

VACCINATION DRIVE, VACCINE DIPLOMACY FOR COVID-19 PANDEMIC: INDIAN PERSPECTIVE

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ABSTRACT

COVID-19 or Corona virus is a new type of infection occurred first in December month of 2019 and is spreading to more than 180 nations including India. Government of India put the nation in a complete lockdown from March, 2020 and it is removed and re imposed based on severity of infection in different states across India. India begins its vaccination programme for Covid-19 on 16th January 2021 and it is now in third phase. The first phase of vaccination covers health and frontline workers and about 14 million frontline and healthcare workers are vaccinated that is less than as the target of 30 million. The second phase of vaccination programme covers all the people in above 60 years of age and, people between 45 and 60 years of age with one or few qualifying comorbidities, and frontline and healthcare workers do not get vaccination in first phase, The third phase of vaccination programme expands eligibility criteria to all people above 18 years of age and the Government of India allows higher flexibility for carrying out vaccination programme in third phase.

India uses mainly Covishield and Covaxin vaccines and followed by Sputnik V and Moderna is approved for vaccination for Covid-19 in India. India adopts centralized procurement policy for vaccination for Covid-19 and as on date, the total vaccination administrated is 43,51,96, 001 in India as a free of cost. Now India is number one nation in vaccination for covid in the world. India has distributed over 58 million vaccine doses to 65 nations through vaccine friendship programme and India stops its commercial exports from March because of domestic needs of vaccines and the stoppage of exports will continue till December, 2021. India is planned to complete vaccination for Covid-19 to all by the end of December, 2021. India is planned to complete vaccination for Covid-19 to all by the end of December, 2021. Covishield, Covaxin and Sputnik V are highly effective against delta variant in India. The oxygen crisis is happening in India during second wave of Covid due to inadequacy of the supply chain and distribution networks of oxygen tankers to transport medical oxygen from producers to the hospitals not

because of availability of medical oxygen in India. At present, India is having adequate amount of medical oxygen and it is highly ready to tackle any kind of medial oxygen related problems.

Key Words: COVID-19, Vaccine Diplomacy, Vaccination Drive, Vaccine effectiveness in India

1. INTRODUCTION

COVID-19 or Corona virus is a new type of infection occurred first in December month of 2019 and is spreading to more than 180 nations. Since, the first case is found in Wuhai city in China and it is very quickly spreading all over the world and World Health Organisation (WHO) declares this outbreak is pandemic in 11th March, 2020. The outbreak of COVID-19 is impacting people and business activities highly in every day. In India, Government of India put the nation in a complete lockdown from March, 2020 and it is removed and re imposed based on severity of infection in different states across India. The lockdown is imposing for the best interest of people and social distancing is need of the hour for avoiding spread of COVID-19 in large scale.

2. VACCINE DEVELOPMENT AND DISTRIBUTION IN INDIA

More than 30 vaccine companies are involving in development of vaccine for Covid-19 and they are in pre clinical trails on earlier part of May 2020. The Serum Institute of India (SII), Pune is the largest producer of vaccine in the globe and its current capacity is making India as a main player in the COVAX programme for distribution of covid vaccines to most of developing nations, The Serum Institute of India located Pune starts vaccine trails with animals and it applies clinical trails on April 2020 and gets approval from the Drug Controller General of India (DCGI) and it is planned to deliver a vaccine for covid within a year with anticipated efficacy of 70 to 80 per cent.

The SII gets approvals for trails in phases 2 and 3 for its vaccine discovered by Oxford university and straZeneca in the month of August, 2020 and it joins GAVI in the partnership with the Bill & Melinda Gates Foundation to manufacture 100 million doses of vaccine for developing nations. The SII plans to produce 1.5 to 2.5 billion of AstraZeneca doses yearly under the name of Covishield and it has stock of 50 million

doses and it is very short of its target quantum of 400 million doses as on January, 2020. The Government of India places order of 21 million doses that has to be delivered in the month of February, 2021 and it does not get any further order from Indian Government, so it exports the rest of stock to other nations.

Bharat Biotech located in Hyderabad starts its first trial of a nasal vaccine in collaboration with FluGen company, USA in the late month of 2020. The Indian Council of Medical Research is generating partnership with Bharat Biotech for developing vaccine for Covid in the month of May, 2020 in India and it gets approval from DCGI in the month of June, 2020 to start trail in phase 1 and 2 for its vaccine in the name of Covaxin and it announced that it has 81 per cent of efficacy in the phase of 3 in the month of March, 2021 and it announced to expand its capacity of producing 700 million doses annually in the month of April, 2021.

Cadila Healthcare starts development of vaccine in the month of March, 2020 and it has trail on human beings in July 2020 for ZyCoV-D, and gets approval for 3 phase in the month of January, 2021 and it starts to produce large quantum of vaccine in the month of April 2021 and it expects to get authorization for emergency use in the month of May to June 2021. Dr. Reddy's is having partnership with Russian Direct Investment Fund (RDIF) to carry out phase 3 trails of Sputnik V vaccine in India and it distributes vaccine after getting approval and it has agreement to produce Sputnik V in India as vaccine production hub. Clinical trail in phase 3 gets approval for another type of vaccine in the month of April 2021 named Corbevax,

The DCGI eliminates the clinical trails in India for vaccine developed across the border on second of June 2021 as they get approval already by reputed international health organization namely European Medicines Agency (EMA), World Health Organization (WHO), UK Medicines and Healthcare products Regulatory Agency (MHRA), US Food and Drug Administration (FDA) and Japan's Pharmaceuticals and Medical Devices Agency. These steps are helping to make accessibility of vaccines that are in use already in other nations. The approvals for Pfizer Moderna are getting delayed and delay in arrival of vaccines given freely by the United States that includes Moderna, AstraZeneca, Pfizer and Janssen due to administrative problem with Indian

authorities in the middle of July that those producers are not ready to take responsibility for adverse effects of their vaccines.

2.1. FIRST PHASE OF VACCINATION IN INDIA

The Government of India is planned to start vaccination to healthcare workers in first quarter of 2021 who are directly dealing with covid patients and it has to cover 30 million healthcare as priority target groups. The Drug Controller General of India (DCGI) approves Covishield on first January, 2021 and it also grants Covaxin as emergency use to treat covid patients on second January, 2021 as they do not complete their phase 3 trials. Because of this reason, those who want to get Covaxin vaccine, they have give consent, while, few states are choosing to demote Covaxin to a just buffer stock and they are mainly distributing Covishield.

India starts its programme for vaccination on 16th January 2021 through 3006 vaccination centers across the nation. The vaccination centre will give either Covaxin or Covishield. In the first three days, 631,417 people are vaccinated. Out of this, 0.002 per cent of them are hospitalized for treatment and observation and 0.18 per cent of them are having side effects. The response of people for vaccination is very low because of technical and safety issues, software problems and spreading of false information among people and creating fears among people about vaccine by opposition political parties and vested interest groups. The first phase of vaccination covers health and frontline workers consisting of sanitation workers, paramilitary forces, police personnel and disaster management volunteers. As on first March, about 14 million frontline and healthcare workers are vaccinated that is less than as the target of 30 million.

2.2. SECOND PHASE OF VACCINATION IN INDIA

The second phase of vaccination programme covers all the people in above 60 years of age and, people between 45 and 60 years of age with one or few qualifying comorbidities, and frontline and healthcare workers do not get vaccination in first phase, Online registration for vaccination starts on first March, 2021 through Co-WIN website and Aarogya Setu app. The vaccine exports are stopped because of starting of second wave of covid-19 and the Indian Government places order of 110 million Covishield doses from SII.

The SII is having goal of production of 100 million doses monthly, but its production capacity is only 60–70 million doses as on May, 2021. After the outcome of its trails, the DCGI gives authorization for emergency use of Covaxin on 11th March 2021. The eligible criterion is extended to all people above 45 years of age on 1st April, 2021. The Prime Minister of India calls for a four-day Vaccine Festival from 11 to 14th April, for the purpose to increase pace of vaccination programme as it covers as much as population. The total of more than 111 million are get vaccinated through Vaccine Festival.

2.3. THIRD PHASE OF VACCINATION IN INDIA

The DCGI gives approval for emergency use of Russia's Sputnik V vaccine in India on 12th April and the trail in phase 3 is conducted in India in September, 2020 and it has efficacy of 91.60 per cent. Dr. Reddy's Laboratories, the domestic distributor announced that it is planning to make vaccine available in end of May 2021 in India. In 19th April, the Government of India announces that third phase of vaccination programme will start on 1st May, expanding eligibility criteria to all people above 18 years of age.

The Government of India allows higher flexibility for carrying out vaccination programme in third phase. According to plan, 50 per cent of vaccines procured by the Central Drugs Laboratory from producers will be distributed by the central government. This supply will go to Government hospitals and health centers and offer at free of cost to people and the vaccines are distributed to states based on the quantum of active covid cases and the speed of administration of vaccines to people The rest will be given to individual states and purchased in the open market including private hospitals that will give vaccine to people above 18 years of age.

Registration for vaccination in third phase begins in 28th April and 13.3 million people have registered in the first day itself. The states namely Gujarat, Delhi and Madhya Pradesh announce that they will delay their vaccination programme because of shortage of supply of vaccines to later dates in May, 2021. The initial amount of 150,000 Sputnik V doses is reached India on 1st May, and the vaccination is started on 14th May. It is expected that around 156 million doses will reach India between August and December and doses will be procured from Russia initially, its domestic production will

start from August 2021. The DCGI approves phase 2 and 3 trials of Covaxin on children for age group 2-18 years on 13th May.

The additional amount of 2.17 billion doses of vaccine will be received during August to December 2021. As on 25th May, India vaccinates more than 200 million doses to people and the Ministry of Health and Family Welfare pre-ordered 300 million doses of Corbevax on 3rd June 2021 which is in clinical trials of phase 3. The Government of India permits walk in registrations for vaccination across the nation and health workers in the vaccination centers will register the recipients in the Co-win vaccination database. The Government of India claims that about 78 per cent of vaccines are administered through walk in registration as on 23rd June, 2021 as India crosses 300 million vaccine doses administered in 23rd June, 2021 and in the month of June 2021, 106 million doses are administered across the nation. India overtakes the United States in the administration of covid vaccine to people on 28th June, and now India is number one nation in vaccination for covid in the world. The Government of India announces that States and Union Territories will get 120 million doses of covid vaccine by the end of July, 2021. As on 26th July, the total vaccination administered is 43,51,96,001 in India.

3. RETURN TO CENTRALISED PROCUREMENT

Initially, Central Government procures and distributes vaccines to all States and Union Territories, but States and Union Territories want to procure vaccines separately by them through global tenders, but, vaccine manufacturers refuse to send vaccine to States and Union Territories and they strongly said that they will deal only with Central Government. Because of this States and Union Territories request Central Government to procure and distribute vaccine to them. As per requests of State Governments and Union Territories, Government of India moves back to centralized procurement of vaccines by 21st June. As per new vaccine policy of India, Out of total procurement, 75 per cent of them will be provided to States and Union Territories at free of cost after procured by Central Government and the rest of 25 per cent will be given to private hospitals as per new vaccine policy of India. These changes are having impact on vaccination programme as 8,270,000 doses are administered to people in 21st June which is the highest single day vaccination in India.

4. STATUS OF VACCINE IN INDIA

The status of vaccine in India is shown in Table-1.

Table-1. Status of Vaccine in India

Name of Vaccine	Status	Production Capacity	Doses Ordered	Date of Approval
Covishield	In use	840 million	750 million	1 st January 2021
Covaxin	In use	700 million	550 million	3 rd January 2021
Sputnik V	In use	140 million	156 million	12 th April 2021
Moderna	Approved	Import only	-	29 th June 2021
ZyCoV-D	Awaiting	-	-	Awaiting
Corbevax	Phase III trials	-	300 million	Awaiting
Covovax	Phase III trials	-	200 million	Awaiting

Source: <https://www.mygov.in/covid-19.html>. Accessed from the Government of India website.

4.1. COMMERCIAL ASPECTS OF VACCINE FOR COVID-19

The Government of India is vaccinating people in India at free of cost and it determines price of vaccines for private hospitals. The price of Covishield is Rs. 780 and the price of Covaxin is Rs. 1410 and the price of Sputnik V is Rs. 1145 per dose in private hospitals.

4.2. COVID-19 VACCINE IN GLOBAL MARKET

The first mass vaccination programme is started in earlier part of December, 2020 and quantum of vaccination is daily updated in data base. There are 13 different vaccines across four platforms are administrated. The Pfizer/BioNtech Comirnaty vaccine is listed for WHO Emergency Use Listing (EUL) on 31st December 2020. The SII / Covishield and AstraZeneca / AZD1222 vaccines developed by AstraZeneca / Oxford and manufactured by the State Institute of India and SK Bio respectively are given EUL on 16th February, 2021. The Janssen/Ad26.COV 2.S developed by Johnson & Johnson is listed for EUL on 12th March 2021. The Moderna COVID-19 vaccine (mRNA 1273) is listed for EUL on 30th April 2021 and the Sinopharm COVID-19 vaccine is listed for EUL on 7th May 2021. The Sinopharm vaccine is manufactured by Beijing Bio-Institute

of Biological Products Co Ltd, subsidiary of China National Biotec Group (CNBG). The Sinovac-CoronaVac is listed for EUL on 1st June 2021.

5. INDIA’S VACCINE DIPLOMACY FOR COVID-19

India begins exports covid vaccines to neighbouring nations in January, 2021 as humanitarian gesture which is known as vaccine friendship with the objective of leveraging nation’s pharmaceutical industry to export vaccines produced in India to other nations. India donates 5.5 million vaccines to, Bangladesh, Mauritius, Nepal, Myanmar, Seychelles, Sri Lanka Maldives, and BahrainBhutan and also to Nicaragua, Africa. India distributes vaccines to other nation through commercial exports through the COVAX programme. India is distributing more than 58 million vaccine doses to 65 countries as on 10th March 2021 through vaccination scheme and India stops its commercial exports because of domestic needs of vaccines and the stoppage of exports will continue till December, 2021.

5.1. EFFECTIVENESS OF VACCINE AGAINST DELTA VARIANT

The delta (B.1.617.2) variant of the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), the virus that causes corona virus disease 2019 (Covid-19), is contributed to a surge in cases in India and has now been detected across the nations. The delta variant is detected first in the last October in India and it lead to a massive second wave of covid cases in India. The delta variant is dominant lineage for most of new covid cases across India. India is using Covishield, Covaxin and Sputnik V for covid vaccination drive and these three vaccines are highly effective against delta variant.

5.2. OXYGEN CRISIS DURING SECOND WAVE OF COVID-19 IN INDIA

In the past one and half years of covid-19 pandemic, hospitals are not facing any shortage of medical oxygen for treating their patients. The second wave covid-19 virus in India commences in mid March 2021 and the problem of oxygen shortage is witnessed huge in the months of April and May, 2021. The distribution of medical oxygen is a highly complex process and large hospitals are receiving medical oxygen directly from producers and they use tankers to transport the oxygen. But, medium and small hospitals and nursing homes are highly depending on intermediaries and they supply oxygen

through various sizes of cylinders to them. The whole supply chain is very severely affected in multiple levels because of sudden and huge increase in demand of oxygen across the nation from 3,842 MT per day on 12th April 2021 to 8,400 MT per day by 25th April 2021, and further increases to 11,000 MT per day at the start of May 2021 and it is slowly reduced as decrease in fresh cases in India.

In the month of April 2021, the demand for medical oxygen is suddenly increased and large number of tankers are required to transport medical oxygen, But, India is having around 1,200 cryogenic oxygen tankers and it is not sufficient to meet out requirements. In order to solve the oxygen shortage problem Government of Uttar Pradesh has repurposed tankers used for other liquid gases for transportation of medical oxygen and it utilizes technology. The big corporate houses namely Reliance, Adani Group, and Tata Companies are diverted their industrial oxygen to various hospitals across the nation. Meanwhile, the Government of India airlifts tankers from other nations and runs Oxygen Express trains for quick transportation of liquid oxygen to needed areas from larger industrial plants and units. In addition, many nations donate oxygen plants, oxygen concentrators and tankers to India in the last week of April.

In the early period of 2020, the Ministry of Commerce's Department of Promotion of Industry and Industrial Trade forms an oxygen monitoring committee and take several rounds of discussions with oxygen manufacturers' associations about the augmentation of capacity based on potential requirements. State governments are apprised of the need and importance to set up oxygen plants at the big and large hospitals in their jurisdictions, and funds are allocated for 162 oxygen plants from PM CARES Fund for this purpose in January 2021. Most number of states do not proceed to setting up the oxygen plant and they are facing severe shortage of medical oxygen during the second wave of covid. Only Assam and Uttar Pradesh states have set up oxygen plants in bigger hospitals and Odisha state which is less affected in second wave supply 345 tankers to various affected states across the nation and it is producing massive quantum of oxygen in their industrial plants and this state is easily managing its own requirements.

As the situation is worst, the Central and State Governments are moving to oxygen rationing. In India, the Central Government collects information on oxygen beds and ICU beds from all covid-19 hospitals in all state and allocates a certain quantity of oxygen to the state, based on the amount that is necessary for the treatment of every patient. (i.e., 5 lit / min is allocated for an oxygen bed, and 20-24 lit / min for an ICU bed) and in turn, each state allocates amount of oxygen to each district and each district to its hospitals. In turn, each state allocated a quota to each district, and each district to the hospitals under their jurisdiction. High-Flow Nasal Cannula (HFNC) is a commonly used treatment modality for covid-19 patients that push in a high flow of oxygen at up to 100 lit/min to severely ill patients and it reduce the need for ventilatory support by over 50 per cent. Hospitals are directed to appoint a nurse whose sole responsibility is to monitor and control oxygen wastage, from leaking oxygen lines to patients not turning off their oxygen on visits to the washroom and another person is appointed to brief the collector's office on daily requirements and supplies.

The Central Government launches Project O₂ For India in the month of June, 2021 and under the direct command of the office of Principal Scientific Advisor, A National Consortium of Oxygen consisting of corporations, Indian Institutes of Technology (IITs), and various non-profit organizations is helping the government in building up the supply chain of critical materials and parts of oxygen plants. Funding for plants is being arranged through PM CARES and corporate sponsorships through CSR funding and more than 1,200 oxygen plants are sanctioned at government hospitals with PM CARES funds. Out of this, 551 plants are approved for district hospitals. Further, various corporate bodies namely Coal India, Maruti Suzuki, and Tata Group have stepped in, offering to build plants at different hospitals.

Several plants are commissioned in UP, Haryana, Kerala, Assam, Nagaland, Gujarat, Maharashtra and other states either through State and Central government funding, or by corporate support. As there are 734 district hospitals in the nation, most of them will have oxygen plant within the next few months, provided the local authorities expedite the installations. The oxygen crisis is happening in India during second wave of covid due to inadequacy of the supply chain and distribution networks

of oxygen tankers to transport medical oxygen from producers to the hospitals not because of availability of medical oxygen in India. At present, India is having adequate amount of medical oxygen and it is highly ready to tackle any kind of medial oxygen related problems.

6. CONCLUSION

India begins its vaccination programme for Covid-19 on 16th January 2021 and it is now in third phase. The first phase of vaccination covers health and frontline workers and about 14 million frontline and healthcare workers are vaccinated that is less than as the target of 30 million. The second phase of vaccination programme covers all the people in above 60 years of age and, people between 45 and 60 years of age with one or few qualifying comorbidities, and frontline and healthcare workers do not get vaccination in first phase, The third phase of vaccination programme expands eligibility criteria to all people above 18 years of age and the Government of India allows higher flexibility for carrying out vaccination programme in third phase. India uses mainly Covishield and Covaxin vaccines and followed by Sputnik V and Moderna is approved for vaccination for Covid-19 in India.

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India is planned to complete vaccination for Covid-19 to all by the end of December, 2021. Covishield, Covaxin and Sputnik V are highly effective against delta variant in India. The oxygen crisis is happening in India during second wave of covid due to inadequacy of the supply chain and distribution networks of oxygen tankers to transport medical oxygen from producers to the hospitals not because of availability of medical oxygen in India. At present, India is having adequate amount of medical oxygen and it is highly ready to tackle any kind of medial oxygen related problems.

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