Malaria Control Before and During the COVID-19's Pandemic in Lawang Kidul, South Sumatera

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Abstract. Global cases of malaria have increased with the COVID-19 pandemic which has affected the morbidity and mortality of malaria in the world. Malaria cases in Indonesia decreased during the COVID-19 pandemic as well as malaria cases in the regions. Lawang Kidul District is a malaria-endemic area and is the focus of a malaria elimination area in Muara Enim Regency, South Sumatra Province. All malaria control activities have been disrupted due to the COVID-19 pandemic. The purpose of this study was to find out how to control malaria in the period before the COVID-19 pandemic and during the COVID-19 pandemic. The research was conducted using a qualitative method with in-depth interview techniques from 11 health and non-health sector informants. Data processing analysis was carried out using the NVivo 12 Pro application with visualization of the results in the form of a project map. The results showed that malaria control efforts during the 2020-2021 COVID-19 pandemic were reduced along with the reduced cross-sectoral involvement, this was due to the increasing development of COVID-19 cases. However, the new form of control during the COVID-19 pandemic is the formation of larva cadres in one elementary school, the formation of village regulations, and increased efforts to clean and healthy living behavior.

1 Introduction

Malaria globally experienced an increase in mortality and morbidity rates in 2020. Malaria cases were spread in 85 endemic countries with a total of 241 million cases in 2020. A total of 627,000 people died due to malaria in 2020, the amount increased by 12% from the previous year. Along with the emergence of the COVID-19 disease that spreads throughout the world, the control and management of malaria are also disrupted and hampered [1]. Coronavirus Disease 2019 or COVID-19 is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV2). COVID-19 was first detected in the city of Wuhan, China, in December 2019. WHO later declared COVID-19 as a public health emergency of

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international concern. On March 11, 2020 WHO declared COVID-19 in the category of a pandemic [2].

Malaria in Indonesia decreased in 2020 with 226,364 cases 2020. Although it decreased from the previous year, the number was still very large because the target for malaria elimination in Indonesia was in 2030 [3]. Malaria handling strategies in the era of the COVID-19 pandemic must consider various aspects such as prevention, service, or treatment of malaria [4]. The Ministry of Health of the Republic of Indonesia as an immediate step has issued guidelines in the form of guidelines for malaria service protocols during the COVID-19 pandemic in 2020. In these guidelines, all activities are adjusted to the COVID-19 protocol, which of course makes many control activities limited.

Efforts from various central to regional levels are made so that elimination can be achieved, one of which is cross-sectoral mobilization starting from the regional sector. One of the regencies/cities included in the malaria endemic area in Indonesia is Muara Enim Regency, which is located in South Sumatra Province. The target of malaria elimination in Muara Enim Regency by 2023, malaria control must certainly be improved in line with the development of the COVID-19 disease. The decline in malaria cases was caused by disrupted activities due to the COVID-19 pandemic. Some activities have stopped and there has been a reduction in active case finding due to the prohibition against causing crowds [5].

Muara Enim Regency has a malaria elimination target in 2023 with priority areas for elimination in Lawang Kidul District and Tanjung Agung District. These two sub-districts are areas with open mining areas, there are many government-owned and private companies and there are also many illegal mining owned by the community which is a complex problem. Lawang Kidul District is a malaria endemic area in Muara Enim Regency. The location of the area which has the characteristics of forests, plantations, rivers, and is a mining area makes this area always has malaria cases every year. Malaria cases in Lawang Kidul District have decreased from year to year. However, the existence of environmental conditions and high population mobilization make Lawang Kidul District an endemic area with transmission of malaria cases spreading to all districts. The problem of illegal mining is also a major factor in the emergence of Anopheles mosquito breeding places in Lawang Kidul District.

2 Research Method

The method in this research is qualitative using a descriptive research design. This study uses an in-depth interview technique with data analysis using the NVivo 12 Pro application as a qualitative data processor. The research results are presented in a project map visualization. The informants in the study were from the health and non-health sectors, totaling 11 people, namely the Head of the Muara Enim Regency Health Office, the Head of the P2P Division of the Muara Enim Regency Health Office, the Head of the P2M Health Office of Muara Enim Regency, Malaria Program Holder Health Office of Muara Enim Regency, Head of Tanjung Enim Health Center, Doctor of Tanjung Enim Health Center and Malaria Program Holder of Tanjung Enim Health Center, Head of Lawang Kidul District, Head of Tegal Rejo Village, the Head of Darmo Village, and the Head of SDN 16 Lawang Kidul.

3 Result and Discussion

3.1 Malaria Cases in Lawang Kidul District

The development of malaria cases in Lawang Kidul District has decreased in the last 4 years. Malaria cases are spread in all villages so that all locations in Lawang Kidul District are

malaria endemic areas. The distribution of malaria cases in Lawang Kidul District is presented in the following figure:

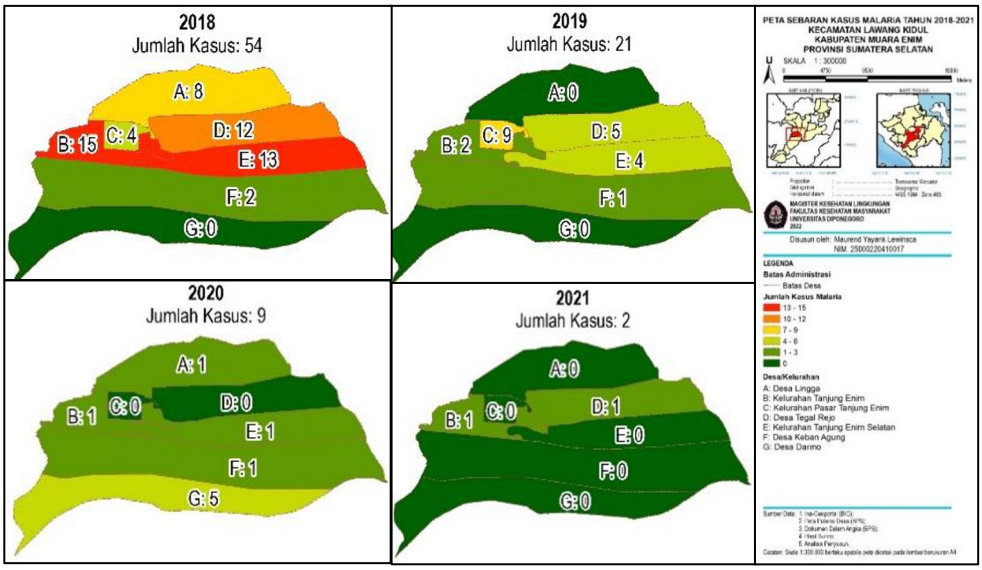


Fig. 1. Distribution of Malaria Cases in Lawang Kidul District in 2018-2021

Based on the picture above, the development of malaria cases from 2018 to 2021 has decreased significantly. In 2018 the number of malaria cases in Lawang Kidul District was 54 cases spread over 6 villages with the highest cases in Tanjung Enim Village (15 cases) and the lowest cases in Darmo Village (0 cases). The number of malaria cases in 2019 in Lawang Kidul District was 21 cases spread across 5 villages with the highest cases in Pasar Tanjung Enim Village (9 cases) and the lowest cases in Lingga Village (0 cases) and Darmo Village (0 cases). The number of malaria cases in 2020 in Lawang Kidul District was 9 cases spread over 5 villages with the highest cases in Darmo Village (5 cases) and the lowest cases in Pasar Tanjung Enim Village (0 cases) and Tegal Rejo Village (0 cases). In 2021, there were only 2 malaria cases in Lawang Kidul District, which were spread in 2 villages is Pasar Tanjung Enim Village (1 case) and Tegal Rejo Village (1 case) [6].

3.2 Causes of Malaria Cases in Lawang Kidul

Malaria cases in Lawang Kidul District are caused by many factors. Geographical conditions, population, environmental conditions, and community behavior can influence the development of malaria cases. The causes of malaria cases in Lawang Kidul District based on the results of interviews with informants are presented in the picture below:

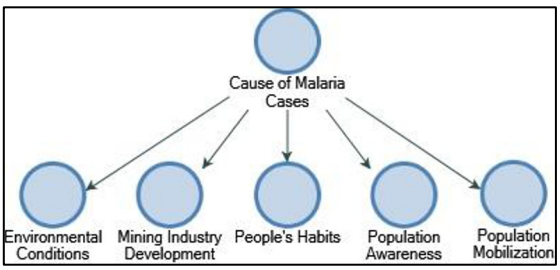


Fig. 2. Distribution of Malaria Cases in Lawang Kidul District in 2018-2021

Based on the picture above, the results of the interview show that the causes of malaria cases in Lawang Kidul District are environmental conditions (forests, swamps, gardens, and mines), the very rapid development of the mining industry, people's habits of going out at night, lack of public awareness in prevention efforts. malaria, high population mobilization because many heterogeneous communities come from outside the region.

Environmental conditions, which include the vast area of plantations, forests, swamps, and mines in Lawang Kidul District dominate, especially for the Darmo Village area, making it difficult to monitor locations and areas that have the potential to become breeding grounds. Efforts made by the government to expand the area of malaria elimination are by monitoring the use of mosquito nets and other preventive measures [7]. Monitoring in Lawang Kidul District is considered difficult, therefore it is necessary to follow up monitoring and evaluation of places such as forests, gardens, and puddles in open-pit mining areas.

The development of the mining industry in Lawang Kidul District is very rapid. Many mining companies owned by the government, private or community owned (illegal mining) are developing so that it affects population mobilization, environmental conditions, population conditions, including housing conditions. The condition of the miners' settlements is very slum, dense, and includes settlements that do not meet healthy houses, thus facilitating the acceleration of malaria transmission in the miners' residential areas. High population mobilization is also a challenge to eliminate malaria, which imports infections through many factors from non-endemic areas to endemic areas [8]. It is necessary to monitor mining areas by the government, especially community settlements around the mines and routine monitoring of environmental conditions in illegal mining areas that cause former mining excavations which if the rainy season can become a breeding ground for the Anopheles mosquito that causes malaria.

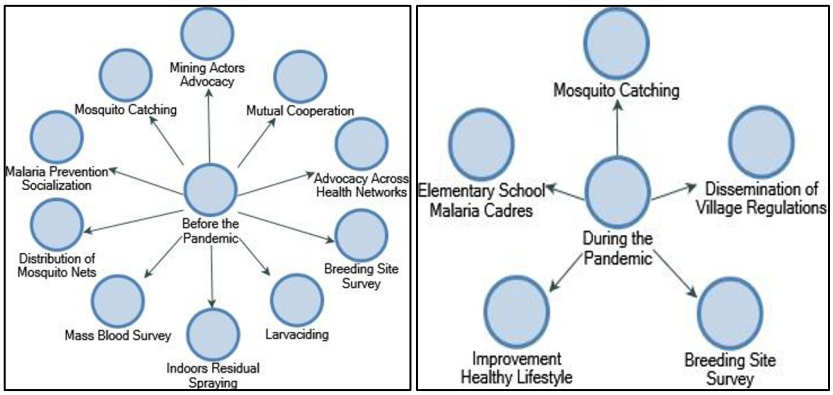
The habit of the community that is generally often carried out in Lawang Kidul District is to carry out activities outside the home at night with the term *"mance"* or activities to sit together on a board in front of a house like a post. The habit of going out at night, precisely at dawn, is a community activity to start work as farmers/rubber planters. Reducing the habit of going out at night and using closed clothes when going out at night is one of the preventive efforts that can be done in preventing malaria due to the Anopheles sp. actively biting between 21.00-04.00 [9]. Efforts to prevent and promote health related to malaria prevention need to be carried out by related sectors.

Public awareness in Lawang Kidul District in controlling malaria is still relatively lacking because based on the results of interviews that people tend to be passive with prevention activities such as there is still a lot of garbage around the yard, puddles of water, bushes that are quite thick which are breeding and resting. place of the Anopheles mosquito that causes malaria. The development of malaria cases continues to increase due to the low public awareness of efforts to prevent and control malaria [10]. However, this can be overcome with the encouragement and efforts of the village government in Lawang Kidul sub-district to invite the community to work together to clean up the environment considering that the community's response to the intervention is very good.

The population mobilization in Lawang Kidul District is very high due to the heterogeneous characteristics of the community, many mining workers and people from outside the province migrate to Lawang Kidul District. Migrant communities come to work as mining workers and there is no early detection or monitoring of migration for people who come from outside the area. Migration of population can be a factor that causes malaria cases, especially imported cases, to grow [11]. The way to overcome this is by conducting malaria migration surveillance so that the development of malaria transmission can be monitored.

3.3 Malaria Control Before and During The COVID-19 Pandemic

Malaria control in the period before and during the COVID-19 pandemic in Lawang Kidul District involved various cross-sectors and activities. Some of the malaria control efforts in Lawang Kidul District are presented in the image below:



(a) **(b)**

Fig. 3. Malaria Control Before The COVID-19 Pandemic (a) and During The COVID-19 Pandemic (b)

Based on the picture above, the results show that malaria control efforts before the COVID-19 pandemic and during the COVID-19 pandemic underwent changes in the form of reducing control efforts. Some of the activities that were not carried out during the COVID-19 pandemic were mining actors advocacy, mutual cooperation, advocacy across health networks, larvaciding, indoors residual spraying, mass blood survey, distribution of mosquito nets, malaria prevention socialization. However, several new control efforts carried out by the government in the Lawang Kidul district are the formation of malaria cadres for elementary school students, the formation of village regulations related to malaria control, and the COVID-19 pandemic has influenced efforts to improve clean and healthy living behavior for the community.

3.3.1 Elementary School Malaria Cadres

The formation of malaria cadres in elementary schools is the output of the socialization of the Tanjung Enim Public Health Center to increase the participation of school children in controlling malaria in the school environment. The formation of malaria cadres in schools was proclaimed in 2020, but due to the COVID-19 pandemic which made students go to school online, cadre formation activities were carried out in early 2022 when schools had started to be carried out offline.

This activity is a cross-sector collaboration between the Tanjung Enim Public Health Center, SDN 16 Lawang Kidul, and PT. Pamapersada Nusantara. Tanjung Enim Health Center as the initiator and promoter, schools as facilitators, and companies as financial support providers. This should be used as an example by other elementary schools in Lawang Kidul District to increase students' knowledge from an early age related to malaria prevention. Other elementary schools in Lawang Kidul District should also form cadres in schools so that they can increase students' knowledge and information in malaria endemic areas which will affect their behavior in malaria prevention. The importance of increasing the knowledge of elementary school students in malaria endemic areas about the Anopheles mosquito as an infectious vector needs to be included in the elementary school curriculum and this is part of Integrated Vector Management [12]. During the COVID-19 pandemic, the

activity of forming student cadres in elementary schools can run and this is a form of novelty in controlling malaria during the COVID-19 pandemic.

3.3.2 Dissemination of Village Regulations

The establishment of village regulations related to malaria prevention is an effort of the Health Office of Muara Enim Regency in the context of malaria elimination in Lawang Kidul District. The cross-sector collaborations involved are the Health Office of Muara Enim Regency, the Office of Community and Village Empowerment of Muara Enim Regency, Tanjung Enim Health Center, Lawang Kidul District Government, as well as companies and smallholder mining businesses as targets of socialization of this village regulation.

The Village and Community Empowerment Service will deal directly with the village government, especially the Village Consultative Body related to the socialization of village regulations that will be carried out to the community. This activity is targeted to be completed by the end of 2022, for that further action is needed regarding the sustainability of this program. Implementation of Village Regulations increases the active role and commitment of the community to eliminate malaria [13]. The cross-sectoral collaboration between the Health Office, Public Health Center, District and Village Governments, and the community in implementing this village regulation can strengthen government policies and achieve malaria elimination targets in Lawang Kidul District.

3.3.3 Improvement Healthy Lifestyle

During the COVID-19 pandemic, people's clean and healthy behavior towards personal hygiene increased. The community is also more concerned about the surrounding environment by routinely cleaning garbage and the home environment so that health is maintained. Although all prevention, handling, and monitoring activities by the government, both in the health and non-health sectors, are focused on controlling COVID-19, several positive impacts such as the fear of people to gather and leave their homes, environmental hygiene, and awareness of illness have contributed to the decline in malaria cases in Indonesia. Lawang Kidul District. The COVID-19 pandemic has also affected the community, so people are afraid and alert to leave their homes and decide to stay at home [14].

The village government through the Tanjung Enim Health Center routinely conducts socialization of clean and healthy living behavior during the COVID-19 pandemic, regeneration activities, especially the elderly, are carried out while socializing malaria control during the COVID-19 pandemic. The appeals given are also related to the prohibition of gathering, maintaining distance, and always cleaning the environment. This can improve malaria control efforts during the COVID-19 pandemic. The application of clean and healthy living behavior during the COVID-19 pandemic can be carried out in the form of utilizing yard land and cultivating herbal plants, increasing body immunity and maintaining health, and environmental hygiene [15].

4 Conclusion

Malaria control in Lawang Kidul District during the COVID-19 pandemic experienced a lack of control forms caused by the COVID-19 pandemic, all activities were focused on controlling COVID-19. Cross-sectoral involvement also experienced a reduction during the COVID-19 pandemic due to services, budgeting, and control focus being directed to handling COVID-19. There are new forms of malaria control during the COVID-19 pandemic in

Lawang Kidul District, namely Elementary School Malaria Cadres, Dissemination of Village Regulations, and Improvement Healthy Lifestyle. In order to achieve the target of malaria elimination in 2023 in Lawang Kidul District, it is necessary to evaluate to improve the form of control according to the causes of cases, regional conditions, and population conditions but still pay attention to the protocol during the COVID-19 pandemic. Cross-sectoral strengthening and sustainability of village regulation programs should be realized by 2022.

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