

## Malaria – Practical Guidance for Seafarers



The Club regularly encounters claims where crewmembers have contracted Malaria whilst working onboard Members' vessels.

Malaria is a potentially life threatening illness which can disrupt the blood supply to vital organs. According to World Health Organisation (WHO) estimates, malaria was responsible for the deaths of approximately 438,000 people in 2015. The plasmodium (P.) parasite which causes malaria is spread by the bite of infected female Anopheles mosquitoes and cannot be transmitted directly between humans.

There are five species of parasite belonging to the genus plasmodium that can cause malaria, four of which cause malaria in humans (*P. falciparum*, *P. vivax*, *P. malariae* and *P. ovale*). Humans may also occasionally be infected by a plasmodium species that usually infects animals; *P. knowlesi* malaria which can be found in monkeys in South East Asia, can be transmitted from monkeys to humans by the bite of an infected mosquito.

Both *P. falciparum* (the most prevalent malaria parasite on the African continent) and *P. vivax* (the dominant malaria parasite in most countries outside of Sub-Saharan Africa) are considered to pose the greatest threat and challenge to public health.

The most severe form is caused by *P. falciparum* which is responsible for the greatest number of malaria related deaths globally. Forms of human malaria caused by other plasmodium

species result in significant illness but are rarely life-threatening. Cases of severe *P. vivax* malaria have recently been reported among populations living in (sub) tropical countries. *P. vivax* and *P. ovale* can remain dormant in the liver potentially leading to relapses months, and occasionally several years after exposure. Latent blood infection with *P. malariae* may be present for many years, but it is very rarely life-threatening. Malaria due to *P. knowlesi*, sometimes known as "monkey malaria", is occasionally fatal.

### Incubation period and symptoms

After being bitten by an infected mosquito, with only one bite required for the parasite to be passed from mosquito to human, malaria symptoms can appear after seven days, but more usually after 10 to 15 days. In some cases, however, it may take up to 12 months or longer for malaria to manifest itself, especially when anti-malaria medications have been taken; therefore seafarers who experience any of the following symptoms after leaving a malaria affected area should seek immediate medical assistance.

Malaria symptoms may initially be mild and flu-like including headache, a high temperature of 38°C (100.4°F), muscle pains, sweats and chills in cycles, vomiting and diarrhoea. Often the symptoms may not be attributed to Malaria, however, in some



cases the patient's condition may deteriorate quite rapidly and complications can develop within hours of a severe attack of malaria, therefore prompt medical attention or advice is essential to determine if malaria is the cause so that treatment can be started immediately.

In certain circumstances, for example if a vessel is trading extensively in malaria areas, and shore based medical attention cannot be easily obtained, then the provision of a [malaria rapid diagnostic test kit](#) onboard may be beneficial. These can be used by seafarers unskilled in laboratory work to provide a quick diagnosis of malaria.

## Affected areas

Countries affected by malaria are more widespread than many seafarers realise; according to the WHO in 2015 there were 95 countries and territories which have ongoing malaria transmission, mostly in Africa, Central and South America, and Asia. Further details of those countries affected can be found on the latest [WHO map of countries or areas at risk of transmission](#).

According to the [WHO World Malaria Report 2015](#), most deaths were in the African Region (90%), followed by the South-East Asian Region (7%) and the Eastern Mediterranean Region (2%). Estimates indicated that 15 countries accounted for 80% of cases and 78% of deaths. The global burden of mortality is dominated by countries in sub-Saharan Africa, with Nigeria and the Democratic Republic of the Congo together accounting for more than 35% of the global total of estimated malaria deaths, although it should be noted that India ranks third for number of malaria cases and number of deaths.

Mosquitoes found in Africa have a particularly long lifespan which allows the plasmodium parasite enough time to complete its development inside the mosquito, which means transmission of the parasite to humans is intense. African mosquitoes also prefer to bite humans rather than animals. These two factors help explain why over 9 in 10 Malaria deaths occur in Africa.

Within malaria affected regions humans can build some immunity to the disease over many years of exposure; however, children have not had a chance to build up this immunity and are therefore particularly susceptible and account for many of the deaths due to malaria. When an adult from a malaria affected country who has built up some immunity moves away to an area where malaria is not present, and then subsequently returns to a malaria area after a

prolonged absence, they will be more at risk as their immunity will have waned over time. Travellers from countries where malaria is not present are specifically at risk as they lack any immunity.

## Preventative measures

Actions that can be taken to protect a crewmember from contracting malaria fall into two categories; practical considerations and anti-malaria treatments.

## Practical considerations

When considering practical steps that can be taken to prevent being bitten an understanding of what attracts mosquitoes is useful; mosquitoes are looking for a human or animal on which to feed, therefore they are attracted by carbon dioxide in exhaled breath, body heat, lactic acid present on human skin and movement indicating that a person or animal is alive. Dark colours and dark clothing contrasting with the background can also help show them that a human or animal is moving. Mosquitoes are not attracted to light; rather they may be attracted to the heat emitted by a light.

The female Anopheles mosquito responsible for carrying the parasite causing malaria, feed and therefore bite mainly between dusk and dawn, therefore, so far as possible, remain inside at these times.

When proceeding outside between dusk and dawn cover up bare skin with light coloured loose fitting clothing; mosquitoes are attracted to dark clothing and can in some cases bite through tight clothing. A suitable insect repellent should be applied to any exposed skin, ideally containing DEET (N-diethylmetatoluamide), whilst following the manufacturer's instructions and re-applying regularly as sweat will reduce its effectiveness over time. When sun screen is also being used, this should be applied first.

On vessels visiting ports in malaria affected areas the accommodation air conditioning should be in use and all doors, windows, ports and, where practicable, vents should be fully and properly closed. Where mesh screen doors are fitted on accesses these should also be closed. If mosquitoes are spotted inside the accommodation these should be killed, ideally using knockdown insecticide spray.

Where air conditioning is not available, then screen doors should be fitted and in use. Bed nets should also be used, ensuring that they are well tucked in and mosquitoes are not

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present within the net prior to going to sleep. Bed nets should be soaked in a suitable insecticide every six months and regularly inspected for holes and tears. The spraying of internal areas with indoor residual insecticide should also be considered, this can be effective for over three months depending on the insecticide used and the type of surface on which it is sprayed. In some areas mosquitoes have developed resistance to some insecticides, therefore it will need to be confirmed that the proposed insecticide is effective in the region where it is to be used.

Since mosquitoes prefer to breed in stagnant water, higher concentrations of mosquitoes may be expected in and around still water areas, even small puddles of rainwater. Areas of standing water on the deck should be brushed away, and any water that has collected, for example, on top of lubricating oil drums, in buckets or in save-alls should be removed to discourage mosquito activity. In some areas malaria transmission may be seasonal; it may be more prevalent during and immediately after the rainy season.

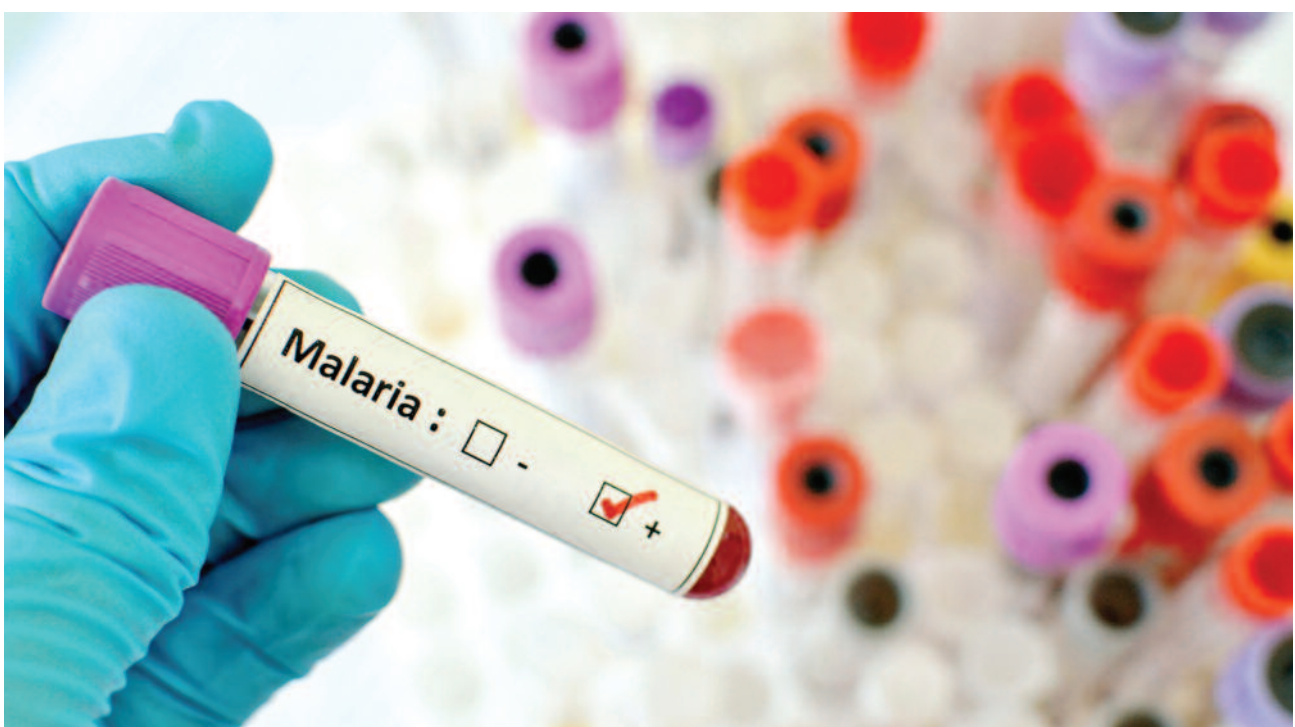
### Anti-malaria treatments

Prior to proceeding to a Malaria affected area, it is recommended that a risk assessment be conducted as, even in areas where malaria exists, the risk may be very low and the

taking of prophylactic anti-malaria drugs may not be deemed necessary, and expert advice should be sought in this regard. The situation in any given port may, however, change, for example in Mumbai when construction works were underway in the port, this led to numerous pools of water being present and a subsequent increase in the number of cases of malaria, therefore risk assessments should be periodically revisited and updated.

Anti-malaria drugs can help prevent as well as treat malaria. The recommended anti-malaria prescription may consist of one of more different drugs and its composition will depend on the area visited. Advice should therefore be sought from medical professionals to determine the most effective course of tablets which should be taken by crewmembers travelling to a particular affected area.

A course of anti-malaria tablets should be taken in accordance with the manufacturers' instructions. Usually the course of tablets will start prior to travelling, be taken for the duration of the visit to a malaria affected area, and then taken for one or more weeks after leaving. It is important that the treatment periods prior to and after being in a malaria affected area and the recommended dosages are strictly adhered to. Often people will forget to take their tablets after leaving an affected area, or they will consider that as they have not fallen ill while in a malaria zone, that it is safe to stop taking their tablets early.



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This is a potentially fatal fallacy and the full course of recommended anti-malarial treatment should always be completed.

The areas visited will dictate the recommended anti-malaria treatment as the *P. falciparum* parasite is resistant to chloroquine in many areas, and resistance to artemisinin is found in a number of South East Asian countries. Common anti-malaria treatments involve Mefloquine (Larium), Doxycycline and / or Atovaquone / Proguanil (Malarone). However, a number of these drugs may cause side effects which should also be considered when evaluating the most suitable therapy for a given area:

- Mefloquine (Larium) – dizziness, headache, insomnia, nightmares, anxiety, depression, panic attacks and hallucinations. Although an effective drug, due to the various side effects it is deemed by medical experts to be an inappropriate drug for seafarers.
- Doxycycline – sunburn due to light sensitivity, upset stomach, heartburn and thrush.
- Atovaquone / Proguanil (Malarone) – upset stomach, headaches, rashes and mouth ulcers.

When considering the foregoing anti-malaria treatments, medical professionals recommend that Atovaquone / Proguanil (Malarone) should be the primary drug to be considered for use by seafarers.

Some anti-malaria drugs may also affect a person's ability to operate machinery. Therefore when selecting the anti-malaria regime it should be ensured that these will not affect the crew's ability to carry out their work safely.

It should, however, be considered that anti-malaria medicines are not 100% effective; therefore these should be taken as well as ensuring practical measures are in place to mitigate the possibility of crewmembers being bitten. As anti-malaria treatments do not guarantee immunity from contracting malaria, it is important that any flu like symptoms that develop even when a full schedule of anti-malarial treatment has been completed, even some time after departing from a malaria area, be referred for medical attention.

Anti-malarial drugs should be sourced from trusted suppliers, as studies have shown that fake anti-malarial drugs are commonplace in some countries, in particular in South East Asia.

At present there is no vaccine against malaria, although research and testing of possible vaccines is ongoing.

Details on the type of malaria risk and the recommended prevention measures by country are published in the [WHO International Travel and Health Country List](#).

## Treatment

In the event of any crewmember developing a fever onboard whilst in or after visiting a malaria affected area, medical attention or advice should be sought immediately and medical staff informed that the patient has visited a malaria area.

When an anti-malaria drug has been taken as a preventative measure it will be necessary to treat any malaria that develops with a different medicine, therefore in the event of malaria being diagnosed, inform medical staff of any anti-malaria medicines that have been taken.

When malaria has been diagnosed and a course of treatment has been prescribed, the drugs should be taken for their full course even when symptoms have disappeared.

## The five principles

As a general guide crewmembers should note the five principles – the **ABCDE** – of malaria protection:

- Be **A**ware of the risk, the incubation period, the possibility of delayed onset, and the main symptoms.
- Avoid being **B**itten by mosquitoes, especially between dusk and dawn.
- Take antimalarial drugs (**C**hemoprophylaxis) when appropriate, at regular intervals to prevent malaria attacks.
- Immediately seek **D**iagnosis and treatment if a fever develops one week or more after entering an area where there is a malaria risk and up to three months (or, rarely, later) after departure from a risk area.
- Avoid outdoor activities in **E**nvironments that are mosquito breeding places, such as where there is standing water, especially in late evening and at night.

Members requiring further guidance should contact the [Loss Prevention department](#).