



## In Depth - Malaria Vaccine

Malaria has been one of the world's deadliest diseases. It kills more than 4,00,000 people a year worldwide and causes illness in millions of others.

In the past two decades, existing interventions have reduced the malaria burden. And **India**, too, has made good progress in malaria control. **The disease burden has declined by 59%**. The fight against the disease got another shot in the arm when the **world's first malarial vaccine got launched in Malawi**.

A large scale pilot project, that has been called the world's first malaria vaccine, to give partial protection to children has begun in Malawi. The vaccine called RTS,S will be **available to everyone under the age of two**. After the rollout in Malawi, vaccination will begin in Ghana and Kenya. Approximately, 3,60,000 children will get the vaccine annually. According to the World Health Organization (WHO), the effort could immunize more than one million children by the year 2023.

### Malaria Vaccine

- **Known** by its lab initials as **RTS,S** but **branded as Mosquirix**, the vaccine has passed lengthy scientific trials that found it to be safe and **reducing the risk of malaria by nearly 40%**, the best ever recorded.
- It was **developed by GlaxoSmithKline (GSK)** company and **approved by the European Medicines Agency in 2015**.
- The RTS,S vaccine trains the immune system to attack the malaria parasite (**Plasmodium (P.) falciparum**, the most deadly species of the malaria parasite) which is spread by mosquito bites.
- This vaccine took 30 years to be developed. The **efficiency** of the RTS,S vaccine was **established in a phase 3 clinical trial that concluded in 2014**.
- The vaccine only prevents four in ten malarial cases and **must be given as four injections over 18 months**.
- WHO wants the **vaccine to be used alongside** other preventive measures such as treated **bednets, insecticides, repellents and anti malarial drugs**.
- **Malawi** is first of the three countries chosen for the pilot program to roll out the vaccine. Soon, **Ghana** and **Kenya** will join in as part of a large scale pilot program backed by the WHO.
  - These three countries were selected for the rollout because their **malaria rates are high**.
- The **vaccine is not registered in India**. Before registration, the trial is must. Also, so far, no vaccine has been tried in India against Malaria.

### World Malaria Report, 2018

- **70% of malaria cases** in the world are concentrated in **India and 10 African countries**.
  - The **ten African countries** reported an **increase** in cases of **malaria in 2017** compared to 2016.
  - Nigeria, Madagascar and the Democratic Republic of the Congo showed the highest rise. In contrast, **India reported 30 lakh fewer cases in the same period**.
- **Children aged under 5 years accounted for 61% of all malaria deaths worldwide**. The highest number of deaths- 19% was recorded in Nigeria.
- **Expenditure on Malaria has remained more or less stable since 2010**.

- In 2017, like the previous years, **America was the largest international source of malaria financing** contributing 120 crore dollars.
- In 2015, it was decided by the World Health Assembly that by 2030, malaria has to be completely eliminated in at least 35 countries. In order to achieve this goal, annual expenditure on programmes related to malaria must be increased by 660 crore dollars by 2020.
- Globally, **the scope of malaria eradication has increased.**
  - There were no cases of malaria in China and El Salvador in 2017.
  - **WHO declared Paraguay a malaria free country in 2018.**
  - Algeria, Argentina and Uzbekistan have requested the WHO to declare them malaria free.

## Malaria Cases in India

- With 9.5 million malaria cases, **India reported almost 3 million fewer malaria cases in 2017** or a 24% decrease over the previous year.
- India's reduction- the sharpest within a year, means that the country accounts for just **4% of the world's total malaria cases** and is no longer among the world's top three countries in terms of number of cases.
- Nearly half of all malaria cases were reported from Odisha, Jharkhand, Chhattisgarh and parts of West Bengal which have a sizeable tribal population living in the remote rural areas.

## India's Missions Against Malaria

- In **1953**, government launched the **National Malaria Control Program** with the focus on indoor residual spraying of DDT. Within five years, the program helped to dramatically reduce the annual incidence of malaria.
- **The National Malaria Eradication Program was launched in 1958** which further reduced the number of malaria cases and also eliminated deaths from the disease.
- After 1967, mosquito's resistance to insecticides and anti malarial drugs led to a resurgence of the disease countrywide.
- In order to combat malaria in high transmission areas of the country, an **enhanced Malaria Control Project was launched with the World Bank's help in 1997.**
- In 2003, **malaria control was integrated with other vector borne diseases** under the National Vector Borne Disease Control Programme (NVBDCP).
- In 2005, the Government also launched the **National Rural Health Mission (NRHM)** to control vector-borne diseases including malaria.
- In 2017, India launched its 5-year **National Strategic Plan for Malaria Elimination** that shifted focus from Malaria control to elimination and provided a roadmap to end malaria in 571 districts out of India's 678 districts by 2022.
- Indian Council of Medical Research (ICMR) has recently established '**Malaria Elimination Research Alliance-India (MERA-India)** which is a conglomeration of partners working on malaria control.

## Malaria

- Predominantly found in the tropical and subtropical areas of Africa, South America as well as Asia, malaria is a life threatening **mosquito borne blood disease caused by plasmodium parasites.**
  - The parasites spread through the **bites of infected female Anopheles mosquitoes.**
- **Four types of malaria parasites can infect humans:** Plasmodium Vivax, P. ovale, P. malariae and P. falciparum.
  - Plasmodium falciparum and Plasmodium Vivax are the most common types that infect humans.
  - Plasmodium falciparum causes a more severe form of the disease leading to higher risk of death.
- When an infected mosquito bites a person, the parasite is released into the bloodstream, it then travels to the liver where it matures.
- After some days, mature parasites start infecting the red blood cells. Within 48 to 72 hours, the

parasites inside the red blood cells multiply causing infected cells to burst open.

- Malaria signs and symptoms typically begin within a few weeks after being bitten by an infected mosquito. However, some types of malaria parasites can lie dormant in body for upto a year.
- **It is preventable as well as curable.**

## Symptoms

Malaria symptoms typically develop within 10 days to four weeks following the infection. Common symptoms of malaria include:

- Shaking chills that can range from moderate to severe high fever.
- Sweating, headache, nausea, vomiting and abdominal pain.
- Diarrhoea, Anaemia, muscle pain and convulsions.
- Severe plasmodium falciparum infection can lead to coma, permanent brain failure and even death.
- Some people who have malaria experience cycle of malaria attacks.
  - Such attacks start with shivering and chills followed by a high fever, sweating and return to a normal temperature.

## Treatment

- Treatment of malaria aims at eliminating the plasmodium parasite from the bloodstream through medication. Chemotherapy is an option.
- Those without symptoms may be treated for the infection to reduce the risk of disease transmission in surrounding population.

## Prevention

- **Vector control** is the main way to prevent and reduce malaria transmission.
  - If coverage of vector control interventions within a specific area is high enough then a measure of protection is needed to be conferred across the community.
- Most malaria carrying mosquitoes bite at night, so **insecticide treated mosquito nets** can be a life saving barrier.
- Doses of antimalarials during pregnancy can protect both mother and child.
- Getting rid of pools of stagnant water, clearing bushes from around the houses and planting lemon grass can all reduce the number of mosquitoes nearby.
- **Health education**, an important aspect for preventing malaria and malaria deaths, is needed for improving people's understanding of the disease which includes awareness of the symptoms, treatments and preventive steps.