Analysis of Environmental Sanitation Factors with Dengue Hemorrhagic Fever Incidents at the Muara Dua Community Health Center UPTD, South OKU Regency

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Abstract—Dengue Hemorrhagic Fever (DHF) is a public health problem that continues to increase globally, especially in tropical and subtropical regions. The Aedes aegypti mosquito transmits this illness, which is affected by several socioeconomic and environmental variables. Based on data from the UPTD Muara Dua Community Health Center, South OKU Regency, the highest DHF cases compared to other community health centers. There were 34 incidents of DHF in 2022, 81 cases in 2023, and 57 fewer cases in 2024. The purpose of this research is to examine the connection between socioeconomic variables, environmental health variables, and the prevalence of DHF in the UPTD Muara Dua Community Health Center, South OKU Regency. The research design is quantitative with approach using cross sectional sample The research subjects were DHF sufferers and non- DHF sufferers in the Work Area. The UPTD of Muara Dua Health Center, OKUS Regency totaling 138 respondents (Purposive Sampling). Analysis data use chi square test at the level 95 % confidence. Results study This the Relationship Between Clean Water Sources and Dengue Fever Incidence at the Muara Dua Community Health Center UPTD, OKUS Regency with p-value 0,000. Relationship Humidity with the Incident of Dengue Hemorrhagic Fever at the Muara Dua Health Center UPTD, OKUS Regency with p-value 0.00 0. Connection Income Level with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency with p-value 0.00 0 . Connection Number of Families with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency with p-value 0.00 0. Conclusion from study This that is There is a Relationship Between Clean Water Sources and Dengue Fever Incidents at the Muara Dua Community Health Center UPTD, OKUS Regency. There is a Relationship Humidity with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency, Is There a Relationship? Income Level with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency, There Connection Number of Families with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency with.

Keywords— Dengue Fever, Clean Water Source, Humidity, Income Level, Family Size.

I. INTRODUCTION

Home environmental sanitation is the health status of an environment, encompassing living conditions, waste disposal, clean water availability, and the presence of water containers. Essentially, home environmental sanitation is a public health effort that emphasizes technical oversight of various environmental factors that influence or have the potential to influence human health (Palancoi et al., 2025) .

Dengue Hemorrhagic Fever (DHF) is a viral disease transmitted through the bite of a female mosquito of the *Aedes aegypti species*. This disease is characterized by sudden fever, headache, pain behind the eyes, nausea, and bleeding manifestations such as nosebleeds or bleeding gums, as well as the appearance of a reddish rash on the surface of the sufferer's body. The WHO states that DHF is widespread throughout the world, especially in tropical and warm climates. This disease is a global concern because dengue virus infection causes not only illness but also significant mortality in various countries. (Azzahra *et al* ., 2025) .

The impact of dengue fever infection on health is significant, ranging from symptoms of high fever, headache, and muscle pain to more severe complications such as organ damage, dengue shock syndrome (DSS), and even death. Beyond the health burden, dengue fever also has significant social and economic impacts on families and communities, including high medical costs, lost work time, and reduced life expectancy. Given the increasing incidence and severity of dengue fever globally and the high number of cases and deaths in Indonesia, effective interventions, particularly at the household level where the primary vector breeds, are urgent (Herdiansyah *et al* ., 2024) .

The Health Profile of South Sumatra Province for DHF has always increased from 2023-2024. In 2023 the number of DHF cases was 2,754 (23.83 %), in 2024 the number of DHF cases was 6,263 (39.02%), with an increase of 15.19% from 2023. Meanwhile, in South Ogan Komering Ulu Regency, DHF is the 3rd most common disease in the South OKU Regency Health Office. In 2023 the number of cases was 134 (20.55%) cases and data on Dengue Hemorrhagic Fever (DHF) cases in South OKU increased. In 2024, 152 (41.20%) cases of DHF were recorded in South OKU, there were 2 deaths due to DHF in South OKU in 2024 (South Sumatra

Provincial Health Office, 2025) .

According to data from the Muara Dua Community Health Center (UPTD) in South OKU Regency, the number of dengue fever cases is the highest compared to other community health centers. In 2022, there were 34 cases of dengue fever, while in 2023, 81 cases were reported, and in 2024, there was a decrease of 57 cases (Dinkes OKUS, 2025) .

Based on the description of the data above, the researcher is interested in researching " Analysis of Environmental Sanitation Factors with the Incidence of Dengue Hemorrhagic Fever at the UPTD Muara Dua Health Center, OKUS Regency".

II.   RESEARCH METHODS

The research design used in this study is quantitative with approach using cross sectional Darussalam et al., (2019) . Sample The research is DHF sufferers and not DHF sufferers in the Working Area of the Muara Dua Health Center UPTD, East OKUS Regency, totaled 138 respondents (Purposive Sampling). Analysis data Which used in research is a *chi square* test at the level 95% confidence.

III.   RESEARCH RESULT

1. Frequency Distribution of Dengue Fever Status

TABLE 1. Frequency Distribution of Dengue Fever Status

No	Category	Frequency (n)	Percentage (%)
1	Dengue Fever	69	50.0%
2	No dengue fever	69	50.0%
	Total	138	100%

Based on the Table 1. It can be seen that the DHF status of respondents at the research location who had DHF was 50 % and those who did not Dengue Fever 50%.

2. Frequency Distribution Clean Water Source

TABLE 2. Frequency Distribution Clean Water Source

No	Category	Frequency (n)	Percentage (%)
1	Not good	64	46.4%
2	Good	74	53.6%
	Total	138	100%

Based on Table 2, it can be seen that 53.6% of respondents have good sources of clean water and 46.4% of respondents have less good sources of clean water.

3. Frequency Distribution Humidity

TABLE 3. Frequency Distribution Humidity

No	Category	Frequency (n)	Percentage (%)	Category
1	Does not meet the Condition	74	53.6%	Does not meet the Condition
2	Fulfil Condition	64	46.4%	Fulfil Condition
	Total	138	100%	Total

Based on Table 3 it can be seen that Humidity Frequency Not Meeting Requirements is 53.6% and Humidity Meets Requirements is 46.4%.

4. Frequency Distribution Income Level

TABLE 4. Frequency Distribution of Income Levels

No	Category	Frequency (n)	Percentage (%)
1	Low	84	60.9%
2	Tall	54	39.1%
	Total	138	100%

Based on Table 4, it can be seen that the frequency of income for most respondents, 60.9%, has a low income and 39.1% has a high income.

5. Distribution Frequency Amount Family

TABLE 5. Distribution Frequency Amount Family

No	Category	Frequency (n)	Percentage (%)
1	Lots	47	34.1%
2	A little	91	65.9%
	Total	138	100%

Based on Table 5, it can be seen that the frequency of large families is 34.1% and having a small number of families is 65.9%.

6. The Relationship Between Clean Water Sources and Dengue Fever Incidences at the Muara Dua Community Health Center UPTD, OKUS Regency

TABLE 6. The Relationship Between Clean Water Sources and Dengue Fever Incidences at the Muara Dua Community Health Center UPTD, OKUS Regency

No	Water sources Clean	Dengue Fever		Total	p-value
		Yes	No		
1	Not good	52 (81.25%)	12 (18.75%)	64 (100%)	0,000
2	Good	17 (22.97%)	57 (77.03%)	74 (100%)	
	Total	69	69	138	

Based on table 6 can known that results study that is proportion respondents who Poor clean water sources that suffer from DHF are 81.25%, more big than proportion respondents who Good Clean Water Sources who suffer from DHF amounted to 22.97%.

Based on statistical tests *chi Square* obtained *p-value* **0,000** more small compared to α 0.05, meaning there is a relationship Significant Difference Between Clean Water Sources with Occurrence of Dengue Hemorrhagic Fever.

7. Connection Humidity with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency

TABLE 7. Connection Humidity with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency

No	Humidity	Dengue Fever		Total	p-value
		Yes	No		
1	Does not meet the Condition	59 (79.73%)	15 (20.27%)	74	0,000
2	Fulfil Condition	10 (15.63%)	54 (84.37%)	64	
	Total	69	69	138	

Based on table 7 is obtained results study proportion Humidity House respondents who do not meet the requirements The conditions for suffering from DHF are: 79.73 %. This is greater than the proportion of Home

Humidity of respondents who meet the requirements and suffer from DHF, which is 15.63% .

Based on statistical tests *chi Square* obtained *p-value* 0.000 is smaller than α 0.05, meaning there is a significant relationship between humidity and the incidence of dengue fever.

8. The Relationship Between Income Level and the Incidence of Dengue Fever at the Muara Dua Community Health Center UPTD, OKUS Regency

TABLE 8. The Relationship Between Income Level and the Incidence of Dengue Fever at the Muara Dua Community Health Center UPTD, OKUS Regency

No	Level Income	Dengue Fever		Total	p-value
		Yes	No		
1	Low	60 (71.73%)	24 (28.57%)	84	0,000
2	Tall	9 (16.67%)	45 (83.33%)	54	
	Total	**69**	**69**	**138**	

Based on Table 8 , the research results show that the proportion of respondents with low incomes who suffered from dengue fever was 71.73% . This is greater than the proportion of respondents with high incomes who suffered from dengue fever, which was 16.67% .

Based on statistical tests *chi Square* obtained *p value* **0.000** is smaller than α 0.05, meaning there is a significant relationship between income level and the incidence of dengue fever.

9. The Relationship Between the Number of Families and the Incidence of Dengue Fever at the Muara Dua Community Health Center UPTD, OKUS Regency

TABLE 9. The Relationship Between the Number of Families and the Incidence of Dengue Fever at the Muara Dua Community Health Center UPTD, OKUS Regency

No	Amount Family	Dengue Fever		Total	p-value
		Yes	No		
1	Lots	39 (82.98%)	8 (17.02%)	47	0,000
2	A little	30 (32.97%)	61 (67.03%)	91	
	Total	**69**	**69**	**138**	

Based on Table 9, the proportion of respondents with a large number of families who suffered from dengue fever was 82.98%. This is greater than the proportion of respondents with a small number of families who suffered from dengue fever, which was 32.97%.

Based on statistical tests *chi Square* obtained *p value* 0.000 is smaller than α 0.05, meaning there is a significant relationship between the number of families and the incidence of dengue fever.

IV. DISCUSSION

1. The Relationship Between Clean Water Sources and Dengue Fever Incidences at the Muara Dua Community Health Center UPTD, OKUS Regency

Research result show that proportion respondents who Poor clean water sources that suffer from DHF are 81.25%, more big than proportion respondents who Good Clean Water Sources that suffer from Dengue Fever amounted to 22.97%. Chi-Square analysis results *p-value*: 0.000 more small compared to α 0.05, meaning there is a relationship Significant Difference Between Clean Water Sources with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency.

The results of this study are in line with research conducted by Son, (2023) entitled Geographic Information System on Dengue Fever Cases in Sidoarjo Regency in 2019 which states that there is a Relationship between Clean Water Sources and Dengue Fever Incidences . Judging from the results of *the Chi-square* statistical test data analysis, the *p-value* was 0.00 1 < 0.05. The results of this study are also the same as the journal of Nur and Karniawati, (2024) entitled Government Strategy in Overcoming the Spread of Dengue Hemorrhagic Fever in Bandung City which states the results of *the p-value of* 0.000 < 0.05 means there is a Relationship Between Clean Water Sources and the Incidence of Dengue Hemorrhagic Fever . Also supported by research conducted by Kinansi and Pujiyanti, (2020) in the journal Balaba: Journal of Research and Development of Animal-borne Disease Control Banjarnegara which states there is a Relationship Between Clean Water Sources and the Incidence of Dengue Hemorrhagic Fever . Strengthened by research by Ernawati, Fajrianti and Yandra, (2024) Title: Analysis of Physical and Behavioral Environmental Factors on the Incidence of Dengue Hemorrhagic Fever, *p-value* 0.000 < 0.05 , the results of the study state that there is a Relationship Between Clean Water Sources and the Incidence of Dengue Hemorrhagic Fever .

Inadequate clean water sources often lead people to store water in various containers in and around their homes due to concerns about insufficient supplies. The availability of clean water for daily needs and proper management prevent it from becoming a breeding ground for the *Aedes aegypti mosquito*. Good management includes covering water reservoirs and regular draining. (Nisa et al., 2021). Diseases transmitted through water are called *waterborne diseases* or *water related disease*. The occurrence of a Disease certainly requires the presence of an agent and sometimes a vector. The *Aedes aegypti* mosquito generally prefers stagnant water collected in a certain place or vessel as a breeding place because the *Aedes aegypti mosquito* cannot lay eggs in stagnant water that is in direct contact with the ground. The preferred water for laying eggs is clear and clean water that is not contaminated by chemicals and organic materials, such as other water reservoirs (Putri & Ardiningrum, 2025) .

2. Connection Humidity with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency

From the research results obtained the proportion of Humidity in the homes of respondents who did not meet the requirements and suffered from DHF was 79.73 %. This is greater than the proportion of Humidity in the homes of respondents who met the requirements and suffered from DHF, which was 15.63%. The results of the Chi-Square analysis *p-value* : 0.000 is smaller than α 0.05, meaning that there is a significant relationship between Humidity and the

Incidence of Dengue Hemorrhagic Fever at the UPTD Muara Dua Health Center, South OKU Regency.

The results of this study are in line with research conducted by international studies in Bangladesh which showed that humidity significantly increases the incidence of Dengue Hemorrhagic Fever. *p-value* 0.001 < 0.05 means there is a significant relationship Higher humidity increases mosquito survival, feeding behavior, and overall vector activity, thereby accelerating the spread of dengue Alam *et al.*, (2025) . The results of this study are also the same as the conclusions of the journal Masjuwita et al., (2024) entitled Analysis of the Correlation of Air Humidity to the Dengue Fever Epidemic that Occurred in Bengkulu City. which states that *the p-value results are* 0.00 7 < 0.05, meaning there is a significant relationship between Air Humidity and the Dengue Fever Epidemic that Occurred in Bengkulu City. With The incidence of Dengue Hemorrhagic Fever. This is also supported by research conducted by Monintja *et al.* , (2021) in the journal Gaceta Sanitaria entitled *Analysis of temperature and humidity on dengue hemorrhagic fever in Manado Municipality,* which states that there is a relationship between humidity and dengue hemorrhagic fever. With Dengue Hemorrhagic Fever Incident. Strengthened by Yanto's research, (2022) The title of the Relationship of Climate to the Increase in Dengue Fever (DHF) Cases in Denpasar City , the results of the study stated that humidity influenced the increase in the number of Dengue Fever cases in Denpasar City in 2014-2019. The increase in humidity is related to the increase in the feeding patterns of *Aedes aegypti mosquitoes* which affects the increase in the mosquito population in Denpasar City. Humidity also affects the development cycle, mating age, and distribution.

Optimal humidity creates environmental conditions that support the *Aedes mosquito life cycle*, including egg survival, larval development, and oviposition, and accelerates viral replication within the mosquito. However, it is important to note the complexity of this relationship. A national study in Bengkulu, Indonesia, reported that humidity, along with other climate variables, generally showed no significant correlation with the total number of dengue cases from 2012 to 2021 (p > 0.05) (Khairinnisa et al., 2025) . This contrast suggests that while humidity is a recognized factor in dengue transmission, its impact may be highly context-specific and modulated by complex interactions of other local climate variables (e.g., temperature, rainfall, wind speed) as well as unique ecological conditions. This implies that a simple and universal linear relationship between humidity and dengue incidence may not always exist. Instead, predictive models and public health strategies must consider the complex multifactorial interactions between climate, local environment, and potential human behavioral factors, highlighting the challenges of generalizing the climate-dengue relationship across geographic regions. *Lagged effects* also reported in some studies (e.g., humidity a month or two earlier can have different effects) further underscore this complexity, suggesting that the relationship is dynamic and not always straightforward (Alam et al., 2025) .

3. Connection Income Level with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency

From the research results it was found that the proportion respondents ' income level Low who suffer from dengue fever, namely 71.73%. More big than proportion respondents with high income levels who suffered from dengue fever were 16.67%. The results of the Chi-Square analysis are *p-value* **0,000** more small compared to α 0.05, meaning there is a relationship significant between Income Level with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency.

are in line with the research of Yustati et al., (2024) entitled Analysis of Factors Associated with Dengue Hemorrhagic Fever (DHF) . The results of the study with *A p-value of* 0.001 < 0.05 indicates a strong correlation between income levels and dengue fever incidence. This study's findings echo those of Akbar et al. (2023) in a journal entitled Dengue Hemorrhagic Fever (DHF) in Southeast Asia in 2022 (Meta-Analysis Study), which states that there is a significant correlation between income levels and dengue fever incidence. This is further supported by Watts et al. (2020). with the title Influence of socioeconomic, demographic, and climate factors on the regional distribution of dengue in the United States and Mexico and Bestari et al. (2020), which demonstrated a strong correlation between income level and the prevalence of dengue fever.

Income low often correlated with quality more housing bad (for example , lack of gauze mosquitoes , ingredients less buildings long lasting which can become nest mosquitoes), access that is not adequate to proper sanitation and infrastructure management waste (causes more Lots point unused water collection managed and place reproduction), capacity limited finances For action protection personal (for example, *repellent* mosquitoes , mosquito nets , control pest professional), and potential reduced access to education health and services proper prevention time. (Belau et al., 2025) . This creates a complex network of indirect causal pathways, making low-income populations disproportionately vulnerable to dengue fever incidence. However, it should be noted that some studies have shown nuances in this relationship. Although poverty has long been considered a determining factor in dengue fever occurrence and severity, a national study showed that there is not always a significant relationship between economic level and disease severity (Siti C. Windhasari, David S. Waworuntu, 2024) .

4. Connection Number of Families with Dengue Hemorrhagic Fever Incident at the Muara Dua Community Health Center UPTD, OKUS Regency

From the results study proportion respondents who Amount Many families suffer from dengue fever, namely 82.98%. More big than proportion respondents who Amount Family Few people suffered from dengue fever, namely 32.97%. Chi-square analysis results *p-value*: more than 0.000 small compared to α 0.05, meaning there is a relationship significant between Number of Families with Dengue Hemorrhagic Fever Incident at the Muara Dua Community

Health Center UPTD, OKUS Regency.

The results of this study are in line with research conducted by Ayuningtyas, (2023) entitled Analysis of the Relationship between Population Density and the Incidence of Dengue Hemorrhagic Fever (DHF) in West Java Province . which states that there is a relationship between Population Density and Dengue Hemorrhagic Fever (DHF) in West Java Province. With Dengue Hemorrhagic Fever Incidence. Based on the results of *the Chi-square* statistical test data analysis, the *p-value* was 0.00 < 0.05. The results of this study are also the same as the conclusions of the journal Shofifah et al., (2023) entitled Distribution of Dengue Hemorrhagic Fever Based on Population Density, Rainfall, and Larvae Free Rate (ABJ) in Madiun City. which states that *the p-value results* are 0.00 0 < 0.05, meaning there is a relationship between Population Density and Dengue Fever. With The incidence of Dengue Hemorrhagic Fever. This is also supported by research conducted by Putri (2025) in the Tambusai Health Journal which states that there is a relationship between population density and With Dengue Hemorrhagic Fever Incidence . Strengthened by Girsang et al., (2024) entitled Population Density and Dengue Hemorrhagic Fever Incidence in Medan City which states that there is a relationship with Population Density With Occurrence of Dengue Hemorrhagic Fever.

Family large and higher risk of dengue fever tall is indicator clear that density, both at the level House ladder and as proxy for density more population road, acting as accelerator strong transmission. The more Lots individuals who live close together in One House stairs , increasingly big opportunity for mosquito Infected *Aedes* For find host man new vulnerable (Khan et al., 2025) . Apart from that , family big often implies movement and interaction more human often between House stairs (for example , visiting relatives), which can facilitate spread of the virus spatially by humans and infected mosquitoes (Stoddard et al., 2013). This is a fundamental epidemiological principle where increasing host density directly increases the rate of pathogen transmission. Beyond increased human-vector contact, high population density (as inferred from large family size) is often correlated with and exacerbates environmental challenges, particularly in urban or peri-urban areas (Wijayanti & Purwani, 2024) .

V. CONCLUSION AND SUGGESTIONS

Based on results study Which has done so can in draw conclusions as following:
1. There is a Relationship between Clean Water Sources and the Incidence of Dengue Fever at the UPTD Muara Dua Health Center, OKUS Regency with *a p-value* of 0.000 .
2. The occurrence of dengue fever at the UPTD Muara Dua Health Center in the OKUS Regency is correlated to humidity, as indicated by a p-value of 0.000.
3. There is a relationship between income level and the incidence of dengue fever at the UPTD Muara Dua Health Center, OKUS Regency with *a p-value* of 0.000.
4. There is a Relationship between the Number of Families and the Incidence of Dengue Hemorrhagic Fever at the UPTD Muara Dua Health Center, OKUS Regency with *a p-value* of 0.000 .

Based on results study Which has done so suggestions as following:
1. Therefore, access to clean water should be improved and the house should be kept clean, such as draining and cleaning water reservoirs (such as bathtubs) at least once a week. Close water reservoirs and drains tightly.
2. Keep the house clean, avoid piling up used items that can collect water.
3. Actively participate In the PSN 3M Plus program, get used to keeping the environment around the house clean, bury unused used items, drain the bathtub and water reservoirs regularly and use mosquito nets when sleeping, maintain optimal temperature and humidity levels in and around the house by installing wire mesh, increase lighting and ventilation .
4. Integrate household sanitation improvement programs as a core strategy for dengue prevention. Provide resources and technical assistance for community-level intervention programs.
5. Advocacy to local governments to support and allocate budget for sustainable sanitation programs.

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