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# 1 Understanding Community Involvement on Dengue Prevention in Sleman, Indonesia: A Free Listing Approach

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1 **Abstract** : To reach the target of ending the dengue epidemic by 2030, all effort shall be made to minimize the dengue transmission across the country through effective, efficient, low-cost and sustainable programs. In Indonesia, the evidence of community empowerment on dengue prevention is insufficient. The objective of this study is to explore the opinion of community and larva monitoring workers (Jumantik cadre) on dengue prevention. A structured free listing interview was conducted in April-May 2019 by targeting two groups: the community and larva workers in one village of Sleman, Yogyakarta. Door to door interviews were done until the quota and saturation were reached. Each group was asked four free listing questions. The analysis was performed in these stages: transcribing, coding, combining by the question, and calculating the salience score. The most salient score about vector control in the larva cadre was not hanging up dirty clothes; in the community it was cleaning the bathtub. Both groups cited themselves as the salient motivator in joining the vector control. Protecting the environment and keeping healthy were the reasons for participating in the vector control. The larva cadre stated community refusal as the main challenge. The community cited the importance of larva cadre: to monitor the presence of larva. Community empowerment on dengue vector control has not been effortlessly executed at the bottom level.

**Keywords** : Dengue, community empowerment, free listing.

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## Introduction

Dengue has grown significantly in the last decade along with people's movements, population increases and climate change occurrences [1–3]. It has been estimated that this disease is responsible for 390 million infections per year and puts at risk 3.9 billion people in 128 countries in the world [4, 5]. In Indonesia, dengue received serious attention from a public health expert, wherein he explained how to prevent transmission in an effective and efficient approach. Health authorities engage and empower the community on dengue prevention through the Jumantik cadre (larva monitoring

workers), which started to be implemented some years ago [6]. The Jumantik program is a follow up of the main dengue control program that is eliminating potential mosquito breeding places, but this program does not seem to run excellently [7].

Previous studies have shown that community empowerment is an effective way of controlling dengue transmission for cost-effectiveness reasons [8, 9]. Maintaining program sustainability is an essential social capital for eliminating dengue [10]. This method tries to involve both individuals and organizations over stakeholders to increase participation in controlling their lives for social determinants [11]. Success stories

3 \*Corresponding Author: Sulistyawati SULISTYAWATI, Department of Public Health, Universitas Ahmad Dahlan, UAD 3<sup>rd</sup> Campus, Janturan, Umbulharjo, Yogyakarta 55166, Indonesia. Tel: +628170402693, Fax: (0274) 564604. E-mail address: sulistyawati.suyanto@ikm.uad.ac.id

2 of community empowerment on dengue control come from several countries, such as Mexico and Cambodia [12, 13]. In Indonesia, involvements of community on fight dengue are conducted through the 3M campaign (Menutup, Menguras, and Mengubur) - which means covering and cleaning water containers, and burying discarded containers - aimed to cut the mosquito life cycle by eliminating their breeding habitat. Some studies have reported that this program works well [14], but some said it fails due to a lack of motivation for joining the program [15].

This study aims to get a better understanding of community empowerment on dengue prevention from the community and Jumantik cadre point of view, which will provide essential perceptiveness into how to maximize this program in the future. This research is valuable for other regions that suffer from dengue transmission but have limited resources.

### Materials and Methods

A qualitative design was used to explore the perception of the Jumantik cadre and the community about vector control. These two groups were selected because they are the main actors in the vector control program. The community is responsible for maintaining their awareness of dengue transmission and actively participating in eliminating mosquito breeding places by cleaning their environment, while the Jumantik cadre plays a role in monitoring the results of community work on vector control, as indicated by the presence or absence of larvae. The community, in this case, is represented by households that were randomly selected during the research.

A qualitative study was done through a free listing that emphasized the ideas/opinions of people about a particular question that we addressed. Free listing is a technique to interview people by asking the respondents to list or mention every related word when we pose a particular question. We started the analysis by transcribing the free listing results that had been performed in Bahasa, Indonesia. That has followed by a coding process that assigned the words according to their core meaning. Finally, one file per one question was made to collect the answers of all the respondents as input on the Salience score analysis, using Anthropac. Research steps can be seen in Figure 1.

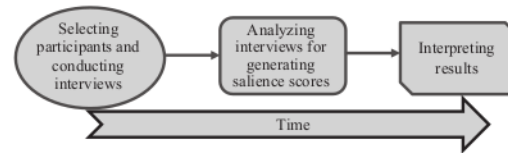


Figure 1. Visualization of the research methods

2 A structured free listing interview was conducted in April-May 2019 by targeting two groups (Society and Jumantik cadre) in Purwomartani Village, Kalasan Sub-district, Sleman. The questionnaire used in this research was based on a literature review from previous studies and documents [15–17]. We recruited 15 respondents per each group by assuming it had reached saturation. The local leader provided a list of Jumantik cadre names. We randomly chose the Jumantik cadre based on that list. For the community, we directly visited houses door to door until the quota was fulfilled. An oral explanation was given to the respondents, followed by written informed consent, prior to starting the interview. Each respondent was given four questions, three of them were the same for both groups as presented in Table 1.

The analysis was performed in several stages: 1) transcribing the words raised from the free listing interviews, 2) coding the free listing, 3) combining the free listing for all respondents by questions, 4) calculating the salience scores. In the coding process, we entered a

Table 1. List of questions for free listing purpose

Respondent	Questions
Jumantik cadre	1. Mention all the things you know about dengue vector control.
	2. Mention your motivator for joining the dengue vector control.
	3. Mention all the reasons why you want to participate in dengue vector control.
	4. Mention all your challenges on playing your task as a Jumantik cadre.
Community	1. Mention all the things you know about dengue vector control.
	2. Mention your motivator for joining the dengue vector control.
	3. Mention all the reasons why you want to participate in dengue vector control.
	4. Mention all the importance of the Jumantik cadre to you.

similar word raised from interviews to the same group. The primary salience score calculation was executed using ANTHROPAC Version 4.98 [18]. Salience was calculated using a salience index (Smith's S), which expressed the function of the frequency raised during the free listing interview and the terms' average position on the participants' lists [19]. In this paper, we present the three most salient lists.

This study was approved by the Medical and Health Research Ethics Committee of the Faculty of Medicine, Gadjah Mada University, Indonesia (ethical approval code: KE/FK/1233/EC/2018).

## Results

### Characteristic respondent

The thirty respondents who participated in this study consisted of 15 Jumantik cadres and 15 community members. All of the interviewed Jumantik cadres

were female. A majority of the community respondents were female (53%) (Table 2).

### Free listing result

An analysis of the interview results was conducted per each question. Table 3 presents the responses from the Jumantik cadre, and Table 4 describes the answers

**Table 2. Characteristic free listing respondent**

Characteristic	Jumantik cadre n (%)	Community n (%)	Total n (%)
Sex			
Female	15 (100)	8 (53)	23 (77)
Male	0	7 (47)	7 (23)
Age (Mean ± SD)	50 ± 7	39 ± 15.2	44 ± 12.8
<40	1 (6)	7 (47)	8 (27)
40–50	7 (47)	6 (40)	13 (43)
>50	7 (47)	2 (13)	9 (30)

**Table 3. Salience score for Jumantik cadre**

About dengue vector controls	S	The motivator for participating in dengue vector control	S	The reason why wants to join on dengue vector control	S	Jumantik cadre challenge on performing the task	S
Not hanging dirty clothes	0.44	One self	0.49	For protecting the environment	0.32	Some communities refused to be monitored for larva	0.46
Cleaning the bathtub	0.43	Hamlet leader	0.32	To improve community knowledge on preventing dengue	0.14	Everything runs well	0.43
Conducting "3M."	0.40	Empowerment and Family Welfare group (PKK)	0.16	To keep clean	0.11	Do not have time	0.07

S = Salience score, PKK = Pemberdayaan kesejahteraan keluarga (Empowerment and family welfare group)

**Table 4. Salience score for community**

About dengue vector controls	S	The motivator for participating in dengue vector control	S	The reason why wants to join on dengue vector control	S	The importance of Jumantik cadre for society	S
Cleaning the bathtub	0.11	One self and surrounding people	0.13	To keep healthy	0.13	To monitor the presence of larva in the community	0.40
To protect environmental cleanness	0.10	One self	0.11	Because of family	0.12	Sharing information about dengue	0.20
Dispose of the waste in place	0.07	Parent	0.10	Because of myself	0.11	Preventing mosquito development and avoiding dengue infection	0.07

S = Salience score

from the community. The most salient response for dengue vector control in the Jumantik cadre group was not hanging dirty clothes, while in the community group it was cleaning the bathtub. When asked about who was the motivator for their participation, the most salient score for both groups was their own self.

In response to the question about the Jumantik cadres' reason to be involved in dengue vector control, the Jumantik cadre listed to protect the environment, and the community mentioned an effort to keep healthy. When the Jumantik cadre was asked about the challenge in performing their task, the most salient answer was that the community refused to be monitored for larva. The most salient response of community about the importance of the Jumantik cadre for them was to monitor the presence of larva.

### Discussion

Globally, dengue is included in neglected tropical diseases. It is a severe problem in tropical and subtropical countries like Indonesia related to the current season, which supports the breeding of *Aedes* mosquitoes as a vector of dengue fever [20, 21]. The Sustainable Development Goals 3 aims to end neglected tropical diseases by 2030 [22]. A sustainable effort to achieve the mentioned target is needed, such as by involving the community, which has proven to be an effective method to control dengue [8].

In Indonesia, the government, through the Ministry of Health of the Republic of Indonesia, has enacted many dengue control and prevention programs through community empowerment. A Jumantik cadre spearheads the control of mosquito vectors by covering, cleaning and burying all potential breeding sites (3M) [23]. However, a problem that often arises is friction between the Jumantik cadre as larva inspector and the community as the target of the 3M program. According to the author's knowledge, evidence about what happened at the root level is unclear. This study elaborated the perceptions of the community and the Jumantik cadre regarding the Jumantik cadre, to find the cause of the gap of community empowerment in dengue prevention control. We compared public opinion and Jumantik cadre about the dengue vector control through interviews and free listing.

Our finding identifies that not hanging dirty clothes, draining the bathtub and 3M are the answers that come up most frequently about vector control from the Jumantik cadre. This is an excellent answer since the Jumantik cadre has received basic training on how to carry out their duties properly. For example, they are educated on how to provide simple education to the community and how to inspect the existence of larvae in people's homes. It is well known that hanging dirty clothes is a significant risk factor in the prevention of dengue [17]. Meanwhile, the community answered draining the bathtub as a vector control. Indeed, the main water storage to be checked is the bathtub in the community house. Perhaps that is the reason that vector control was identified with cleaning bathtubs or water containers. In addition, the community has to be educated that the potential breeding places for *Aedes* are not the only bathtub but could be something else, such as flower vases.

Regarding who was the motivator for participating in the dengue vector control program, the two groups similarly answered themselves as the most reason to be involved. This indicates that both groups voluntarily participated in dengue vector control actively. This self-motivation is the principal capital of the success of programs that involve the wider community because to run a particular program successfully needs a strong motivation [24]. Meanwhile, the reasons for the two groups to participate in the dengue vector controls were slightly different. The Jumantik cadre said that it was related to the environment, while the community was oriented toward general health. Referring to this result, the health authority suggested that when delivering information about the impact of dengue on the individual mainly, it should also relate to the environmental impact.

The final question for the Jumantik cadre was about difficulties in carrying out their duties, and the majority responded that some community members refused to be monitored. Other researchers have also reported the citizens' rejection of this activity, including studies that were conducted in Jakarta [25, 26]. The main reasons for this refusal as discussed in the present study were that the community lacked trust in the cadre and some complexity in the social structure. On the other hand, residents said positively that the Jumantik cadre



is essential to monitor the existence of larvae in residential areas. Accordingly, these two groups reached a contra-productive opinion.

All of our Jumantik cadre respondents were female. As Jumantik cadres are recruited through the Empowerment and family welfare group, called PKK in the local setting, so most of the Jumantik cadres are women. Nonetheless, there are a few males who participated in this activity. Based on this result, we can see that this phenomenon does not fit with Sustainable development goals (SDGs) 5: gender equality [27]. Placing the larva monitoring responsibility mostly on women is not reasonable, since mosquitoes bite people without differentiating the sex. Besides, based on a study in six Asian countries, most reported dengue incidences involve males [28]. This strengthens our argument that the larva monitoring business is a task for everyone in society, not only women. This statement is supported by the WHO guideline on dengue prevention and control [29].

This study had some limitations that require attention when interpreting the result. Firstly, we conducted our research in a small sample. However, we executed our data collection in the high incidence area of Sleman District based on information from the local public health center. This could imply that, even though the sample was small, the given information is essential for policymaking on building the dengue prevention and control program, particularly as regards community empowerment.

### Conclusions and recommendation

Community empowerment on dengue vector control is not running smoothly at the bottom level in the research area; that potentially threatens the program's sustainability in the long-term implementation. Awareness of the community's refusal of the larva-monitoring cadre is of vital importance for the health authority when considering community involvement in dengue control. Accordingly, we propose that the health authority improve the capacity of the larvae cadre on inspecting and educating the community. On the other hand, the community has to be educated about the importance of their involvement in dengue vector control.

### Acknowledgment

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### Conflicts of Interest

There are no conflicts of interest.

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