

Healthy Village Facilitator's Guide

Malaria Prevention and Control



Ministry of Health and Medical Services, Solomon Islands

May 2021

Table of Contents

1. Basic Information	1
1.1 What is malaria?	1
1.2 What causes malaria?	1
1.3 How malaria is transmitted or spread?.....	2
1.4 What are the malaria signs and symptoms?	3
1.5 What is severe malaria?	4
2. Diagnosis and Treatment	6
2.1 Diagnosis	7
2.2 Treatment	8
3. Where do Malaria Mosquitoes live?	9
4. How to prevent malaria?	10
4.1 Environmental clean-up.....	11
4.2 Sleep under treated mosquito nets.....	12
4.3 Mosquito screen	13
4.4 Indoor residual spraying	13
4.5 Prophylaxis treatment	14
4.6 Mosquito repellents - coils.....	14
4.7 Local methods.....	15
4.8 Wear long sleeve and long trousers	15
Glossary of Terminology	16

1. Basic Information

1.1 What is malaria?

- Malaria is a killer disease common in many tropical countries including the Solomon Islands. Malaria attacks can cause severe sickness including high fever and body ache and can lead to death if not treated or managed properly.
- In 2019, approximately 10% of the population living in malaria risk areas was infected with malaria. Malaria incident rates were highest in Central (27%), Malaita (14%), Guadalcanal (13%) provinces and Honiara city (12%).
- Pregnant women and children are at greater risk of getting sick and dying of malaria.
- Effects of malaria results in high school absenteeism (education), less food for the family (food production), less money earning and increase disability (economy).
- Prevention and treatment of Malaria places a big demand on the country's health system and budget.

1.2 What causes malaria?

- Malaria is caused by a parasite (germ or small worm) called Plasmodium.
- The parasite (germ or small worm) infects and destroys the person's blood.
- There are four species of Plasmodium malaria parasites that infects humans but only two are the most common ones in the Solomon Islands (SI). They are *Plasmodium falciparum* (PF) and *Plasmodium vivax* (PV).
- *Plasmodium vivax* can cause relapse or stay in the body and become active again.
- *Plasmodium falciparum* can cause severe malaria resulting in death.



Malaria parasites



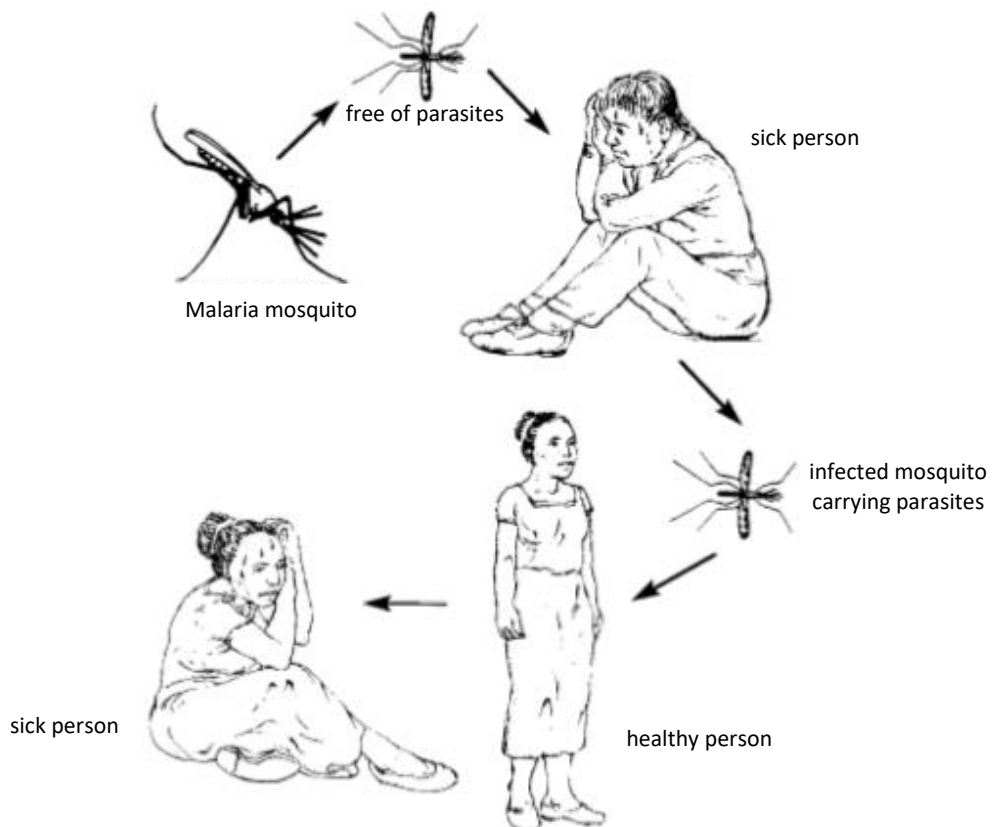
Mosquito – carrier of parasites

1.3 How malaria is transmitted or spread?



Female Anopheles Mosquito

- Malaria sickness is spread from person to person through the bites of infected female *Anopheles* mosquitoes.
- Anopheles mosquitos usually bite all through the night with peak hours between dusk (5:00 – 7:00 in the evening) and dawn (5:00 – 6:00 in the morning).



Malaria Transmission Cycle

- 1) Female anopheles mosquito bites a malaria infected sick person and sucks his/her blood containing the plasmodium parasites.
- 2) In the meantime, the parasite multiplies (grows and increases) inside the body of the mosquito. After 10-14 days, the parasites are mature.
- 3) As the infected mosquito bites a healthy person, the malaria parasites enter the blood stream and travel to the liver.
- 4) The parasite multiplies (grows and increases) in the liver for 10-14 days, then they are released into the blood stream.
- 5) In the blood stream, the parasites infect and kill the red blood cells (RBC, responsible for carrying oxygen from the lungs to the tissues) and therefore make you feel sick.
- 6) *Plasmodium vivax* parasite can remain dormant (asleep) in the liver, reactivate later and flow in the blood stream, which often results in relapse or repeat attacks of malaria.
- 7) Malaria parasite can pass from a pregnant mother to the foetus (unborn baby) through the placenta that can result in still birth or death of the baby while still in the mother's womb.
- 8) Malaria parasite can also be passed to another person through blood transfusion.

1.4 What are the malaria signs and symptoms?

Common signs and symptoms of malaria include:



Shaking chills and cold



High fever and sweating



Headache and joint pains



Nausea and vomiting



Belly pain and diarrhea



Anemia and loss of appetite

These signs and symptoms of malaria:

- can be felt within 7-10 days following the bite of the infected mosquito.
- can be confused with other sicknesses like cold or flu.
- may occur later if the patient has not been taking malaria medication properly.
- may occur after months or even years when dormant (asleep) *Plasmodium vivax* parasites become reactivated.

1.5 What is severe malaria?

Severe malaria occurs when the parasite (germ) affects important organs or parts of the body, making you feel very sick and possibly leading to death. This is often caused by **not going early to the clinic to check your blood and not taking malaria treatment properly**. Most cases of **severe malaria** are caused by *Plasmodium falciparum*.

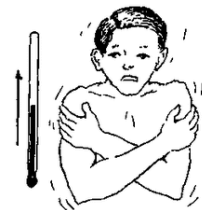


Source: afriem.org

- Always go for early diagnosis and proper treatment.

Signs and Symptoms of severe malaria include the following:

- Continuous high fever, cold and shivering.
- Shock, unconsciousness or coma (sudden drop in blood flow).
- General convulsions (fit or body shake).



- Breathing problems – shortness of breath (SOB) due to fluids or water in the lungs.



- Vomiting and not being able to drink.



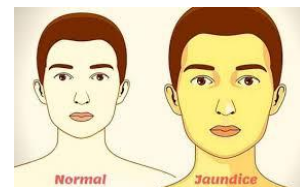
- Severe anaemia (short blood) due to destruction or killing of red blood cells (RBC) – common in children and pregnant women.



- Abnormal bleeding with dark and/or little urine production.



- Liver failure and jaundice (yellow skin) are evidence of vital organ dysfunction (body part not working properly).



- Malaria in pregnant women can cause stillbirths (born dead), abortion (pregnancy spoiled) and low birth weight.



- Severe malaria can cause death, if malaria treatment is not taken by the patients.



2. Diagnosis and Treatment

- If you have any malaria signs or symptoms, go quickly to your nearest clinic or hospital to test your blood for malaria.
- Early diagnosis or check-up followed by treatment of malaria reduces sickness and prevent deaths.
- It also contributes to reducing malaria transmission (spread) in the communities.



- **Always try and apply the WHO T3 (TEST, TREAT, TRACK) malaria management.**

TEST:

Anyone complaining of fever should be tested for malaria parasites. No blood test means that nurses must do clinical assessment to decide on presumptive treatment.

Test before Treat (TBT)

TREAT:

All those tested positive with malaria should be treated with recommended anti-malarial drugs by a nurse or doctor.

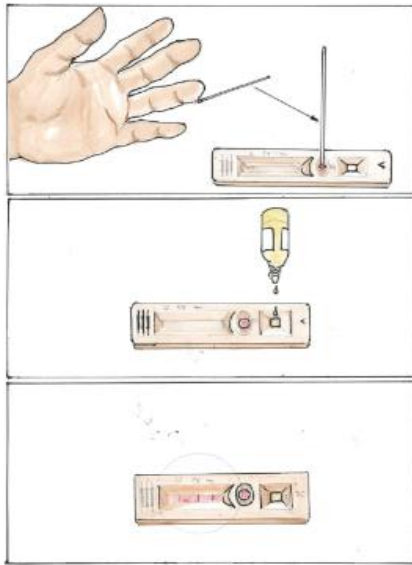
Those tested negative for malaria but are clinically diagnosed to have malaria are treated by the nurse or doctor.

TRACK:

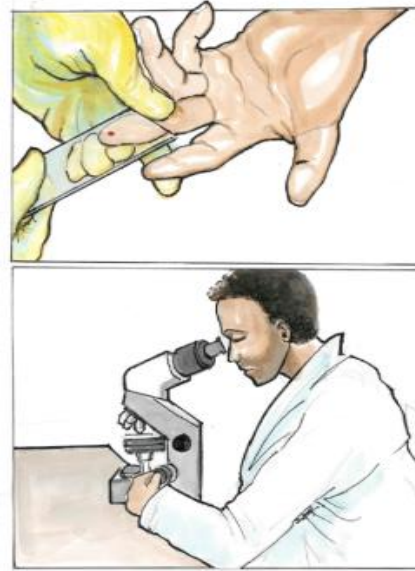
Those who are treated for malaria should be followed up for treatment compliance (finish taking full treatment). The nurse must check for any new malaria infections in the community and maintain appropriate surveillance (follow up).

2.1 Diagnosis

There are two ways of diagnosing malaria. Your blood is taken and tested for malaria through Rapid Diagnostic Test (RDT) and Microscopy Test.



Rapid Diagnostic Test (RDT)

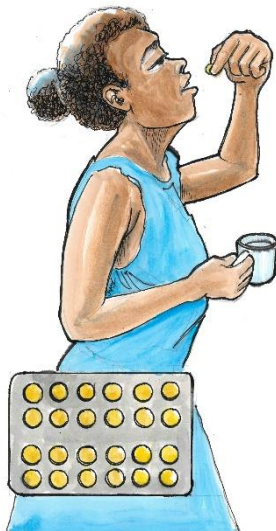


Microscopy Test

- These two tests are available in Rural Health Centre (RHC), Area Health Centres (AHC) and hospitals. Malaria is preventable and curable if you check your blood and take treatment early.

2.2 Treatment

- If your blood test result is positive with malaria, then you will be given treatment.
- Only a nurse or doctor will prescribe (give) medicine to any patient with malaria.
- Patients must complete their medicine as advised by the nurse or doctor.
- Do not stop taking your medicine, even if you feel better before completing treatment.
- Do not share your medicine with anyone including other family members and relatives at home.
- Always eat healthy food before, during and after taking your malaria treatment.



Patients must:

- **complete all the prescribed medicine.**
- **not stop taking medicine by their own decision.**

3. Where do Malaria Mosquitoes live?



Female Anopheles

Living Environment

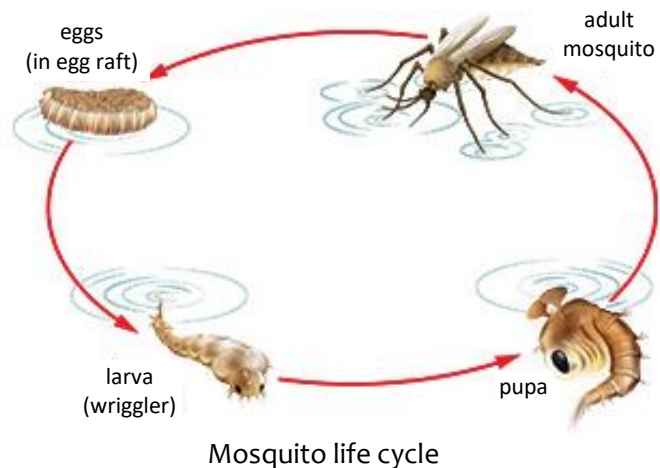
- Anopheles mosquitoes (malaria vector) are found anywhere near permanent water bodies including swamps, lagoons, creeks, blocked river mouth, bushy streams, community open wells and water holes, rain pools and grassy drains.
- Mosquitoes also live near artificial water containers like old tires, flower pots, tins of taiyo, old canoes and anything which holds water.
- Mosquitoes rest in tall grasses, weeds and bushes near houses in the village.

Behaviour of Mosquito

- Mosquitoes bite between dusk (5:00 – 7:00 in the evening) and dawn (5:00 – 6:00 in the morning).
- After a mosquito bite in the house, it flies and rest on the wall in a dark corner.
- Mosquitoes flight range is from 50 meters to 2 kilometres.
- The anopheles' mosquito can live up to 2 months.
- Only female anopheles bites human to obtain blood to produce eggs, thus can spread malaria.

Life cycle of Mosquito

- The female anopheles mosquito lays eggs in pools of water in the blocked drains, coconut shells, tin cans, taiyo tins, buckets, old tires, old canoes and so forth.
- Female mosquitoes can produce 100-300 eggs at one time.
- It grows through four stages in their **life cycles**: egg, larva, pupa, and adult.
- The first three stages (egg, larva, and pupa) are aquatic (in water) and together they last 7 –14 days to become a young adult mosquito.
- A mosquito egg, larva, pupa and the new young adult do not carry malaria parasites.
- Mosquito breeding places can be found anywhere in our village and communities.



4. How to prevent malaria?

Prevention of malaria includes methods to control mosquito breeding sites, stop mosquitoes from biting people, kill adult mosquitoes and clear the malaria parasite in the body before it causes malaria.

Important methods for preventing and controlling malaria are;

- Environmental clean-up – eliminate or destroy all mosquito breeding places and conduct general clean-up of bushes and tall grasses where they live.
- Insecticide-treated mosquito nets and house screening – prevent adult mosquito biting in the house.
- Indoor residual spraying – killing of adult mosquitoes in the house.
- Presumptive treatment – killing of malaria parasite in the blood before they cause malaria.
- Mosquito repellents – mosquito coils and local remedies.
- Individual protection – wearing long sleeve and trousers.
- Early diagnosis, timely and adequate treatment of all malaria cases.

4.1 Environmental clean-up

Mosquitos need water to breed and grow. To avoid breeding of mosquitos, villagers should do the following:

- Always clean and maintain proper drainage and avoid pools of water.



Village Clean-up



Digging Drainage

- Cut long grass and clear bushes around houses and in the village.



Cutting Grass

- Bury tins, beer cans, bottles and clam shells.



Burying tins, cans, etc.

- Burn coconut shells, buckets, old canoes and tires, and other rubbish.



Burn coconut shells, buckets, etc.

- Use old buckets, canoes and tires to plant vegetables in your supsup garden.

- Stock pond/pool with larvivores fish.



Larvivores fish

4.2 Sleep under treated mosquito nets

Using long-lasting insecticide treated nets (LLINs) is the common and effective way of malaria prevention because mosquitos are active at night time. In the use of mosquito nets, pay attention to following points.



Sleep in a mosquito net

- Check the mosquito net for holes or tears every time.
- Make sure there is no gap between net and floor.
- Wash your net every six months.
- Sleep in the mosquito net every night.
- Replace your mosquito net after using for 3 years.
- Use old mosquito nets to cover gaps or openings from windows or doors in your house.
- Do not use your mosquito net for fishing and covering of melon fruits in the garden.

4.3 Mosquito screen

Mosquito screen must be fixed on all the windows and doorways leaving no gaps or cracks for mosquitoes to go into the house.



Window screen

- Mosquito screen installed on your windows becomes extremely important to prevent mosquitoes, flies and other harmful insects from entering your house.
- The mosquito screen is a mesh made up of wires and threads.

4.4 Indoor residual spraying

Indoor residual spraying (IRS) is a method to apply insecticide on the walls of houses in the target area to kill the mosquitoes. After the mosquito bites you in the house, it either flies out or rests on a dark wall of your house.



Indoor residual spraying

IRS is a powerful way to rapidly reduce the adult mosquito population and malaria transmission.

- Indoor spraying is effective for 3 – 6 months.
- It requires special equipment and insecticides.
- It requires well trained and supervised personnel.
- This activity is conducted by the Vector-Borne Diseases Control Program (VBDCP)/Provincial Health Office (PHO).
- People in the communities are encouraged to allow their houses to be sprayed.

4.5 Prophylaxis treatment

Prophylaxis treatment kills the malaria parasite in the body, before it kills the person.

- Pregnant mothers are recommended to take malaria medicine once a week during her pregnancy to prevent herself and foetus from getting malaria.



Pregnant Mother



Unborn Fetus (baby)

- Travelers from non-malaria endemic countries can also take prophylaxis treatment to prevent malaria.

4.6 Mosquito repellents - coils

Mosquito coils are not meant to kill mosquitoes. They are meant to repel mosquitoes using the strong smell of incense. It is considered to be safe for humans when used outside.

- A mosquito coil is a mosquito-repelling incense, made into a spiral and dried paste of pyrethrum (poison) powder.
- Mosquito coil is probably the most common mosquito repellent used, because it is cheap and easy to use.
- The smoke is harmful to infants in particular and advised to be used at night outside the house.



4.7 Local methods

For generations people have used local ways to keep mosquitoes away from the villages. It is important that such traditional methods are taught and practiced in the villages.

- Common methods used to keep mosquitoes away includes burning of lemon leaves, coconut scraps and wet rubbish, which produce thick smoke and smell that chase the mosquitoes away.



Lemon Leaves

4.8 Wear long sleeve and long trousers

People in the village do not usually wear long sleeves and trousers at night. But it is an important way to prevent mosquito bites.



Long sleeve shirt and trousers

- Long sleeves and pants cover a lot of skin and prevent the mosquito bite.
- Mosquitoes are not attracted to clothes with light colours like white.
- Wearing long sleeves and trousers with light colours reduces the chance of a mosquito bite.
- Mosquitoes can bite through clothes if the fabric is thin and tight fitting.
- Always try and wear long sleeve or clothes to cover your arms and legs.

Glossary of Terminology

Abortion	A procedure or way to end a pregnancy. It uses medicine or surgery to remove the embryo or foetus (unborn baby) and placenta from the uterus.
Anopheles	The mosquitoes that transmit (spread) the malarial parasite to humans.
Anaemia	A condition in which you lack enough healthy red blood cells to carry adequate oxygen to your body's tissues. Short of blood in the body.
Convulsion	A sudden, rough, twisted body movement caused by involuntary contraction of muscles.
Diagnosis	Identifying a disease by examining its signs, symptoms and causal agents.
G6PD Deficiencies	Malaria is treated with drugs that can cause severe haemolysis or bleeding in G6PD-deficient individuals. In people with G6PD deficiency, either the RBCs do not make enough G6PD or produced G6PD does not properly function.
Insecticide	A substance used to kill insects.
Larvivores	Fish that eat larvae, used in the control of mosquito populations.
Parasite	An organism or animal that lives on or in a host and gets its food from or at the expense of its host.
Plasmodium	It is a malaria parasite or germ: micro-organisms, and is the most harmful species among all malaria parasites.
Presumptive	Treatment of clinically suspected cases without, or prior to, results from confirmatory laboratory tests.
Prophylaxis	Treatment designed and used to prevent a disease from occurring.
Pyrethrum	Insecticides recommended for treatment of mosquito nets which are relatively non-toxic to humans.
Red blood cell: RBCs	The blood cells which carry oxygen and carbon dioxide in the body.
Stillbirth	A childbirth - when a baby is born dead after 24 complete weeks of pregnancy.



Health Promoting Village Project
Japan International Cooperation Agency