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Analysis of key factors in SMK3 development: Malaria elimination policy in South Buru, Maluku

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Abstract The highest prevalence of malaria has been observed in South Buru Regency. Effective elimination strategies can be developed only through an improved understanding of the etiology and spatial distribution of malaria cases. To meet the objectives of this study, spatial analysis was combined with the MICMAC method, which was conducted in two stages to clarify and formulate a malaria elimination strategy. The spatial distribution of malaria cases was mapped, while the MICMAC method was applied to examine factors influencing malaria elimination. The relationships among critical factors and their impact on malaria eradication were derived from the data analysis. Spatial analysis indicated that Namrole District is currently a malaria hotspot and may serve as a strategic target for preventive measures. The MICMAC analysis identified that human resource development, routine surveillance and rapid treatment investigations, and community education fall within Quadrant 1 (high influence–low independence), underscoring their importance in malaria elimination efforts. This study emphasizes the role of community engagement in achieving malaria eradication. Recommended strategies include: (1) prioritizing high-risk areas, (2) promoting intersectoral collaboration, (3) implementing active surveillance and case management, and (4) allocating resources effectively. Enhancing community awareness is essential for encouraging healthy practices and ensuring medical adherence. Insights from this study provide local authorities with valuable information for decision-making in malaria control, highlighting indispensable factors in Quadrant 1 that warrant focused attention, especially when identified as key predictors.

Keywords: malaria elimination, south Buru regency, spatial analysis, MICMAC analysis, key factors

1. Introduction

The World Health Organization (WHO) has made significant progress in combating malaria, mainly through substantial investments in preventative measures and effective treatments in countries where malaria is endemic. From 2000 to 2018, malaria cases declined by 30%, decreasing from 80 to 57 per 1000 people, whereas malaria-related deaths decreased by 60% (WHO, 2020). In Indonesia, the Ministry of Health Regulation Number 22 of 2022 on malaria control demonstrates the government's commitment to addressing this issue, establishing a robust foundation for achieving malaria elimination in the country. By emphasizing prevention and effective treatment, Indonesia has the potential to contribute significantly to the global effort against malaria.

Control of the vector (vectors) now represents a challenge for further reducing the global malaria burden. However, it is critically compromised by the emergence of pyrethroid-resistant vectors (Chaccour et al., 2021). Legal strengthening and framing by Maluku Province Governor Regulation No. 11/2020 is not smooth against malaria elimination efforts, so it contributes significantly to Governor Regulation No. 11 in supporting its implementation and framework for governance. The participation of local governments in APLMA 2017 activities is evidence of this shared commitment, underscoring collaboration and alignment between all stakeholders toward a common goal of driving malaria elimination. Governor Decree No. 95 of 2020, which governed the establishment of a provincial malaria elimination team, reflects a strong commitment to real action to address crucial public health problems. The RANPERDA for Maluku Malaria elimination is the cornerstone of organized and targeted elimination planning. The proactive efforts taken by Maluku Province in confronting new challenges demonstrate a locality-oriented strategy to achieve the global goal of defeating malaria (Oktaviyani et al., 2020).

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The country has shown remarkable progress in the fight against malaria through a campaign, which started in 2014 and covered five malaria-endemic districts or cities. As noted in this article, this new distribution carried out another milestone, with KKM nets distributed in 5 more regions (excluding Ambon city) in 2017. This commitment broadened in 2020 with the addition of targeted mass insecticidal mosquito net distributions in ten districts and municipalities. This reflects that the government still prioritized eradication programs, except for Ambon city.

Malaria distribution can be explained via splenic visualization, and geographic information systems (GIS) are typically used for spatial analysis. The government can use this tool to map malaria prevalence in some parts of Maluku, including in the South Buru Regency, along with population, altitude, and environmental factors (Galisong & Kholifah, 2023). Second, Micmac analysis is essential for identifying parameters influencing malaria elimination (Riniwati et al., 2023a). The researchers then examined mosquito nets and use, the adherence of communities to preventative measures, environmental factors promoting the breeding of mosquitoes, and access to healthcare services to better understand the nature of the problem rather than just developing disease mapping models.

The combination of both approaches helps the government determine where a high-risk area is located to adjust its intervention, evaluate the history of efforts that have been implemented previously, and form a policy strategy for malaria elimination in general and in Maluku Province specifically, especially South Buru Regency. The South Buru Regency's commitment and all-inclusive efforts in tackling this fatal public health problem promise a day with no malaria for its inhabitants.

This study aimed to address several critical gaps in malaria elimination efforts, particularly in Maluku and Indonesia. Despite significant progress in global malaria control, challenges, such as insecticide resistance in malaria vectors, notably pyrethroids, persist. GIS technology has been employed to map malaria; however, previous studies have yet to fully integrate environmental data, demographic factors, or access to health services to design more effective intervention strategies. This research makes a distinct contribution by combining GIS-based spatial analysis and the Micmac approach to map malaria distribution and explore interrelated causal factors. Furthermore, this study emphasizes improving community adherence to preventive measures such as using insecticide-treated bed nets and enhanced insecticide resistance management. Employing a collaborative, data-driven methodology, this research addresses gaps in the literature. It contributes to developing sustainable, evidence-based malaria elimination strategies for Maluku and Indonesia.

2. Materials and methods

This research uses mixed methods such as document analysis, literature reviews, expert interviews, and surveys of medical workers on the Maluku Islands (Lameky & Nugroho, 2024). This multidimensional view can enrich the description of malaria in this setting. Spatial analysis methods were applied to describe the geographical distribution of malaria cases, define hot spot areas, and identify where intensive actions should also be conducted. Moreover, MICMAC (Matière-Interaction-Milieu et Action-Connaissance) analysis has been employed to study major driving factors affecting the malaria burden in the South Buru Regency (Riniwati et al., 2023). This is where spatial analysis is essential, which enables the MICMAC in this study to help characterize distributional disease and clarify key determinants to better support malaria elimination interventions in the area (Ipa et al., 2020).

This methodological approach was integrated, combining spatial analysis, expert participation, focus group discussions, and quantitative data analysis to achieve a comprehensive solution. The following is a detailed explanation of the methodology based on this Figure 1:

2.1. Document Study

The initial step in the research was to review relevant literature and documents to obtain initial information on malaria cases in the research area.

2.2. Mapping Malaria Cases Using Spatial Analysis

This study used a spatial analysis approach to map the distribution of malaria cases. Tools such as ArcGIS visualized the location of the spread of malaria cases in the five districts studied (Madan, Lexulla, Namrole, Fena Fafan, and Waisama).

2.3. Focus Group Discussion (FGD) with the Research Team

Researchers have conducted focus group discussions to design further research steps, including identifying the ten leading factors influencing the resolution of malarial problems.

2.4. Involving Health and Malaria Experts in 5 Districts

Experts from each district provided more specific local information about malaria conditions in their area.

2.5. Focus Group Discussion (FGD) for Key Factors

Researchers and experts from each district conducted FGDs to determine the ten key factors in overcoming malaria health problems.

2.6. Matrix Table Creation

Information from the FGD was used to compile a matrix table, which served as the basis for further analysis.

2.7. Data Collection through Matrix Questionnaires

The FGD results were used as guidelines for designing a distributed matrix questionnaire to collect additional data. 2.8. MICMAC Analysis

The collected data were analyzed using the Matrice d' Impacts Croisés Multiplication Appliquée à un Classement (MICMAC) approach. This method is used to identify the key variables that influence system dynamics.

2.9. Identification of Key Variables

The MICMAC analysis results helped identify the most significant critical variables in solving malaria problems.

2.10. Policy Development

Based on the identified vital variables, policies were formulated to address malaria health problems in the region.

2.11. Collaboration with Government and Stakeholders

The research findings and proposed policies were discussed with the government and relevant stakeholders for implementation.

2.12. Final Objective

The final objective is to develop data- and policy-based solutions to reduce malaria cases and improve public health in the study area.

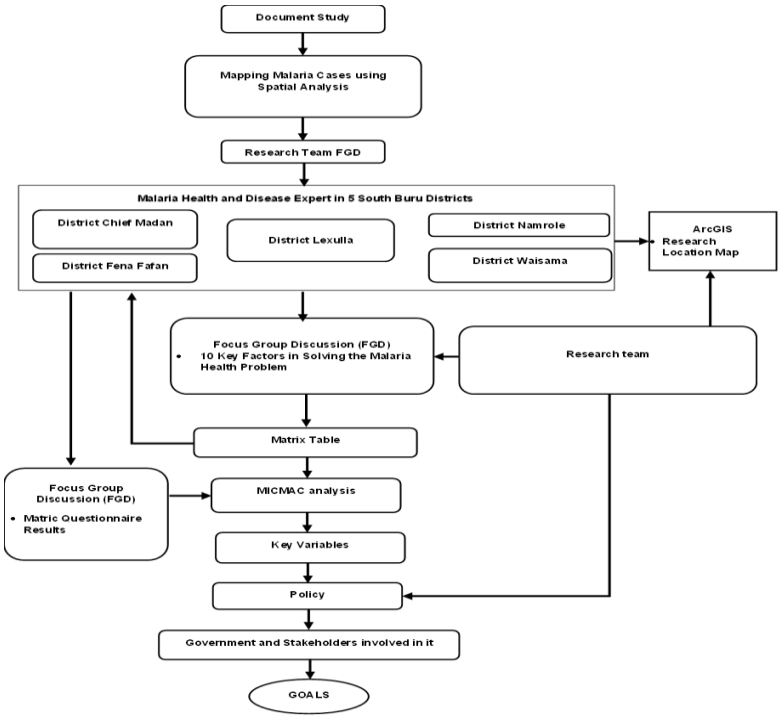

Figure 1 Analysis plan.

3. Results

South Buru Regency, Maluku: South Buru is a new regency that was established in 2008 as part of the independence movement. The region is rich in various landforms, ranging from mountainous terrain to tropical rainforests and vast consumption areas that contain resources that support future economic development, such as agriculture, fisheries, and tourism (Hehanussa et al., 2023). Its ethnic richness shines through its local artistic expressions, musical traditions, and festivities. Government ventures emphasize building infrastructure, the caliber of education, and amenities in healthcare to

ameliorate living standards. In addition to addressing the problems of inadequate infrastructure development and economic diversification, South Buru Regency plans to increase the tourism industry, accelerate economic growth, and improve human resource capacity. In health, medical capabilities, including preventive malaria, have been updated and expanded through a comprehensive strategy in health efforts (Ipa et al., 2020). South Buru Regency works to underscore and improve public health initiatives by collaborating with private and health organizations Figure 2.

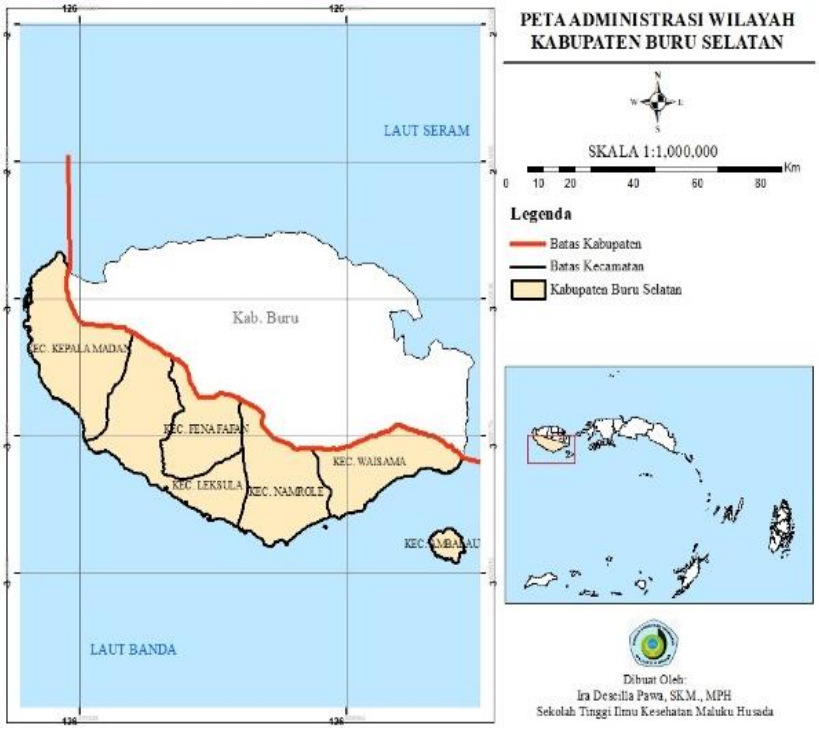

Figure 2 Map of South Buru Regency.

The results of spatial analysis mapping displayed a map of malaria case distribution in the South Buru Regency, which shows a clustering of incident rates within the Namrole District Figure 3. This highlights the need to understand more completely how malaria is spread if we are to pool our resources and address this vicious disease on a larger scale at an international level. Therefore, the exact causes of increasing levels of malaria should be established by further studies so that health interventions can be developed and directed to reduce the toll values of this disease in South Buru District.

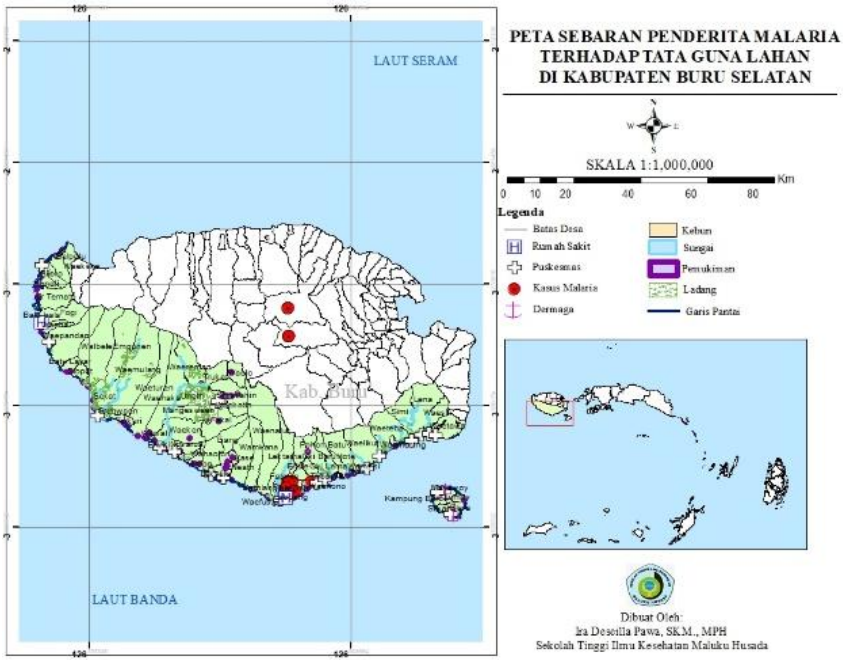

Figure 3 Spatial analysis map of malaria distribution in South Buru.

3.1. MICMAC analysis

Multiple methods have been used to assess which factors influence the development of malaria elimination policies at this level Table 1. These included direct observations, stakeholder interviews, and document/literature reviews. The field observations provided firsthand experiences of the local conditions; in contrast, the interviews with decision-makers and stakeholders provided internal perspectives on the policies (Lameky & Nugroho, 2024). The librarian provided an examination of the documents and literature to gain insight into the theoretical and contextual background, which helped understand the respective health problems (Nazlabadi et al., 2023). Together, these results cover the most critical inputs to formulate Malaria Elimination SMK3 policies in the South Buru District (Sholihah, 2023).

Table 1 Findings on factors for developing the Malaria Elimination SMK3 policy in South Buru.

No	Long label	Short label	Description
1	Mass Vaccination Program	MVP	Implementing a large-scale vaccination campaign targeting populations in high-risk regions can significantly reduce the incidence of malaria (Greenwood et al., 2021).
2	Distribution of insecticide-impregnated bed nets	DIN	Widespread distribution of insecticide-treated mosquito nets, particularly in high-risk areas, can effectively combat the spread of malaria-transmitting mosquitoes (Ezezika et al., 2022).
3	Routine Examination and Rapid Treatment	RERT	Implementation of policies for systematic screening and prompt treatment of malaria cases can lower mortality rates and inhibit further transmission (Otambo et al., 2022).
4	Public Education	PE	Policies that educate the public about healthy lifestyle practices, proper utilization of mosquito nets, and the necessity of seeking medical attention can enhance awareness and promote self-protection measures (Balami et al., 2021).
5	Surveillance and Monitoring	SM	Establishing an efficient surveillance and monitoring system to track malaria cases enables expeditious governmental response to rising infection rates (Visa et al., 2020).
6	Environmental Control	EC	Policies aimed at controlling mosquito breeding environments, such as eliminating stagnant water sources, can contribute to reducing populations of malaria-carrying mosquitoes (Baghbanzadeh et al., 2020).
7	Intersectoral Collaboration	IC	Promoting intersectoral collaboration among health, environmental, and educational sectors can enhance malaria control efforts through a comprehensive approach (Kgoroebutswe et al., 2020).
8	Availability of Drugs and Diagnostics	ADD	Ensuring the accessibility of sufficient medications and diagnostic tools facilitates prompt and appropriate treatment for malaria cases (Azizi et al., 2023).
9	Community Engagement	CE	Incorporating community input in policy planning and execution can enhance active engagement in malaria prevention initiatives (Valdez et al., 2020).
10	Human Resource Development	HRD	Policies focused on developing human resources in the health sector, including training local healthcare workers, can improve the efficiency of the health system in managing malaria cases (Okumu et al., 2022).

This was followed by incorporating those factors in a survey tool for expert evaluation. This matrix questionnaire has an influence scale of 0 = no influence, one weak, 2 moderate, and three medium (Adegoriola et al., 2023). The optimal mode values for completing the matrix questionnaire were determined via mode values obtained from health sector experts, including those with extensive knowledge and experience in malaria control practices currently implemented in the South Buru Regency Table 2. The approach shows promise for mapping relevant high influencers and influencing groups of variables and is a building block for the establishment of case–control malaria prevention action plans (Sholihah, 2023).

Table 2 Questionnaire completion mode of the experts.

	1 : MVP	2 : DIN	3 : RERT	4 : PE	5 : SM	6 : EC	7 : IC	8 : ADD	9 : CE	10 : HRD
1: MVP	0	1	3	2	2	3	1	2	2	1
2 : DIN	1	0	1	2	1	3	2	1	1	2
3 : RERT	3	3	0	1	3	2	2	2	2	2
4 : PE	3	1	2	0	2	3	3	1	2	3
5 : SM	2	2	2	1	0	3	2	3	2	2
6 : EC	1	3	3	1	2	0	3	1	2	1
7 : IC	3	2	2	3	3	3	0	3	3	3
8 : ADD	3	2	3	1	1	3	2	0	1	2
9 : CE	3	2	2	2	2	2	3	1	0	2
10 : HRD	3	2	1	3	3	2	3	2	2	0

The experts who completed the matrix questionnaire were provided deep insight into the interactions and influences among the variables, which might help researchers understand their associations (Alam et al., 2023). The key factors were

analyzed via MICMAC software, enabling an in-depth investigation of the role of elements with solid influence on malaria elimination policy-making in the South Buru Regency. This provided a nuanced understanding of the interplay of variables relevant to the dynamic while identifying which factors have the most leverage in this context. The results provide a crucial basis for implementing targeted interventions that could ultimately impact malaria elimination in the region.

This layout of variables into the MICMAC matrix quadrants shown on the map is an elaborate way to understand the interconnections Figure 4. Quadrant I includes critical but insignificantly impactful key variables that contribute to the construction system, whereas Quadrant II identifies relay variables of solid influence and equally high dependencies. Quadrant III includes dependent variables with extensive definitional overlap with other system components, whereas Quadrant IV consists of excluded variables with only weak effects on the system overall (Sharma et al., 2021). This categorization briefly explains the utility of each variable identified by the MICMAC analysis.

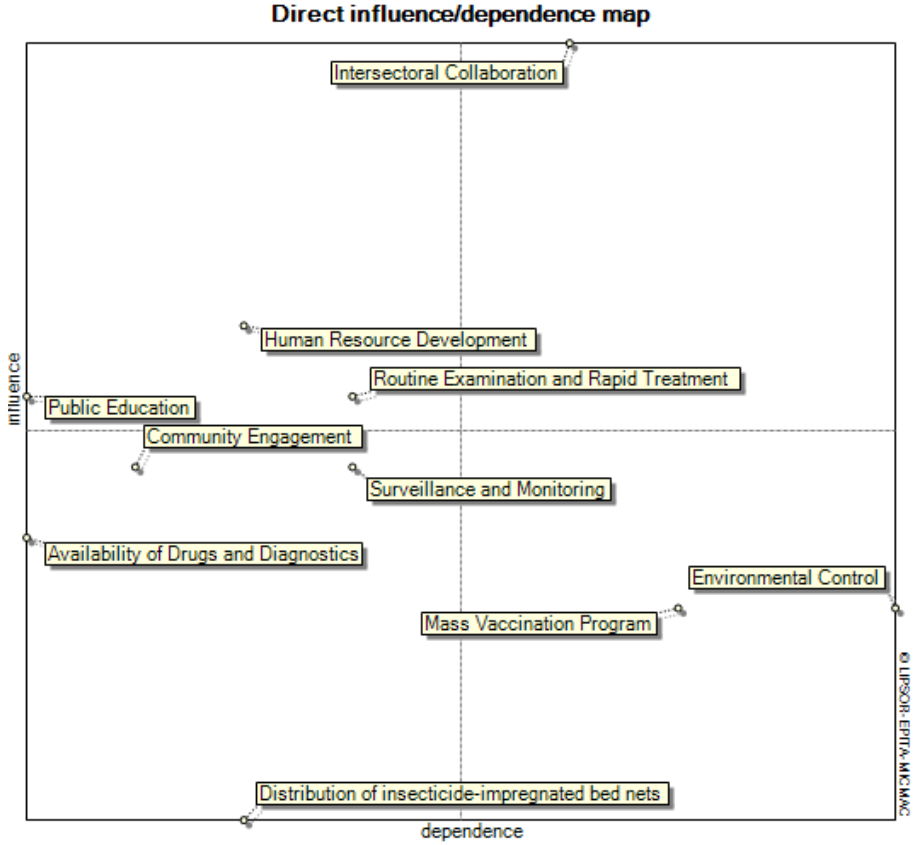

Figure 4 Map of influence and dependency between variables.

Summary of the results of the key factor analysis carried out via MICMAC software. This process resulted in an in-depth understanding of the factors that had a significant influence on the development of malaria elimination policies in South Buru Regency (Table 3).

Table 3 Summary of the results of the Micmac analysis of key factors.

Rank	Direct Influence/dependence Map		Information
	Variables	Quadrant	
1	Human Resource Development	1	High Influence
2	Routine Examination and Rapid Treatment	1	High Influence
3	Public Education	1	High Influence
4	Intersectoral Collaboration	2	Influence the system if it receives intervention
5	Mass Vaccination Program	3	Influenced or impacted by other variables in the system
6	Environmental Control	3	Influenced or impacted by other variables in the system
7	Community Engagement	4	Not significant in influencing system performance
8	Surveillance and Monitoring	4	Not significant in influencing system performance
9	Availability of Drugs and Diagnostics	4	Not significant in influencing system performance
10	Distribution of insecticide-impregnated bed nets	4	Not significant in influencing system performance

The direct influence/dependence map shows three key factors that strongly influence and are in quadrant 1: human resource development, routine examination and rapid treatment, and public education. The public education factor, located

in Quadrant 2, also influences the system if it receives intervention. Quadrant 3 shows two factors, the mass vaccination program and environmental control, which are influenced by other variables in the system. Finally, in quadrant 4, there are four factors: community engagement, surveillance and monitoring, availability of drugs and diagnostics, and distribution of insecticide-impregnated bed nets, which do not significantly influence system performance. These findings illustrate the dynamics of critical factors in the context of malaria elimination research in South Buru District.

4. Discussion

The spatial analysis revealed malaria locations as clusters in Namrole, an administrative division of South Buru Regency. These findings support the importance of understanding disease distribution to effectively implement malaria interventions in control and elimination efforts. Because of the very high incidence in Namrole District, any migrant to South Buru District would result in a substantial improvement. Therefore, the primary target for health policy provision should be why malaria remains so prevalent in Namrole. Some critical strategies for malaria elimination exist in the South Buru Regency region. The mass vaccination programme (MVP) and distribution of insecticide-impregnating bed linens (DIN) are necessary interventions for high-risk areas to decrease malaria incidence (Greenwood et al., 2021; Ezezika et al., 2022). Adhering to the routine examination and rapid treatment (RERT) policy is essential for reducing mortality and breaking the chain of transmission (Otambo et al., 2022). Public education (PE) has a significant role in promoting knowledge on how to lead a healthy life (Balami et al., 2021).

Surveillance and monitoring (SM) are cardinal elements of a well-designed system for longitudinal tracking of malaria cases (Visa et al. Environmental control (EC) refers to the management of potential breeding habitats for mosquitoes, specifically making innoxious stagnant water sites (Baghbanzadeh et al., 2020). Since cooperation among sectors is necessary, intersectoral collaboration (IC) is essential to generate this harmony among various sectors (Kgoroebutswe et al., 2020). Prompt and appropriate treatment of malaria cases depends on a continuous supply of drugs and diagnostics (ADDs) registered as quality-assured products by the national regulatory authorities or the WHO prequalification process (Azizi et al., 2023). Community engagement (CE) is considered an indispensable element; involving the community in policy planning and implementation may lead to active participation in malaria control programs (Valdez et al., 2020). The same national and subnational human resource development policies, particularly in the health sector, which include strengthening the capacity of local health workers through training, are beneficial in equipping the health system to address malaria cases adequately (Okumu et al., 2022).

In the influence/dependency map analysis, three main items were identified in Quadrant 1: human resource development, routine diagnosis, prompt treatment, and public enlightenment. Public education in Quadrant 2 also impacted the system when interventions were applied. Quadrant 3 depicts mass vaccination and environmental control as being subject to numerous other factors throughout the system. Finally, Quadrant 4 includes four factors that do not significantly impact system performance: community participation, surveillance and monitoring, availability of drugs and diagnostics, and distribution of insecticide-treated mattress substrates. These results highlight the key elements necessary to successfully eliminate malaria in South Buru District (diagrams prepared on the basis of Greenwood et al., 2021).

This study's findings align with the malaria elimination target in Indonesia. They are supported by various studies that show the importance of developing an effective Occupational Safety and Health Management System (SMK3). Roosihermiatie et al. (2012) emphasized that understanding policies and regulations, such as the Decree of the Minister of Health No. 293 of 2009, is a significant factor in the effectiveness of implementing malaria elimination policies. This is reinforced by the findings in Bali Province, which show that a deep understanding of policies allows local stakeholders to implement malaria elimination programs better. In addition, local government commitment, including budget allocation and political support, determines the success of this policy. Studies in Kupang City (Selasa, 2017) and Tomohon City (Renwarin, 2014) have emphasized the importance of adequate financial support for implementing epidemiological surveillance, community empowerment, and early detection of malaria cases. Program innovation is also a crucial element in SMK3 development. Research in the Central Bengkulu Regency (Gunasari, 2018) shows that using technology for early detection and case reporting can increase the efficiency of policy implementation while accelerating the response to the spread of the disease. In addition, community empowerment through health cadre training and public education has been shown to increase public awareness and participation, as demonstrated in a study in Tomohon City (Renwarin, 2014). Increasing human resource capacity is also a significant supporting factor. Studies in Bali Province and Kupang City (Roosihermiatie et al., 2012; Selasa, 2017) have found that ongoing training for health workers can improve the quality of diagnosis, patient management, and surveillance data processing. An effective epidemiological surveillance system is the backbone of malaria elimination policy. Research in Kupang City (Selasa, 2017) has shown that real-time case reporting can accelerate the prevention and control of the spread of the disease, thus becoming a key element in the integration of SMK3. Thus, the success of developing SMK3 to support malaria elimination policies depends on the synergy of various factors, including policy understanding, government commitment, program innovation, community empowerment, increasing the capacity of health workers, and a robust surveillance system. A multidisciplinary approach and the involvement of various parties are vital to ensuring the program's sustainability and achieving the national malaria elimination targets.

The ethical implications of malaria interventions, particularly those concerning vulnerable populations, cover many aspects that require serious attention. One key challenge is ensuring equitable accessibility to health resources such as vaccines, insecticide-treated nets, and medication. Populations in remote areas, such as the South Buru district, often experience limited access; therefore, malaria policies should be designed to reduce this inequality. In addition, health data collection through surveillance and spatial analysis may pose the risk of privacy violations, making personal data protection and transparency an ethical imperative. The active involvement of communities is also an important aspect, as decisions that do not involve local people can create distrust and resistance toward the program. In the long term, the sustainability of interventions should be prioritized, emphasizing community education and strengthening local capacity, such as training health workers, to ensure a sustained impact. An evidence-based approach is needed to manage the risks of insecticide and drug resistance, which could jeopardize the effectiveness of future interventions. In addition, people's rights to information about malaria risks, prevention measures, and treatment availability must be respected by providing precise and accessible information. Considering these aspects, malaria interventions can be inclusive, ethical, and practical, providing sustainable benefits to the most vulnerable communities.

4.1. Public health ramifications

The study results have wide-ranging public health implications, especially in the South Buru Regency. Namrole District has been identified as a high-burden area and should be prioritized during malaria control interventions. Discovering the most significant determinants of malaria transmission, such as human resources due to health, regular health check-ups, prompt treatment, and community education, is a call for action for an all-inclusive approach that integrates preventive measures with case management and public mobilization. Strategic policies such as increasing awareness and implementing environmental control could help reduce the burden of malaria and eventually improve health benefits, thus leading to a better quality of life among populations in that region.

4.2. Study Constraints and Considerations

While providing valuable exploratory findings on local perceptions of malaria control in South Buru District, this study is limited. The choice of geographic space and the location where mosquitoes, hosts, and pathogens interact are significant factors. The focus on spatial analysis, such as broad geographic space, may overlook how qualitative factors provide insight into malaria transmission dynamics that may contribute to disease. Furthermore, this study used data that may be limited in availability and may be directly applicable to changing times. Thus, while the results are essential, caution is needed in generalizing them to local contexts or emerging information.

4.3. Recommendations for Policy

The mechanisms underpinning the most critical influences highlighted by quadrants one and two are human resource development, regular inspection, rapid treatment, and public education. Through these insights, we provide several policy recommendations that could promote better performance of the malaria elimination initiative in the South Buru Regency.

Improving human resources development (HRD) efforts: the importance of developing the human resource aspect within the health sector, especially in increasing training and directing skills for health workers or local healthcare professionals to integrate a culture of culture with safety standards. (Sholihah, 2023). A robust training system and the enhanced potential of human resources are needed to allow early diagnosis, prompt treatment initiation, and follow-up of each malaria case (Okumu et al., 2022).

The Routine Examination and Rapid Treatment (RERT) Program should be strengthened: Efforts should be made to implement this program regularly and treat any infected person promptly. This may entail improving public health provisions to allow prompt treatment of patients when symptoms appear and motivate early presentation, which could decrease mortality, prevent further disease transmission, and curtail outbreaks (Otambo et al., 2022).

The public education (PE) programs' current PE policies should be rewritten, and more public awareness campaigns should be designed to promote healthy lifestyle habits, the importance of bed nets, and malaria prevention strategies. Community engagement may involve going directly into communities to talk with people about how they can be better prepared for an SCD or sharing educational resources (Balami et al., 2021). Mass media is used to reach more people as part of the campaign.

Applying Education and Communication Technologies: Current technologies for education and communication can improve public educational campaigns. The authors concluded that information could be quickly posted and interactively made public on digital platforms, smartphone applications, and social media (Balami et al., 2021).

These policy recommendations, generated from quadrants one and two, we expect to help improve the efficiency and effectiveness of the malaria elimination program in the South Buru Regency.

5. Conclusions

Finally, an examination of the spatial and MICMAC analysis results of malaria eradication in the South Buru Regency revealed that these two approaches are important ways to develop intervention programs. The high concentration of malaria cases in Namrole District underscores the importance of focused preventive efforts in hot spots. These considerations must be of utmost priority, along with a vigorous public health education program to increase public awareness about preventing malaria and the need to trap body catchers for regular examination and treatment. Moreover, effective malaria elimination interventions must formulate and implement concrete strategies and policies involving multisector coordination and funding mechanisms. Real-time environmental surveillance enables responses to changes in malaria transmission. The results from the MICMAC analysis can be a valuable decision-making tool for local governments trying to eliminate malaria on South Buru Island.

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Ethical considerations

The research was performed in compliance with the ethical guidelines of the Declaration of Helsinki. All the informants provided written informed consent. The respondents could drop out whenever they wanted; the details were kept 100% confidential. This study was approved by KEPK (Health et al. Commission) of STIKes Maluku Husada.

Conflict of interest

No potential conflicts of interest were reported by the author(s).

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