

# Covishield Vs Covaxin

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**Abstract-** *The vaccination drive for prevention against COVID-19 in India started from 16th January 2021. Two vaccines used for this drive are Oxford-AstraZeneca's Covishield and Bharat Biotech's Covaxin. This drive has already crossed 600,000 mark in first four days and the government has stated that the drive will be further accelerated in coming days to ensure immunity to the citizens of the country. However, there is a section of the community which is still skeptical to the COVID-19 vaccination. This research work has been conducted to analyze the sentiments in the tweets posted in India regarding these two vaccines. The analysis shows that while a majority of the population is posting with positive sentiments towards these vaccines, there are also negative sentiments associated with them, associated with the emotions such as fear and anger[1]*

**Keywords-** COVID-19, Vaccine, India, Covaxin, Covishield

## I. INTRODUCTION

Coronavirus disease-2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was declared a global pandemic on 11 March 2020, by the World Health Organisation.[9] The methods used to control the spread of the virus have been the traditional social distancing, quarantine, use of disinfectant substances, and wearing of protective face masks. These measures have adverse consequences, both psychological and economic, and have resulted in substantial disagreement among the medical community and political decision-makers regarding their efficacy. In parallel with the imposed restrictions to prevent viral spread and the testing of (mainly) repurposed anti-viral treatments is the accelerated development of vaccines to prevent/restrict potential viral damage. Safe and effective vaccines will be a gamechanger but for the foreseeable future we must continue wearing masks, physically distancing and avoiding crowds.[10] Being vaccinated does not mean that we can throw caution to the wind and put ourselves and others at risk, particularly because it is still not clear the degree to which the vaccines can protect not only against disease but also against infection and transmission.[8][9]

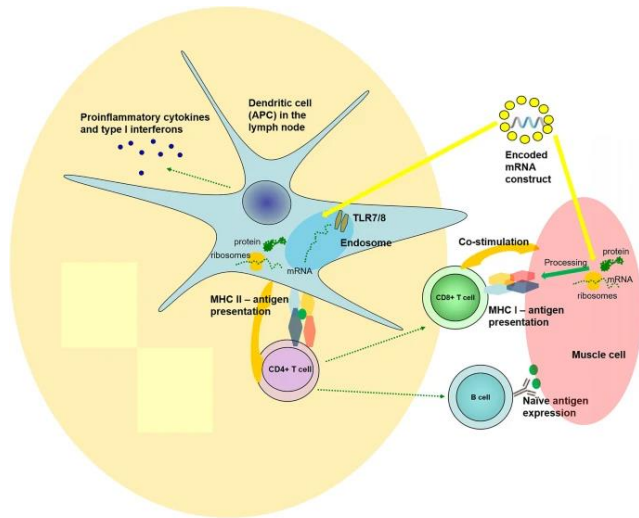
## History of Covishield

AZD1222 by Astra Zeneca and University of oxford On December 30, 2020, UK and on January 2, 2021, India

approved AZD1222 COVID-19 vaccine developed by AstraZeneca and the Oxford Vaccine Group at the University of Oxford. It was previously called as ChAdOx1, a chimpanzee adenovirus vaccine. This group has previously developed a MERS vaccine. In India, this vaccine is jointly developed by Serum Institute of India and AstraZeneca and is branded as Covishield. Oxford University and AstraZeneca, a pharmaceutical company both are engaged in developing Covishield vaccine. Its Indian partner —Serum institute Pune, is enduring for production of viral vector vaccine as brand name AZD1222. This contains weakened, genetically modified, nonreplicating strains of SARS-CoV-2 and adenovirus (causative of common cold). From the interim analysis, AZD1222 is found 70.4% efficacious against prevention of COVID-19 with no prominent adverse effects.[2]

## Mechanism of action covishield

Mechanism of action AZD1222 vaccine is a monovalent vaccine composed of a single recombinant, replication-deficient chimpanzee adenovirus vector encoding the S glycoprotein of SARS-CoV-2 (ChAdOx1-S (recombinant)). The SARS-CoV-2 S immunogen in the vaccine is expressed in the trimeric prefusion conformation. The coding sequence has not been modified, in order to stabilize the expressed S-protein in the prefusion conformation. Adenoviruses are nonencapsulated, icosahedral particles (virions), and contain a single copy of the double-stranded DNA genome. The expression cassette for the SARS-CoV-2 spike protein fused to the tissue plasminogen activator leader sequence uses a modified human cytomegalovirus promoter and a bovine growth hormone polyadenylation sequence.[3]



### Composition of Covishield

Composition One dose (0.5ml) contains  $5 \times 10^{10}$  ChAdOx1-S (recombinant) viral particles. The vaccine is produced in genetically modified human embryonic kidney (HEK) 293 cells. In addition to ChAdOx1-S (recombinant), this product also contains the excipients L-histidine, L-histidine hydrochloride monohydrate, magnesium chloride hexahydrate, polysorbate 80, ethanol, sucrose, sodium chloride, disodium edetate dihydrate and water for injection. None of the excipients are of animal or human origin. The excipients are well established for pharmaceutical products.[3]

### Administration

The vaccination course consists of two doses (each 0.5 ml) and should be administered within 4–6 weeks apart.[2]

### Adverse events for covishield

Adverse events Very common ( $\geq 10\%$  of subjects): headache, nausea, myalgia, arthralgia, injection site tenderness, injection site pain, injection site warmth, injection site pruritus, fatigue, malaise, feverishness, chills. Common (1–10% of subjects): injection site swelling, injection site erythema, fever  $\geq 38^\circ\text{C}$ .[3]

### Storage for covishield

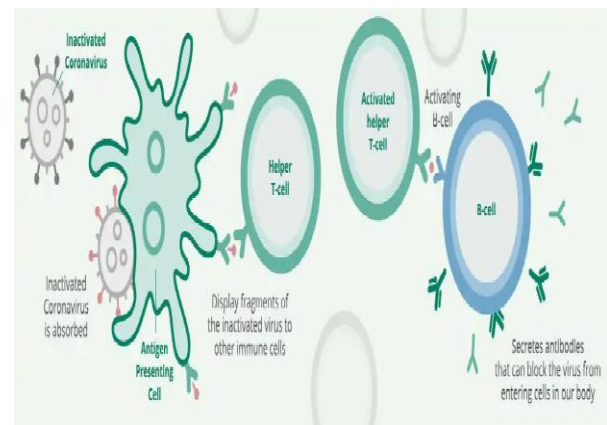
A shelf-life of 6 months is proposed. Chemical and physical in-use stability from the time of vial opening (first needle puncture) to administration is up to 48 hours in a refrigerator ( $2-8^\circ\text{C}$ ). Within this period, the product may be kept and used at temperatures up to  $30^\circ\text{C}$  for a single period of up to 6 hours, after which it must be discarded. It should not be returned to the refrigerator.[3]

### History of Covaxin

COVAXIN by Bharat Biotech and National institute of Virology, India COVAXIN, which is an indigenous COVID-19 vaccine to fight against corona virus, has been developed by Bharat Biotech in collaboration with Indian Council of Medical Research (ICMR) and National Institute of Virology (NIV). Whole Virion Inactivated Vero Cell derived platform technology was used to developed the vaccine. The Vero cell manufacturing platform has an excellent safety record of more than 300 million doses. The inactivated vaccines cannot possibly replicate and are thus cannot likely revert and cause pathological effects. They are manufactured using dead virus, incapable of infecting people but still able to instruct the immune system to mount a defensive reaction against an infection. On January 2, 2021, India approved an inactivated vaccine called Covaxin, developed by Bharat Biotech and India's National Institute of Virology.[5]

### Mechanism of action covaxin

Mechanism of action The vaccine is similar to CoronaVac (the Chinese vaccine developed by Sinovac) in that it uses a complete infective SARS-CoV-2 viral particle consisting of RNA surrounded by a protein shell, but modified so that it cannot replicate. After being injected in the body, the inactivated viruses are engulfed by immune cells called antigen presenting cells. The latter degrade the inactivated virus and display some of its protein on the surface of the cell. B cells and Helper T cells identify the spike proteins. The immune cells get activated and proliferate antibodies against the antigen.[7]



**Composition of Covaxin**

Composition COVAXIN is an inactivated vaccine obtained from the SARS-CoV-2 strain. The vaccine is used along with immune stimulants, commonly known as vaccine adjuvants (AlhydroxiqumII), to improve immune response and longer-lasting immunity. The vaccine candidate is produced through the formulation of the inactivated virus with Kansas-based ViroVax’s Alhydroxiqum-II adjuvant. COVAXIN mainly contains 6µg of whole-virion inactivated SARS-CoV-2 antigen (Strain: NIV2020-770), and the other inactive components such as 250µg aluminium hydroxide gel, 15µg TLR 7/8 agonist (imidazoquinolinone), 2.5mg TM 2-phenoxyethanol, and phosphate buffer saline up to 0.5ml. The vaccine requires no sub-zero storage and reconstitution requirement and available for use in multi-dose vials, stable at 2- 6°C.[5]

**Administration**

Covaxin comes as a two-dose regimen, recommended to be taken intramuscularly 28 days apart.[6]

**Adverse event of Covaxin**

Adverse event Bharat Biotech also listed the risks/side effects of Covaxin. These include: "Injection site pain, site swelling, redness, site itching, stiffness in the upper arm, weakness in injection arm, body ache, headache, fever, malaise, weakness, rashes, nausea,vomiting".[5]

**Storage of Covaxin**

Storage It is a vaccine with no sub-zero storage, no reconstitution requirement, and ready to use liquid presentation in multi-dose vials, stable at 2-8 °C.[5]

**Covaxin vs Covishield Efficacy Rate**

Covaxin	Covishield
If you apply it in a phase 3 study with Covaxin, it will have a 78% to 100% effect.	If you use this covid injection, the effect is 70% to 90%.
These injections only apply to people over 18 years old.	Covishield only applies to persons over 12 years of age.

The injection should only be performed under medical supervision and do not use anything without medical advice.	We ask that you only use this vaccine under the supervision of doctors and follow the advice of doctors.
This injection is given to you for 46 weeks.	You should take a full two or two weeks after 4 to 8 weeks of this second vaccination.

**Approval Status, Efficacy Rate, and Price**

- Covaxin vs Covishield Efficacy rate can be determined as covishield is the first vaccine to be approved for use in the 18 years and older age groups. The vaccine has a proven efficacy rate of up to 91% when the nurse gives both doses.
- Covishield is available free from public facilities and is the cheapest of the vaccines available from private organizations.
- Covaxin is also authorized for administration to those over 18 years of age. The Bharat Biotech team is working on clinical trials for the administration of Covaxin in children over 12 years of age.
- Covaxin has a proven efficacy rate of up to 100%. Covaxin is available at 1300 rupees per dose.[11]

**Latest vaccine updates**

- With the spread of the Delta variant and the anticipated third wave, studies show a decline in the vaccine’s effectiveness against it.
- Covishield has fallen to 65% and to 61% for Covaxin. Vaccines do not prevent a person from being infected, they help fight Covid19 infection. Vaccines greatly reduce the chances of landing in the hospital.
- Sputnik and Moderna are the vaccines that are creating a bus lately. While Sputnik is readily available in most cities, Moderna has yet to enter India.
- Thanks to the WHO COVAX program, India will receive more than 7.5 million doses of Moderna.[10]

**II. CONCLUSION**

The review outlines the real knowledge regarding covid 19 vaccines authorized by India. The review

concentrates on the kind of vaccine, administration route, effective dosing, observed side effects and storage conditions of covishield and covaxin, covid 19 vaccine candidates approved for use by India. Those vaccine are same effective

### III. ACKNOWLEDGEMENT

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### Abbreviations

- COVID-19: coronavirus disease 2019
- MERS-CoV: Middle East respiratory syndrome coronavirus
- SARS-CoV: severe acute respiratory syndrome-associated coronavirus
- SARS-CoV-2: severe acute respiratory syndrome coronavirus 2
- S protein: spike protein of SARS-CoV-2
- RBD: receptor binding domain
- VLP: virus-like particle
- CVCs: COVID-19 vaccine candidates

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