



R21/Matrix-M Malaria Vaccine

Why in News?

Recently, the [World Health Organisation \(WHO\)](#) has recommended the use of the **R21/Matrix-M malaria vaccine**, co-developed by the **University of Oxford and the Serum Institute of India**.

- The **Matrix-M component** is a proprietary **saponin-based adjuvant** developed by Novavax and licensed to the Serum Institute for use in endemic countries.
- As of now, the vaccine has been licensed for use in **Ghana, Nigeria and Burkina Faso**.

What is Adjuvant?

- An adjuvant is an **ingredient in a vaccine that enhances the immune system's response to that vaccine**.
 - Adjuvants help the immune system better recognize what's in a vaccine and remember it longer, increasing the amount of time that a vaccine may offer protection.
- **Matrix-M adjuvant** is derived from **saponins**, naturally occurring compounds found in the bark of the **Quillaja saponaria tree in Chile**. Saponins have a history of medicinal use.

What is Malaria?

- **About:**
 - Malaria is a life-threatening disease caused by the **Plasmodium parasite**.
 - This parasite is transmitted to humans through the bites of **infected female Anopheles mosquitoes**.
- **Plasmodium Parasite:**
 - There are **5 Plasmodium parasite species** that cause malaria in humans and 2 of these species, ***P. falciparum* and *P. vivax***, pose the greatest threat.
 - ***P. falciparum*** is the **deadliest** malaria parasite and the most prevalent on the African continent.
 - ***P. vivax*** is the **dominant malaria parasite** in most countries outside of sub-Saharan Africa.
 - The other malaria species which can infect humans are ***P. malariae*, *P. ovale* and *P. knowlesi***.
- **Symptoms:**
 - Mild symptoms are **fever, chills and headache**. Severe symptoms include **fatigue, confusion, seizures, and difficulty breathing**.
- **Prevalence:**
 - According to the **WHO's World Malaria report 2022**, there were 247 million cases of malaria in 2021 compared to 245 million cases in 2020.
 - It is mostly found in tropical countries. Four African countries accounted for just over half of all malaria deaths worldwide: **Nigeria (31.3%), the Democratic Republic of the Congo (12.6%), United Republic of Tanzania (4.1%) and Niger (3.9%)**
- **Vaccine:**

- Along with the recently confirmed **R21/Matrix-M vaccine**, WHO also recommends broad use of the **RTS,S/AS01 malaria vaccine** among children living in regions with moderate to high *P. falciparum* malaria transmission.
- **Elimination Strategies:**
 - **Global:**
 - The **WHO Global Technical Strategy for Malaria 2016-2030, updated in 2021**, sets ambitious but achievable global targets, including:
 - reducing malaria case incidence by at least 90% by 2030
 - reducing malaria mortality rates by at least 90% by 2030
 - eliminating malaria in at least 35 countries by 2030
 - preventing a resurgence of malaria in all countries that are malaria-free.
 - **India:**
 - [National Framework for Malaria Elimination \(2016-2030\)](#)
 - [Malaria Elimination Research Alliance-India \(MERA-India\)](#)

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Widespread resistance of malarial parasite to drugs like chloroquine has prompted attempts to develop a malarial vaccine to combat malaria. Why is it difficult to develop an effective malaria vaccine? (2010)

- (a) Malaria is caused by several species of Plasmodium
- (b) Man does not develop immunity to malaria during natural infection
- (c) Vaccines can be developed only against bacteria
- (d) Man is only an intermediate host and not the definitive host

Ans: (b)

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