

Forum: General Assembly

Issue: Combatting the spread of Malaria in Sub-Saharan Africa

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Introduction

Malaria, coined after the term mal aria, meaning ‘malicious air’, is a disease that is responsible for a child’s life every two minutes, according to the World Health Organization (WHO). The disease continues to ravage through countries infecting over 200 million people and killing half a million people yearly. Frequently found in Sub-Saharan Africa and other tropical regions, malaria is usually spread by female Anopheles mosquitos. These mosquitos infect people by transmitting parasites into the bloodstream of those bitten, effectively transfusing blood from its source to the victim. The parasite that causes malaria is called Plasmodium, which has many forms but only a few cause malaria. These mosquitos bite around dusk, which makes mosquito nets essential in risk areas. Symptoms appear 7-18 days after infection or sometimes even later. Early detection of malaria is key to successful intervention and restraining the spread of the disease. In Sub Saharan Africa, most Malaria fatalities are from children or new-borns that lack the necessary immunity to fight off malarial infections.

Overall, since the turn of the century, the number of malaria cases and death have been decreasing in Africa. However, progress has been stalling as malaria research and programs have been underfunded, failing to meet funding goals such as the Global Technical Strategy (GTS).

The mortality from malaria is high, with approximately 405,000 deaths reported in 2018. According to the WHO, in 2017, 93% of malaria deaths occurred in Africa and India. Since it is a tropical disease, many nations have the privilege to be not burdened. Currently, there are diverse preventative measures for Malaria, from mosquito nets to vaccination. Leading nations adopt a combination of several preventative measures such as insecticide treated nets (ITNs), Vector Control, Chemoprophylaxis, indoor residual spraying (IRS), and now other nations have followed suit.

Definition of Key Terms

Malaria

a human disease that is caused by sporozoan parasites (genus Plasmodium) in the red blood cells, is transmitted by the bite of anopheline mosquitoes and is characterized by periodic attacks of chills and fever

Chemoprophylaxis

the prevention of infectious disease by the use of chemical agents

RTS, S

RTS, S is a vaccine that aims to trigger the immune responses to defend against the early stages of malaria. According to the malariavaccine.org, the vaccine is the world's first vaccine to provide partial protection against malaria.

insecticide treated nets (ITNs)

These nets are nets that are usually put over a bed to protect those sleeping from mosquito bites, which could transmit diseases such as malaria.

Control of Malaria

Preventative Drugs

In the last decade, chemoprophylaxis was frequently used. Chemoprophylaxis is the use of drugs to prevent or mitigate diseases. Commonly given to pregnant women and young children that were in the risk areas, these drugs weren't successful since there were adverse effects such as hallucinations, confusion, delirium and other adverse behaviour for the users. This made it gradually harder to find suitable drugs to protect travellers, as areas with extreme resistance to earlier drugs required even more powerful drugs. There were also other side effects associated with these anti-malarial drugs. Therefore, because of the low efficacy and its insufficient role as a preventative measure, the reliance on Chemoprophylaxis was lessened.

Vector Control

Vector control is reducing or eliminating the birds, insects, or other spreaders (vectors) to reduce the transmission of malaria or other pathogens. Currently, there are two types of vector control: controlling the adult population or aquatic population. There are different ways to apply vector control, both separately and in combination with other preventative measures. When vector control is being used in a widespread fashion it is proven to successfully reduce Malaria transmission. Currently, Vector Control is being used along with other preventative measures in Sub-Saharan Africa.

Insecticide Treated Nets (ITN)

In 2018, approximately 50% of people at risk of malaria were sleeping under ITN mosquito nets, which is a significant increase from 29% in 2010. However, since 2016, the increase in people using the nets have been stagnant or marginal at best. Currently, there are programs to distribute ITN mosquito nets and other commodities, but these programs only affect a small proportion of the population. A study carried out by ITN showed that between 3230 migrant households in high-risk areas, nearly one-third of all ITN nets showed that they had holes or had undergone repairs. Also, in some cases, people were sharing one ITN net, which is insufficient to provide full protection. The study also found that the limiting factors for ITN net distribution were due to resource constraints such as time and money. In addition, there were other limiting factors such as price and availability for those in rural regions. In some areas where spraying is limited, implementation of ITNs would be optimal, as these nets can reduce malarial infection during the most vulnerable time.

According to the World Bank, in 2010, in Sub-Saharan Africa, Eswatini had the lowest proportion of ITN users, which was 1.5%, for the under-five population. Although the number would be higher currently, Eswatini still suffers from low usage of ITNs in risk areas. Eswatini is followed by Namibia, according to data from 2013, as it has 5.6% of ITN usage for under-five population. Then, Namibia is followed by Zimbabwe, as it has 9% of under-five population under ITNs.

Indoors Residual Spraying (IRS)

IRS is a form of vector control that has high success if implemented accordingly. During IRS, a household is usually sprayed with chemicals from the inside that would reduce transmission of malaria by killing off mosquitos. For successful implementation, the “WHO recommends the use of IRS provided that it is timely, selectively targeted according to the local environmental situation, and where there is documented evidence that it can be successful” (Malaria Control...). IRS has been effective to control and eliminate Malaria in nations such as Russia, Southern Europe, and Mediterranean, South Africa, and other Malaria stricken regions. However, just like drugs, the IRS is also affected by the evolution of mosquitos. Since IRS is done with a few chemicals, when too much of one chemical is used, it could drive evolution for mosquitos. Therefore, the WHO recommends nations to change chemicals. This change in chemicals, however, reduces the total IRS coverage since these alternatives are usually costlier.

Malaria Funding

General Funding

In 2017, there was an estimated \$3.1 billion invested into malaria control and elimination. This amount had increased steadily since the past decade, but the investment has been highly affected by other factors such as the condition of the economy. For example, in 2018, the funding fell by \$5 billion from \$3.1 billion to \$2.7 billion, stalling progress against the fight against malaria. In addition, from the \$2.7 billion investment into malaria, \$1 billion had been diverted to other programmes for diseases including AIDS, and tuberculosis. In addition, the current investment that is coming into malaria research is not sufficient to meet goals of the GTS (Global Technical Strategy), which is, according to the WHO, a “reduction of at least 90% in malaria case incidence and mortality rates by 2020, compared with 2015 levels” (The “World Malaria...)

Research and Development (R&D) Funding

In 2018, however, the funding for R&D funding rose to a record high, due to increases in private sector investments into several promising vaccines. There are several vaccines in stage II trials, which is a promising sign for investors and also for the development of vaccines.

Malaria Commodities

Between 2016 and 2018, there was an estimated total of 278 million insecticide-treated mosquito nets (ITNs) delivered into countries in need of such commodities. Other commodities such as Rapid Diagnostic Tests (RDTs) were estimated to have sold approximately 412 million units in 2018, a significant increase from 297 million units in 2014. These early diagnostic tests allow for early detection of the parasite in the bloodstream, a component crucial for recovery.

Cases and Deaths

Globally, from 2010 to 2018, the Malaria cases went down in risk areas from 71 to 57 cases per 1000 population at risk. However, progress has been stagnating since 2014, as the rate of decrease has been slowing down. For Malaria deaths, there has been a reduction from approximately 585,000 deaths in 2010 to approximately 405,000 deaths in 2018. The Malaria mortality rate decrease has also slowed down since 2016, similar to the number of cases. Therefore, there is still much improvement needed as elimination or complete control of the disease is not yet realistic. In 2018, 49 countries reported less than 10,000 malaria cases from 40 countries in 2010. This slower improvement is the case for several countries that are around the equator, but not in Africa.

According to the World Bank, in 2018, Rwanda had the highest incidence of malaria cases for under-five population with approximately 486 cases per 1000 people at risk. This was significantly higher than other at-risk regions such as Burkina Faso, Mali, and Benin. Nigeria accounts for 25% of the cases

worldwide followed by the Democratic Republic of Congo and Uganda. The large population of these countries accounts for the overwhelming proportion of cases, not because of their lack of preventative measures. By looking at incidence of malaria per 1000 at risk, we can determine that these regions have lower amount of cases per 1000 at risk population than other countries such as Nigeria.

Nigeria

Nigeria carries the burden of 25% of the world's Malaria cases. A staggering 97% of the Nigerian population is at risk for the disease, and the remaining 3% are those in highlands, separated from the major hubs. Current prevention efforts are aimed at the female Anopheles population by using Vector control, IRS, and such measures. However, in a study carried out by the government in Gboko and Otukpo, the results showed that "more humans (36.8%) had the malaria parasites than the anthropophagic female Anopheles (0.5%)" (Onyawoibi). Therefore, the preventative efforts from the government by aiming to eliminate the female Anopheles are hindered by other factors such as human activity.

Congo

The Democratic Republic of Congo has a high number of malaria cases and deaths, as it is responsible for more than 40% of total visits to health facilities and 19% of deaths for children under-five. According to the U.S. President's Malaria Initiative (PMI), since 2010, the mortality rate for children under age 5 has decreased 34% and total cases have fallen by 40%. This statistic represents the improvement that most of Africa had from 2010 to now.

Major Countries and Organizations Involved

World Health Organization (WHO)

The WHO serves as an international health organization, which includes being involved in Outbreaks and Health Emergencies (OHE). It has been involved in the prevention of diseases such as Malaria, the H1N1Zika virus, MERS, and COVID 19. In many cases, the WHO has been praised for its swift response and its transparency. It receives funding from member states and other partners receiving a sizable majority of the funding from the United States and the United Kingdom. The WHO actively attempts to control and eliminate malaria in the WHO African regions, South East Asia, the Americas, Eastern Mediterranean, and Western Pacific.

Roll Back Malaria (RBM)

RBM is a movement launched by the World Health Organization (WHO), UNICEF, UNDP, and the world bank to provide “a globally coordinated response” (RBM...). RBM serves as a global program that utilizes its resources to foster the spread of information, keeping malaria a global priority, encouraging sustainable funding for Malaria, and more.

African Leaders Malaria Alliance (ALMA)

The ALMA is an alliance that includes 49 heads of state and government that is dedicated to ending malaria deaths. The purpose of this organization is to increase cooperation between the leaders and to ensure that malaria control interventions are being used and also to share information regarding the status of malaria and efficient practices.

Timeline of Events

Date	Description of event
August 20, 1897	Sir Ronald Ross discovers that Malaria is from a parasite transmitted by mosquitos
1934-1935	A devastating Malaria Epidemic occurs in Siri Lanka, infecting over 5 million people
1934	Hans Andersag discovers Chloroquine, which would become a prominent antimalarial drug.
1948	The WHO is formed as an international health organization
1996	Atovaquone is introduce as a malarial resistance drug
1998	Roll Back Malaria program is launched to provide a coordinated response for Malaria
2019	A potential Malaria vaccine, RTS,S begins testing in several regions in Africa

Relevant UN Treaties and Events

If general information of UN involvement is to involve, please write this in paragraph form. When listing past UN Resolutions, it is suggested that you make use of bullet points and the specified format below.

- Consolidating gains and accelerating efforts to control and eliminate malaria in developing countries, particularly in Africa, by 2030, 17 September 2019 (A/RES/73/337)
- 2001–2010: Decade to Roll Back Malaria in Developing Countries, Particularly in Africa, 28 September 2001 (A/RES/55/284)

Previous Attempts to solve the Issue

Malaria Eradication Research Agenda (MERA)

According to isglobal.org, the MERA was a “scientific consultative progress to identify knowledge gaps and new tools that will be needed to eradicate malaria globally.” The progress included 250 scientists who worked together to produce an agenda for malaria eradication.

Vaccination

There have been several attempts at making a successful vaccine for Malaria. Currently, there are several in clinical testing, but only one has been approved. The only approved vaccine is the RTS,S, which has shown that it can reduce malaria infections in younger children, but it still has low efficacy. This vaccine is currently undergoing pilot programs, so it is not commercially available and only available to select countries in Africa through programs to test the efficacy of the vaccines. Therefore, the vaccine is not de facto approved. Currently, the impact of these vaccines is quite limited and not sufficient due to it covering a limited area. The nature of malaria being highly infectious has the ability to compromise immune defences. Therefore, finding an effectual treatment for this disease is challenging.

Possible Solutions

Improved vaccination

Since Malaria vaccinations are not prevalent and has relatively low efficacy, much improvements need to be made. Since vaccines have proven that, in the long run, it is effective in controlling or eliminating the disease, more urgency and funding needs to go to the development of such vaccines. To do so, world leaders should meet funding goals such as the GTS 2030 targets, which would hasten the vaccine implantation progress.

Genetic Modification

Genetic modification of mosquitos in the region can potentially make the mosquitos unable to carry or transmit malaria. To do so, large amounts of Genetically Modified mosquitos would have to be released, which would reduce the population of the native species and eventually diminish them.

Increased Availability of ITNS

The governments could create an environment for ITNs where there is no tariffs or taxes on the purchase of nets. This would allow manufacturers to price their nets at better prices and make the nets

affordable for the majority. In addition, there could be programs to increase awareness which would increase the demand for such nets, fostering a competitive environment between the manufacturers which makes availability increase.

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Recommended Reads

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