

# Factors Associated with the Incidence of Dengue Hemorrhagic Fever (DHF) at the Suruh Trenggalek Health Center

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## ABSTRACT

**Background:** Dengue Hemorrhagic Fever (DHF) is one of the public health problems in Indonesia which tends to increase in the number of patients and the wider its spread. The purpose of this study was to determine the factors for the occurrence of Dengue Hemorrhagic Fever (DHF) in the Public Health Center in Suruh Trenggalek. **Method:** The research design used is quantitative with a "cross sectional" approach. The sampling technique used is Simple Random Sampling with a sample of 108 respondents. Data analysis technique using Logistic Regression. **Results:** The results showed that there was a relationship between the habit of hanging clothes with the incidence of dengue hemorrhagic fever, with a p-value of  $0.000 < = 0.05$ . The results showed that there was a relationship between the frequency of bathtub draining and the incidence of dengue hemorrhagic fever, with a p-value of  $0.000 < = 0.05$ . The results showed that there was a relationship between the presence of larvae with a p-value of  $0.000 < = 0.05$ . Simultaneous test results also show the influence of all variables on the incidence of dengue hemorrhagic fever with a p-value of  $0.000 < = 0.05$ . **Conclusion:** It is hoped that there will be cooperation between local village government health officers and the community in order to minimize the incidence of dengue hemorrhagic fever.

## I. Introduction

Dengue Hemorrhagic Fever is a disease caused by the dengue virus which is transmitted through the bite of the *Aedes aegypti* and *Aedes albopictus* mosquitoes. DHF is an acute febrile disease that attacks mainly children aged less than 15 years, but can also attack adults, which is accompanied by bleeding manifestations, causing shock that can cause death (Zulkoni, 2011). Breeding sites are usually clean water reservoirs such as baths, used tires, used cans and others. The incidence of dengue has increased dramatically, especially in the tropics (Sembel, 2009).

Dengue Hemorrhagic Fever (DHF) or Dengue Hemorrhagic Fever (DHF) is currently one of the public health problems in Indonesia, which tends to increase the number of patients and its spread is increasingly widespread. Dengue fever is found in almost all parts of the world, especially in tropical and subtropical countries, both as endemic and epidemic diseases. The results of epidemiological studies show that DHF attacks the age group of toddlers up to the age of about 15 years.

From 2014 to January 2019. The Director of Vector Infectious and Zoonotic Diseases of the Ministry of Health has received reports on DHF for the last five consecutive years, namely since 2014, 2015, 2016, 2017, 2018, to 2019.

The number of DHF sufferers in 2014 was 100,347 people, then in 2015 there were 129,650, then in 2016 there were 204,171. Then in 2017 as many as 68,407, then 2018 as many as 53,075, and 2019 as many as 13,683 people. Meanwhile, the number of DHF sufferers who died in 2014 was 907 people, the following year 1,071 people, then in 2016 there were 1,598 people, and 2017 as many as 493. Then during 2018 there were 344 people and in 2019 (until January 29, 2019) there were 133 people.

Previously, the Director of Vector and Zoonotic Diseases of the Ministry of Health received reports from 34 provinces that from January 1, 2019 to Wednesday (29/1) there had been 13,683 cases of dengue fever and hundreds of people who had not been helped. The death data up to January 29, 2019 was 133 people, (Kusriastusi, 2019). Diseases transmitted by mosquitoes, such as dengue fever, are still a public health problem in East Java Province, both in urban and rural areas. In recent years, mosquito-borne diseases tend to increase in the number of cases and deaths.

Based on the profile of the Trenggalek District Health Office in 2019 During January 2019 the attack of dengue fever in Trenggalek district had claimed 2 lives, out of 43 dengue fever sufferers. Because of that the Trenggalek Regency Health and Population Control Office, determined it as, a very extraordinary incident. The Dalduk Health Office said that there were 2 victims who died from Watulimo and Pogalan sub-districts. For the area in Trenggalek district, the highest number of DHF sufferers is in the Pogalan District. He added that in order to prevent the spread of dengue fever, the Health Office instructed that fogging be carried out in all areas indicated where the spread of dengue had been. The goal is to reduce the spread of dengue fever mosquitoes.

Based on a preliminary study that the researcher conducted on June 17, 2019 at the Suruh Trenggalek Health Center, 34 patients with dengue fever were found in the period from January to June 2019, based on observations and interviews with 10 housewives who when the researchers conducted the preliminary study, it was found data from 5 housewives who do not know about dengue fever and do not know how to prevent their children from contracting dengue fever, 3 people say that they have made 3M efforts but still their children are also infected with dengue fever and 2 other people said they were confused about how to solve the dengue fever disease while all efforts had been made but still contracted the disease. From the several factors that cause bleeding above, the researcher wants to investigate further about the incidence of DHF, especially at the Suruh Trenggalek Health Center which includes the presence of *Aedes aegypti* larvae in the water tendon, the habit of hanging clothes, the availability of lids on the water reservoir, the frequency of cleaning the water reservoir and the respondent's knowledge about dengue. can help in reducing the number of morbidity and mortality due to dengue fever and help the community to pay more attention to what factors can be the cause of the transmission of dengue disease. Based on the above background, the researcher wants to take the title "Factors Associated with the Incidence of Dengue Hemorrhagic Fever (DHF) at the Suruh Trenggalek Health Center".

## II. METHODS

The type of research used in this study is regression research with a "cross sectional" approach which emphasizes the measurement time or observation of the independent and dependent variables only once at a time. The sampling technique used is Simple Random Sampling with a sample of 108 respondents. Data analysis technique using Logistic Regression.

## III. RESULTS

Table 1 Incidence of Dengue Hemorrhagic Fever in the Work Area of the Suruh Health Center, Trenggalek Regency

No	Dengue Hemorrhagic Fever Incidence	$\Sigma$	%
1	Exposed to DHF	75	69,4
2	Never happen	33	30,6
<b>Total</b>		<b>108</b>	<b>100</b>

Table 2 Habits of Depending on Housewives in the Work Area of the Suruh Health Center, Trenggalek Regency

No	Habit of Hanging Clothes	$\Sigma$	%
1	Good	40	37
2	Not good	68	63
<b>Total</b>		<b>108</b>	<b>100</b>

Table 3 Bathtub Drain for Housewives in the Work Area of the Suruh Health Center, Trenggalek Regency

No	Bath Drain	$\Sigma$	%
1	Good	38	35,2
2	Not good	70	64,8
<b>Total</b>		<b>108</b>	<b>100</b>

Table 4 The Presence of Larva in Households in the Work Area of the Suruh Health Center, Trenggalek Regency

No	Presence of Larva	$\Sigma$	%
1	No larvae	38	35,2
2	There are larvae	70	64,8
<b>Total</b>		<b>108</b>	<b>100</b>

Table 5 Results of the Analysis of Factors Associated with the Incidence of Dengue Hemorrhagic Fever (DHF) at the Suruh Trenggalek Health Center

Variable	<i>p-value simultan</i>	<i>p-value parsial</i>
Habit of Hanging Clothes	0,000	0,000
Bath Drain	0,000	0,000
The Presence of Mosquito Larvae	0,000	0,000

The results of the logistic regression analysis above show the probability values as follows:

1. The habit of hanging clothes variable (X1) shows a p-value of  $0.000 \leq 0.05$  so that H0 is rejected and H1 is accepted, which means that there is a relationship between the habit of hanging clothes and the incidence of dengue hemorrhagic fever in the work area of the Suruh Health Center, Trenggalek Regency.

2. The bathtub draining variable (X2) shows a p-value of  $0.000 \leq 0.05$  so that H0 is rejected and H1 is accepted, which means that there is a relationship between bathtub draining and the incidence of dengue hemorrhagic fever in the work area of the Suruh Health Center, Trenggalek Regency.

3. The presence of larvae variable (X3) shows a p-value of  $0.000 \leq 0.05$  so that H0 is rejected and H1 is accepted, which means that there is a relationship between the presence of larvae and the incidence of dengue hemorrhagic fever in the work area of the Suruh Health Center, Trenggalek Regency.

Simultaneous test results show p-value  $0.000 \leq 0.05$  so that H0 is rejected and H1 is accepted, which means that there is a joint influence between the habit of hanging clothes, draining the bathtub, and the presence of larvae on the incidence of dengue hemorrhagic fever in the work area. Health Center Tells Trenggalek Regency

#### IV. DISCUSSION

##### The Habit of Hanging Clothes in the Work Area of the Health Center Tells Trenggalek Regency

Based on the results of the study, it is known that most of the respondents have a bad habit of hanging clothes, as many as 68 respondents (63%) and only 40 respondents (37%) of respondents who have a good habit of hanging clothes.

According to Luluk (2016) the risk factor that can be infected with dengue fever is the house or the environment with clothes hanging. According to Suroso and Umar, mosquitoes prefer objects that hang in the house such as curtains, mosquito nets and clothes/clothes. Therefore, clothes hanging behind the

door should be folded and stored in a cupboard, because the *Aedes aegypti* mosquito likes to perch and rest in dark places and hanging cloth to breed, so that mosquitoes have the potential to bite humans (Yatim, 2007). Purnama Sari, 2018)

The habit of people hanging clothes has long been happening in both urban and rural communities. This bad habit has been going on for a long time. According to researchers, this condition can cause mosquitoes to live and stick to clothes which in turn can be one of the causes of people suffering from dengue fever due to bites from these mosquitoes.

The results showed that most of the respondents who worked in the private sector had a bad habit of hanging clothes, as many as 28 respondents (25.9%).

A total of 27 (25%) respondents with a high school education level also have a bad habit of hanging clothes. The level of education affects knowledge, where knowledge is a domain that shapes a person's behavior and actions. Although most respondents who have a high school education level know that hanging clothes can cause mosquitoes to stay and stick to the clothes, the habit of hanging clothes, especially behind the bedroom door, is still carried out with the assumption that clothes that are not too dirty can still be used again.

### **Frequency of Bath Drains in the Work Area of the Public Health Center in Trenggalek Regency**

Based on the results of the study, it is known that most of the respondents have a bad habit of draining the bathtub, as many as 70 respondents (64.8%) and only 38 respondents (37%) of respondents who have a good habit of hanging clothes.

Prevention of DHF can be done by controlling mosquito vectors, including by draining the bath/water reservoir at least once a week; changing/draining flower vases and bird drinking containers once a week; tightly closing the water reservoir; bury used cans; used batteries and old tires around the house; and home design improvements (A. Arsunan Arsin, 2013).

Respondents aged 45-54 years have a bad habit of draining the tub, as many as 19 respondents (17.6%). The age range of 45-54 years is a productive age who should be more aware of the importance of bath hygiene, but in reality this is not the case, this can be influenced because the majority of respondents work in the private sector so they don't have much free time so that respondents only refill the bath in their room. take a shower when you have a little left without draining it first.

The results showed that as many as 26 respondents (24.1%) who had a high school education level had poor bathtub draining habits. The higher a person's education level, the higher the person's knowledge about healthy living behavior. Apart from the lack of awareness and willingness of respondents to drain the bath regularly once a week, this could also be due to the lack of information they received about the importance of keeping the bath clean.

The study also shows that respondents who work in the private sector have a bad habit of draining the bathtub, as many as 31 respondents (28.7%). Job status often makes a person forget important things that can have a big impact on health. The tight work schedule is still the cause of the respondents having a bad habit of draining the bath. In addition, through direct interviews, researchers also found the fact that respondents who work in the private sector are reluctant to drain the bath once a week because apart from working, respondents are also housewives who take care of a lot of housework and children.

The researcher assumes that cooperation within the family must be built in order to keep the environment around the house clean, although in this case the respondents who are housewives are mostly housewives who work in the private sector, but the condition of house cleanliness, especially the cleanliness of the bath, must also be a priority to be considered. considering that the bathtub is the most preferred place for mosquitoes to breed.

### **The Presence of Larva in the Bathtub in the Work Area of the Public Health Center in Trenggalek Regency**

Based on the results of the study, it was found that larvae were found in water reservoirs, mostly 70 respondents (64.8%) and only 38 respondents (35.2%) of respondents who had no larvae found in water reservoirs.

The frequency of bathtub draining is one of the main causes of the large number of larvae, this is because the bathtub is a water reservoir that does not come into direct contact with the ground which is a breeding ground for *Aedes Aegypti* larvae. Considering that the *Aedes Aegypti* larva is the forerunner to the development of mosquitoes that cause dengue fever, the life cycle must be interrupted, one of which is by not allowing the larvae to develop into adult mosquitoes, namely by draining the bath at least once a week, besides that, the places where the water is accommodated must also be considered for cleanliness.

The results showed that there were larvae in water reservoirs in respondents aged 45-54 years, as many as 19 respondents (17.6%). The age range of 45-54 years is a productive age category, in that age range respondents can still access good information about health problems in general, or related to the importance of maintaining the cleanliness of the bathtub from *Aedes Aegypti* larvae. that age who still does not maintain the cleanliness of the bath which causes the emergence and development of *Aedes Aegypti* larvae. The researcher assumes that this can happen due to various factors such as the living environment or the role of the jumantik which must be further improved.

The study also showed that there were larvae in water reservoirs in respondents who had education levels up to high school, namely 17 respondents (15.7%). A high level of education affects a person's good behavior, this is because the higher the education, the higher and the more information he receives so that he is considered to have a high awareness of the importance of clean and healthy living behavior. There are still many larvae found in the respondent's bath, indicating that the respondent's lack of awareness of the importance of cleanliness of the bathtub from larvae.

The researcher argues that in addition to draining the frequency of the bath which must be maintained, extermination from within also needs to be done, for example by doing abatement or by raising fish, this is intended so that the larvae do not first become adult mosquitoes.

### **The Incidence of Dengue Hemorrhagic Fever in the Work Area of the Public Health Center in Trenggalek Regency**

The results showed that as many as 75 respondents (69.4%) said that in their family there had been dengue hemorrhagic fever and only 33 (30.6%) said that in their family there had never been dengue fever.

Dengue Hemorrhagic Fever (DHF) or Dengue Hemorrhagic Fever (DHF) is currently one of the public health problems in Indonesia, which tends to increase the number of patients and its spread is increasingly widespread. Dengue fever is found in almost all parts of the world, especially in tropical and subtropical countries, both as endemic and epidemic diseases (Djunaedi, 2010).

The results of Duma et al's research (2007) on the analysis of factors related to the incidence of DHF in Baruga District, Kendari City stated that the knowledge factor, habit of hanging clothes, landfill conditions, environmental cleanliness were related to the incidence of DHF. TPA factor which is the most influential factor with the incidence of DHF.

The results showed that as many as 32 respondents (29.6%) who worked as a private sector said that someone in their family had been sick with dengue hemorrhagic fever. Housewives who have a busy work schedule often forget to be able to maintain cleanliness, especially in the house, because housewives who work more often interact with the outside world so it is difficult to control cleanliness in the house such as the cleanliness of the bath which causes a lot of larvae, as well as the habit of hanging clothes for a long time. This can be one of the causes of dengue fever in the respondent's family.

### **Factors Related to the occurrence of Dengue Hemorrhagic Fever in the Work Area of the Suruh Health Center**

Simultaneous test results show  $p\text{-value } 0.000 \leq 0.05$  so that  $H_0$  is rejected and  $H_1$  is accepted, which means that there is a joint influence between the habit of hanging clothes, draining the bathtub, and the presence of larvae on the incidence of dengue hemorrhagic fever in the work area. Suruh Health Center in Trenggalek Regency.

According to the results of research by Widyana (1998), the risk factors that influence the incidence of DHF are the habit of hanging clothes, the TPA draining cycle > once a week, the TPA with larvae, unclean yard and children aged 5-9 years.

Until now, there is no vaccine or anti-viral drug for dengue hemorrhagic fever (DHF). The most effective measure to suppress the epidemic of dengue fever is to control the presence of mosquito vectors carrying the dengue virus. The most effective and efficient prevention for *Aedes* mosquitoes is the 3M method, namely draining, brushing and closing clean water reservoirs, bathtubs, flower vases and so on (Purnama Sari, 2018).

The results of the study regarding the habit of hanging clothes with the incidence of dengue fever showed a p-value of  $0.000 < = 0.05$  so that  $H_0$  was rejected and  $H_1$  was accepted, which means that there is a relationship between the habit of hanging clothes and the incidence of dengue fever in the work area of the Suruh Health Center, Trenggalek Regency.

From these results, it means that respondents who still have the habit of hanging clothes have the opportunity to get dengue disease than respondents who do not have the habit of hanging clothes. The clothes hanging behind the closet or behind the door should be folded and stored in the cupboard, because the *Aedes aegypti* mosquito likes to perch and rest in dark places and hanging cloth.

The clothes hanging behind the bedroom door are indeed very liked by mosquitoes, so the researcher believes that if the clothes have been used, if they are not folded and put in the closet, it is better to put them directly into the laundry basket, so as not to let mosquitoes have a place to stay longer in the room.

The results of the study on bathtub draining with the incidence of dengue fever showed a p-value of  $0.000 < = 0.05$  so that  $H_0$  was rejected and  $H_1$  was accepted, which means that there is a relationship between bathtub draining and the incidence of dengue hemorrhagic fever in the work area of the Suruh Health Center, Trenggalek Regency.

Drainage of water reservoirs needs to be done regularly at least once a week so that mosquitoes cannot breed in those places. At this time, the term "3M" plus is also known, namely an expanded 3M activity. If the DHF PSN is carried out by the entire community, the population of *Aedes aegypti* mosquitoes can be suppressed as low as possible, so that DHF transmission does not occur again (Depkes RI, 2010).

Lack of frequency of draining can lead to the growth of mosquito larvae to live and can trigger cases of dengue hemorrhagic fever, so it is recommended to drain the bath at least once a week, because these mosquitoes breed from eggs to adults within 7-10 days.

The results of the study on the presence of larvae showed p-value  $0.000 < = 0.05$  so that  $H_0$  was rejected and  $H_1$  was accepted, which means that there is a relationship between the presence of larvae and the incidence of dengue hemorrhagic fever in the work area of the Suruh Health Center, Trenggalek Regency.

The existence of live mosquito larvae is very possible for the occurrence of dengue hemorrhagic fever. Mosquito larvae that live in various places such as water tanks, or perched in tree holes, stone holes, leaf midribs, coconut shells, banana midribs, bamboo pieces (Ministry of Health, 2010).

As previously explained that this dengue virus has an incubation period that is not too long, which is between 3-7 days, the virus will be present in the human body. Therefore, if the presence of mosquito larvae is allowed, what will happen is that the incidence of dengue hemorrhagic fever will continue to increase.

Considering that dengue fever is a disease that spreads very quickly when the rainy season comes, to reduce and prevent the occurrence of dengue fever, cooperation from various parties is needed, both from the government, health workers, community leaders and the community itself.

The researcher argues that the expected cooperation in this case is the existence of a special program from health workers which can then be determined by the local village government as a special policy or provision and then must be implemented by residents or the community. For example, the obligation to carry out 3M is to drain, brush and close clean water reservoirs without exception for every citizen.

## V. CONCLUSION

There is a relationship between the habit of hanging clothes with the incidence of dengue fever with a statistical test result  $p\text{-value } 0.000 \leq 0.05$ .

There is a relationship between the drain of the bath with the incidence of dengue fever with the results of the statistical test  $p\text{-value } 0.000 \leq 0.05$ .

There is a relationship between the presence of larvae and the incidence of dengue fever with statistical test results  $p\text{-value } 0.000 \leq 0.05$ .

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