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Relationship between community knowledge by the existence of mosquitoes as a vector of disease in the Bagan Deli village, Medan Belawan District, Medan City

M Panggabean*, L Siahaan, and Y C Panggabean
Department of Parasitology, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia
*Email: merina@usu.ac.id, mer.pgb@gmail.com

Abstract. Mosquitoes are vectors that can transmit of diseases, such as malaria, chikungunya, filariasis. Knowledge of the mosquito's life cycle is very important for the community to prevent mosquito breeding. The objective is to know the relationship between people's knowledge and the existence of mosquito larvae. This research was conducted from August to September 2018 by interviewing the community and taking mosquito larvae in 100 houses visited in Bagan Deli Village, Medan Belawan District, Medan City. The results of this study showed that 38% of the houses found were only *Aedes aegypti* mosquito larvae, public knowledge was generally poor (as much as 50% of houses), the largest breeding place for mosquito larvae was 31.58% at bath, followed by dispenser shelter 23.68%, buckets and drums as much as 21.05% and jars of 2.63%. Based on multiple linear regression analysis of variables, s significant relationship between community knowledge and the presence of mosquito larvae was found in this study where *p value* was 0.001 (*p* <0.05).

1. Introduction
Mosquitoes as vectors can carry out viral diseases such as: dengue fever, chikungunya, yellow fever, encephalitis and Zika, diseases caused by nematodes such as filariasis and protozoa such as malaria. The types of mosquitoes which are the main vectors, usually are *Aedes* sp, *Culex* sp, *Anopheles* sp, and *Mansonia* sp. Therefore, mosquito-borne diseases are a problem in public health [1]. In 2015, malaria alone worldwide caused 438,000 deaths. Whereas the incidence of dengue (dengue fever) worldwide has increased 30-fold in the last 30 years [2]. The incidence in Indonesia for cases of dengue fever in 2014 was reported as many as 100,347 cases with a total number of deaths of 907 people (IR / morbidity rate = 39.8 per 100,000 population and CFR / mortality rate = 0.9%) [3].

Mosquito control efforts are important to prevent outbreaks of mosquito-borne diseases [2]. To be able to control mosquitoes, we have to know what the life cycle of mosquitoes and what kind of environment can cause high breeding of mosquitoes. In the reproductive process, the mosquitoes will lay eggs and the eggs need suitable habitat to develop. Water is needed in this development. Some mosquito species have to lay eggs on immovable water. Without the water, the eggs will dry out and cannot develop into larvae anymore. These species are classified into "Permanent Water Mosquitoes", such as *Anopheles* sp., *Culex (Melanconium) sp.*, *Cx. salinarius*, *Cx. territans*, *Coquillettidia* sp. and *Mansonia* sp [4][5] and “Non Water Mosquitoes”, such as *Aedes* sp. Where these mosquitoes can lay their eggs without water and once they get water they can hatch into larvae. This mosquito can only breed in water that is quite clean and does not lay on the ground directly [6]. It can be said that all...
types of mosquitoes need water for their survival because larvae of mosquitoes continue to live in water and only adult forms that live on land. Larval stage is very important because at this stage it is a vulnerable time in the mosquito's life cycle and is important for planning effective control programs. To prevent diseases caused by mosquitoes, we must eliminate them in the larval rank, because this is the most ideal and effective way [1].

An environment suitable for breeding mosquitoes is not only formed by its own nature such as the topography of the region, but humans often provide an ideal place for them, such as dirty and large amounts of waste, unplanned urbanization, inadequate solid waste management and poor effective. These things will increase the mosquito population accidentally [7].

2. Method
This research was analytic study with cross sectional design. Where this study was conducted by looking knowledge respondents by the existence of mosquitoes as a vector of disease. The level of knowledge consists of 3 categories, namely: good if > 75% , moderate if 40% -75% and less good if < 40% of the answers answered correctly. This research was conducted from August to September 2018.

2.1. Population
The population of this study were 100 residents' houses in Bagan Deli Village, Medan Belawan District, Medan City. To get the data, it was done by visiting the houses of the residents to interview the residents and observing the environmental sanitation at the research site for Then take the larvae in each puddle in and around the house. The larvae that have been taken are transferred into plastic containers and labeled, the location, and pH of the water where mosquito larvae are found. Then the identified larvae were carried out at the Parasitology Laboratory Faculty of Medicine University Sumatera Utara (SU) using a mosquito identification journal [7,8,9].

2.2. Data analysis
The data from the questionnaires were answered by the respondents, then data processing is carried out. Univariate analysis and multiple linear regression analysis was done to explain the frequency distribution of each variable and presented in table and relationship between community knowledge by the existence of mosquitoes as a vector of disease.

3. Results and Discussions
The questionnaires of 100 respondents attended were analyzed in this study. Table 1 presents the characteristics of the respondents.

| Table 1. Characteristics of respondents | f | % |
|---|---|---|
| Age (yrs) | | |
| < 36 | 28 | 28 |
| 36-45 | 28 | 28 |
| 46-55 | 28 | 28 |
| 56-65 | 13 | 13 |
| > 65 | 3 | 3 |
| Ethnicity | | |
| Malay | 66 | 66 |
| Java | 22 | 22 |
| Batak (Mandailing) | 6 | 6 |
| Aceh | 5 | 5 |
| Minang | 1 | 1 |
| Education | | |
| Elementary School | 49 | 49 |
Characteristics of respondents based on age were made in several age groups with age categories according to the Indonesian Ministry of Health. Based on table 1, the age group of respondents <36, 36 to 45 years, 46 to 55 same with a total of 28 people (28%) and the least age group is above 65 years with a total of 3 people (3%). The same number of the three age groups of respondents was accidentally. In general, respondents were Malay, because the village of Bagan Deli was a village whose ancestors were Malay with fishermen's. Other ethnic groups are migrants to this village. Education respondents generally are in elementary schools.

The results of this study found 38 houses with mosquito larvae, all of them were *Aedes aegypti* larva. There were no larvae mosquitoes other than *Ae. aegypti* because the environment in which the study is located is the sea area with a height of 1-2 meters above sea level. The research site every day the tide is around 2 pm and shrinks back at night. This tide causes mosquito larvae do not be able to live and flow into the sea during tides. And also the habit of *Aedes aegypti* mosquitoes who like clean water, especially in the bath, becomes a breeding place for larvae.

Larvae samples were found in several different breeding sites or containers. The most larval samples were found in bathtubs inside the homes of the research sites (31.57%), and the least were found in the jars containers outside people’s homes (2.63%). Based on the pH test it was also found that most the water pH 7 (78.95%) and pH 6 (21.05%). This is also directly proportional to the habit of the *Aedes aegypti* mosquito, which prefers water with pH optimal is pH 7-8 for lay eggs [10]. Table 2 presents pH water in containers found with mosquito larva *Aedes aegypti*.

**Table 2. pH water in containers found with mosquito larvae Aedes aegypti**

| Containers | pH 7 | Total (%) |
|------------|------|-----------|
| Bath       | 26.32| -         |
| Dispenser  | 23.69| -         |
| Drum       | 21.05| 78.95     |
| Bucket     | 5.26 | -         |
| Jars       | 2.63 | -         |

| pH 6 | Bath | 5.26 | 21.05 |
|      | Bucket | 15.79 | -     |
|      | Total  | 100.00 | 100.00 |

Level of knowledge between respondents by the existence of mosquitoes as a vector of diseases is shown on Table 3. Knowledge level analysis was carried out by giving questions including signs of dengue disease, prevention of dengue disease, breeding sites of mosquitoes, favoured places and when mosquitoes bite humans from the *Aedes aegypti* mosquito, source of knowledge about mosquitoes as a vector diseases.
4. Conclusions

The research that has been done in the Bagan Deli village, Medan Belawan district, it can be concluded that there is a relationship between the level of knowledge mostly poor in the presence of mosquitoes as a disease vector and the most found mosquito larvae is in the bath.

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