



Assessment of Houses Environmental Sanitation due to the Existence of Aedes Aegypti Larva in Paccerakkang Makassar

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Abstract

Dengue hemorrhagic fever (DHF) is one of the important public health problem in Indonesia and often give rise to an extraordinary event with a great death. In Indonesia, the mosquito transmission of dengue fever is *Aedes aegypti*. This study was an observational study with cross sectional design is the independent variable and the dependent variables were tested simultaneously. The aim of research to determine the relationship of the depletion of water reservoirs, water reservoirs closure, Burial of second-hand goods and giving abate with the presence of *Aedes aegypti* larvae. This research was conducted in the Paccerakkang Village, Makassar in 2013 from February to April 2013. Population all existed homes on the RW I and RW IV which is prone to dengue RW totaling 724 homes. The sample is partially elected of 251 homes. The results showed no relationship between the depletion of water reservoirs, the closure of water reservoirs, burial secondhand goods and giving abate with the presence of larvae in the Paccerakkang Village, Makassar in 2013, so it is advisable to *the people to regularly conduct the PSN in shelters water*.

Keywords: Environmental Sanitation; Home; existence of larva; *Aedes aegypti*.

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1. Introduction

Dengue hemorrhagic fever (DHF) is one of the important public health problem in Indonesia and often give rise to an extraordinary event with a great death. In Indonesia, the mosquito transmission of dengue fever is *Aedes aegypti* important [1].

Dengue Hemorrhagic Fever (DHF) in Indonesia began to pose a public health problem since the discovery of the case in Surabaya in 1968 and in 1962 found 53 cases treated with 24 deaths (CFR = 46%). In a relatively short period of dengue fever have been reported in various regions in Indonesia, and until 1981 only the province of East Timor has not been reported dengue disease. In addition to the increasing number of cases of dengue fever outbreak also in rural areas. Based on data from the Ministry of Health in 1981 (in [2] shows the number of deaths nationwide dengue fever patients decreased from 4.0% in 1968 to 4.1% in 1977, and to 4.0% in 1980. Meanwhile, in 2007 CFR dengue fever in Indonesia amounted to 1% with IR 71.78 / 100,000 inhabitants and by 2008 DHF CFR of 0.86% with IR 60.02 / 100,000 population [1].

Indonesia has experienced the biggest cases (53%) of DHF in 2005 in Southeast Asia, namely 95 270 cases and 1,298 deaths of people (CFR = 1.36%) [3]. The number of cases increased to 17% and mortality 36% compared to the year 2004[4]. Many factors affect the incidence of Dengue. Some factors are including host, environmental and infectious factors and pathogen (virus). host susceptibility and immunity concerning to disease, whereas environmental factors regarding the geographic conditions (altitude above sea level, precipitation, wind, humidity, season), demographic conditions (density, mobility, behavior, customs, socioeconomic population), and the type and density of mosquitoes as vectors transmitting the disease.

According to [5] population density of *Aedes aegypti* larvae measured by the density and number of containers is very real influence on the transmission of dengue cases. Increasing the case is closely related to poor environmental sanitation in the area of events Dengue Hemorrhagic Fever (DHF) has spread to all provinces in the country with a number of districts / cities infected by 2008 were 257 districts / cities. At the beginning of the epidemic patterns occurred every five years, but within the last fifteen years changed with a period of between 2-5 years. While the mortality rate tends to decrease [1]. In South Sulawesi, according to a report from Subdin of PPM & PL in 2009, the number of incidents of disease Dengue Hemorrhagic Fever (DHF) in 27 districts. / in the city was 2,636 patients with 39 deaths (CFR = 1.48%), besides that it is also the number of events outstanding (KLB) of 82 events with a number of cases as many as 495 people and 19 deaths (CFR = 3.84%) [6].

Based on profiles Health Agency of Makassar in 2008 cases of dengue in the region from year to year tends to decrease, which in 2005 were a number of cases that is 832 cases with cases died as many as 22 cases decreased in 2006 as many as 815 cases of the number of cases as many as 6 people died and more slightly in 2007 that as many as 452 cases of dengue outbreak with 5 cases died. However, prevention and curative disease of Dengue Hemorrhagic Fever (DHF), among others, prevention focus, PSN / 3M application, survey larvae and giving abate, and fogging bulk / case absolutely necessary for efforts to prevent the incidence of dengue which at times can occur (Profile Napier City Health Department, 2008). Meanwhile, District of Biringkanaya consisting of 5

villages is one of the endemic areas of dengue fever in the city of Makassar, in 2011 the number of dengue cases in the district Biringkanaya reached 171 cases with 2 cases died [7].

In the Village of Paccerakkang is one of the villages endemic in Sub Biringkanaya, in the Village Paccerakkang the number of houses as many as 5233 is a village that dengue each year in the top position among 5 sub-district another in the District Biringkanaya the number of cases in 2009 were 55 cases, In 2010 as many as 43 cases with 1 case died and 2011 were 41 cases with 2 cases died [7]. RW preliminary survey results obtained with the highest number of cases, namely RW I with the number of cases of seven patients in 2011 and there were 2 cases died. RW I are 1,824 households residing in 724 houses with a population density is quite high [7]. Although each year the number of dengue cases in the Village Paccerakkang tend to decrease but the number of deaths are increasing. Based on the above background it is necessary to investigate the relationship of environmental sanitation condition of the house by the presence of *Aedes aegypti* larva areas prone to dengue hemorrhagic fever (DHF) in the Paccerakkang Village, Biringkanaya District of Makassar in 2013.

2. Materials and Methods

This study was an observational study with cross sectional design is the independent variable and the dependent variables were tested simultaneously. The research location in Paccerakkang sub-district Makassar from February to April 2013. The population of existing homes on the RW I and RW IV which is prone to dengue RW totaling 724 homes. The sample is partially elected house which is calculated using the formula:

$$n = \frac{N Z^2 p.q}{d^2 (N-1) + Z^2 p.q}$$

where :

n = Sample size

N = Population

d^2 = Degree of reability (0,05)

Z^2 = Confidence level (1,96)

P = Proportion (0,5)

q = 1 - p

Therefore the number of known populations are 724 houses, then the sample size can be calculated as follows:

$$n = \frac{724 \cdot 1,96^2 \cdot 0,5 \cdot 0,5}{(0,05)^2 (724 - 1) + 1,96^2 \cdot 0,5 \cdot 0,5}$$

$$= \frac{695,3}{2,767}$$

$$= 251,2 \text{ or } 251$$

So the sample size is 251 homes

Sampling with proportional sampling technique.

Data were obtained through interviews using a questionnaire method of research related to the variable under study and direct observation. Secondary data regarding the description of the study site and the total population obtained from the Village Office, health centers and district offices Sudiang, Biringkanaya, Makassar

Data processing and analysis

Data were processed using computer assistance, then were analyzed by statistical tests χ^2 squared.

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

χ^2 = Chi Square ; E = expectation frequency ; O = Observation frequency; $\alpha = 0.05$

3. Results and Discussion

Based on the results of data processing that has been carried out of the 251 respondents about the sanitary conditions of the home environment with the presence of *Aedes aegypti*-prone areas dengue hemorrhagic fever (DHF) in Ex. Paccerakkang, Biringkanaya frequency, Makassar in 2013, can be seen in the table and narrative as follows:

3.1 characteristics of Respondents

Respondents in the Paccerakkang Village.

Table1: Respondents Characteristics in Biringkanaya District of Makassar, 2013

Age group	n	%
35-39	24	9,6
40-44	104	41,8
45-49	52	20,7
50-54	35	13,9

	55-59	25	10,0
>59		10	4,0
<hr/>			
Sex			
<hr/>			
	Male	238	94,8
	Female	13	5,2
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Education			
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	Basic school	10	4,0
	Junior high school	15	6,0
	Senior high school	180	71,7
	Diploma 1	12	4,8
	Diploma 3	11	4,4
	Bachelor	19	7,6
	Master degree	4	1,6
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Occupation			
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	Businessman	164	65,3
	Civil servant /POLRI/TNI	34	13,5
	Labour	27	10,8
	Worker	26	10,4
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Based on Table 1 shows that the highest percentage of respondents age group is the age group 40-44 years were 105 people (41.8%) and the lowest percentage of age group is the age group > 59 years were 10 people (4.0%). Based on Table 1 above shows that the sex of the respondents largely male gender were 238 people (94.8%) and the other with female gender which is 13 people (5.2%). According to the table 1 below shows that out of 251 respondents, past high school education at most that 180 people (71.7%) and the least that educational S2 / S3 as many as 4 people (1,6,6%). Based on Table 1 above shows that out of 251 respondents, self-employed work more than 164 people (65.3%) and the least that is employment as a staff of about 26 people (10.4%).

3.2 Bivariate Analysis

Based on Table 2 above shows the depletion of the category held as many as 23 respondents (11.8%) with the presence of larvae existing categories and as many as 172 respondents (88.2%) with the presence of larva category does not exist. While respondents who did not carry out the draining of 27 respondents (48.2%) with the presence of larvae existing categories and as many as 29 respondents (51.8%) with the presence of larva category does not exist. After the Chi square test found a significant level or value of $P = 0.000$. Because the P value is smaller than the significance level ($\alpha = 0.05$), it is stated that there is a relationship between the depletion of the existence of larva in the Paccerakkang Village, Biringkanayya District of Makassar in 2013.

Table 2 shows that the closure of the category held as many as 23 respondents (12.4%) with the presence of larvae existing categories and as many as 163 respondents (87.6%) with the presence of larva category does not exist. While respondents who did not carry out the closure of as many as 27 respondents (66.6%) with the presence of larvae existing categories and as many as 38 respondents (33.4%) with the presence of larva category does not exist. After the Chi square test found a significant level or value of $P = 0.000$. Because the P value is smaller than the significance level ($\alpha = 0.05$), it is stated that there is a relationship between the closing of the existence of larva in Paccerrakkang, Biringkanayya district, Makassar in 2013.

Table 2: Factors related with less presence of larva in the Paccerrakkang Biringkanaya District of Makassar in 2013

Variables	the existence of larva				p
	Yes		None		
	n	%	n	%	
Depletion					0,00
Conducted	23	11,8	172	88,2	
Not conducted	27	48,2	29	51,8	
Cover					0,00
Conducted	23	12,4	163	87,6	
Not conducted	27	66,6	38	33,4	
Burial					0,00
Conducted	44	32,8	90	67,2	
Not conducted	6	5,1	111	94,9	
Giving abate					0,00
Conducted	22	11,2	175	88,8	
Not conducted	28	51,9	26	48,1	

Table 2 above shows the burial of the category held as many as 44 respondents (32.8%) with the presence of larvae existing categories and as many as 90 respondents (67.2%) with the presence of larva category does not exist. While respondents who did not carry out the burial of as much as 6 respondents (5.1%) with the presence of larvae existing categories and as many as 111 respondents (94.9%) with the presence of larva category does not exist. After the Chi square test found a significant level or value of $P = 0.000$. Since P is smaller than the significance level ($\alpha = 0.05$), it is stated that there is a relationship between the burial with the presence of larvae in the Paccerrakkang Village, Biringkanaya District of Makassar in 2013.

Table 2 above shows giving abate by categories implemented by 22 respondents (11.2%) with the presence of larvae existing categories and as many as 175 respondents (88.8%) with the presence of larva category does not

exist. While respondents were not implementing giving abate were 28 respondents (51.9%) with the presence of larvae existing categories and as many as 26 respondents (48.1%) with the presence of larva category does not exist. After the Chi square test found a significant level or value of $P = 0.000$. Because the P value is smaller than the significance level ($\alpha = 0.05$), it is stated that there is a relationship between abatesasi with the presence of larvae in the Paccerrakkang Village, Biringkanaya District of Makassar in 2013.

4. Discussion

From the results of research conducted with respondents as many as 251 people representing the home as a sample, obtained respondents consisted of 238 men and 13 women, most of the respondents aged between 40-44 years as many as 105 people. The majority of respondents last education with a high school education level as many as 180 people (71.7%) and the least was the last educational S2 / S3 as many as four respondents (1.6%). While the work of self-employed respondents with 164 respondents (65.3%) and the least was a staff of about 26 people (10.4%).

4.1 Existence picture Flick

Aedes aegypti larvae are *aedes aegypti* mosquito life cycle after egg *aedes aegypti* mosquito. Flick requires four stages of development. Duration of larva development depends on the temperature, food availability, and density of larvae in a container. In optimal conditions, the time required from egg to hatch into adult mosquitoes is seven days, including two days in a period of pupa. While at low temperatures, it takes several weeks (MOH, 2003).

The existence or absence of larvae was no larvae were found either through direct examination (the naked eye) and using the tool of a flashlight on the water reservoirs and used goods. The results showed that the presence of larvae in the home of the respondents more categories there are as many as 201 homes (80.1%) compared to the existing categories larvae are 50 houses (19.9%).

4.2 Drain relation to the existence Flick

PSN is an action to break the chain of PSN. The development consists of several activities, such as 3M One activity as an act done on a regular basis to eradicate the larva is doing depletion. Depletion of water reservoirs are draining activity shelters like bath water, jars, buckets, and others once a week. According to the results of research carried out, draining the activities carried out as many as 23 categories of respondents (11.8%) with the presence of larvae existing categories and as many as 172 respondents (88.2%) with the presence of larva category does not exist. While respondents who did not carry out the draining of 27 respondents (48.2%) with the presence of larvae existing categories and were 29 respondents (51.8%) with the presence of larva category does not exist. This shows that the drainage activities have been carried out regularly once a week by the respondent and effective enough to reduce the presence of even eliminate mosquito larvae in water reservoirs respondents.

As for the house of respondents conducting depletion but still found the larva probably influenced by other factors not simultaneously performed with draining activities such as abandonment and clean water reservoirs.

This is consistent with the results of research by [8, 9, 10] which states that respondents who perform activities in the watersheds draining more that there are no larvae.

4.3 Closing relation to the existence Flick

Closure of water reservoirs is one of the activities in PSN. Covering of water reservoirs is an activity close tightly all water reservoirs such as a bucket, barrel, drum, and others. Based on the results of the study indicate that the closure of the category held as many as 23 respondents (12.4%) with the presence of larvae existing categories and as many as 163 respondents (87.6%) with the presence of larva category does not exist. While respondents who did not carry out the closure of as many as 27 respondents (66.6%) with the presence of larvae existing categories and as many as 38 respondents (33.4%) with the presence of larva category does not exist. According to the results of this study, the closure activities have been carried out by some of the respondents and the presence of larvae in the water reservoirs which include buckets, jars and drums are not obtained. So that the activities of closing shelters in meeting water needs to be done continuously by the respondents to maintain that the larvae do not develop the existing water reservoirs. On the other hand, there were respondents who did not conduct water reservoirs closing properly so need to be given information about the importance of the closure in an effort to prevent the existence of larva as the entrance of dengue hemorrhagic fever (DHF). This is consistent with the results of research by [8], which states that respondents who perform closure activities at the shelter more water that is not contained larvae.

4.4 Burial relation to the existence Flick

Funerary goods buried all the activities of the former is used goods that are around the house that can hold rainwater that tin cans, buckets of used and scrap tires each week. Burial has also become one of the activities in the PSN besides draining, closing and abatesasi. The results showed that the burial activities by categories implemented by 44 respondents (32.8%) with the presence of larvae existing categories and as many as 90 respondents (67.2%) with the presence of larva category does not exist. While respondents who did not carry out the burial of as much as 6 respondents (5.1%) with the presence of larvae existing categories and as many as 111 respondents (94.9%) with the presence of larva category does not exist. The persistence of the respondents as many as 111 respondents who did not carry out the burial goods used but there is no presence of larvae due to the habits of the respondents dispose of used goods which include tin cans, buckets of used or scrap tires into a landfill or regularly transported by car garbage that reach up to the house in front of the respondent. Meanwhile, respondents who carry out the burial of second-hand goods, but still found the presence of larvae at the time of the study carried out because of second-hand goods around the house forgot buried a week earlier given the respondents routinely bury mark items once a week. This is consistent with the results of research by [8], which states that the respondents conducting burial secondhand goods more that there are no larvae.

4.5 Giving Abate relation to the existence Flick

Abatesasi is sowing abate powder or altosid in places that are difficult drained of water or hard water to kill mosquito larvae of dengue fever were sown 2-3 months, [11,12, 13]. Abate brownish powder, made from sand

coated with chemicals that can kill mosquito larvae, whereas altsid granulated sugar black as charcoal. Chemicals in altsid will inhibit (kill the cocoon, so it does not become a mosquito). In the implementation of abatesasi in Paccerrakkang, Biringkanayya District of Makassar portrayed in the research that has been done is abatesasi by categories implemented by 22 respondents (11.2%) with the presence of larvae existing categories and as many as 175 respondents (88.8%) with the presence of larvae category does not exist. While respondents were not implementing abatesasi as many as 28 respondents (51.9%) with the presence of larvae existing categories and as many as 26 respondents (48.1%) with the presence of larva category does not exist. The existence of larva in the water reservoirs of respondents who carry out abatesasi more than 175 respondents and did not find any larvae. This shows that abatesasi effective enough to break the life cycle of the mosquito *Aedes aegypti*. Abatesasi execution routine so very necessary [14-17].

5. Conclusions and Suggestions

5.1 Conclusion

Based on these results it can be concluded as follows: there is a relationship between the depletion of water reservoirs with the presence of larvae in the Village District of Biringkanaya Paccerrakkang Makassar Year 2013. Ada connection between the closure of water reservoirs with the presence of larvae in the Village District of Biringkanaya Paccerrakkang Makassar Year 2013. Ada relationship between burial goods used by the presence Paccerrakkang larvae in the Village District of Biringkanaya Makassar Year 2013. Ada abatesasi relationship between the presence of larvae in the Paccerrakkang, Biringkanaya District of Makassar in 2013.

5.2 Suggestion

Based on the conclusions of this study, formulated suggestions as follows: it is Suggested to people in the village Paccerrakkang of Biringkanaya District of Makassar in order to regularly carry out activities at the shelter of mosquitoes nest eradication. To the Government of Makassar in this case Makassar City Health Department that regularly distribute abate powder and providing information about the importance of Mosquito eradication to the community in Paccerrakkang, Biringkanaya district, Makassar.

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