

**India Malaria Vaccine Market Assessment, By Agent [Plasmodium Falciparum, Plasmodium Vivax, Plasmodium Malariae, Plasmodium Ovale, Plasmodium Knowlesi], By Stage Targeted [Pre-erythrocytic vaccines, Erythrocytic vaccines, Transmission-blocking vaccines, By Type of Vaccine [Whole Organism Vaccine and Protein Subunit Vaccine], By Technology [mRNA and Recombinant], By Route of Administration [Intramuscular, Subcutaneous, Intradermal, Others], By End-user [Hospitals, Specialty clinics, Homecare, Others], By Distribution Channel [Hospital, Retail Pharmacy, Online Pharmacy Government, Non-Governmental Organisations], By Region, By Opportunities and Forecast, FY2017-FY2031**

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## **Abstracts**

India Malaria Vaccine market size was valued at USD 125.2 million in FY2023, which is expected to reach USD 215.44 million in FY2031 with a CAGR of 7.02% for the forecast period between FY2024-FY2031. According to the WHO, India had a significant share in global malaria cases and deaths in 2021. India accounted for about 4% of global malaria cases and 7% of malaria deaths in 2021. The India malaria vaccine market is driven by several factors, including increasing malaria prevalence, the rising demand for effective and affordable malaria vaccines, and increasing investments in research and

development. Technological advancements in this field also contribute to the market's growth.

The India malaria vaccine market has attracted significant attention from the global healthcare industry due to high number of malaria cases. The growth of India malaria vaccine market has been accelerated in recent years by two factors, the growing awareness of malaria's impact on Indian population and the healthcare industry's focus on developing effective malaria vaccines. Numerous public and private stakeholders, encompassing pharmaceutical firms, research institutions, and non-profit organizations, are actively involved in designing malaria vaccines specifically suited to the Indian setting. The partnership between international organizations and Indian research institutions has expedited the progress and evaluation of potential vaccine candidates.

The India Malaria Vaccine Market shows excellent potential in combatting malaria. As vaccine development advances, the opportunity to revolutionize malaria control and prevention strategies becomes more apparent. The successful implementation of a malaria vaccine has the power to revolutionize healthcare in India, saving numerous lives and moving us closer to the ultimate objective of eradicating this devastating disease.

#### Dependency on India to produce Vaccine

India is a major player in the global malaria vaccine manufacturing market. The country has a strong pharmaceutical industry with a long history of vaccine production and is attracting significant foreign investment. While some countries are concerned about their dependency on India for manufacturing of malaria vaccines, the Indian government is committed to ensuring the continued production of vaccines. India's low cost of manufacturing, regulatory solid environment, and track record of vaccine production is some of the key reasons why many countries rely on India for manufacturing malaria vaccines.

Several pharmaceutical companies across the globe are partnering with Indian pharmaceutical companies to produce vaccines for malaria. For instance, as part of global efforts to combat the deadly fever, British pharmaceutical company GSK has decided to transfer the production of the world's first effective malaria vaccine to Bharat Biotech, an Indian COVID-19 vaccine developer, in 2021. Under the agreement, Bharat Biotech will take over the manufacturing of the protein component of the vaccine, RTS, S/AS01, while GSK will retain responsibility for supplying the adjuvant, or vaccine booster, required for the shot.

## Increasing Awareness for Malarial Vaccine

Public knowledge plays a crucial role in eliminating malaria, encompassing awareness of disease transmission, preventive measures, and information about vaccines. Increasing vaccine acceptance and reducing vaccine hesitancy are essential steps toward this goal. According to a 2022 article published by the National Centre for Biotechnology Information, awareness of the malaria vaccine was high among the Indian population (72%). However, vaccine acceptance did not match the level of awareness. Responses to three vaccine acceptance items were as follows: support for vaccinating all children below five years old (68.75%), encouragement for others to get vaccinated (67.27%), and belief that vaccines should be recommended (59.05%). This discrepancy could be attributed to a lack of understanding about the vaccine's safety or existing distrust. However, levels of vaccine distrust concerning efficacy and safety varied among different sociodemographic groups and depended on vaccine availability. The study presents significant evidence of vaccine awareness among the Indian population following the recent approval of RTS, S, a malarial vaccine based on a recombinant protein by the World Health Organization (WHO).

## Government Initiatives

Chhattisgarh has consistently grappled with malaria as a significant health concern. To address this problem, the Chhattisgarh government initiated the 'Malaria Mukta Bastar Abhiyan (Malaria Free Bastar Campaign)' in January 2020. The Malaria Mukta Bastar Abhiyan is a comprehensive program by the National Health Mission, encompassing the districts of Bastar, Kanker, and Kondagaon regions. This ambitious project's significance lies in that around 72% of all malaria cases in the country are reported in the Bastar region. Its noteworthy success has garnered attention due to its extensive coverage and effective execution. The program's primary objective is to decrease the incidence of illness and deaths caused by malaria in the state, particularly in regions with a significant tribal population and high endemicity. The program specializes in pregnant women, lactating mothers, and children under five years old. It aims to achieve this by identifying both symptomatic and asymptomatic (afebrile) malaria cases in highly endemic areas and ensuring that all individuals receive thorough treatment to reduce the parasite burden in the community. In 2022, the Union Health Ministry in New Delhi recognized Chhattisgarh with a national award for its exceptional efforts in combatting malaria within the state.

## Pre-erythrocytic Vaccines Enjoy Significant Popularity

Pre-erythrocytic vaccines (PEVs) target the malaria parasite's infective stage, known as sporozoites. These sporozoites are transmitted into the bloodstream through mosquito bites and subsequently migrate to the liver, where they mature into merozoites. The primary goal of pre-erythrocytic vaccines is to combat the infection of liver by preventing the sporozoites from successfully establishing themselves. Pharmaceutical companies are focusing on developing pre-erythrocytic vaccines because it is the most effective vaccine, as it acts on early stages, completely obstructing the development of subsequent stages, infection, and transmission. PEV s target the crucial initial phase during which sporozoites infect a small number of liver cells and require about a week to develop in the liver. This timeframe allows the vaccine enough time to act effectively.

### Recombinant Vaccines are Gaining Popularity

In pre-clinical studies, various recombinant proteins representing multiple asexual blood stage antigens of *P. falciparum* have demonstrated potential as promising vaccine candidates. In recent times, recombinant-based malaria vaccines have emerged as a highly promising strategy, harnessing advanced biotechnology methods to generate innovative vaccine candidates. By employing recombinant DNA technology, these vaccines can manufacture precise malaria antigens or proteins, primarily stimulating a protective immune response against the *Plasmodium* parasite. Recombinant-based malaria vaccines present numerous benefits compared to traditional methods. Utilizing recombinant DNA technology allows to produce specific malaria antigens in substantial amounts, ensuring a uniform and standardized vaccine composition.

Moreover, these vaccines can be precisely designed to target various stages of the malaria parasite's lifecycle, including sporozoite, merozoite, or sexual stages, providing a comprehensive preventive approach. Furthermore, the engineered nature of recombinant-based vaccines enables the enhancement of the immune response, potentially leading to increased vaccine efficacy. For instance, RTS,S vaccine, developed Bharat Biotech, India based biotechnology company received its approval for use in children in 2023 by WHO.

### Impact of COVID-19

The Centre's goal of achieving a malaria-free India by 2030 has faced significant setbacks due to the impact of the Covid-19 pandemic on effective interventions. Data reveals a concerning trend, with 185 malaria-related deaths reported in 2017, declining to 125 in 2018, and then rising again to 150 in 2019. However, the year 2020 saw a

notable increase, with 202 deaths, and the following year, while the pandemic persisted, the toll surged to 306 people succumbing to the disease .

The COVID-19 pandemic shifted considerable focus and resources to address the urgent crisis, resulting in delays in research and clinical trials for different vaccines, including those for malaria. Moreover, the strain on healthcare systems impacted existing malaria control and prevention initiatives, which could have contributed to an upsurge in malaria cases due to disruptions in healthcare services and mosquito control activities.

### Key Players Landscape and Outlook

The Indian pharmaceutical industry has earned worldwide acclaim for its cost-effective manufacturing capabilities and well-equipped research and development facilities. By collaborating with foreign pharmaceutical companies, they have an opportunity to utilize India's expertise and extensive infrastructure in vaccine development and production. On the other hand, foreign companies bring advanced research methodologies, cutting-edge technologies, and financial resources to the partnership. This harmonious collaboration between foreign and Indian pharmaceutical companies opens up new possibilities for exploring innovative vaccine candidates, conducting clinical trials, and navigating regulatory approvals. It has the potential to expedite the development of a malaria vaccine and solidify India's role as a significant contributor to global health solutions. For instance, in January 2021, GSK (global biopharma company), PATH (an international, nonpro fit global health organization), and Bharat Biotech (biopharma company based in India), signed an agreement to ensure the long-term supply of the RTS, S/AS01E vaccine. This agreement gives BBIL the license to commercialize and supply the vaccine, which will enable its continued production and availability.

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\*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work

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