

# Bio E's corbevax vaccine

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## In news

Corbevax would be India's cheapest vaccine at Rs 250 per dose once it gets emergency use approval

## Key updates

- Corbevax is undergoing phase III trials and with phase I & II trials showing promising results, the Centre has pre-booked 30 crore doses for an advance payment of Rs 1,500 crore.
- It is being developed by Hyderabad-based company Biological E.
- **This is the first time the Indian government has placed an order for a vaccine that has not received emergency use authorization.**
- The Centre has provided major pre-clinical and clinical trial support towards the vaccine's development, including a grant-in-aid of Rs 100 crore from the Department of Biotechnology.

## How does Corbevax work?

- Corbevax is a "recombinant protein sub-unit" vaccine, which means **it is made up of a specific part of SARS-CoV-2 the spike protein on the virus's surface.**
- The spike protein allows the virus to enter the cells in the body so that it can replicate and cause disease. However, when this protein alone is given to the body, it is not expected to be harmful as the rest of the virus is absent.
- The body is expected to develop an immune response against the injected spike protein.
- Therefore, when the real virus attempts to infect the body, it will already have an immune response ready that

will make it unlikely for the person to fall severely ill.

- Although this technology has been used for decades to make hepatitis B vaccines, **Corbevax will be among the first Covid-19 vaccines to use this platform.**

### **How was Corbevax made?**

- While it is indigenously produced, Corbevax's beginnings can be traced to the Baylor College of Medicine's National School of Tropical Medicine. The School had been working on recombinant protein vaccines for coronaviruses SARS and MERS for a decade.
- When the genetic sequence for SARS-CoV-2 was made available in February 2020, researchers at the School pulled out the sequence for the gene for the spike protein, and worked on cloning and engineering it.
- The gene was then put into yeast, so that it could manufacture and release copies of the protein.
- After this, the protein was purified to remove any remnants of the yeast "to make it pristine".
- Then, the vaccine was formulated using an adjuvant to better stimulate the immune response.
- Recently, BCM transferred its production cell bank for this vaccine to Biological E, so that the Hyderabad-based company could take the candidate through trials.

### **Difference between Corbevax and other vaccines**

Other Covid-19 vaccines approved so far are either **mRNA vaccines** (Pfizer and Moderna), **viral vector vaccines** (AstraZeneca-Oxford/**Covishield**, Johnson & Johnson and Sputnik V) or **inactivated vaccines** (Covaxin, Sinovac-CoronaVac and Sinopharm's SARS-CoV-2 Vaccine–Vero Cell).

### **mRNA(messenger ribonucleic acid )**

Messenger RNA (mRNA) is a single-stranded RNA molecule that is complementary to one of the DNA strands of a gene. The mRNA

is an RNA version of the gene that leaves the cell nucleus and moves to the cytoplasm where proteins are made.

- Inactivated vaccines, which include killed particles of the whole SARS-CoV-2 virus, attempt to target the entire structure of the virus.
- On the other hand, **Corbevax, like the mRNA and viral vector Covid-19 vaccines, targets only the spike protein, but in a different way.**
- **Viral vector and mRNA and vaccines use a code** to induce our cells to make the spike proteins against which the body has to build immunity.
- In this case (Corbevax), researchers are actually giving the protein.
- Like most other Covid-19 vaccines, Corbevax is administered in two doses. However, as it is made using a low-cost platform, it is also expected to be among the **cheapest available in the country.**

### **About Biological E,**

- Biological E, headquartered in Hyderabad, was founded by Dr D V K Raju in 1953 as a biological products company that pioneered the production of heparin in India.
- By 1962, it forayed into the vaccines space, producing DPT vaccines on a large-scale.
- Today, it is among the major vaccine makers in India and, by its own claim, the “largest” tetanus vaccine producer in the world.
- It has seven WHO-prequalified shots, including a five-in-one vaccine against diphtheria, tetanus, pertussis, hepatitis B and haemophilus influenza type-b infections.
- Its vaccines are supplied to over 100 countries and it has supplied more than two billion doses in the last 10 years alone.
- The company has received WHO prequalification of its

Japanese encephalitis, DTwP and Td as well as measles and rubella vaccines and also commenced commercial operations in the US.