

DENSITY OF AEDES SP LARVAE IN PINANG MERAH URBAN VILLAGE

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ABSTRACT

Background: Dengue fever is an endemic and a global problem in over 100 countries. According to the Directorate of Disease Prevention and Control of the Indonesian Ministry of Health's publication data from 2023 until August, 57,884 dengue cases were reported, with 422 deaths. The national ABJ has not reached the target, so it is necessary to observe vectors at the larval stage to determine the distribution, mosquito density, the primary habitat of larvae, and the alleged risk of transmission. This research aimed to determine the density of the Aedes population through indicators such as the House Index, Container Index, Breteau Index, and Density Figure.

Method: This research was quantitative descriptive with a cross-sectional method that describes the density of Aedes mosquito larvae according to HI, CI, and BI indicators. The research samples amounted to 160 houses. The sampling technique used proportional sampling.

Result: The results of this research showed that the House index was 36%, the Container Index 23.21%, and the Breteau Index 52%, resulting in a Density Figure of 5.6, which means that the Pinang Merah Village area is a high-risk area (red zone) so that immediate vector control is needed, considering that the ABJ obtained is still far below the standard of 64%.

Conclusion: In conclusion, it is necessary to implement dengue vector control in Pinang Merah Village so that ABJ can increase and reduce the status of mosquito larvae density in the area. It is recommended that the community starts to carry out PSN actively, and government attention is needed to increase public awareness of mosquito nets eradication efforts.

Keywords: DHF, Larvae, Aedes aegypti, Density Figure, House Index, Container Index, Breteau Index.

INTRODUCTION

Hemorrhagic Fever (DHF) is a global problem that has been endemic to more than 100 countries, especially in medium-sized countries. Dengue Hemorrhagic Fever has infected more than 100 million lives worldwide, where 500,000 cases of dengue fever require hospital treatment. As for mortality due to dengue fever, which occurs on a global scale, reaching 22,000 cases of death every year. The recent prevalence of DHF cases throughout the world continues to experience a drastic increase. As much as 40% of the world's population is at risk of infection (Lesmana, 2020).

Hemorrhagic fever (DHF) or dengue hemorrhagic fever (DHF) is a disease caused by the dengue virus transmission through bite mosquito Aedes sp. Dengue Hemorrhagic

Fever (DHF) was discovered in Indonesia for the first time in Surabaya in 1968. As many as 58 people were infected, and 24 of them died. The death rate / Case Fatality Rate caused by this disease is 41.3%, and since then, dengue fever has spread throughout Indonesia (Prasetyowati, 2017). Generally, three contributing factors are essential in DHF endemicity: host (human), vector (Aedes aegypti and Aedes albopictus), and environment. Aedes sp. mosquitoes reproduce on artificial media, such as cans, bottles, drums, bathtubs, gutters, roof drains, or places for drinking birds. The preferred type of water as a medium for laying eggs is clear water, which is not contaminated directly with land. Prevention of Dengue Hemorrhagic Fever disease will depend heavily on control from vectors (Fahri, 2022). Dengue fever is also related directly to society

and the environment, possibly enhancing widespread transmission. Enhancement aligns with enhancement displacement and density of residents in endemic areas (Kumara, 2020).

Based on data from the Jambi City Health Office 2021, the Alam Barajo sub-district occupies the highest dengue fever cases in Jambi City, with a CFR of 10%. In 2022, Alam Barajo sub-district will also occupy the top 3 positions, recording as many as 40 cases of dengue fever in the work area Kenali Besar and Rawasari Community Health Centers with a CFR of 4.2% (Jambi City Health Office, 2022). In 2023, Kec. Barajo Nature returns to occupy position first with an enhancement in dengue fever cases to up to 53 people (Dinkes, 2023). In 2023, there will be 2 Community Health Centers in the district. Alam Barajo, recorded as typical of the highest dengue fever in this region, has 31 Kenali Besar Community Health Centers specialties and Puksemas Rawasari—22 specialties.

The profound goal of this research is to know the index flick mosquito as vector disease fever Dengue Blood (DHF) in Pinang Merah sub-district via calculation density flick *Aedes sp* mosquito, as follows:

1. To find out the House Index (HI) of the larva *Aedes sp* mosquitoes in Pinang Merah Village.
2. To know the Container Index (CI) of the larva *Aedes sp* mosquitoes in Pinang Merah Village.
3. To get more information on the Breteau Index (BI), flick *Aedes sp* mosquitoes in Pinang Merah Village.
4. For the density/density figure (DF) of flick mosquitoes in Pinang Merah Village,
5. For now, ABJ value (Free Number Jentik) in Pinang Merah Village

Based on this background, the researcher is interested in doing research entitled "Density Flick *Aedes sp* mosquitoes in Pinang Merah Village.

METHODS

This research is descriptive quantitative with a cross-sectional method that describes the density of the *Aedes* mosquito and how it complies with HI, CI, and BI indicators until research totaling 160 houses. The retrieval technique sample uses proportional sampling.

RESULTS AND DISCUSSION

Based on the results, observations carried out in the Pinang Merah Subdistrict area at RT 01 to RT 10 found several place water reservoirs as follows:

Table 1. Distribution Frequency Existence Flick Based on Jensi Kontainer in Pinang Merah sub-district

Container Type	Variable	Flick				Amount	%
		There is	%	There isn't any	%		
Controllable sites	Bathtub water	20	38,4	92	53,4	112	50,0
	Storage tank (drum)	8	15,3	30	17,4	38	17,0
	Well	0	0,0	24	14,0	24	10,7
	Flower pot	0	0,0	17	9,9	17	7,6
	Used bottles	9	17,3	4	2,3	13	5,8
Disposable sites	Used cans	7	13,5	2	1,2	9	4,0
	Used fires	2	3,9	2	1,2	4	1,8
	Used bucket	6	11,6	0	0,0	6	2,7
Under controllable sites	Fish pond	0	0,0	1	0,6	1	0,4
Amount		52	100	172	100	224	100

1. House Index (HI)

House Index (HI) is the percentage between houses with found flick and all-over inspected houses. HI, more describe the breadth of mosquitoes that spread in an area. Based on inspections of 100 house respondents, as many as 36 houses had positive flick, and 64 houses had No found (-) larvae. So, HI is obtained by 36% based on the HI formula under This:

$$\begin{aligned}
 HI &= \frac{\text{Number of homes that tested positif for larvae}}{\text{Number of houses inspected}} \times 100\% \\
 &= \frac{36}{100} \times 100\% \\
 &= 36\%
 \end{aligned}$$

All of the samples taken after Data processing is 36%, namely 100 houses inspected and 36 houses positive for *Aedes* mosquito. According to WHO in Lesmana and Halim (2020), an area considered risky is the spread of dengue fever if HI > 10% (more significant than 10%). Based on the table, the Pinang Merah sub-district included tall risk areas Because the HI indicator is at DF 5.

2. Container Index (CI)

Container Index (CI) is the percentage of found containers flicked and the number of inspected containers. CI shows a container as a place for the reproduction of *Aedes* sp larvae. Based on Table 4.1 above, of the 224 containers examined, 52 containers (+) were found to flick, and 172 containers (-) were not found to flick, so a CI of 23.21% was found to be the appropriate CI formula.

$$CI = \frac{\text{Number of containers are larva positive}}{\text{Number of containers inspected}} \times 100\%$$

$$= \frac{52}{224} \times 100\%$$

$$= 23.21\%$$

The *container index* value obtained is 23.21%, with several positive containers, as many as 52 of 224. The dominant container is type *controllable sites*, i.e., bathtub and disposable site types bottles are used

3. Breteau Index (BI)

The *Breteau Index* (BI) is the amount of positive water reservoir or container flick out of 100 houses inspected. BI describes density density and distribution vector in a region. Based on Table 3.1, the number of positive containers flicks as many as 52, so BI was found to be 52% appropriate BI formula.

4. Density Figure (DF)

Density Figures analyze the density population of flick *Aedes* mosquito in an area under review from HI, CI, and BI results. *Density Figures* can have stated in 3 categories that are area green (low) on the range numbers 1-3, yellow (medium/alert) on

numbers 2-5, and red (high/necessary control) at numbers >5.

From the results calculations obtained from a combination of HI, CI, and BI, which was carried out in the Pinang Merah sub-district, the level density flick mosquitoes obtained based on DF can seen in the table below:

Table 3.2 *Density Figure Flick Aedes mosquitoes in Pinang Merah Village in 2024*

Index Larvae	Results	Density Figures
House Index	336%	5
Container Index	223.21%	6
Breteau Index	552%	6

$$DF = \frac{5 + 6 + 6}{3} = 5.6 = 6$$

Based on the results of the DF calculation above, the DF value in Pinang Merah Village is >5 (bigger than 5). It is meaningful that Pinang Merah Village goes inside the category red, that is, degrees transmission brought disease vector tall so that required control quick.

5. Free Numbers Flick (ABJ)

ABJ is the observation of the results against 100 house respondents in Pinang Merah sub-district, obtained found house flick (+) of 36% of the House respondents. Based on the ABJ formula below:

$$ABJ = \frac{\text{The number of house where larvae were not found}}{\text{Number of houses inspected}} \times 100\%$$

$$= \frac{64}{100} \times 100\%$$

$$= 64\%$$

Based on the ABJ calculation above, The ABJ value in Pinang Merah Village is 64%, which indicates that The ABJ value in Pinang Merah Village is still under standard and density flick mosquitoes Still tall so that risky speed up transmission vector-borne dengue fever mosquito *Aedes* sp in the area.

CONCLUSION

The results of research conducted about the density flick mosquito *Aedes* sp in Pinang

Merah Village in 2024 then obtained the conclusion as follows:

1. Density flick *Aedes* mosquitoes in Pinang Merah Village based on *House Index* (HI) was 36% of the 100 houses inspected.
2. The density of flick *Aedes* mosquitoes in Pinang Merah Village based on the *Container Index* (CI) was 23.21% of the 224 containers examined.
3. Density flick *Aedes* mosquitoes in Pinang Merah Village based on *Breteau Index* (BI) as much as 52% of 100 houses.
4. From the third indicator (HI, CI, and BI), the *Density Figure* (DF) in Pinang Merah Village is > five, which means entering the category area red and requiring control quickly. The RT is at risk, namely RT 03, RT 04, and RT 10.
5. The ABJ value in Pinang Merah Village is 64%, indicating that the ABJ value is still under standard, meaning the density of mosquitoes is still high-risk, speeding up transmission of vector-borne dengue fever mosquito *Aedes*.

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