



Integrated Vector Management to Control Malaria During the Covid-19's Pandemic in Lawang Kidul District

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ABSTRACT

Integrated Vector Management (IVM) is an effective effort to achieve malaria elimination. Reducing malaria cases in Indonesia still requires strategic steps to achieve the malaria elimination target in 2030. Lawang Kidul District is a priority area for malaria elimination in 2023 in Muara Enim Regency with an API value of 0,13). This study aims to analyze the application of Integrated Vector Management (IVM) in controlling malaria in the era of the COVID-19 pandemic in Lawang Kidul District. The method used is a qualitative approach with in-depth interviews with informants from the health and government sectors. The results of the reference analysis of the NVivo 12 Pro coding show an integrated approach (126 codes), case-based decision making (37 codes), cross-sectoral cooperation (102 codes), advocacy for legislative mobilization (31 codes), and resource capacity (57 codes). Malaria Integrated Vector Management (IVM) efforts in Lawang Kidul District have not been maximized in several IVM elements such as assessing resource needs, preventing control efforts that are hampered due to the COVID-19 pandemic, community involvement in decision making, strengthening cross-sectoral commitments, policymaking, and policy implementation. Increased commitment to cross-sectoral advocacy, prioritizing the issue of malaria elimination, empowering mining communities, following up on village regulations, and making district-level policies are needed so that district-level malaria elimination can be achieved by 2023.

Kata kunci:

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ABSTRAK

Integrated Vector Management (IVM) merupakan upaya efektif untuk mencapai eliminasi malaria. Penurunan kasus malaria di Indonesia tetap membutuhkan langkah-langkah strategis agar dapat mencapai target eliminasi malaria tahun 2030 mendatang. Kecamatan Lawang Kidul merupakan wilayah prioritas eliminasi malaria tahun 2023 di Kabupaten Muara Enim dengan nilai API 0,13. Penelitian ini bertujuan untuk menganalisis penerapan Integrated Vector Management (IVM) dalam pengendalian malaria pada era pandemi COVID-19 di Kecamatan Lawang Kidul. Metode yang digunakan pendekatan kualitatif dengan teknik wawancara mendalam pada informan yang berasal dari sektor kesehatan dan pemerintahan. Hasil analisis referensi koding NVivo 12 Pro menunjukkan elemen pendekatan terintegrasi (126 koding), pengambilan keputusan berdasarkan kasus (37 koding), kerjasama lintas sektor (102 koding), advokasi mobilisasi legislasi (31 koding), dan kapasitas sumber daya (57 koding). Upaya Integrated Vector Management (IVM) malaria di Kecamatan Lawang Kidul belum maksimal di beberapa elemen IVM seperti penilaian kebutuhan sumber daya, upaya pencegahan pengendalian yang terhambat karena pandemi COVID-19, keterlibatan masyarakat dalam pengambilan keputusan, penguatan komitmen lintas sektor, pembuatan kebijakan dan implementasi kebijakan. Peningkatan komitmen advokasi lintas sektor, memprioritaskan masalah eliminasi malaria, memberdayakan masyarakat tambang, tindak lanjut kebijakan peraturan desa, dan pembuatan kebijakan tingkat kabupaten diperlukan agar eliminasi malaria tingkat kabupaten dapat tercapai pada tahun 2023.

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INTRODUCTION

Deaths due to malaria in 2020 increased by 12% compared to the previous year, which was around 627,000 people. It is estimated that 47,000 (68%) of the 69,000 deaths were due to service interruptions during the COVID-19 pandemic (WHO, 2021). Malaria is one of the indicators of the 2030 Sustainable Development Goals (SDGs) to end the epidemic by 2030 (Ministry of Health of the Republic of Indonesia, 2016).

The trend of the development of the number of malaria cases in Indonesia has decreased from 2010 to 2020. The annual parasite incidence (API) of malaria in Indonesia in 2010 reached 1.96 and in 2020 it decreased to 0.87 per 1,000 population (Ministry of Health of the Republic of Indonesia, 2021b). The decrease in malaria cases in Indonesia is very significant by 58.2% with a total of 94,610 cases in 2021 and 2020 as many as 226,364 cases. However, despite the decline, the malaria problem remains a common problem in controlling and maintaining the condition of the area that has achieved malaria elimination. The number of cases is still quite large when compared to the national target of malaria elimination in 2030 (Ministry of Health of the Republic of Indonesia, 2022).

The decrease in malaria cases affects the achievement of malaria elimination at the district or city level in Indonesia. The achievement of malaria elimination which was originally in 2019 was 300 districts or cities to 318 districts or cities in 2020 (Ministry of Health of the Republic of Indonesia, 2021a). Some areas in Indonesia with the highest malaria cases are generally in the eastern region including Papua, West Papua, East Nusa Tenggara, and East Kalimantan (Ministry of Health of the Republic of Indonesia, 2020). In 2020 there will be 23 districts or cities that are high endemic areas, 21 districts or cities with moderate endemic, and 152 districts or cities with low endemic (Ministry of Health of the Republic of Indonesia, 2021a).

Muara Enim Regency is one of the malaria-endemic areas in South Sumatra Province. The trend of malaria development in Muara Enim Regency is still influenced by the habitat of the *Anopheles* spp. which is by the geographical and environmental conditions of Muara Enim Regency. Muara Enim Regency is the center of South Sumatra Province. Although there has been a decrease in malaria cases when compared to other districts in the South Sumatra Province, Muara Enim Regency is an area that always has malaria cases and is a focus district in South Sumatra in malaria control. Muara Enim Regency was in the second-highest rank of malaria cases in South Sumatra in 2019 and in 2020 it was the first highest ranking.

The areas that are the main focus of malaria control in Muara Enim Regency are two mining areas, namely Lawang Kidul District and Tanjung Agung District. The target of malaria elimination in Muara Enim Regency is in 2023. Lawang Kidul sub-district is an area with geographical, environmental, and community behavior conditions in line with the development and breeding of the *Anopheles* spp. The geographical condition of Lawang Kidul District is an area with a high to low plateau transition and is included in the Bukit Barisan area (Puskesmas Tanjung Enim, 2020). The location of Lawang Kidul District is very strategic, causing high community mobility. The area is dominated by plantations, forests, swamps, and coal mines. In the last 5 years (2016-2020) Lawang Kidul District has always had malaria cases. In 2021, malaria cases in Lawang Kidul District have not been confirmed to be indigenous or imported, so it is still possible if Muara Enim Regency can achieve its elimination target in 2023.

The development of COVID-19 affects malaria cases and deaths (WHO, 2021). This is a new challenge in eliminating malaria in Muara Enim Regency. In 2020, Lawang Kidul District is included in the COVID-19 red zone for several months in a row. This also shows the high mobility of the people in Lawang Kidul District.

The central government's strategy in efforts to eliminate malaria is to encourage local government commitments, especially regions with malaria-endemic conditions (Ministry of Health of the Republic of Indonesia, 2021a). Efforts to control malaria during the COVID-19 pandemic are different from control in the past. The Indonesian Ministry of Health has issued guidelines for malaria services during the COVID-19 pandemic (Directorate General of Disease Prevention and Control, 2020). This condition resulted in a change in strategy in controlling malaria during the COVID-19 pandemic. IVM is still an effective and efficient effort in controlling malaria, both before the COVID-19 pandemic and during the COVID-19 pandemic.

IVM is an effort to optimize the use of resources including the community in vector control so that they can synergize effectively and efficiently. IVM does not only involve the health sector but involves many sectors that are integrated and have the same goals with different ways of controlling according to their respective roles. The points in IVM include an integrated approach, case-based decision making, collaboration between and across sectors, advocacy and mobilization of social legislation, capacity building of resources (World Health Organization, 2012). Therefore, this research was conducted to identify and integrate the efforts that have been carried out in the application of Integrated Vector Management (IVM) in malaria prevention in the COVID-19 pandemic era and readiness for malaria elimination in Lawang Kidul District.

METHOD

The type and design in this study used a descriptive research design. The method used in this study is a quantitative method with a qualitative approach. The research variables for qualitative research with descriptive analysis are elements contained in Integrated Vector Management (IVM), namely an integrated approach, case-based decision making, a collaboration between and across sectors, advocacy for mobilization of social legislation, and capacity building of resources. The research instrument used is an in-depth interview guide. Determination of informants in this study using purposive sampling technique with the criteria of mastering and playing an active role in malaria control, being the manager of the malaria program, malaria policymakers, and sectors involved in malaria control.

The informants in this study amounted to 12 people, namely the Head of the Muara Enim District Health Office (1 person), the Head of the P2P Division of the Muara Enim District Health Office (1 person), the Head of the Infectious Disease Eradication Section (P2M) of the Muara Enim District Health Office (1 person), Malaria Program holders from Muara Enim District Health Office (1 person), Head of Tanjung Enim Health Center (1 person), Tanjung Enim Health Center Doctor (1 person), Tanjung Enim Health Center Malaria Program holder (1 person), Lawang Kidul Sub-district Head (1 person), Head of Tegal Rejo Village (1 person), Darmo Village Head (1 person), and Head of SDN 16 Lawang Kidul (1 person).

Research data processing using NVivo 12 Plus is a program that helps researchers analyze qualitative data that functions

to process and visualize data in the form of text in various forms including in-depth interviews. Data analysis was carried out with data reduction, data display, conclusion drawing/verification (Sugiyono, 2015). In the NVivo Plus 12 applications, conclusions are drawn by comparing the reference values of each factor in each 1 variable. The

reference value is one of the outputs of the NVivo 12 Plus application data processing. The highest reference factor value indicates the most influential sub-variable in a research variable because the sub-variable is a topic that is often discussed in research by informants.

RESULTS AND DISCUSSION

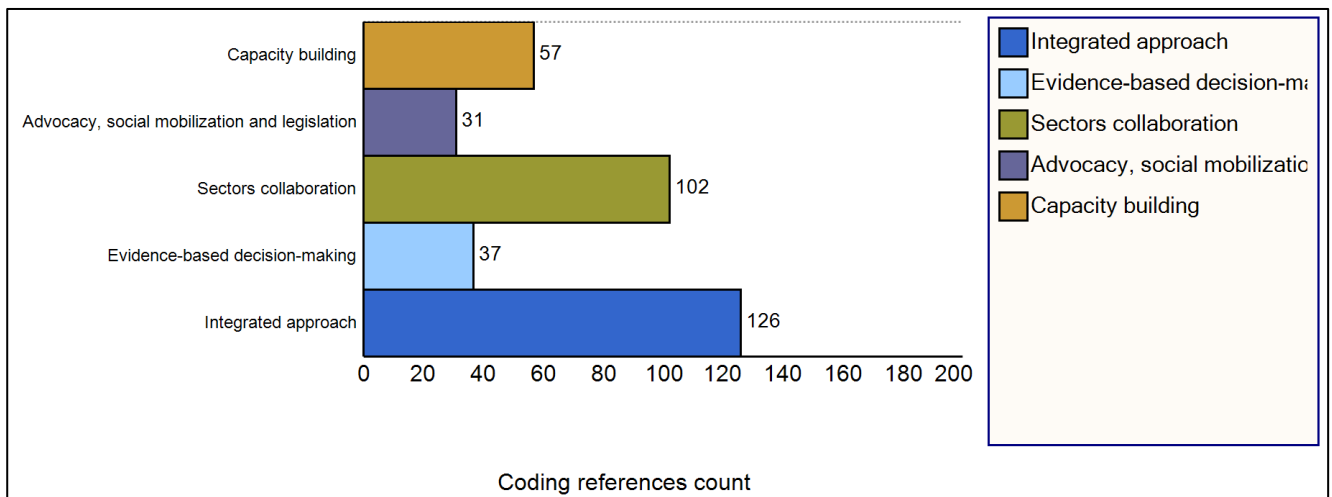


Figure 1. Integrated Vector Management (IVM) Malaria in Lawang Kidul Kecamatan District

Integrated Vector Management (IVM) Malaria in Lawang Kidul District

The results of the Nvivo 12 Pro analysis related to the five points of IVM Malaria in Lawang Kidul District are described in figure 1. Based on the figure 1, the results of the reference analysis of the NVivo 12 Pro coding show an integrated approach (126 codes), case-based decision making (37 codes), cross-sectoral cooperation (102 codes), advocacy for legislative mobilization (31 codes), and resource capacity (57 codes). Based on the figure above, shows that the dominant element of IVM Malaria in Lawang Kidul District is an integrated approach and the lowest element of IVM is advocacy, mobilization, and legislation. Malaria vector control is focused and takes into account variables in the environment, even within one district there may be large differences in the risk of transmission, consequences, impacts so there is no single vector control that can be applied in all circumstances (USAID, 2017).

Integrated Approach

The integrated IVM approach can treat multiple vector-based diseases simultaneously and multiple interventions are

effective against multiple vectors. An integrated approach based on local ecological conditions and social mobilization has proven successful in overcoming the problem of resistance to pesticides (Carina Weber, Dr. Charles Mbogoa, 2013).

The results of the analysis show that the prevention and control sub-variables dominate the IVM effort in an integrated approach in Lawang Kidul District with a total coding reference of 83 codings. Analysis of the situation in Lawang Kidul District consisted of mapping, interviewing disease knowledge, entomological studies, and epidemiological studies. The situation analysis process is a very important part of IVM planning and implementation. Situation analysis serves as a guide in determining further program decisions by mapping analysis, disease knowledge interviews, entomological studies, and epidemiological studies (World Health Organization, 2012).

Situation analysis activities in Lawang Kidul District did not change during the COVID-19 pandemic. Activities are still being carried out by the Baturaja Health Research and Development Center, the Muara Enim District Health Office, and the Tanjung Enim Health Center.

Table 1. Situation Analysis Interview Result

Informant	Interview result	Description
Head of the Disease Control and Eradication Division (P2P) of the Health Office of Muara Enim Regency	<i>“Selama masa pandemi Covid ini kita karena pemeriksaan ini kalau yang kaya survei dan penangkapan nyamuk itu tetap dilakukan pada malam hari masih sesuai dengan jadwal mereka...”</i>	Situation analysis activities during the COVID-19 pandemic were all carried out by the province, in this case by the Baturaja Health Research and Development Center

Malaria control activities have differences before and during the COVID-19 pandemic. The most dominant effort made before the COVID-19 pandemic was larviciding (9 codings). According to research informants, control activities before the COVID-19 pandemic were still active and well-coordinated. To be better and more effective control activities must involve local communities. Biological mosquito control can encourage the public to use mosquito repellent plants, spread fish, spread tin head fish (*Aplocheilus panchax*) in collaboration with non-governmental organizations, and use coconut for controlling pre-adult mosquitoes and involve the active role of cadres and pomades if they have been established (Willa et al., 2015).

This is indicated by the reduced prevention and control activities during the COVID-19 pandemic. All activities are limited since COVID-19, local government regulations and policies also follow national regulations related to the COVID-

19 circulation. This also affects activities that are directly related to the community in the Lawang Kidul District. The COVID-19 pandemic conditions that occurred throughout 2020 affected the number of case findings with community visits in the work area of the public health center or PCD (Passive Case Detection) (Dinas Kesehatan Provinsi Sumatera Selatan, 2020).

An illustration of the activities carried out during the COVID-19 pandemic is socialization. This socialization activity consisted of strengthening the clinic network and DPM, cross-sectoral mining business actors, and socializing the establishment of malaria village regulations. In addition, it is necessary to socialize the importance of using personal protective equipment when active at night and or when traveling to malaria-endemic areas so that people are more concerned and protect themselves from transmission independently (Ruliansyah & Pradani, 2020).

Table 2.
Prevention and Control Interview Result

Informant	Interview result	Description
Head of Health Service Office of Muara Enim	<i>"Hanya dalam bentuk sosialisasi di fasyankesnya aja di puskes-puskes, cuma dalam bentuk tidak ada pencegahan tapi dalam bentuk promotif yang dilakukan"</i>	During the COVID-19 pandemic, malaria control activities were only in the form of promotion in the community health center

Table 3.
Resources Needs Assessment Interview Result

Informant	Interview result	Description
Head of Tanjung Enim Health Center	<i>"Pada prinsipnya pengendalian sesuai dengan SOP kan sesuai dengan SOP nya jadi kita tidak membedakan 1 wilayah 1 tempat cuma karena ada prinsip-prinsip nya"</i>	There are no special activities related to resource assessment carried out by the community health center, all according to standard operating procedures

The assessment of resource needs carried out by the Tanjung Enim Health Center is to adjust the needs and directions from the Muara Enim District Health Office.

The assessment of resource needs in the health care sector only adjusts the needs to conditions in the field, there is no special assessment carried out either from the Tanjung Enim

Health Center or the Muara Enim District Health Office. It is necessary to assess the Standards for the Number and Quality of Health Personnel/Human Resources to fulfill the fulfillment of basic service quality at the minimum service standards in the regional health sector (Kementerian Kesehatan Republik Indonesia, 2019).

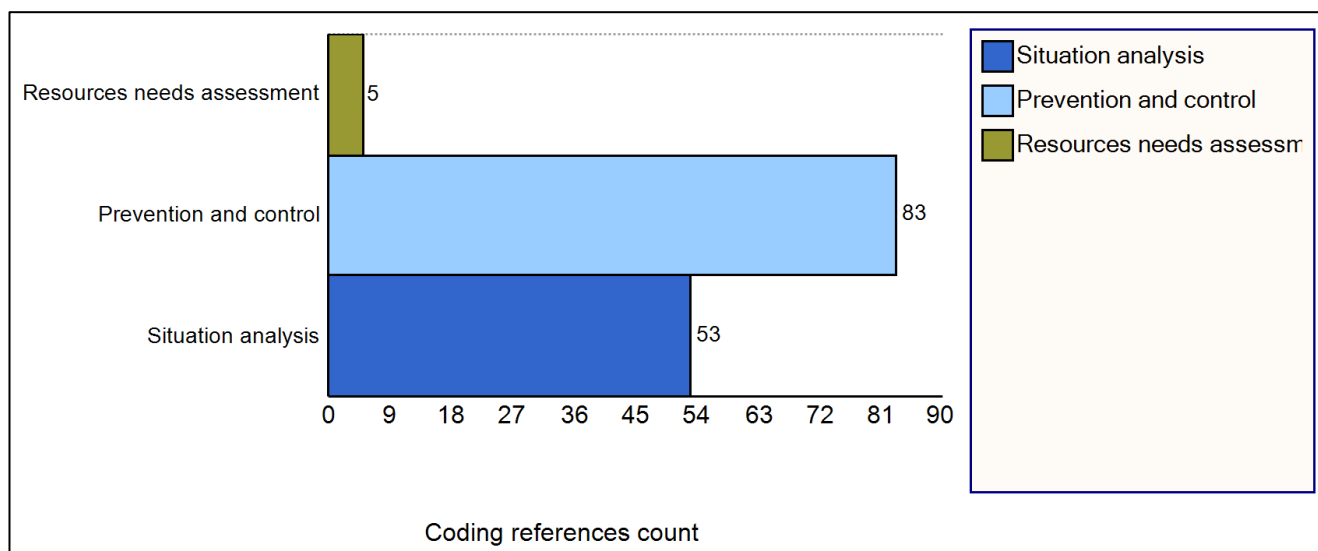


Figure 2. Integrated approach in Lawang Kidul District

Case-Based Decision Making

The results of the coding reference analysis are presented in the figure 3. The sub-variables of identification and control renewal dominate IVM's efforts in case-based decision-making in Lawang Kidul District (22 codings). Identification

and updating of malaria IVM control in Lawang Kidul District are related to planning the formation of village regulations related to malaria control and migration surveillance. In this case, the Tanjung Enim Health Center cooperates with the District and Provincial Health Offices.

Table 4.
Identification and Updating Control Interview Result

Informant	Interview result	Description
Head of Tegal Rejo Village	<i>".....cuman kemarin ada surat untuk migrasi malaria kemarin, makanya kita bentuk itu kan, cuman karena sekarang masih COVID jadi mereka fokus ke COVID semua"</i>	Early 2020 before the COVID-19 pandemic there was a letter regarding the formation of village regulations for malaria control but it was stopped because all activities were focused on controlling COVID-19

Table 5.
Intervention and Community Acceptance Interview Result

Informant	Interview result	Description
Head of the Tanjung Enim Health Center	<i>".....kita sering melaksanakan himbauan-himbau kepada masyarakat khususnya petani dan pekerja tambang.... kita membagikan kelambu kita adakan himbauan kemudian untuk masyarakat-masyarakat yang berpotensi untuk diperkirakan bakal ada malaria kita kasih kelambu dan respon masyarakat baik"</i>	Malaria prevention is carried out according to mining habitats and garden areas in Lawang Kidul District. The community's response to the intervention is very good.

Based on the results of the analysis of decision-making based on the case, there are updates to control efforts, namely migration surveillance, interventions based on mining habitat, and good community acceptance. Public acceptance of the intervention received a good and positive response. To make decisions based on these cases, it is necessary to involve the community in giving and receiving interventions by

forming malaria cadres per village to control and increase community knowledge with an appropriate approach.

In the condition of the development of the COVID-19 disease which is a priority for the government, a regional-based management approach is needed (Firmansyah et al., 2021). Region-based disease management for malaria elimination is part of the integrated approach of IVM.

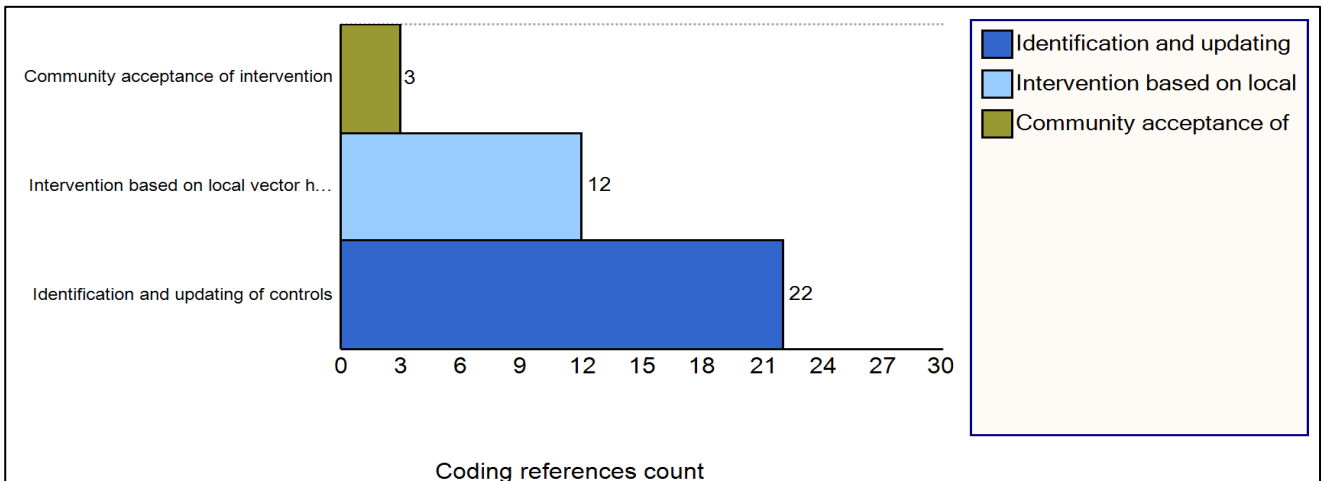


Figure 3. Decision Making Based on IVM Malaria Cases in Lawang Kidul District

Cross-Sector Cooperation

The cross-sectors involved in malaria IVM in Lawang Kidul District are the South Sumatra Provincial Health Office, Baturaja Health Lokalitbang, Health Service, Education Office, Environment Service, Fisheries Service, Agriculture Service, Community and Village Empowerment Service, Tanjung Enim Health Center, SDN 16 Lawang Kidul, Lawang Kidul Sub-

district, Village Heads in Lawang Kidul District, BPD Lawang Kidul District, Head of RT, and BUMN (PTBA) and BUMS (PT Pamapersada Nusantara) companies in Lawang Kidul District.

The cross-sectoral implementation above has not been maximized, such as related agencies (environment, education, fisheries, agriculture, and village community empowerment) in collaboration with the Health Office of Muara Enim Regency. Based on the results of interviews with

informants that the health office has sought integrated activities according to their respective fields, but the lack of

cooperation, monitoring, and evaluation between these services causes the planned program not to run as it should.

Table 6.
Cross-Sector Cooperation Interview Result

Informant	Interview result	Description
Head of the Disease Control and Eradication Division (P2P) of the Health Office of Muara Enim Regency	<i>“Sudah dilakukan lintas sektor cuma ga intens. Setiap pertemuan kan gini misalnya dengan perikanan, bagaimana mereka membuat tambak terus kemudian dengan LH begitu, dengan PMD tentunya bagaimana kebijakan sampai ke tingkat desa seperti itu”</i>	Cross-sectoral cooperation is still lacking even though several sectors have been invited to be involved. This collaboration is not sustainable.

The active role of health workers at the Tanjung Enim Health Center and the Muara Enim District Health Office is to hold regular meetings and compile plans for re-cooperation that can be agreed upon for common goals. Malaria elimination is unlikely to get optimal results if there is no cross-sector support, be it the legislature, local government,

relevant agencies, the community including community organizations, the private sector/business world. The commitment of the central and local governments affects the sustainability of the malaria control program (Manalu et al., 2014).

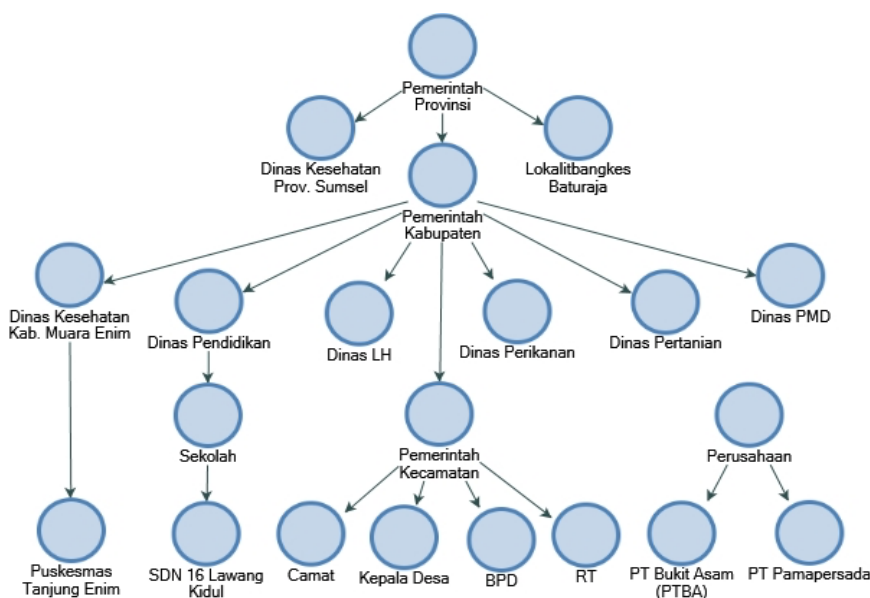


Figure 4. Cross Sector IVM Malaria in Lawang Kidul District

Advocacy, Mobilization, and Legislation

The IVM Advocacy, Mobilization, and Legislation variables in this study have two sub-variables, namely the inculcation of IVM principles and strengthening IVM policies. The IVM principal implantation is presented in the figure 5.

The results of the study based on the analysis of the NVivo 12 Pro coding reference showed that the dominant factor in

inculcating the principles of IVM malaria in Lawang Kidul District was advocacy activities carried out in the mining environment with a total of 14 coding references.

The strengthening of the malaria IVM policy based on the Nvivo 12 Pro analysis shows that the formulation of malaria village regulations (village rules) is the only effort made related to policies with a total of 11 coding references.

Table 7.
Cross-Sector Cooperation Interview Result

Informant	Interview result	Description
Head of the Disease Control and Eradication Division (P2P) of the Health Office of Muara Enim Regency	<i>“...kemarin minta bantuan ke PMD untuk pendampingan dalam pembuatan perdes, jadi perdes tentang malaria. Itu tinggal disosialisasikan perdes itu, kan minta bantuan dari PMD karena mereka yang membawahi pemerintah desa gitu”</i>	In Lawang Kidul District, no village has yet made village regulations related to malaria, this is because there is no continuity of the program during the COVID-19 pandemic.

The implementation of the malaria policy at the Muara Enim Regency level has not met the activity indicators for the malaria elimination stage where there are no local regulations or regent regulations related to efforts to support malaria elimination in 2023. In the elimination indicators by the ministry of health, it is stated that the regions can function by

Perda or other laws and regulations to waive the cost of laboratory diagnosis and treatment of malaria in government health service units, and prohibit the sale of malaria drugs installs or street vendors (Kementerian Kesehatan Republik Indonesia, 2009).

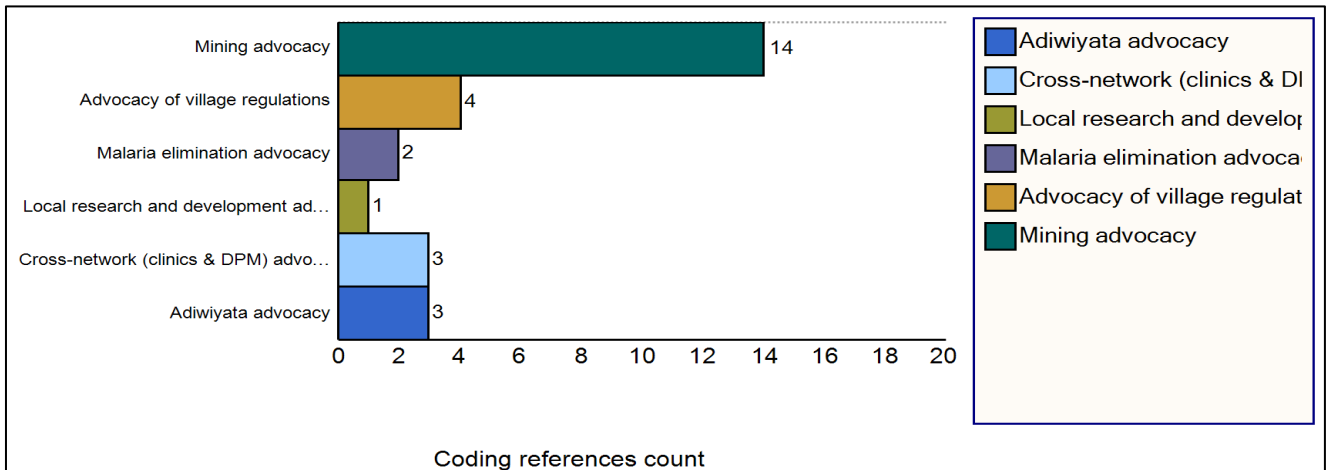


Figure 5. Planting IVM Malaria Principles in Lawang Kidul Kecamatan District

Resource Capacity

The human resources of IVM Malaria in Lawang Kidul District are presented in the figure 6. Efforts to increase the capacity of human resources in Lawang Kidul District that are focused and planned related to malaria are still not optimal. According to an interview with a malaria program holder at

the Tanjung Enim Health Center, the only training he received during his tenure was E-Sismal training. Meanwhile, during the pandemic, no training was carried out at all, only in the form of socialization of malaria elimination to the heads of a public health center and doctors at the public health center in Muara Enim Regency.

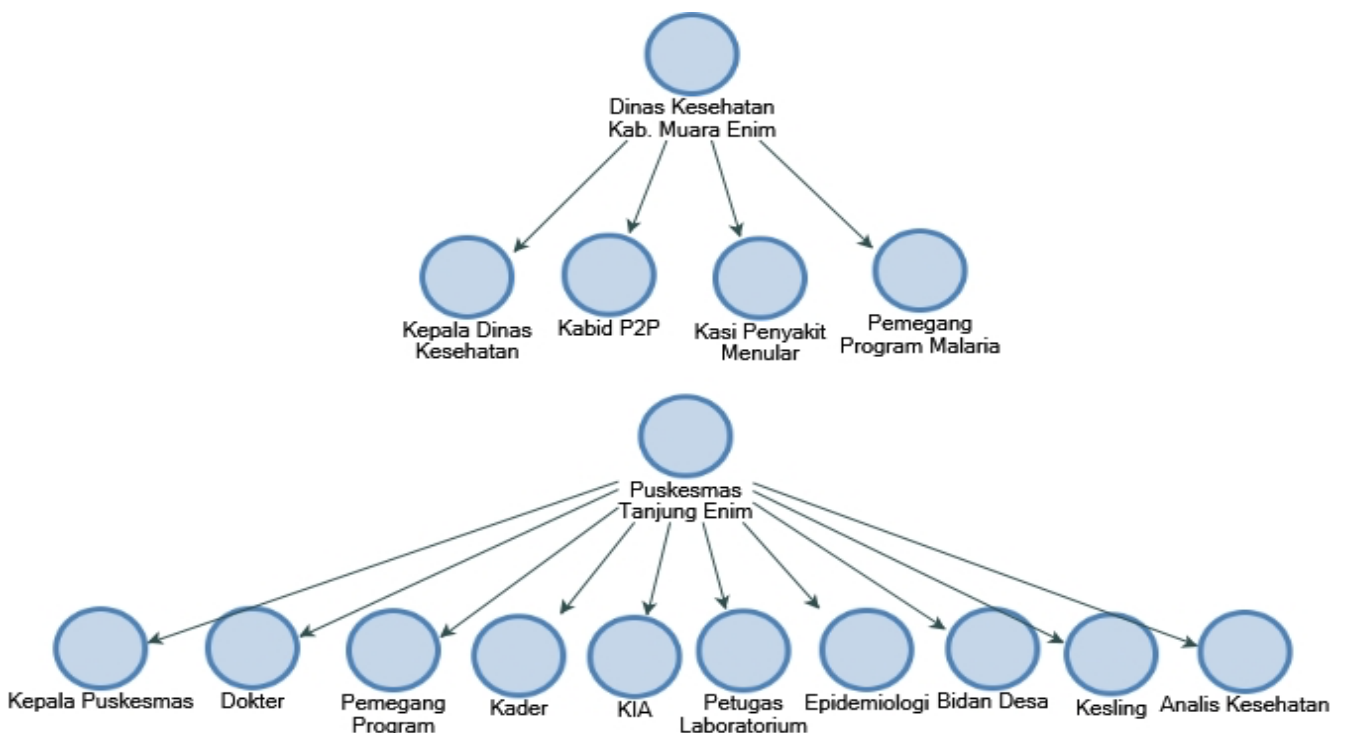


Figure 6. Human Resources of IVM Malaria in Lawang Kidul District

Table 8.
Resource Capacity Interview Result

Informant	Interview result	Description
Malaria Program Holder informant at the Tanjung Enim Health Center	“Kalau kemarin cuma pelaporan sistem pelaporan itu aja, e-sismal. Tahun ini ga ada, terakhir 2017 ya apa 2018 terakhir.”	There is no form of training and capacity building for human resources during the COVID-19 pandemic. However, in 2021 there will be socialization activities carried out to accelerate the elimination of malaria at the district level.
Doctor at the Tanjung Enim Health Center	“Sosialisasi-- kampanye menuju eliminasi malaria kabupaten di awal Oktober. Dokter sama kepala puskesmas yang diundang”	

The reorientation of the program towards the malaria elimination stage has been carried out by public health center officers by advocating for mining companies, mining businesses, clinics, and independent practice doctors (DPM). However, this is not effective because there is no change in the acceptance of tasks that must be carried out by each sector. Efforts are needed to follow up on the continuity of the agreement (MoU) that has been made, monitoring, and routine evaluation between sectors. The role of cross-sectors is still not optimal because they are still hampered by their respective duties and functions so they cannot make the malaria program a program priority. The new cross-sectoral role is optimal when there is a program from health whose command remains from the health sector (Wahono et al., 2021).

The increase in resource capacity can still be carried out during the COVID-19 pandemic while still paying attention to health protocols so that the COVID-19 pandemic does not affect efforts to increase resource capacity.

CONCLUSIONS AND SUGGESTION

IVM Malaria in Lawang Kidul District has fulfilled five key elements according to WHO. IVM Malaria in Lawang Kidul sub-district stands out in the elements of an integrated approach (126 codes) and is lowest in terms of advocacy for legislative mobilization (31 codes). The implementation of the malaria IVM in Lawang Kidul District has not been maximized in several IVM activities such as assessing resource needs, preventing control efforts that are hampered due to the COVID-19 pandemic, community involvement in decision making, strengthening cross-sectoral commitments, policymaking, and policy implementation. Malaria has not become a priority for controlling health problems across sectors other than the health sector. During the COVID-19 pandemic, the government and private sectors were more focused on controlling COVID-19. To achieve elimination in 2023, Muara Enim Regency is currently still waiting for the results of the examination of transmission cases in Lawang Kidul District including indigenous or imported transmission. Apart from that, it needs to be supported by a commitment to cross-sectoral advocacy, prioritizing the issue of malaria elimination, empowering mining communities, following up on village regulations, and making district-level policies.

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Conflict of Interest Statement

The authors declared that no potential conflicts of interest with respect to the authorship and publication of this article

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