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Malaria Caused by Plasmodium Vivax: A Case Report with Thrombocytopenia

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Keyword
imported malaria, plasmodium vivax, epidemiological investigator 1-2-5, thrombocytopenia

Abstract
Malaria is an infectious disease that can be life-threatening and remains a major public health problem to this day. One contributing factor is the high number of imported malaria cases, which has led to the emergence of new cases in areas classified as low-endemic and even in malaria elimination settings. This case report aims to describe an imported malaria case accompanied by thrombocytopenia in a low-endemic area. Case Report: A 38-year-old male presented with complaints of high fever that had subsided one week prior to hospital admission. The patient had previously lived for one month in Papua and had returned to East Nusa Tenggara (NTT) one week before presentation. Laboratory examinations revealed thrombocytopenia and Plasmodium vivax infection. The patient received treatment for four days, consisting of dihydroartemisinin–piperaquine for three days and primaquine. On the fourth day of treatment, the patient reported no complaints, platelet counts improved, and microscopic blood examination showed no presence of Plasmodium vivax. The patient was discharged and advised to continue primaquine therapy at home and to attend follow-up visits at the internal medicine clinic. This case highlights the importance of strengthening epidemiological investigation programs using the 1-2-5 strategy, particularly in low-endemic and malaria-elimination areas. It also emphasizes that malaria should not be excluded from the differential diagnosis in patients presenting with fever and thrombocytopenia, especially in individuals with a history of travel to endemic regions.

INTRODUCTION

Malaria remains one of the major public health problems in Indonesia and Southeast Asia and has yet to be fully resolved. It has wide-ranging impacts and serious consequences, positioning it as one of the most significant infectious diseases in global health (Piergentili et al., 2021; Ryan et al., 2015; Taylor & Habibi, 2020).

In 2024, Indonesia recorded 543,965 malaria cases, representing a 30% increase compared to 2023. Of these cases, 93% originated from Papua. Currently, five provinces in Indonesia have achieved malaria elimination status: Banten, DKI Jakarta, West Java, Bali, and East Java. In East Nusa Tenggara (NTT), out of 22 districts/cities, 9 are classified as malaria elimination areas, 8 as low endemic, 4 as moderate endemic, and 1 as high endemic. In the districts/cities on Flores Island, 5 of 8 districts/cities are categorized as malaria elimination areas, while 1 is moderate endemic and 2 are low endemic. Meanwhile, Mimika Regency, with Timika as its capital, remains a high endemic area (category III) (Ministry of Health of the Republic of Indonesia, 2025).

One of the main factors hindering malaria elimination in certain regions is the high number of imported malaria cases. This is driven by increasing population mobility between regions, rising population density, and insufficient monitoring of individuals returning from high-endemic areas. As a result, surveillance of imported malaria cases must be strengthened. Any confirmed malaria case in low-endemic or malaria-elimination areas should be followed up with epidemiological investigation using the 1-2-5 method (Ministry of Health of the Republic of Indonesia, 2023a; Prasetyowati et al., 2021).

The urgency of this case report is underscored by several factors. First, the 30% increase in malaria cases in Indonesia from 2023 to 2024 indicates a setback in elimination progress and highlights the need for renewed vigilance (Ministry of Health of the Republic of Indonesia, 2025). Second, imported malaria cases pose a particular threat to areas that have achieved elimination status, as local healthcare workers may have limited experience in recognizing and managing malaria. Third, thrombocytopenia in febrile patients is often misattributed to dengue fever in many regions, which can lead to delayed or missed diagnosis of malaria. Fourth, delayed diagnosis and treatment may result in severe complications, including severe malaria with high mortality risk (Ministry of Health of the Republic of Indonesia, 2023). Therefore, timely documentation and dissemination of imported malaria cases are essential to maintain clinical awareness and strengthen surveillance systems (Bennett et al., 2017; Fountain et al., 2022; Ma et al., 2016).

The novelty of this case report lies in several aspects. First, it provides a detailed clinical description of imported Plasmodium vivax malaria in NTT, a low-endemic region where malaria is rarely encountered by local clinicians. Second, it documents the complete trajectory of thrombocytopenia during treatment, from severe thrombocytopenia (43,000/μL) to normalization (195,000/μL) within four days of appropriate antimalarial therapy. Third, it highlights the critical importance of a detailed travel history in diagnosing imported malaria, as the patient's prior residence in Timika (a high-endemic area in Papua) was essential for establishing the diagnosis. Fourth, it demonstrates the effectiveness of dihydroartemisinin–piperaquine therapy in treating P. vivax malaria, with rapid clinical and parasitological response. Fifth, it emphasizes the continued relevance of the 1-2-5 epidemiological investigation strategy in malaria elimination programs. This case report contributes to the limited literature on imported malaria in low-endemic regions of Indonesia (Hasyim, 2025; Herdiana et al., 2025; Wahono et al., 2025).

Although challenges remain in the implementation of the 1-2-5 epidemiological investigation strategy, this approach has significantly contributed to reducing malaria cases and mortality in Indonesia. Through this case report, it is expected that the implementation of the 1-2-5 strategy will be further strengthened, particularly in low-endemic and malaria-elimination areas. In addition, healthcare workers are encouraged not to exclude malaria as a differential diagnosis in patients presenting with typical signs and symptoms such as fever with a characteristic pattern, a history of travel to high-endemic areas, or thrombocytopenia, which is a common hematological finding in malaria patients.

RESEARCH METHOD

A 38-year-old male presented with complaints of high fever that had been present for one week prior to hospital admission. The fever was intermittent and was typically followed by a

preceding chilling phase. Over the course of one week, the fever did not occur continuously; instead, there were afebrile periods, which led the patient not to seek medical attention and to self-medicate with paracetamol at home. However, in the last two days, the patient's condition worsened, with high fever accompanied by severe headache, nausea, postprandial vomiting, generalized myalgia and arthralgia, and decreased appetite. There were no complaints of spontaneous bleeding such as epistaxis or gum bleeding. A history of similar symptoms in close family members was denied.

The patient had a history of working in Timika, Papua, for one month prior to presentation and returned to East Nusa Tenggara (NTT) one week before symptom onset. While in Papua, he lived in a mountainous area with seven other individuals. Two of his housemates experienced similar symptoms and were diagnosed with malaria at a local health facility. However, the patient was asymptomatic at that time and did not seek medical evaluation. Symptoms began only after he had returned to NTT for one week.

Upon arrival at the emergency department, the patient was conscious (E4M6V5), with a blood pressure of 100/80 mmHg, pulse rate of 89 beats/minute, respiratory rate of 22 breaths/minute, temperature of 36.7°C, and oxygen saturation of 97% on room air. The patient weighed 83.4 kg and had a height of approximately 170 cm, corresponding to a body mass index (BMI) of 28.9 kg/m² (overweight).

Physical examination revealed epigastric tenderness on abdominal palpation, warm extremities, and a capillary refill time (CRT) of less than 2 seconds. Cardiopulmonary examination was within normal limits.

Laboratory investigations showed hemoglobin of 16 g/dL, leukocytes 5,900/µL, and thrombocytopenia with platelets at 43,000/µL. Liver function test revealed SGPT of 69 U/L, creatinine 1.0 mg/dL, and random blood glucose of 114 mg/dL. Dengue serology (anti-Dengue IgM and IgG) was negative. Malaria microscopic examination was positive for Plasmodium vivax, trophozoite stage, with parasite density of 132 per 215 WBC, approximately 4,900 parasites/µL.

The patient was treated with oral dihydroartemisinin–piperaquine at a dose of 1 × 5 tablets daily for 3 days and oral primaquine 1 × 1 tablet daily for 14 days. Supportive therapy was also administered, including intravenous Ringer's lactate 1,500 cc/24 hours and intravenous paracetamol 1 g three times daily, given symptomatically according to clinical condition.

Table 1. Results of microscopic examination of malaria (5/3/2026)

Indicator	Results
Test Malaria	Positive (+)
Species Identification	*Plasmodium Vivax*
Stage	Tropozoit
Calculate Types of Parasites	132/215 WBC

On the first day of treatment (6/3/2026) the patient said that the frequency of fever began to decrease, headaches and pain in all muscles and joints were still present, on the blood pressure check it was 110/80 mmHg, pulse 72 x/min, respiratory frequency 20x/min, temperature 36.6 0C, oxygen saturation 98% with room air. In the supporting examination, hemoglobin was 15.3 gr/dL, leukocytes 6,600 /µL, platelets 48,000 /µL.

Table 2. Results of microscopic examination of malaria (6/3/2026)

Indicator	Results
Test Malaria	Positive (+)
Species Identification	*Plasmodium Vivax*
Stage	Tropozoit
Calculate Types of Parasites	81/518 WBC

On the second day of treatment (7/3/2026) the patient complained of fever, muscle and joint pain improved, on the blood pressure examination 110/80 mmHg was obtained, pulse 72x/min, breathing frequency 20x/minute, temperature 36.8 C and oxygen saturation 98% in free air. At the supporting examination, it was obtained hemoglobin 15.7 gr/dL, leukocytes 6,500 /µL, platelets 88,000 /µL. On microscopic examination of malaria, no malaria parasites were found in the blood.

Table 3. Results of microscopic examination of malaria (7/3/2026)

Indicator	Results
Test Malaria	Negative (-)
Species Identification	-
Stage	-
Calculate Types of Parasites	-

On the third day of treatment (8/3/2026) the patient said that there were no complaints, the patient had begun to be able to mobilize as usual, the blood pressure check was 100/70 mmHg, pulse was 62 x/min, breathing rate was 21 x/min, temperature was 36.9 C and oxygen saturation was 96% in free air. At the supporting examination, it was obtained hemoglobin 14.9 gr/dL, leukocyte 6,600 /µL, platelet 141,000 /µL.

On the fourth day of treatment (9/3/2026) the patient said that fever complaints were no longer there, headache and abdominal and muscle pain were denied, appetite returned to normal, on the blood pressure check it was 110/70 mmHg, pulse 81 x/min, breathing frequency 20 x/min, oxygen saturation 97% in free air. In the supporting examination, hemoglobin was 15.7 gr/dL, leukocytes 7,300 /µL, platelets 195,000 /µL. In the SPGT examination, the results of 42 U/l were obtained. Patients on the fourth day of treatment were allowed to go home by continuing oral therapy of primacuin 1x1 tablets for 10 days and oral supportive therapy such as paracetamol 500 mg taken with fever and recommended for control back to the disease polyclinic in 2 weeks for a microscopic examination of malaria.

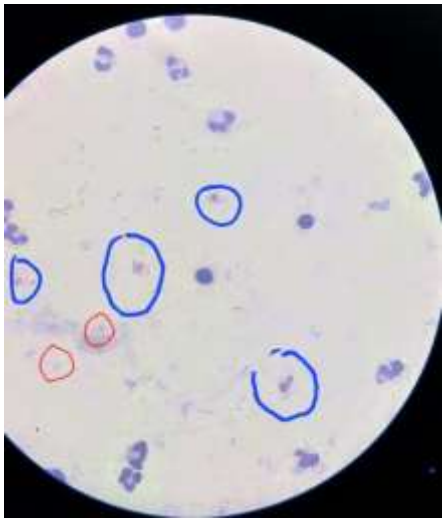

Figure 1. Edge Blood Removal
(Red circle: Picture of young tropozoites)
(Blue circle: Picture of mature tropozoites)

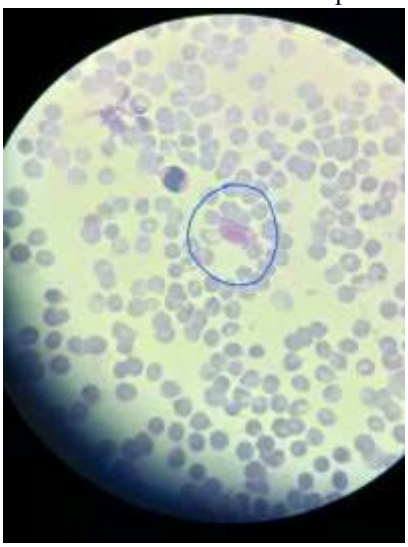

Figure 2. Overview of *plasmodium vivax* stage of mature tropozoites on the removal of blood edges

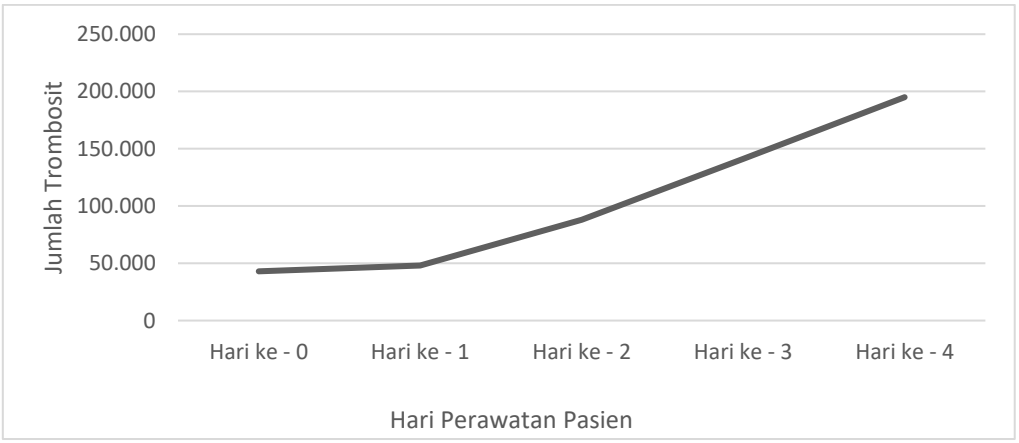

Figure 3. Results of the patient's platelet examination during treatment

RESULTS AND DISCUSSION

Malaria is a dangerous infectious disease, and if not treated promptly, it can progress to severe malaria and potentially cause death. Malaria is transmitted to humans through the bite of infected mosquitoes (Ministry of Health of the Republic of Indonesia, 2023b).

Based on the case report, microscopic blood examination showed a positive result for Plasmodium vivax. From the anamnesis, it was known that the patient had returned from the Timika area, Papua, approximately one month prior to admission.

In Indonesia, imported malaria cases are defined as malaria cases acquired outside the district/city of diagnosis, with a history of travel to malaria-endemic areas within the previous four weeks before the onset of illness, and confirmed by a positive blood smear. This definition differs from that of the WHO, where imported malaria is defined as a confirmed malaria infection diagnosed within three months after returning from an endemic area (Arisco et al., 2022; Ministry of Health of the Republic of Indonesia, 2022). Increasing population mobility between regions has contributed to the re-emergence of malaria in areas previously declared malaria-free. Differences in malaria control strategies across regions or countries may also result in the reintroduction of cases in elimination areas. In addition, imported malaria cases may contribute to the emergence of drug-resistant parasites (Arisco et al., 2022; Ministry of Health of the Republic of Indonesia, 2022).

Given the significant impact of imported malaria, comprehensive surveillance data collection is essential. According to The European Surveillance System (TESSy), in 2018 there were 8,347 confirmed malaria cases in the European Union, of which 7,338 were imported cases. A complete surveillance system is necessary to control imported malaria, as highlighted in the World Malaria Report 2020, which showed that among 103 malaria-endemic countries, 45 countries did not report imported malaria data between 2000 and 2019 (Arisco et al., 2022).

In 2024, Indonesia recorded 543,965 malaria cases, an increase of 30% compared to 2023. Of these, 93% originated from Papua. Currently, five provinces have achieved malaria elimination status: Banten, DKI Jakarta, West Java, Bali, and East Java. In East Nusa Tenggara (NTT), out of 22 districts/cities, 9 are categorized as malaria elimination areas, 8 as low endemic, 4 as moderate endemic, and 1 as high endemic. On Flores Island, out of 8 districts/cities, 5 are classified as malaria elimination areas, 1 as moderate endemic, and 2 as low endemic. Meanwhile, Mimika Regency (Timika) remains a high endemic area (category III) (Ministry of Health of the Republic of Indonesia, 2025; World Health Organization, 2025).

Imported malaria remains a major challenge in malaria elimination efforts. Therefore, surveillance systems must be strengthened. Any malaria case detected in low-endemic or malaria-elimination areas should be followed by an epidemiological investigation using the 1-2-5 strategy. The "1-2-5" framework refers to specific time-bound actions following case detection: (1) malaria cases must be reported within 24 hours; (2) case investigation must be conducted within two days, including travel history, occupation, residence, and classification as imported or locally transmitted; and (5) within five days, case response activities must be completed, including treatment monitoring, vector control, environmental management, and prevention of further transmission (Ministry of Health of the Republic of Indonesia, 2022, 2023a, 2024; Prasetyowati et al., 2021). In this case report, the hospital has coordinated with relevant authorities for further 1-2-5 epidemiological investigation.

The 1-2-5 epidemiological approach in Indonesia shares similarities with malaria control strategies in other countries, such as China, which implements the 1-3-7 strategy (1-day reporting, 3-day investigation, and 7-day response). The implementation of the 1-3-7 system in China has contributed significantly to malaria elimination, with a reported 99.1% reduction in cases (Cao et al., 2022; Sogandji et al., 2024; Yi et al., 2023). In Indonesia, the 1-2-5 system has also contributed significantly, with investigation coverage of confirmed cases reaching 80% in 2020 and increasing to 88% in 2021. Most cases identified in low-endemic and elimination areas were imported malaria (Prasetyowati et al., 2021). However, several challenges remain in implementation, including geographical barriers, limited resources, and the absence of a standardized real-time reporting system, unlike China's web-based surveillance system that enables real-time case monitoring (Prasetyowati et al., 2021).

In this case report, the patient presented to the emergency department with intermittent high fever preceded by chills, occurring in cycles every 2–3 days. The patient had returned from Papua one month prior, and there was a history of cohabitants in Papua who were diagnosed with malaria. Microscopic examination confirmed Plasmodium vivax infection. Based on these findings, the patient met the diagnostic criteria for imported malaria. The patient's awareness of malaria symptoms and travel history facilitated early healthcare seeking, which significantly aided diagnostic confirmation and prompt treatment initiation. This is consistent with studies showing that knowledge of malaria symptoms and transmission is associated with preventive health-seeking behavior (Casella et al., 2024).

Laboratory findings revealed thrombocytopenia, which in malaria may result from immune-mediated platelet destruction, splenic sequestration, and decreased platelet production in the bone marrow. Patients with platelet counts below 50,000/μL are at increased risk of severe malaria. Thrombocytopenia is a common hematological finding in both *P. falciparum* and *P. vivax* infections and serves as an important diagnostic and prognostic marker in patients presenting with fever suspected of malaria (Alawad et al., 2024; Sacomboio et al., 2024).

The patient received oral dihydroartemisinin–piperaquine at a dose of 1 × 5 tablets daily for 3 days and oral primaquine 1 × 1.5 tablets (22.5 mg) daily for 14 days, along with supportive therapy including intravenous fluids and intravenous paracetamol according to clinical symptoms. The treatment regimen and dosage were adjusted according to the patient's body weight and clinical condition (Ministry of Health of the Republic of Indonesia, 2023b).

This case report highlights the importance of strengthening the 1-2-5 epidemiological surveillance system to reduce imported malaria cases and support Indonesia’s goal of malaria elimination.

CONCLUSION

Malaria is a mosquito-borne infectious disease and is considered a serious health problem that can be fatal if not treated promptly. Imported malaria is defined as a malaria case in which transmission occurs outside the patient’s district or city of residence, with a history of travel to a malaria-endemic area within the previous four weeks before the onset of illness, and confirmed by a positive malaria blood test. Imported malaria cases remain a major challenge in malaria elimination efforts due to increasing population mobility between regions and limited access to health services in certain areas. One of the strategies to reduce imported malaria cases is the implementation of epidemiological investigations using the 1-2-5 method. Although the

1-2-5 approach has several limitations in field implementation, such as the absence of standardized reporting formats, geographical constraints, and limited human and logistical resources, it has made a significant contribution to reducing malaria transmission, particularly imported cases in low-endemic and malaria-elimination areas.

This case report is also expected to increase clinicians' awareness of the typical signs and symptoms of malaria, such as thrombocytopenia. Thrombocytopenia in malaria may be caused by several mechanisms, including immune-mediated platelet destruction, splenic sequestration, and decreased platelet production in the bone marrow. This is especially important in patients with a recent travel history to high-endemic malaria areas. Early diagnosis and prompt administration of antimalarial therapy are essential, as they are strongly associated with improved prognosis in malaria cases.

REFERENCE

Alawad, H. A., Almay, A. R. A., & Almusayid, W. H. (2024). Malaria and thrombocytopenia: A systematic review and meta-analysis. *International Journal of Scientific Research and Innovation Studies, 3*(1), xx. https://doi.org/10.63883/ijsrisjournal.v3i1.485

Arisco, N. J., Peterka, C., & Castro, M. C. (2022). Imported malaria definition and minimum data for surveillance. *Scientific Reports, 12*(1), 17982. https://doi.org/10.1038/s41598-022-22590-6

Bennett, A., Avanceña, A. L. V., Wegbreit, J., Cotter, C., Roberts, K., & Gosling, R. (2017). Engaging the private sector in malaria surveillance: A review of strategies and recommendations for elimination settings. *Malaria Journal, 16*(1), 252.

Cao, Y., Lu, G., Cotter, C., et al. (2022). Improving the surveillance and response system to achieve and maintain malaria elimination: A retrospective analysis in Jiangsu Province, China. *Infectious Diseases of Poverty, 11*, 20. https://doi.org/10.1186/s40249-022-00939-3

Casella, A., Monroe, A., Toso, M., et al. (2024). Understanding psychosocial determinants of malaria behaviours in low-transmission settings: A scoping review. *Malaria Journal, 23*, 15. https://doi.org/10.1186/s12936-023-04831-9

Fountain, A., Ye, Y., Roca-Feltrer, A., Rowe, A. K., Camara, A., Fofana, A., Candrinho, B., Hamainza, B., Ndiop, M., & Steketee, R. (2022). Surveillance as a core intervention to strengthen malaria control programs in moderate to high transmission settings. *The American Journal of Tropical Medicine and Hygiene, 108*(2 Suppl.), 8.

Hasyim, H. (2025). Understanding malaria determinants and prevention in low-endemic regions: A narrative review. *Malaysian Journal of Medicine & Health Sciences, 21*(2).

Herdiana, H., Prameswari, H. D., Puspadewi, R. T., Fajariyani, S. B., Diptyanusa, A., Theodora, M., Supriyanto, D., & Hawley, W. A. (2025). Shrinking the malaria map in Indonesia: Progress of subnational control, elimination, and future strategies. *BMC Medicine, 23*(1), 512.

Ma, S., Lawpoolsri, S., Soonthornworasiri, N., Khamsiriwatchara, A., Jandee, K., Taweeseneepitch, K., Pawarana, R., Jaiklaew, S., Kijsanayotin, B., & Kaewkungwal, J. (2016). Effectiveness of implementation of electronic malaria information system as the national malaria surveillance system in Thailand. *JMIR Public Health and Surveillance, 2*(1), e20.

Ministry of Health of the Republic of Indonesia. (2022). *Technical instructions for controlling malaria risk factors*. Directorate General of Disease Prevention and Control.

Ministry of Health of the Republic of Indonesia. (2023). *National strategic plan revision 29 May 2023*. Ministry of Health of the Republic of Indonesia.

Ministry of Health of the Republic of Indonesia. (2024). *Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/MENKES/1988/2024 concerning the roadmap for malaria elimination and prevention of retransmission in Indonesia for 2025–2045*. Ministry of Health of the Republic of Indonesia.

Ministry of Health of the Republic of Indonesia. (2025). *Report on the latest situation of malaria control program developments in Indonesia 2024 (Factsheet malaria 2024)*. Ministry of Health of the Republic of Indonesia.

Ministry of Health of the Republic of Indonesia, Malaria Working Team of the Directorate of Prevention and Control of Infectious Diseases. (2023). *A book on malaria cases*. Ministry of Health of the Republic of Indonesia.

Piergentili, R., Del Rio, A., Signore, F., Umani Ronchi, F., Marinelli, E., & Zaami, S. (2021). CRISPR-Cas and its wide-ranging applications: From human genome editing to environmental implications, technical limitations, hazards and bioethical issues. *Cells, 10*(5), 969.

Prasetyowati, H. G., Widawati, M., Fuadzy, H., Fuadiyah, M. E. A., Ginanjar, A., Nurindra, R. W., Ridwan, W., Hodijah, D. N., & Sulaeman, R. P. (2021). Evaluation of epidemiological investigation 1-2-5 implementation program in Sukabumi. *Indonesian Journal of Tropical and Infectious Disease, 9*(3), 160–171. https://doi.org/10.20473/ijtid.v9i3.29599

Ryan, B., Franklin, R. C., Burkle, F. M., Jr., Aitken, P., Smith, E., Watt, K., & Leggat, P. (2015). Identifying and describing the impact of cyclone, storm and flood related disasters on treatment management, care and exacerbations of non-communicable diseases and the implications for public health. *PLoS Currents, 7*.

Sacomboio, E. N. M., Zua, S. D., Tchivango, A. T., Pululu, A. D., et al. (2024). Blood count changes in malaria patients according to blood groups (ABO/Rh) and sickle cell trait. *Malaria Journal, 23*. https://doi.org/10.1186/s12936-024-04886-2

Sogandji, N., Stevenson, A., Luo, M. Y., et al. (2024). Systematic review of evidence for the impact and effectiveness of the 1-3-7 strategy for malaria elimination. *Malaria Journal, 23*, 371. https://doi.org/10.1186/s12936-024-05200-w

Taylor, A. L., & Habibi, R. (2020). The collapse of global cooperation under the WHO international health regulations at the outset of COVID-19: Sculpting the future of global health governance. *ASIL Insights, 24*(15), 15.

Wahono, T., Yuliasih, Y., Astuti, E. P., Ipa, M., Dhewantara, P. W., Ruliansyah, A., Hendri, J., Riandi, M. U., Pradani, F. Y., & Dinata, A. (2025). Malaria elimination challenges and barriers in high, middle, and low endemic areas: A qualitative study in Western Indonesia. *BIO Web of Conferences, 193*, 37.

World Health Organization. (2025). *World malaria report 2025*. World Health Organization. ISBN 9789240117822.