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Efforts to Control Dengue Hemorrhagic Fever (DHF) in Mataram City

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ABSTRACT

Mataram City is one of the dengue endemic areas in NTB Province. Based on these problems, an analysis needs to be carried out to provide appropriate information to health policy makers in the city of Mataram. The aim of the research is to analyze efforts to control dengue fever carried out in Mataram City. The method used is a qualitative descriptive approach. Data collection was carried out through in-depth interviews with the community in the working area of the Pagesangan and Dasan Agung Community Health Centers and stakeholders. The analysis used is content analysis. The results of the research illustrate that efforts to control dengue fever in Mataram City are more hampered on the managerial side, especially on program inputs such as inadequate budget allocation, the absence of technical instructions and minimum standards for implementing activities as well as regional laws/regulations. At the process stage, the implementation of this program is still hampered by lack of optimal cross-program and cross-sector collaboration as well as a lack of community participation and participation. This research concludes that efforts to handle dengue fever in Mataram City will not be optimal without significant improvements, especially at the program input stage. Stakeholder commitment needs to be renewed and community empowerment efforts need to be increased. To optimize these efforts, there is a need for joint commitment, adequate budget allocation, technical instructions and minimum standards for implementing activities as well as regional laws/regulations.

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1. Introduction

Dengue Hemorrhagic Fever (DHF) is still a public health problem in Indonesia (Sudarmaja et al., 2022). Based on the 2020 Indonesian Health Profile, dengue fever cases reported in 2020 were recorded at 108,303 cases with an Incident Rate (IR) per 100,000 population of 40. There are still 138 districts/cities (26.85%) that reached an IR of > 49/100,000 population . Is still homework and requires attention and cooperation from various parties. Based on data on dengue fever cases for the last 3 years at the NTB Provincial Health Service and Mataram City, in 2019 there were 2,971 cases recorded (IR of 58.60), the highest cases occurred in Mataram City with 961 cases (IR of 201.3). In 2020, 4,733 cases were recorded (IR of 92.3) with the highest cases occurring in West Lombok Regency and Mataram City in second place with 938 cases (IR of 189.2). Meanwhile, in 2021 there were 2,697 cases (IR of 50.9) with the highest incidence again occurring in Mataram City with a total of 544 cases recorded (IR of 109.7). The spread of

dengue fever is closely related to population problems, mobility, knowledge, attitudes, behavior and community participation as well as climate conditions (Aristawati et al., 2019). Poor environmental management can be a factor that influences the high breeding habitat and spread of mosquitoes that transmit dengue fever, in addition to the problem of virus mutation and vector resistance. N no exists control vector effective mosquito in the area endemic cause spread disease the more wide . Various studies show that participation public role in control vector as effort decline dengue fever cases (Hikmah & Kasmini H, 2015) .

Human behavior plays a role in increasing the mosquito population, such as the habit of hanging clothes in the house and not doing 3M, the lack of appropriate information to the public about dengue prevention is also a complicating factor (Aristawati et al., 2019), while to manipulate the environment, knowledge is needed . about evolutionary science, population ecology and mosquito population dynamics. Research on community participation in dengue vector control in Semarang City, Central Java Province states that successful vector control is the responsibility and commitment of policy makers, community leaders and the community (Lesmana et al., 2022);(Sutriyawan et al., 2022).

Efforts to control dengue fever carried out in Mataram City through Epidemiological Investigation (PE), Periodic Larvae Monitoring (PJB), larvicide, 1 House 1 Jumantik Movement (1R1J Movement), fogging focus and health promotion, have not been optimal in reducing the high number of cases that occur every year. Situations like this require serious attention and good cooperation between cross-sectors (government) and require community participation and involvement. Based on the description above, to find out the causes of less than optimal control efforts in reducing the high number of dengue fever cases in Mataram City, it is necessary to conduct research on "Analysis of efforts to control Dengue Hemorrhagic Fever (DHF) in Mataram City." Previous research has studied the control of dengue fever in relation to efforts to reduce the burden of this disease, both in terms of prevention and treatment in a national context, whereas in this study the focus is on efforts to prevent dengue fever in the context of local policies, namely in the city of Mataram, West Nusa Tenggara. This research is important to carry out considering that cases of dengue fever in this region are still high every year. By analyzing this policy, it is hoped that we can find suggestions for improving policies in dealing with dengue fever in the city of Mataram. Research on dengue prevention policies is critical to global efforts to contain the disease. This research not only provides an in-depth understanding of the causes and spread of dengue fever, but also helps design concrete measures to protect society from this disease.

2. Methods

This research use desciptive qualitative approach. Qualitative descriptive studies are the method of choice when the phenomenon to be studied is straightforward, that is, it is not too complex and offers a comprehensive summary and synthesis of an event (Notoatmojo, 2018). Informants in the research were selected from those who were directly involved in dengue prevention activities and had sufficient information related to the phenomenon being studied. The informants consisted of managers of the DHF Disease Control program (P2DBD) and Health Promotion program (Promkes) at the Health Service and Community Health Centers as well as the community. The data collection method is by using in-depth interviews. To increase rigour in this research, the researcher triangulated sources, observations and documentation. The data analysis method used is theme analysis (content analysis). This research was carried out from June to December 2022.

3. Results and Discussion

3.1. P2DBD Program in Mataram City

The management of the P2DBD program generally refers to the Guidebook for the Prevention and Control of DHF in Indonesia issued by the Ministry of Health. Specifically for the activities of the 1R1J Movement, it refers to the Circular Letter of the Mayor of Mataram which is a derivative of the Circular Letter of the Minister of Health Number PM.01.11/MENKES/591/2016 which regulates the Procedure for Eradicating 3M Plus Mosquito Nests (PSN) with the One House One Larva Monitoring Movement.

(Jumantik). Some of the activities carried out in the P2DBD program by both Health Office officers and Community Health Center officers include:

Epidemiological Research (PE)

PE is an activity carried out to trace the source of dengue fever transmission around the sufferer's residence by monitoring the larva population and to find the possibility of other sufferers (fever without cause) around the sufferer's house within a 100 meter radius. This activity has been carried out at the community health center level with the result that the larvae-free rate (ABJ) is <95%.

Periodic Larval Monitoring (PJB)

PJB activities are carried out routinely every year involving Community Health Center officers and health cadres who are prepared to become larva monitors (jumantik) to monitor the population of dengue fever mosquito larvae. However, the frequency of implementation varies at each community health center. PJB activities were initially carried out 4 times a year, but since 2020 during the Covid-19 pandemic, planning and budgeting for PJB activities was transferred from the Health Office to the Community Health Center. Since the transition, there has been a decrease in the quantity/frequency of implementation from 4 times a year to 1 or 2 times a year and there has been a lack of uniformity in implementation between each Community Health Center. This is because the transition was not accompanied by technical instructions and minimum standards for implementing PJB activities which were used as guidelines by Puskesmas officers. Apart from that, differences in the quantity of implementation are also influenced by different budget allocations in each Puskesmas, as stated by the P2DBD program manager at Dasan Agung Puskesmas as follows: "We only implemented PJB once because our budget was small and not enough, but other *Puskesmas "There are those who carry it out twice because the budget is large, the maximum for the Puskesmas is only to carry it out twice, but next year we have proposed it to be carried out twice" (PDA1).* Based on the recapitulation of PJB activity reports, the Larvae Free Rate (ABJ) shows a figure above 95%, almost 100% (almost no larvae were found).

Larvacidation

Larvicide activities at community health centers are carried out during PJB and PE activities for dengue fever cases where each officer is provided with larvicide powder which has been wrapped in a plastic clip to be given to the public free of charge. When it was distributed, an explanation was also given of how to use larvicide, namely by inserting the larvicide packaging which has been perforated so that water can soak the larvicide powder into a water reservoir which is difficult to clean regularly. Apart from that, apart from preparing larvicide supplies at the Community Health Center, each cadre head or neighborhood head is also provided with supplies to anticipate residents who need larvicide.

1 House 1 Jumantik Movement (1R1J Movement)

The 1 House 1 Jumantik Movement was introduced in 2019 with the name 1R1J Movement in accordance with the Mataram Mayor's Circular, which was then continued with outreach to cadres. However, apart from training and technical guidance activities and the formation of the team, until now no other activities have been carried out to speed up the implementation of the 1R1J Movement, in fact the 1R1J Movement team from 2021 until now no longer exists. Working groups (Pokja) such as supervisors and coordinators which are the implementing structures for the 1R1J Movement as required in the circular letter from the Ministry of Health at both the city and sub-district levels have not been formed to date.

Fogging focus

It can be said that fogging is the most popular activity in the community in controlling dengue fever. Focus fogging activities are carried out by the Health Office based on PE results or at the request of the community. Fogging is carried out in 1 cycle, in 1 day fogging is carried out at 1 to 2 locations and even up to 4 locations a day if there is an increase in cases and there are many requests from the public. Implementation starts in the morning around 07.00 to 11.00 and from 15.00 to 17.00 if held in the afternoon. Fogging is carried out within a radius of 200 meters from the sufferer's house as a coordinate point, but sometimes less or more than 200 meters if it borders a different environmental area. Based on the results of the researcher's observations during the fogging focus implementation in the Gapuk

Selatan Neighborhood, Dasan Agung Subdistrict on October 24 2022, it was discovered that the sufferer's house which was the focal point of the fogging implementation was not far from the road/alley which was the barrier between the South Gapuk Neighborhood (the location of the sufferer's house) and the West Arong-arong neighborhood, focused fogging was implemented only in the South Gapuk neighborhood and houses that only faced the alley in the West Arong-arong neighborhood, while other houses, even though they were less than 200 meters away, were not sprayed. Apart from that, during the fogging focus, researchers found that many residents were still in the spraying area to ensure that their homes were sprayed by officers, while to protect themselves they only did so by covering their noses with their hands or using masks.

Health Promotion

Dissemination of information and education to the public has been carried out in collaboration with various media, both print and electronic, even through social media, pamphlets, posters, stickers and others. Efforts to promote health to the community are carried out in various ways, such as by conducting mobile education using mobile health center cars, through mosque funnels and inserting information about dengue fever in various health center activities, both inside the building and outside the building. This outreach activity is carried out at the beginning of the rainy season or when dengue cases occur in places or areas where there is potential for an increase in cases. The health promotion coordinator of the Mataram City Health Office also said that one of the health promotion program activities is conducting a Clean and Healthy Living Behavior (PHBS) survey which is carried out every year in each environment.

3.2. Public Knowledge About DHF

Public understanding of dengue fever prevention in West Nusa Tenggara (NTB) or in Indonesia in general can vary, but there are several important aspects that must be considered: a) *Knowledge about Dengue Disease :* Awareness of dengue fever and knowledge of the causes, symptoms and ways of transmission of this disease are very important. Public understanding of dengue fever is the first step in prevention. b) *Mosquito Nest Eradication Efforts*: The public needs to understand that the Aedes aegypti mosquito is the main vector of dengue disease. Therefore, they must know how to prevent the transmission of this disease by eliminating mosquito nests, such as used water containers which can become breeding grounds for mosquitoes. c) *Use of Mosquito Nets and Repellent:* The public must understand the importance of using mosquito nets when sleeping, especially in high-risk areas. Apart from that, using anti-mosquito lotion or spray (repellent) can also help prevent mosquito bites. d) *Environmental Management:* Understanding the importance of maintaining cleanliness and avoiding standing water around the house can help prevent mosquito nests. e) *Healthy Living Behavior*: People need to understand the importance of maintaining their own health condition by implementing healthy living behavior. Good health can help the body be more resistant to disease. f) *Medical Consultation:* Understanding the early signs of dengue fever and when to seek medical help is important. Early treatment can reduce the risk of complications. g) *Role of Government and Community*: Public understanding of the role of government and communities in preventing dengue fever, such as fogging programs or environmental cleanup campaigns, is also important.

It is important to note that the level of public understanding can vary depending on many factors, including education, access to information, and local levels of awareness. Therefore, public health education and outreach campaigns are important tools to increase public understanding and awareness about dengue fever prevention. Governments, non-governmental organizations and local communities can work together to increase this understanding and reduce the risk of dengue fever.

3.3. P2DBD problems

The various efforts made to control dengue fever cannot be separated from various problems which can ultimately hinder efforts to achieve the goals of an activity.

Government Problems in Efforts to Control DHF

Efforts to control dengue fever include increasing public awareness about the importance of carrying out PSN so that the 1R1J Movement that has been launched has not yet run optimally (DK1), apart from that, the public's perception of fogging *as* the most effective effort to eradicate dengue

fever causes high levels of demand for *fogging* and low levels of implementation of PSN in the community. As expressed by the P2DBD management of the Health Office as follows: *"People still think that fogging is the most effective way to prevent the spread of dengue fever, so every time there is a case they are always asked to do fogging."* (DK1). This was also expressed by the P2DBD program manager at the Community Health Center as follows: *"Every time we carry out PE, the community always demands that fogging be carried out. Even though it has been explained what the function and dangers of fogging are, people still ask for fogging to be carried out."* (PPG1). According to the P2DBD program manager at the Health Office, the Health Service hopes that the public's view of *fogging activities* can change, but this is still difficult to achieve due to the high demand from the public regarding *fogging* , such as getting support from *stakeholders* in the community and government structure.

Community Problems in Efforts to Control DHF

Several problems are faced so that the efforts made by the community itself cannot run optimally. This problem is expressed as follows: *"Our problem in preventing dengue fever is the difficulty of awareness to carry out mutual cooperation and maintain cleanliness in each other's homes."* (PG6). *"What I have noticed is that the lack of outreach and approach to the community regarding the importance of keeping the surrounding environment clean is a problem in preventing dengue fever."* (DA14).

The waste problem, which until now has not been handled properly, is also an environmental factor that can cause health problems. The government has taken various steps to overcome the waste problem, such as campaigning for the LISAN (Environment with Zero Waste) Program towards NTB *Zero Waste* 2023, forming a waste bank, and providing three-wheeled vehicles complete with operators in each environment to transport waste. To overcome the high incidence of dengue fever, the community hopes that community outreach activities will be carried out more frequently so that it can increase community awareness and concern in maintaining the cleanliness of the health of their homes and environments, as expressed as follows: "The health team or government is expected to be able to carry out *activities continuous education about dengue fever."* (DA13). This result is in line with the results of the village community deliberation (MMD) where the community hopes that socialization activities can be included in community activities such as recitation activities, social gatherings, youth activities and other community activities where many people gather.

3.4. Discussion

Efforts to control dengue fever in Mataram City are experiencing many challenges. This is what causes efforts to control this disease to be not optimal. The following can be described as factors inhibiting the control of dengue fever in the city of Mataram.

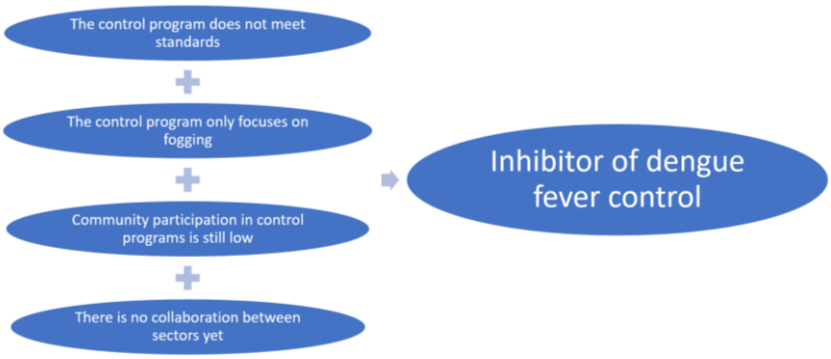

Figure 1. Inhibitors of dengue fever control

Based on figure 1, there are at least four factors inhibiting the control of dengue fever. Population density and high community mobility give rise to health problems regarding the high number of dengue fever cases that occur every year. For this reason, it is necessary to control and manage population density by improving people's behavior so that they have a clean and healthy culture and

lifestyle, which can be done by providing ongoing motivation and health education so that a healthy environment can be created.

Management of dengue fever

Focus fogging activities are still considered by the people of Mataram City to be the most effective way to control dengue fever in Mataram City. Studies in other cities also show the same results where most residents ask that their residences be fogged even though the area does not meet the criteria for implementing fogging. Implementation of fogging that does not comply with standards can cause negative impacts on health. This is the reason for (Ginanjar, 2019) to create a Policy Brief which provides recommendations so that; prohibit fogging activities that do not meet standards and for political reasons, the implementation of fogging must be carried out and with the approval of the Health Office, as well as providing widespread outreach to the community and stakeholders about the negative effects of implementing fogging.

Carrying out excessive fogging and not complying with standards can cause negative effects such as mosquito immunity (resistance) to insecticides (Hikmah & Kasmini H, 2015). Several previous studies have shown mosquito resistance to certain insecticides in several areas, including; In the cities of Bontang, East Kalimantan, Jakarta, Bogor, Yogyakarta, Central Java, South Sumatra, South Kalimantan, Maluku and Palu, Sulawesi, including in Malaysia and Pakistan. Apart from that, *fogging fumes* can also have negative impacts on humans and the environment, similar to the impacts caused by the use of other insecticide chemicals (Indriani et al., 2023).

Fogging is ineffective in controlling dengue fever because the target of *fogging* is only adult mosquitoes, even though adult mosquitoes are 1 cycle of 4 mosquito life cycles and the other 3 cycles have a longer lifespan and live in water so that PSN is the most effective way to control dengue fever. Apart from the implementation of *fogging* which does not comply with standards, other activities carried out as an effort to trace the source of transmission and monitor the dengue vector mosquito population are not carried out optimally. Problems that occur in the implementation of Epidemiological Investigations (PE), such as not finding sufferers and not tracking other than around the sufferer's residence, can hinder efforts to break the chain of transmission . Previous research revealed that one of the obstacles that often occurs during the implementation of PE is that the patient's address given by the hospital does not match the address where they live (Purnawinadi et al., 2020), obstacles to supervision carried out during PE come from external sources such as addresses that not appropriate so that PE activities were not carried out because the patient's house could not be found. If the source of infection is not found, it will be difficult to carry out countermeasures to break the chain of transmission completely.

Periodic Larval Monitoring (PJB) is an implementation of larval survey activities which aims to monitor and supervise the dengue vector mosquito population by checking the presence of larvae in water reservoirs. PJB also functions as an Early Alert System for Extraordinary Events (SKD KLB). Previous research stated that measurements of the *Aedes aegypti mosquito population* were carried out by examining larvae in all water reservoirs, both inside and outside the house (Sutriyawan et al., 2020). Considering the objectives of implementing the PJB, problems that occur such as a decrease in the frequency of implementation and the reluctance of the community to check the condition of water reservoirs in the house as well as the presence of people who are difficult to find, cause the implementation to be less than optimal, which will hamper the early warning system caused by minimal or reduced quality of data used as evaluation material. A weak early warning system is one of the factors that prevents dengue fever prevention efforts from being optimal (Ernawati et al., 2022).

Considering the function of *fogging* and paying attention to the objectives of controlling dengue fever and other P2DBD program activities being implemented, it is necessary to re-plan to determine how to solve the problem/control activities that are made a priority (Laur et al., 2021) . Efforts to overcome dengue fever by increasing cross-sector collaboration and community participation in implementing PSN through optimizing 1R1J Movement activities and health promotion activities. The Ministry of Health introduced the 1R1J movement in 2016 as an effort to civilize the community in

implementing PSN. In the 1R1J Movement program, the formation of jumantik in each house is the main goal as a form of community participation in efforts to control dengue fever. To change people's behavior so that they want to be involved in the 1R1J Movement program, intense outreach and mentoring efforts are needed involving various elements in society. It is stated that efforts to control dengue fever must involve the role of community independence down to the smallest unit, namely the family, so that handling dengue fever is the responsibility of all parties, not just the Health Service. Intervention efforts were made by carrying out G1R1J socialization activities and providing assistance to the community by the Health Department and Community Health Center teams so that with this intervention, community awareness of carrying out PSN began to emerge. Coaching and counseling for families is able to increase knowledge and motivation, resulting in improved attitudes and actions with the understanding that threats such as dengue fever must be prevented so that community participation in the 1R1J Movement program can be maximized.

The lack of formation of the 1R1J Movement Working Group has proven to hamper implementation because it will make it difficult for public awareness to get involved and participate i. To increase participation and participation, socialization and education is needed for the community to better understand the function and objectives of the 1R1J Movement so that with sufficient understanding the community is willing and aware to make efforts to control dengue fever. To optimize the 1R1J Movement in the City of Mataram, intense efforts are needed in providing outreach and education as well as assistance and advocacy to the community and related stakeholders so as to increase understanding and awareness of the methods and importance of efforts to control dengue fever. The results of this research found that the health promotion activities carried out so far were considered insufficient, this was because the messages conveyed by health workers had not been fully received by the community.

According to Bloom's division of behavioral domains, which divides behavior into 3 levels, namely knowledge, attitudes and actions or practices, people's behavior is still at the second level, namely attitude which is defined as readiness or willingness to act and not implementation. To reach the third level, namely action, stimulation or encouragement is needed either from within oneself or from outside (Krathwohl, 2002) . One external stimulus that can be carried out is by conducting health outreach and education through health promotion efforts so that public knowledge increases and is able to encourage behavior change. Health promotion is a revitalization of health education which has the concept of not only being a process of public awareness but also an effort capable of bridging behavior change (Viner & Macfarlane, 2005) . Community empowerment is influenced by the perspective or view of human relationships with where they live/environment and the health experiences they experience. Community empowerment can be done by providing health promotion through various methods and media so that people are expected to behave in a clean and healthy lifestyle (Nutbeam, 1998) .

If you pay attention to the process of dengue fever, mosquito bites play a role as an intermediary vector for the entry of the dengue virus into the human body, causing illness. To avoid getting sick, what you need to do is try to avoid mosquito bites. The presence of viruses in life is certainly very difficult to eliminate, but efforts to avoid viruses entering the body can be done by adjusting your lifestyle. In epidemiology, it is known that there is an epidemiological triangle of disease development, namely Host, Agent and Environment, which must be maintained in balance so as not to cause health problems. Environmental conditions greatly influence the presence of dengue mosquitoes, poor environmental conditions become potential places for mosquito breeding, and whether environmental conditions are good or bad depends on human behavior (Whitehead, 2004) .

4. Conclusion

Based on the results of the analysis of efforts to control dengue fever in the city of Mataram, it can be concluded that the efforts made have not been optimal. The lack of optimal control of dengue fever is caused by several things as follows: a) The implementation of the P2DBD program is less than optimal and does not meet standards (less than optimal) so that data collection on the population density of

dengue vector mosquitoes and tracking the source of transmission is not carried out properly. b) The dengue fever prevention activities carried out seem to be limited to eradicating adult mosquitoes only through focused fogging activities, while efforts to eradicate the life cycle of mosquitoes through PSN activities are still lacking. c) The good level of knowledge and attitudes of the community regarding dengue fever has not yet been realized in the form of actions/practices in carrying out PSN efforts so that community participation and participation in overcoming dengue fever is still lacking. d) Cross-sector collaboration in efforts to increase community participation and participation as well as in creating a healthy environment has not been implemented well so that public health problems seem to be only the responsibility of the health sector.

To break the chain of transmission and reduce the high number of dengue fever cases, the most important thing to do is increase public awareness to adopt a clean and healthy lifestyle, turning the good knowledge and attitudes they have into actions/practices to protect themselves to avoid dengue fever. This can be done by providing motivation and assistance through health promotion activities and cultivating PSN through the 1R1J movement. The policy for controlling dengue fever, which so far seems to only eradicate dengue vector mosquitoes, must be immediately changed to a policy that can increase public awareness so that they care more about their own health status and create a healthy environment so that overcoming dengue fever becomes a joint commitment of all parties. The first step that can be taken to realize the same commitment to all parties is by advocating to regional heads so that regional regulations can be issued which can be used as joint guidelines in carrying out efforts to control dengue fever. With the existence of this regional regulation, it is hoped that this can change the view which has previously assumed that the problem of dengue fever and other health problems is only the responsibility of the Health Service, not just the government's responsibility but the joint responsibility of both the government, the community and the private sector.

This research helps in the development and refinement of dengue fever prevention policies. With strong scientific data and evidence, governments and health institutions can design more effective policies to control this disease. Research is useful for evaluating existing prevention programs. This helps in assessing the success of these programs, identifying weaknesses, and providing recommendations for improvement. Policy research can help in determining intervention priorities. This allows allocating limited resources to areas that need the most attention, such as regions with high rates of dengue fever cases. Research on policy also includes aspects of public awareness. This helps in designing information and education campaigns that can increase public understanding about dengue fever and preventive measures. Further researchers are advised to research how to increase the effectiveness of the dengue fever control program to reduce dengue fever cases in the city of Mataram.

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