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Research

Agam Regency Toddlers Stunting Incidents From 2018 to 2022

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A B S T R A C T

Background: Stunting is a dietary problem that can have negative effects on IQ, raise the likelihood of non-communicable diseases, and impede future output. According to the findings of the 2022 SSGI, the occurrence of stunting in Agam Regency is 24.6%, surpassing the national occurrence of just 21.6%.
Objective: The purpose of this study is to ascertain the prevalence of stunting in toddlers and provide a geographical representation of Agam Regency from 2018 to 2022.
Method: This study employed an ecological approach, utilizing secondary data obtained from the health profiles and nutritional reports of the Agam Regency Health Department spanning the years 2018 to 2022. The study sample comprised of young children who have undergone stunting in Agam Regency during the years 2018 and 2022. The sample selection employed the total sampling technique.The analysis encompassed both univariate and spatial analysis techniques.
Result: The univariate analysis shows that the occurrence of stunting increased in 2020 and then decreased from 2021 to 2022. The highest frequency in 2018 was documented at a rate of 28 per 100 youngsters. The Agam District Health Service should improve cooperation with many initiatives and interconnected sectors relating to environmental health.

INTRODUCTION

Nutritional issues persist worldwide, including Indonesia. Nutritional issues in Indonesia continue to affect HR quality. Stunting is a major nutritional issue in Indonesia. (1) The World Health Organization (WHO) defines stunting as a child's height being fewer than two standard deviations from the median. WHO sets the criteria at 20%, or 20% of under-5s. In the first 1000 days of pregnancy (HPK), dietary deficits can cause stunting. (1) Stunting demands greater attention than other dietary issues because to its multiple causes. External community elements and internal child environment aspects are the key determinants. Culture, education, health services, economic and political situations, agriculture and food systems, water, sanitation, and environmental conditions are external variables. Internal elements in the child's household include sufficient child care, exclusive breast milk (ASI), and supplementary foods optimal breast milk (MPASI), mother's health, household environment, low food quality, food and water safety, infections, vaccines. (3.9)

Zainirayati (2019) found that 60% of stunting cases came from families that use pit latrines or poor sanitation to dispose young feces. (14) Other environmental considerations A clean water source can stunt. Nisa, Septi et al. (2021) found a strong correlation between sanitation and clean water supply and stunting (p = 0.047, OR = 2.705). (15) Wanda Yosinta et al (2021) found a significant correlation between basic immunization status and stunting risk in toddlers, with a p value <0.05. with

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insufficient immunization is 4.9 times higher than toddlers with full immunization. Incomplete basic immunization makes youngsters prone to infectious illnesses. Untreated infectious illnesses stunt children. This is consistent with Sutriyawan et al. (2020), who found a relationship between infectious diseases and stunting, as well as LBW history and stunting events, with a P-value = 0.000 and OR = 3.4, respectively.

Children under five with stunting are less intelligent and more likely to acquire obesity, illness, and non-communicable diseases like high blood pressure. Stroke, diabetes, and heart disease reduce productivity.Stunting slows economic growth, increases poverty, inequality, and government costs.(1) Apriluana et al (2018) found that stunting can lead to long-term disruptions in physical, mental, intellectual, and cognitive development. Children with stunting until age 5 will be hard to correct and may develop low birth weight. Stunted toddlers over two will struggle to grow. (7) World stunting prevalence was 22% in 2018, according to WHO. After Africa (33.1%), Southeast Asia had the highest stunting rate (31.9%) in 2019. The WHO ranks Indonesia sixth in Southeast Asia for stunting at 36.4%, behind Bhutan, Timor-Leste, Maldives, Bangladesh, and India. Indonesia ranks high. In 2018, Basic Health Research (Riskesdas) reported 30.8% stunting in Indonesian children under five.(8)

This shows that stunting rates are still above WHO's 20% limit. Thus, about 8 million under-5s grow poorly. LBW 10.2% and malnutrition 19.6% are less common in Indonesia than stunting. According to the 2021 Indonesian Nutritional Status Study (SSGI), stunting dropped from 27.7% in 2019 to 24.4%. (11) West Sumatra, rated fourth in Sumatra and classified as chronic-acute, records a significant proportion of stunting patients. The West Sumatra Provincial Health Service reported 23.3% stunting in 2021, down from 27.47% in 2020. West Sumatra's stunting rate is over the WHO maximum despite a declining trend. Agam District in West Sumatra has similarly shown a drop in toddler stunting. Stunting is diminishing, according to Riskesdas and SSGI. Stunting prevalence dropped from 30% in 2018 (8) to 26.64% in 2019. The decline continues in 2021 to 19.1%. However, prevalence will rise to 24.6% in 2022, greater than the national prevalence of 21.6% and far beyond the ministry of health's 2024 stunting reduction objective of 14%.(2)

No regional spatial analysis of stunting and its causes has been done in Agam Regency. Technological advances make geographical data processing easy. Geographic Information Systems is one. GIS can evaluate data from several sources, track trends, and assess their spatial influence on places and events. The ability to understand patterns, events, and processes makes GIS a powerful and efficient problem-solving tool. Maantay (2002) found that GIS maps can demonstrate the link between variables in a visually appealing manner (19). (20) In 2021, Putu Aris et al. found that GIS can show stunting patterns and the association between incidences and risk factors. (22) Another GIS-based study by Putu Aris Budiyasa Putra et al. (2019) indicated that stunting instances are predominantly found in rural areas in temperate and hilly regions. (21)

In 2018–2022, this research will use a spatial approach to analyze the determinants of toddler stunting in Agam Regency. The results are expected to help policymakers understand the regional distribution of stunting incidents and the risk factors that cause it. This can be utilized to create sensitive and unique nutritional intervention programs and policies to control nutritional disorders, as program handling varies by region. In Agam Regency, the topographic conditions and demographic diversity of Minang, Javanese, Batak, Nias, and other tribes, as well as religious communities' food provision and choice cultures, can affect the analysis results. Agam Regency features mountainous landscapes, lakes, and beaches, which are rare in West Sumatra, in addition to population variety. Stunting interventions will also be severely affected. In addition, stunting frequency in Agam district has fluctuated over the past five years, from 16th out of 19 districts/cities in West Sumatra in 2021 to 8th. No. 2 has the biggest 2022 prevalence rise. The Agam Regency administration must work hard to reduce stunting by 14% in 2024. Given this context, researchers want to study stunting in toddlers in Agam Regency using a geographical approach. This study will establish the distribution, and spatial description of toddler stunting episodes in Agam Regency in 2018–2022.

METHOD

1. **Research Design**

   Quantitative ecological study research based on time and place is analytical observational. Ecological studies use vast populations as units of observation. This study analyzes all 16 Agam Regency sub-districts.

2. **Time and Place**

   The research will be conducted in every sub-district of Agam Regency. The study was carried out between November 2022 and July 2023.

3. **Population and Sample**

   The study focused on a population and sample including exclusively of children under the age of five who experienced stunting, as indicated by the Health and Nutrition Section report and the Health Profile Report of the Agam District Health Service for the period of 2018-2022. The research employed a technique known as total sampling for the purpose of sampling.

4. **Data Collection Technique**

   This research uses aggregate data. This study seeks to gather data on stunting incidence and its determinants. This study collected data through document observation. Note secondary data from the family health and nutrition section report and the Agam District Health Service health profile report for 2018–2022, BPS Agam District.

5. **Data Analyze**

   Study data processing makes it easier to offer information from study outcomes. This research presents document observation data as tabulations, maps, and narratives. Stages before data presentation include:

   a. **Checking Data**.

      Before processing the data, check that it matches the researcher's variables, is complete, and is not empty. Re-interpret the data.

   b. **Data Entry**

      Researchers enter data into SPSS and Quantum GIS software

   c. **Cleaning**

      Checking the data again ensures no errors were entered.

   d. **Tabulation**

      The software scores, analyzes, and groups data by variables, Making maps. This study presents a stunting incidence and determinants map for Agam Regency in 2018–2022. Making this map requires multiple steps: Create an Agam Regency base map. Data grouping, to map stunting episodes, classify. Adding determinants to stunting or digitalization event maps, Grade map colors using preset indications. Symbolize stunting causes above the basic map. Create a caption or description for the map.

RESULT DAN DISCUSSION

1. **Distribution of Stunting Incidents in Toddlers**

   According to data from the Central Statistics Agency, there is a consistent decrease in the population of children under the age of five in Agam district over the years. The subsequent figures represent the count of young children between 2018 and 2022, categorized by sub-districts within Agam Regency:

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Table 1 Frequency Distribution of Stunting Incidents in Agam Regency 2018-2022

No.	Subdistrict	Stunting Incident										Average Prev
		2018		2019		2020		2021		2022		
		f	prev	f	prev	f	prev	f	prev	f	prev	
1	Tanjung Mutiara	526	29.48	116	6.34	252	13.08	365	14.67	73	3.24	13.36
2	Lubuk Basung	216	15.67	279	7.41	130	6.15	188	8.54	67	1.30	7.81
3	Ampek Nagari	564	33.93	439	20.66	382	24.54	267	15.44	152	8.84	20.68
4	Tanjung Raya	418	20.60	411	19.46	141	36.99	265	10.93	126	5.53	18.70
5	Matur	128	22.07	31	8.20	56	11.72	297	17.43	49	4.63	12.81
6	Palembayan	668	33.22	317	17.92	179	18.47	510	10.39	166	8.18	17.64
7	IV Koto	406	35.09	394	22.27	335	25.69	112	19.86	215	12.91	23.16
8	Malalak	257	44.08	155	25.62	109	20.49	519	19.02	41	6.88	23.22
9	Banuhampu	541	33.85	694	26.50	361	18.13	11	1.04	225	8.76	17.66
10	Sungai Pua	251	31.38	381	22.91	127	22.48	280	15.97	165	10.27	20.60
11	Ampek Angkek	771	27.16	396	14.96	311	10.32	81	2.87	172	5.67	12.20
12	Candung	250	21.83	215	15.97	75	11.57	182	8.09	92	5.87	12.67
13	Tilatang Kamang	452	25.67	260	13.88	171	50.45	284	16.32	135	6.94	22.65
14	Kamang Magek	225	27.64	98	15.81	144	13.69	77	6.54	97	8.27	14.39
15	Baso	488	22.37	177	8.93	200	10.90	131	5.46	126	5.25	10.58
16	Palupuh	109	30.53	245	27.50	140	23.53	136	11.16	108	12.34	21.01
17	**Agam Regency**	**6,270**	**28.41**	**4,608**	**17.15**	**3,113**	**19.89**	**3,705**	**11.48**	**2,009**	**7.18**	**16.82**

Source: Report from the Nutrition Health Section of the Agam District Health Service
Information: prev= Prevalence per 100 children under five

In 2018, the greatest incidence of stunting in Agam Regency was estimated to be 28 cases per 100 children. The district with the highest average prevalence of stunting cases from 2018 to 2022 was Malalak, at a rate of 23.22. The prevalence of stunting has declined from 2021 to 2022. According to the data in Table 4.2, the district with the largest number of stunting cases in Agam Regency between 2018 and 2022 was Tilatang Kamang District. In 2020, the prevalence of stunting in this district was 50 instances per 100 children. In 2021, the Banuhampu District had the lowest frequency of 1 per 100 children. The frequency of stunting has a fluctuating pattern, with the maximum occurrence observed in 2018. Subsequently, there was a drop in 2019, followed by an increase in 2020.

In 2018, the highest prevalence of stunting among toddlers in Agam Regency was observed, with Malalak District having the highest number of cases. Malalak sub-district has the highest average rate of stunting among children under five from 2018 to 2022. The occurrence of stunting in children under the age of five has shown varying patterns over time. In 2020, there was a notable rise in stunting cases, primarily driven by the Tilatang Kamang District. This district had a substantial increase, shifting from the low category in 2019 to the very high category in 2020. Despite a downward trend in 2021 to 2022, the average number of sub-districts in the medium category remains at 6 from 2018 to 2022. These sub-districts are Malalak, IV Koto, Tilatang Kamang, Palupuh, Ampek Nagari, and Sungai Pua. Meanwhile, 10 other sub-districts have already been classified as low. Nevertheless, it is imperative to undertake substantial measures given the variable tendency of stunting incidences between 2018 and 2022, with varying distribution across all sub-districts on an annual basis. In addition, according to the average data from 2018 to 2022, the prevalence of stunting in the Religious District is 16.82%, which exceeds the Ministry of Health's target of reducing stunting by 14% by 2024. Furthermore, there are still 6 sub-districts that have stunting incidence rates above the maximum limit set by the World Health Organization. 20 percent. Out of the 6 sub-districts in Agam Regency, 5 are situated in the eastern part, specifically Malalak, IV.Koto, Tilatang Kamang, Palupuh, and Sungai Pua sub-districts. These 5 sub-districts are located in highland areas. On the other hand, 1 sub-district, Ampek Nagari, is in the western part of Agam Regency and mainly consists of lowland areas. Unfortunately, the average incidence of stunting in Ampek Nagari sub-district exceeds the limit set by the World Health Organization.

2. Spatial Analysis prevalence of stunting in Agam Regency 2018-2022

a. Prevalence of Stunting in Agam Regency in 2018

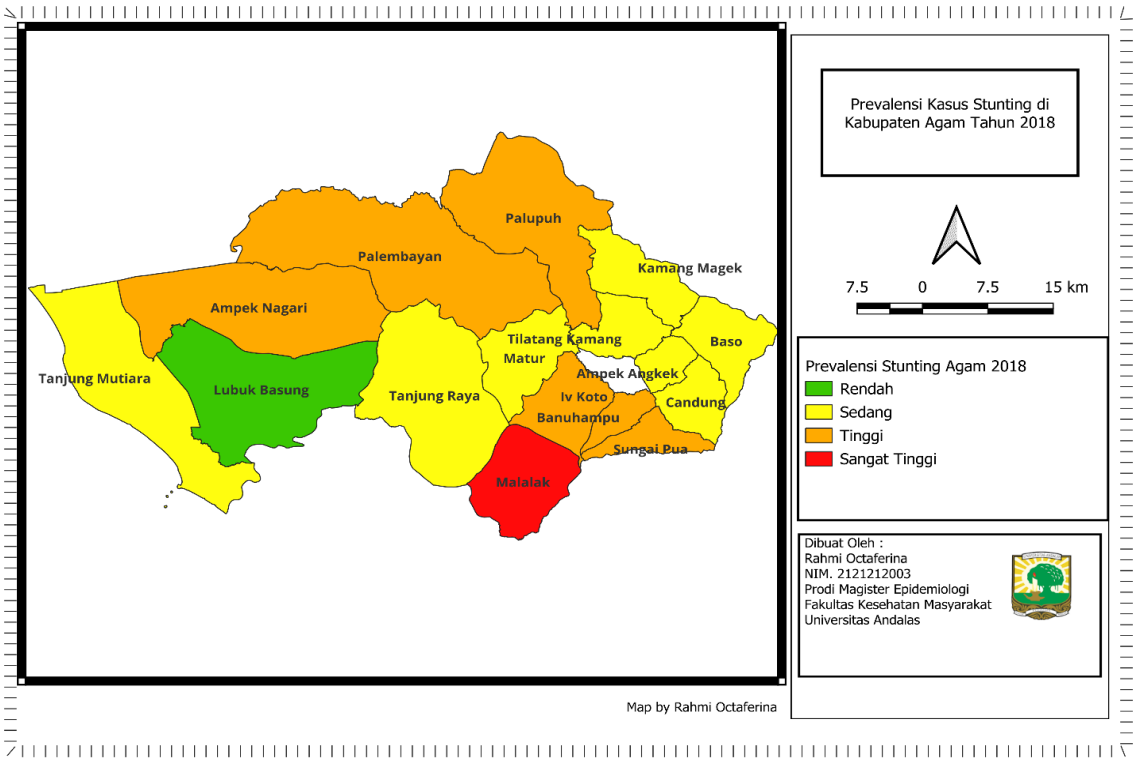

Figure 1: Spatial Description of Stunting Prevalence in Agam Regency 2018

b. Prevalence of Stunting in Agam Regency in 2019

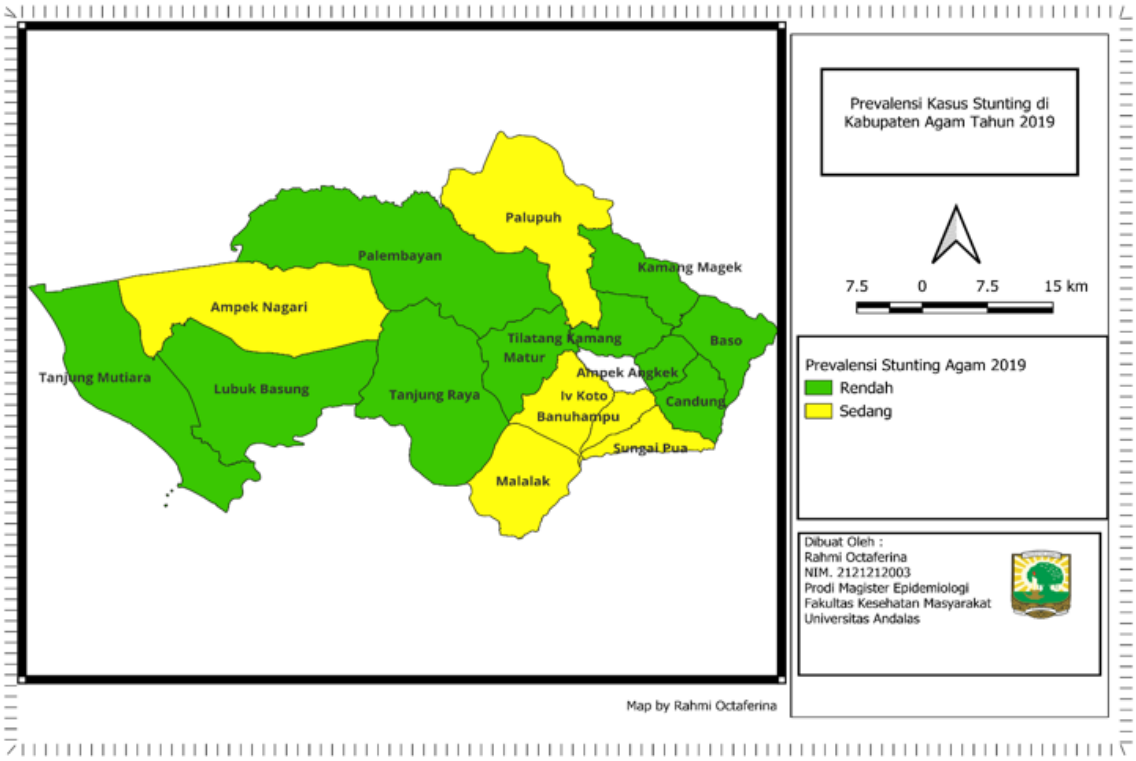

Figure 2: Spatial Description of Stunting Prevalence in Agam Regency 2019

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c. Prevalence of Stunting in Agam Regency in 2020

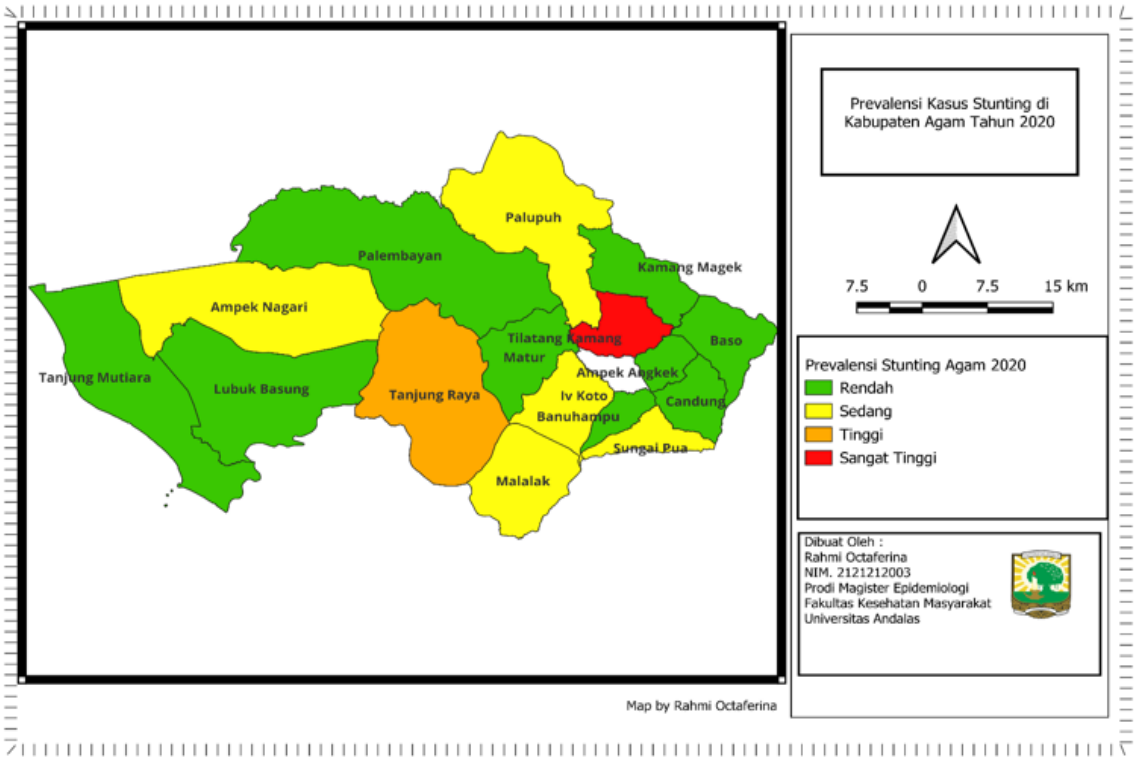

Figure 3: Spatial Description of Stunting Prevalence in Agam Regency 2020

d. Prevalence of Stunting in Agam Regency in 2021

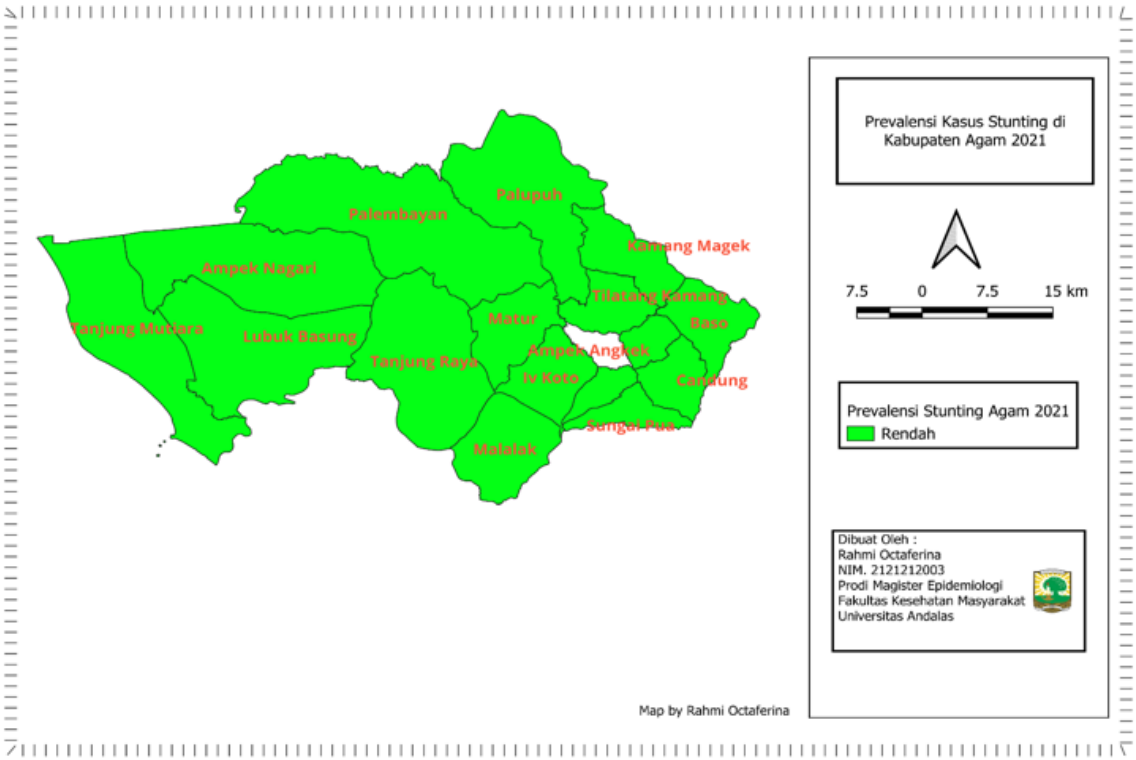

Figure 4: Spatial Description of Stunting Prevalence in Agam Regency 2020

e. Prevalence of Stunting in Agam Regency in 2022

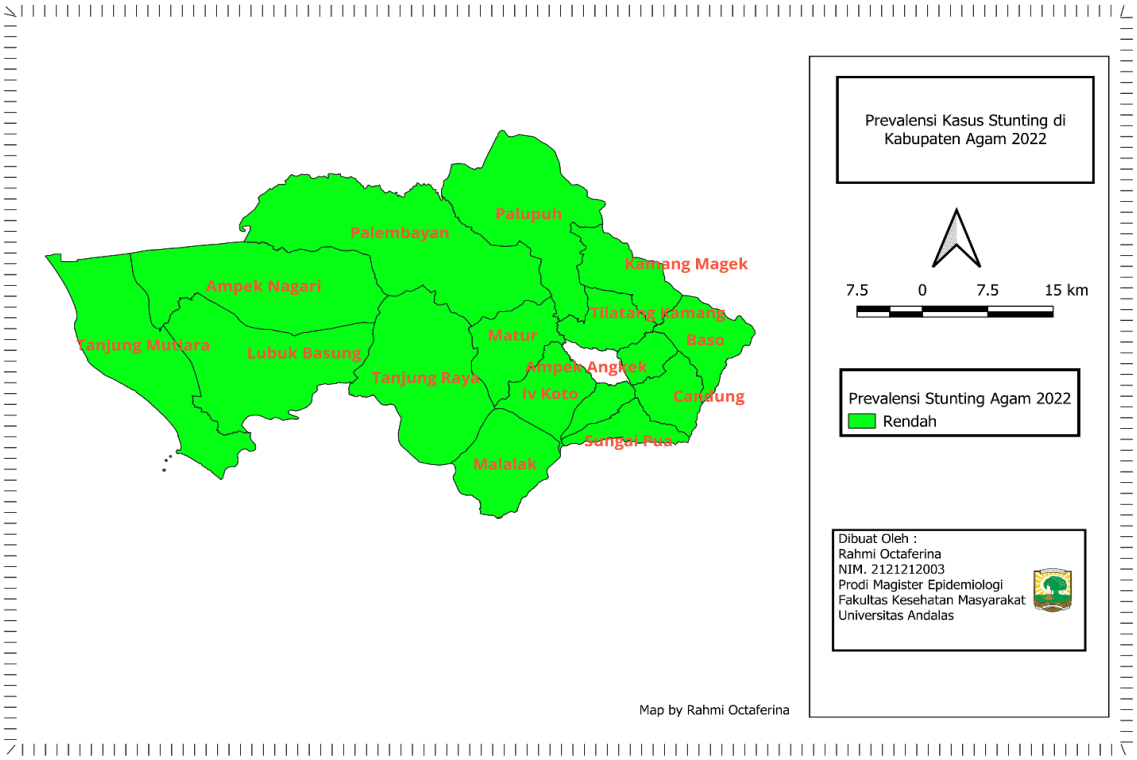

Figure 5: Spatial Description of Stunting Prevalence in Agam Regency 2021

f. Prevalence of Stunting in Agam Regency in 2018-2022

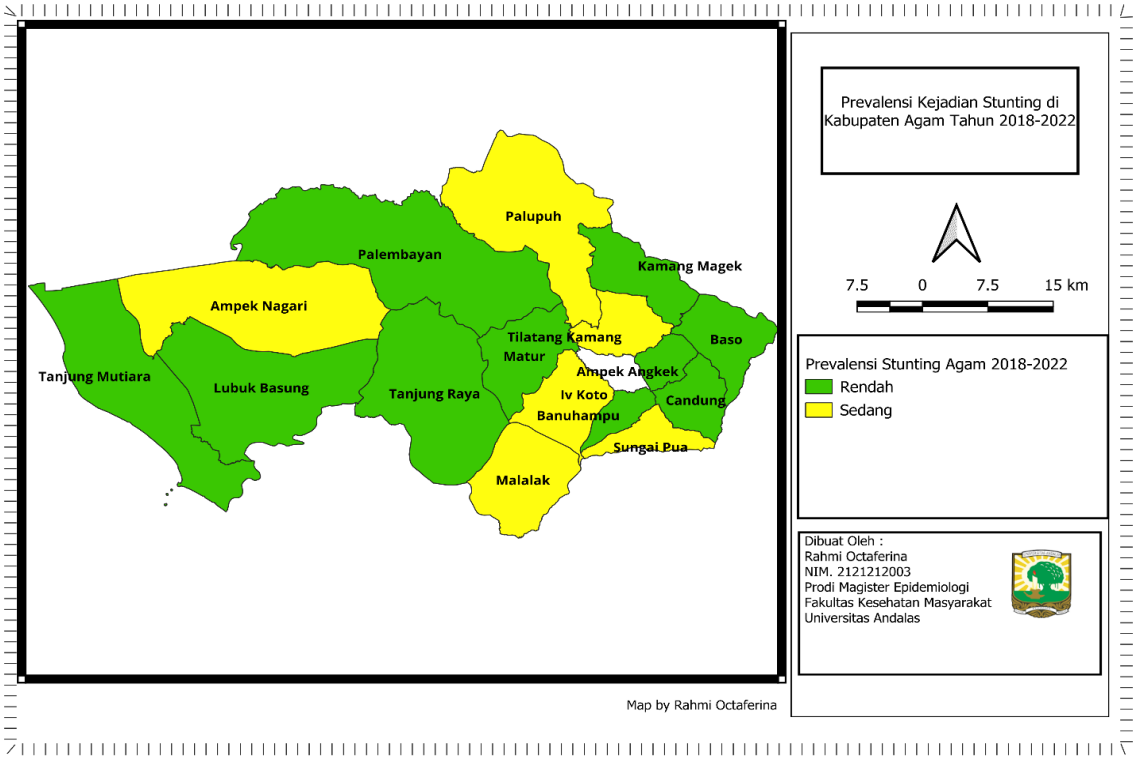

Figure 6: Spatial Description of Stunting Prevalence in Agam Regency 2018-2022

The spatial distribution of stunting prevalence has an irregular trend between 2018 and 2022. This is apparent from the depiction of the frequency of stunting in children under the age of five, which is distributed among 16 sub-districts in Religious Regency and varies annually in the categories of very high, high, medium, and low. In 2018, the occurrence of

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stunting in Agam Regency, categorized as very high, was recorded at 44.08% in Malalak District. The stunting prevalence in Lubuk Basung District is 15.67%, making it the sole sub-district in the low stunting prevalence group. There are fourteen sub-districts in Agam Regency that have medium and high prevalence rates. Specifically, these sub-districts have stunting prevalence rates ranging from 20% to 39%.

In 2019, a number of sub-districts in Agam Regency, namely Lubuk Basung, Tanjung Mutiara, Palembayan, Tanjung Raya, Candung, Baso, Ampek Angkek, Kamang Magek, Matur, and Tilatang Kamang sub-districts, were classified as having a moderate prevalence. Meanwhile, the remaining six sub-districts fall into the category of mild stunting prevalence. Among them, Palupuh District has the highest prevalence rate in this group, reaching 27.5%. In 2020, the occurrence of stunting in Agam Regency, specifically in Tilatang Kamang District, reached a staggering 50.45%, placing it in the very high category. Tanjung Raya District had the highest prevalence of stunting in 2020, with a rate of 36.99%. There were fourteen other sub-districts in Agam Regency that had low prevalence rates, with stunting rates ranging from 6% to 25.69%.

The prevalence of stunting in all sub-districts in Agam Regency in 2021 is classified as low. These findings indicate that the stunting prevalence in all sub-districts of Agam Regency is less than 20%. The district of Banuhampu has the lowest prevalence rate of stunting, with a rate of 1.08%. On the other hand, the district of IV Koto has the greatest prevalence rate of stunting in this category, specifically 19.86%. By 2022, the occurrence of stunting in all sub-districts within Agam Regency shall be classified as minimal. These findings indicate that the stunting prevalence in all sub-districts of Agam Regency is less than 20%. The district of Lubuk Basung has the lowest prevalence rate of stunting, with a rate of 1.08%. On the other hand, the district of IV Koto has the greatest prevalence rate of stunting in this category, specifically 12.91%.

The occurrence of stunting cases in Agam Regency from 2018 to 2022 exhibits an inconsistent trend that hinders its reduction. During the period from 2018 to 2022, sub-districts with a high prevalence of stunting were never found in more than two sub-district areas. In 2020, the Tilatang Kamang District in Agam Regency experienced the highest recorded prevalence of stunting, reaching 50.45%. Subsequently, the figure had a decline until it reached a value of 7.18% in the year 2022. Despite a continued drop in the trend from 2021 to 2022, there are still 6 sub-districts classified as medium, while 10 additional sub-districts successfully achieved stunting prevalence rates below 20% in 2022.

CONCLUSION

The prevalence and occurrence of stunting cases in children under the age of five, as well as the factors influencing it, shown changes in Agam Regency between 2018 and 2022. In 2018, the stunting prevalence reached its peak at 28 cases per 100 children. The spatial relationship between the occurrence of stunting in children under the age of five and the factors that influence it from 2018 to 2022 exhibits an irregular pattern.

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