**TRANSPUBLIKA INTERNATIONAL RESEARCH IN EXACT SCIENCES (TIRES)**

# RELATIONSHIP BETWEEN MOSQUITO NEST ERADICATION (PSN) AND THE PRESENCE OF AEDES AEGYPTI LARVAE IN GUNONG MANTOK VILLAGE, PANGA SUB-DISTRICT, ACEH JAYA DISTRICT

**Srie Wahyuni[1], Juliana[2*]**
[1-2]Universitas Abulyatama, Aceh Besar
E-mail: [1)] sriewahyuni3139@gmail.com, [2)] juliya.tnn@gmail.com

***Abstract***

*Dengue hemorrhagic fever (DHF) remains a significant public health problem, especially in tropical and subtropical regions, including Indonesia. The disease is transmitted by Aedes aegypti and Aedes albopictus mosquitoes, which breed in environments with standing water. Community behavior and behavior in conducting Mosquito Nest Eradication (PSN) greatly affect the spread of this disease. This study aims to evaluate community behavior related to mosquito nest eradication and its association with dengue outbreaks in Gunong Mantok Village, Panga District, Aceh Jaya Regency. This study used a quantitative approach with a cross-sectional method, which allows data collection at a single point in time to understand the prevalence of PSN behavior and factors that contribute to the spread of DHF. The results showed that the majority of respondents, 68 people (80%), did not conduct routine eradication of larvae. Only 17 respondents (20%) reported that they did. This low rate reflects the lack of awareness and knowledge of the community regarding the importance of PSN in preventing the spread of DHF. The results of this study highlight the importance of increasing community awareness and education about PSN as a preventive measure to control the spread of DHF. The government and related parties need to conduct more intensive interventions, such as more vigorous health campaigns and sustainable PSN programs. Hopefully, with increased awareness and active participation of the community, dengue cases in Gunong Mantok Village can be significantly reduced, so that public health can be better maintained.*

***Keywords:*** *Dengue, Larvae, Aedes Aegypti*

## 1. INTRODUCTION

Dengue hemorrhagic fever (DHF) is still a public health problem, especially in tropical and subtropical areas. DHF is an acute disease caused by a virus transmitted by female Aedes aegypti and Aedes albopictus mosquitoes (Akbar & Syaputra, 2019). Data from around the world shows that Asia ranks first in the number of dengue fever patients each year. Dengue fever is endemic in tropical and subtropical regions. WHO (2009) noted that from 1968 to 2009, the highest number of dengue cases in Southeast Asia occurred in Indonesia (Muda & Haqi, 2019).

There are an estimated 390 million dengue virus infections worldwide each year, of which 96 million are symptomatic. About 70% of dengue infections occur in Asia. Up to 3.9 billion people are at risk of contracting the dengue virus. In Indonesia, the incidence of dengue fever has increased over the past 50 years, from 0.05 cases per 100,000 people in 1968 to 22.55 cases per 100,000 people in 2017 (Hutapea et al., 2022). Dengue fever is an infectious disease caused by the Dengue virus and transmitted through the bite of the Aedes aegypti mosquito. DHF always increases at the beginning of the rainy season

and causes Extraordinary Events (KLB) in several regions in Indonesia. DHF has been a serious public health problem for the past 45 years, with the disease spreading to 33 provinces and 436 districts (88%) of the total 497 districts in Indonesia (Sari & Putri, 2019).

Indonesia is one of the countries with the highest number of infected people in Southeast Asia. In 2018, there were 65,602 dengue cases reported and this number increased to 138,127 in 2019. The number of dengue deaths also increased from 467 to 919 in 2019 compared to 2018. In 2019, the dengue incidence rate was 51.53 per 100,000 population (Kemenkes RI, 2019). The Ae. aegypti mosquito has two subspecies, Ae. aegypti queenslandensis and Ae. aegypti formosus. The first subspecies lives freely in Africa, while the second subspecies lives in the tropics where it is known to transmit the dengue virus. The second subspecies is more dangerous than the first (Knowlton et al., 2009).

The emergence of DHF incidence, due to the agent (dengue virus), susceptible hosts and an environment that allows the growth and breeding of Aedes spp. mosquitoes. In addition, it is also influenced by predisposing factors including population density and mobility, housing quality, distance between houses, education, occupation, attitude to life, age group, ethnicity, susceptibility to disease, and others (Candra, 2010). Community behavior and PSN behavior towards dengue hemorrhagic fever (DHF) is one of the risk factors for dengue outbreaks. Behavior is influenced by knowledge and information handling (Ramdhani et al., 2022). Counseling is also an activity carried out to prevent dengue fever and aims to change community behavior, including increasing knowledge, attitudes and behavior, providing learning experiences and creating situations for individuals, groups and communities. Counseling is basically a process of communication and behavior change through education (Bestari & Ramanda, 2020).

Efforts to prevent and control dengue fever transmission are to prevent Aedes aegypti mosquito bites through PSN 3M Plus activities, larviciding and spraying. In control efforts, the Ministry of Health continues to monitor and implement dengue fever. We tend to think that fogging is still the right way to fight dengue fever. People believe that fogging is one of the best options and solutions to combat dengue attacks. In reality, fogging or spraying only lasts two weeks after fogging, and people are no longer bitten by mosquitoes. Fogging only kills adult mosquitoes. Mosquito eggs that are not killed develop into adults (Kurniawati et al., 2020). To achieve the expected results, PSN activities must be carried out comprehensively and continuously. The target is all areas where mosquitoes are found, such as household water pools and natural water pools (Sutriyawan, 2021).

3M PSN program: Draining/cleaning, Covering, and Reusing or recycling used items that can become breeding grounds for mosquitoes carrying dengue fever. The pluses include spraying larvicide powder on reservoirs, using mosquito repellent, using mosquito nets when sleeping, keeping fish that catch mosquito larvae, as well as improving lighting in the house and avoiding the habit of hanging clothes in the room where mosquitoes rest (Sutriyawan et al., 2022). If this activity is done well, it will be able to reduce mosquito breeding, at least the larva-free rate in periodic larva checks is more than 95%.

The increase in dengue cases is still related to the community's action on the poor implementation of PSN. Although this figure is clearly still far from the larval freedom

target set by the government in 2015, which is above 95%, the field conditions show larval freedom of 52.54%. Given that there is currently no vaccine or drug to overcome dengue virus infection, this PSN prevention measure is considered an effective prevention effort (Hutapea et al., 2022). The first observation that has been carried out obtained the results that the presence of larvae is still a lot in Gunong Mantok Village. This can be caused by the lack of awareness of the dangers of mosquito larvae.

## 2. RESEARCH METHODS

This study is a quantitative study with a cross-sectional or cross-sectional approach and also observational. This assessment was carried out by interviewing respondents and also looking directly at the situation of the presence of larvae in the area. This research was conducted in Gunong Mantok Village, Panga District, Aceh Jaya Regency. This research was conducted on December 21, 2023. In this study the data used is primary data. Primary data were obtained from direct interviews with the people of Gunong Mantok Village by providing research questionnaires in the form of questionnaires related to the eradication of larvae. The data presented in this study are in the form of tables.

## 3. RESULTS AND DISCUSSION

**Table 1. Characteristics of Respondents Based on Gender**

| Gender | Frequency | Percentage |
|---|---|---|
| Male | 58 | 68,2% |
| Female | 27 | 31,8% |
| Total | 85 | 100% |

The majority of respondents in this study were men with a frequency of 58 respondents (68%), and women totaled 27 respondents (31.8%) out of a total of 85 respondents (100%).

**Table 2. Characteristics of Respondents Based on Age**

| Age | Frequency | Percentage |
|---|---|---|
| <60 Years | 51 | 60% |
| >60 Years | 34 | 40% |
| Total | 85 | 100% |

Based on table 2. The characteristics of respondents in this study are categorized into two, namely under 60 years, 51 (60%) respondents and over 60 years, 34 (40%) respondents.

**Table 3. Characteristics of Respondents Based on Age**

| Jobs | Frequency | Percentage |
|---|---|---|
| Self-employed | 28 | 32,9% |
| Housewife | 14 | 16,5% |
| Farmer | 39 | 45,9% |

| | | |
|---|---|---|
| Civil Servant | 4 | 4,7% |
| Total | 85 | 100% |

Table 3 shows that the majority of respondents' occupations are farmers totaling 39 (45.9%) respondents, followed by self-employed with 28 (32.9%) respondents, housewives totaling 14 (16.5%) respondents and civil servants totaling 4 (4.7%) respondents.

**Table 4. Characteristics Based on Education Level**

| Education level | Frequency | Percentage |
|---|---|---|
| Elementary | 44 | 51,8% |
| Junior High | 16 | 18,8% |
| Senior High | 23 | 27,1% |
| Graduate | 2 | 2,4% |
| Total | 85 | 100% |

Table 4 shows that respondents with the majority of education levels are elementary school graduates with 44 (51.8%) respondents, junior high school with 16 (18.8%) respondents, high school with 23 (27.1%) respondents and college graduates with only 2 (2.4%) respondents out of a total of 85 (100%) respondents.

**Table 5. Characteristics of Respondents on Larvae Eradication**

| Flick Eradication | Frequency | Percentage |
|---|---|---|
| Yes | 17 | 20% |
| No | 68 | 80% |
| Total | 85 | 100% |

Based on Table 5, it can be concluded that the majority of respondents did not eradicate larvae with a frequency of 68 (80%) respondents and respondents who eradicated larvae only amounted to 17 (20%) respondents out of a total of 85 (100%) respondents. This is in line with the researcher's initial observation were based on the results of the initial observation it was stated that there were still many larvae in the gutters, bathtubs and water reservoirs in the community area of Mantok Village, Panga District, Aceh Jaya Regency. The results also show that the majority of people do not eradicate larvae, this can be based on the lack of application of clean and healthy living behavior (PHBS) in the community which causes the presence of Aedes Aegypti larvae to still be a lot, this can cause dengue if not prevented from now on.

The community also does not apply Mosquito Nest Eradication (PSN) behavior, which causes the presence of larvae to still be found in many residential areas. The community does not implement the 3M Plus Method, which includes three main steps, namely "Draining" (cleaning water reservoirs), "Closing" (tightly closing water reservoirs), and "Reusing" (recycling used items that have the potential to become mosquito breeding grounds).

Other activities include planting mosquito-repellent plants, finding reservoirs, raising mosquito larvae-eating fish, using anti-mosquito sprays, installing wire mesh on windows, and working with ventilation to keep the environment clean. To effectively

prevent the spread of dengue fever, these measures must be implemented regularly and require active community participation. In this study, it was found that there was a significant relationship between PSN measures and the presence of Aedes mosquito larvae. The presence of Aedes mosquito larvae in this study was found to be more prevalent among those who lacked PSN measures.

## 4. CONCLUSION

The level of awareness and behavior of the community is still lacking towards eradicating mosquito nests and larvae, causing the presence of many larvae in Gunong Mantok Village, Panga District, Aceh Jaya Regency. This study showed a significant relationship between mosquito nets eradication and the presence of larvae and found that many people still do not perform PSN and eradicate larvae. The government and local health center officials should routinely conduct counseling to the community to increase public awareness of the dangers of mosquito larvae that cause dengue. The behavior of people who are less aware of this can be improved through useful activities such as gotong royong every week.

## REFERENCES

Akbar, H., & Syaputra, E. M. (2019). Faktor risiko kejadian demam berdarah dengue (DBD) di Kabupaten Indramayu. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, *2*(3), 159–164.

Bestari, R. S., & Ramanda, F. F. (2020). *Penyuluhan Kesehatan tentang Pemberantasan Sarang Nyamuk (PSN) Demam Berdarah Dengue (DBD) Berpengaruh terhadap Tingkat Pengetahuan dan Sikap Siswa Sekolah Dasar (SD)*.

Candra, A. (2010). Demam berdarah dengue: Epidemiologi, patogenesis, dan faktor risiko penularan. *ASPIRATOR-Journal of Vector-Borne Disease Studies*, *2*(2).

Hutapea, E. S., Balatif, R., & Siahaan, L. (2022). Hubungan Pemberantasan Sarang Nyamuk Dengan Keberadaan Aedes Spp. Sebagai Vektor Penyakit Demam Berdarah Dengue. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*, *8*(2), 68–73.

Knowlton, K., Rotkin-Ellman, M., & Soloman, G. (2009). *Mosquito-Borne dengue fever threat spreading in the Americas*. Natural Resources Defense Council.

Kurniawati, R. D., Sutriyawan, A., Sugiharti, I., Supriyatni, S., Trisiani, D., Ekawati, E., Verano, V., Cahya, A. A., Astrid, A., & Sony, S. (2020). Pemberantasan sarang nyamuk 3M plus sebagai upaya preventif Demam Berdarah Dengue. *JCES (Journal of Character Education Society)*, *3*(3), 563–570.

Muda, A. S., & Haqi, D. N. (2019). Determinan yang berhubungan dengan keberadaan jentik di kelurahan Rangkah buntu, Surabaya. *Jurnal PROMKES*, *7*(1), 22.

Ramdhani, A. N., Ernawati, K., Jannah, F., Rizon, J. M. E., Abdusyakur, A. F., Batubara, L., & Tunru, I. S. A. (2022). Pengaruh Penyuluhan DBD Dengan Media Video Terhadap Pengetahuan Mayarakat di Kampung Kesepatan, Cilincing Jakarta Utara. *Majalah Sainstekes*, *9*(1), 23–31.

Ri, K. (2019). Profil kesehatan indonesia. *Pusat Data Dan Informasi Kementrian*

*Kesehatan RI*.
Sari, T. W., & Putri, R. (2019). Pemberantasan Sar ang Nyamuk 3M Plus terhadap Kejadian Demam Berdarah Dengue di Puskesmas Payung Sekaki Kota Pekanbaru. *Jurnal Epidemiologi Kesehatan Indonesia*, *3*(2).
Sutriyawan, A. (2021). Pencegahan Demam Berdarah Dengue (DBD) Melalui Pemberantasan Sarang Nyamuk. *Journal of Nursing and Public Health*, *9*(2), 1–10.
Sutriyawan, A., Darmawan, W., Akbar, H., Habibi, J., & Fibrianti, F. (2022). Faktor yang Mempengaruhi Pemberantasan Sarang Nyamuk (PSN) Melalui 3M Plus dalam Upaya Pencegahan Demam Berdarah Dengue (DBD). *Jurnal Ilmu Kesehatan Masyarakat*, *11*(01), 23–32.

## Copyrights