

# EXPLAINED

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Quelling the chills: The RTS,S vaccine (Mosquirix) is made by GlaxoSmithKline after successful pilot programmes in Kenya, Ghana and Malawi. | Photo Credit: [Getty Images/iStockphoto](#)

**The story so far:** On October 6, the World Health Organization made a historic announcement, [endorsing the first-ever malaria vaccine](#), RTS,S, among children in sub-Saharan Africa, and in other regions with moderate-to-high Plasmodium falciparum malaria transmission. It made its [recommendations based on the results from a pilot programme](#) administering the vaccine to children in Ghana, Kenya and Malawi.

Malaria is a life-threatening disease caused by micro-organisms that belong to the genus Plasmodium, and is transmitted by infected female Anopheles mosquitoes. In 2019, according to the WHO, there were an estimated 229 million cases of malaria, and the estimated deaths were 4,09,000. About 67% of the deaths were among children aged under five, the group most vulnerable to malaria. Furthermore, 94% of the cases and deaths due to malaria occurred in the WHO African region, a disproportionately high share of the burden. But the WHO says its regions of Southeast Asia, eastern Mediterranean, western Pacific, and the Americas are also at risk. While research for a vaccine and therapeutics for malaria had been on for nearly half-a-century, success has been elusive until recently. While preventive and treatment interventions have continued (bed nets and indoor residual insecticide spraying) over the years, it was clear that the best tool against the constantly mutating pathogen would not emerge until an effective vaccine was at hand.

Editorial | [Killing the chills: On the malaria vaccine](#)

As Matthew B. Laurens argues in a paper in *Human Vaccines and Immunotherapeutics*: “An effective malaria vaccine would be an important tool to combat the enormous socioeconomic burden caused by this disease. Vaccines promote both individual and public health, and are thus considered among the most highly successful public health tools. After provision of clean water and sanitation, vaccination against infectious diseases has contributed the greatest to public health worldwide, compared with other human interventions.” And it was at a time when it was believed that anti-malarial research was flailing, that RTS,S did emerge. Pilot projects rolled out in sub-Saharan Africa showed that among children aged 5-17 months who received the recommended four doses of RTS,S, the vaccine prevented approximately 4 in 10 (39%) cases of malaria over four years of follow-up; about 3 in 10 (29%) cases of severe malaria, with a significant reduction in overall hospital admissions due to malaria or severe anaemia (a side effect). The need for blood transfusions to correct life-threatening anaemia also came down by 29%.

RTS,S/AS01 is a recombinant protein-based vaccine that acts against *P. falciparum*, believed to be the deadliest malaria parasite globally and the most prevalent in Africa. It reportedly offers no protection against *P. vivax* malaria, found in many countries outside Africa. The development of the vaccine was led by pharma major GSK over 30 years ago. In 2001, GSK began collaborating with PATH's Malaria Vaccine Initiative (MVI). A five-year Phase 3 efficacy and safety trial that concluded in 2014 was implemented through a partnership between GSK and MVI, with support from the Bill & Melinda Gates Foundation and a network of African research centres. In July 2015, the European Medicines Agency authorised the use of the vaccine, concluding that the benefits of the vaccine outweighed the risks. Known side-effects include pain and swelling at the injection site and fever, similar to the other children's vaccines. It is

associated with an increased risk of febrile seizures within seven days of administration. In the Phase 3 trial, children who had febrile seizures after vaccination recovered completely, and there were no long-lasting consequences, the WHO reported.

Pilots were launched in Malawi, Ghana, and Kenya over 2019. Health workers reported that the vaccine was easy to introduce and integrate into their schedule. The data were submitted to the WHO's Strategic Advisory Group of Experts on Immunisation and the Malaria Policy Advisory Committee that gave the go-ahead for the first ever anti-malarial vaccine.

Also read | [Bharat Biotech to make malaria vaccine](#)

Malaria is a major public health problem in India, endemic to many States, and involves multiple Plasmodium species, including *P. falciparum*, said the authors of a paper in *Acta Tropica*, an international journal on infectious diseases. India will therefore benefit from the vaccine, and Bharat Biotech has entered into a partnership with GSK for technology transfer and production. This vaccine is likely to be ready for use in India, in a couple of years, as per reports.

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Dr. Gagandeep Kang speaks to us about ZyCoV-D, the world's first DNA vaccine that is set for roll out in India

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