

Distribution Pattern of Stunting Incidence at Gedong Tataan Community Health Center Pesawaran District

Sutarto^{1,*}, Ratna Derwi Puspita Sari¹ and Winda Trijayanti Utama²

¹Medical Education Study Program, Faculty of Medicine, University of Lampung, Bandar Lampung, 35145, Indonesia

²Medical Professional Study Program, Faculty of Medicine, University of Lampung, Bandar Lampung, 35145, Indonesia

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Abstract: Introduction: According to the 2022 Indonesian Nutrition Status Survey (SSGI), stunting in Indonesia is 21.6%, down from 24.4% in the previous year, with a target of 14% in 2024. The situation in Lampung Province is highest in Pesawaran Regency (25.1%) and the most in Gedong Tataan were 175 stunted children. Factors that influence the prevalence of stunting are influenced by regional and geographical factors. The aim of this research is to determine and explain the distribution pattern of stunting in the work area of the Gedong Tataan Community Health Center, Pesawaran Regency. Method: Quantitative analysis to describe using Nearest Neighbor Analysis. Nearest Neighbor Analysis is an analysis method used to examine stunting distribution patterns. Results: The indicator values in the Nearest Neighbor Ratio analysis illustrate that the incidence of stunting is spread geographically. An NNR that is lower than 1 (0.567095) means that the incidence of stunting at the Gedong Tataan Community Health Center has a tendency towards a concentration or clustering pattern. Conclusion: The incidence of stunting at the Gedong Tataan Community Health Center has a cluster pattern, although the incidence of stunting is very low, and the difference is very statistically significant compared to the expected average.

1 INTRODUCTION

Reducing child stunting is an important goal of the 6 goals in the Global Nutrition Targets by 2025 and is a key indicator in the second Sustainable Development. Consistent evidence shows that non-exclusive breastfeeding in the first 6 months, low household socioeconomic status, premature birth, short birth length, and low maternal height and education are determinants of stunting in children in Indonesia. Stunting results in decreased motor and (Beal et al., 2018; Yuda et al., 2023) cognitive development, impaired immunity and low educational attainment. In adulthood, stunting leads to a decrease in economic productivity, an increased risk of chronic diseases and weight loss born in spring (Murti, 2020; Uwiringiyimana et al., 2019).

Stunting is influenced by maternal factors (short maternal height, low education, short birth spacing, poor health before conception), and by household and

life characteristics (low income, inadequate water and sanitation, and low access to health services) (Islami & Khourouh, 2021). In implementing stunting reduction programs, there are many obstacles, when the implementation of the program lacks human resources and workload in the health office district/city. Gedong Tataan Community Health Center is one of the sub-districts in Pesawaran Regency with the highest number of stunting children and spread across 10 villages. Stunting prevention and control services by the health service network in the Gedong Tataan Community Health Center work area have been carried out in auxiliary puskesmas units and posyandu units. The health services provided affect the pattern of distribution of stunting events, because the services in the Gedong Tataan Community Health Center area are served by Auxiliary Health Center and Posyandu.

The government has created a medium-term program of the National Strategy for the Acceleration

^a <https://orcid.org/0000-0002-6859-0938>

^b <https://orcid.org/0000-0002-1025-0981>

^c <https://orcid.org/0009-0000-8840-5042>

of Stunting Prevention 2018-2024, in the form of stunting acceleration that prioritizes and focuses targets on pregnant women, breastfeeding mothers, children 0-23 years old, children aged 24-59 months, women of childbearing age and adolescent girls, in its implementation in 1,000 focus villages in 100 priority (Yuda et al., 2023). Districts / cities Stunting is a major global public health problem and has spatial variations that change contextual variables from one region to another, suggesting that geography is an important component in the development of stunting reduction and prevention strategies. After adjusting for demographic and socioeconomic factors, altitude of residence and being served by rural markets was also significantly associated with the incidence of stunting in children (Tamir et al., 2022; Uwiringiyimana et al., 2019). The spatial distribution rate of stunting using the latest data is very important in planning and implementing geographically targeted and optimized nutrition interventions in the Gedong Tataan Community Health Center area. Interventions are carried out by health service units in healthcare center. Auxiliary community health center and *Posyandu*, so it is necessary to buffer health services in stunting prevention.

This study aims to assess the spatial distribution pattern and buffer of stunting prevention health services in children under five in the work area of Gedong Tataan Community Health Center.

2 METHOD

The study design used population-based cross-sectional study analysis and explored geographic variation and identified patterns of distribution and buffering of health services, factors influencing child stunting and stunting. The research was conducted at Gedong Tataan Community Health Center.

The analysis uses spatial analysis and nearest neighbors to describe the phenomenon of distribution patterns and buffering of health services. Data source. This research data was taken from a survey by a student enumerator majoring in Geography, Faculty of Teacher Training and Education, University of Lampung. To provide timely and reliable data on health and demographic outcomes, standardized GPS measuring instruments are used.

3 RESULTS

Pesawaran Regency is one of the regencies in Lampung Province, Indonesia. Geographically,

Pesawaran Regency is located between 1040-05014' East Longitude and 507'-5048' South Latitude. This regency was inaugurated on November 2, 2007 based on Law Number 33 of 2007 concerning the Establishment of Pesawaran Regency. Initially this regency was part of South Lampung Regency. The total area of Pesawaran Regency is 1,173.77 km² or 117,377 Ha with Padang Cermin District as the largest district, which is 31,763 Ha. Pesawaran Regency consists of 37 islands. The three largest islands are Legundi Island, Pahawang Island, and Kelagian Island.

Figure 1, administratively seen Pesawaran Regency has the following boundaries.

- The northern part is bordered by Kalirejo District, Bangunrejo District, Bumi Ratu Nuban District, Trimurjo District, Central Lampung Regency
- The eastern part is bordered by Natar District, South Lampung Regency, Kemiling District, and Teluk Betung Barat District, Bandar Lampung City
- The southern part is bordered by Lampung Bay, Kelumbayan District, and Cukuh Balak District, Tanggamus Regency
- The west is bordered by Adiluwih, Sukoharjo, Gadingrejo, and Pardasuka Districts, Pringsewu Regency.

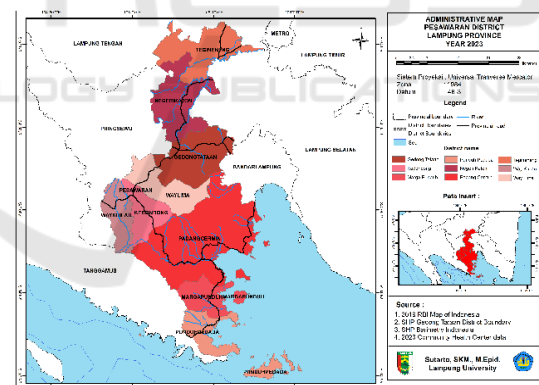


Figure 1: Pesawaran District Administration Map (Primary data collection results, 2023)

Throughout 2023, there will be 175 cases of stunting. The pattern of distribution of stunting cases from the *Average Nearest Neighbor* (ANN) analysis, provides an overview of the phenomenon of the spread of stunting to form a pattern. Spatial statistics that have been carried out describe geographical objects / changes in events at a location, in addition to describing spatial patterns formed by three types of spatial patterns, clustered, dispersed, and random.

Figure 2 explains the clustering pattern of stunting incidence in health services in 2 (two) auxiliary community health center units located in the Gedong Tataan Community Health Center work area. Each auxiliary community health center unit is realized as an independent health service center that provides high-quality services to the local community. The clustering pattern of stunting events based on the service coverage of 2 (two) auxiliary health center seems to have reached all stunting incidents so that the role of health services is needed by the auxiliary auxiliary health center as a network in the work area of the Gedong Tataan Community Health Center. The efficiency and effectiveness of health services in these 2 (two) auxiliary community health center units are divided into certain groups based on the health service needs of stunting locations that have the characteristics of local residents in getting good health services.

The clustering pattern of stunting incidence in health services in 2 (two) auxiliary community health centers, and the basis for improving children's health services in this region. Collaboration between auxiliary community health center and joint efforts in overcoming stunting problems are expected to be increased in response to the findings of this study. In addition, the accuracy of the location and placement of auxiliary community health center units in the clustering pattern of stunting events also allows for more even distribution of health resources. This helps maximize the accessibility of stunted toddlers to health services, reduces transportation burdens, and increases responsibility towards local health needs.

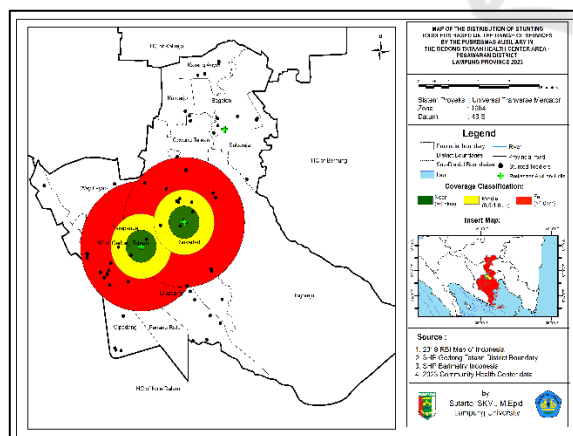


Figure 2: Clustering Pattern of Stunting Incidence in Health Services in 2 (two) auxiliary Puskesmas units in the Gedong Tataan Health Center Work Area (Primary data collection results, 2023)

Figure 2 shows the pattern of clustering services in two auxiliary health center units in the Gedong

Tataan community health center work area creating a coordinated and structured system, optimizing community health services with a holistic approach and based on local needs. This cluster is formed in 3 (three) central locations, centered on health services, north to northeast and south to southwest.

Posyandu is a form of community-sourced health efforts carried out by, from, and with the community, to provide convenience for the community in obtaining health services for mothers, babies, and children under five. The skills of each *posyandu* cadre in carrying out anthropometric measurements are very necessary, for the detection of child growth and development. *Posyandu* cadres are community members who are willing, able, and have the time to organize *posyandu* activities voluntarily. Early detection of toddler growth disorders is one of the best ways to reduce stunting prevalence, involving *posyandu* cadres is a role in the implementation of the 3 (three) pillars stunting program in Indonesia, empowering the community in stunting prevention (Julianti & Elni, 2022; Sanjaya et al., 2022; Tri Astuti, 2022).

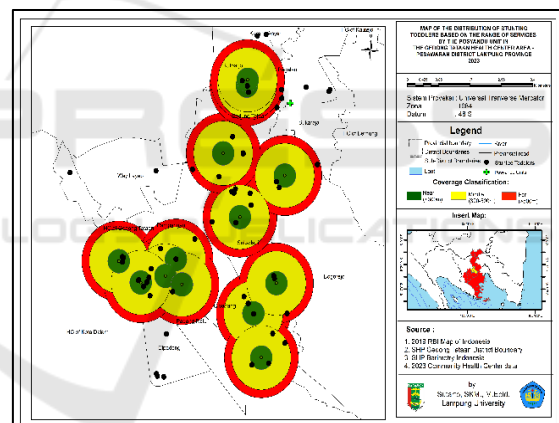


Figure 3 Clustering Pattern of Stunting Incidence in 10 (ten) health services in Posyandu units in the Gedong Tataan Health Center Work Area (Primary data collection results, 2023)

Figure 3 reflects the exploration of certain patterns in the incidence of stunting related to the quality of health services provided by *Posyandu* in the Gedong Tataan Community Health Center area. Identifying risk factors that influence the incidence of stunting, as well as mapping this clustering pattern between *Posyandu* locations can be associated with differences in health services. Factors such as diet, accessibility of maternal and child health services, and socioeconomic variables help detail specific aspects that need attention. Assessing the existence of specific geographical patterns in the incidence of stunting to

understand the spatial distribution of stunting cases across the working area of Gedong Tataan community health center. This setting can provide a more holistic view of the health challenges in each *Posyandu* and assist in designing more targeted intervention strategies.

The clustering pattern in health services is contained in 10 (ten) *Posyandu* units in the Gedong Tataan community health center working area, with a planned layout, each *Posyandu* is organized in such a way as to provide holistic and coordinated health services to the local community. This clustering pattern was designed by taking into account the diversity and health needs of the community around the Gedong Tataan community health center work area. Each *Posyandu* focuses on preventive, promotive and curative health services that are specific to the public health profile in their environment. With strategic placement, this clustering pattern in *Posyandu* health services allows efficient and optimal utilization of resources. People can easily access quality healthcare without having to travel far. In addition, collaboration between 10 *Posyandu* units enables effective information exchange and coordination in addressing various health issues at the community level for stunting prevention.

The importance of clustering stunting events in health service *Posyandu* can be seen in an effort to improve the welfare of the community as a whole. With a focus on disease prevention and health promotion, this system contributes positively in improving the quality of health and quality of life of residents in the Gedong Tataan community health center work area.

Community health center can manage and implement all work programs and other health efforts continuously well, so that community health center must be able to prepare activity plans and budgeting based on health development policies and the results of situation analysis, not only that community health center also needs to supervise and control activities that have been running. Figure 4 explains that the distribution pattern of stunting events can still be reached by the Gedong Tataan community health center office with the closest service distance of 5 kilo meters and the farthest 10 kilo meters. Figure 4 also shows clusters of stunting events in the south to southwest, closest to health services in the nearest sub-district (Kota Dalam sub-district by Kota Dalam Health Center) (Al Hikami et al., 2022; Pratiwi Yunus et al., 2021).

Grouping distance, travel time and availability of transportation to access health services including community health center is an access variable, the

longer the distance to the puskesmas will reduce the frequency of visits to community health center, indirectly can affect the incidence of stunting (Son & Suariyani, 2021).

The distance between the patient's home and the health facility (more than 10 kilo meters) reduces visits and adherence to treatment. Patients stop visiting treatment because the distance from home to the community health center is too far requires transportation costs and time, even though the person concerned has understood and understood the impact of non-compliance in undergoing treatment (Riki Yudianta et al., 2022).

Nutrition-sensitive interventions have an effect on reducing the incidence of stunting through various improvements in health services both in the primary target of toddlers, pregnant women, as well as secondary targets of adolescent girls and community leaders. To realize this, the government established Guidelines for the Implementation of the Healthy Indonesia Program with a Family Approach, through efforts to provide services for Pregnant and Maternity Women through Intervention in the first 1,000 days of life; integrated antenatal care (ANC) quality assurance; childbirth in a health facility; high-calorie, protein, and micronutrient feeding programs, early detection of diseases (infectious and non-communicable); eradication of worms; transformation of *Kartu Menuju Sehat* (KMS) into MCH Book; Early Breastfeeding Initiation Counseling, exclusive breastfeeding; and monitoring toddler growth by organizing supplementary food activities for toddlers at *posyandu* (Maesaroh & Sulistyorini, 2021; Sugianti & Devianti Putri, 2022).

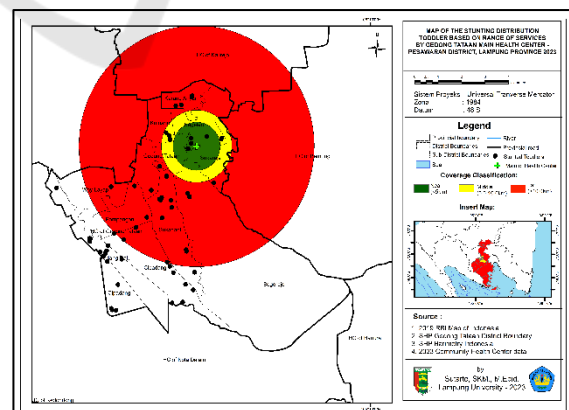


Figure 4: Clustering Pattern of Stunting Incidence according to the Gedong Tataan Community Health Center (Primary data collection results, 2023)

Specific interventions carried out by all community health center in Indonesia are in

accordance with applicable guidelines, each with different targets. In target adolescent girls, two specific interventions were carried out, namely anaemia screening and consumption of blood-boosting tablets. Anaemia screening activities that can be carried out include Haemoglobin (Hb) Examination activities for junior and senior high school students, adolescent female anaemia education, anaemia screening training, female student training on measuring height, weight, upper arm circumference and clinical signs of anaemia, distribution of iron tablets that must be taken for 12 weeks (1 tablet/week). The target of pregnant women is three activities, namely antenatal care (ANC), consumption of iron tablets for pregnant women, supplementary feeding for pregnant women with chronic energy deficiency. The toddler target is carried out with five specific activities, namely monitoring toddler growth, exclusive breastfeeding, giving food rich in animal protein for under two years old children, managing nutritional problems, increasing immunization coverage (Pratiwi, 2023)

In Figure 5 and Table 1, the context of stunting events in the working area of Gedong Tataan community health center, the results of Average Nearest Neighbor (ANN) analysis with important information, the average distance observed was 278.7904 meters, reflecting the average distance between each stunting case and other nearby stunting cases in the Gedong Tataan community health center work area. The Nearest Neighbor Ratio value of 0.567095 shows the relationship between the observed mean distance and the expected average distance of each randomly distributed stunting case. If this value is less than 1, it indicates a tendency to form clusters. The Z-score of -6.573460 is used to measure the distance of the observation value from the randomly distributed expectation value, and a negative value indicates that the distribution of stunting cases is not random (distributed cluster). A very small P value (0.000000001) indicates that the difference between the observed and expected distributions is significantly randomly distributed. The results obtained from these values show patterns or clusters in the distribution of stunting events in the work area of the Gedong Tataan community health center.

Based on these results, there are factors that can cause cluster patterns, namely health service factors that have been carried out by *posyandu*, auxiliary community health centers and elderly health centers. Health services carried out by these health facilities are anaemia screening and consumption of iron tablets for adolescent girls, distribution of iron tablets

for pregnant women, antenatal care (ANC), supplementary feeding for pregnant women who are chronically deficient in energy and for toddler targets in the form of monitoring toddler growth, exclusive breastfeeding, providing complementary foods, managing nutritional problems, increased immunization coverage and others (Pratiwi, 2023).

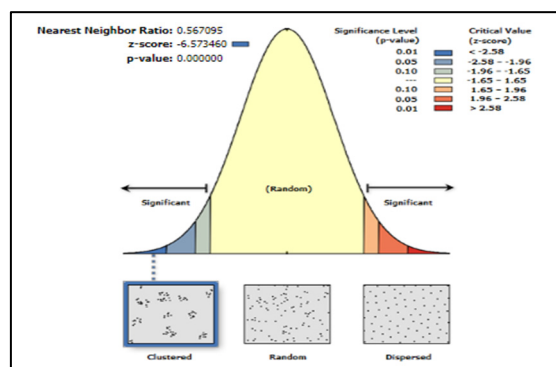


Figure 5: Neighbor Nearest Average Test Results Analysis of Stunting Incidence in Gedong Tataan Health Center Working Area (Primary data collection results, 2023)

Table 1: Analysis of the Average Closest Distance to the Incidence of Stunting in the Working Area of Gedong Tataan Community Health Center

Average observed distance	278.7904 meters
The ratio of nearest neighbors	0.567095
Z-Score	-6.573460
p-value	0.000000

Source: primary data processing results, 2023

Table 1 shows that the average distance between stunting toddlers is 278 meters, this distance shows the density and very close between stunting toddlers, the close distance between stunting toddlers is possible because of the similarity in the receipt of health services provided by health facilities related to the average distance from stunting toddlers' homes to health facilities. The distance between health facilities has an impact on the utilization rate of these facilities, if health facilities are located far away or difficult to access, people may not want or have difficulty in utilizing available health services (Muin & Radaya, 2023). In this analysis of the distribution of stunting toddlers, distribution patterns that tend to form clusters around health facilities, mean that stunted toddlers tend to be localized or gather in areas close to health facilities. These results illustrate the possible influence or relationship between the incidence of stunting in toddlers and the location of health facilities. This pattern of group distribution has important implications for strategic planning and

implementation of health interventions in the regions, focusing on areas that show higher stunting rates and adjacent to health facilities.

The proximity of health facilities, taking into account the distance of the house from the facility, can provide information on the grouping of health service recipients around the location of health facilities, so that this condition can be a solution by ensuring optimal health services for the community so that stunting events can be prevented and overcome.

4 CONCLUSIONS

The incidence of stunting in the working area of the Gedong Tataan community health center determination of the results of the analysis The Average Nearest Neighbor formed a cluster with an average distance of 278.7904 meters, reflecting the average distance between stunting cases so close that it formed a cluster pattern. Nearest Neighbor Ratio with a value of 0.567095 indicates that the distribution of points or objects observed tends to be more collected or form groups. There is a tendency to approach each other in space, an indication of collected spatial patterns or clusters. The condition of this observed spatial pattern is not due to chance, but is caused by certain factors or processes that affect the distribution pattern. Distribution patterns tend to form clusters around health facilities, illustrating the possible influence or relationship between the incidence of stunting in toddlers and the location of health facilities. This cluster distribution pattern has important implications for strategic planning and implementation of health interventions for stunting prevention and control with a focus on areas adjacent to health facilities.

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