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The Relationship Between Sanitation Facilities and Dengue Fever Incidents on Jl. Aman, Tanjung Balai City, Simardan Island

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ABSTRACT

The incidence of dengue fever is closely related to sanitation facilities that invite Aedes aegypti mosquitoes to breed and become a disease problem that always occurs every year, including in Tanjung Balai City, around 70 cases of people contracting dengue fever and this is an endemic area for dengue fever in 2023. This research aims to determine the relationship between sanitation facilities and the incidence of dengue fever on the Safe Road in Tanjung Balai City, Simardan Island. This research uses a quantitative approach with a cross-sectional method, the population in this study is the entire community on safe roads totaling 170 people and the total sample in this study is 60 people. Based on the results of the analysis, it was found that there was a relationship between garbage disposal (p value = 0.032) and water storage (p value = 0.015) with the incidence of DHF in Jalan Aman Kota Tanjung Balai Simardan Island. It is hoped that this research can provide awareness to the government and health workers to carry out outreach and supervision to the public regarding the importance of maintaining the sanitary conditions of the home environment in good condition.

Introduction

An environmental-based disease is a type of disease phenomena that affects a population that is closely associated, rooted, or tied to one. or more environmental elements in an area where the community resides or functions for a set amount of time. (Kumiasa, 2021).

One of the environmental-based diseases is Dengue Hemorrhagic Fever. DBD (Dengue Hemorrhagic Fever) is an infectious disease caused by the entry of the dengue virus into the body through the bite of the Aedes aegypti and Aedes Albopictus mosquitoes which can appear throughout the year.

DBD (Dengue Hemorrhagic Fever) is known as an endemic disease in society because the process of spreading is very fast in a region and has even increased throughout the world in the last decade (Kharisna, 2022). In 2023, dengue fever cases reached a record high, impacting over 80 countries throughout the WHO's regions. More than 6.5 million cases and more than 7,300 dengue-related deaths have been documented since the beginning of 2023 due to continuing transmission and an unanticipated surge in incidence. In 2023, there were the most recorded cases of dengue disease. There were 2,300 deaths and 4.5 million cases reported by the WHO Americas Region. Asia accounted for the majority of instances reported, with Bangladesh (321 000), Malaysia (111 400), Thailand (150,00), and Vietnam (369,000) having the highest numbers (Who, 2024).

Based on data from the North Sumatra Provincial Health Office in 2022, the number of dengue fever cases was 1,777 cases and in 2023 the number of dengue fever cases was 1,894 cases. The DHF incidence rate in North Sumatra Province is still relatively high, namely 57.2 per 100,000 population, where this figure has exceeded the national DHF incidence rate in 2022, namely 52 per 100,000 population (Ministry of Health 2023).

Based on data from the Central Population Data Statistics Agency, the number of dengue fever in the people of Tanjung Balai city is around 70 cases of people infected with dengue fever (BPS Tanjung Balai City 2023). This can be seen from the sanitation facilities of the coastal communities in the city of Tanjung Balai, such as throwing rubbish carelessly, so that there are blockages in drains or ditches caused by careless rubbish dumping, and the large number of water reservoirs which can be a factor in the development of mosquito vectors that carry dengue fever which is increasingly growing in the area. Based on this, it can be said that the incidence of dengue fever is strongly related to the sanitation of the home environment which invites the Aedes aegypti mosquito to breed.

According to Prasetyo (2018), respondents who have poor sanitation conditions can be 3.65 times more likely to suffer from dengue fever compared to having good sanitation conditions, supported by research by Chairil (2018) that this can play a role and influence the risk of dengue fever and is also supported by research. Herlina, H., & Husna, A., (2023) Environmental sanitation plays a major role in dengue fever. Environmental sanitation factors that can influence dengue fever include water reservoirs and waste disposal systems. Based on research by Dompas (2020) Respondents were 6.41 times more likely to have a reservoir that did not meet their needs suffer from dengue fever. Disposal sites or waste management that do not meet the requirements can also increase the risk of dengue fever (Arsyad, et al. 2020).

So based on this, researchers are interested in conducting research on renvironmental sanitation facilities with the incidence of dengue fever on Jalan Aman,

Simardan Island, Tanjung Balai City. The general objective of this research is whether there is a relationship between sanitation facilities and the incidence of dengue fever on the safe road in Tanjung Balai City, Simardan Island.

Method

This kind of study uses a cross-sectional methodology and a quantitative approach to measure the independent and dependent variables at the same time. The independent variable in this research is environmental sanitation, such as rubbish dumps and water reservoirs, while the dependent variable is the incidence of dengue fever This research was carried out on the Safe Road in Tanjung Balai City, Simardan Island, with the population in this research being all the people on the safe road who were registered in the local neighborhood head (Kepling) data of 170 people. The sample size was calculated using the Lameshow formula so that the results were 60 people. In this research, data collection methods were used through interviews using questionnaires.

Result and Discussion Characteristics

Respondent characteristics aim toidentify the special characteristics that respondents have, making it easier for authors to conduct research analysis. The characteristics of the respondents can be seen from the table below.

Table 1. Characteristics of Responden

Variable	Sum	%
Age		
18 - 30	35	58,3%
30 – 40	25	41,7%
Gender of Respondents		
Man	10	16,7%
Woman	50	83,3%
Education Level		
elementary school	10	16,7%
Junior high school	20	33,3%
Senior High School	30	50%
Work		
Fishermen	10	16,7%
Housewife	50	83,3%
Total	60	100%

Based on table 1 above, it showsthat most of the respondents' ages are in the age range of 18 – 30 years old as many as 35 (58.3%) people, the genderof the respondents is mostly in the female gender as many as 50 (83.3%),the most common level of education of the respondents is high school as manyas 30 (50%) based on occupation, the majority of respondents are unemployed or are housewives, amounting to 50 (83.3%) respondents.

Univariate Analysis

Univariate analysis was carried out to get an overview of the description of each variable in the study, the list analyzed was obtained from distribution, frequency and presentation.

Tabel 2. Distribution of Dengue Incidence Frequency on Jalan Aman, TanjungCity, Balai Pulau Simardan

Dengue incidence	Sum	%
No dengue	27	45%
dengue fever	33	55%
Total	**60**	**100%**

Based on table 2, it shows that respondents who suffer from dengue fever are 33 (55%) people and respondents who do not suffer from dengue are 27 (45%) people.

Table 3. Frequency Distribution of Respondent Waste Disposal Sites on Jalan Aman, Tanjung City, Balai Pulau Simardan

Landfill	Sum	%
Not Eligible	50	83,3%
Qualify	10	16,7%
Total	**60**	**100%**

Based on table 3 above, the results were obtained that of the 60 respondents, the majority or almost most of the respondents whose landfills did not meet the requirements, namely 50 respondents (83.3%).

Table 4. Frequency Distribution of Respondent Water Shelters on Jalan Aman, Tanjung City, Balai Pulau Simardan

Water Reservoir	Sum	%
Not Eligible	42	70%
Qualify	18	30%
Total	**60**	**100%**

Based on table 4 above, the results were obtained that of the 60 respondents, the majority or almost most of them Respondents whose water shelters do not meet the requirements, namely 42 respondents (70%).

Bivariate Analysis

Bivariate analysis is carried out to see and find out whether there is a relationship between landfills garbage, water reservoirs and home environmental conditions with the occurrence of dengue on the safe road of Tanjung City Balai PulauSimardan.

Table 5. Results of Analysis of the Relationship Between garbage dumps and Dengue Incidence on Jalan Aman, Tanjung City, Balai Pulau Simardan

	Garbage Dump		Dengue incidence				
	Dengue Fever		No dengue				
	Sum		P - value				
	n	%	n	%	N	%	
Ineligible	37	61.6	12	20,4	49	81,7	0,032
Qualified	4	6.7	7	11.7	11	18,3	
Total	41	68.3	19	31.7	60	100	

Based on table 5 above, it is known that of the 49 respondents whose garbage disposal sites do not meet the requirements, there are 37 (61.7%) respondents suffering from dengue fever and as many as 12 (20%) respondents do not suffer from dengue, while of the 11 respondents whose garbage disposal sites meet the requirements, there are 4 with the incidence of dengue fever on the safe road of Tanjung Balai city, Simardan island with p value = 0.032 < sigma = 0.05. (6.7%). respondents suffered from dengue and 7 (22.2%) respondents did not suffer from dengue. Based on the results of the chi square test, it shows that there is a relationship between the Waste Disposal Site.

Table 6. Results of Analysis of the Relationship Between Water Reservoirs and Dengue Incidence on Safe Streets, Tanjung City, Balai Pulau Simardan

Water Reservoir			**Dengue incidence**				
Dengue Fever			No dengue		Sum		P - value
	n	**%**	**n**	**%**	**N**	**%**	
Ineligible	39	65	10	20	49	81,7	0,015
Qualified	2	3.3	9	11.7	11	18,3	
Total	41	68.3	19	31.7	60	100	

Based on the table above, it is known that of the 49 respondents whose water shelters do not meet the

requirements, 39 (65%) respondents suffer from dengue and as many as 10 (20%) respondents do not suffer from dengue, while of the 11 respondents whose water shelters meet the requirements, 2 (3.3%) respondents suffering from dengue and as many as 9 (11.7%) respondents did not suffer from dengue. And based on the results of the chi square test, it shows that there is a relationship between the Water Reservoir and the incidence of dengue fever on the safe road of the city of Tanjung Pulau Balai, Simardan with p value = 0.015 < sigma =0.05

The Relationship between garbage dumps and Dengue Incidence

Based on the results of research conducted on 60 respondents, it is known that of the 49 respondents whose landfills are not There were 37 (61.7%) respondents suffering from dengue fever and as many as 12 (20%) respondents not suffering from dengue, while of the 11 respondents whose garbage disposal was eligible, 4 (6.7%) respondents suffered from dengue and 7 (22.2%) respondents did not suffer from dengue. Furthermore, Ha is accepted based on the chi square test results, which indicate a p value of 0.010 < p (0.05), indicating a correlation between the dengue outbreak and the waste disposal site.

This can happen because unqualified garbage disposal sites such as open and impermeable garbage cans or people who litter carelessly, of course, it can be a gathering place or as a breeding ground for vectors, one of which is mosquitoes, so it can allow mosquitoes that breed in respondents who have an unqualified garbage disposal system to enter the house and biting the occupants of the house.

The results of this study are in line with research conducted by Elisabeth et al. (2018) that there is a meaningful relationship between the waste disposal system and the incidence of dengue fever (Astuti, 2018). This research is also in line with the research of Khairiyah, N. (2020) which shows that landfills have a significant relationship with the incidence of dengue with a value (p-value=0.015).

The garbage disposal site in the environment of Tanjung Balai City, Simardan Island is not good, with there are still people who have garbage dumps that are not closed and waterproof and there are even many people who throw garbage carelessly in their yards, which of course the garbage around the community's home environment can cause waterlogging which can be a supporting factor against the occurrence of dengue disease.

The local community is also less to participate in mutual cooperation or work individually or carry out the 3M movement, namely burying used items or garbage that is no longer used, draining places where there is water, closing holes that can hold water to keep the environment clean and healthy.

With people who still do not have a qualified garbage disposal site and their behavior of still littering can certainly cause diseases such as dengue fever because the existence of waste in the home environment such as waste cans, bottles,

drums, used tires can be a breeding ground for Aedes aegypti mosquitoes because these used items can hold water or become aplace for waterlogging if waste management is not carried out properly and correctly because it will contribute as a breeding ground for Aedes aegypti mosquitoes which can cause dengue disease.

Therefore, to prevent or analyze the incidence of dengue disease, it is hoped that the community will have a qualified garbage disposal site and implement behaviors that do not litter and must carry out the 3 M movement, because the garbage disposal site is a
place that no less needs attention to prevent dengue.

The Relationship between Water Reservoirs and Dengue Incidence

Based on the results of the study conducted on 60 respondents, it was shown that of the 49 respondents whose water shelters did not meet the requirements, 39 (65%) respondents suffered from dengue and as many as 10 (20%) respondents did not suffer from dengue, while of the 11 respondents whose water shelters met the requirements, 2 (3.3%) respondents suffered from dengue and as many as 9 (11.7%) respondents did not suffer from dengue. Additionally, the Water Reservoir and the incidence of dengue fever on Tanjung Balai City's safe road, Simardan Island, are related, according to the findings of the chi square test, with p value = 0.015 < sigma a = 0.05.

The requirements for a good water shelter include draining the water reservoir which needs to be done regularly at least once a week or two weeks so that mosquitoes cannot breed in the place because based on Lagu research (2020) there is a relationship between draining water reservoirs and the presence of aedes aegypti mosquito larvae which can cause dengue. In addition, closing water reservoirs also plays an important role, water reservoirs that are at risk of dengue incidence are open landfills.

According to Gama (2018), houses that have a place to store water with more than 1 shelter will be at risk of contracting dengue because the more places to accommodate water, the greater the possibility of Aedes aegypti mosquitoes to breed.

Based on the results of observations, using more than 1 water tank for the reason of storing more water will make it easier to meet daily needs.

The relationship between the water storage system and the occurrence of dengue is also because most of the shelters are open, especially water reservoirs outside the house.

Based on the results of interviews and observations, it was shown that many respondents collected rainwater outside the house for daily needs in water reservoirs such as water barrels, buckets, drums and others and were not covered. A place to hold water that does not have a cover will make a good place for mosquitoes to breed. Because of course, a place to accommodate water that has a high risk of dengue transmission is a place to accommodate ends that do not have a cover so that mosquitoes

can easilymultiply.

The study's findings are consistent with the disgraceful research of Mawaddah et al. (2022), which founda link between the incidence of dengue and a water reservoir that did not fulfill standards.

Therefore, the most important factor that can be done in suppressing the spread of Aedes aegypti mosquitoes is to close all existing waterreservoirs so that mosquitoes cannot enter to lay eggs.

In addition, there are still some respondents who rarely drain and clean water reservoirs, such as pools, bathtubs, and others. To minimize mosquito breeding grounds, people are required to drain water reservoirs once a week so that mosquitoes cannot breed and mosquito eggs do not hatch and turn into adult mosquitoes that can carry dengue fever.

Conclusion

Based on the research conducted, it is known that there is a relationship between dengue fever and garbage dumps (p-value = 0.032) and water reservoirs (p-value = 0.015).

Thus, it can be concluded that garbage dumps and home environmental conditions have an important role in influencing dengue disease in the subjects of this study.

Suggestion

The researcher suggested that there is participation from local health centers/health workers such as holding counseling and treatment of the surrounding environment to increase public awareness of cleaning the surrounding environment, the need to hold activities that can improve environmental cleanliness.

For the next researcher, it is hoped that they can improve or complete the research by making improvements or adding variables that will be used, to find out what factors can cause dengue disease.

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