Advances in Social Science, Education and Humanities Research, volume 591

Proceedings of the 6th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2021)

Mapping the Distribution of Stunting Toddlers in Supporting the Successful Achievement of the Millenium Development Goals (Mdgs) in Deli Serdang District

Hesti Fibriasari[1], Baharuddin[2], Dina Ampera[3*], Syamsul Gultom[4], Restu[5],

Winsyahputra Ritonga[6], Nurpelita Sembiring[7], Sukma Erni[8]

[1] *Department of French Language Education, Universitas Negeri Medan, Indonesia*
[2] *Department of Electrical Engineering Education, Universitas Negeri Medan, Indonesia*
[3] *Departement of Fashion Management Education, Universitas Negeri Medan, Indonesia*
[4] *Departement of Public Health Universitas Negeri Medan, Indonesia*
[5] *Departement of Geography Education, Universitas Negeri Medan, Indonesia*
[6] *Departement of Physics, Universitas Negeri Medan, Indonesia*
[7] *Program Studi Gizi, Universitas Islam Negeri Sultan Syarif Kasim, Riau, Indonesia*
[8] *Program Studi Tardis IPS, Universitas Islam Negeri Sultan Syarif Kasim, Riau, Indonesia*
[*] *Corresponding author. Email: dinaampera@unimed.ac.id*

ABSTRACT

The direction of nutrition development policy in Indonesia is to strengthen research and development, including monitoring and evaluation. This means that research is one way to develop quality nutrition, both for individuals and for the community. Data shows that Indonesia is the fifth country with stunting in the world, and is number one in Southeast Asia. In general, this research aims to provide information on the distribution area of stunting under five in Deli Serdang Regency. Meanwhile, specifically to analyze and project forward related to stunting development in Deli Serdang Regency, and map the distribution area of stunting under five based on the projection results. This research uses quantitative methods to analyze statistical data, namely data on the trend of stunting development in Deli Serdang Regency, for the last few years (trace data) then performs projections by reading the trend of stunting data, using exponential smoothing analysis tools with Microsoft Excel software and IBM SPSS statistical software. 22 with Holt's linear trend model. The results show that 1) The projected number of stunting cases in Deli Serdang Regency in the 2020-2029 period has decreased or in other words there is a positive trend. 2) Mapping of the distribution area of stunting cases was carried out in 34 Puskesmas or 34 coordinate points of installation with the Global Positioning System (GPS), spread over 22 sub-districts or the entire area of Deli Serdang Regency, the results of the analysis showed that Pantai Labu District was the sub-district with the highest percentage of stunting cases. in 2020 and the lowest cases were in Lubuk Pakam sub-district. While the highest cases in 2019 were in Kutalimbaru District and the lowest cases were in Beringin District.

Keywords: Projection and mapping, stunting, exponential smoothing, information system.

1. INTRODUCTION

Stunting is a condition of failure to thrive in children under five as a result of chronic malnutrition so that the child is too short for his age. Malnutrition occurs since the baby is in the womb and in the early days after the baby is born. However, the stunting condition only appears after the baby is 2 (two) years old. Thus, the period of the First 1,000 Days of Life (HPK) should receive special attention because it determines the level of physical growth, intelligence, and productivity of a person in the future. Indonesia is the third country with

the highest prevalence of stunting in the Southeast Asia region with an average prevalence of stunting under five (2005-2017) of 36.4%. Currently, the prevalence of stunting in Indonesia reaches 30.7% (2018) which has decreased from 2013 (37.2%) (Kemenkes RI, 2018). Reducing the prevalence of stunting is a priority for the Sustainable Development Goals (SDGs) in Indonesia until 2030 to reduce as much as 40% of the number of stunting under-fives (Ministry of Health RI, 2018; WHO, 2018). Directly stunting is caused by food intake and infectious diseases determined by maternal parenting (Pratiwi, Masrul, and Yerizel, 2016). Various studies have shown that the application of balanced nutrition during pregnancy and nutritional parenting, especially in the first 1000 days of life, will affect the incidence of stunting in children under five. In addition, maternal health status plays an important role in determining the nutritional status and health of toddlers (Altare, et al., 2016; Huicho, et al., 2017; Kismul, et al., 2018).

Stunting is caused by multi-dimensional factors and is not only caused by poor nutrition experienced by pregnant women and children under five. The most decisive intervention to reduce the prevalence of stunting is the intervention carried out on 1,000 HPK of children under five. Stunting intervention requires program convergence and synergistic efforts of the government, the business world, and the community. In 2020, the Regional Government of Deli Serdang Regency has held a Stunting Conference by setting 20 village loci for specific and sensitive interventions at these loci.

One of the points in the direction of nutrition development policy in Indonesia is strengthening research and development including monitoring and evaluation, meaning that research is an alternative to quality nutrition development, both for individuals and for the community. When stunting is considered a problem in national development, what is often done is to identify, study and analyze and conclude that the cause is due to malnutrition in children.

Indonesian children have the right to live healthy and get better health services (Santoso EB, 2018). The Global Nutrition Report, 2018 reports that there are as many as 22.2% or as many as 150.8 million children under five in the world experiencing stunting. The wasting rate was 7.5% or 50.5 million children, while 5.6% or 38.3 million children were overweight. The stunting rate decreased from 37.2% in 2013 to 30.8 percent in 2018. This data also shows that Indonesia is one of the countries with a triple double of nutritional problems.

The achievement of the MDGs to reduce poverty and hunger is a challenge that must be faced in Indonesia, this is in accordance with research which states that the main challenge in achieving the MDGs in the health sector is how the government can translate commitments and effective intervention policies that are already available into routine health service programs that can directly touch the community, especially those who need it most, namely the poor (Utomo, 2011). Achievement of the MDGs in Deli Serdang Regency.

Short toddlers or stunting illustrates the existence of chronic nutritional problems in children, this can be influenced by the condition of the mother or future mother, fetal period and infancy/toddler period, including the disease suffered. Like other nutritional problems, they are not only related to health problems, but are also influenced by various other conditions that indirectly affect children's health (Agung Sutriyawan, 2020). Furthermore, Agung Sutriyawan, (2020), explained that the impact of under-fives experiencing stunting could increase their vulnerability to infectious disease morbidity and mortality, reduce their future educational achievement and reduce their economic productivity in the future. Research by Fuada, et al (2012) regarding the determination of nutrient-prone areas based on spatial analysis, with the aim of identifying areas that are prone to the nutritional status of children under five. The analysis method uses GIS (Geography Information System) by grouping data and overlaying maps by union. The results of the study concluded that there were four districts with the most serious nutritional status in the high category including Cianjur, Garut, Tasikmalaya and Tasikmalaya districts (Fuada, 2012). Elisanti (2017) researched the mapping of the nutritional status of children under five in Indonesia with the aim of mapping the nutritional status of children under five in Indonesia. The method used is non-reactive, the study uses secondary data sourced from the 2010 Riskesdas report.

The prevalence of stunting in North Sumatra according to Riskesdas in 2010 was 43.2% (very short at 20.6% and short at 22.6%). Meanwhile, according to the profile of North Sumatra (2013) in Deli Serdang district, the prevalence of stunting reached 18.7% in the very short category, and 19.0% short (stunting). According to Bloem (2013) the cause of stunting is malnutrition which involves various aspects, namely inadequate nutritional intake, difficulty in accessing healthy food, lack of attention and health facilities for mothers and children, lack of knowledge, to social, economic and political aspects as aspects of stunting. -fundamental aspects. Jam that growth failure is caused by inadequate intake of one or more nutrients including energy, protein or macronutrients such as iron (Fe), zinc (Zn), phosphorus (P), vitamin D, vitamin A, vitamin C. Macro (E, P) and micronutrients (Fe, Zn) especially during growth period will interfere with the growth process of a child which has an impact on stunting (Mikhail et al. 2013). Factors that affect protein and Fe intake can be seen from their daily food consumption and eating habits (Arisman,

2007). The problem of lack of nutrient intake is widely found in remote areas caused by lack of understanding of nutrition knowledge, eating many types of food ingredients in the area are not used for consumption by children (Suhardjo, 2003). Data on the health profile of Deli Serdang Regency in 2018 shows that poor nutrition status is 1.97%, undernutrition is 6.78%, good nutrition is 90.15% and over nutrition is 1.11%. Forecasting techniques can be done from the simplest way to the most complex way. Coupled with the use of technology on the one hand in the form of computer hardware and software, it makes it easier and simplifies the way of forecasting. Although on the other hand, the simplicity and ease of doing forecasting does not reduce the accuracy of forecasting results.

According to Aronoff (1989 in Annugerah, et al 2016) Geographic Information System (GIS) or Geographic Information System (GIS) is a computer-based information system that is used to process and store geographic data or information. GIS has the ability to connect various data at a certain point on the earth, combine them, analyze and finally map the results. The data to be processed in the GIS is spatial data, which is geographically oriented data and is a location that has a certain coordinate system as the basis for reference. So that the GIS application can answer several questions such as; location, condition, trend, pattern and modeling, this is what distinguishes GIS from other information systems (10).

Based on the data and literacy studies used in this study, in supporting government policies related to the one map policy, it is better if research related to stunting is carried out in the form of modeling in the form of mapping graphics (maping), to make it easier for us to read regionally and spatially. In general, this research aims to provide information on the distribution area of stunting under five in Deli Serdang Regency. Meanwhile, specifically to analyze and project forward related to stunting development in Deli Serdang Regency, and map the distribution area of stunting under five based on the projection results in this research.

This research becomes urgent when the data shows that the focus in Deli Serdang Regency by intervening in integrated stunting reduction in 2020, will be expanded to all sub-districts in 2021. This means that the stunting problem becomes important in the nation's development going forward, so that monitoring, evaluation and intervention efforts done effectively. Targeting needs to be coordinated and orchestrated the handling of stunting throughout Indonesia, especially Deli Serdang Regency. The author hopes that this research can produce a novelty in science related to public health research, especially the problem of stunting. The purpose of the study was to determine the distribution of stunting areas for toddlers

in Deli Serdang Regency based on an information system.

The mapping was carried out based on a secondary data survey (stunted toddlers) obtained from the Deli Serdang District Health Office in 2020, then processed and strengthened by a primary survey by taking the location of 34 health centers with recorded stunting cases. Point retrieval is carried out by means of a location survey, then at each location coordinates are paired using a global position system (GPS) to support the data processing of stunting cases in Deli Serdang Regency.

The purpose of the mapping is to provide information that there are several Puskesmas with stunting cases. The information submitted is for the public interest (public interest), the interest of the bureaucracy (government of interest) and the interest of science (science of interest), so it is necessary to have an action plan to handle stunting cases. Various stunting prevention and treatment efforts have been carried out. However, the reduction in stunting prevalence in Indonesia has not been significant and is still trying to achieve the Target Sustainable Development Goals (SDGs). One of the strategic efforts to prevent stunting can be done since pregnancy by integrating nutrition education and reproductive health. Based on these problems, a research problem formulation emerged to find out the mapping of the distribution of stunting toddlers in Deli Serdang Regency based on information systems.

2. METHOD

Research method is an instrument that must be clearly clarified and serves to solve a problem. This study uses a quantitative approach with an exponential smoothing analysis tool, aiming to forecast or forecast the development of cases of children under five with stunting. The Exponential Smoothing method (Makridakis, 1999 in Raharja, et al 2011) is a continuous improvement procedure for forecasting the latest observation objects.

Location and Time of Research The research will be conducted in Pantai Labu Subdistrict and Lubuk Pakan Subdistrict, Deli Serdang Regency because it has the highest and lowest prevalence of stunting under five in 2020 based on the Deli Serdang Regency Health Office. The intervention group was taken from the Pantai Labu Health Center area and the control group was from the Lubuk Pakam Health Center area. The research will be conducted for 3 (three) months, namely in September-November 2021.

This type of research is a correlation research with a cross sectional approach. The study was conducted in Deli Serdang Regency, with a stunting toddler population aged 0-59 months. The number of samples in this study

was 90 people. Bivariate data analysis using Chi Square and multivariate data analysis using logistic regression.

There are two exponential smooth approaches used in this study, aiming to see a comparison of the results of forecasting or projection analysis, namely:

1. Exponential smooth method using Microsoft Excel software

2. Exponential smooth method with Holt's linear trend model using IBM SPSS statistics 22 software.

As for mapping the distribution area of stunting toddlers, secondary data interpretation is carried out in the form of tables, sourced from the Deli Serdang District Health Office in the 2018-20210 period. which serves geographic and spatial information. After that, the data that has been analyzed and projected will then be inputted and processed into Arcview GIS software. 10.5 to be presented in the form of a mapping for information.

3. RESULTS AND DISCUSSION

Based on the results of the analysis, it is known that 90 respondents with stunting under five with very short status 26 people (28.9%), and 64 people (71.1%). The age of the respondents under five years old is 44 people (48.9%), and 46 people (51.1%). The nutritional status of respondents with poor nutrition was 17 people (18.9%), undernourished 16 people (17.8), and good nutrition was 57 people (63.3%). The number of respondents with mothers having a height <150 cm was 44 people (48%), and respondents with mothers having a height> 151 cm 46 people (51.1%). The number of respondents with a history of mothers taking Fe tablets were 79 people (87.8%), while respondents with a history of mothers not consuming Fe were 11 people (12.2%). The number of respondents who had a history of doing antenatal care was 87 people (96.7%), while those who did not do antenatal care were 3 people (3.3%).

The number of respondents who have mothers with comorbidities in pregnancy are 14 people (15.6%), and

respondents who do not have a history of comorbidities in pregnancy are 76 people (84.4%), the number of respondents with exclusive breastfeeding is 64 people (71.1), and 26 people were not given exclusive breastfeeding (28.9%). The number of respondents with health problems in children is 51 people (56.7%), and 39 people who do not have health problems (43.3%).

The number of respondents who have the habit of eating instant food are 37 people (41.1%), and those who do not have the habit of eating instant food are 53 people (58.9%). The number of respondents who do not own and use their yards are 37 people (41.1%), while those who do not own and do not use people's yards (58.9%). The number of respondents who have a source of clean water is 87 people (96.7%), while those who do not have clean water are 3 people (3.3%). The number of respondents who live in a smoking environment is 66 people (73.3%), while 26.7% do not live in a smoking environment. The number of respondents with moderate economic families was 29 people (32.2%), while the number of respondents with less economic families was 61 people (67.8%). From table 1, it is known that stunting in toddlers is known to be related to the nutritional status of children, a history of health problems in toddlers, eating habits of instant food, and a history of exclusive breastfeeding, and maternal height with a P value < 0.05. The results of this study revealed that the history of mothers who consumed iron tablets during pregnancy, history of mothers who did antenatal care examinations, ownership and use of yards to grow various vegetables and fruits, ownership of clean water sources, living environment with smokers and family economic conditions were not related to stunting. in toddlers. Based on the criteria for the independent variable having a p value < 0.25, including nutritional status in toddlers, history of exclusive breastfeeding, toddler health problems, eating habits of instant food, maternal height, history of consumption of Fe tablets, history of comorbidities during pregnancy, and family economy.

Table 1. Relationship of Factors Affecting Stunting in Toddlers in Deli Serdang Kabupaten Regency.

		STUNTING					
		Very Short		Short			
		N	%	N	%	df	pvalue
Nutritional status	Severe Malnutrition	16	94.10	1	5.90	2	0.000
	Malnutrition	8	50.00	8	50.00		
	Good Nutrition	2	3.50	55	96.50		
Child Health Problems	Have	21	41.20	30	58.80	1	0.004
	Not have	5	12.80	34	87.20		
Abstinence Food	Have	8	25.00	24	58.80	1	0.621
	Not have	18	31.00	40	87.20		

The habit of eating instant food	Have	18	46.60	19	51.20	1	0.001
	Not have	8	15.20	45	83.80		
Mother's height	<150 cm	19	43.20	25	56.80	1	0.003
	>150 cm	7	15.20	39	84.20		
Fe consumption	Not consuming	1	9.10	10	90.10	1	0.166
	Consumption	25	31.60	54	67.30		
ANC History	Not have	0	0.00	3	100.00	1	0.554
	Have	26	29.00	61	70.10		
History of Diseases during Mother's Pregnancy	Not have	6	42.90	20	26.30	1	0.217
	Have	8	57.10	56	73.70		
Exclusive breastfeeding history	Not given	15	57.80	16	42.20	1	0.000
	Given	11	17.10	48	82.70		
Utilization of the Home Yard	Not utilized	8	33.30	16	17.10	1	0.605
	Be utilized	18	27.30	48	72.70		
Source of clean water	Not have	1	33.30	2	66.70	1	1.000
	Have	25	27.30	62	71.30		
Smoker environment	Yes	20	30.30	46	69.60	1	0.794
	No	6	28.60	17	72.00		
Family Economy	Less	23	37.70	38	62.30	1	0.006
	Sufficient	3	10.30	36	89.70		

Table 2. Multivariate Analysis of Risk Factors for The Influence of Toddler Stunting.

Variable	B	SE	p.Value	OR	95%
Nutritional status	-4.677	2.041	0.022	0.009	0.000-0.508
Mother's Height	-3.303	1.334	0.013	0.013	0.003-0.502
History of Fe	4.586	2.801	0.102	97.444	0.405-23934
History of Maternal Pregnancy Concomitant Disease	-0.925	1.687	0.583	0.395	0.015-10.750
Exclusive Breastfeeding	-3.562	1.965	0.069	0.027	0.001-1.328
Toddler health problems	-1.000	1.455	0.492	0.367	0.0021-6.367
Fast Food Habits	-2964	1.391	0.033	0.052	-.003-0777
Family Economics	-1.070	1.441	0.458	0.343	0.020-5779

The results of the data table 2 above concluded that the nutritional status of children under five with a p value of 0.022 <0.05 means that nutritional status is related to the incidence of stunting in toddlers. and an Odd Ratio value of 0.009 means that nutritional status is a risk factor for stunting. Mother's height is known to have a p value = 0.013 < 0.05, with an OR value = 0.037 meaning that maternal height is a risk factor for stunting and the risk is 0.037 times greater than maternal height > 151 cm.

The habit of eating instant food has a p value = 0.033 with an OR of 0.052, thus that the child's habit of consuming instant food is a factor that affects the incidence of stunting under five, and has a 0.052 times greater risk than children who do not have the habit of eating instant food.

The results showed that, history of consuming Fe tablets, history of comorbidities in pregnancy, history of exclusive breastfeeding, and family income were not related to the incidence of stunting in toddlers, nor were they a risk factor for stunting.

The results of statistical observations show that nutritional status is a related and risk factor for stunting in children under five. nutritional status of children. Stunting is a condition where toddlers have a length or height that is less than their age. this condition is measured by calculating the length or height of a body

that is more than minus 2 standard deviations of the median standard deviation of child growth from WHO (Ministry of Health, 2018). The results showed that the nutritional status of toddlers with p value = 0.022 <0.05, OR = 0.009, this means that the nutritional status of toddlers affects the occurrence of stunting and is a risk factor for stunting in toddlers. The results of this study are in line with research conducted by Mugiyati, et al (2018) that energy consumption intake is associated with stunting. Inadequate nutritional intake will affect physical growth in children (Mugianti, Mulyadi, Khoirul, & Najah, 2018).

The problem of malnutrition begins with a slowdown or retardation of fetal growth known as IUGR (Intra Uterine Growth Retardation). In developing countries, malnutrition in pre-pregnancy and pregnant women has an impact on the birth of IUGR and Low Birth Weight (LBW) children. Almost half of the IUGR conditions are related to the nutritional status of the mother, namely the weight (BB) of the pre-pregnant mother that is not in accordance with the mother's height or short stature, and the weight gain during pregnancy (PBBH) is less than it should be. Mothers who are short when they are 2 years old tend to be short when they reach adulthood. When pregnant, short mothers will tend to give birth to LBW babies. Short pregnant women limit uterine blood flow and growth of the uterus, placenta and fetus so that they will be born with low body weight (Kramer, 1987). If there is no improvement, the occurrence of IUGR and LBW will continue in the next generation, resulting in the problem of intergenerational short children (Unicef, 2013; Republic of Indonesia, 2012; Sari et al, 2010).

Nutritional status in children as one of the benchmarks in assessing the adequacy of daily nutritional intake and the use of nutrients for body needs. If the child's nutritional intake is fulfilled and can be used optimally, the growth and development of the child will be optimal, and vice versa if the nutritional status of the child is problematic it will affect the growth and development of the child to adulthood.

The results of the bivariate analysis showed that health problems in children were known to have p value = 0.004 < 0.05. It could be seen that health problems in children were related to the incidence of stunting in children under five, although in the multivariate analysis, health problems in children were not a risk factor for stunting.

In line with research by Aridiyah, et al (2015) that infectious diseases are associated with stunting in children under five in rural and urban areas (Aridiyah et al., 2015). Children's health problems that often occur are infectious problems such as diarrhea, upper respiratory tract infections, worms and other diseases related to chronic health problems. Toddler health problems can interfere with growth and development due to decreased food intake, decreased absorption of nutrients by the

body which causes the body to lose nutrients needed for growth and development. Continuing health problems cause the body's immunity to decrease, so that disease or infection has occurred. Such conditions, if they occur continuously, can cause chronic nutritional disorders and will cause growth disorders such as stunting.

Furthermore, the results of the study showed that certain dietary habits were known that the p value = 0.631, it could be concluded that certain dietary restrictions were not related to the incidence of stunting under five. This taboo on certain foods consumed by toddlers should be done because not all foods are good and healthy for toddlers. Some foods consumed by toddlers can cause allergies, vomiting, or choking. Foods that are not recommended for consumption such as fizzy foods which if consumed in the long term can cause health problems, foods that contain preservatives and high sugar levels can also increase various health risks in toddlers, this is reinforced by research conducted by Laili , et al (2008) that food intake and food security in the family affect the incidence of stunting in children under five years (Ayik Nikmatul Lailli, Al Munawar, 2018). The results of the bivariate analysis of the habit of eating instant food are known to have p value = 0.001 which means that the habit of eating instant food is related to stunting in toddlers, in addition to the results of multivariate analysis it is known that the p value = 0.033 with OR = 0.052 thus the habit of eating food Instant food in toddlers has a 0.052 greater risk of stunting compared to toddlers who do not have the habit of eating instant food. Instant food is food that is easy in terms of processing, however, instant food contains high calories, and contains high levels of sugar, fat and salt. Instant food when consumed for a long time will increase body weight which leads to obesity, instant food increases the risk of type 2 diabetes due to the high calorie and fat content which will increase blood sugar in the body. Toddlers who often consume instant food can increase tooth decay, as well as respiratory problems due to obesity, and the risk of cancer. Although instant food actually increases obesity, it does not mean that the intake of micro and macro nutrients for growth and development in children, so that growth is not in accordance with age. This is reinforced by research conducted by Payab, et al (2015) that consumption of junk food increases and is generally at risk for obesity (Payab et al., 2015).

The results of the bivariate analysis showed p value = 0.003 it can be seen that maternal height is associated with stunting, in addition to multivariate analysis it is known that the OR value = 0.037 can be concluded that maternal height is at risk of 0.037 times greater in the incidence of stunting. The results of this study are in line with research conducted by Amin and Julia (2014) that the height of parents is related to the incidence of stunting in children, especially in mothers who have normal height. (Nur Afia Amin, 2014).

The results of the bivariate analysis on the history of consuming iron tablets showed that the p value = 0.166. Thus, the history of consuming iron tablets during pregnancy was not associated with the incidence of stunting in children under five. However, improving nutrition in pregnant women by giving iron tablets of at least 90 tablets during pregnancy is very important, in addition to maintaining maternal health, it is also used for the adequacy of iron during pregnancy which is used for fetal growth and development. The provision of iron tablets is also one of the government programs in an effort to reduce stunting rates programmed by the Ministry of Villages, development of underdeveloped areas and transmigration (Kemendesa, 2017).

Antenatal care history in this study was not related to the incidence of stunting, it is known from the results of bivariate analysis where p value = 0.554. The results of this study are not in line with research conducted by Najanah, et al (2013) that non-standard antenatal visits are associated and the risk of having stunting toddlers is 2.4 times greater than mothers who perform standard ANC (Najahah, Adhi, Ngurah, & Pinatih, 2013).

Health services during pregnancy aim to fulfill the right of every pregnant woman to obtain quality health services so that they are able to undergo a healthy pregnancy, give birth, safely and give birth to a healthy and quality baby. Antenatal care is carried out during conception until the start of the labor process, and is carried out at least 4 times during pregnancy (Ministry of Health, 2014).

The results of data analysis in this study found p value 0.217 < 0.005, it can be concluded that the disease that accompanies pregnancy is not associated with the incidence of stunting in children under five, although early detection of diseases that accompany pregnancy is needed through an antenatal care program aimed at maintaining the survival of the mother. and fetus, as well as efforts to reduce morbidity and mortality for both mother and fetus.

The results of this study explained that exclusive breastfeeding with stunting incidence with p Value = 0.000 < 0.05 means that exclusive breastfeeding is associated with stunting in toddlers, even though it turns out that exclusive breastfeeding is not a risk factor for stunting based on multivariate data analysis p value = 0.069. The results of the study are in line with Ni'mah and Nadhiroh in 2015 where toddlers who did not receive exclusive breastfeeding (6 months) were higher in the stunting toddler group compared to the normal toddler group, and it was known that there was a relationship between exclusive breastfeeding and the incidence of stunting (Ni'mah & Nadhiroh, 2015). In line with research by Rahmad and Miko (2016) that not giving exclusive breastfeeding causes stunting in toddlers, as well as not giving exclusive breastfeeding is the dominant factor as a risk factor for children experiencing

stunting (Rahmad & Miko, 2016). The frequency of giving MP-ASI that is less and giving MP-ASI/formula too early can increase the risk of stunting (Padmadas et al, 2002; Hariyadi & Ekayanti, 2011). The arrangement and quality of food given to infants is highly dependent on the mother's education and knowledge and the availability of food at the household level.

The results of the study found that families who use their yards to grow various vegetables and fruits with bivariate analysis are known to have p value = 0.605, this means that the use of yards is not related to stunting in toddlers. The use of the yard is expected to be able to increase food security in the family and also as a source of diverse food to fulfill nutrition, especially vegetables and fruits which contain minerals and vitamins needed during the growth and development of children.

Sources of clean water in the family in this study with a p value = 1,000, which means that there is no significant relationship between ownership of clean water sources and the incidence of stunting in children under five. The results of this study are not in line with the research of Desyanti and Nindya (2017) where poor hygiene practices are a risk factor for stunting by 4.808 times greater (Al-Rahmad et al, 2013). Sources of clean water owned by the family are related to sanitation of clean and healthy water sources, where consumption of clean and healthy water sources will reduce the risk of the incidence of diseases caused by diarrhea or worms, however in this study it was proven that there was no relationship with the incidence of stunting because there were various There are many influencing factors such as the nutritional status of the child and the height of the mother.

The results of research on smoking environments were not associated with stunting in children, this was in contrast to the finding that children living in households with chronic and transient smoking parents tended to have slower growth in weight and height than those living in households without smoker. Children who live in smoking environments can cause interference with nutrient absorption due to cigarette smoke, and parents who smoke reduce the amount of shopping costs that should be used to purchase nutritious food, health and education costs for children.

Bivariate analysis in this study is known that the economic condition of the family has a p value = 0.06 < 0.05, in the multivariate analysis it is known that the economic condition with a p value = 0.458 OR = 0.343, this means that economic conditions are not related and not as a factor risk of stunting in toddlers. Lack of family income or economic conditions will usually have an impact on access to food ingredients associated with low purchasing power, in addition, if purchasing power is low, food insecurity may occur at the household level. (Ministry of Health RI, 2018). Different results were obtained from the research of Rahmad and Miko (2016)

which concluded that low family income was associated with stunting in toddlers (Rahmad & Miko, 2016).

A mother who is malnourished is more likely to give birth to a stunted child, perpetuating a vicious cycle of malnutrition and poverty (Unicef, 2013). Fulfillment of adequate nutrition, both macronutrients and micronutrients is needed to avoid or minimize the risk of stunting. Good quality and quantity of MP-ASI is an important component in food because it contains sources of macro and micro nutrients that play a role in linear growth (Taufiqurrahman et al, 2009). The provision of foods that are high in protein, calcium, vitamin A, and zinc can stimulate children's height (Koesharisupeni, 2002). Providing adequate nutritional intake affects normal growth patterns so that they can be caught up (Rahayu, 2011).

Mother's awareness of good nutrition given to children plays an important role in maintaining the quality of the food provided. Research shows that households with poor nutrition awareness have an opportunity to increase the risk of stunting under five children 1.22 times compared to households with good nutrition awareness behavior (Riyadi et al, 2011). Other studies show that the role of mothers as "gate keeper" in maintaining household consumption and nutritional status is very prominent. This role can be seen from the influence of maternal nutrition knowledge, access to nutrition and health information, nutrition and maternal health practices and the allocation of food and non-food expenditures (income) (Picauly & Magdalena, 2013).

Another study conducted in Kenya showed that the risk of stunting was significantly increased in adopted children (Bloss, 2004). Research in Ethiopia identified factors associated with high rates of stunting in breastfed infants. The results show that babies of mothers who have low concentrations of zinc in breast milk are more likely to be stunted (Assefa et al, 2013). For this reason, it is necessary to increase the supply of nutrients by providing additional food/supplements and continue to provide breast milk to the baby. Toddlers who are no longer breastfeeding have a 2 times greater risk of experiencing stunting compared to toddlers who are still breastfeeding (Taufiqurrahman et al, 2009). The provision of foods that are high in protein, calcium, vitamin A, and zinc can stimulate children's height (Koesharisupeni, 2002). Providing adequate nutritional intake affects normal growth patterns so that they can be caught up (Rahayu, 2011).

Mother's awareness of good nutrition given to children plays an important role in maintaining the quality of the food provided. Research shows that households with poor nutrition awareness have an opportunity to increase the risk of stunting under five children 1.22 times compared to households with good nutrition awareness behavior (Riyadi et al, 2011). Other studies show that the role of mothers as "gate keeper" in

maintaining household consumption and nutritional status is very prominent. This role can be seen from the influence of maternal nutrition knowledge, access to nutrition and health information, nutrition and maternal health practices and the allocation of food and non-food expenditures (income) (Picauly & Magdalena, 2013).

Another study conducted in Kenya showed that the risk of stunting was significantly increased in adopted children (Bloss, 2004). Research in Ethiopia identified factors associated with high rates of stunting in breastfed infants. The results show that babies of mothers who have low concentrations of zinc in breast milk are more likely to be stunted (Assefa et al, 2013). For this reason, it is necessary to increase the supply of nutrients by providing additional food/supplements and continue to provide breast milk to the baby. Toddlers who are no longer breastfeeding have a 2 times greater risk of experiencing stunting compared to toddlers who are still breastfeeding (Taufiqurrahman et al, 2009).

Another determinant factor related to the incidence of stunting is socioeconomic factors. Socio-economic status, age, gender and maternal education are important factors of adolescent nutritional status (underweight and stunting) (Assefa, 2013). Research conducted in middle- and low-income countries shows that children living in slum areas, as children age, exacerbate the risk for stunting (Kyu & Shannon, 2013). Child health is also a determining factor in the incidence of stunting. Repeated or prolonged episodes of diarrhea during childhood increase the risk of stunting (Ricci et al, 2013).

The policy foundation for the long-term food and nutrition program is formulated in Law No.17 of 2007 concerning the National Long-Term Development Plan (RPJPN) for 2005-2025. A multi-sectoral approach in food and nutrition development includes production, processing, distribution, to food consumption, with sufficient, balanced, and guaranteed nutritional content. Long-term development is carried out in stages over a period of five years, formulated in the National Medium-Term Development Plan (RPJMN) document stipulated in a Presidential Regulation.

In the second phase of the RPJMN for the 2010-2014 period, there are two outcome indicators related to nutrition, namely the prevalence of malnutrition (malnutrition and malnutrition) of 2-year-old children (Republic of Indonesia, 2012). The focus of the nutrition improvement movement is on the group of the first 1000 days of life, at the global level it is called Scaling Up Nutrition (SUN) and in Indonesia it is called the National Movement for Nutrition Awareness in the Context of Accelerating Nutrition Improvement in the First 1000 Days of Life (The First 1000 Days of Life Movement and abbreviated as 1000 HPK Movement). The SUN movement is a global effort from various countries in order to strengthen commitments and action plans to accelerate nutrition improvement, especially handling

nutrition from 1,000 days from pregnancy to children aged 2 years.

This movement is the response of countries in the world to the condition of nutritional status in most developing countries and the result of uneven progress in achieving the Millennium Development Goals/MDGs (Goal 1) (Republic of Indonesia, 2012). The SUN movement is a new effort to eliminate malnutrition in all its forms. The principle of this movement is that everyone has the right to good food and nutrition. This is something unique because it involves different groups of people from government, private sector, NGOs, scientists, civil society, and the United Nations together to take collective action to improve nutrition. Interventions carried out on SUN are specific interventions and sensitive interventions (Scaling Up Nutrition, 2013).

4. CONCLUSION

It can be concluded that nutritional status, health problems in children, eating habits of instant food, and maternal height are associated with stunting in toddlers. Abstinence from food, history of consumption of iron tablets, history of antenatal care, history of comorbidities in pregnancy, history of exclusive breastfeeding, clean water sanitation, smoking environment and economic conditions were not associated with stunting in children under five. Nutritional status, maternal height, and the habit of eating instant food together are risk factors for stunting in toddlers.

The problem of stunting is a nutritional problem faced by the world, especially poor and developing countries. Stunting is a growth failure due to the accumulation of nutritional inadequacy that lasts for a long time starting from pregnancy until the age of 24 months. Many factors cause the high incidence of stunting in toddlers. People are not aware of stunting as a problem compared to other malnutrition problems.

Globally, the policies implemented to reduce the incidence of stunting are focused on the first 1000 days' group or what is called Scaling Up Nutrition. WHO recommends a stunting reduction of 3.9% per year in order to meet the 40% stunting reduction target by 2025. Interventions are carried out throughout the life cycle both in the health and non-health sectors involving various levels of society such as the government, private sector, civil society, the United Nations through collective action to increase nutrition improvement, both short term (specific intervention) and long term (sensitive).

REFERENCES

[1] Agung Sutriyawan CCN. Kejadian Stunting pada Balita di UPT Puskesmas Citarip Kota Bandung. JKMK J Kesehat Masy KHATULISTIWA. 2020;7(2):79–88.

[2] Agung Sutriyawan, Ratna Dian Kurnaiwati, Ricky Hanjani SR. Prevalensi Stunting dan Hubungannya dengan Sosial Ekonomi. J Kesehat. 2020;11(3):351–5.

[3] Annugerah A, Astuti IF, Kridalaksana AH. Sistem Informasi Geografis Berbasis Web Pemetaan Lokasi Toko Oleh-Oleh Khas Samarinda. Inform Mulawarman J Ilm Ilmu Komput. 2016;11(2):43.

[4] Assefa H, Belachew T, Negash L, 2013. Socioeconomic Factors Associated with Underweight and Stunting among Adolescents of Jimma Zone, South West Ethiopia: A Cross-Sectional Study. Hindawi Publishing Corporation ISRN Public Health Volume Article ID 238546, 7 pages http://dx.doi.org/10.1155/2013/238546

[5] Bhutta ZA, Ahmed T, Black RE, Cousens S, Dewey K, Giugliani E, Haider BA, Kirkwood B, Morris SS, Sachdev HPS, Shekar M, 2008.What works? Interventions for maternal and child undernutrition and survival. Journal Lancet, January 17, 2008 DOI:10.1016/S0140-6736(07)61693-6 www.thelancet.com

[6] Black RE, Allen LH, Bhutta ZA, 2008 Maternal and Child Undernutrition Study Group. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet Journal 2008. published online Jan 17. DOI: 10.1016/S0140-6736(07)61690-0.

[7] Bloem MW, Pee SD, Hop LT, Khan NC, Laillou A, Minarto, Pfanner RM, Soekarjo D, Soekirman, Solon JA, Theary C, Wasantwisut E, 2013. Key strategies to further reduce stunting in Southeast Asia: Lessons from the ASEAN countries workshop. Food and Nutrition Bulletin: 34:2

[8] Bloss E, Wainaina F, Bailey RC, 2004. Prevalence and Predictors of Underweight, Stunting, and Wasting among Children Aged 5 and Under in Western Kenya. Journal of Tropical Pediatrics, 50:5

[9] Cobham A, Garde M, Crosby L, 2013.Global Stunting Reduction Target: Focus On the Poorest or Leave Millions Behind, Akses www.savethechildren.org.ukTanggal 26 Desember 2013.

[10] Crookston B, Penny M, Alder SC, Dickerson T, Merrill RM, Stanford J, Porucznik CA, Dearden KA, 2010.Children Who Recover from Early

Stunting and Children Who Are Not Stunted Demonstrate Similar Levels of Cognition. American Society for Nutrition. 2010; doi:10.3945/jn.109.118927.

[11] Dinas Kesehatan Kabupaten Deli Serdang. Jumlah Balita Stunting 2016-2019. Makassar: Dinas Kesehatan Kabupaten Deli Serdang; 2020.

[12] Elisanti AD. Pemetaan Status Gizi Balita di Indonesia. Indones J Heal Sci. 2017;1(1):37–42.

[13] Fuada N, Muljati S, Hidayat TS. Determinating High Risk Malnutrition Area Based On Anallyzation, Spatial. Media Litbang Kesehat. 2012;22 Maret(1):18–29.

[14] Handayani, O. W., & Prameswari, G. N. 2012. Daerah Positive Deviance sebagai Rekomendasi Model Perbaikan Gizi. Jurnal Kemas, 7 (2): 102-109.

[15] Hariyadi D, Ekayanti I, 2011.Analisis pengaruh perilaku keluarga sadar gizi terhadap stunting di Propinsi Kalimantan Barat, Teknologi dan Kejuruan, 34: 1,71-80.

[16] Hoffman DJ, Sawaya AL, Verreschi I, Tucker KL, Roberts SB, 2000. Why are nutritionally stunted children at increased risk of obesity? Studies of metabolic rate and fat oxidation in shantytown children from São Paulo, Brazil. Am J Clin Nutrition 72:702–7.

[17] Intje Picaly, Sari, 2013. Analisis Determinan dan Pengaruh Stunting terhadap Prestasi Belajar. Journal Gizi dan Pangan: 8 (1).

[18] Jogiyanto, H. 2005. Analisis dan Desain-Sistem Informasi : pendekatan terstruktur teori dan praktek aplikasi bisnis. Yogyakarta: ANDI.

[19] Kementrian Kesehatan RI. Perkembangan Masalah Gizi Dan Penguatan Pelayanan Gizi Dalam Pencegahan Stunting Di Indonesia. Jakarta: Direktur Bina Gizi, Ditjen Bina Gizi Dan Kia Kementerian Kesehatan RI; 2013.

[20] Kementrian Kesehatan RI.TBC, Stunting, Imunisasi Jadi Prioritas Pengawasan Itjen [Internet]. Kementrian Kesehatan Republik Indonesia. 2018. Available from: https://www.kemkes.go.id/article/view/180315000 03/tbc-stunting-imunisasi-jadi-prioritas-pengawasan- itjen.html.

[21] Kennedy, E., & Cooney, E. 2001. Development of the Child Nutrition Programs in th United States. The Journal of Nutrition, 431S-436S.

[22] Kramer MS, 1987. Determinans of low birth weight: methodological assessment and metaanalysis.

Bulletin World Health Organization, 65 (5): 663-737.

[23] Kusharisupeni, 2002. Peran status kelahiran terhadap stunting pada bayi : sebuah studi prospektif, Jurnal Kedokteran Trisakti, 2002,23: 73-80.

[24] Kusharisupeni, 2002.Growth Faltering pada Bayi di Kabupaten Indramayu Jawa Barat. Makara Kesehatan, 2002, 6:1-5.

[25] Kyu HH, Shannon HS, Georgiades K, Boyle MH, 2013.Association of Urban Slum Residency with Infant Mortality and Child Stunting in Low and Middle Income Countries. Hindawi Publishing Corporation BioMed Research International Volume, Article ID 604974, 12 pages http://dx.doi.org/10.1155/2013/604974.

[26] MuchaN, 2012.Implementing Nutrition-Sensitive Development: Reaching Consensus.briefing paper,Akses:www.bread.org/institute/papers/n utrition-sensitive-interventions.pdf tanggal 26 Desember 2013.

[27] Mutalazimah, Handaga, B., & Anggoro, A. 2009. Aplikasi Sistem Informasi Geografis pada Pemantauan Status Gizi Balita di Dinas Kesehatan Kabupaten Sukoharjo. Forum Geografi, 23: 153 - 166.

[28] Ngianga-Bakwin Kandala, T. P. 2011. Malnutrition among Children under the age five in the Democratic Republic of Congo (DRC): does geographic location matter? BMC Public Heallth (11): 261-264.

[29]Onis M, Monika B, Borghi E, 2011.Prevalence and trends of stunting among pre-school children,1990–2020, Public Health Nutrition: page 1-7 doi:10.1017/S1368980011001315.

[30] Prentice AM, Ward KA, Goldberg GR, Jarjou LM, Moore SE, Fulford AJ, Prentice A, 2013.Critical windows for nutritional interventions against stunting, Am J Clin Nutr. 97:911–8.

[31]Rahayu LS, 2011.Associated of Health of Parents with changes of Stunting from 6-12 months to 3-4 years (Tesis): Yogyakarta, Universitas Gajah Mada.

[32] Rahim, F. K. 2014. Faktor Risiko Underweight Balita Umur 7 - 59 Bulan. Kesehatan Masyarakat 9 (2): 115-121.

[33] Remans R, Pronyk PM, Fanzo JC, Chen JH, Palm CA, Nemser B, Muniz M,Radunsky A, Abay AH, Coulibaly M, Homiah JM, Wagah M, An X,Mwaura C, Quintana E, Somers MA, Sanchez PA, Sachs SE, McArthur JW, Sachs JD, 2011.Multisector

intervention to accelerate reductions in child stunting: anobservational study from 9 sub-Saharan African countries. American Society for Nutrition doi: 10.3945/ajcn.111.020099.

[34] Reynolds, R. S. 2008. Principles of Information System. Canada: Thomson Course Technology.

[35] Sabrina Marx, R. P.-J. 2014. Geographic information analysis and web-based geoportas to explore malnutrition in sub-Saharan Africa: a systematic review of approaches. BMC Public Health, (14): 1189.

[36] Santoso EB, Akbar H. Faktor yang Berhubungan Dengan Kejadian ISPA Pada Balita Di Wilayah Kerja Puskesmas Juntinyuat. Hibualamo Seri Ilmu-Ilmu Alam dan Kesehat [Internet]. 2018;2(2): 36–40. Available from: http://journal.unhena.ac.id

[37] Sartika, R. A. 2012. Analisis Pemanfaatan Program Pelayanan Kesehatan Status Gizi Balita. Jurnal Kesmas Universitas Indonesia.

[38] Shaw, N. T. 2012. Geographical Information Systems and Health: Current State and Future Direction. Healthc Inform Research, 18 (2): 88-96.

[39] Yudaruddin R. Forecasting: Untuk Kegiatan Ekonomi dan Bisnis (Cetakan Pertama). Samarinda: RV. Pustaka Horizon; 2019. [9] A. Pnueli, In transition from global to modular temporal reasoning about programs, in: K.R. Apt (Ed.), Logics and Models of Concurrent Systems, Springer, Berlin, Heidelberg, 1984, pp. 123–144. DOI: https://doi.org/10.1007/978-3-642-82453-1_5

[40] B. Meyer, Applying "Design by Contract", Computer 25(10) (1992) 40–51. DOI: https://doi.org/10.1109/2.161279

[41] S. Bensalem, M. Bogza, A. Legay, T.H. Nguyen, J. Sifakis, R. Yan, Incremental component-based construction and verification using invariants, in: Proceedings of the Conference on Formal Methods in Computer Aided Design (FMCAD), IEEE Press, Piscataway, NJ, 2010, pp. 257–256.

[42] H. Barringer, C.S. Pasareanu, D. Giannakopolou, Proof rules for automated compositional verification through learning, in Proc. of the 2nd International Workshop on Specification and Verification of Component Based Systems, 2003.

[43] M.G. Bobaru, C.S. Pasareanu, D. Giannakopoulou, Automated assume-guarantee reasoning by abstraction refinement, in: A. Gupta, S. Malik (Eds.), Proceedings of the Computer Aided Verification, Springer, Berlin, Heidelberg, 2008, pp. 135–148. DOI: https://doi.org/10.1007/978-3-540-70545-1_14