

Dengue Fever Outbreak in Mataram City, West Nusa Tenggara Province In 2002

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ABSTRACT

Dengue fever is one of the essential public health problems in Indonesia and often leads to an outbreak event with a high mortality rate. Dengue fever is not only a disease burden but also a high economic burden for individual, family, and country. No effective medication or vaccine has limited options for prevention and treatment. The implemented program is a control vector to limit the transmission of viruses that require the role of community continuously. The aim of this study is to ensure the existence of dengue fever outbreak and identify an epidemiological picture of dengue fever in three sub-districts in Mataram city, NTB Province. The study was conducted in Mataram City in 2002. The results showed that dengue fever cases spread in three sub-districts in Mataram City. The number of identified urban villages that infected dengue fever is 21 villages from 23 urban villages (91%) in those sub-districts. There are six urban villages infected in Ampenan sub-district (86%), all urban villages in Mataram sub-district are infected, while there are 7 urban villages in Cakranegara sub-district. The highest Attack Rate in East Cakra sub-district is 1.9% followed by South Ampenan urban village which is 1.03%, Sayang-Sayang urban village is 0.99% and West Cakra urban village is 0.92%. In conclusion, there are cases of dengue fever outbreaks in three locations: Ampenan, Cakranegara and Mataram Sub-District.

Keywords: Dengue Hemorrhagic Fever, Outbreaks, Mataram

INTRODUCTION

Dengue fever is one of the important public health problems in Indonesia and

often leads to an outbreak with a high mortality rate. In Indonesia, the mosquitoes that transmit important dengue fever disease are *Aedes aegypti* and *Aedes albopictus*, but to date, the main vector of dengue fever is *Aedes aegypti*. Dengue fever was first discovered in 1968 in Surabaya with 58 children cases, 24 of whom died with Case Fatality Rate (CFR) = 41.3%. Since then dengue fever has shown a trend of increasing number of cases and the extent of the infected area. ^[1] All areas of Indonesia are at risk to be infected by dengue fever, except for areas that have a height of more than 1000 meters above sea level. Dengue fever is influenced by environmental condition, population mobility, population density, artificial or natural containers in landfills or in other landfills, counseling and community behavior, such as knowledge, attitude, mosquito nets eradication activities, fogging, abatement and 3M implementation (draining, closing and burying).

Dengue fever is an infectious disease by the dengue virus that is transmitted through the bite of *Aedes* mosquito characterized by sudden high fever and accompanied by hemorrhagic manifestations and tendency to cause shock and death. Until now, the drug and vaccine of dengue fever has not been found, so the only way to prevent the occurrence of this disease is by breaking the transmission chain with vector control. ^[2] The main vector of dengue fever in Indonesia is the *Aedes aegypti* mosquito. The preferred place as a place to breed is a pool of water contained in a container, an artificial water

reservoirs such as drum, tub, barrel, bucket, etcetera; natural water reservoirs such as tree holes, banana leaves, leaf buds, stone pits; or not a water reservoir such as flower vases, used tires, used bottles, container of drinking water of birds and so forth. The results of the survey of the RI Department of Health in nine major cities in Indonesia in 1986-1987 showed that one of three houses and public places was occupied by *Aedes* mosquito larva. In addition, the knowledge, attitudes, and behavior of the community about the prevention of dengue fever, in general, are very lack. [3-5]

In the city of Mataram, West Nusa Tenggara Province in 2001, there were 105 dengue fever cases with the mortality rate of 1.90%. [6] The dengue fever outbreak is an increase in the number of dengue fever cases in a village or urban village which is twice or more within one month compared to the previous month or the same month last year, or found one or more cases in a village or urban village where in those areas, there has never been a previous case. Based on the report of Department of Health of West Nusa Tenggara Province in March 25, 2002 and Head of Department of Health in Mataram City in 12 April 2002 [7] that there had been dengue fever outbreak in three sub-districts and 23 urban villages from the total 24 urban villages in Mataram City, in May 19-27, 2002 an epidemiological investigation was conducted by a team consisting of Arbovirus and Surveillance Subdivision, Director General of PPM&PLLL it bangkes, Department of Health of NTB Province, Department of Health of Mataram City, Tanjung Karang Public Health Center (Puskesmas), Mataram Puskesmas, West Cakra Puskesmas, East Cakra Puskesmas and Pusan Dasan Carmen Puskesmas..

The outbreak occurred three times, the first outbreak was in 1986 in the same three sub-districts with 146 cases and 8 deaths (CFR = 5.5%), while the second outbreak in 1998 was 715 cases and 10 deaths (CFR = 1.4%). There was no

confirmation of serotype virus in outbreak in 1986 and 1998.

This study is to ensure the dengue fever outbreak and to know the epidemiological picture of dengue fever disease in three sub-districts in Mataram City, NTB Province. In addition, it is also to ensure the dengue fever outbreak in three sub-districts in Mataram City, to know the distribution of patients according to the people, time and place, to know the extent of the prevention efforts that have been implemented by the Health Staff, Local Government and local communities, and to know the factors which is related to the outbreak.

MATERIALS AND METHODS

This study was a descriptive approach based on data and reports from all patients of dengue fever who had recovered and treated in hospital in three sub-districts in Mataram City during the occurrence of dengue fever outbreak. Case data of dengue fever was taken in three sub-districts in Mataram City, NTB Province that is Ampenan and Mataram sub-district and Cakranegara sub-district is high case level. [7]

The data analyzed in this research is secondary data gained through the report of Department of Health and Facility of Health that handles dengue fever patients. In addition, the serum sample of patients is examined serologically and PCR. the data were also obtained from registration books/patient status in Mataram Public Hospital (RSU), daily diaries and weekly report forms, monthly reports from Department of Health of Mataram City and Department of Health of NTB Province.

RESULTS

The dengue fever outbreak in Mataram City occurred in the third time. The first occurrence was in 1986, while the second was in 1998. Another factor that might infect dengue fever in Mataram City is a good means of transportation within the city and from other regions. The flow of

transportation and the number of inhabitants coming in and out of Mataram City via airplane or other transportation is quite high, among them it can be a career or patients who visit Mataram City.

The number of dengue fever case-patients in Mataram City, NTB Province in 1998-2002 is shown in figure 1, the number of dengue fever cases to May (21st week) in Mataram City in 2002 was 199 cases with three deaths (CFR = 1.5%). The number of cases and deaths increased twice compared to the previous year (in 2001) with 78 cases and one death.

It has been recorded from 331.000 population in Mataram City that the number of dengue fever cases to dengue fever outbreak in 5th week to 21st week in 2002 reported 108 cases (AR = 0.54 per 1000 population) with two death cases (CFR = 1.1%) Number of dengue fever outbreak in Mataram City in the 5th week to 21st week in 2002.

As it can be shown in table 1, dengue fever cases spread in three sub-districts in Mataram City. The number of infected urban villages is 21 from 23 urban villages (91%) in those sub-districts. The number of infected urban villages in Ampenan sub-district is six sub-districts (86%). In Mataram sub-district, all urban villages are infected, while in Cakra sub-district, there are seven infected urban villages (78%).

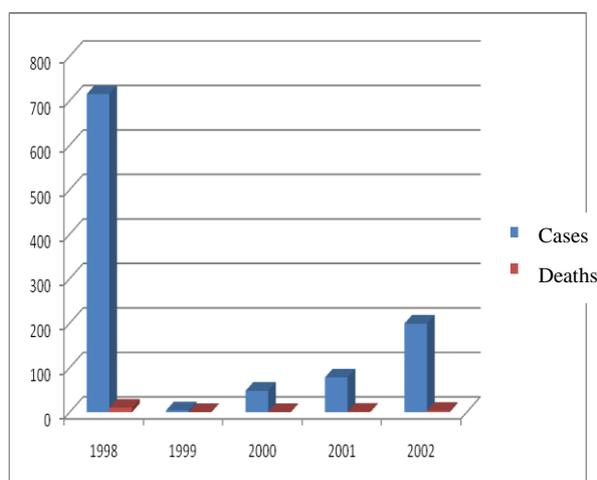


Figure 1. Number of case and mortality of dengue fever in Mataram City NTB Province from 1998 to 2002

Table 1. Number of Sub-district invaded by dengue fever outbreak in Mataram City, NTB Province from 5th week to 21st week in 2002

Subdistrict	Village	Dengue fever	
		n	%
Ampenan	7	6	86
Mataram	7	7	100
Cakranegara	9	7	78
Total	23	20	91

DISCUSSION

The first case of dengue fever occurred in Pegasang urban village, Mataram sub-district identified one case and South Ampenan urban village, Ampenan sub-district is three cases which then spread to 19 other urban villages. The highest Attack Rate in East Cakra urban village is 1.9% and followed by South Ampenan urban villages is 1.03%, Sayang-sayang urban village is 0.99% and West Cakra urban village is 0.92%. Otherwise, Centre Ampena urban village, Ampena sub-district, Dasan Carmen urban village and Cakranegara sub-districts are never found dengue fever cases since the KLB occurred until the 21st week in 2002.

The increase of dengue fever cases is closely related to seasonal changes. In tropical areas consisting of four seasons. Generally, Dengue Fever increases in the rainy season due to the amount of stagnant water that breeds *Aedes aegypti* and *Aedes albopictus* vector.

The expansion of the occurrence of dengue fever is believed to increase due to modern dynamics of climate change, globalization, transnational travel, trade, social economy, settlement and virus evolution. Until now, there has been no vaccine or antiviral specific to prevent transmission. Current therapy is only used to treat the symptoms of dengue fever. [8]

The trend of dengue fever occurrence is strongly influenced by the environment. In general, the spread of dengue fever occurs more quickly in urban areas that are generally densely populated. [9] The urban area with a very adjacent building structure becomes one of the factors that accelerate the transmission of this disease. Maximum flight distance of *Aedes* vector which is 100 makes vectors

easily fly to any homes. In addition, human mobility which is very high supported by a large social connection makes humans do a rapid movement, facilitate the transmission of dengue fever. [10] It is added to the less clean behavior such as disposing of containers that can accommodate water which can increase the potential of *Aedes aegypti* mosquito nests.

Several recent studies on the prevalence of dengue fever show considerable attention. Environmental changes provide opportunities for dengue fever [11] epidemiological changes. The urban population does not dominate the high prevalence again. The trend of population in the countryside also experience a prevalence increase such as in Malaysia, [12] Cambodia, [13] and India. [14]

Handling epidemic and dengue fever outbreak in Indonesia is still experiencing many obstacles. When compared to neighboring countries like Singapore that has been able to overcome the epidemic of dengue fever since the 80s. [15] Handling dengue fever by the government is considered insignificant to reduce the prevalence of dengue fever due to the trend tends to be fluctuated. [16] Each government should be able to play its role in reducing health risks and improving public health by the development and implementation of policies and supportive laws.

One of the components that contribute to disease transmission is environmental factors according to previous theory. The environmental contribution to dengue fever transmission is by vector breeding. Vector control in the environment can be one of the ways to break the chain of disease transmission that prevent the transmission of sick people to healthy people. Dengue fever vector control can be done in various ways including mosquito nest eradication, abatement, and biological control [17] which utilize larvae fish such as killfish, guppy, tin, and etcetera. Several studies have shown an increase in ABR after placing larvae fish to a water reservoir. [18,19] In addition, the method of

controlling dengue fever vector can be done by utilizing natural larvicides such as *Etligera elatior*, [20] Teklan leaf, [21] pandanusfragrant leaf, [22] Mangkokan leaf, [23] Sirsak leaf, [24] Lengkuas leaf (local food), [25] lime leaf. [26]

CONCLUSION

Based on the result of research data analysis concluded that among three districts observed the development of dengue fever case, the most identified dengue fever case led to Ampenan sub-district, Cakranegara sub-district, and Mataram sub-district. Adjacent locations among different urban villages in the infected sub-district are the cause of the transmission which becomes faster and facilitates the *Aedes* mosquito to spread to several sub-districts. Vectors and the location of the sub-district is a very important factor towards the transmission or the occurrence of dengue fever outbreak in Mataram City, West Nusa Tenggara.

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