

Article Review

The Impact of Relocating the Capital to the Capital of the Archipelago on the Potential Spread of Malaria (Plasmodium)

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Abstract

The plan to build a new capital city in East Kalimantan has caused many changes to the region, one of which is the relocation associated with deforestation, decreased levels of biodiversity and increased risk of plasmodium infection. This conservation makes East Kalimantan (the capital of the archipelago) ranked second after Papua in malaria cases. Not only that, the construction of the new capital also makes many people from outside the island of Kalimantan who will later move (migration) to the new capital, this causes the interaction between population and environment to be unbalanced and the development of zoonoses that can cause malaria. The purpose of this study was to determine how the development of malaria cases with the relocation of the New Capital to East Kalimantan.

Keywords: Malaria, IKN, Conservation

INTRODUCTION

Malaria is a public health challenge in Indonesia where more than 273 million people live on 16,671 islands with limited access to simple health facilities in endemic provinces. Recently, this challenge has been exacerbated by an increase in the annualized parasite incidence rate (API) from 0.84 in 2018 to 0.94 in 2020 (MOH, 2020). A gradual increase in malaria cases from 51,418 in 2010 to 216,841 in 2020 occurred in Papua Province (Eastern Indonesia), representing more than 85% of national cases (MOH, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020), while 33 provinces reported a decrease in the number of malaria cases (MOH, 2020).

The Ministry of Health is targeting a malaria-free Indonesia by 2030. A total of 5 regions have been designated as elimination targets to achieve malaria-free. Thus, based on the number of cases, the malaria morbidity rate, expressed by the Annual Parasite Incidence (API) indicator, is 1.1 cases per 1000 population. The achievement of Malaria-Free Indonesia 2030 is preceded by the achievement of malaria-free areas at the provincial level and before that all districts / cities in Indonesia must have achieved malaria-free (Ministry of Health, 2023). As of 2021, 347 out of 514 districts/cities or 68% have achieved elimination. In order to achieve the target of a Malaria-Free Indonesia by 2030, regionalization of elimination targets was made. "The success of Malaria-Free Indonesia in 2030 is determined by the success of early detection of malaria cases in the community,

especially cases in migrant populations. Detection of migrant population cases is related to the authority of sectors outside of health" (Ministry of Health, 2022).

Malaria remains a significant public health problem in Indonesia. As a malaria risk country there are still 23 high endemic districts/municipalities, 21 medium endemic areas, and 152 low endemic areas. The Ministry of Health (kemenkes) in 2020 reported that as many as 300 districts/cities or 208.1 million (77.7%) of the Indonesian population live in malaria-free areas, mostly in the provinces of DKI Jakarta, East Java, and Bali.

Almost 80% of malaria cases are concentrated in Papua Province. 27 districts/cities from Papua, West Papua and NTT provinces and 1 district (North Penajam Paser District), in East Kalimantan province were reported as high endemic areas (MOH, 2016).

In previous research, on Sebatik Island, Nunukan Regency, East Kalimantan Province, there were problems that often occur in Indonesia, such as health problems and lack of education. The incidence of malaria in the Sebatik Island area is still quite high. The results of blood tests that have been carried out show that 5.6% of 194 samples were found to be positive for *P. falciparum* and also found positive for *P. falciparum* in one baby. This indicates that there is endogenous transmission in the area and transmission is still ongoing. Surveillance data conducted by the Nunukan District Health Office shows that in 2009 on Sebatik Island the Slide Positive Rate (SPR) at Puskesmas Aji Kuning, Sungai Nyamuk and Setabu was 63.61%, 28.04% and 30.12% respectively¹², while the target set for the malaria preelimination program is $SPR < 5\%$.

The relocation of Indonesia's capital may lead to an increase in malaria transmission. The current capital of Indonesia is Jakarta, a large city that faces major challenges including vulnerability to natural disasters such as flooding, air and water pollution, and overcrowding. Then the government decided to move the capital from Jakarta to East Kalimantan (Shimamura T, 2020).

Moving the capital of a country or region can have an impact on infrastructure, population and the environment. It can affect the spread of infectious diseases such as malaria. Moving capitals also often involves changes in the physical environment, including changes in climate and ecosystems. This can affect the ecology of *Anopheles* mosquitoes and the spread of malaria. Not only that, the relocation of the new capital, which was originally in Jakarta and then moved to East Kalimantan, can cause a high flow of community mobility in and out of high endemic areas, so the potential for malaria spread is still high. "The arrival of workers from malaria endemic areas to East Kalimantan and the lack of prevention efforts from the community also increase malaria cases in our area,"

As a long-standing malaria endemic area, East Kalimantan province has implemented a national malaria elimination program. The Ministry of Health targets malaria elimination for the Kalimantan and North Maluku regions by 2027. Data from 2020 illustrates that the number of areas with high and moderate malaria endemicity status that changed to low and free is increasing, meaning that the elimination roadmap program is running well.

Obstacles and challenges faced in overcoming Malaria problems in 10 districts / cities in East Kalimantan, namely limited human resources, minimal funding (malaria is not a priority), cross-sectoral coordination is not optimal. So it is very important to provide health counseling, especially on malaria cases to the local community and maintain the cleanliness of the surrounding environment.

An analysis of the impact of the relocation of the capital region on the spread of malaria requires careful research. This includes monitoring malaria cases, population surveys, analyzing climate data, and other factors that affect the spread of the disease.

IMPLEMENTATION METHOD

This research was conducted using the literature method using google scholar using the keywords "malaria" and "IKN". There were filter and year restrictions used when searching for journal references. Records with the following exclusion criteria were excluded: studies that had nothing to do with malaria cases, studies that were not specifically related to malaria located in East Kalimantan.

RESULTS AND DISCUSSION

The literature search identified 25 records through a single source, google scholar. After duplicate removal, the eligibility of the remaining studies (N=4) was assessed based on title, abstract and content. In total, 21 records were excluded as they did not meet the selection criteria. Reasons for exclusion Most of the studies were 60% non-malarial and 40% did not address NI in Indonesia.

Prospects for Accelerating Malaria Elimination in the New Capital Region

Despite a significant reduction in the number of cases and deaths from malaria in the last decade, globally malaria remains a public health problem. In 2020, an estimated 229 million people were infected with malaria in 87 countries (WHO, 2020). Malaria still threatens the population, especially infants, toddlers, and pregnant women because mosquitoes with plasmodium are widely distributed in parts of the world, especially tropical and sub-tropical regions such as Asia, especially Southeast Asia, South America and Sub-Saharan Africa [18]. Environmental factors influence the transmission intensity, seasonality, and geographic distribution of malaria, and together with the vector, host, and plasmodium form the malaria system (Mokuolu, et al 2014, ; Castro, et al 2017).

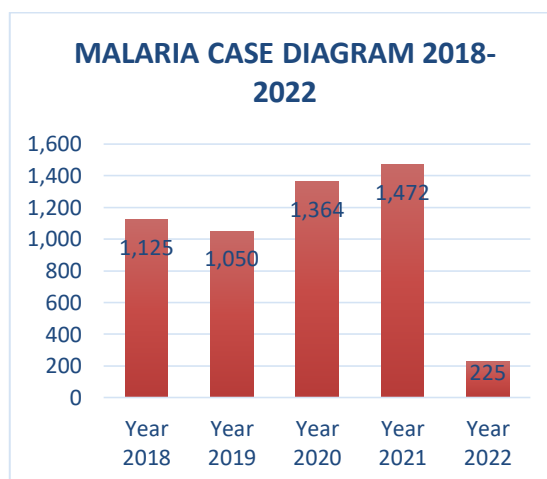


Figure 1: Malaria Program Manager of Penajam Paser Utara District Health Office

In Penajam Paser Utara District in 2018, 1,125 malaria cases were recorded, in 2019 as many as 1,050 cases, in 2020 as many as 1,364 cases. Then there was another increase in 2021 to 1,472 cases, and throughout 2022 225 malaria cases have been recorded.

Only about 25 percent of malaria cases recorded occurred in the Penajam Paser Utara area, while about 65 percent of malaria transmission occurred outside the local area. Residents infected with malaria are more common in border areas, precisely the border of North Penajam Paser Regency - Paser Regency and North Penajam Paser Regency - West Kutai Regency.

The situation of malaria cases in Indonesia has also decreased since the last decade. As a malaria risk country, there are still 23 high endemic districts, 21 medium endemic areas, and 152 low endemic areas. The Ministry of Health (MoH) in 2020 reported that 300 districts/cities or 208.1 million (77.7%) of the Indonesian population live in malaria-free areas, mostly in the provinces of DKI Jakarta, East Java, and Bali. Although the proportion of the Indonesian population living in malaria-free areas is getting higher, the flow of community mobilization in and out of high endemic areas is quite large, so the potential for malaria spread is still high. As a malaria endemic area, East Kalimantan Province has implemented a national malaria elimination program. The Ministry of Health targets malaria elimination for the Kalimantan and North Maluku regions by 2027. Data from 2020 illustrates that the number of areas with high and moderate malaria endemicity status that changed to low and free is increasing, meaning that the elimination roadmap program is running well. However, there are still three districts with medium and high endemicity levels, namely Penajam Paser Utara, Paser and West Kutai districts with a total of 2356 cases and 5 deaths.

Incidence of malaria in mining workers

Endemic areas are caused by environmental conditions that support the spread of anopheles mosquitoes that cause malaria. This is in line with research conducted in Columbia theory. The condition of the home environment that is slum and full of lush bushes will cause sunlight not to enter or be around the house, causing the environment to become humid and this situation is a preferred resting place for anopheles mosquitoes, besides that the type of house affects the number of mosquito populations such as the type of wall of the house (Sanchez, et al 2017).

The high incidence of malaria is also influenced by differences in microecology and rainfall in the two regions. Control and Prevention of Malaria Incidence in Mining Workers After knowing the high probability of malaria case occurrence (Dewi, et al 2022).

Contribution to malaria cases in sabang city

Malaria is a disease with complex transmission dynamics associated with geographic heterogeneity and over time. Based on secondary data from the Sabang City Health Office, the number of cases from 2013 to March 2017 (post-elimination) found 35 cases of positive malaria cases.5 Malaria cases again experienced a significant increase in 2014-2021, totaling 100 malaria cases. Imported malaria cases in Sabang City were reported in the period 2011 to 2013, with an accumulation of 12 imported cases (6 cases of *P. vivax*, 4 cases of *P. falciparum* and 2 cases of mixed infection of *P. falciparum* and *P. vivax*). Research by Herdiana et al stated that cases of *P. falciparum*, most of *P. vivax* and *P.*

knowlesi that occurred in Aceh Besar were work-related, namely through exposure to the forest or because of the residence adjacent to the forest. The current dominant Plasmodium species in Sabang City is *P. knowlesi*, although *P. falciparum*, *P. vivax* and *P. ovale* are still found from cases that have been reported so far (Mualana, et al 2022).

Non-climatic factors including vector types, parasite types, environmental development and urbanization also influence the increase in malaria cases. Research by Ramadhan et al showed that during the 2018-2019 period in Aceh Province, 19 positive cases of *P. knowlesi* infection were reported. Research conducted by Sandy et al shows that rainfall, temperature, humidity, and wind speed have a weak correlation and have no significant relationship with the Annual Parasite Incidence (API) rate of malaria. Sabang City has successfully eliminated four Plasmodium (*P. falciparum*, *P. vivax*, *P. malariae*, and *P. ovale*), but the increase in imported cases and the emergence of *P. knowlesi*, which transmits through *macaques* (*Macaca fascicularis*) as its natural host (Mualana et al, 2022).

CONCLUSIONS

The results of this study can be concluded that the incidence of malaria that occurs in East Kalimantan, especially in the capital city of the archipelago, is due to changes in infrastructure, population, and environmental factors. In addition, land clearing that disrupts the natural habitat of Anopheles mosquitoes makes mosquitoes move to residential areas. Control is needed as a preventive effort so that malaria can be handled properly by reforestation with restoration of excavated land, vector control activities, better malaria screening and measures to maintain the environment around the house to remain protected are actions that can be taken in community settlements.

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