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Analysis of community empowerment programs in controlling and preventing dengue hemorrhagic fever in Pekanbaru city

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Abstract
The objective of this research was to analyze the implementation of dengue fever prevention and control using community empowerment strategies in Pekanbaru City, with a focus on the input, output, and process of the program as they relate to regional planning. The research was conducted using qualitative methods, and informants played a key role in determining the results. The study found that the "one house, one jumantik" program faced significant obstacles due to insufficient funding and the diversion of funds for Covid-19 management. Furthermore, the completeness of facilities and infrastructure in Limapuluh District did not meet the required standards. The ABJ in Limapuluh and Sail Districts were unable to achieve the target of ≥ 95% set by the Indonesian Ministry of Health, although the incidence rate of dengue fever has improved with the achievement of the incidence rate target in these two districts in 2022.

Keywords: Dengue Fever, Input, Output, Process

1. Introduction

The incidence rate of Dengue Hemorrhagic Fever (DHF) in four Indonesian provinces did not meet the target of less than 49 cases per 100,000 people in 2017. Bali Province had the highest incidence rate of 105.95 per 100,000 people, while Riau Province ranked 17th out of 34 provinces with an incidence rate of 28.96 per 100,000 people (Ministry of Health, 2018). In Pekanbaru city, the number of reported DHF cases was 358 in 2018, which increased to 488 in 2019 and further increased to 494 in 2020. However, the government's efforts to control the spread of DHF in 2021 resulted in a decrease in the number of cases to 313.

The environment is an important factor that affects the breeding and survival of *Ae. Aegypti* mosquitoes, which are the primary vector for Dengue Hemorrhagic Fever (DHF) (Dinata and Dhewantara, 2011) [2]. The participation and involvement of communities in activities that aim to eliminate mosquito breeding sites, such as cleaning, draining, and covering water storage containers, recycling used items (3M), and using larvicidal pesticides, are crucial in preventing the transmission of DHF (Wahyono *et al*., 2010) [22] and (Widiyanto, 2007). Besides environmental factors, economic factors also play a significant role in the spread of DHF. For instance, communities living in water-scarce areas may have to purchase and store water, which can become potential breeding sites for mosquitoes (Chahaya, 2003).

The region is an inseparable aspect in this matter. Difficulty in obtaining a source of water causes the community to store water for a long period, creating a high chance for mosquito larvae to live. Combating dengue fever requires synergy between sectors, especially the health and regional sectors. The prevention and control policy of dengue fever in the form of the Dengue Prevention and Control Strategy, according to the Ministry of Health of Indonesia (2017), includes vector control of dengue transmission by empowering the community and involving them in the eradication of mosquito breeding sites (MBS) and closing, draining, and recycling used items that become mosquito breeding grounds (3M Plus) through the "1 House 1 Jumantik" movement.

Miryanti, *et al*. (2016) [16] identified individual factors such as knowledge of Dengue Fever (DF) and its prevention among community health volunteers, psychological factors such as their motivation, and organizational factors such as supportive infrastructure and facilities for activities.

The control of DF requires collaboration between the government and the community through community empowerment activities such as educating the public about DF, building joint programs with the community, organizing the community, and implementing programs with the community on a sustainable basis (Sukesi, *et al*., 2018).

The research conducted by Chadijah *et al*. (2011) [6] found that empowering jumantik (mosquito larvae controllers) through PSN activities had a significant effect on increasing the number of mosquito-free areas and decreasing the house index. Despite the government's implementation of the One House One Jumantik campaign since 2016, the actual decrease in the incidence rate of Dengue Fever in Pekanbaru has not yet been significant enough to meet the government's targets. This has led researchers to analyze the effectiveness of community empowerment strategies in controlling Dengue Fever in Pekanbaru, with the aim of improving the success of these efforts in the future.

The city of Pekanbaru is actively engaged in the prevention and control of dengue fever. The implementation of dengue fever prevention and control measures, as well as community empowerment strategies, are regularly evaluated to minimize the spread of the disease in Pekanbaru. This monitoring helps to ensure that the input and output of the measures are effective in minimizing the incidence of dengue fever in the city.

2. Literature Review

Empowering communities is a process of enhancing the knowledge, awareness, and abilities of individuals, families, and society to actively participate in health efforts, achieved through facilitating problem-solving processes with an educational and participatory approach, taking into account local needs, potential, and socio-cultural factors (Kemenkes RI, 2019). According to Nuradhawati (2019), community empowerment, which is a manifestation of the decentralization goal with a participatory democracy approach, is intended to grant regions the authority to determine their own development priorities based on their potential.

In the 1 house 1 jumantik program, community empowerment is one of the steps taken to develop areas from a socio-cultural and environmental perspective to instill a better standard of living among communities through controlling mosquito larvae in households, thus reducing the incidence of Dengue Fever. This is done because public health, as measured by life expectancy, is one of the indicators of successful development and regional growth.

Dengue Fever, also known as Dengue Hemorrhagic Fever, is a potentially fatal viral disease caused by the Dengue virus that is transmitted to humans through the bites of infected *Aedes* mosquitoes. In Indonesia, three types of mosquitoes have been identified as capable of transmitting the virus - *Aedes aegypti*, *Aedes albopictus*, and *Aedes scutellaris*. However, it can be challenging to distinguish between *Aedes aegypti* and *Aedes albopictus* based on their morphology, as they both have black-colored scutum with white stripes. The white stripes in *Aedes aegypti* are located in the dorsal center and are flanked by two white curved lines, while *Aedes albopictus* has a single thick white line in its dorsal area. Hence, it is crucial to be familiar with the characteristics of these mosquitoes, as it can aid both surveillance personnel and the community in identifying the type of mosquito involved in Dengue Fever transmission. Check out the following Figure for a visual comparison of *Aedes aegypti* and *Aedes albopictus* mosquitoes:

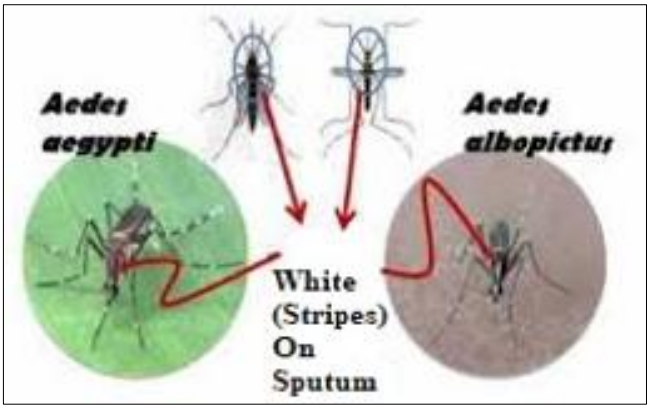


Fig 1: Comparison between *Ae.Aegypti* and *Ae. Albopictus* Mosquitos

Male Ae. aegypti mosquitoes feed on plant sap or flower nectar for their survival, while female mosquitoes prefer human blood over that of animals (anthropophilic). Human blood is required for the maturation of mosquito eggs, which takes approximately 3-4 days to complete (gonotropic cycle), starting from when the mosquito feeds on blood until the eggs are laid.

The results of the recorded *Ae. aegypti* mosquito larvae survey can be analyzed by calculating the larval free index (LFI), container index (CI), house index (HI), and Breteau index (BI) (Kemenkes RI, 2017). The house index is the most commonly used analysis for monitoring the number of Ae. aegypti mosquito larvae without taking into account the number of positive or productive containers. This is almost the same as the container index, which only provides an overview of the proportion of positive water-holding containers.

The high risk of dengue fever transmission in an area is if the CI ≥ 5% and HI ≥ 10% with a BI of more than 50%. The LFI is the percentage of houses where mosquito larvae are not found and is a more commonly used indicator nationally (target LFI ≥ 95%) (Joharina and Widiarti, 2014) [10]. The following is the formula for calculating mosquito larval density (Joharina and Widiarti, 2014) [10]:

$$\text{HI} = \frac{\text{Number of Positives Houses}}{\text{Total Number of Houses Inspected}} \times 100\%$$

$$\text{CL} = \frac{\text{Number of Positive containers}}{\text{Total Number of Inspected Containers}} \times 100\%$$

$$\text{BI} = \frac{\text{Number of Positive containers}}{\text{Total Number of Houses Inspected}} \times 100\%$$

$$\text{ABJ} = \frac{\text{Number of Mosquito larva-Free houses}}{\text{Total Number of Houses Inspected}} \times 100\%$$

3. Research Method

The development of *Aedes aegypti* mosquitoes occurs in three habitats: water, land, and air. The pre-adult stage of female mosquitoes consists of eggs, larvae, and pupae, which are found in water habitats. Adult *Ae. aegypti* mosquitoes, on the other hand, are found in terrestrial and aerial habitats and only seek water to lay their eggs. Each time a female mosquito lays eggs, approximately 100 eggs are produced. The mosquito eggs can survive for approximately six months

in dry places without water, but will hatch more quickly if the area is flooded or experiences increased humidity (Kemenkes RI, 2017). The mosquito larvae that hatch from the eggs float on the surface of the water and breathe through a respiratory tube called a siphon in their respiratory system (Supharta, 2008).

This research will be conducted in Limapuluh and Sail Kota Pekanbaru districts from December 2021 to March 2023. This is a qualitative study using a case study method, which is an intensive, detailed, and in-depth research on a program, event, or activity, either at an individual level, group of people, institution, or organization to obtain a profound understanding of an event.

The data used in this research will be primary data obtained from interviews, observation, and documentation related to the implementation of the one-house-one-larvae-inspector movement in the prevention and control of dengue hemorrhagic fever in Pekanbaru City, as well as secondary data obtained from available data in the field related to research, such as policies, larval-free rates, and others. The data collection techniques used in this study are as follows:

In-depth interviews using a research instrument such as a list of questions or interview guide. The interviews will be conducted with informants by asking in-depth questions according to the interview guide.

Observation, the researcher acts as an observer who assesses, records, and summarizes every piece of information derived from the research object, which can be documents, behavior, or informant's speech during the research. Observation can also be done by the researcher by observing the environment where the research is conducted.

Documentation, this research will be conducted by collecting necessary documents in the form of recordings, writings, pictures, policy regulations, photos of larval inspector activities, and photos during the research.

The research subjects who can provide information on the phenomena or issues raised in the research are called research informants. The characteristics of the informants in this study consist of:

Table 1: Characteristics of Informants

No	Informant	Total Informant	Informant Code
1	Key Informant		
	▪ Holder of the dengue fever prevention and control program at the Pekanbaru City Health Office	1 Person	K1 Informant
	▪ The program holder for the prevention and control of dengue fever at the Public Health Center	3 Persons	K2-K4 Informant
2	Primary Informant		
	Jumantik Coordinator cadres	6 Persons	U1-U6 Informant
3	Supporting Informants		
	Jumantik in house/community	8 Persons	P1-P8 Informant

3.1. Data Reduction

In the process of data collection, information is obtained in various forms. Interviews provide information from the researcher and informants, observations provide notes on the real conditions of the research environment, and documentation provides information from program managers, related agencies, and publications. During the data analysis process, the collected information is reduced by summarizing, determining, and extracting important patterns and key information (Sugiyono, 2013).

3.2 Data Display

After reducing the data, the next step in qualitative data analysis is to display the data. Displaying data is intended to provide an overview and interpretation of the relationship between data from the research (Samsu, 2017). Qualitative data is usually displayed using narrative texts. Data can also be displayed through tables, graphs, pie charts, and so on, according to Sugiyono (2013).

3.3 Drawing Conclusions Process

In qualitative research, the conclusion is the new information discovered through the study. According (Harahap, 2020) it can be a description or a clearer picture of an object that was previously unclear. Although conclusions may have been drawn during the data reduction phase, they are only temporary. The final conclusion is reached after data has been reduced and displayed, resulting in more accurate information.

4. Result and Discussion

The one house one jumantik program is a national-scale program that involves many parties and requires a systematic implementation process. According to the Ministry of Health (2016) [11], the activity process starts with preparation, house visits, mosquito larvae monitoring, recording the results of mosquito larvae monitoring, and health education. Here are the details of each activity:

4.1 Preparation

The preparation involves mapping the locations that need monitoring for mosquito breeding before conducting a house visit. A meeting is held with RT officials, local residents, community and religious leaders, and potential groups to introduce the "one house, one mosquito larvae monitor" program. The meeting aims to select a coordinator and environmental monitors for mosquito larvae, through negotiations between RT officials and other parties involved in the program.

4.2 House Visit

Based on the mapping results obtained during the preparation process, the coordinator conducts house visits once every two weeks. During the house visit, the mosquito larvae monitor coordinator performs the following tasks:

1. Initiates conversation with the residents, showing interest by asking about their wellbeing, etc.
2. Continues the conversation with a topic related to dengue fever outbreaks in the surrounding area.
3. Provides an explanation of the dangers of dengue fever, its transmission, and prevention methods.
4. The homeowner is invited to inspect mosquito larvae and their breeding sites in the house with the coordinator.
5. A house mosquito larvae monitor is selected to independently monitor the mosquito larvae in the house and taught how to fill out the house mosquito larvae

monitoring card.

These tasks are essential for the "one house, one mosquito larvae monitor" program, as they aim to educate the residents about dengue fever and empower them to prevent mosquito breeding in their homes. The tasks also ensure the implementation of the program and the identification of potential mosquito breeding sites in the neighborhood.

4.3 Mosquitos Larvae Monitoring

Mosquito larvae monitoring is conducted in houses, public buildings, and public spaces using the following guidelines: (1) Monitoring is conducted in bathtubs/ toilets, water containers, drums, and other water storage areas such as flower vases, bird feeders, used cans, plastic bottles, old tires, dispenser stands, clogged drains, and holes in bamboo or tree trunks. (2) If larvae inspection is conducted in deep or dark wells or water storage, a flashlight is needed during the inspection. (3) If no mosquito larvae are found, water storage inspection must continue for more than a minute since larvae usually surface to breathe within that duration. Through regular monitoring, potential mosquito breeding sites are identified, and prompt action is taken to eliminate them to reduce the risk of mosquito-borne diseases such as dengue fever. The community is encouraged to participate in monitoring activities to prevent mosquito breeding sites and protect themselves from mosquito-borne diseases.

4.4 Mosquitos Larvae Observations

Every house visited by the jumantik coordinator must be noted whether there are larvae or not in the house, water containers, or other breeding sites. The jumantik coordinator's records are made once a month. The procedure for filling out the larvae card for the jumantik coordinator is as follows: If within a period of 4 or 5 weeks of observation, there is only 1 "+" sign, then the house or container is noted or reported as a "+". The jumantik coordinator's monthly records are submitted to the jumantik supervisor. The format of the larvae report by the jumantik coordinator can be seen in Figure 2.

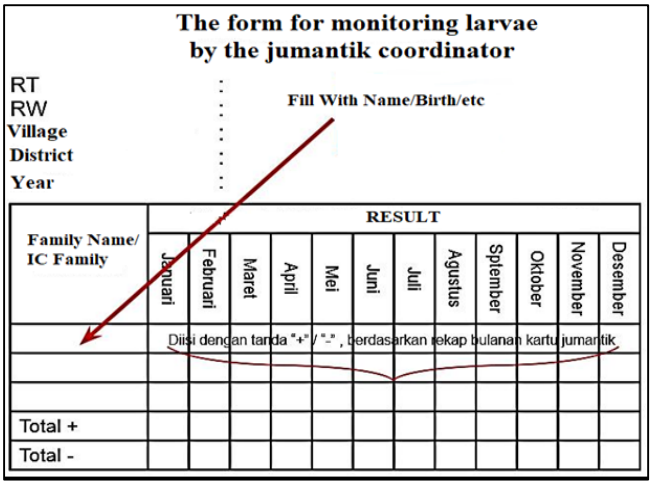
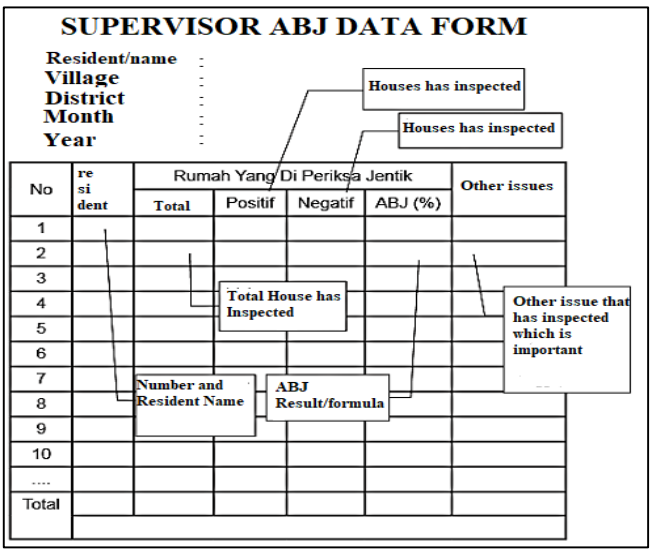


Fig 2: Form for monitoring larvae

After receiving the jumantik card report from the jumantik coordinator, the jumantik supervisor is also responsible for recording the larvae and reporting it to the neighborhood health center, which will be further reported to the Health Department. The output of the report made by the jumantik supervisor is the ABJ value. The data that needs to be filled out on the ABJ form are the RW name, Village/Sub-district, District, Month, and Year of the ABJ data creation. In the ABJ form table, ABJ data is created per RT in that RW. The format of the ABJ data form that needs to be filled out by the jumantik supervisor can be seen in Figure 3.



***Source*:** Kemenkes, 2016

Fig 3: Supervisor ABJ Data Form

If the recording and monitoring of mosquito larvae are carried out in accordance with the guidelines, the magnitude of the free larvae index (ABJ) in the area will be known at the district health center level, whether in the sub-district or district. ABJ, or the percentage of negative larvae in relation to the total number of houses/TTUs/TTIs examined, is an important indicator of mosquito-borne disease transmission risk.

Unfortunately, the district of Limapuluh has no household mosquito monitors due to low community participation in the one-house-one-monitor program. This was reported by the district authority, who noticed the low turnout at the program's socialization event held at the sub-district level. Confirming this, some residents of Limapuluh sub-district stated that they were not aware of the one-house-one-monitor program, while others reported that the coordinator had never visited their home to provide information on the PSN 3M Plus program, although they would have welcomed such a visit.

In contrast, the mosquito monitoring program in Sail sub-district has been implemented in the Suka Mulia neighborhood, with selected volunteers conducting home visits every two weeks. Due to limited human resources, however, not all households can be examined, so the focus is on those affected by dengue fever. Based on interviews with residents of Limapuluh, it appears that only households with at least one member infected with dengue fever are visited by the mosquito monitors.

In Sail District, jumantik cadres actively visit houses twice a week, rotating the houses and each coordinator is assigned to inspect 20 houses during their field duty. The jumantik coordinators also conduct socialization on how to inspect mosquito larvae using a flashlight, how to prevent dengue fever with the 3M Plus program, and provide information on places where mosquitoes nest, such as behind refrigerators, on clothes hanging behind doors, and elsewhere. When asked

about the 3M Plus program, supporting informants from District Sail answered correctly. Socialization is not only done from house to house every two weeks, but jumantik cadres also conduct socialization in schools, neighborhoods, and gathering places. Another activity carried out as part of the 3M Plus program is community service, which is initiated by the neighborhood and block heads once a month in both District Limapuluh and District Sail. The frequency of community service will be increased when there is a dengue fever outbreak and during the rainy season to prevent stagnant water from becoming mosquito breeding grounds.

Jumantik coordinators in District Sail also check the mosquito larvae cards given to each household during their house visits. At the beginning of the one-house-one-jumantik program, each household in Suka Mulia Resident was given a mosquito larvae card and educated on how to fill it out. The format of the house's mosquito larvae card used in District Sail is the same as that in the guidelines. The mosquito monitoring results recorded by the jumantik in each house are then transferred to the jentik monitoring report sheet held by the jumantik coordinator. The mosquito larvae card format used by the jumantik coordinator in District Limapuluh and District Sail is the same as that in the Ministry of Health guidelines. The monitoring results by the jumantik coordinator in District Sail are then reported to the neighborhood health center and forwarded to the district health center until they reach the Department of Health.

The output of the "one house one mosquito larvae inspector" program is a low level of mosquito larvae-free index (ABJ) and a low incidence rate (IR) of Dengue Fever (DF). Based on interviews with the main informant in Sail District, it is known that the ABJ value in Sail District was 65% in 2017, 90% in 2018, 85% in 2019, and 85% in 2022. If we look at the IR value in 2020 in Limapuluh District, there were 38 cases with a population of 38,613 people, and the IR value was 95/100,000 people. This number indicates Limapuluh District's inability to achieve the target output of the "one house one mosquito larvae inspector" program in 2020. In 2021, Limapuluh District was able to achieve the target with 21 DF cases out of a population of 45,578, with an IR of 46/100,000 people. Sail District, which implemented the "one house one mosquito larvae inspector" program consistently and attempted to follow the guidelines, was able to achieve the IR target. In 2020, it had 9 DF cases out of a population of 20,384, with an IR of 44/100,000 people. In 2021, there were 11 cases out of a population of 25,290, with an IR of 44/100,000 people.

The findings from interviews conducted with the informants include input aspects (human resources, funding, facilities and infrastructure, and methods), process aspects (implementation processes, obstacles and facilitators), and output aspects (ABJ and IR) compared to guidelines issued by the Ministry of Health of the Republic of Indonesia for the "one house one mosquito larvae inspector" program, as well as the ABJ and IR targets set by the Ministry of Health. The research findings can be viewed in the following table 2:

Table 2: Result of the Research

No.	Analysis	Indicator	Result	Guideline	Agree	Disagree
1.	Input	▪ Human Resources	▪ All areas of the Health Department work continuously, including: ▪ Community Health Centers (Puskesmas) members in the district as the responsible party for the DBD program. ▪ Sub-district (Kelurahan) Health Centers members as special surveillance for DBD or dual surveillance for several diseases. ▪ Sub-district Head (Lurah)/Village Head (Kepala Desa) ▪ Head of RT and RW as a liaison between the government and the community. ▪ Community members as jumantik cadres from community health centers and house-to-house jumantik.	▪ The Health Department ▪ Community Health Centers (Puskesmas) at the district and sub-district levels ▪ Village or Sub-district Leaders (Lurah/Kepala Desa) ▪ Neighborhood Association Leaders (Ketua RW) ▪ Community Unit Leaders (Ketua RT) ▪ Community members who participate as Jumantik cadres under the supervision of Puskesmas and as Jumantik for their own households	√	-
		▪ Financial Resources	▪ Health Operational Assistance (BOK) from the Health Department ▪ BOK from the local public health center (puskesmas) ▪ Village funds ▪ Special Allocation Funds.	▪ Local Government Budget (APBD) of the district/city ▪ Health Operational Assistance (BOK) ▪ Village Fund Allocation ▪ Other funds.	√	-
		▪ Facilities and Infrastructure	▪ In District Limapuluh, the incentive for jumantik cadres varies from Rp50,000 to Rp75,000 per month, while each jumantik cadre receives Rp50,000 for every fieldwork they undertake.	▪ Transportation allowance, incentives, and honorarium are provided for coordinators and supervisors	√	-
			▪ The jentik cards are not distributed to all residents due to the limited number of jumantik cards provided by the Health Department.	▪ Jentik cards, Coordinator and Supervisor Jumantik	-	√

				report forms.		
			▪ Dengue fever community health workers are not provided with guidelines and educational materials to use when interacting with the public or conducting socialization campaigns.	▪ Guidelines and educational materials	-	√
			▪ Only a few dengue fever community health workers, especially those who participated in the initial socialization campaign for the One House One Jumantik program, received the PSN kit. Newly recruited health workers only use a smartphone flashlight to assist in monitoring mosquito breeding sites. Larvicides are provided to community health workers during monthly evaluation or routine meetings and distributed to households with stagnant water containers that cannot be drained.	▪ The PSN kit contains a hat, vest, work bag, writing tools, flashlight, pipette, and containers for mosquito larvae and larvicides.	√	-
		▪ Method (Standard Operating Procedure)	▪ The house-to-house dengue vector surveillance (Jumantik) program has not been conducted in the Limapuluh District, but the community has responded well to the visits of Jumantik workers to their homes. In the Sail District, there are family members in one household who are appointed as Jumantik workers.	▪ household dengue vector surveillance	√	-
			▪ The Jumantik coordinator is proposed by the head of the neighborhood association (RT) or community association (RW) to the local sub-district office (Kelurahan) in collaboration with the community health center (Puskesmas). In the Limapuluh District, one RW is monitored by two Jumantik coordinators, while in the Sail District, one RT is monitored by three Jumantik coordinators.	▪ Dengue Vector Control Coordinator	√	-
			▪ There is no Jumantik supervisor	▪ Jumantik Supervisor	-	√
2.	Procedure	▪ The process of implementing the program, obstacles and facilitation during the activities	▪ Sociolization by the Pekanbaru City Health Department was conducted in 2017. The sociolization from the sub-district health center to the community was carried out in 2018. A re-sociolization was conducted by the Pekanbaru City Health Department in 2019, and the implementation of the 'One House One Jumantik' movement was resumed.	▪ Preparation (sociolization, determination of places to be inspected, recruitment of jumantik)	√	-
			▪ Kader jumantik conduct house visits to monitor households based on a predetermined list provided by the puskesmas during their field visit, and the checked households are rotated. In District Limapuluh, jumantik workers visit 20 households twice a week on a rotating basis, with a focus on areas with reported dengue fever cases. They also visit the households once or twice a week. All community members have been informed about the jentik card filling mechanism and the 3M Plus PSN activities.	▪ Home Visits	√	-
			▪ The jumantik cadres monitor mosquito larvae in both inhabited and uninhabited houses. If it is possible to enter uninhabited houses, they will be entered and inspected. If not, the inspection will only be conducted on the outside of the house.	▪ Monitoring of mosquito larvae (jentik)	√	-
			▪ In the Limapuluh district, there was no recording and reporting of the number of houses with larvae. In the Sail district, the community actively records and submits jumantik cards when jumantik cadres visit their homes. The results of the jumantik card records carried out by jumantik cadres in the Sail district are then submitted to the community health center in the sub-district.	▪ Recording and reporting the monitoring results	√	-
			▪ The jumantik cadres actively provide education during home visits, social gatherings such as arisan, and religious events. The promotion of	▪ Health Education	√	-

			communal clean-up activities is actively conducted by the puskesmas in collaboration with the kelurahan, RW, and RT. However, there are reports from some community members that clean-up activities in their area are rarely conducted.			
3.	Output	▪ larvae-free index (ABJ)	▪ The ABJ in Sail District in 2017 was 65%, in 2018 it was 90%, in 2019 it was 85%, and in 2022 it was 85%. There is no data on ABJ in Limapuluh District	▪ ABJ ≥ 95%	-	√
		▪ Dengue Incidence Rate	▪ The incidence of dengue fever (DBD) in Limapuluh District in 2020 was 38 cases with a population of 38,613 people, in 2021 there were 21 cases with a population of 45,578 people, and in 2022 there were 34 cases. Meanwhile, Sail District had 9 DBD cases in 2020 with a population of 20,384 people, 11 cases in 2021 out of 25,290 people, and 17 cases in 2022.	▪ The incidence rate of dengue fever should be ≤ 49 cases per 100,000 population.	-	√

5. Conclusion

The lack of funding and diversion of funds for Covid-19 pandemic response poses a significant obstacle to the implementation of the one house one jumantik program. The equipment and infrastructure provided to jumantik cadres were only given during the initial program socialization, and new PSN kit cadres had to rely on existing equipment, with some even using personal flashlights. The roles of each stakeholder in the one house one jumantik program, such as home jumantik and jumantik coordinator, are still not in accordance with the guidelines set by the Ministry of Health, and in District Limapuluh, home jumantik is not implemented.

1. The recording and reporting process is not yet optimal as home jumantik still requires assistance from jumantik coordinators, making the jumantik coordinator's job less efficient. The PSN 3M Plus socialization by jumantik coordinators is still limited to verbal communication without the facilitation of educational materials and socialization aids.
2. The ABJ in District Limapuluh and District Sail still cannot reach the target set by the Indonesian Ministry of Health, which is ≥ 95%, and the incidence rate of DBD is seen to be improving with the achievement of the target incidence rate in both districts in 2022.
3. In terms of geography, District Limapuluh and District Sail are prone to flooding due to their flat topography, and the drainage and sanitation systems that still rely on gravity will increase the risk of high DBD rates and low ABJ due to the accumulation of stagnant water.

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