

Evaluation of one-house one-larvae observer program in controlling dengue hemorrhagic fever in Central Sulawesi

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ABSTRACT

Dengue hemorrhagic fever (DHF) is still a health problem in Poso District. This can be seen from the high number of DHF cases and potential outbreaks from 2017 to 2018. The local government took the initiative to prevent DHF outbreaks in Poso Regency. The Central Sulawesi Provincial Health Office and the Poso Regency Health Office have implemented one-house one-larvae observer program in the Poso Kota Selatan District area by engaging the local government and community. The implementation of the program and its accomplishments requires evaluation. This study aims to evaluate the one-house one-larvae observer program using input, process, output, and outcome indicators. The research adopts a descriptive-qualitative approach, employing observation and interviews within an evaluation research design. Data analysis was performed using interpretation and triangulation methods. Policy documents are available, and human resources supporting the program are in compliance with the decree. However, the budget for the program is insufficient, while the available infrastructure is sufficient. The process indicators demonstrate satisfactory progress. Based on outputs, there was an increase in achievement against the program target of the number of buildings inspected by house larvae observers over four years. The outcome indicator in the form of the larvae-free rate increased by >90% during one year of program implementation. The implementation of local innovations initiated by the Regency Health Office and stakeholders' engagement has been proven to increase community participation in programs that impact the achievement of program outputs and outcomes.

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1. INTRODUCTION

Dengue hemorrhagic fever (DHF) remains health problem in Poso Regency. The incidence rate (IR) of DHF cases in Poso Regency showed a fluctuating incidence rate trend in 2016. However, the number of DHF cases increased from 2017 to 2018, suggesting an outbreak in the Poso Regency, evident from the significant rise in numbers during that period. The high number of dengue cases and the emergence of outbreaks will impact the health, social, economic, and political sectors. Therefore, local governments need to control dengue disease transmission in their areas through related programs [1], [2].

The one-house one-larvae observer program aims to reduce the incidence of DHF cases and associated mortality rates by enhancing the participation and empowerment of family-based communities for

prevention. This movement is a tangible manifestation of the mosquito breeding eradication program, which aims to achieve a larvae-free index >95% by involving the entire community in preventing mosquito breeding. Under this program, a designated larvae observer trained by the local health center monitors the presence and development of mosquito larvae to control dengue disease in the area. Community engagement is highly important in the implementation and success of the program. Health interventions must involve the community actively and participatively, from planning to evaluation; hence, these interventions can be sustainable in the community [3]–[5].

The one-house one-larvae observer movement was introduced in Poso Regency in 2017. The implementation focused on the Poso Kota Selatan District, which includes five subdistricts. While the program's technical guidelines were not strictly followed during the implementation, a larva observer team, comprising larva monitor supervisors and coordinators, was formed following the one-house one-larvae observer program technical guidelines. However, the technical guidelines state that the program implementation involves several main elements: the house larva monitor, environmental larva monitor, larva monitoring coordinator, and larva monitoring supervisor. The three elements routinely coordinate the monitoring and reporting of larva data in an area. The problem found was that the house larvae observer coordinator played no role in monitoring larvae in their respective homes. Hence, larva control cards were not filled out routinely. Thus, evaluating program implementation in the Poso Regency, Central Sulawesi, is important. This study aims to evaluate the one-house one-larvae observer program based on input, process, output, and outcome indicators.

2. RESEARCH METHOD

2.1. Study setting

Among the 19 districts in Poso Regency, the one-house one-larvae observer program, depicted in Figure 1, was implemented in Poso Kota Selatan District in 2017. The one-house one-larvae observer program has been implemented since 2017. This program, approved by the Regent of the Poso Regency, was implemented by the Poso Regency Health Office and supervised by the Central Sulawesi Provincial Health Office. The implementation process involved collaboration with primary health care in the Poso Kota Selatan District area, local agencies, leaders of the Kawua Subdistrict, and community leaders.

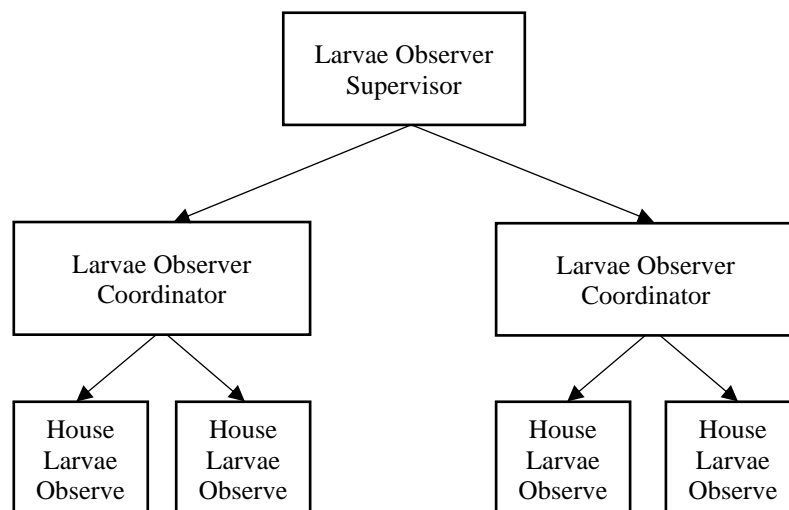


Figure 1. Structure of one-house one-larvae observer program in subdistrict levels

2.2. Study design

The research adopts a descriptive-qualitative approach, using observation and interviews for primary data collection. The research design is evaluation research comprising input, process, output, and outcome as shown in Figure 2. There were 21 respondents interviewed, they consisted of 4 people from the Poso Regency Health Office, 1 respondent from the Poso Kota Selatan District office, 1 respondent from the Kawua Subdistrict office, 3 respondents from the Kawua Primary Health Care, 5 respondent from the

community leaders in Kawua Subdistrict and 7 respondents who represents the one-house one-larvae observer team.

The data were collected in the form of primary data and secondary data. Primary data include policy implementation, human resources, budget, infrastructure, and community empowerment. Secondary data include a decree on the implementation of the one-house one-larvae observer program, technical instructions for eradicating dengue mosquito nests by larvae observer or standard operating procedure, achievement standards from the one-house one-larvae observer, data on the number of dengue cases in Poso Regency, resource data including human resources and infrastructure, data on one-house one-larvae observer activity reports, data on larvae-free index values, and data on sources of program funds. In-depth interviews were conducted with stakeholders, including the head of the Poso Regency Health Office, the head of the infectious disease division in the Poso Regency Health Office, the head of the infectious disease control section in the Poso Regency Health Office, the manager of the DHF Program in the Poso Regency Health Office, the head of the Poso Kota Selatan District, the head of Kawua Subdistrict, the head of Kawua Primary Health Care, the head of communicable disease division in the Kawua Primary Health Care, the manager of DHF program in the Kawua Primary Health Care, and a community leader in Kawua Subdistrict. Furthermore, in-depth interviews were conducted with three larvae observer supervisors and coordinators in the Poso Kota Selatan District. The validity and reliability of the questionnaire was checked using triangulation to determine credibility, confirmability, meaning in context, recurring patterns, saturation, and data transferability. Ethical clearance (No. LB 02.01/2/KE/296/2018) was obtained from the National Institute of Health Research and Development (NIHRD), Ministry of Health.

2.3. Data analysis

A transcription expert transcribed all audio files verbatim. We reviewed all transcripts for transcription accuracy by comparing them to the audio files and making the necessary corrections. All transcripts, field notes, and electronic documents were analyzed using triangulation methods and interpretation [6].

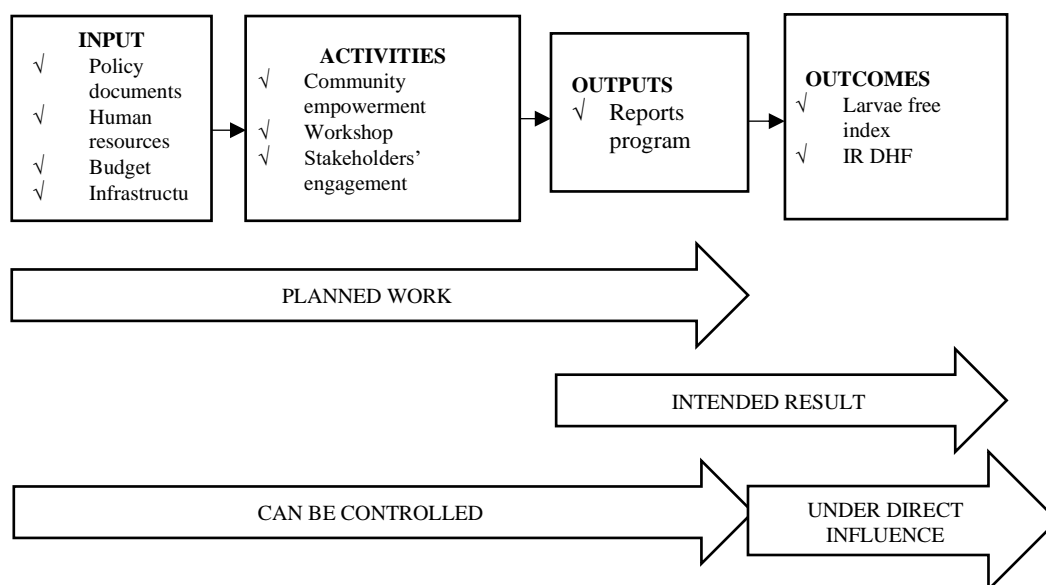


Figure 2. The research evaluation pathway, modified from [7]

3. RESULTS AND DISCUSSION

The observations and interviews conducted in this research reveal that the policy implementation of the one-house one-larvae observer movement program in Central Sulawesi has a legal basis, either by decree or technical instructions for mosquito breeding eradication in standard operating procedure in Table 1. The interview results indicate that government regulations and the Minister of Health decree specifically address prevention measures through mosquito breeding eradication. Provincial and regency/city program managers only follow government regulations and decree guidelines. Meanwhile, regional regulations do not yet exist.

Table 1. One-house one-larvae observer program implementation

Indicators	Action
Input	
Policy Documents	<ul style="list-style-type: none"> Decree on the implementation of one-house one-larvae observer at the Regency level Technical instructions for dengue mosquito breeding eradication by larvae observers or standard operating procedures
Human Resources	<ul style="list-style-type: none"> Informants come from the head of the Poso Regency Health Office, the head of the infectious disease division in the Poso Regency Health Office, the head of the infectious disease control section in the Poso Regency Health Office, the manager of DHF Program in the Poso Regency Health Office, the head of Poso Kota Selatan District, the head of Kawua Subdistrict, the head of Kawua Primary Health Care, the head of communicable disease division in Kawua Primary Health Care, the manager of DHF program in Kawua Primary Health Care, and community leaders in Kawua Subdistrict. One-house one-larvae observer team consists of a larvae observer supervisor and larvae observer coordinator The human resources of the larvae observer team in each subdistrict in the Poso Regency comprise one larvae observer supervisor and three larvae observer coordinators.
Budget	<ul style="list-style-type: none"> Regional revenue and expenditure budget for logistics (Temephos and Survey tool kit)
Infrastructure	<ul style="list-style-type: none"> Health Operational Assistance Fund of Primary health Logistics for household larvae observer (Survey tool kit), such as mosquito larva control cards, batteries, manuals, stationery Temephos (chemical larvicide) Transportation
Process	
Community Empowerment	<ul style="list-style-type: none"> “Friday morning cleaning the environment” action program Little detective of larvae
Workshop	<ul style="list-style-type: none"> Mini quarterly workshop by primary health care
Stakeholder engagement	<ul style="list-style-type: none"> Cross-sectoral meetings and socialization
Output	
	<ul style="list-style-type: none"> Written reporting monthly Mobile reporting
Outcome	The increase of “Larvae free index” in the Poso Kota Selatan District area

3.1. Policy documents

Currently, the implementation of the one-house one-larvae observer movement in the provincial level area lacks an official decree, and only the Poso Regency work areas have obtained it [8]. Until now, the decree issuance for implementing the one-house one-larvae observer movement was handed out directly to the respective program manager of the health office in regencies and cities in Central Sulawesi, which the Regencies or Cities Health Office signed. From the regency or city office, the decree is then forwarded to the program manager at the provincial level and sent to the central government. This decree implies that the central government is willing to admit that the one-house one-larvae observer program has been running, even though the head of the regency or city health office legitimizes it. The role of the legitimator is very important in successfully implementing the program, as it is the key holder.

Regarding the technical instructions for implementing the one-house one-larvae observer program or guidelines and standard operating procedure, based on the results of interviews, all informants acknowledged the existence of a technical manual used by the health office and larvae observer personnel regarding instructions for establishing and fostering family larvae observer, larvae observer coordinators and supervisors, as well as technically inspecting, monitoring, and eradicating mosquitoes using the mosquito breeding eradication method. Policies issued by local governments are a form of serious effort to control DHF and prevent outbreaks. Local public health authorities must provide continuous health education efforts, communicate with the community, and provide a sufficient budget to control DHF, not only during outbreaks [9]. In Singapore, there is a focus on implementing policies that aim to control DHF vectors by exploring new interventions that are both more effective and economically efficient while evaluating their implementation [10].

3.2. Human resources

Based on interviews with informants at the provincial and district levels, the structure of the resources involved in implementing this program is stated. First, the Central Sulawesi provincial health office and the Poso regency health office comprise the manager of the DHF program, the head of the infectious disease control section, and the head of infectious disease division. Those who manage policy and program implementation at the provincial and district levels. Second, informants at the district level are personnel in the Kawua Primary Health Care, i.e., the head of the primary health care and the manager of the DHF program. Their job is to implement the program in the field, namely accompanying the larval observer team and educating and socializing the community. Third, the head of the subdistrict level, i.e., the head of the subdistrict. They also socialize the program and coordinate the community to implement the program. The fourth involves the larvae observer coordinator selected from the neighborhood association and hamlet to monitor larvae cards in people's homes and public or worship houses and report any findings to the larvae observer supervisor. The fifth is the house larvae observer, who is responsible for checking the water reservoir and writing down the inspection results on the larva card at his house. Program managers at the provincial/regency and subdistrict levels have the task of recapitulating the number of supervisors and the number of larvae observer coordinators, as revealed in the results of interviews with program managers at the regency level.

The human resources involved in one-house one-larvae observer in Poso Kota Selatan District include five subdistricts with one larvae observer supervisor and three larvae observer coordinators. Most larvae observer coordinators also serve as other personnel, such as tuberculosis program personnel and integrated health care center personnel, whereas the larvae observer supervisor is a subdistrict employee. This becomes a challenge for the larvae observer coordinator in performing his duties because of the dual duties and other activities, such as family affairs and social and religious activities.

3.3. Budget

Initially (in 2018), the larvae observer's incentive funding source and transportation were sourced from the district health office. However, it was later transferred to primary health care health operational aid funds. The incentive amount for transportation costs is IDR 50,000 per month, and it is paid quarterly when the larvae observer personnel are deployed to the field. Unfortunately, this arrangement has led to occasional decreases in the morale of larvae observer coordinators. Moreover, they serve as personnel for other programs, such as tuberculosis and integrated healthcare centers. This additional workload is one of the factors that hinder larvae observer personnel. Economic factors also play a significant role in the success of the DHF program. The involvement of people with higher income and higher education levels in DHF control programs is greater than that of people with lower income and education levels [11].

3.4. Infrastructure

The larvae observer coordinator uses private vehicles for transportation. The Poso Regency Health Office has not been able to provide transportation equipment for the larvae observer coordinator to perform their duties. However, transportation assistance is provided in the form of transportation costs, which, according to the larvae observer coordinator, are still low. According to the Poso Regency Health Office explaining the infrastructure used in the one-house one-larvae observer program, each subdistrict initially received a mosquito breeding eradication survey KIT, including a larvae control card. The larva control card was used to record the daily count of larvae in each house. Furthermore, personal protective equipment, fogging, larvicides, and logistics are provided routinely. Vector control by fogging is still highly relied upon as a mosquito control effort when there is an increase in DHF cases in the Poso District. Previous studies have also found that fogging is still effective in controlling the density of DHF vector mosquitoes [12]. Similarly, abatement (larvacides) remains highly effective in eliminating mosquito larvae [13]. However, educating the public about fogging is crucial for successful DHF vector control [14].

3.5. Community empowerment

The Poso Regency Health Office and the Kawua Health Center implemented three events related to cross-sectoral involvement, including the Friday morning clean environment action program, little detectives, and the mini quarterly workshop at Kawua Primary Health Care.

3.5.1. Friday morning clean environment action program

The Friday morning clean environment action program has been running in the Poso Regency area since 2015 and has been implemented in all districts. The Poso Regency government initiated this program, particularly the Poso Regent, which aims to appeal to all community members to perform clean environmental activities around their homes, public places, or houses of worship. This program involves all work units (regional organizations), including the health office and citizens in the Poso Regency area.

The District of Poso Kota Selatan also routinely implements this program, involving five subdistricts in the District of Poso Kota Selatan. The head of the subdistrict coordinates the program implemented in each subdistrict. Notably, the program, held in the Poso Regency, has not been implemented by the entire community as the community has not been independent and active in implementing it. This program is still incidental and coordinated by the district and subdistrict heads. The same thing occurred in the Kawua subdistrict. The program activity, which is coordinated by the subdistrict head, is scheduled once a week with different locations and rotations in each subdistrict. This program involved community leaders in the subdistrict area in the Poso Kota Selatan District. Like Poso Regency, Padang City has also launched a program to control DHF, the "Bundo Peduli Jentik Program," which aims to control DHF through 3M plus activities performed by mothers. The program is a policy of the local government to prevent DHF transmission in the community [15].

3.5.2. Larvae little detective

The larvae detectives were selected from every elementary school in four districts, and primary health care coordinates the selection of little detectives for students. These little detectives are to monitor and clean larvae in their respective schools. This little detective is expected to help the *jumantik* coordinator monitor mosquito larvae in the school's water shelters. They are equipped with larval survey equipment and were previously campaigned in elementary schools in four districts in the Poso Kota. However, several obstacles emerged, including the results of the larva examination by the little detective not being continuously reported properly on the larvae card, the student's role as a little detective will end when they graduate, and there has been no attempt to regenerate or change roles as a little detective. Involving children and adolescents in mosquito control is an attractive and effective strategy for educating them about DHF control [16]. Teachers also have the responsibility to teach dengue prevention at school [17]. Interventions involving school children should adopt an ecological approach (environmental and behavioral factors) to achieve real and sustainable health behavior change [18].

3.6. Workshop

A mini-workshop at Kawua Primary Health Care is implemented every three months, in the second week, in the Kawua Primary Health Care meeting room. This activity aims to convey the results of primary health care programs, evaluate their programs, and hear proposals or opinions from cross-sectors related to primary health care activities. This program involves cross-sectoral activities, including district heads, subdistrict heads, schools, community leaders, religious leaders, and personnel, such as larvae observer coordinators and supervisors. This meeting discussed the activities of essential public health efforts implemented by primary health care for the past three months. The larvae observer coordinator presents the DHF report, including the larva inspection report, to the DHF program manager. Providing DHF education to health workers effectively changes their knowledge and attitudes about DHF prevention [19], [20].

3.7. Stakeholder engagement

The Poso Regent places significant emphasis on cleanliness within the Poso Regency area, particularly the Poso Kota area. This is evident through the implementation of the Friday morning clean environment action program. In addition, this program, the one-house one-larvae observer program by mosquito breeding eradication, along with the 3M Plus approach (draining, burying, and closing) and other preventive measures, also receives support and attention from the Poso Regent. Some supporting factors include: i) the cross-sectoral cooperation, especially the district head, subdistrict head, neighborhood association, community leaders, and primary health care, all working to promote the program; ii) the community response was quite good in accepting the education of mosquito breeding eradication through the 3M Plus program via the one-house one-larvae observer program, both at the district and subdistrict levels; iii) support from the regency health office in the form of operational, coaching and training, and education of the sustainable one-house one-larvae observer program, and iv) adequate participation and cooperation between the larvae observer coordinator and residents in developing awareness of healthy living and residents' willingness to be involved as house larvae observer in every neighborhood association and hamlet. Health education efforts are important in changing perceptions and healthy home environment conditions, which impact increasing community participation in DHF control [21]. In Bali, there is even a 4M-Plus (draining, closing, reusing used goods, and monitoring) and mosquito nest control; integration of dengue information services; using natural insecticides and larvicides; observing and reporting the presence of vectors to the larva monitoring officer; and regular monitoring weekly (SIGAP). SIGAP strategy that involves the community's active role. This strategy integrates DHF information services, the use of natural pesticides, activating the role of *jumantik*, and regular weekly larvae monitoring, although its future implementation also requires evaluation [22]. Cross-sectoral cooperation efforts in mosquito eradication efforts are still needed [13].

3.8. Output

Each coordinator makes a report on the written document containing the activities performed by the larvae observer personnel, including checking the larvae card in homes and public places. Written reports are made monthly and are reported to the managers of the DHF program in primary health care. An innovative approach has been adopted to enhance the reporting of activities within the one-house one-larvae observer program. This involves utilizing mobile reporting through a dedicated "WhatsApp chat group" comprising larvae observer coordinators, larvae observer supervisors, and the manager of the DHF program in primary health. This platform allows for the efficient reporting of larvae observer coordinator activities, including larvae card examinations and larvae survey activities conducted by larvae observer coordinators and supervisors. The report was sent as larvae survey activities containing data on the number of buildings checked by house larvae observers. In addition, other program achievement activities involving the community and cross-sectors, such as cross-sectoral meetings and socialization, Friday morning cleaning environment programs, and monthly larvae monitoring reports by larvae little detectives, were reported. Table 2 shows the activity outcome data. All activities went well, although the socialization target was only achieved 100% in 2020.

Table 2. Activity outcomes of the one-house one-larvae observer program of Poso Kota Selatan District from 2017–2020

Activity	Outcomes n (%)			
	2017	2018	2019	2020
Number of buildings inspected by larvae observer	2229 (87.5%)	2271 (89%)	2316 (91%)	2320 (91%)
Cross-sectoral meetings/socialization at the subdistrict level twice a year	1 (50%)	1 (50%)	1 (50%)	2 (100%)
Friday morning cleaning environment program, which is done once a week	4 (100%)	4 (100%)	4 (100%)	4 (100%)
Monthly larvae monitoring report by larvae little detective	12 (100%)	12 (100%)	12 (100%)	12 (100%)

3.9. Outcome

The larvae-free index percentage before implementing the one-house one-larvae observer program in the Poso Regency, especially in the Poso Kota Selatan District (2016), was 62.3%. However, following the program's implementation in 2017, the percentage increased significantly to 90.5% by 2019. Similarly, incidence rate of DHF appears to have decreased from 2017 to 2018. However, it was necessary to be aware of the increase in IR again in 2019. Table 3 describes the percentage of the larvae-free index in the Poso Kota Selatan District during 2016–2019.

Table 3. Larvae-free index and IR DHF of Poso Kota Selatan District From 2016-2020

Year	Larvae free index (%)	IR (per 1000)
2016	62.3	2.11
2017	72.2	0.67
2018	83.7	0.57
2019	90.5	1.05
2020	90.1	1.92

Community empowerment is used in social science to overcome societal issues, particularly in the public health sector. It encompasses various efforts or processes to enhance the community's awareness, willingness, and ability to recognize, overcome, maintain, protect, and improve their welfare. Previous studies have identified the reasons that encourage people to participate in mosquito vector control programs. These include the desire to protect themselves and their families from mosquitoes, gaining new knowledge and skills, and even exploring income opportunities, which are important for young people [23]. Such community awareness and expectations are critical to designing a program that can gain stable and sustainable community support [24]. Implementing community interventions is not easy, but it is possible. Some stages of empowerment are as follows: i) building trust by making families no longer objects but subjects who will implement the program. ii) Increasing community awareness about diseases such as DHF, which is often

ignored unless it has a negative impact on the community [25]. Continuous education is imperative to building and increasing community awareness. iii) Program development efforts should involve the community and those who play an important role in it. iv) Engaging in community organizing activities. v) Program improvement initiatives should be performed continuously with evaluation and improvement [26].

Policy implementation is an ongoing process. One of the government policies is the one-house one-larvae observer program, which has been implemented in Indonesia since 2015. The program centers on family development through primary health care, cross-sectoral districts, and health cadres, aiming for each family to actively monitor and eradicate vector mosquito larvae in each household. In Poso Regency, the one-house one-larvae observer program has been implemented since 2017, which was marked by the issuance of a decree of the head of the Poso Regency Health Office, specifically addressing the implementation of the one-house one-larvae observer movement in the Poso Kota Selatan area. The issue of this decree implies that the central government is willing to admit that the program has been running, even though the head of the regencies/cities' health office legitimizes it.

The legitimator plays a crucial role in successfully implementing the program as they serve as the key holder. The adoption rate of a collective innovation program is positively related to the level of involvement of social system legitimators in decision-making; the more legitimators are involved in the decision-making process, the faster the collective innovation spreads. Therefore, in 2019, a revision was made to the program implementation decree in Poso Regency. The original decree, issued by the head of the Poso Regency Health Office, was revised to be issued by the Poso Regent. The decree accommodates several things resulting from mentoring activities performed four times in the intervention area of the Kawua subdistrict, including increasing the number of larvae observer coordinators in the Kawua subdistrict area from three to five people. Furthermore, in the decree, the program area was expanded beyond the Poso Kota Selatan District to include two more districts (Poso Kota District and Poso Kota Utara District), bringing the total to three subdistricts that implemented the program in the Poso Regency area.

The guidelines for implementing the one-house one-larvae observer program in the Poso Regency area are based on the revised 2017 one-house one-larvae observer technical guidelines. Despite the DHF managers claiming to have followed the 2017 technical guidelines, discrepancies were observed in practice. The discrepancies included the continued use of the old format of larvae control cards (technical guidelines) and the lack of regular reporting of larva control card inspection results in primary health care. The Regency and provincial health offices need evaluation and monitoring efforts to overcome these problems. Moreover, efforts to renew the larvae observer coordinators, performed every month, have been agreed upon by the larvae observer coordinators, larvae observer supervisors, and the DHF manager at the primary health care in four-time mentoring activities as an alternative solution to overcome these problems. This effort effectively increases community participation in filling out larva control cards.

The success of a program hinges on the abilities and contributions of its human resources, such as the agent of change, community leaders, social systems, and their members. The agent of change, typically a professional worker, plays a vital role in influencing and directing innovation decisions according to the goals of the institution. Agents of change in this case could be government representatives, program holders, cadres, or larvae observers. Community leaders, who may hold formal positions such as religious figures, priests, subdistrict heads, or heads of neighborhood associations, have the power to influence others' behaviors. They play a crucial role in promoting specific actions within the community. Furthermore, the social system, particularly those included in the organizational structure of the one-house one-larvae observer movement, along with its members like larvae observer personnel or opinion leaders, contribute significantly to the dissemination of new ideas within the program. Last, the community itself, being the recipient of the program, actively engages and cooperates to determine its ultimate success. Efforts to convey information about the one-house one-larvae observers have also been conducted through the socialization and education of DHF program managers in regencies and communities.

The DHF program manager at the provincial health office, program managers at the regency health office, and primary health care implemented the socialization activity. Then, the regency health office gave socialization and technical guidance to the primary health care. It conducts socialization with the community through mini-quarterly workshops involving cross-sectors such as subdistricts, urban villages, neighborhood associations, hamlet, women associations, community leaders, religious leaders, schools, larvae observer coordinators, and larvae observer supervisors in the working area of the primary health care. Community knowledge of the methods of controlling DHF vectors is essential in preventing the rise of DHF cases. This knowledge is expected to change people's attitudes and behavior [27], [28].

The most crucial challenge is community participation. Community participation in consistently protecting the environment from DHF is still difficult. Despite significant efforts made by the government, including mosquito breeding eradication, 3M Plus, one-house one-larvae observer program, and more, these achievements hold little significance without the active participation of the community [29]. Consistency is

necessary not only during DHF outbreaks when the community reacts but also under normal circumstances when no efforts are made to control DHF [30]. Communities should strive to meet health needs and collaborate to solve health problems [31]–[33]. The community needs to be equipped with knowledge about the program so that they can play an active role and determine the success of the program [33]. Education can also be provided directly to communities in dengue-endemic areas [34].

4. CONCLUSION

Based on research results, there was an increase in community participation in conducting larvae checks in their homes, leading to a notable increase in the number of houses checked for larvae. The outcome indicates an increase in the larvae-free index that exceeds 90% in the Poso Kota Selatan district. However, the larvae-free index is still below the national standard of 95%. The increase in the number of free larvae has an impact on reducing the incidence of DHF in Poso Kota Selatan Sub-district and thus reducing the risk of DHF outbreaks. Monitoring the achievements of the DHF program over the next few years is necessary to anticipate potential DHF outbreaks.

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