Original Article

Changes In The Prevalence Of Stunting Among Toddlers In Papua, West Papua, And Maluku Provinces In Indonesia

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Abstract

Early detection of toddler stunting must begin at a critical period of growth and development specifically in the first 1000 days of live birth, or commencing from the ninth month of pregnancy to when the child is 24 months old. Therefore, this study aims to determine changes in health and social programs in relation to the prevalence of stunting toddlers in Papua, West Papua, and Maluku Provinces. The study was conducted using a cross-sectional design and the samples included 37 respondents from different provinces. The data obtained were analyzed using the Chi-Square Statistical Test (χ^2). The results showed no significant changes in the prevalence of stunting toddlers with fiscal capacity index and household low income (Q_1-Q_2). Significant changes in the low prevalence of stunting toddlers were found with a high vitamin A coverage, reduced percentage of toddlers who did not complete immunization nor have Card Towards Health (CTH)/ Mother and child health book, as well as toddlers who were not weighed periodically for six months. Based on the results, toddler stunting has become a problem from 2007 to 2018 in Indonesia. Therefore, the coverage of government health programs and the achievement of changes in the prevalence of stunting are very important for the future of children in Papua, West Papua, and Maluku provinces, Indonesia.

Keywords: Health and social programs, stunting toddlers**.**

1. Introduction

Stunting is caused by prolonged and chronic malnutrition in the critical period of growth and development especially in children aged 0-59 months. The nutritional status of stunted children can be assessed based on anthropometry using height and length according to age, with values <-2 SD and < -3 SD representing moderate and severe stunting respectively in line with the WHO Child Growth Standard [1].

Early detection of toddler stunting must begin at the critical period of growth and development in the first 1000 days of live birth, commencing from the ninth month after pregnancy to when the child is 24 months old [2]. This period is called the Window of Opportunity or the golden period of growth [3]. Damage in this period is irreversible, which means that it cannot be repaired in the next phase of life, and might affect the health of toddlers when they become adults [4].

Two factors that affect stunting toddlers include direct and indirect. Direct factors comprise infectious diseases and nutrient intake, while the indirect refers to the nutritional status of pregnant women, health services, hygiene, sanitation, and demographic location [5]. Based on a previous study, nutrition programs for toddlers implemented by improving public health services reduced child mortality by 14% in Latin America, South Asia 24%, and 31% in Africa [6]. Meanwhile, fundamental factors that cause stunting are the socio-economic level, education, employment, family income, and the number of family members [5].

Approximately 165 million children are stunted in developing countries due to poor family socio-economic status, education, employment, as well as low and middle income [7]. Furthermore, stunting is a global and national health problem in Indonesia. It is one of the most common cases in the world of children's illnesses and has a prevalence of 80% in developing countries. National figures in Indonesia show that the prevalence of stunting among toddlers in 2007, 2010, 2013 and 2018, was 36.8%, 35.6%, 37.2%, and 30.8% respectively. Consequently, the incidence is included in the high category of nutrition problems which

ranges from 30-39.9% according to WHO standards.

A total of 17 Provinces in 2007 showed a high prevalence of stunting for under-five years old children including Papua, West Papua, and Maluku. In 2013, about 14 Provinces were also confirmed to have a high prevalence [8]. Therefore, this study aims to identify the government programs that have been implemented to changes the prevalence of stunting toddles in Papua, West Papua, and Maluku Provinces from 2007 to 2018.

2. Methods

This cross-sectional study was performed to determine the relationship between changes in government programs with the prevalence of stunting among toddlers from 2007 to 2018 [9]. The factor analyzed was changes in the prevalence in Papua, West Papua, and Maluku Provinces.

The selected samples were permanent residents in the aforementioned provinces including Papua 20, West Papua 9, and Maluku 8, amounting to a total of 37. Meanwhile, the New Autonomous Regions (NAR) was not included in the unit of analysis.

This study used secondary data from basic health research and the Ministry of Finance comprising household low income (Q1-Q2), vitamin A coverage, Toddlers who did not complete immunization nor have Card Towards Health (CTH)/ Mother and child health book, and those who are not weighed after six months. Additionally, the Ministry of Finance's secondary data was used to obtain the fiscal capacity index. Anthropometric measurements including Height/Age or Lenght/Age were used to determine normal or stunted children in a health survey [8], while stages of data analysis included data normality and Chi-Square statistical tests (χ^2) [10].

3. Results and Discussion

3.1 Regencies/Cities Not New Autonomous Regions, and New Autonomous Regions

The Regencies/Cities in Papua Province which are the New Autonomous Regions (NAR) from 2007 - 2018 included a total of 9 namely Deiyai, Dogiyai, Intan Jaya, Yapen Islands, Lanny Jaya, Mamberamo Raya, Mamberamo Tengah, Nduga, and Yalimo. Meanwhile, about 20 Regencies/Cities are not part of the New Autonomous Regions including Merauke Regency, Jayawijaya, Jayapura, Nabire, Yapen Waropen, Biak Numfor, Paniai, Puncak Jaya, Mimika, Boven Digoel, Mappi, Asmat, Yahukimo, Pegunungan Bintang, Tolikara, Sarmi, Keerom, Waropen, Supiori, and Jayapura City.

Among the total 13 Regencies/Cities in the West Papua Province, 4 are New Autonomous Regions (NAR), namely Manokwari Selatan, Maybrat, Pegunungan Arfak, and Tambarauw, while 9 are not. This includes Fak Fak Regency, Kaimana, Teluk Wondama, Teluk Bintuni, Manokwari, Sorong Selatan, Sorong, Raja Ampat, and Sorong City.

Maluku Province has a total of 11 Regencies/Cities, the New Autonomous Regions (NAR) from 2007 - 2018 are 3, namely Buru Selatan and Maluku Barat Daya Regencies, as well as Tual City, while the other 8 are not. This includes Maluku Tenggara Barat Regency, Maluku Tenggara, Maluku Tengah, Buru, Kepulauan Aru, Seram Bagian Barat, Seram Bagian Timur, and Ambon City.

From the total 53 Regencies/Cities in Papua, West Papua, and Maluku Provinces between 2007-2018, about 16 are New Autonomous Regions (NAR), while 37 are not. However, 16 New Autonomous Regions (NAR) were not included in this study.

The New Autonomous Region (NAR) Law for Indonesia plays a role in improving the welfare of the population. One of the important parts of the law is realizing the empowerment of healthy, just, and prosperous Indonesians [11,12].

The prosperity of a nation can be achieved through a development approach that is evenly distributed from one region to another. The expansion of new Regencies/Cities is one of the solutions for the Ministry of Home Affairs to bring government services such as health, education, and economy closer to the community. According to the President of Indonesia, infrastructure is an important part of connecting one region to another, and this will make economic access and regional development run smoothly [13,14,15].

National Medium and Long Term Development from 2005-2025 is the main focus in improving the welfare of the population in underdeveloped areas of Indonesia. Population welfare issues must be discussed by the people's representative council, to make policies for building a just and prosperous society [16,17,18].

The role of special autonomy and new autonomous districts is an important part of achieving equitable development and poverty alleviation. Four strategic aspects should be considered such as (a) inequality of development and regulatory orientation, b) effectively encouraging equitable development in regional autonomy, (c) the existence of development-based inclusive growth, (d) Sustainable development towards efficient equity [19].

Table 1.1 shows the frequency distribution of the autonomous regions in Papua, West Papua, and Maluku provinces between 2007-2018. In the Papua province, 17% of the Regencies/Cities are new autonomous regions, while 37.7% are not. West Papua

Province has 17.0% non-autonomous regions and 7.5% autonomous regions. Meanwhile, in the Maluku Province, 5.7% of the regencies/cities are new autonomous regions, while 15.1% are not.

Table 1. Distribution of Regencies/Cities according to Not New and New Autonomous Regions in Provinces (Papua, West Papua and Maluku 2007 - 2018)

In 2007 - 2018	n	%
Regencies /City of Papua Province		
- Not New Autonomous Region		
- New Autonomous Region	20	37.7
	9	17.0
Regencies /City of West Papua Province		
-Not New Autonomous Region		
-New Autonomous Region	9	17.0
	4	7.5
Regencies/City of Maluku Province		
-Not New Autonomous Region		
-New Autonomous Region	8	15.1
	3	5.7
Total	53	100

Explanation: Percentage of Not New Autonomous Regions and New Autonomous Regions, 2007-2018

The division of new regencies is high in Papua Province but low in West Papua and Maluku Provinces due to the large and small total land area respectively. The area and population in mountainous and coastal areas are in dire need of development hence, the Regencies were divided into new autonomous regions. The division is the responsibility of the regional and central government to bring health, education, and economic services closer to the community [20,21].

Papua's regional development targets for 2020-2024 prioritize cultural, contextual, as well as an ecologically-based approach in seven customary territories namely Laa Pago, Saireri, Tabi, Mee Pago, Anim Ha, Bomberay, and Domberay. The implementation of Law No.35/2008 regarding the Special Autonomy for Papua and West Papua mandates the strengthening and empowerment of indigenous Papuans, based on culture and customs that prioritize human values. The development of indigenous territories is based on Presidential Instruction No.9 / 2017 concerning the Acceleration of Development in Papua and West Papua which mandates: (1) Increasing the quality and access to education; (2) Increasing the quality and access to health; (3) Social security and welfare; (4) Adequate housing, clean water, and sanitation; (5) Local economic development; (6) Connectivity: Trans Papua, sea, river, air, telecommunications and internet; as well as (7) Strengthening governance and institutions [22].

According to Maulana Arief, the New Autonomous Regions in Indonesia have a great opportunity to improve the welfare of society in the fields of health, education, and economy. This is important to balance the progress of community development in the new autonomous and other regions in Indonesia. According to reports from the Ministry of Home Affairs, regencies that have large areas need to be expanded or become new administrative areas for easier access by the government [23, 24].

The new autonomous regions have a greater opportunity for development than other regions. However, both the new and other regions must be considered for the welfare of the people [25, 26].

New regencies need to be created in Papua, West Papua, and Maluku provinces to ensure that the level of development progress is evenly distributed throughout Indonesia. However, this development requires strong support from the new Provincial and Regency governments, to accelerate development according to the target of Central government programs [27,28,29].

3.2 The Reduction in the Prevalence of Stunting Toddlers

The results showed a reduction in the prevalence of stunting among under-five years old children in the Not New Autonomous Region in Papua, West Papua, and Maluku provinces from 2007 – 2018. The picture below shows the decline in toddlers stunting.

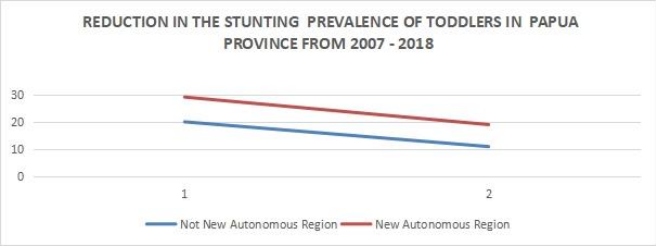

Figure 1. Reduction in the Stunting Prevalance of Toddlers of Papua Province in 2007 - 2018
Explanation:
1. Not New Autonomous Region, the prevalence of stunting is low
2. New Autonomous Region, the prevalence of stunting is high

The results for Papua Province showed that the prevalence of stunting among under-five years old children in the New Autonomous Regions is still high. The cause of the difference is that the Not New Autonomous Regions have adequate facilities, infrastructure, human resources, and easy transportation access, while the New Autonomous Regions have limited service facilities and health personnel.

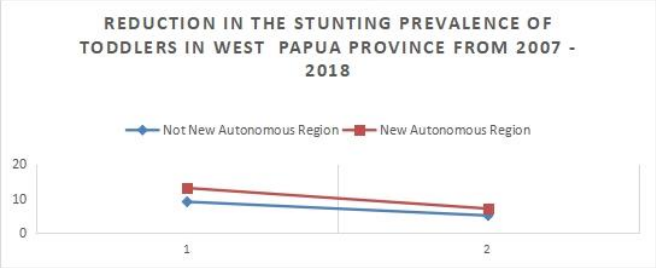

Figure 2. Reduction in the Stunting Prevalence of Toddlers in West Papua Province from 2007 - 2018
Explanation:
1. Not New Autonomous Region, the prevalence of stunting is low
2. New Autonomous Region, the prevalence of stunting is high

Based on the results of West Papua Province, the low quality of service in the New Autonomous Regions culminated in a high stunting rate, while the Not Autonomous Regions have a low prevalence. This proves that the progress of development in the field of maternal and child health in the Not Autonomous Region is still dominant compared to the New Autonomous Regions.

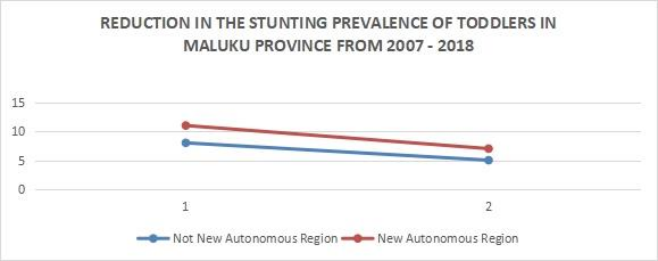

Figure 3. Reduction in the Stunting Prevalence of Toddlers in Maluku Province from 2007 - 2018
Explanation:
1. Not New Autonomous Region, the prevalence of stunting is low
2. New Autonomous Region, the prevalence of stunting is high

Maluku Province consists of 8 Not New and 3 New Autonomous Regions between 2007 – 2018. The health service program in the Ministry of Health's National Medium–Term Development Plan shows that the number of stunting cases is still high in the New Autonomous Regions compared to the Not New Autonomous Regions where it is low. This shows that there are differences in the health status of children under five years old in the new and non–expanding area.

3.3 The Change in Coverage of Health and Social Programs

According to the Ministry of Finance for the Republic of Indonesia, the fiscal capacity is grouped according to regional indexes. Annual and income budgets are discussed by the Regional Government and Representative Council for the welfare of the population in the Province and Regencies/Cities [30]. The results showed that the change in the fiscal capacity index from 2007

to 2013 amounted to 43.2%, and from 2013 to 2018, it was 56.8% for the Regencies/Cities in Papua, West Papua, and Maluku provinces.

Approximately 50% of people in low and middle-income countries (LMIC) are poor and have a low health status. Health socio-economic imbalance affects the system of differences between morbidity and mortality. Moreover, the high and low socio-economic status is an indicator of different levels of education, employment, and income for healthy living [31]. The results showed that changes in the household low income (Q1 - Q2) from 2007 to 2013 amounted to 51.4%, and from 2013 to 2018, it was 48.6% in the three provinces.

Table 2. Changes in Coverage of Health and Social Programs from 2007 to 2018.

Coverage of Health Programs	N	%
Fiscal capacity index		
Changes (2007 - 2013)	16	43.2
Changes (2013 - 2018)	21	56.8
Household Low income(Q1-Q2)		
Changes (2007 - 2013)	19	51.4
Changes (2013 - 2018)	18	48.6
Toddlers vitamin A coverage		
Changes (2007 - 2013)	20	54.1
Changes (2013 - 2018)	17	45.9
Toddlers did not complete immunization		
Changes (2007 - 2013)	24	64.9
Changes (2013 - 2018)	13	35.1
Toddlers did not have Card Towards Health (CTH)/ Mother and child health book		
Changes (2007 - 2013)	24	64.9
Changes (2013 - 2018)	13	35.1
Toddlers for six months are not weighed		
Changes (2007 - 2013)	31	83.8
Changes (2013 - 2018)	6	16.2

Note: Secondary Data Sources Basic health research and the Ministry of Health

The health programs from 2007 to 2018 show that the coverage of vitamin A toddles was significantly low. Meanwhile, Vitamin A is an important nutrient needed to maintain immune function, eye health, growth, and survival in humans [32]. Approximately 190 million children aged 6 -59 months received high-dose vitamin A supplementation in 2014. However, about 127 million preschool children globally experience vitamin A deficiency, which affects morbidity and death [33]. The results in this study showed that the change in vitamin A coverage from 2007 to 2013 was 54.1%, and from 2013 to 2018, it was 45.9% as shown in Table 1.2.

The children's immunization program has been carried out adequately, but the coverage rates are still below 90% or 100% in Indonesia [34]. The percentage of toddlers who did not complete immunization from 2007 to 2013 was 64.9%, and from 2013 to 2018, it was 35.1% in the three provinces.

According to a previous study, it was very difficult to monitor the growth of toddlers on a monthly basis from 2007 and 2013 because most of them did not have Card Towards Health (CTH)/Mother and child health book [8]. Good growth monitoring in toddlers requires routine weight assessment every month at Posyandu and recording in Card Towards Health (CTH)/Mother and child health book [35]. The results showed that changes in toddlers who do not have Card Towards Health (CTH)/ Mother and child health book from 2007 to 2013 amounted to 64.9%, and from 2013 to 2018, it was 35.1%.

Furthermore, nutritional status assessment is an effort to interpret the information obtained through anthropometry, biochemistry, food consumption, and clinical assessment in a person [36]. Failure to weigh toddlers periodically for six months can affect their growth and development [37]. The results showed that changes caused by failure to weigh toddlers for six months in 2007 to 2013 amounted to 83.8%, and from 2013 to 2018, it was 16.2%.

3.4 Relationship between Changes in Coverage of Health and Social Programs with the Prevalence of Stunting Toddlers from 2007 – 2018

Table 3. Distribution of Regencies/Cities according to Not New and New Autonomous Regions in Provinces (Papua, West Papua and Maluku 2007 - 2018)

Changes	**Prevalence of Stunting Toddlers**	χ^2		
Regencies/Cities	Category Change	p-value	RP	95 % CI (Lower -Upper)
Fiscal capacity index				
Change Up	Not Change	1.00	0.964	0.260 – 3.583
Change Down				
Household Low income(Q1-Q2)				
Change Down	Not Change	0.70	1.733	0.360 – 8.351
Change Up				
Toddlers vitamin A coverage		**		
Change Up	Change	0.02	3.333	0.856- 12.978
Change Down				
Toddlers who did not complete immunization		**		
Change Down	Change	0.04	1.944	0.495 – 7.638
Change Up				
Toddlers who did not have Card Towards Health (CTH)/ Mother and child health book		**		
Change Down	Change	0.03	1.354	0.342- 5.360
Change Up				
Toddlers who are not weighed for six months		**		
Change Down	Change	0.01	3.167	0.500 – 20.036
Change Up				

Note: 1. Test Statistics χ^2
2. Continuity Correction: No cells <5
3. Likelihood Ration: Stratification Analysis
4. Fisher's Exact Test: There are cells <5

Table 1.3 shows the fiscal capacity index, household low-income(Q1-Q2), Vitamin A Coverage, toddlers who did not complete immunization or have the Card Towards Health (CTH)/ Mother and child health book, as well as those who are not weighed for six months.

The results showed no significant changes in the prevalence of stunting with fiscal capacity index and household low income (Q1-Q2). Therefore, both parameters did not affect the prevalence of stunting among toddlers in Regencies/Cities of Papua, West Papua, and Maluku provinces.

The fiscal capacity index is low in relation to the level of poverty or welfare of the population area. Low local income particularly, is the root cause of stunting problems in toddlers. This is consistent with a previous study which stated that economic growth in a region is very influential in reducing poverty and improving the welfare of the population [30]. Poor economic growth is reflected in malnourished children with stunting in developing countries [38], this is because both poverty and health are closely related. In addition, lowincome countries tend to have worse health outcome rates compared to those with better economic levels [39]. This factor causes stunting to occur in many families with low incomes and large family members [40].

The results also showed significant changes in the prevalence of stunting in relation to vitamin A coverage, toddlers who do not have complete immunization nor have Card Towards Health (CTH)/ mother and child health book, and those who are not weighed for six months. From 2007 to 2018, the coverage of health programs implemented by the Ministry of Health indicated a decline in the prevalence of stunting in Regencies/Cities of Papua, West Papua, and Maluku provinces

In 2004, approximately 190 million children aged 6-59 months received high doses of vitamin A supplementation. However, about 127 million preschoolers globally experience vitamin A deficiency which affects morbidity and death. Childhood stunting is one of the various problems associated with vitamin A deficiency, [33] and this condition is most predominant in Africa and Southeast Asia. It causes the death of children under 5 years with a prevalence of 6.0% and 8.0% in Africa and Southeast Asia, respectively [41].

According to a study on the effect of maternal education and immunization in Kenya, 80.0% of children below five years old were stunted, 51.0% among them were not immunized, while 49.0% were immunized [42]. Therefore, complete immunization

is an important part of preventing under five years old children from being infected by infectious diseases [1].

One of the health indicators usually evaluated for the achievement of MDGs is the nutritional status of toddlers which is measured by age, body weight, and height. Height by Age (H/A) is used to assess the nutritional status of normal, short, as well as very short children, and is recorded in the Card Towards Health (CTH)/ mother and child health book [43]. The use of health card is very important to assess the growth of under-five years old children on a monthly basis according to the WHO growth standards [1].

Nutritional status assessment is important for evaluating the overall health of a person or a community [36]. Failure to weigh toddlers periodically for six months can affect growth and development [37]. This is because the anthropometric assessment is affected when toddlers are not weighed in this period. Based on a WHO report, stunting can be prevented in several countries by providing exclusive breastfeeding and complementary foods above 90.0% [44].

The nutritional status is one of the important behavioral changes in utilizing food according to the social views of the community. Therefore, growth and development in pregnant women, breastfeeding mothers, as well as toddlers are very closely related to the perception of the community about providing nutritious food for their families [45]. Cultural knowledge of social relations greatly influences the degree of public health. This relates to the provision of food for the family and how to prevent infectious diseases in the culture of the community [46].

Health services, visits of pregnant women to health service units, provision of additional food for pregnant women and nursing mothers, infants and toddlers, as well as immunization for mothers and children are very important for good generations. According to previous studies, nutritional assessment, complete immunization, and visits of mothers and children to health service units are good behaviors for preventing stunting in Indonesia [47, 48].

Furthermore, to mitigate the incidence of stunting, knowledge, attitudes, and actions of the family are required in providing nutritious food to their children. According to a previous study, nutrition-conscious family can prevent their children from becoming stunted in Indonesia [49, 50].

4. Conclusion

Toddler stunting has been a national problem in Indonesia from 2007 to 2018. Based on the results, the coverage of government health programs and the achievement of changes in the prevalence of stunting toddlers is very important for the future of children in Papua, West Papua, and Maluku provinces, Indonesia.

Changes in the low prevalence of stunting toddlers from 2007 to 2018 were observed with high vitamin A coverage, reduction in the percentage of toddlers who did not have complete immunization nor have Card Towards Health (CTH)/ mother and child health book, as well as those who were not weighed periodically for six months

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