



Targeted Malaria Elimination in  
Indigenous Populations:

# Strategic Engagement with the Orang Rimba in Indonesia's Forest Regions

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## Acknowledgements

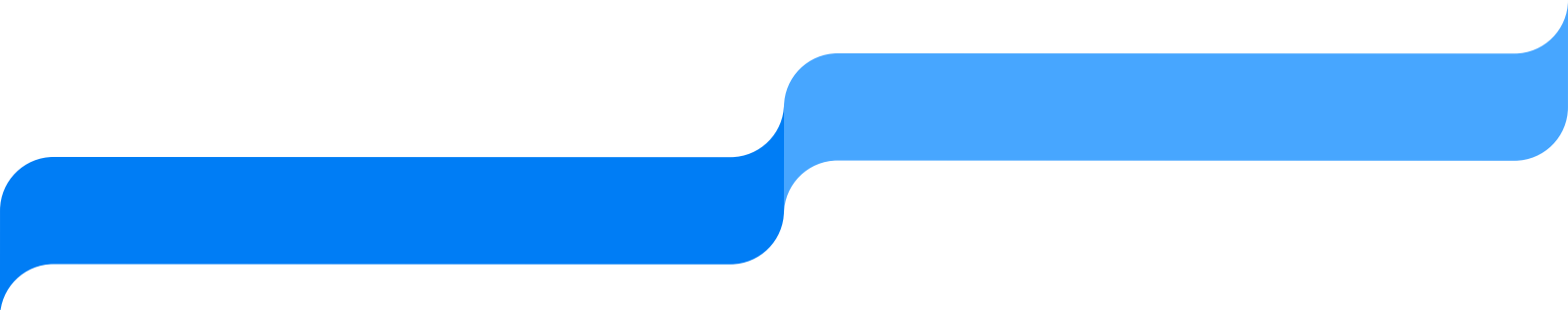
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## I. Introduction

Malaria remains a significant public health challenge in the Asia Pacific region, despite considerable progress towards the shared goal of eliminating the disease from the region by 2030. The challenges of malaria elimination are particularly salient in Indonesia: Though 85% of the population live in areas certified as malaria-free [1], the country reported over 400,000 malaria cases and accounted for 27% of all estimated cases in the WHO South-East Asia region in 2023 [2]. While most reported cases are concentrated in the lowland areas of Papua province, several low-endemicity<sup>1</sup> provinces and districts are struggling to achieve full malaria-free status. Specifically, rural and tribal indigenous communities in these areas often face heightened vulnerabilities, marginalization, and barriers to accessing health services. These inequities extend to malaria, placing these communities at elevated risk of experiencing persistent and elevated levels of malaria transmission.

Failure to meaningfully engage these communities will hinder progress towards elimination of malaria. A successful elimination strategy must intentionally incorporate a gender equality, disability and social inclusion (GEDSI) approach that improves access and services particularly for the most remote and socially excluded communities. This case study documents the collaborative efforts of the Indonesia National Malaria Control Program (NMCP), provincial and district health offices, community health centres, civil society organizations (CSOs), and research institutions in malaria elimination efforts among the Orang Rimba population, a nomadic and isolated ethnic group that primarily resides in the lowland tropical rain forests of the western Indonesian island of Sumatra.

<sup>1</sup> Low endemicity is defined as having an annual parasite incidence (API) of <1 per 1000 population.



Despite the overall low malaria prevalence in Sumatra, certain provinces and regencies, including those home to the Orang Rimba, continue to report indigenous malaria cases. Ongoing transmission in Sumatra poses a challenge to reaching malaria elimination in Sumatra by 2025, a key milestone in Indonesia's broader goal of achieving nationwide malaria elimination by 2030 [3]. The 2025-2045 National

Malaria Elimination Roadmap highlights the need for targeted efforts in areas with ongoing transmission, particularly in remote and indigenous communities [4]. As such, these findings may inform future national and regional efforts to promote social inclusion and ensure malaria interventions are equitable, accessible, and acceptable for forest-dwelling, tribal, and indigenous populations in Asia Pacific.

## II. Malaria and the Orang Rimba

The Orang Rimba, or “people of the forest,”<sup>2</sup> are one of three remote tribal indigenous communities that reside in the forests of what is now Jambi province [5]. An estimated 3,200-6,000 Orang Rimba<sup>3</sup> are scattered across six regencies in Jambi Province: Merangin, Sarolangun, Batanghari, Tebo, Bungo, and West Tanjung Jabung (See Figure 1 for a map

of Jambi Province) [6]. The majority of Orang Rimba—around 2,900 people—live in the Bukit Dua Belas National Park (TNBD), which spans Sarolangun, Batanghari, and Tebo regencies (see Figure 2) [7]. The topography, temperature, and humidity of this region has been found to be suitable for the proliferation of the Anopheles mosquitos that carry malaria [8], [9].

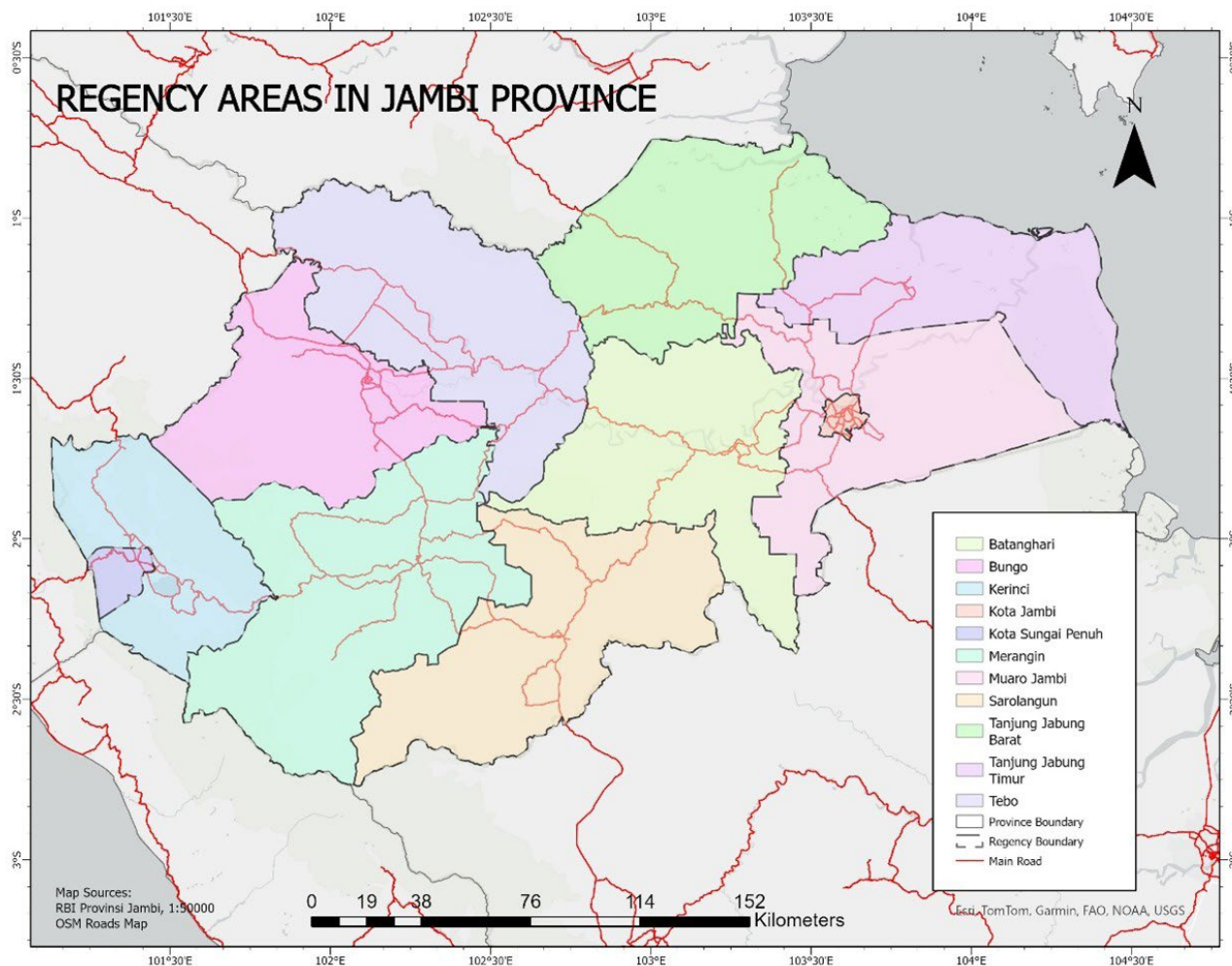


Figure 1. Administrative Map of Jambi Province  
Note. Map produced by OUCRU ID.

<sup>2</sup> The Indonesia government also refers to this population as the Suku Anak Dalam (SAD); however, this naming is imprecise and is used to describe all the existing tribes that reside in the lowland forests of Jambi. The Orang Rimba is the preferred name of the tribe themselves.

<sup>3</sup> Government census data from 2010 reports 3,205 Orang Rimba in Jambi. Surveys conducted in 2013 and 2017 suggest there are at least 4,393 Orang Rimba in Jambi. More recent news reports report that the Orang Rimba population totals 6,000 people.

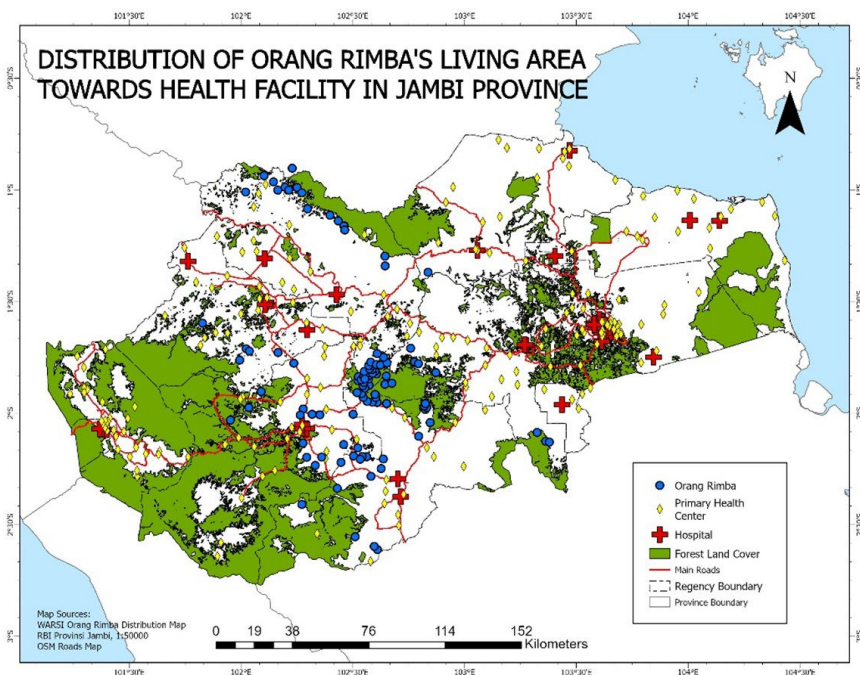


Figure 2. Geographic Distribution of the Orang Rimba and Health Facilities in Jambi Province, Sumatra  
 Note. Map produced by OUCRU ID, adapted from KKI Warsi.

The Orang Rimba live in semi-nomadic groups, with each group led by a *Tumenggung* (customary leader). They intentionally maintain limited contact with outside populations, making access to healthcare challenging. Their movement is driven by practical needs—such as securing sustenance through swidden farming or foraging for wild yams—as well as the cultural tradition of *melangun*, wherein the group migrates from place to place after the death of a group member to forget the sorrow of their loss [10]. As Orang Rimba migrate, they build various forms of open shelters in temporary settlements, depending on the needs of the group, leaving them vulnerable to mosquitos. Traditionally hunter-gatherers, the livelihoods, customs, and existence of the Orang Rimba are being threatened by deforestation and natural resource exploitation, particularly through the expansion of oil palm plantations [11]. As the forest ecosystem around them is altered and shrinks, Orang Rimba are additionally experiencing increased contact with long-tailed

macaques, a known carrier of the zoonotic malaria species, *Plasmodium knowlesi* [12].

Many Orang Rimba refer to what is clinically categorized as malaria as *demam kuro*, or Kuro fever, though some consider Kuro fever to be distinct from malaria [13]. Orang Rimba attribute the illness to various factors, including mosquito bites, environmental conditions, dietary influences such as consuming sour or sweet foods, or fatigue, while others contend that it is influenced by divine will [13], [14]. To treat malaria or Kuro fever, Orang Rimba often adopts a pluralistic approach to treatment and use traditional medicines and practices alongside seeking treatment at health centres. Though reports indicate the use of up to 17 different traditional malaria remedies by Orang Rimba, one of the most commonly utilized medicinal plants is *Eurycoma longifolia*, known locally as *pasak bumi* [13], [14]. Scientific studies have also demonstrated the antimalarial properties of *Eurycoma longifolia* [15].

### *Malaria burden in the Orang Rimba over time*

According to the 2010 population census, fever was the most common disease among the Orang Rimba, affecting 30.11% of the population [16]. More targeted studies have found a 16.7% malaria positivity rate among Orang Rimba in Sarolangun in 2016 [14] and a 2.97% malaria positivity rate among Orang Rimba in Batanghari in 2019 [8] when using rapid diagnostic tests (RDTs). However, use of more sensitive polymerase chain reaction testing has found higher positivity rates among Orang Rimba, including a 24.26% malaria prevalence rate among Orang Rimba residing in the TNBD

buffer zone across Sarolangun, Batanghari, and Tebo in 2015 [12] and a 35.5% malaria positivity rate among the same Batanghari sample that was found to have a 2.97% positivity rate using RDTs in 2019 [8]. These results suggest the existence of low-density and asymptomatic infections that are going largely undetected and untreated among the Orang Rimba. Furthermore, recent research activities have identified six positive *P. knowlesi* cases among the Orang Rimba living in the TNBD buffer zone in Tebo regency, contributing to an increase in overall reported cases of zoonotic malaria in Jambi [12].

### III. Community Engagement to Reduce Malaria Burden

A range of diverse partners work collaboratively with the Orang Rimba to undertake malaria elimination efforts. The Jambi Provincial Government, supported by initial research findings, has identified the Orang Rimba as a high-risk population for malaria, requiring tailored interventions and support [17]. In response, the Jambi Provincial Health Office, District Health Offices, and Community Health Centres (CHCs) have undertaken targeted field implementation, community engagement, and healthcare delivery under the national oversight and strategic direction of the NMCP.

Furthermore, the government closely collaborates with research institutes and CSOs to ensure culturally appropriate and effective interventions. The Eijkman Institute for Molecular Biology (EIMB), a long-standing technical partner,

provides robust scientific support. CSOs, particularly *Komunitas Konservasi Indonesia* (KKI) WARSI, play a key role in advocacy and empowerment activities with communities in and around forests, including Orang Rimba, bridging public health programs with Indigenous knowledge and practices to enhance community engagement.

Other entities, such as religious organisations and the Indonesia Ministry of Social Affairs, have contributed to housing and livelihood support for Indigenous populations living on the forest fringe. In their totality, these partnerships have facilitated more intentional engagement with the Orang Rimba, enabling more extensive assessments of their unique health challenges and development of targeted solutions to address their needs.

#### 1. Improving access to testing, diagnosis and treatment

As part of the national malaria elimination strategy, mobile teams have been deployed by district health services at least five times per year to undertake prevention activities and provide malaria blood smear examinations and treatment [18]. Orang Rimba are able to access free health services from government hospitals; furthermore, community health center teams regularly provide free health service visits, including malaria detection and treatment [19]. Durian Luncuk CHC, in particular, has established effective communication channels with four Tumenggung who, in total, are responsible for 600 Orang Rimba [18].

Malaria elimination efforts among Orang Rimba have been further enhanced through the recruitment and integration of Orang Rimba into community-based malaria cadres in Batanghari, Tebo, and Sarolangun. In total, 61 health cadres have been recruited in areas where the Orang Rimba reside, of which 17 Orang Rimba have received training provided by the Provincial Health Office. Given the Orang Rimba's semi-nomadic lifestyle and limited healthcare access, these malaria cadres serve as vital links in bridging healthcare gaps and improving malaria control. The inclusion of Orang Rimba individuals within the cadres themselves has been instrumental in

fostering trust between the community and the health system.

These cadres play a key role in diagnosing malaria using RDTs, providing first-line treatment under CHC supervision, and educating communities on malaria prevention, including the use of

insecticide-treated bednets (ITNs) and the importance of seeking timely treatment. Moving forward, expanding cadre training, improving supervision, and strengthening health system linkages will be essential to sustain malaria elimination in Orang Rimba communities.

## *2. Improved understanding of perceptions of malaria among the Orang Rimba*

The Jambi Provincial Health Office has undertaken focused efforts to better understand the malaria situation among Orang Rimba, including by conducting epidemiological investigations, a mass blood survey (MBS) using PCR, receptive mapping, entomological surveys, and other specific research activities [12].

In 2016, Orang Rimba surveyed in Sarolangun were found to have poor knowledge of malaria (53.6%), with only 18% of respondents indicating that mosquito bites were the cause of malaria, though the majority knew that malaria was dangerous (85.7%) and could be cured (82.1%) [14]. Most Orang Rimba were found to use both biomedical and traditional medicine to treat malaria (57.1%), with almost all indicating they believed that traditional medicine was efficacious (92.9%) [14].

In 2021, the Jambi Provincial Health Office, EIMB, KKI WARSI, and international partners from the University of California San Francisco, the University of Notre Dame, and the University of Iowa collaborated to conduct a more in-depth study to understand perceptions of malaria

and preventative practices among the Orang Rimba in TNBD [17]. They found that 49% of participants knew that the bite of an infected mosquito was required for transmission. Other participants incorrectly believed malaria was transmitted from drinking dirty water (21%), eating contaminated food (21%), or having an unsanitary home (10%), while still others indicated they did not know how malaria is transmitted. Though knowledge of malaria transmission was limited, the vast majority of participants indicated using multiple methods of effective malaria prevention practices, including using mosquito coils (89%), using insecticide-treated nets (ITN) (87%), burning animal manure or leaves (29%), covering exposed skin with clothing (26%), and draining stagnant water (5%). Save one participant (2.6%), all Orang Rimba had used some prevention practice the night before being interviewed. However, women generally did not perceive malaria to be a greater health risk in pregnancy, very few accessed medical care during pregnancy (29%), and less than half (46%) used an ITN during their pregnancy.

### 3. Provision of technical support to local health authorities

Additional efforts have been undertaken to improve the provision of health services more broadly across Sumatra. In 2022, the World Health Organization (WHO) and the Indonesian Parasitic Control Association (P4I) launched a program of comprehensive technical support to local health authorities and communities to bolster malaria elimination efforts in Sumatra, including in Merangin and Sarolangun regencies where Orang Rimba live [3]. A baseline evaluation assessing regency readiness for malaria elimination revealed significant systemic challenges across regencies, including infrequent malaria activities, a shifting workforce, and a lack of trained microscopists. In response, the

WHO and P4I conducted a series of intensive training sessions for malaria program managers, Puskesmas (community health center) workers, field entomologies, and laboratory analysts in 2023, empowering health workers to routinely conduct malaria activities in their communities. Furthermore, the program strengthened cross-sector relationships and advocacy, including with local community and religious leaders. By August 2023, Sarolangun demonstrated readiness for malaria elimination assessment; however, Marangin regency reported high numbers of indigenous malaria cases in 2022, postponing its expected malaria elimination pre-assessment (see Figure 3) [3], [20].

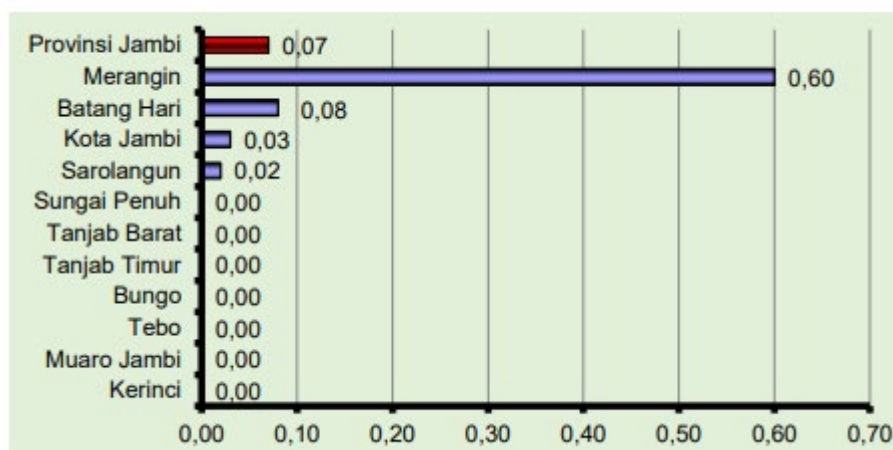


Figure 3. Annual Parasitic Index (/1,000) by Regency/City in Jambi Province, 2022 (Dinas Kesehatan Provinsi Jambi, 2023)

## IV. Lessons Learned & Persistent Challenges

### 1. Successful engagement with hard-to-reach communities necessitates close partnerships with long-standing local civil society organizations, traditional leaders, and local community members.

The Jambi Provincial Health Office has effectively leveraged a relationship with KKI Warsi to address health needs of the Orang Rimba since 2016. Established in 1991, KKI Warsi works to promote the protection of forest areas and empower communities living inside and around the forest, making it a trusted partner of the Orang Rimba. Since 1998, KKI Warsi has been engaged in a number of health promotion activities with the Orang Rimba, including advocacy for improved and free healthcare services and research with EIMB on communicable diseases among the Orang Rimba [21]. Their knowledge and familiarity with the community and the *Tumenggung* has allowed for meaningful and culturally sensitive engagement with the Orang Rimba, ensuring ethical and empowering research arrangements [17].

Notably, the inclusion of Orang Rimba community members in community malaria cadres has strengthened local participation in malaria prevention and treatment efforts. Equipping community members with the knowledge and resources to identify and respond to malaria cases further fosters community resilience and trust in public health initiatives. The success of malaria elimination efforts in the Orang Rimba and other indigenous, forest-dwelling populations in Indonesia hinges upon continued engagement with local communities and strong collaborations between provincial health authorities and organizations like KKI Warsi.

### 2. Existing data on specific populations still lack sufficient detail to design tailored and culturally sensitive interventions.

Due in part to the nomadic and secluded lifestyle of the Orang Rimba, significant knowledge gaps remain regarding the needs and best practices for engaging the Orang Rimba in malaria prevention, surveillance, and response [18]. Estimates of malaria burden among the Orang Rimba differ both by location and testing method, suggesting a need for additional and recurring data collection efforts. There is limited knowledge on the size and distribution of members of the Orang Rimba population, though KKI has been involved in mapping efforts. Without a clearer

and more comprehensive understanding of the unique barriers and inequities experienced by the Orang Rimba, such as challenges in seeking or accessing malaria diagnosis or treatment or perceptions around the causes of malaria, developing effective solutions will remain difficult. Recognizing this, the Jambi Provincial Health Office has undertaken a number of commendable research and engagement initiatives, which must continue to tailor appropriate interventions to reduce malaria burden among Orang Rimba communities.

### 3. An effective response will require an intersectional gender-sensitive and One Health approach that addresses overlapping vulnerabilities.

For the Orang Rimba in Indonesia, effective malaria interventions should not only include considerations of indigenous culture and practices but also incorporate gender-sensitive and One Health approaches. Orang Rimba, who are generally unaware of the heightened malaria risks during pregnancy and face limited access to prenatal care, may need to receive targeted malaria education to increase uptake of prenatal interventions and services. Given cultural sensitivities of the Orang Rimba, enhancing malaria awareness among women and increasing use of prenatal malaria interventions will likely require considerable engagement with the *Tumenggung* and male relatives [17]. A gender-sensitive approach may also include efforts to better understand and strengthen women's

decision making in healthcare, including community awareness approaches that target men and other decision makers in Orang Rimba communities.

Furthermore, as Indonesia sees a rise in *P. knowlesi* cases [2] and deforestation and other land use activities continue to impact the ecology of the Jambi forests, the Orang Rimba are particularly vulnerable to changes in vector behavior and increasing encounters with zoonotic malaria reservoirs. With zoonotic malaria now included in global malaria elimination certification criteria, continued transmission could threaten Indonesia's path toward malaria elimination certification [22].

## V. Conclusion

The Indonesian government, in close collaboration with partners, has increasingly adopted a GEDSI lens to tackle malaria in the most hard-to-reach communities, including the Orang Rimba population. Using culturally sensitive community engagement approaches, the national program and local health authorities has developed an increasingly comprehensive understanding of the malaria knowledge and practices among the Orang Rimba and implemented initiatives to improve their access

to healthcare broadly. While malaria burden has declined across Sumatra, other regions in Indonesia, including Papua province, are similarly home to Indigenous tribal communities but are experiencing significantly higher malaria burdens. Lessons learned through engagement with the Orang Rimba community should be applied to efforts to bring down the malaria burden in these similarly vulnerable populations in high endemicity areas.

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