

# Malaria Prevention and Eradication Program Towards Malaria-Elimination in West-Seram

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## Abstract

Malaria is a health problem in the world spread in 95 countries. The research objective describes the evaluation of malaria-prevention and eradication programs including inputs, processes, and outputs using qualitative approach. Data were collected by in-depth interview. Research informants were 1 key-informants and 4 supporting-informants. Malaria-elimination program in West-seram District based on the guidelines of the Ministry of Health of the Republic of Indonesia and operationally outlined in the form of a technical guide. Case surveillance has not been carried out. Malaria vector control was done by eradicating mosquito nests and using mosquito nets containing insecticides. Cross-program and cross-program cooperation had been going well, but cross-sectoral collaboration, still needs to be improved. The funding was largely supported by donor agencies namely the Global Fund for AIDs, TBC, and Malaria (GF-ATM) while Government of West-Seram allocates microscopic slide examination costs. It is necessary to increase health personnel, facilities and infrastructure, discovery, prevention, and case management.

**Keywords:** malaria, elimination, evaluation, prevention, eradication

## Introduction

Global Malaria Program (GMP) states that malaria is a disease that must be continuously monitored, monitored and evaluated and the appropriate formulation of policies and strategies is needed. The Global Malaria Program aims to reduce the burden of global disease by 40% by 2020, and by 90% by 2030.<sup>(1)</sup>

The Indonesia Government establishes efforts to eliminate malaria in Indonesia through Health Minister Decree No.293/MENKES/SKI/IV/2009 regarding malaria-elimination, so malaria is a complex problem so malaria-elimination must be carried out in an integrated manner by all related components and become part of national development. So that the realization of healthy people who are free from malaria gradually until 2030.<sup>(2)</sup>

Malaria can cause death, especially in high-risk groups such as infants, toddlers, and pregnant women. Malaria can also cause outbreak and can indirectly reduce work productivity.<sup>(3)</sup> The incidence of malaria has decreased globally by 37% in the range between 2000 and 2015. There has been an increase in countries moving towards malaria-elimination, but implementation

strategies are needed to adjust for changes in malaria-epidemiology.<sup>(4)</sup>

Malaria in Indonesia often causes outbreak. Efforts made to address the problem of malaria are global commitments that require each country to carry out a malaria-elimination program. This was the result of the 60th World Health Assembly (WHA) meeting in 2007. In addition, one of the Millennium Development Goals (MDG's) goals is to fight infectious diseases including malaria.<sup>(5)</sup>

Malaria-cases in Maluku Province in 2015 was 1,332 positive cases, with a morbidity-rate/ Annual Parasite Incidence (API) of 3.2 per 1000 population. MDGs target for API 2015 is <1%. 2014 as many as 1086 positive cases with API of 4.5 per 1000 population. This means that for 2015 there was a decrease in the number of malaria-cases, although it did not show a sharp decline. Health Profile of West-seram Regency in 2018, positive malaria-cases in West-seram in 2015 were around 1087 cases. This number decreased when compared with positive malaria-cases in 2014, which were 1915 cases. The West-seram administratively has 11 Subdistricts, of which 7 of the 11 districts are malaria-

endemic areas, the sub-district with the highest malaria-endemic is Huamual. Positive malaria-cases were based on a microscopic examination of 1087 cases. The sub-districts with the highest endemicity were found in the village of Uweng Beach in 2015 (546 cases). In 2016, the highest malaria-cases occurred in Talaga Kambelu, which was 120 cases. In 2017, Tanah Goyang sub-village was in the first place of malaria-cases with 256 cases and in January to July 2018 the highest number of malaria-cases occurred in Talaga Kambelu (15 cases).<sup>(6)</sup>

Based on API of West-Seram, the highest malaria-incidence in the last five years occurred in 2015 (55.60 per million). Whereas for the Annual Malaria Incidence (AMI) indicator in West-seram, the highest malaria-incidence rate based on clinical-symptoms occurred in 2015-2018 occurred in Talaga Kambelu with the highest occurrence in 2015 (85.88 per million)<sup>(6)</sup>

The malaria-elimination program in the regency is carried out thoroughly and integrated by government together with partners and the community. Malaria-elimination program was carried out in 18 health centers in sub-districts. The Government through the primary health care has done various things, starting from finding malaria sufferers, establishing malaria diagnoses through microscopic examination, treatment using Artemisinin Combination Therapy (ACT), treating malaria in pregnancy, provision of facilities (microscopy, Rapid Diagnosis test/RDT) for laboratory materials and medicines, distribution of mosquito nets, improvement of human-resources quality and eradication of mosquito breeding-sites.<sup>(6)</sup>

This study aims to describe malaria-prevention and eradication programs based on input, process and output.

## Method

This type of research was qualitative study, involved 1 key-informant (the program manager at the West-Seram Health Office) and supporting-informants namely: the head of the West-Seram Health Office, 1 surveillance officer, and 2 community members living in West-Seram. The study was conducted in September to October 2018. Data validity was done by triangulating data sources. Stages of data analysis: 1) writing interview transcripts, 2) reading and reducing data, 3) providing data codes based on the meaning of data 4) drawing conclusions.

## Findings

Respondents were 2 people consisting of supporting informants and key-informants. It was found that all informants had the same answer to the main questions about the malaria-elimination program. Another thing was revealed from interviews:

“The malaria-elimination program in West-Seram began in 2006 in collaboration with the central government through GF and began in 2007-2008. The background to the malaria-elimination program is that malaria-cases are very high in West-seram”(BT,PA).

Next question;

“For an organization in the malaria-elimination program in West-seram in the head directly by the Head of the Health Office then under the head of the malaria-elimination program office is headed by the head of the malaria-elimination program field. In addition, the elimination process also involves various health workers such as the program manager in the DHO, MCH and immunization program manager. For facilities and infrastructure for malaria-elimination in West-Seram, it is financed by two sources, GF and the Government of West-Seram” (BT,PA)

Facilities and infrastructure

“Every primary health care in West-seram is required to have a laboratory and laboratory personnel. However, most primary health care in the district do not have laboratories and laboratory personnel, so most malaria examinations in primary health care using RDT. Of the 17 health centers in West-seram that have trained/trained laboratories: Kairatu, West Kairatu, Waimital, Piru, Waisala, Taniwel” (BT)

“Other health centers do not have laboratory personnel and malaria testing still uses RDT system”.

“There are no specific policies issued by the Head of the Local Health Office, in the form of malaria-prevention programs in West-seram District, both in the form of standard operating procedures (SOP) and implementation guidelines (operational guidelines). “However, in the planning and implementation of malaria-prevention programs, the health department compiles technical guidelines (Technical Guidelines) which contain, among others, the objectives of the program, program indicators, types of activities and activities funded for a period of one year. Technical

*guidelines compiled by the health office become a reference for the implementation of malaria-prevention programs at the level of health centers and health offices. The reference used to compile the Technical Guidelines is the malaria-prevention program guidelines from the center, in this case, the Ministry of Health of the Republic of Indonesia” (BT).*

#### Process: Discovery and management of patients

*“The mechanism of finding malaria is seen from the health center data. There are two activities carried out by the government in the malaria-elimination program, namely active activities and passive activities in terms of activities inside and outside the building. Passive activities in the form of health services only accept or wait for malaria sufferers to come for a check-up while active activities or outdoor activities are Mass Blood Survey (MBS) activities with a record that all people in West-seram Regency must be examined and MFS activities that are only in the form of searching for the sick. The sick person in question is only people with malaria-symptoms who are examined not everyone. How to find people with malaria-symptoms is done by asking the community about people who have malaria-symptoms”.*

In the next question;

*“In the malaria-elimination process, the most influential obstacle is funding. Because of this lack of funding there are still many planned programs that have not yet been implemented. In addition, the geographical location of the health center is also very influential, for example, the distance and the road taken is not good. In addition, there are also some primary health care that are located if they have to use a motorized boat to cross the road so that the access of health workers to the primary health care is a bit difficult and the mobility of sufferers from their homes is still relatively difficult to reach a more adequate health service center”.*

*“In addition, obstacles from the patient’s side are not compliant or routine taking medication and do not follow re-examination. Every patient who has been taking malaria medicine for three days must return to health services to do a re-examination. The lack of awareness among the people that causes malaria in West-seram Regency is still fairly high” (BT).*

Malaria-elimination program in West-Seram are: 1) Discovery and management of patients

(discovery, treatment), 2) Prevention and control of risk factors (distribution of insecticide-treated bed nets, health promotion), 3) Surveillance epidemiology and epidemic prevention (SKD-KLB reporting, prevention of outbreaks, malaria information-systems), 4) Improvement of Communication, Education and information (cross-sectoral coordination and cooperation in malaria-elimination), 5) Increasing human-resources (training for health workers and microscopic personnel).

#### Prevention and control of risk factors

*“The prevention and control of risk factors are carried out by spraying the walls of houses or IRS, but IRS activities are also still ineffective due to funding constraints. In addition, there are activities in the distribution of mosquito nets in each health center and other activities, namely the distribution of abate powder and IRS”. (BT)*

*“West-seram District last experienced an outbreak of malaria in 2010. During the last 8 years (2011-2018), although malaria-cases were fairly high, it did not reach the KLB. The information system in Seram Barat Barat has four health centers that have been trained, namely, Tomalehu, Kairatu, Kairatu Barat and Piru. The most perceived obstacle in the information system is that it is difficult to signal, especially for primary health care which is located in remote areas”. (BT,PA)*

#### Information Education Communication Improvement

*“To increase IEC, it is carried out under the supervision of GF. Supervision is carried out in the form of direct supervision of officers from the health center level starting from reporting on laboratory supervision and work processes carried out at the health center”(BT,PA).*

#### Increase in human-resources

*“Human-resources have been trained, especially for microscopic personnel. In minimizing the obstacles to the malaria-elimination program, the malaria-elimination program section of the West-Seram Health Office is working with the planning department to coordinate every activity proposed by the program manager. Malaria-cases in West-seram have decreased from 2016 8.00 / mil and in 2017 to 4.92 / mil”. (BT,PA)*

It was found that malaria-elimination in West-seram chose 4 stages:

- a. Eliminating criteria, not all primary health care have been trained with microscopic staff using RDT.<sup>(7)</sup>
- b. Before eliminating the criteria, all officers have been trained and 100% have taken medicine
- c. Eliminating criteria, all primary health care still have malaria but with a very small percentage.
- d. Maintenance is no case (0%) (PA, 05 October 2018)

## Output

“The hope of the implementation of malaria-elimination in the West-seram District Health Office is to reduce malaria positive cases and the target of malaria-elimination in West-seram in 2021 can be achieved. Suggestions and funding, as well as community participation in supporting malaria-elimination programs, are highly expected by the government because to date community awareness and community participation is still lacking” (BT,PA).

## Discussion

### Input

The goal of malaria-elimination in West-seram will be achieved in 2021 so that in that year it is expected that a healthy living community is free from malaria transmission.<sup>(2)</sup> There is no specific organization for the malaria-elimination program in West-Seram, the organization still uses the structure of the West-Seram Health Service. The malaria-elimination program in West-Seram began in 2006 in collaboration with the central government through the GF. Guidelines from the Ministry of Health (Technical Guidelines) as operational guidelines that contain goals, targets, indicators, and budgets sourced from the Government of West-Seram for malaria control.

### Process

The implementation of the discovery of malaria sufferers in West-Seram was carried out passively and actively. Case finding is passively carried out through services at primary health care while waiting for patients who come for treatment. Patients who come to the clinic with clinical-symptoms of malaria, blood is drawn and examined microscopically. Whereas patients with clinical-symptoms of malaria who come to the primary health care have their blood drawn and blood tested

Patient discovery is actively carried out in areas with cases that are still high by means of MBS. This is in accordance with the guidelines for malaria management, that the method of finding patients can be done through these activities<sup>(8)</sup>. The patient discovery activity in West-Seram is the same as the activity carried out in the Principe Islands, Taiwan, with PCD and MBS to support malaria-elimination efforts in Taiwan. Malaria sufferer discovery activities in Purworejo, besides PCD, ACD activities are carried out not only by SBM but through active search activities in the community by the Village Malaria (JMD).<sup>(9)</sup>

Proof of malaria based on PfMSP-1 allele K, MAD20 and RO33 polymorphisms found in closed communities living in malaria-endemic areas. Early-detection and screening are very helpful in eliminating malaria.<sup>(10)</sup> Laboratory tests to determine malaria diagnosis are carried out microscopically and using RDT. Microscopic examinations are carried out if the patient comes to primary health care, whereas RDT are done if the patient with clinical-symptoms comes to the nurse. Laboratory tests carried out in West-Seram are in accordance with the standards set by the Ministry of Health, even though the gold standard is microscopic examination. The guideline in conducting standard diagnosis is that every case of suspected malaria must be examined by a blood supply using a microscope or RDT.<sup>(2)</sup>

The role of the local government in the malaria-elimination program includes mobilizing potential resources including funding support. The results showed that the West-seram Government Fund for the implementation of malaria control programs was minimal and the budget provided for microscopic slide examinations by primary health care in endemic areas. The source of funds for the discovery and treatment of sufferers and vector control by the use of insecticide-treated bed nets comes from donor agencies, the GF.<sup>(11)</sup>

### Output

West-seram is an area with a target of 2021 has reached elimination status. The target can be achieved if there is a commitment of the local government, especially in financing. The number of malaria-cases in West-Seram is in line with the number of malaria-cases nationally, which tends to decrease. The number of malaria-cases nationally in 2010 was 465,764 cases with



an API of 1.96 “and decreased in 2014 to 252,027 cases with an API of 0.99”.<sup>(12)</sup>

The number of cases and deaths in the world (WHO), there was a decrease from 2000-2015 there was a decrease in cases by 60% and a decrease in deaths by 37%.<sup>(1)</sup> The South Buru Health Office noted that 494 cases of malaria were positive in 2014 and API 6.86%<sup>(5)</sup>. Sillehu et al. (2019) stated that the high and low cases of malaria in Buru Regency in closed and open community groups were related to the interaction of the host with agents due to agricultural land opening, high population mobility to endemic areas.<sup>(10)</sup> The malaria-elimination in West-seram will be maximal if there is support from all parties, across sectors and across programs and is supported by public awareness in participating in the success of malaria-elimination activities.

### Conclusion

The malaria-prevention and eradication in West-Seram is carried out across sectors, inputs such as facilities and infrastructure are available as needed. The process in terms of implementation in the form of case finding. Increasing the capacity of human-resources in supporting malaria-elimination programs through active case detection education and training programs, supporting local governments in providing diagnostic and financing support facilities. Prevention program with the use of mosquito nets to avoid contact with mosquitoes. The availability of medicines is adequate for vector control.

**Conflict of Interest-No**

**Funding-Authors**

**Ethical Clearance-Yes**

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