



# Fighting the pandemic that's disrupting our WORLD

**KNOWLEDGE REPORT**

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# Foreword

## *"Supply Chain Challenges of COVID-19 Vaccines: The Indian Imperative"*

**Devendra Mishra,  
Executive Director & Co-Founder, BSMA**

A consortium of eight national and international institutions of Life Sciences, Biotech and Pharmaceutical Industries and Academia, has organized this International Virtual Conference on November 20, 2020 to fight the war on the apocalyptic pandemic of COVID-19. The Supply Chain challenge of delivering vaccines to the 1.35 billion people of India is unprecedented.

The timely and effective delivery of approved vaccines to the population of India will require a comprehensive approach for the vaccine manufacturers and the distribution networks to operate under the guidelines of the Indian Government and collaborate with distributors and hospitals under rigorous conditions of cold chain, safety and regulatory compliance.

India, while having four times the population of the USA, the greatest democracy and richest nation on earth, has a COVID-19 infection of 80% and deaths of 50% of that of the USA. The world is taking a cue from the unprecedented collaboration between the Central Government of India, State Governments, vaccine manufacturers and distributors, hospitals, doctors and nurses.

I believe 20 years ago, the Y2K crisis enabled the IT industry of India to seize the global market for Information technology. Ironically, the Coronavirus pandemic is providing the bio-pharmaceutical industry of India the unique opportunity to seize a significant share of the Trillion \$ global bio-pharmaceutical market. Furthermore, the USA has concluded that it must mitigate its risk of excessive dependence for drugs, APIs and materials on China, and India is an ideal second choice for sourcing. After all, India is known as "the pharmacy of the world." Its factories churn out more than half the globe's total vaccine supply and produce more generic drugs than anywhere else. The Serum Institute of India, Zydus Cadila, Bharat Biotech and possibly 4 other vaccine manufacturers are in advanced stages of clinical trials for COVID-19 vaccines.

In addition to the challenge of leveraging India's scientific pool for innovation in biopharma, the supply chain for the industry must be built over time. A widespread awakening from the current coronavirus epidemic is how vulnerable the bio-pharmaceutical supply chain is, even in the USA, where human lives have been lost because of it. Building India's supply chain infrastructure for life sciences may prove to be the greatest enabler of the country becoming the 3<sup>rd</sup> largest economy in the world in the next two decades.

Let this conference be a precursor for a national dialog so that the mission can be operationalized to maximize the health of the people of the nation.



## About the Author

### Mr. Rahul Agarwal

**Managing Director,  
Kool-ex Cold Chain Ltd. & Kool-ex Warehousing Ltd.**

Completed his B. Com from Symbiosis College of Arts & Commerce, Pune in 1993 and a Diploma in Business Management from Symbiosis Institute of Business Management, Pune.

Immediately after education he moved to Singapore where he took charge of trading activities for a large Indian Group primarily involved in Commodity trading globally. A three-year stint in this company got him tremendous exposure in International trade & Finance & on return to India in 1997, joined his family business of transportation.

Took charge of activities & over the next 10 years he has transformed the company into a Logistics Organization with strong focus on Pharma and FMCG logistics with a huge fleet of 250 – 32FT MXL trucks.

In the year 2012, the company took a step further to venture into the Temperature Controlled movement of Pharmaceuticals, based on the advice given by various Pharma Principals.

This paid huge dividends & the company has grown from 12 reefer trucks in 2012 to 350 reefer trucks in Dec 19 with a target to cross 800 reefer trucks by Dec 2023. Global quality guidelines & Government regulatory are also instrumental in driving the Pharma industry towards a complaint supply chain right up to retail levels in the last mile.

The client base boasts of the top Pharma companies in India & is currently providing all types of services under the supply chain to its customers. The company has started last mile delivery recently & announced its foray into large scale temp controlled warehousing services & poised to emerge as an end to end Supply Chain Company, providing complete solutions.

Along with his brother Kunal Agarwal, who is an MBA from USA, the organization is heading for a big jump in the field of Pharma Cold Chain Services. Under his leadership, Kool-ex is the proud recipient of multiple awards and is a co-organizer/ speaker at most Pharma/ Cold Chain conferences, Government Initiatives and at Management Institutes.



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# Preface

The **COVID-19 pandemic**, also known as the **coronavirus pandemic**, is an ongoing pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), first identified in December 2019 in Wuhan, China. The World Health Organization declared the outbreak a Public Health Emergency of International Concern in January 2020 and a pandemic in March 2020. As of 15 November 2020, more than 54.3 million cases have been confirmed, with more than 1.31 million deaths attributed to COVID-19.

COVID-19 mainly spreads through the air when people are near each other long enough, primarily via small droplets or aerosols, as an infected person breathes, coughs, sneezes, sings, or speaks. Transmission via fomites (contaminated surfaces) has not been conclusively demonstrated. It can spread as early as two days before infected persons show symptoms (pre-symptomatic), and from asymptomatic (no symptoms) individuals. People remain infectious for up to ten days in moderate cases, and two weeks in severe cases.

Common symptoms include fever, cough, fatigue, breathing difficulties, and loss of Smell and taste. Complications may include pneumonia and acute respiratory distress syndrome. The Incubation period is typically around five days but may range from one to 14 days. There are several vaccine candidates in development, although none have completed clinical trials as on date.



# Preface

There is no known specific antiviral medication, so primary treatment is currently symptomatic.

Recommended preventive measures include hand washing, covering one's mouth when sneezing or coughing, social distancing, wearing a face mask in public, ventilation and air-filtering, disinfecting surfaces, & monitoring and self-isolation for people exposed or symptomatic. Authorities worldwide have responded by implementing travel restrictions, lockdowns, workplace hazard controls, and facility closures. Many places have also worked to increase testing capacity and trace contacts of the infected.

The responses have caused global social and economic disruption, including the largest global recession since the Great Depression. It has led to the postponement or cancellation of events, widespread supply shortages exacerbated by panic buying, famines affecting hundreds of millions of people, and decreased emissions of pollutants and greenhouse gases. Educational institutions have been partially or fully closed. Misinformation has circulated through social media and mass media.

There have been incidents of xenophobia and discrimination against Chinese people and against those perceived as being Chinese or as being from areas with high infection rates. With the opening up of most countries, there is a strong likelihood of a second wave of the virus, which could further disrupt our way of life.

# Current Pandemic Situation - Global

The global epidemiological situation In the past week, the global number of cases of COVID-19 has increased by 8% compared to the previous week, totalling more than 3.6 million new cases, while new deaths have increased by 21% to over 54000.

This brings the cumulative numbers to over 49.7 million reported cases and over 1.2 million deaths globally since the start of the pandemic.

The European Region continues to account for the greatest proportion of new cases and deaths in the past 7 days, the Region reported over half (54%) of all new cases and nearly half (47%) of new deaths. Although it still accounts for only 2% of the global total

number of cases and deaths, this week the Western Pacific Region showed the largest relative proportional increase in new cases (19%) compared to the previous week followed by the Eastern Mediterranean Region (18%) and the European region (11%).

The three regions reporting the highest proportional increases in newly reported deaths in the past 7 days compared to the previous week are Europe (44%), Africa (30%) and the Eastern Mediterranean (23%). The Western Pacific Region was the only region to report a decrease in deaths (5%) this week compared to the previous week.

The five countries reporting the highest number of cases in the past week were The United States of America, France, India, Italy and the United Kingdom.

Additional Region-specific information can be found below: [African Region](#), [Region of the Americas](#), [Eastern Mediterranean Region](#), [European Region](#), [South-East Asia Region](#), and [Western Pacific Region](#).

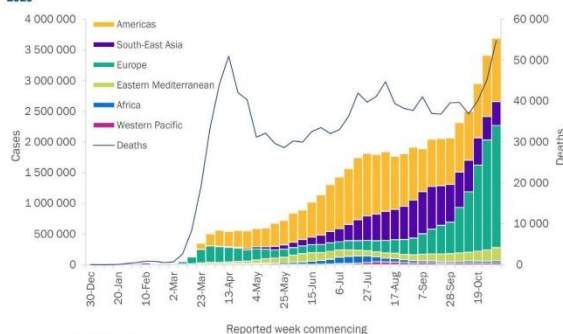
**Table 1. Newly reported and cumulative COVID-19 confirmed cases and deaths, by WHO Region, as of 8 November 2020<sup>\*\*</sup>**

| WHO Region            | New cases in last 7 days (%) | Change in new cases in last 7 days * | Cumulative cases (%)     | New deaths in last 7 days (%) | Change in new deaths in last 7 days* | Cumulative deaths (%)   |
|-----------------------|------------------------------|--------------------------------------|--------------------------|-------------------------------|--------------------------------------|-------------------------|
| Europe                | 1 989 636 (54%)              | 11%                                  | 13 144 973 (26%)         | 25 531 (47%)                  | 44%                                  | 311 542 (25%)           |
| Americas              | 1 031 573 (28%)              | 3%                                   | 21 509 104 (43%)         | 17 289 (32%)                  | <1%                                  | 656 629 (53%)           |
| South-East Asia       | 390 157 (11%)                | 2%                                   | 9 641 945 (19%)          | 5 132 (9%)                    | 10%                                  | 149 326 (12%)           |
| Eastern Mediterranean | 214 072 (6%)                 | 18%                                  | 3 307 411 (7%)           | 5 675 (10%)                   | 23%                                  | 84 305 (7%)             |
| Africa                | 33 687 (1%)                  | 2%                                   | 1 357 945 (3%)           | 831 (2%)                      | 30%                                  | 30 616 (2%)             |
| Western Pacific       | 31 370 (1%)                  | 19%                                  | 765 197 (2%)             | 377 (1%)                      | -5%                                  | 15 942 (1%)             |
| <b>Global</b>         | <b>3 690 495 (100%)</b>      | <b>8%</b>                            | <b>49 727 316 (100%)</b> | <b>54 835 (100%)</b>          | <b>21%</b>                           | <b>1 248 373 (100%)</b> |

\*Percent change in the number of newly confirmed cases/deaths in past seven days, compared to seven days prior. Regional percentages rounded to the nearest whole number, global totals may not equal 100%.

\*\*See data, table and figure notes.

**Figure 1: Number of COVID-19 cases reported weekly by WHO Region, and global deaths, as of 8 November 2020<sup>\*\*</sup>**



\*\*See data table and figure notes.

# Current Pandemic Status - India

While India has the second highest number of detected cases, second to the USA, it also has amongst the lowest death ratios, and amongst the highest recovery ratios.

| #  | Country,  | Total       | Total     | Total      | Active     | Population    | Total      | Total      | Total       | Total      |
|----|-----------|-------------|-----------|------------|------------|---------------|------------|------------|-------------|------------|
|    | Other     | Cases       | Deaths    | Recovered  | Cases      |               | Deaths/    | Deaths/    | Recovery/   | Recovery/  |
|    | World     | 54,328,752  | 1,318,278 | 37,869,096 | 15,141,378 |               | Cases      | Population | Cases       | Population |
| 1  | USA       | 11226038.00 | 251256.00 | 6891015.00 | 4083767.00 | 331727464.00  | 2.23815383 | 0.07574169 | 61.38421231 | 2.07731218 |
| 2  | India     | 8814902.00  | 129674.00 | 8203737.00 | 481491.00  | 1385049027.00 | 1.47107705 | 0.00936241 | 93.06668412 | 0.59230661 |
| 3  | Brazil    | 5848959.00  | 165673.00 | 5291511.00 | 391775.00  | 213122892.00  | 2.83252114 | 0.07773590 | 90.46927838 | 2.48284497 |
| 4  | France    | 1954599.00  | 44246.00  | 139140.00  | 1771213.00 | 65327655.00   | 2.26368682 | 0.06772936 | 7.11859568  | 0.21298790 |
| 5  | Russia    | 1903253.00  | 32834.00  | 1425529.00 | 444890.00  | 145957963.00  | 1.72515162 | 0.02249552 | 74.89960610 | 0.97667093 |
| 6  | Spain     | 1492608.00  | 40769.00  | N/A        | N/A        | 46761579.00   | 2.73139364 | 0.08718482 | N/A         | N/A        |
| 7  | UK        | 1344356.00  | 51766.00  | N/A        | N/A        | 68019263.00   | 3.85061695 | 0.07610491 | N/A         | N/A        |
| 8  | Argentina | 1304846.00  | 35307.00  | 1119366.00 | 150173.00  | 45350087.00   | 2.70583655 | 0.07785432 | 85.78529574 | 2.46827751 |
| 9  | Colombia  | 1191004.00  | 33829.00  | 1097576.00 | 59599.00   | 51084356.00   | 2.84037669 | 0.06622184 | 92.15552593 | 2.14855601 |
| 10 | Italy     | 1144552.00  | 44683.00  | 411434.00  | 688435.00  | 60428372.00   | 3.90397291 | 0.07394374 | 35.94716535 | 0.68086229 |

ACTIVE CASES  
484547

DEATHS  
128668

DISCHARGED / MIGRATED  
8115580/1

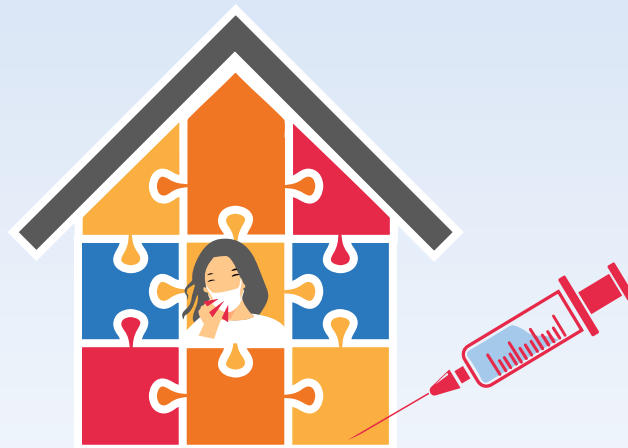
Situation Update  
on 13<sup>th</sup> November 2020



# Status Of Vaccines Candidates

- **Is there a vaccine for Covid 19?**

Many potential vaccines for COVID-19 are being studied and several large clinical trials may report results later this year. If a vaccine is proven safe and effective, it must be approved by national regulators, manufactured to exacting standards, and distributed. WHO is working with partners around the world to help coordinate key steps in this process. Once a safe and effective vaccine is available, WHO will work to facilitate equitable access for the billions of people who will need it.



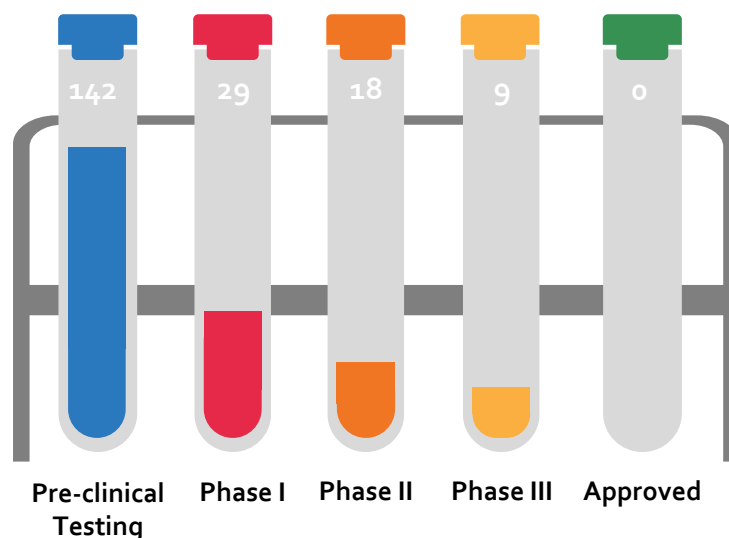
- **When is a vaccine for Covid 19 expected?**

It is estimated that it could be in early to mid-2021, before COVID-19 vaccines can be delivered & several important challenges must be overcome:

The vaccines must be proven safe and effective in large (phase III) clinical trials. Many potential vaccines for COVID-19 are being studied, and some of the large clinical trials may report results in late 2020 or early 2021.

## How Close Is The World To A Corona Virus Vaccine?

Number of Covid-19 vaccine candidates by development phase\*



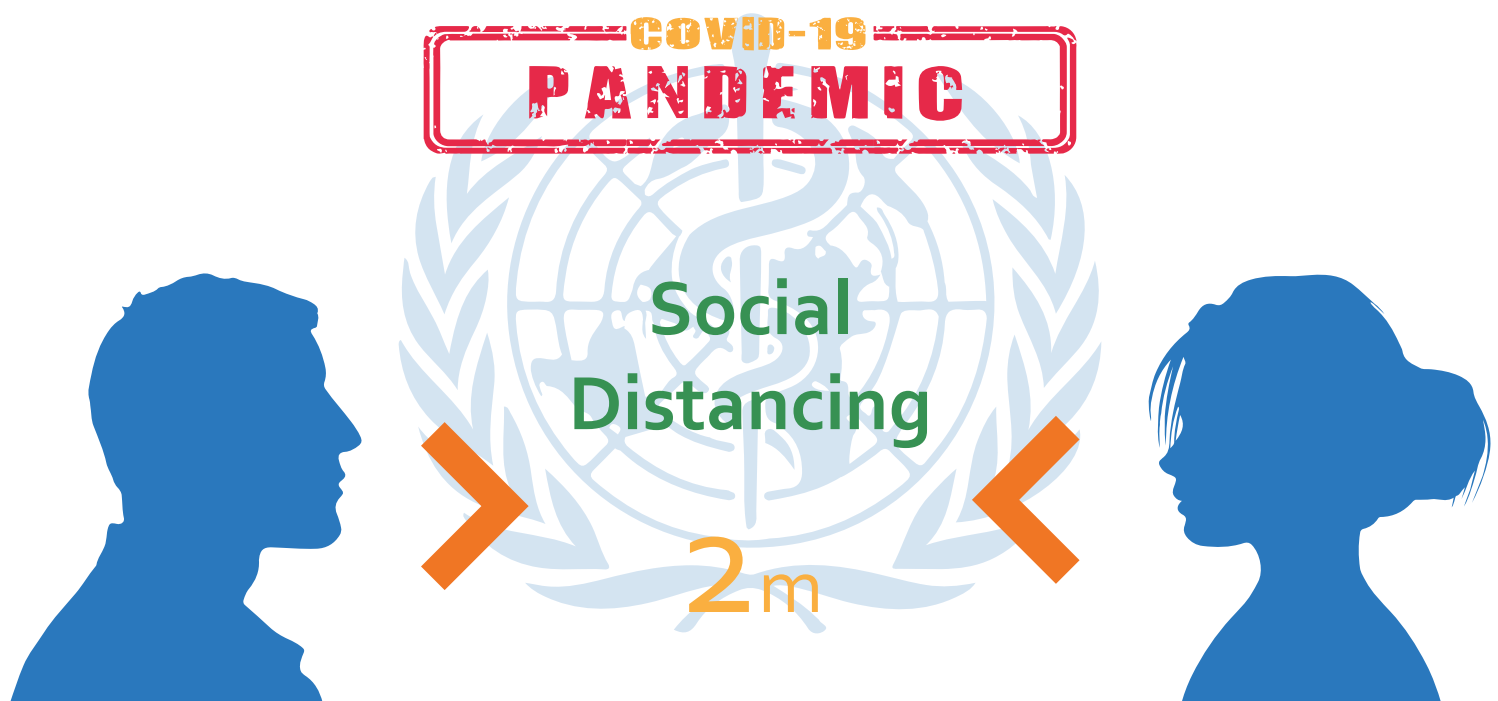
\*As of September 8, 2020

Source: World Health Organisation via The Guardian

# Status Of Vaccines Candidates

- A series of independent reviews of the efficacy and safety evidence is required, including regulatory review and approval in the country where the vaccine is manufactured, before WHO considers a vaccine product for prequalification. Part of this process also involves the Global Advisory Committee on Vaccine Safety.
- An external panel of experts convened by WHO, called SAGE, will analyse the results from clinical trials and along with evidence on the disease, age groups affected, risk factors for disease, and other information, they will recommend whether and how the vaccines should be used. Officials in individual countries will decide whether to approve the vaccines for national use and develop policies for how to use the vaccines in their country based on the WHO recommendations.
- The vaccines must be manufactured in large quantities, which will be a major and unprecedented challenge – all the while continuing to produce all the other important life-saving vaccines already in use.
- As a final step, vaccines will be distributed through a complex logistical process, with rigorous stock management and temperature control.

**WHO is working with partners around the world to accelerate every step of this process, while also ensuring the highest safety standards are met. WHO is cautiously optimistic that safe and effective vaccines for COVID-19 will be successfully developed. There is a robust pipeline of potential vaccines in development, and some have already advanced to large (phase III) clinical trials based on promising early data.**



# Developing Vaccine at the Pandemic Speed

## Challenges

- ❑ In the first six months of the pandemic, more than 700 products for treatment or prevention of COVID-19 went into the pipeline, which is unprecedented.
- ❑ The development of a vaccine against SARS-CoV-2 to contain its spread and help eliminating it from the human population is a challenging task because there is lack of information on its biological properties, epidemiology, specific immune responses against it, etc. Another problematic aspect of SARS-CoV infections is the presence of the non-structural protein papain-like protease which behaves like a deubiquitinase and may deubiquitinate certain host cell proteins such as interferon factor-3 and nuclear factor kappa B, resulting in immune suppression.

The potential of transmissibility or spread of viruses is measured in terms of the reproductive number ( $R_0$ ). Stochastic and statistical methods have revealed an average  $R_0$  of 3.28 for SARS-CoV-2 which exceeds the WHO estimates of 1.4–2.5. However, the transmissibility of SARS-CoV and MERS-CoV in the hospital setting is comparatively lower, which is indicated by their lower (less than 1)  $R_0$  values.

It means a COVID-19-infected person can transmit the virus to 3.28 persons, whereas SARS- and MERS-infected persons can transmit the virus to less than one person. About 50% of the COVID-19 cases do not show signs of fever before hospitalization. The higher  $R_0$  value of SARS-CoV-2 along with the transmission from asymptomatic infected individuals indicates that control and prevention of COVID-19 will be challenging without development of a vaccine.



### COVID-19 Vaccine and Treatment Tracker

CoVaTrack is the first COVID-19 Vaccine & Treatment Tracker portal for India, featuring the latest news and updates on vaccines & treatments for Novel Coronavirus, including clinical trials to approvals.

#### Global Statistics

| 291                                           | 204                                                | 8                                                      | 10                                                  | 3                                                 | 1                                                  | 5                                      | 0                                       |
|-----------------------------------------------|----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------|----------------------------------------------------|----------------------------------------|-----------------------------------------|
| Pre-clinical                                  | Clinical                                           | Phase I                                                | Phase I / II                                        | Phase II                                          | Phase II / III                                     | Phase III                              | Approved                                |
| Treatments & Vaccines not yet in human trials | Treatments & vaccines undergoing clinical research | Clinical trials with volunteer groups of less than 100 | Simultaneous trials on small & large patient groups | Clinical trials on larger groups of more than 100 | Simultaneous trials in large and very large groups | Vaccines in large-scale efficacy tests | Approved for nation-wide sale and usage |

Last updated: 02:45 AM, IST, 29<sup>th</sup> Aug 2020 | Source: Milken Institute

# Developing Vaccine at the Pandemic Speed

## Challenges

### The Vaccine Production Process

Normal vaccine production timeline 8-15 years  
**Target for COVID-19 vaccine 12-18 months\***

#### 1. Research

Normal 2-4 years

**Accelerated 6 months**



#### 4. Approval

Normal 1 year

**Accelerated 6 months**

#### 2. Preclinical preparation

Normal 2 years

**Accelerated 6 months**



#### 5. Manufacturing

Normal 2 years

**Accelerated 3-6 months**

#### 3. Clinical Trials

Normal Up to 5 years

**Accelerated 1.5 months**



#### 6. Distribution

Normal 3-6 months

**Accelerated 1 month**

\*Under an accelerated timeline, development stages would proceed simultaneously or overlap.

# The Unprecedented Challenge Of Pricing The Vaccine

The optimal pricing strategy for a new vaccine involves setting a fair and sustainable price that enables the eligible population in need across the world to gain access, while also rewarding innovation and supporting further research and development.

The need for a SARS-CoV-2 vaccine is arguably more urgent, and more global, than ever before for a vaccine. As the 130+ vaccine candidates currently in development progress through clinical testing, a key question for their manufacturers is how COVID-19 might be changing the equation when it comes to what a responsible pricing strategy might look like. At the same time, payers are also faced with needing to prepare and plan for how to react and manage this situation.

Payers' expectations regarding the pricing of SARS-CoV-2 vaccines was one of most important aspects, in which agencies set out to assess the impact of COVID-19 on biopharmaceutical market access through interviews conducted with payers and advisors in the US, Europe, Brazil, and China during April and May 2020. Selected insights are available, bringing the perspectives of the experts together.

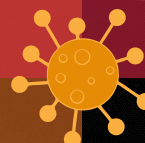
## LEARNINGS FROM DRUGS AND THERAPIES

Vaccine development – even at the accelerated speeds developers are currently working towards – takes significantly longer than repurposing existing or legacy treatments that have already been developed or entered the clinical development process for other indications. Many Governments are looking at distributing the vaccine free of cost to the population, under their healthcare programs.

## HOW MUCH WILL THE COVID-19 VACCINE COST IN INDIA?

Although the government is looking at ways to distribute the vaccine for free, the price of coronavirus vaccine, when it releases, is expected to vary somewhere between Rs 450 to Rs 5,500 for a double dose. This is the estimated price around the world, as a single dose has been pegged at \$32 to \$37 (approximately Rs 2700)

Apart from the basic cost of the vaccines, distribution is the bigger challenge, especially due to non – availability of compliant cold chain infrastructure required to handle these vaccines. The major spend will be on creating compliant, temperature controlled, distribution networks, that are virtually non-existent for certain vaccines.



# Vaccine Distribution

## Challenges

Around 4.2 billion people live in countries where vaccines would have to be transported from other parts of the world, according to supply chain consultants.

### Temperature challenge

Most of the vaccines are fragile and need to be kept in a cold environment (in around 2 to 8 degrees Celsius or -20 degrees Celsius).

However, Pfizer's COVID-19 vaccine needs to be stored at minus 80 degrees Celsius and requires an elaborate cold-chain distribution network. Governments would need to buy special equipment, such as "ultra low temperature freezers" (prices going up to \$15,000 for one). The vaccine also has to be injected within 5 days after reaching the hospitals.

Nowhere on the planet does the logistical capacity exist to distribute vaccines at this temperature on such a large scale.

The Sputnik V vaccine from Russia has to be kept at a temperature of -20 to -70 degrees Celsius. Other potential vaccines, still undergoing trials, such as those from Johnson & Johnson and Novavax, can be stored at between 2 - 8 degrees. If effective, they could mean simpler logistics for ground and air transport.



# Vaccine Distribution

## Challenges

### Limited air cargo capacity

To illustrate the massive scale of capacity required, the current population of the United Kingdom is 62 million people,” said consultant. “Around 100 B777 freighters would be needed to transport a vaccine (double doses per capita) to vaccinate the UK’s entire population from a faraway manufacturer. That’s just to serve the needs of one country.”

The International Air Transport Association (IATA) calculated that 8 billion doses to vaccinate the entire global population would require around 8,000 Boeing 747 aircraft. That number would double if two doses per person are required as in the case of Pfizer’s vaccine.

“Even if we assume that half the needed vaccines can be transported by land, the air cargo industry will still face its largest single transport challenge ever. In planning their vaccine programs, particularly in the developing world, governments must take very careful consideration of the limited air cargo capacity that is available at the moment.

### Lack of Road & Storage Infrastructure

Ground transportation & storage infrastructure is an equally large challenge as most developing countries have very limited, quality infrastructure to handle these vaccines at sub-zero temperatures. While primary distribution can still be handled, tertiary distribution is a challenge, very difficult to overcome at short notice.



# India Strategy

## Nothing on the scale of vaccination planned for COVID-19 has been attempted in India before.

While India has reported one of the highest number of cases, it also boasts of the highest recovery rate, excess of 93% and one of the lowest death rates of under 1.47% of the reported cases.

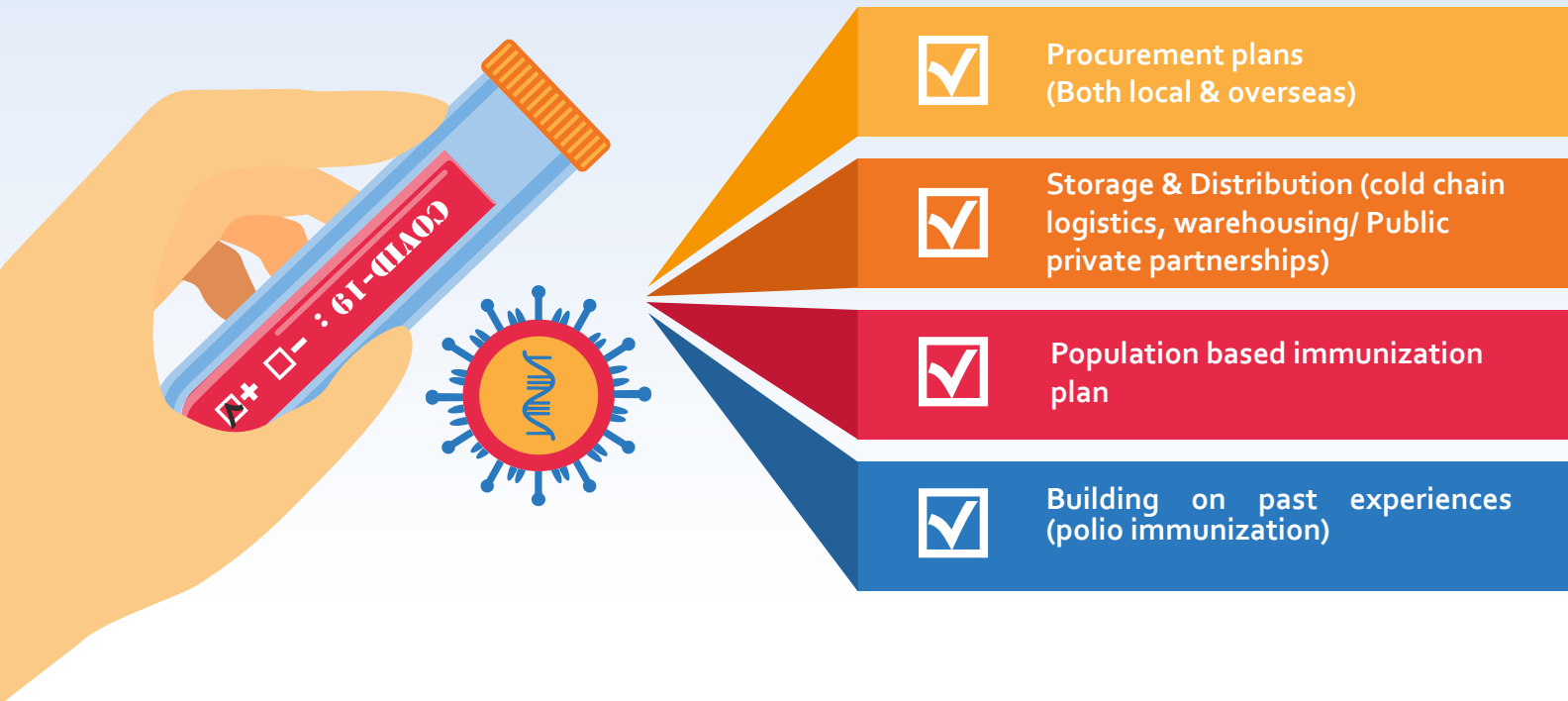
The Government has been continuously planning the way forward and a core committee is formulating the policies and framework to effectively roll out the immunization program to our massive population.

Since information around the vaccines & quantities expected to be available is in public domain, it is important for the Government to reach out to the Pharma Companies & Cold chain logistics companies focussed on pharma distribution, to ascertain existing capabilities and quickly plan and build on the infrastructure gaps.

It is important to understand that such infrastructure takes time to build, and while phase III trials are expected to commence shortly, this time should be utilized to create the infrastructure, so that we are prepared in time to avoid disruption. The biggest challenge will be for the healthcare workforce to administer the vaccine and also monitor the adverse effects of the same.

# India Strategy

**The Some of the key factors to be considered in the roll out strategy would be the following:**



Organising the administration of the vaccine to the huge (1.35 billion) population will call for a large health workforce. We have never had the need to vaccinate our entire population at one go. The national immunisation programmes of countries generally take care of paediatric vaccinations, hence the concern. We're only now beginning to understand the complexities of the delivery side of the vaccine. The funding requirement for distribution of free vaccine to all Indians will be huge. This itself could be a challenge for the Government.

India is also quite demographically diverse and no two regions experience the same weather conditions. While geographically, this is not a problem, when it comes to vaccine distribution and administration, temperature and heat can create problems in the long run. Unlike Western countries, mass-scale immunization programs aimed at the adult population does not have much awareness right now. Vaccination is currently limited to children and pregnant women. Infrastructural problems, which control a sizeable population could pose challenging risks and hurdles for authorities to deliver a vaccine on a priority basis.

Even though India might get hands on a vaccine by early 2021, delivery and strategizing the path for the same is a big problem to deal with.



# India Strategy - Procurement

## Single central procurement pathway for vaccines against covid-19

Health Ministry



- There will be a single central procurement pathway for vaccines against covid-19 across India, as per the Health Ministry.
- The National Expert Group on Vaccine Administration for covid-19 has said that the States have been advised not to chart separate pathways of procurement.
- India will leverage domestic vaccine manufacturing capacity and will also engage with all international players for early delivery of vaccines not only in India but also in low and middle income countries.
- India will also support its key neighbours and development partner countries for covid-19 vaccines.
- Mechanisms for creation of a digital infrastructure for inventory management and delivery mechanism of the vaccine including tracking of vaccination process with particular focus on last mile delivery are also being discussed.
- Guiding principles for prioritization of population groups for vaccination are also being formulated
- Available options in terms of delivery platforms, cold chain and associated infrastructure for roll out of covid-19 vaccination were also taken up.

While the Government needs to quickly announce the final steps being planned, it also needs to enter into partnerships with private service providers, especially those having cold-chain infrastructure and expertise in handling vaccine delivery, to ensure an unbroken cold chain, which remains the biggest hurdle in the immunization program

# India Strategy – Storage & Distribution



## The logistic challenges of vaccine distribution in India

Vaccine handling requires a very experienced team of logisticians with a good knowledge of the 'Good Distribution Guidelines' (GDP) as laid down by the WHO & CDSCO, Min of Health, India. There are very few logistics service providers who are focussed on Pharma/ Vaccine distribution, and a working experience of handling these products in  $+2$  to  $8^{\circ}\text{C}$  &  $-20^{\circ}\text{C}$ . Handling the Pfizer vaccine at  $-70^{\circ}\text{C}$  is a challenge of a different dimension altogether.

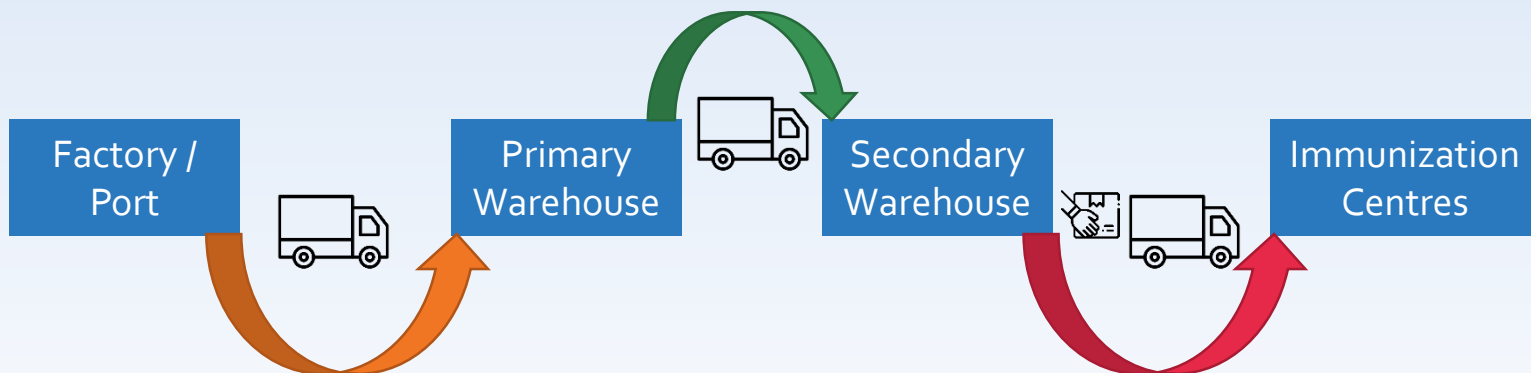
Hence the first challenge is to find capabilities in such temperature ranges across the country. The larger challenge would be to find spare capacity within these networks. The networks need to be fully compliant and have ability to adapt to technologies such as 'Blockchain' to enable real time monitoring of the vaccines to ensure complete visibility in the distribution chain. Augmenting capacities within these networks will be the most difficult part as cold chain networks can take months to build and validate.

As we move from the primary to secondary chains and then on to tertiary points, the challenges will be greater, due to increasing problems of skilled manpower, storage infrastructure, uninterrupted power etc.

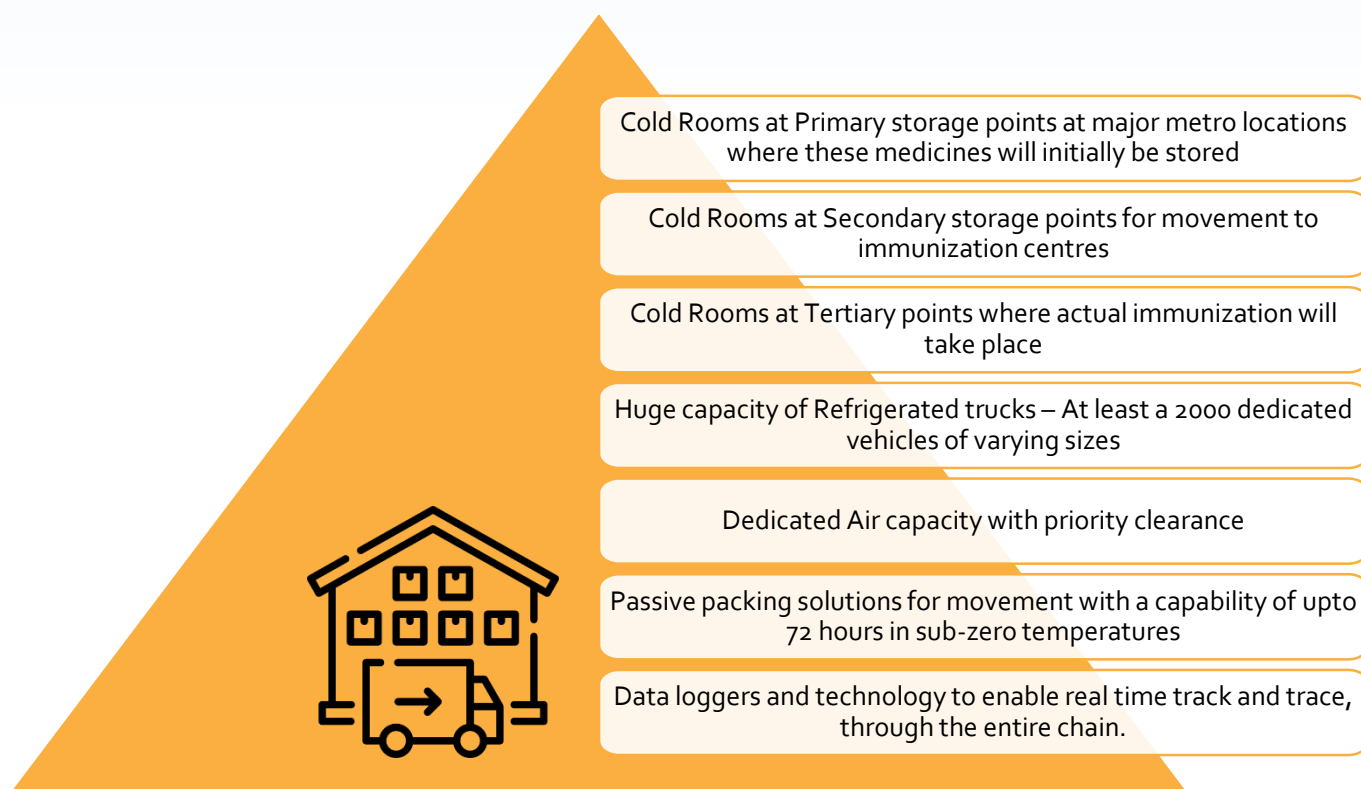
It is very important for the Government to control and bring all stakeholders such as the Pharma Companies, Logistics companies, various Government bodies involved, onto a common platform, with a clear guideline on the way forward.

# India Strategy – Storage & Distribution

## How will the vaccine be distributed in India – Probable scenario



Even if the Government is looking at covering a population of 50 crores, considering double dosage, we are looking at distributing 100 crore vials of vaccine in sub zero temperatures. The sheer magnitude of this exercise will require:



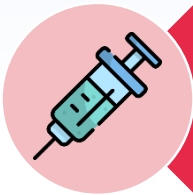
We do not have the capacities required, and are a long way from readiness. It is time to gear up and the Government needs to take the lead.

# India Strategy – Immunization Plan



**As per government sources, Covid-19 vaccine could be distributed under a special immunization programme.**

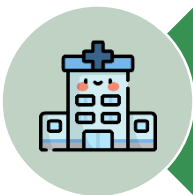
The existing digital platform and processes used for the Universal Immunisation Programme are being enhanced to track Covid-19 vaccine administration and movement, from procurement to storage to distribution to individual beneficiaries, as and when the vaccine becomes available



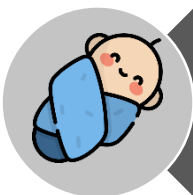
The Centre has started the process of identifying around 30 crore priority beneficiaries who will be given vaccine in the initial phase in four categories including healthcare professionals, including doctors, MBBS students and nurses, frontline workers, including municipal corporation workers, ASHA workers and police personnel & people aged above 50 and those below 50 with co-morbidities.



The government is working round-the-clock to ensure that there is a fair and equitable distribution of vaccines, once they are ready. the Centre estimates to receive and utilise 40-50 crore doses of Covid-19 vaccine covering around 25 crore people by July next year.



The Government will have to keep a close watch on the immunization to avoid chaos and confusion as there will remain a demand-supply gap in the vaccines and every individual will want to take the vaccine, once it is available.



India adds approximately 27 million new-borns to its populations annually, all of who will need the vaccine.

# India Strategy

## Building on Past Experiences

Presently, under the UIP children, adolescents and pregnant women are vaccinated against vaccine-preventable diseases free of cost by the state.

The National Expert Committee on Vaccine Administration for Covid-19 has already mapped the existing cold chain being utilised under the government's immunisation program and has also made a projection of the additionality that will be required, health ministry officials earlier had said & is now engaged with mapping the private sector facilities that could serve the needs of supplementing the cold chain equipment.

The biggest benefit that India has is that it has a robust immunization program in place and it is also implementing the largest immunization program of the world, with nearly 27 million new-borns targeted annually. We have an established infrastructure for supply, storage and delivery of vaccines to the last mile, under our Universal Immunization Program, where the Government is administering around 600 million doses to children annually.

The strength of these experiences in the vaccination landscape, best practices and the robustness of our health delivery system will be leveraged and augmented using a strong IT backbone, to ensure that this humongous national mission of vaccinating the identified priority groups with Covid-19 vaccine is achieved in a timely manner

The government will leverage an integrated IT platform e-Vin (electronic Vaccine Intelligent Network) for managing vaccine distribution. The government has accorded top most priority to research and manufacturing to ensure that the vaccine reaches the last person.





## About



Kool-ex Cold Chain Limited, is India's leading pharma supply chain company, with a fleet of 280+ reefer trucks of varying sizes, 9 cold rooms strategically placed across India, and a Pan-India presence.

Kool-ex is a market leader in handling sensitive temperature controlled medicines such as vaccines, insulins, biologics, injectables etc., in the primary and secondary distribution chain.

Kool-ex has recently tied up with India's leading real estate company, Indo-space to create the largest network of, world class GDP/GWP compliant pharma facilities across India, spanning a total foot print of nearly 7 million square feet and a capacity of 0.5 million pallet positions.

Kool-ex has also recently tied up with TESSOL a leading passive cold chain packaging solutions company to create solutions for the pharma industry, including customized solutions for the COVID-19 vaccine.

Kool-ex is also in the process of tying up with a leading IT giant, to design 'Blockchain for Pharma' which will enable real time traceability of medicines across the distribution network.

This enables Kool-ex to be an end to end pharma supply chain entity, providing bundled services across the pharma distribution platform, making it a unique, one of a kind service provider, with end to end solutions in its offering.

Kool-ex aims to be India's largest, most compliant pharma distribution company and has a strong team of experienced professionals, each having over 20+ years of experience, giving it the ability to scale up its operations in short span of time.

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