
Public Knowledge and Perception of the Wolbachia Program in the Working Area of the Tlogosari Wetan Health Center

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ABSTRACT

Background: Dengue Hemorrhagic Fever (DHF) remains a major public health problem in Indonesia, including in Semarang City, where cases continue to increase. One of the innovative strategies for dengue control is the Wolbachia program, which requires adequate community knowledge and positive perception for successful implementation. This study aimed to describe the level of knowledge and community support toward the Wolbachia program in the working area of Tlogosari Wetan Public Health Center, Semarang. **Method:** This research was a descriptive quantitative study with a cross-sectional approach involving 50 respondents selected from the community. Data were collected in December 2025 using structured questionnaires and analyzed descriptively. **Results:** The results showed that 50.0% of respondents had a high level of knowledge, while the remaining 50.0% had low knowledge regarding the Wolbachia program. Despite this, the majority of respondents (86.0%) demonstrated a supportive attitude toward the program. Most respondents obtained information from direct socialization conducted by the Public Health Center (86.0%). **Conclusion:** although community knowledge regarding Wolbachia was evenly distributed between high and low categories, community support for the implementation of the Wolbachia program was very high. Strengthening health education with simple and clear messages is recommended to improve community understanding and ensure the sustainability of the program.

Keywords: dengue, wolbachia, community knowledge, public health center

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INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is an infectious disease transmitted through the bite of *Aedes aegypti* mosquito. Until now, dengue is still a public health problem in Indonesia, with a relatively high incidence rate and among the highest compared to other countries in the Southeast Asian region. Dengue Hemorrhagic Fever (DHF) is still a serious public health problem in Semarang City and shows an alarming increase from year to year (1).

Data from the Semarang City Health Office noted that in the first semester of 2024 there were 231 cases of dengue with 3 deaths (2). This condition worsened in the following year, where until the end of June 2025 the number of dengue cases in Semarang City jumped sharply to 3,016 cases, making Semarang City one of the regions with the highest number of cases in Central Java Province and showing that dengue transmission is still active and massive (3).

Based on data from the Tlogosari Wetan Health Center UPTD, in 2024 there will be 11 Dengue Hemorrhagic Fever (DHF) patients and there will be no deaths due to dengue. Meanwhile, in 2025 the number of dengue patients will be recorded at 10 cases, but there will be 1 death. Although the number of dengue cases in 2025 shows a decrease compared to 2024, the emergence of death cases in 2025 indicates that dengue still has a fatal impact and remains a health problem that needs serious attention in disease prevention and control efforts.

The significant increase in dengue cases in two consecutive years shows the urgency of the need for a more effective and sustainable vector control strategy, one of which is through the implementation of the *Wolbachia program innovation* which requires the support of knowledge and positive perceptions from the community. *Wolbachia* is a natural *endosymbiont* bacteria that live in various insect species and is able to inhibit the replication of the dengue virus in the body of the *Aedes aegypti* mosquito. The existence of *Wolbachia* makes mosquitoes less effective in transmitting the dengue virus to humans, so this bacterium is seen as a safe, ecological, and sustainable innovation in the control of dengue (4). According to the *World Health Organization* (WHO) in 2021, *Wolbachia* was included as one of the *complementary methods in the dengue control strategy*, especially for endemic areas with a high burden of cases. WHO states that the application of *Wolbachia* can be used in conjunction with other vector control methods as part of an integrated dengue management approach (5).

The effectiveness of the *Wolbachia* method has been proven through a *randomized controlled trial (RCT)* study in Yogyakarta City. The study showed that areas that received interventions for the spread of *Wolbachia* mosquitoes experienced a 77% reduction in dengue incidence, as well as an 86% reduction in dengue hospitalizations compared to control areas without intervention (6).

METHODS

This study is a quantitative descriptive research with a cross-sectional approach with a sample of 50 respondents. This approach was chosen to provide an objective picture of the level of knowledge and community response to the *Wolbachia* program at a given point in time. The research was carried out in the working area of the Tlogosari Wetan Health Center UPTD, Semarang City. Data collection will be carried out in December 2025.

RESULTS AND DISCUSSION OF

RESULTS

1. Frequency Distribution of Respondent Characteristics by Gender, Education, and Occupation

Univariate analysis was conducted to determine the basic characteristics of respondents based on gender, education level, and occupation variables. Table 1 below shows the frequency distribution and percentage of each characteristic of the 50 respondents studied in the work area of the Tlogosari Wetan Health Center UPTD, Semarang City.

Table 1. Frequency Distribution of Respondent Characteristic Based on Gender, Educarion, and Occupation

Respondent Characteristics	Categories	Frequency (n)	Percentage (%)
Gender	Male	13	26.0
	Women	37	74.0
Final Education	SD	4	8.0
	SLTP	4	8.0
	High School/High School	30	60.0
	College (D3/S1)	10	20.0
	SMK	2	4.0
Jobs	Housewives	26	52.0
	Private	18	36.0
	Entrepreneurship	5	10.0
	ASN	1	2.0

Source: Primary Data,2024

Based on Table 1, the majority of respondents in this study were women, namely 37 people (74.0%). This is in line with the job characteristics of the respondents which are dominated by housewives as many as 26 people (52.0%). This condition is natural considering that data collection is carried out in residential environments where housewives are the easiest group to meet and have a central role in the health management of the household environment.

In terms of education, most of the respondents had a secondary education background (high school/vocational) of 64.0%, followed by university graduates of 20.0%. This level of education indicates that respondents have good enough literacy skills to receive health information.

2. Frequency Distribution of Information Resources for *the Wolbachia Program* in the working area of UPTD Tlogosari Wetan Health Center

The following table presents the results of a univariate analysis that illustrates the distribution of information sources of *the Wolbachia* program among respondents.

Resources	Frequency (n)	Percentage (1%)
Socialization of Health Centers	43	86.0
Social Media	6	12.0
Poster/Billboard/Leaflet	1	2.0

Source: Primary Data,2024

The data in Table 2 shows the dominance of the role of health agencies, where 86.0% of respondents knew about the *Wolbachia* program through direct socialization from the Health Center. Only a small part of it

(12.0%) get information from social media, and very few (2.0%) are exposed through outdoor print media such as billboards.

3. Frequency Distribution of Community Knowledge Level in the work area of UPTD Tlogosari Wetan Health Center

Table 3. DDistribution of Community Knowledge Level in the Working Area of UPTD Tlogosari Wetan Health Center

Knowledge Categories	Frequency (n)	Percentage (%)
Low Knowledge (≤ 23.2)	25	50.0
Higher Knowledge (>23.3)	25	50.0
	50	100.0

Source: Primary Data,2024

The results in Table 3 show a balanced proportion, where respondents are divided equally 50.0% in the high knowledge category and 50.0% in the low knowledge category, respectively. Although the average score is quite high (23.2 out of 27), the variation in public understanding of the technical details of Wolbachia is still quite diverse.

4. Distribution of Frequency of Attitudes and Community Support in the work area of UPTD Tlogosari Wetan Health Center

Table 4. Frequency Distribution of Attitudes and Community Support

Attitude/Support Category	Frequency (n)	Percentage (%)
Less Supportive Attitude (≤ 8.74)	7	14.0
Supportive Attitude (>8.74)	43	86.0
	50	100.0

Source: Primary Data,2024

Table 4 shows that the majority of respondents, namely 43 people (86.0%), have a supportive attitude towards the implementation of the Wolbachia program. Only a small percentage (14.0%) still showed doubts or less supportive attitudes.

DISCUSSION

Overview of the Level of Knowledge and Community Perception in the Working Area of the Tlogosari Wetan Health Center, Semarang City

This study aims to investigate the level of knowledge and public perception or support for the implementation of the Wolbachia program in the working area of the Tlogosari Wetan Health Center. Key findings show that the knowledge level of the community is evenly divided between the low and high categories (50% each). However, the level of public support for this program is very high, with 86% of respondents expressing a supportive attitude. This shows that public acceptance of health innovations is not always directly proportional to in-depth technical understanding, but is influenced by the factor of trust in information providers.

The findings on information sources show the dominance of the role of health agencies, where 86% of respondents get information directly through the socialization of the Health Center. This is in line with the pattern

health communication in Indonesia where Puskesmas is still the most trusted information reference by the local community. However, the role of social media (12%) and outdoor media (2%) in this study is different from the trend of modern health campaigns that are now starting to shift to digital platforms. In addition, the education level of the respondents, the majority of whom are high school/vocational school graduates (64%) reflects adequate literacy skills to receive new information, but the variety of technical understandings that still varies shows challenges in delivering scientific material such as Wolbachia technology.

The high participation of women (74%) and housewives (52%) in this study provides an important contextual explanation. Housewives are the easiest group to meet when taking data in settlements and have a central role in the health management of the family environment. Very high support (86%) even though knowledge is still evenly divided indicates the existence of "institutional trust". The community tends to support the programs brought by the Puskesmas because they are considered the official authorities responsible for the health of residents. The emergence of dengue deaths in the region in 2025 is also likely to be a strong incentive for people to be open to any disease prevention innovations offered by the government for the safety of their families.

The results of this study have practical implications for dengue control strategies in Semarang City, especially in the Tlogosari Wetan area. Given the massive surge in dengue cases in Semarang City reaching 3,016 cases until June 2025, the Wolbachia program is an urgent strategy. The main implication is that the Puskesmas must remain at the forefront of socialization, but there needs to be a simplification of the message regarding the technical mechanism of Wolbachia so that the low-knowledge group (50%) can understand the program more fully, in order to avoid potential doubts in the future.

This study has several limitations, including the number of samples that is limited to 50 respondents. In addition, the cross-sectional approach only provides an overview at one specific point in time. The dominance of female respondents (74%) also means that male perspectives in family health decision-making may not be proportionally represented in this study.

Overall, the results of this discussion confirm that the community in the work area of the Tlogosari Wetan Health Center has very good social readiness to support the implementation of the Wolbachia program. Although the community's technical knowledge still needs to be improved equally, high trust in the role of the Puskesmas is the main social capital in the sustainability of dengue prevention programs in the region.

CONCLUSION

This study concludes that the community in the working area of the Tlogosari Wetan Health Center has a very high readiness and support for the implementation of the Wolbachia program as an innovation in dengue control. Although the level of knowledge of the respondents is still evenly divided between the high and low categories, this does not prevent the positive attitude of the public from accepting this program. This massive support is rooted in the great trust of the public in information and socialization that

given by the Health Center. As a suggestion for the next step, a more intensive and communicative communication strategy is needed to improve the technical understanding of the community who are still in the low category. This is important to maintain the sustainability of community support and minimize potential concerns when the release stage of *Wolbachia* mosquitoes begins to be carried out in residential environments. In addition, the active involvement of community leaders and health cadres can be strengthened to expand the reach of education beyond the formal channels of health centers.

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