

## Mali Malaria Outbreak Prevention

The intended message of this report is to set out the appropriate preventions which will slow down a new outbreak of malaria in the African country of Mali. Malaria is a fatal disease caused by female Anopheles mosquitos and is a disease spread through a vector. Malaria is also a parasite, and its symptoms include: a high fever, headaches and frequent chills. These symptoms tend to start 15 days after the mosquito has first bitten a person. Once these symptoms start to occur, there is a window of 24 hours before malaria becomes severe (according to Médecins sans Frontières). In Mali (a country in West Africa) malaria is the highest cause of death and they are now experiencing an outbreak of malaria that has ravaged the rural areas of the country. Mali is a landlocked country in west Africa with a population of 21 million people, most of them (roughly 67%) under 25. It is a mainly flat and dry country - 65% is desert or semi-desert. It is one of the poorest countries in the modern world. Mali is in the top 10 countries for both deaths and cases of malaria and, of the 229 million cases per year, it holds 3% (6,870,000) (1) of all cases in the world caused by the disease. Mali also holds a further 6% of all cases in West Africa, the place that is well known for having the world's biggest outbreaks of malaria. Mali has 3% (30,000) (1) of the world's annual 1 million deaths caused by malaria within its borders, once again solidifying its place among the world's top 10 countries plagued by malaria. This report will cover an emerging situation in Mali which has seen an outbreak spread rapidly across the nation and suggests an urgent strategy for dealing with this new outbreak.

The most important thing is to get the outbreak under control as quickly as possible because we need to limit the number of deaths to the absolute minimum. We also need to limit the infection rate and the number of people, particularly children, becoming seriously ill. If we do not act now, the number of infections could quickly overwhelm the healthcare service and the amount of people who are ill and in hospitals could have an economic effect, meaning there is even less money to tackle the outbreak in a country where resources are hard to come by. Even if people are not killed by malaria, the disease could have lifelong effects such as kidney failure and other consequences of the disease furthermore decreasing the workforce in communities and damaging the economy. Another important thing is to take into account the different regions of Mali and how likely infection is in each, for example, in the Sakasso region of Mali (1) there is a 30% chance of infection (1) whereas in the Bamako region there is only 1% chance of being infected (1). I believe it is vital to keep the regions with lower infection rates clear of malaria so we can contain the spread of the outbreak. However, I am confident that all of this can be solved through the strategies we will use to combat the outbreak.

This all said, the thing that makes malaria particularly deadly is how difficult it is to stop. Mosquitos are an efficient carrier of malaria because of their size, speed and sheer numbers, meaning that you only realise over two weeks later that you have been infected with malaria. Another huge factor is that malaria often thrives in poorer countries such as Mali that typically have less access to healthcare than countries in the developed world.

Mosquitos also tend to attack between dusk and dawn as that is when most humans are asleep and are vulnerable targets. The people also are usually poor and therefore cannot afford many effective preventions of malaria for example mosquito nets and special sprays to deter mosquitos (3). Specifically, what makes malaria so difficult to stop is the fact that mosquitos adapt extremely quickly to avert preventions and so the strategies to deal with these outbreaks must adapt with them. To combat this problem healthcare workers need to develop new tools and preventions to eliminate the adaptation problem. The government of Mali and for that matter any government of a country that malaria thrives in needs to constantly and consistently invest money into stopping malaria. Richer nations must support those countries with fewer resources.

The strategies we will prioritise to control the outbreak in Mali are tried and tested to be effective at preventing the spread of Malaria. The most effective preventions identified by the World Health Organisation (WHO) are the use of insecticide treated nets (mosquito nets) and indoor residual sprays (IRS) (3). These methods were used very successfully and efficiently for example in China which went from having 30 million cases per year in the 1940s to being certified malaria free in 2021 (3). Our main objective is to distribute these preventions for free in large quantities, specifically targeting pregnant women and children under five (2) because these are the most vulnerable groups. Our second main objective is to prioritise regions of Mali that are at the least risk and work our way up, protecting regions from the outbreak and finally attacking the regions with the highest rates that contain sources of the outbreak (1). The third and final strategy (for now) is to make sure people in Mali are diagnosed as early as possible. This means that we should supply the network of private clinics with the correct equipment to test and analyse patients' blood for malaria parasites. We will also need to increase the amount of rapid diagnostic tests in use which are much faster ways of seeing if a person has malaria, these work by looking for proteins known as antigens which are released by the malaria parasite. This strategy will increase the flow of patients coming in to receive an early diagnosis of malaria and subsequently provide treatment for any symptoms they may have. For the duration of the outbreak, we will ensure that all healthcare is free and accessible. This is a vital part of the strategy because most people in Mali have a low income and may not be able to afford treatment. There are inevitably limitations to these strategies, however. Mali is a massive country being the 8<sup>th</sup> biggest in Africa with 1.241 million km<sup>2</sup> of territory, Mali is a mainly rural country making distribution of medical equipment more difficult; these preventions will be expensive and will not cure Mali of malaria forever but will slow down the progression of the outbreak and prevent the spread of disease. The clear alternative to the preventative strategies outlined above is a programme to distribute vaccines to the people of Mali. The WHO approved the malaria vaccine in the autumn of 2021, giving us a vaccine to distribute to people across sub-Saharan Africa (4). Matshidiso Moeti, WHO regional director for Africa, said: "[The WHO recommendation] offers a glimmer of hope for the continent, which shoulders the heaviest burden of the disease, and we expect many more African children to be protected from malaria and grow into healthy adults." (4). Although these vaccines will protect the people of Mali, the vaccine itself is only 30% effective (4) and requires four doses to work efficiently making it hard to organise and afford. Even when we

manage to start distributing the vaccine, there will be obstacles such as people doubting its ability to treat malaria and being suspicious of injections and the ingredients of the vaccine.

In conclusion, malaria is a parasite that, with no precautions, will run rampant throughout Mali. Mali is particularly vulnerable because of its high rates of poverty, rurality and relative lack of infrastructure. Our three main preferred strategies (summarised) are: to first distribute insecticide-treated nets and indoor residual sprays for free in large amounts; then to tackle the different regions of Mali, protecting those least at risk and working our way up to those most at risk and then finally to give private clinics the supplies they will need to ensure that a steady flow of patients is diagnosed and treated for malaria. If we continue to apply these strategies quickly and efficiently, I am confident that it will be possible to stop this outbreak from escalating and spreading to other Western African countries that surround Mali. With these strategies we shall move steadily towards eradication.

### **Sources**

- (1) Severe Malaria Observatory. 2020. Mali malaria facts. <https://www.severemalaria.org/countries/mali> Accessed on 13/01/22
- (2) NHS. 22<sup>nd</sup> August 2018. Overview: Malaria. <https://www.nhs.uk/conditions/malaria/> Accessed on 13/01/22
- (3) WHO, 2021. Malaria fact sheet. <https://www.who.int/news-room/fact-sheets/detail/malaria>. Accessed on 13/01/22
- (4) SciDev.net, 8/10/21. WHO approves first malaria vaccine. <https://www.scidev.net/global/news/distribution-key-as-who-approves-first-malaria-vaccine/>. Accessed on 15/01/22.