

# Services Marketing of COVID-19 Vaccines in the Present Scenario

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## ABSTRACT

*The global COVID-19 vaccines market is projected to reach USD 1,401 million by 2025 from USD 2,273 million in 2022, at a CAGR of -14.9% during the forecast period. The growth of the COVID vaccines market is attributed majorly to the rising number of people infected with COVID-19 and increasing funding for vaccine development.*

*On the other hand, the global COVID-19 drugs market is projected to reach USD 2 million by 2025 from USD 165 million in 2020, at a CAGR of -57.8% during the forecast period. The growth of the COVID drugs market is primarily attributed to use of repurposed drugs for compassionate use, and the emergence of alternative therapies such as convalescent plasma therapy which were earlier used for treating epidemic diseases such as SARS, MERS, and H1N1. Moreover, collaborations between global organizations and governments of various nations to promote the supply of essential drugs and medical supplies are fueling the market growth.*

*Researchers worldwide are working around the clock to find a vaccine against SARS-CoV-2, the virus causing the COVID-19 pandemic. The Herculean effort means that a fast-tracked vaccine could come to market anywhere from the end of 2020 to the middle of 2021. To date, just two coronavirus vaccine has been approved. Sputnik V – formerly known as Gam-COVID-Vac and developed by the Gamaleya Research Institute in Moscow – was approved by the Ministry of Health of the Russian Federation on 11 August. Experts have raised considerable concern about the vaccine's safety and efficacy given it has not yet entered Phase 3 clinical trials. A second vaccine in Russia, EpiVacCorona, has also been granted regulatory approval, also without entering Phase 3 clinical trials. Operation Warp Speed (OWS) is a collaboration of several US federal government departments including Health and Human Services and its subagencies, Agriculture, Energy and Veterans Affairs and the private sector. OWS has selected three vaccine candidates to fund for Phase 3 trials: Moderna's mRNA-1273, University of Oxford and AstraZeneca's AZD1222, and Pfizer and BioNTech's BNT162.*

*Within OWS, the US National Institutes of Health (NIH) has partnered with more than 18 biopharmaceutical companies to accelerate development of drug and vaccine candidates for COVID-19 (ACTIV). The COVID-19 Prevention Trials Network (COVPN) has also been established, which combines clinical trial networks funded by the National Institute of Allergy and Infectious Diseases (NIAID): the HIV Vaccine Trials Network (HVTN), HIV Prevention Trials Network (HPTN), Infectious Diseases Clinical Research Consortium (IDCRC), and the AIDS Clinical Trials Group.*

## INTRODUCTION

The global COVID-19 vaccines market is projected to reach USD 1,401 million by 2025 from USD 2,273 million in 2022, at a CAGR of -14.9% during the forecast period. The growth of the global COVID-19 vaccines market is majorly attributed to the increasing number of people infected with COVID-19 and growing funding for vaccine development.

The global COVID-19 drugs market is projected to reach USD 2 million by 2025 from USD 165 million in 2020, at a CAGR of -57.8% during the forecast period. The growth of COVID-19 drugs market is attributed primarily to use of repurposed drugs for compassionate use and the emergence of alternative therapies such as convalescent plasma therapy which were used earlier for treating epidemic diseases such as SARS, MERS, and H1N1.[1]

Furthermore, collaborations between global organizations and governments of various nations to promote the supply of essential drugs and medical supplies will fuel market growth. However, factors such as herd immunity, and uncertainty over the efficacy of vaccines and drugs are expected to hinder the market growth.

Currently, the R&D landscape for COVID-19 vaccines includes 115 vaccine candidates. The most advanced candidates that have recently moved into clinical development are:

- mRNA-1273 from Moderna
- Ad5-nCoV from CanSino Biologics
- INO-4800 from Inovio
- LV-SMENP-DC and pathogen-specific aAPC from Shenzhen Geno-Immune Medical Institute

While global drug makers are pouring massive resources into developing targeted therapies and vaccines, contract development and manufacturing organizations (CDMOs) are finding ways to ramp up the production of vaccines. In line with this, a new CDMO from Belgium's Univercells is offering its expertise to help drug makers scale up their manufacturing. Currently, around 155 molecules are under clinical investigation, and approximately 45 molecules are under preclinical development to be targeted against COVID-19. In this list, four promising drugs have been repurposed for use against COVID-19.[2]

- Remdesivir
- Chloroquine and hydroxychloroquine

- Lopinavir and ritonavir (and that same combination plus interferon-beta)
- An immune system messenger that can help stop the multiplication of viruses.

Researchers and physicians in several countries are focusing on various other existing drugs to examine their potential to treat COVID-19. Chinese authorities, which have been dealing with the virus longer, are recommending Arbidol (umifenovir), which has not been approved in Western countries, as well as old antivirals ribavirin and interferon-alpha. Similarly, Avigan (favipiravir) by Fujifilm has shown promise in the treatment of COVID-19.[3]

## DISCUSSION

The pandemic declaration of Covid-19 disease by World Health Organization (WHO) and subsequent widespread morbidities and mortalities in almost all countries of the world led to the research and development to find out a vaccine against SARS-CoV2 virus. Normally any new vaccine development takes 10–15 y time but the search for vaccine against SARS-CoV2 is going on at a very fast pace resulting in almost breakthrough in vaccine development by several research institutions and vaccine manufacturers. In pandemic situation, however, the entire process of vaccine development including clinical trials gets shortened and may be fast tracked to 15–18 mo time. It is expected that there shall be simultaneous marketing of several vaccines by the beginning of 2021. [4] There are more than 164 candidate vaccines which are in the process of development and among them 24 vaccines are in advanced stages of development. This review aims at highlighting the present stages of development of vaccines and discussing the challenges that may be faced with these novel vaccines.

On 30th January, 2020 World Health Organization (WHO) declared a severe respiratory disorder syndrome which originated in Wuhan city as a global public health emergency and on 11th February named the disease as Covid-19. The pandemic declaration by WHO was made on 11th March 2020. The spread of Covid-19 is now relentless and the spread in almost all the countries of the world is causing serious public health, social and economic upheaval. Vaccine is one of the best armamentaria in public health especially where no effective treatment is available against a disease. Since the declaration of outbreak

of Covid-19, there is a race for development of a safe and effective vaccine against SARS-CoV2. As of 21st July 2020, the landscape of SARS-Cov2 vaccine development in the world shows that there are 24 vaccines that are in advance stages and another 142 vaccines are also in various early stages of development[5]

## RESULTS

India's first COVID-19 vaccine Covaxin has been developed by Bharat BioTech, Indian Council of Medical Research (ICMR) and National Institute of Virology (NIV). Hyderabad-based vaccine maker has "successfully completed" Phase-I human clinical trials of the vaccine and Phase-II will start soon, Assam health minister Himanta Biswa Sarma said.

Another vaccine was developed by Zydus Cadila. Dubbed as ZyCoV-D, Zydus' COVID-19 vaccine commenced phase II clinical trials from August 6. "ZyCoV-D was found to be safe and well tolerated in the phase I clinical trial," the drug maker said.[6]

"All the subjects in phase I clinical trial were closely monitored in a clinical pharmacological unit for 24 hours post dosing for safety and for 7 days thereafter and the vaccine was found to be very safe," Zydus Cadila Chairman Pankaj R Patel said.

## CONCLUSION

With **four vaccine candidates in final stage human trials** and firms eyeing to launch them by year-end, the topic has now veered towards the pricing of the shots and which countries would access them first. The Covid-19 vaccine candidates by University of Oxford-AstraZeneca, Moderna Inc, Pfizer Inc-BioNTech and Chinese firm Sinovac are all undergoing Phase III trials at present.

While Pfizer, Moderna and Merck & Co have said they plan to sell their vaccines at a profit, some drug makers, including Johnson & Johnson have announced plans to price their vaccines on a not-for-profit basis. Johnson and Johnson has said it would make the Covid-19 vaccine available at \$10 for "emergency pandemic use".[7]

**Coronavirus (Covid-19) vaccines price, availability**

### **Oxford-AstraZeneca coronavirus vaccine**

Oxford University's AZD1222 vaccine, based on a chimpanzee adenovirus called ChAdOx1, is already undergoing a combined Phase II/III trials in the UK, Brazil and South Africa and may soon be tested in India as well. Early results have shown

that the vaccine produces a dual immune response in people aged between 18 and 55 years. The vaccine increased levels of both protective neutralising antibodies and immune T-cells that target the virus.

**Availability and deals:** AstraZeneca has partnered with Serum Institute of India (SII) to produce one billion doses of the vaccine in India and middle and low-income countries. **Phase III human clinical trials** is likely to start in India by late August and it may be launched as early as November.

The UK government has already struck a deal for 100 million doses of the Oxford vaccine. The firm has also signed a \$127 million deal with the Brazilian government to produce an initial 30 million doses. The firm has agreed to provide the US 300 million doses of the vaccine in exchange for \$1.2 billion in upfront funding.

**Oxford vaccine price:** Adar Poonawalla, CEO of Serum Institute of India, said the cost of the vaccine is estimated to be below Rs 1,000 (\$13) and will be called Covishield in India. In the UK, Oxford has said the vaccine will be available at a low cost.[8]

### *A. Moderna coronavirus vaccine*

Moderna Inc has **started Phase III trials of its mRNA-1273 vaccine** involving 30,000 human volunteers. The vaccine uses messenger RNA, a synthetic form of genetic material from the virus designed to nudge the body's immune system into attack mode. **Phase I results have shown the vaccine** is safe and provoked immune responses in all 45 healthy volunteers.

**Availability and deals:** Data of Phase III trials to determine the safety and efficacy of the vaccine will start coming in by November and the vaccine may be available by the end of December.

The US government is supporting Moderna's vaccine with nearly half a billion dollars and the firm has signed an agreement with drugmaker Catalent Inc to make an initial 100 million doses. It has also signed an agreement with Spain's Laboratorios Farmaceuticos Rovi SA, Swiss contract drugmaker Lonza Group AG and the Israel government.

**Moderna vaccine price:** Moderna is planning to price the vaccine at \$50-60 (Rs 3,700-Rs 4,500) for the entire course. This would mean that per dose would be priced at \$25-30 (Rs 1,800-Rs 2,300). Moderna's proposed price will apply to the United States and other high-income countries, a Reuters report said.[9]

### B. Pfizer-BioNTech coronavirus vaccine

Last week, American drugmaker Pfizer Inc, which has partnered with German biotech firm BioNTech to develop a vaccine candidate called BNT162b2, **progressed to phase II/III trials**. The vaccine, which will be tested on up to 30,000 participants, has been found to induce an immune response in patients, early results have revealed. Volunteers given two doses of the vaccine produced virus-neutralising antibodies.

**Availability and deals:** Pfizer is hoping to seek regulatory approval for the vaccine “as early as October” and have a vaccine on the market by year end.

Recently, the Donald Trump administration, in one of the largest investments yet, announced a nearly \$2 billion contract with Pfizer for 100 million doses. The UK government has secured 30 million doses of the BioNtech/Pfizer vaccine. Deals have been signed with the Netherlands, Germany, France and Italy as well.

**Pfizer vaccine price:** In The Netherlands, Germany, France and Italy, the vaccine will be priced at \$3-4 (Rs 225-300) per dose, as mentioned in Financial Times. In the US, the price will be \$39 for what is likely to be a two-dose course of treatment, or \$19.50 per dose.

### C. GAVI vaccine alliance

The GAVI vaccine alliance, of which India is a part and has pledged \$15 million, said it would seek to negotiate tiered pricing for richer and poorer countries. Seth Berkley, chief executive of the alliance, which is co-leading the COVAX facility, told Reuters that it was targeting a \$40 price for the vaccines in the wealthy countries.

With over 75 countries expressing interest in joining COVAX, the alliance aims to secure supplies of and deliver 2 billion doses across countries who sign up by the end of 2021.[10]

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