Sensitive Intervention Policy Recommendations to Reduce Stunting Rates Based on Spatial Analysis of Sanitary Factors on the Prevalence of Stunting in DKI Jakarta Province in 2021

Septiria Irawati¹, Ema Hermawati²

¹²Faculty of Public Health, Universitas Indonesia, Kampus Baru UI Depok 16424, Indonesia

*Correspondence: Septiria Irawati, Faculty of Public Health, Universitas Indonesia, Kampus Baru UI Depok 16424, Depok, Indonesia septiria.irawati@gmail.com

Abstract. The purpose of this study was to describe the prevalence of stunting in children under five and the percentage of proper sanitation, as well as recommendations for priority areas for stunting control interventions in the Province of the Special Capital Region of Jakarta in 2021. This study used a descriptive approach to present an overview of the percentage of sanitation and prevalence of stunting in children under five by sub-district in 38 districts in DKI Jakarta. Data is displayed as a map to show distribution areas based on high, medium, and low categories. An overlay was made between the distribution map of the percentage of sanitation and the prevalence of stunting to determine the areas with the highest risk. Analysis was carried out on the area's characteristics obtained from the spatial mapping results to determine the recommended intervention program policies. Based on the results of the overlay on the distribution of stunting prevalence and sanitation percentage maps, the recommended areas for priority intervention are Tambora, Sawah Besar, Johar Baru, Senen, Menteng, Jatinegara, Tebet, and Mampang Prapatan sub-districts. The recommended program to be carried out is sensitive interventions consisting of improving sanitation facilities and increasing knowledge and perceptions about sanitation. Improving sanitation facilities means increasing access to gooseneck latrines with septic tanks and access to clean water. Increasing knowledge and perception of the importance of sanitation to prevent stunting is carried out intensively and routinely through community activities and optimizing the role of community leaders.

Keywords: stunting, sanitation, sensitive intervention, spatial analysis, DKI Jakarta.

INTRODUCTION

Stunting is a form of growth failure that occurs over a long period. It can occur in toddlers due to growing up with limited access to food, health, and care. Stunting is also known as chronic malnutrition, although malnutrition is only one of the causes. (De Onis and Branca 2016) Stunting in toddlers is not only caused by a lack of nutritional intake. The framework for handling stunting published by the World Health Organization WHO states that apart from nutritional intake, stunting is also caused by the mother’s condition, environmental conditions, food and water security, and infection. (World Health Organization 2014) About 56% of nutritional problems are caused by poor hygiene and sanitation condition. (Hasanah and Susanti 2018)

The prevalence of stunting under five in DKI Jakarta in 2018 was 17.61% with a 95% confidence interval ranging from 14.27-21.63%. (Badan Penelitian dan Pengembangan Kesehatan 2019b) The report from the DKI Jakarta Provincial Health Office at the beginning of 2021 shows that there
are still several urban areas in DKI Jakarta that have stunting rates above 20%.

Acceleration strategy interventions in stunting reduction consist of specific interventions and sensitive interventions. Specific interventions address the direct causes of stunting, such as providing additional food supplements and managing malnutrition. Meanwhile, sensitive interventions are carried out to address the indirect causes of stunting, such as providing drinking water and sanitation, education, counseling, and increasing access to nutritious food for the community. (Ministry of National Development Planning 2020a).

The general objective of this study is to describe the incidence of infectious diseases and immunization coverage and their correlation with the incidence of stunting in children under five in DKI Jakarta Province in 2022 so that it can be used as a scientific reference in determining program priorities and areas of intervention so that the incidence of stunting in children under five decreases significantly. This research is expected to benefit researchers, academics in public health, and practitioners struggling to eradicate stunting, both from government institutions, NGOs (Non-governmental organizations), and society in general.

METHOD

This study uses a descriptive approach to present an overview of the percentage of sanitation and the prevalence of stunting in toddlers in DKI Jakarta in 2021 based on the sub-districts in 38 districts in DKI Jakarta. Data is displayed as a map to show distribution areas based on high, medium, and low categories. An overlay was made between the distribution map of the percentage of sanitation and the prevalence of stunting to determine the areas with the highest risk. Analysis was carried out on the area's characteristics obtained from the results.

Data on the prevalence of stunting under-fives and the percentage of household sanitation conditions by sub-district area for 2021 were obtained from data reported by the DKI Jakarta Provincial Health Office. Meanwhile, data on the percentage of access to drinking water based on the sub-district area for 2021 was obtained from data from the DKI Jakarta Provincial Public Works Office's report. To obtain this data, the researcher made a written request by writing to the relevant agency.

The researcher requests permission to use the data in writing so that conflicts of interest do not occur in the future. Suppose there is a conflict of interest at a later date. In that case, the researcher will communicate this to the Health Research Ethics Commission (KEPK) according to established procedures and resolve the conflict following Indonesian regulations.

RESULTS

Data on the prevalence of stunting shows that sub-districts in DKI Jakarta Province have stunting rates as low as 0.1% and as high as 3.6%. The average stunting rate in toddlers is 1.19% with a 95% CI between 0.89% - 1.48%. The median or median value is 1.1%, with a standard deviation of 0.89%. This variable has a skewness value of 0.958, which means it is skewed to the left. The Kolmogorov-Smirnov test value shows a value of p = 0.013, meaning the data distribution is abnormal.

Sanitation percentage data shows that the sub-districts in DKI Jakarta Province have the lowest percentage of proper sanitation at 76.8% and the highest at 99.4%. The average percentage of proper sanitation is 92.27%, with a 95% CI between 90.17% - 94.36%. The mean or median value is 94.4%, with a standard deviation of 6.38%. This variable has a skewness value of -0.931, skewed to the right. The Kolmogorov-Smirnov test value shows a value of p = 0.010, meaning the data distribution is abnormal. The stunting prevalence variable is divided into three categories: low, medium, and high. Regions with a stunting prevalence of 0.09-1.28% are included in the low category, areas with a stunting prevalence of 1.29-2.48% are included in the medium category, while areas with a stunting prevalence of 2.49-3.68% are included in the high category.

<table>
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<th>Variabel</th>
<th>Jumlah</th>
<th>Min-Max</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>95% CI Mean</th>
<th>Nilai p*</th>
<th>Skewness</th>
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<td>1.19</td>
<td>1.1</td>
<td>0.89</td>
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<td>Sanitasi</td>
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<td>92.27</td>
<td>94.4</td>
<td>6.38</td>
<td>90.17-94.36</td>
<td>0.010</td>
<td>-0.931</td>
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</tbody>
</table>

*Normality Test with Kolmogorov-Smirnov
Figure 1. Map of the Distribution of Stunting in Toddlers in DKI Jakarta Province in 2021

On the stunting distribution map, color differences can be seen where areas with darker colors have a higher prevalence of stunting than areas with lighter colors. This region is in the western and central parts. The areas with the highest prevalence of stunting are Cengkareng, Tambora, Sawah Bedar, and Mampang Prapatan sub-districts.

The variable percentage of proper sanitation is divided into three categories: low, medium, and high. Regions with a percentage of access to proper sanitation of 76.82-84.37% are included in the low category, areas with a percentage of access to proper sanitation of 84.38-91.93% are included in the moderate category, while areas with a percentage of access to proper sanitation of 91.94-99.49% are included in the high category.

Figure 2. Distribution Map of Sanitation Access in DKI Jakarta Province in 2021
The sanitation access distribution map shows the distribution of areas marked in darker colors for sub-districts with a lower percentage of access to sanitation than areas with lighter colors, so they are at risk of a higher stunting rate. This area is in the center and slightly to the west. Four sub-districts are classified as low sanitation: Menteng, Senen, Johar Baru, Tebet, and Jatinegara Districts.

This study's definition of proper sanitation refers to progress indicators of household access to healthy latrines, both permanent and semi-permanent, private and shared. Access to sanitation is said to be proper if they have used a gooseneck toilet and a septic tank for feces storage. (8) Even though DKI Jakarta is an urban area that is also the capital city of the Republic of Indonesia, this province still needs help realizing access to proper sanitation for all its citizens. Research conducted in 2021 states that the people of Jakarta are still unable to fully access healthy latrines due to limited land, economic constraints, as well as the habit of open defecation in rivers or seas. This study recommends sanitation management using fecal disposal facilities equipped with communal wastewater treatment. (9) The spatial analysis results show that the distribution pattern of areas with lower access to sanitation compared to other areas is in Jakarta's central and western areas. Besides, it also pictured the spatial pattern of areas with a higher prevalence of stunting than other areas in the central and western parts of the Jakarta area.

![Sanitation Access Distribution Map](image)

**Figure 3.** Comparison of Stunting and Sanitation Distribution Map
Researchers overlaid maps of the distribution of stunting and sanitation to see the combined risk of the two variables. This is done to facilitate the selection of priority areas through the visualization of map color gradations. Areas with the darkest color or darker than other areas are areas that are recommended to be priority areas for intervention.

Based on the map resulting from the overlay of sanitation and stunting variables, there are eight areas that have low access to sanitation compared to other areas. The eight areas are the sub-districts of Tambora, Sawah Besar, Johar Baru, Senen, Menteng, Tebet, Jatinegara and Mampang Prapatan. Researchers recommend that these areas become priority areas for sanitation interventions to reduce the incidence of stunting in DKI Jakarta. The eight priority areas are in four different administrative regions. Even though they are in different administrative areas, these eight sub-districts have one thing in common, which is that they are traversed by rivers. Tambora District is in the West Jakarta Municipal area. This district has an area of 5.4 km². To the north of Tambora District, it is bordered by Kali Angke. To the east, there is the Krukut River, while to the south, there is the Banjir Kanal River. (10)

Sawah Besar District is one of the sub-districts in Central Jakarta Municipality and has an area of 6.16 km². The Sawah Besar sub-district is traversed by the Ciliwung River. (11) Johar Baru District is in the administrative area of Central Jakarta Municipality. The total area of Johar Baru District is 2.37 km². This sub-district is traversed by the Sunter River. (12) Senen District is one of the sub-districts in the administrative area of Central Jakarta Municipality. This region has an area of 4.22 km². Senen District is bordered by the Ciliwung River to the west. (13) Menteng District is in the administrative area of Central Jakarta Municipality. This region has an area of 6.53 km². This district is traversed by the flow of the Ciliwung River to the south and east. (14) Jatinegara District is one of the sub-districts in East Jakarta Municipality and has an area of 10.25 km². The Jatinegara sub-district is bordered by the Ciliwung River to the west and is traversed by the Cipinang River and flood canals to the east. (15) Tebet District is in the administrative area of the South Jakarta Municipality. This region has an area of 9,035 km². Tebet District is bordered by the Ciliwung River to the north and east, and the Grogol River to the west. (16)

Mampang Prapatan District is one of the sub-districts in the administrative area of South Jakarta Madya Municipality. This district has an area of 7.73 km². Mampang Prapatan District is bordered by Mampang River and Cideng River to the east, and Krukut River to the west. (17)

**Sensitive Intervention Policy Recommendations**

The DKI Jakarta area, traversed by many rivers, has challenges in realizing one hundred percent access to sanitation for its citizens. Many DKI Jakarta residents still do not have a septic tank and prefer to dispose of their feces directly into
the river on the grounds that they have no money. Another reason that came out of the community was the unavailability of land to build a septic tank. (18)

The intervention program that can be carried out is the construction of septic tanks for residents. The limited land residents complain about can be overcome by building a communal septic tank as an alternative. In addition to increasing the percentage of using septic tanks as feces storage, it is also necessary to ensure that residents use goose-neck latrines. Using latrines without goose-neck pipes is essential to prevent fecal contamination through disease vectors. Increasing access to sanitation cannot be separated from the availability of clean water. Healthy latrines available for residents will function better if it is accompanied by clean water as a means of supporting hygiene and sanitation. Increasing access to clean water for residents is an essential intervention for improving the quality of sanitation in an area.

Research on the obstacles in creating an area free of open defecation states that there are differences in perceptions between residents who practice and those who do not practice open defecation regarding barriers to owning and using latrines. Both of them mentioned the cost factor as a barrier. However, groups of people who do not open defecation think that a lack of education is the cause of open defecation. In contrast, people who practice open defecation tend to blame the location where they live as the reason they do open defecation. (19)

After conducting further research, it was found that the cause of this lack of awareness was the need for more knowledge and the need for the role of community leaders. (20)

The necessary intervention is to increase education efforts to the community intensively and periodically regarding the importance of sanitation in reducing stunting rates. Education can be carried out not only by health workers but also by utilizing the nodes of community activities such as routine religious and social events. Education needs to be packaged in interesting activities and not only once. With education that is carried out regularly, it is hoped that the community will be increasingly motivated to improve health efforts for themselves and their immediate environment.

The role of community leaders is also important in educating and building community perceptions. Figures who can play a role are not only those with formal positions but also figures who are informally known as KOL (Key Opinion Leader) in the community. Formal figures can strengthen efforts to improve sanitation by making official rules and reward and punishment. Meanwhile, non-formal figures can direct the community through an interpersonal approach from heart to heart.

CONCLUSION

The sub-districts in DKI Jakarta Province have the lowest stunting rate of 0.1% and the highest 3.6%. The average stunting rate in toddlers is 1.19%, with a 95% CI between 0.89% - 1.48%. The sub-districts in DKI Jakarta Province have the lowest percentage of proper sanitation at 76.8% and the highest at 99.4%. The average percentage of proper sanitation is 92.27%, with a 95% CI between 90.17% - 94.36%. On the stunting distribution map, the sub-districts with a higher prevalence of stunting than other regions are in the western and central parts. This area is the sub-districts of Cengkareng, Tambora, Sawah Bedar, and Mampang Prapatan.

The sub-district areas with a lower percentage of access to sanitation compared to other areas, so they are at risk of a higher stunting rate, are located in the center and slightly to the west. Four sub-districts are classified as low sanitation: Menteng, Senen, Johar Baru, Tebet, and Jatinegara Districts. Based on the results of the overlay on the distribution of stunting prevalence and sanitation percentage maps, the recommended areas for priority intervention are Tambora, Sawah Besar, Johar Baru, Senen, Menteng, Jatinegara, Tebet, and Mampang Prapatan sub-districts.

The recommended program to be carried out is a sensitive intervention consisting of improving sanitation facilities and increasing knowledge and perceptions about sanitation. Improving sanitation facilities means increasing access to gooseneck latrines with septic tanks and access to clean water. Increasing knowledge and perception of the importance of sanitation to prevent stunting is carried out intensively and routinely through community activities and optimizing the role of community leaders, both formal and non-formal.

REFERENCES