strategy or program modification so that it can go beyond the scope of traditional interventions to be able to address the need for clean water, sanitation, and the environment during the first two years of life when the stunting process is concentrated. Likewise, the results of previous research stated that the residential environment influences the incidence of stunting, as written (Sari & Suhardin, 2020) a systematic review. Five databases (Scopus et al., EBSCO, ProQuest, and PubMed) were explored to find relevant articles published from 2015 to 2020. Other research was done at the Ramung Community Health Center, Permata District, Bener Meriah Regency (Nurmawati et al., 2022).

Economic Losses**Table 10. Amount of Economic Loss per Person Due to Stunting in Ketapang Regency**

Big	Loss	Individual Sufferer	Stunting in the District	Ketapang With	Assumption of Decline	Productivity	2%-9%
Year	Number of sufferers	Economic Potential	missing	loss per person	per year	Average of Years	loss per person 2018-2022
		2%	9%	2%	9%	2%	9%
2018	21.340	403.565.729.604	1.816.045.783.216	18.910.856	85.098.850		
2029	10.891	208.196.382.679	936.883.722.055	19.116.233	86.023.049		
2020	8.705	200.363.494.851	901.635.726.828	23.016.802	103.575.609		90.101.154
2021	10.798	219.034.545.928	985.655.456.676	20.284.395	91.279.776	20.022.479	
2022	10.798	202.834.176.522	912.753.794.349	18,784,108	84,528,485		
AMOUNT	62,533	1,233,994,329,583	5,552,974,483,124	100112393	450,505,770		

From this table, it can be seen that the amount of loss per person with a decrease in productivity of 2 percent is at least Rp. 18,910,856.00, and the largest reaches Rp—23,016,802.00 per year. For a decrease in productivity of 9 percent, you will experience a loss of a minimum of IDR 84,528,485.00 and a maximum of IDR. 103,575,609.00. During the 2018-2022 period, there will be an average economic loss of IDR. 20,022,479.00 due to a 2 percent decrease in productivity amounting to Rp. 90,101,154.00 due to a decrease in productivity of 9 percent.

In Table 10, the magnitude of economic losses due to stunting varies each year depending on the prevalence of stunting, where the more significant the prevalence of stunting, the greater the economic losses incurred. Both groups and individuals studied the economic losses due to stunting. The results still show that stunting causes economic losses with different percentages depending on the prevalence of stunting in a region or area being studied.

The enormous economic potential that will be lost due to the stunting problem in Ketapang Regency when toddlers become stunted in 2018-2022 will have an impact on their productive years. The calculation of losses due to stunting with a 2 percent decline in productivity reaches 200 billion rupiah, whereas, with a 9 percent decline in productivity, it can reach 1.8 trillion rupiah.

This research is in line with previous research conducted by (Renyonet et al., 2016) using secondary data from surveys conducted by several related agencies in Indonesia in 2013, especially by the Central Statistics Agency and the Ministry of Health. The research was conducted in Bogor from December 2015 to March 2016. The data was analyzed descriptively by calculating economic losses due to stunting according to the Konig 1995 formula, using coefficients compiled from Horton 1999. The research results show great potential for the national economy. Losses due to stunting in children under five range from 3.057 billion rupiah to 13.758 billion rupiah or 0.04 percent-0.16 percent of Indonesia's total GDP (Renyonet et al., 2016). (Titaley et al., 2019) she has conducted research using a descriptive method using the Konig formula and the Horton correction factor to find that Indonesia's Gross Domestic Product (GDP) would experience a loss of 2-3 percent due to Stunting (Titaley et al., 2019). (Wardani & Renyonet, 2022) which was carried out using a literature study, it is estimated that it will cause economic losses for Indonesia of 3,057 billion rupiah due to a 2 percent decline in productivity and reach 13,758 billion rupiah if the decline in productivity reaches 9 percent (Wardani & Renyonet, 2022).

This is supported by research from (Suryana & Azis, 2023), which was carried out with a descriptive study based on secondary data processing from various related agencies. As a nation, Indonesia faces potential economic losses due to stunting in children under five years old, which

ranges from 15,062 to 67,780 billion rupiah. This is equivalent to a range of 0.89-3.99 percent of total GDP in 2021 (16,970.8 trillion rupiah). Research on economic losses due to Stunting in Indonesia was carried out by Bappenas in 2018. Stunting can cause economic losses of 2-3 percent of Gross Domestic Product (GDP) every year. Economic losses due to stunting continue to increase every year if stunting is severely intervened. This research was also carried out in other countries, such as that carried out by Sebastian (Mary, 2018), who observed the study in 74 developing countries between 1984 and 2014. Research shows that Stunting's economic growth reduces labor market productivity, which causes a decrease in GDP. (Gross Domestic Products) (Mary, 2018).

From the results of these studies, if this condition is not handled correctly, it can affect Indonesia's development performance, as well as inequality and poverty. Stunting can hamper economic growth and labor productivity. In line with this, it will affect economic growth and hamper labor productivity in Ketapang Regency.

CONCLUSION

Based on the results of research conducted to look at the factors that cause stunting in Ketapang Regency, especially the influence of food security, social environment, health environment, and residential environment on the incidence of stunting in Ketapang Regency, it can be concluded as follows: 1). This research provides results that are suitable for three hypotheses, namely food security factors, social, environmental factors and social, environmental factors that influence the incidence of stunting in Ketapang Regency. One hypothesis has not been proven to influence the incidence of stunting in Ketapang Regency, namely residential environmental factors. 2) Food security factors influence the incidence of stunting in Ketapang Regency. Family food security depends on access to nutritious food that the family can consume in order to improve the family's nutritional status. The government has made efforts to increase access to food for underprivileged communities whose income is below the minimum wage so that they can receive social assistance to maintain family food security. 3) Social environmental factors influence the incidence of stunting in Ketapang Regency. The social environment is closely related to local customs. The social environment has a significant influence on children's growth and development. Parenting styles in the family shape children to become better. Families are expected to have sufficient knowledge of child-rearing patterns so that they can direct families to care for children well and correctly. 4) Health and environmental factors influence the incidence of stunting in Ketapang Regency. A good health environment can help mothers access health facilities properly so that they are able to maintain their health by having prenatal check-ups during pregnancy, giving birth in health facilities, bringing toddlers to the posyandu to monitor the child's growth and development, getting complete immunizations for their beloved children. Ease of access to health facilities increases the utilization of health insurance at health facilities for participants who have health insurance/BPJS. 5) Residential environmental factors do not influence the incidence of stunting in Ketapang Regency, considering that stunting families and non-stunting families have the same problems in accessing clean water and sanitation in the residential environment. Access to clean water and environmental sanitation is the responsibility of various sectors. This problem is a world problem whose target is to be resolved by 2030. They consider clean water and adequate sanitation to be basic human needs. 6) Economic losses due to stunting in Ketapang Regency due to a decrease in productivity of 2 percent to 9 percent range from 1.02 percent to 10.8 percent of

Ketapang's GRDP or as much as 200 billion rupiah to 1.8 trillion rupiah. This loss is greater than the economic loss due to Stunting in Indonesia because the prevalence of stunting in Ketapang is higher than in Indonesia in general.

REFERENCES

- Beckmann, J., Lang, C., du Randt, R., Gresse, A., Long, K. Z., Ludyga, S., Müller, I., Nqweniso, S., Pühse, U., & Utzinger, J. (2021). Prevalence of stunting and relationship between stunting and associated risk factors with academic achievement and cognitive function: A cross-sectional study with South African primary school children. *International Journal of Environmental Research and Public Health*, 18(8), 4218.
- Cumming, O., & Cairncross, S. (2016). Can water, sanitation and hygiene help eliminate stunting? Current evidence and policy implications. *Maternal & Child Nutrition*, 12, 91–105.
- De Onis, M., & Branca, F. (2016). Childhood stunting: a global perspective. *Maternal & Child Nutrition*, 12, 12–26.
- Dimiati, H., & Hajar, S. (2019). The correlation between stunting and learning achievement in 9-12 years old children at Idi Rayeuk, East Aceh Regency, Indonesia. *Journal of Medical Practice and Review*, 3(5), 539–544.
- Febriyanti, A., Isaura, E. R., & Farapti, F. (2022). Hubungan antara Ketahanan Pangan Rumah Tangga, dengan Kejadian Stunting pada Balita Usia 24-59 Bulan. *Media Gizi Kesmas*, 11(2), 335–340.
- Fund, United Nation Children's. (2009). *The State of the World Children*.
- Fund, United Nations Children's. (2022). *Laporan Tahunan Indonesia 2022*. [Www.Unicef.Org. https://www.unicef.org/indonesia/media/17226/file/Laporan Tahunan UNICEF Indonesia 2022 - Single page.pdf](https://www.unicef.org/indonesia/media/17226/file/Laporan_Tahunan_UNICEF_Indonesia_2022_-_Single_page.pdf)
- Harper, A., Rothberg, A., Chirwa, E., Sambu, W., & Mall, S. (2023). Household food insecurity and demographic factors, low birth weight and stunting in early childhood: findings from a longitudinal study in South Africa. *Maternal and Child Health Journal*, 27(1), 59–69.
- Irmis, S. K. (2022). *Hubungan Ketahanan Pangan dan Pola Asuh dengan Kejadian Stunting Balita pada Keluarga Miskin di Kabupaten Langkat*. Universitas Sumatera Utara.
- Ketapang, B. P. S. K. (2022). *Kabupaten Ketapang Dalam Angka 2022*.
- Ketapang, D. K. K. (2022). *Profil Dinas Kesehatan Kabupaten Ketapang Tahun 2021*. Dinas Kesehatan Kabupaten Ketapang.
- Mary, S. (2018). How much does economic growth contribute to child stunting reductions? *Economies*, 6(4), 55.
- Nasional, B. P. (2022). *Peta Ketahanan dan Kerentanan Pangan Tahun 2022*.
- Ngaisyah, R. D. (2015). Hubungan sosial ekonomi dengan kejadian stunting pada balita di Desa Kanigoro, Saptosari, Gunung Kidul. *Medika Respati: Jurnal Ilmiah Kesehatan*, 10(4).
- Nurmawati, N., Ginting, D., & Brahmana, N. E. (2022). Analisis Faktor Resiko Kejadian Stunting Pada Balita Di Wilayah Kerja Puskesmas Ramung Kecamatan Permata Kabupaten Bener Meriah Tahun 2021. *Journal of Healthcare Technology and Medicine*, 7(2), 1137–1157.
- Pangaribuan, I. A., & Wau, H. (2019). Faktor-Faktor Yang Berhubungan Dengan Kejadian Stunting Pada Balita Diwilayah Kerja Puskesmas Medan Deli Tahun 2018. *Jurnal Kesehatan Masyarakat Dan Lingkungan Hidup*, 4(1), 34–41.
- Pertiwi, M. R., Lestari, P., & Ulfiana, E. (2019). Relationship between parenting style and perceived information sources with stunting among children. *International Journal of Nursing and Health Services (IJNHS)*, 2(4), 273–279.
- PPN, K. (2018). *Pedoman Pelaksanaan Intervensi Penurunan Stunting Terintegrasi di Kabupaten/Kota*. Kementerian PPN/Bappenas.
- Rahmawati, U. H., & Rasni, H. (2019). Hubungan pelaksanaan peran keluarga dengan kejadian stunting pada balita di kecamatan arjasa, jember. *Pustaka Kesehatan*, 7(2), 112–119.
-

- Renyoet, B. S., Martianto, D., & Sukandar, D. (2016). Potensi kerugian ekonomi karena stunting pada balita Di Indonesia tahun 2013. *Jurnal Gizi Dan Pangan*, 11(3), 247–254.
- RI, K. K. (2019). *Laporan Nasional Riskesdas 2018*.
- RI, K. K. (2022). *Status Gizi SSGI 2022*.
- Saraswati, D., Gustaman, R. A., & Hoeriyah, Y. A. (2021). Hubungan status ketahanan pangan rumah tangga dan pola asuh terhadap kejadian stunting pada baduta: Studi pada baduta usia 6-24 bulan di Kelurahan Karanganyar Kecamatan Kawalu Kota Tasikmalaya. *Jurnal Ilmu Kesehatan Bhakti Husada: Health Sciences Journal*, 12(2), 226–237.
- Sari, M., & Suhardin, S. (2020). Family determinants of stunting in Indonesia: A systematic review. *Int. J. Psychosoc. Rehabil*, 24(1), 815–822.
- Sihite, N. W., Nazarena, Y., Ariska, F., & Terati, T. (2021). Analisis Ketahanan Pangan dan Karakteristik Rumah Tangga dengan Kejadian Stunting. *Jurnal Kesehatan Manarang*, 7(Khusus).
- Sudargo, T., & Armawi, A. (2019). Sosio Demografi Ketahanan Pangan Keluarga Dalam Hubungannya Dengan Kejadian Stunting Pada Anak Usia 1–5 Tahun (Studi Di Wilayah Kerja Puskesmas Bandarharjo Kelurahan Tanjung Mas, Kecamatan Semarang Utara, Kotamadya Semarang, Provinsi Jawa Tengah). *Jurnal Ketahanan Nasional*, 25(2), 178–203.
- Suryana, E. A., & Azis, M. (2023). The potential of economic loss due to stunting in Indonesia. *Jurnal Ekonomi Kesehatan Indonesia*, 8(1), 52–65.
- Titaley, C. R., Ariawan, I., Hapsari, D., Muasyaroh, A., & Dibley, M. J. (2019). Determinants of the stunting of children under two years old in Indonesia: A multilevel analysis of the 2013 Indonesia basic health survey. *Nutrients*, 11(5), 1106.
- Transmigrasi, K. D. P. D. T. dan. (2017). *No Title*. Kementerian Desa Pembangunan Daerah Tertinggal dan Transmigrasi.
- Walrod, J., Seccareccia, E., Sarmiento, I., Pimentel, J. P., Misra, S., Morales, J., Doucet, A., & Andersson, N. (2018). Community factors associated with stunting, overweight and food insecurity: a community-based mixed-method study in four Andean indigenous communities in Ecuador. *BMJ Open*, 8(7), e020760.
- Wardani, K., & Renyoet, B. S. (2022). Studi Literatur: Estimasi Potensi Kerugian Ekonomi Akibat Undernutrition Di Indonesia: Literature Study: Estimation of Potential Economic Loss Due to Undernutrition in Indonesia. *JURNAL GIZI DAN KESEHATAN*, 14(1), 114–127.
- Weatherspoon, D. D., Miller, S., Ngabitsinze, J. C., Weatherspoon, L. J., & Oehmke, J. F. (2019). Stunting, food security, markets and food policy in Rwanda. *BMC Public Health*, 19, 1–13.
- Widyaningsih, N. N., Kusnandar, K., & Anantanyu, S. (2018). Keragaman pangan, pola asuh makan dan kejadian stunting pada balita usia 24-59 bulan. *Jurnal Gizi Indonesia (The Indonesian Journal of Nutrition)*, 7(1), 22–29.
- Woldehanna, T., Behrman, J. R., & Araya, M. W. (2017). The effect of early childhood stunting on children's cognitive achievements: Evidence from young lives Ethiopia. *Ethiopian Journal of Health Development*, 31(2), 75–84.
- Yu, S. H., Mason, J., Crum, J., Cappa, C., & Hotchkiss, D. R. (2016). Differential effects of young maternal age on child growth. *Global Health Action*, 9(1), 31171.



© 2024 by the authors. It was submitted for possible open-access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>).