

INDIAN STATES & GLOBAL VACCINATION MARKET: THE TEMPLATE FOR MAKING STATE VACCINE PROCUREMENT A SUCCESS

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Second wave of COVID-19 has been stabilising with declining 7D Moving Average of daily new cases for the past few days, indicating the peak of the second wave is behind us. Furthermore, daily recovered cases are now higher than daily new cases and the gap between the two is much higher than what was observed during the first wave peak. However, the share of rural districts in new cases has increased from 45.5% in end-Apr'21 to 52.9% as per the latest data. This is slightly lower than the peak of 53.7% during the first wave. However, when compared to Sep'20 the situation is marginally better in certain states like Andhra Pradesh, Bihar, Karnataka, Tamil Nadu, Uttarakhand and West Bengal where rural penetration was even higher at the time of first peak than what has been observed so far in May. A point of worry is, however, the high test-positivity along with much lower number of tests witnessed in certain states like Goa, Karnataka, West Bengal, Himachal Pradesh, Rajasthan, Odisha among others. The extended lockdowns/restrictions are having huge negative impact on economic activity, particularly in May. SBI Business activity index has dipped to 62.6 for the week ended 17 May'21, the lowest since 25 May'20.

We believe that the Government should focus on vaccinating people of the worst affected districts first so that the spread can be controlled. As per UNICEF data, globally, the reported production capacity (per dose) stands at 22.2 billion in 2021. Out of the reported production capacity of 22.2 billion, 13.74 billion doses' agreements is already formalized and out of this, 9.34 billion doses are secured and India has secured 0.28 billion as per the dashboard data in UNICEF. India is also exploring other options and the Government has committed at a 2.14 billion pipeline between August and December.

Additionally, if we look at the various stages of development, there are 15 vaccines approved for emergency use and 15 potential candidates in phase II/III or phase III stage of development and 4 others in the regulatory review stage. Against this backdrop, states in India are floating global tenders for procurement of vaccines. Central government is also in talks with global manufacturers with RNA technology viz. Pfizer and Moderna, as well as, Janssen Pharmaceuticals to supply coronavirus vaccines in the country. As per UNICEF data, of the 3.9 billion vaccine doses with RNA technology 2.69 billion have been secured by other nations.

Thus, Indian states are in a fix as currently they are facing an inelastic supply curve at least in the near two months. If we look at the UNICEF website, the vaccine's reported price is in the range of \$2-\$40. If we construct simple scenarios with different price ranges, i.e., at \$5, \$10, \$20, \$30 and \$40, with the Rupee dollar exchange rate of 73, and assume that Centre gives 50% of the vaccines for the states' population, the vaccine expenditure for the rest 50% for various Indian states would be in the range of Rs 0.2 billion for Sikkim (if the vaccine is procured at \$5 per dose) and Rs 671 billion for Uttar Pradesh (if the vaccine is procured at \$40 per dose). However, these represent extreme scenarios and the cost for each state will lie somewhere in between. If we map this scenario analysis with the budgeted FY22 total expenditure of 20 major states, at the highest price point, the vaccine procurement is 16% of the total expenditure for Bihar, 12% for states like Uttar Pradesh and Jharkhand. **However, we reemphasize that this cost is an absolute must as even at highest vaccine price, the total vaccination cost at Rs 3.7 lakh crore is much lower than revenue loss at Rs 5.5 lakh crore assuming lockdown for states end mostly by June. Interestingly for some states, like UP & Bihar, the revenue loss is less than increase in expenditure at the highest price point. Also, the budgeted capital expenditure of Rs 8.8 lakh crore could see a significant rollback to balance revenue loss, further exacerbating GDP loss. Additionally, the payment though will be made in domestic rupee resources, it would possibly imply equivalent dollars from our reserves to make the payment! However, such payments could potentially trigger a renewed interest of capital flows into India as investors will look through the huge benefits of such mass vaccination!**

We recommend that States and Centre must chalk out a cold chain infrastructure system quickly while simultaneously targeting international vaccine manufacturers through advance purchase agreements. Meanwhile improving the local supply of Covaxin and using other vaccine producing units for dedicated COVID-19 vaccine manufacturing is a sine qua non. With states entering directly into contracts with global vaccine developers, it leads to increased competition among states. Poorer states with high population would not be able to vaccinate themselves quickly. Meanwhile richer states may have to pay a much steeper price given the global oligopolistic market. Our best hope remains that the vaccines in regulatory trials and phase II/III and III are successful and are authorised for emergency use and can be the best target for procurement by states (Refer annexure).

We also recommend that, Centre in coordination with states, should enter into deals with these companies so that we vaccinate a sizeable population. India should ideally follow the EU template in global vaccine procurement. Globally, the EU Commission jointly with a Joint Negotiation Team carries out the negotiations with vaccine suppliers. The members of the Joint Negotiation Team – representing seven Member States - are appointed by a Steering Committee. The Steering Committee discusses and reviews all aspects of the Advanced Purchase Agreement (APA) contracts before signature. All EU Member States are represented in this Committee. All Member States have endorsed this approach, which is at the heart of the EU Vaccines Strategy.

India has so far given 187 million doses but total vaccination/100 population is still at 13.8. However, if we consider the fact that EU had already entered into contracts for vaccine procurement well in advance, European countries have been able to vaccinate less than 50% of their population, it seems that vaccination drive might pick up pace once the supply becomes streamlined from July and India needs to move quickly if it wants to vaccinate its adult population by the end of this year.

COVID UPDATE

- ◆ India's second wave of COVID-19 has been stabilising for the past few days. The cumulative cases now stand at 257 lakh, with 31.25 active cases and 223 lakh people recovered.
- ◆ The 7D MA of new cases has been declining now for the past 11 days. Moreover, the daily recovered cases are now above the daily new cases for the past 12 days, thereby indicating that the peak of the second wave might be over. The maximum daily cases was 4.14 lakh crore observed on 7 May, with active cases 36.4 lakh (as predicted by us) and with a recovery rate 81.95% which is better than first peak recovery rate of 78.53%.
- ◆ Difference between the daily recovered and daily active cases has significantly improved in May when compared to April. Only 2 states, Chhattisgarh and Delhi are witnessing decline in May as against the previous month.
- ◆ The gap has improved for all other states, especially for Kerala, Rajasthan, UP and Gujarat.
- ◆ Meanwhile, localised restrictions and lockdowns have resulted in decline in mobility in May, particularly in case of Odisha, Kerala, Tamil Nadu.
- ◆ However, Chhattisgarh, Gujarat, Jharkhand and Uttar Pradesh have registered increase in mobility.

RURAL COVID-19 PENETRATION INCREASING FAST

- ◆ The infection is spreading fast in rural areas. The share of rural districts in new cases is rising rapidly during May. It has increased from 45.5% in end-Apr'21 to 48.5% as on 3rd May to 52.9% as per the latest data. This is slightly lower than the peak of 53.7% observed during end-Aug'20. The fast spread of infection in rural areas is disturbing as rural India does not have adequate health infrastructure.
- ◆ The total share of top 20 rural districts is currently 11.6% in country-wise new cases. Meanwhile, the top 20 urban districts account for more than 26% in daily new cases. The Government should focus on vaccinating the people of these worst affected districts first so that the spread can be controlled.
- ◆ Notably, the infection has been spreading to all states' hinterland. When new cases in the top 50 rural districts are compared it is observed that one district each from Odisha, Tamil Nadu and Uttarakhand has been added in top 50 in May when compared to April.
- ◆ Karnataka is another state where the rural penetration has increased with 8 districts among the top 50 in May compared to 5 in April. Likewise, Himachal Pradesh, Kerala, West Bengal have one additional district added in top 50 during May.

Covid cases & Google Mobility (Difference in 7 Days MA)				
States	Average Google Mobility		Recovered & Active Cases gap	
	Apr-21	May-21	Apr-21	May-21
Andhra Pradesh	-17.2	-29.2	-2716	15200
Assam	-16.7	-35.7	-1160	3064
Bihar	-11.8	-21.0	442	18060
Chhattisgarh	-44.5	-40.7	17516	16067
Delhi	-50.3	-52.2	19652	16915
Gujarat	-32.8	-31.3	-1715	19934
Haryana	-41.7	-40.7	487	18916
Jharkhand	-30.5	-28.2	198	10525
Karnataka	-41.3	-46.8	-12422	28596
Kerala	-5.0	-43.5	-12190	50490
Madhya Pradesh	-40.8	-43.2	7782	14249
Maharashtra	-35.5	-36.5	59583	78640
Odisha	-1.7	-33.3	-337	8514
Punjab	-23.3	-24.7	1571	8128
Rajasthan	-35.0	-43.7	-5170	21467
Tamil Nadu	-9.2	-36.5	4390	8788
Telangana	-23.2	-40.2	-963	8185
Uttar Pradesh	-37.0	-29.8	6797	36375
Uttarakhand	-25.3	-36.0	-1543	4504
West Bengal	-24.3	-26.3	1161	18438
India	-29.3	-36.3	84602	418647

% Share of Top 20 Districts in India's Daily Cases			
Rural Districts	% share	Urban Districts	% share
Palakkad	0.93	Bengaluru Urban	4.33
East Godavari	0.92	Delhi	2.78
Ahmednagar	0.85	Chennai	2.10
Chittoor	0.76	Pune	2.05
Anantapur	0.76	Malappuram	1.40
Tumakuru	0.70	North 24 Parganas	1.30
Kottayam	0.69	Ernakulam	1.30
Solapur	0.69	Kolkata	1.21
Ballari	0.60	Thiruvananthapuram	1.12
Guntur	0.57	Thrissur	1.00
Satara	0.52	Kozhikode	0.95
Y.S.R. Kadapa	0.48	Jaipur	0.94
West Godavari	0.47	Coimbatore	0.94
S.P.S. Nellore	0.47	Kollam	0.88
Kolhapur	0.47	Ahmedabad	0.84
Kangra	0.37	Chengalpattu	0.71
Srikakulam	0.37	Alappuzha	0.69
Mandya	0.36	Visakhapatnam	0.67
Buldhana	0.35	Gurugram	0.65
Udaipur	0.28	Nagpur	0.57
Total	11.63	Total	26.43

- ◆ Furthermore, overall state-wise rural-urban districts' share in new cases reveal that rural penetration has increased in many states in May when compared to April. These states include Bihar, Gujarat, Haryana, Jharkhand, Karnataka, Maharashtra, Odisha and Uttar Pradesh.
- ◆ However, when compared to Sep'20 the situation is still better in certain states like Andhra Pradesh, Bihar, Karnataka, Tamil Nadu, Uttarakhand and West Bengal where rural penetration was higher at the time of first peak than what has been observed so far in May.
- ◆ Many of these states where rural penetration is currently high, produce paddy, wheat, pulses, sugarcane among others, and thus if the production of these staples gets affected it is likely to put upwards pressure on food inflation going forward.

DAILY TESTS & TEST POSITIVITY IN STATES

- ◆ Many major states, including Delhi, Maharashtra, Gujarat Haryana, Jharkhand, Kerala, MP, UP and Uttarakhand are showing decline in daily new cases for the past few days.
- ◆ Meanwhile, in Himachal Pradesh, Karnataka, Odisha, Rajasthan the daily new cases have not yet stabilised.
- ◆ One worrying trend is the high test positivity along with low number of tests which is being witnessed in certain states like Goa, Karnataka, West Bengal, Himachal Pradesh, Rajasthan, Odisha among others.

BUSINESS ACTIVITY INDEX

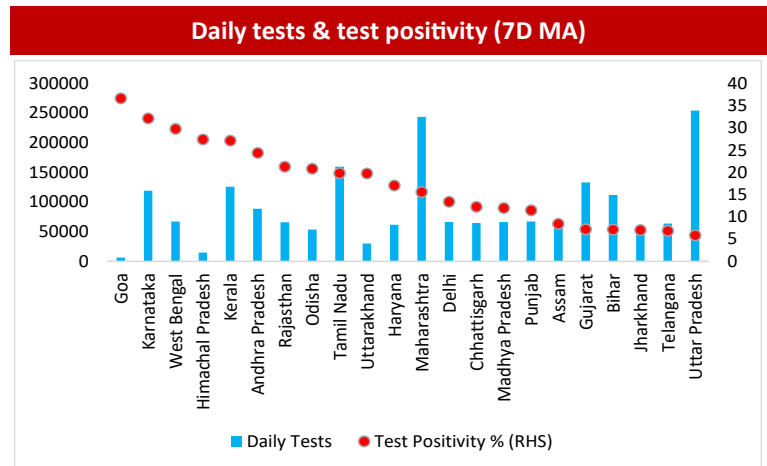
- ◆ The extended lockdowns and restrictions are having huge negative impact on economic activity particularly in May as visible by our Business activity index.
- ◆ The index has further dipped to 62.6 for the week ended 17 May'21, with all the indicators declining compared to the previous week. The current level is 51-weeks low with 58.7 last registered in the week ended 25 May'20. The latest reading shows maximum decline in weekly food arrival followed by RTO revenue collections and electricity consumption.
- ◆ However, with sequential reopening/removal of restrictions expected from Jun'21 we believe the destruction to overall activity in Q1 FY22 will be lower than what was witnessed last year.
- ◆ Furthermore, vaccines inoculation which is experiencing a slowdown currently is expected to pick-up pace from July.

VACCINE UPDATE

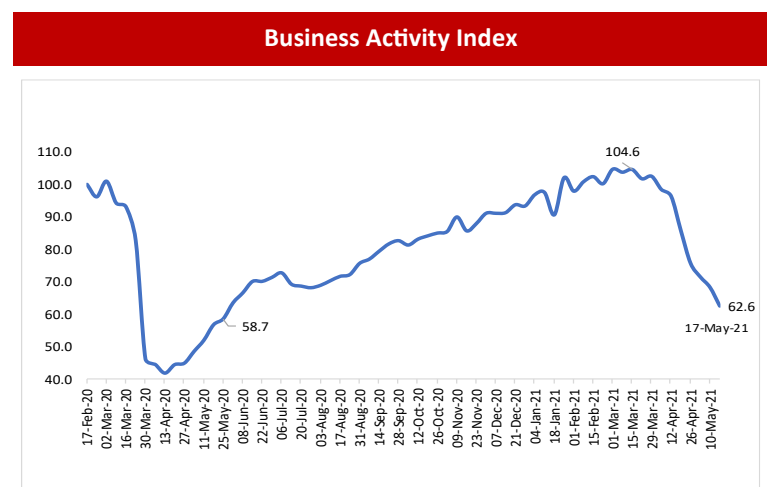
- ◆ The UNICEF COVID-19 Vaccine Market Dashboard provides a wealth of data on the global COVID-19 production capacity and how vaccines are being distributed globally.

States	% share of Daily Cases(7 Days MA)					
	Rural % share			Urban % share		
	Sep-20	Apr-21	May-21	Sep-20	Apr-21	May-21
Andhra Pradesh	90.7	86.6	84.7	9.3	13.4	15.3
Bihar	83.5	74.0	78.5	14.2	21.2	18.4
Chhattisgarh	98.7	99.0	98.2	1.3	1.0	1.8
Gujarat	30.1	23.2	33.4	69.9	76.8	66.6
Haryana	52.2	41.5	50.8	47.8	58.5	49.2
Jharkhand	44.0	47.2	54.7	56.0	52.8	45.3
Karnataka	46.9	31.7	43.0	53.1	68.3	57.0
Kerala	23.2	26.7	24.7	76.8	73.3	75.3
Madhya Pradesh	58.5	57.3	56.0	41.5	42.7	44.0
Maharashtra	44.3	43.9	56.9	55.7	55.9	43.1
Odisha	74.5	75.4	79.6	19.6	21.3	17.7
Punjab	40.2	42.2	45.3	59.8	57.8	54.7
Rajasthan	67.0	70.2	71.4	33.0	29.6	28.5
Tamil Nadu	32.8	20.8	22.4	67.1	79.2	77.6
Uttar Pradesh	59.2	58.9	66.7	39.0	39.4	31.3
Uttarakhand	67.9	62.6	62.6	32.1	37.4	37.4
West Bengal	62.2	51.4	53.1	37.8	48.6	46.9

Source: SBI Research, Rural + urban share for some states does not add up to 100 as some districts are not classified

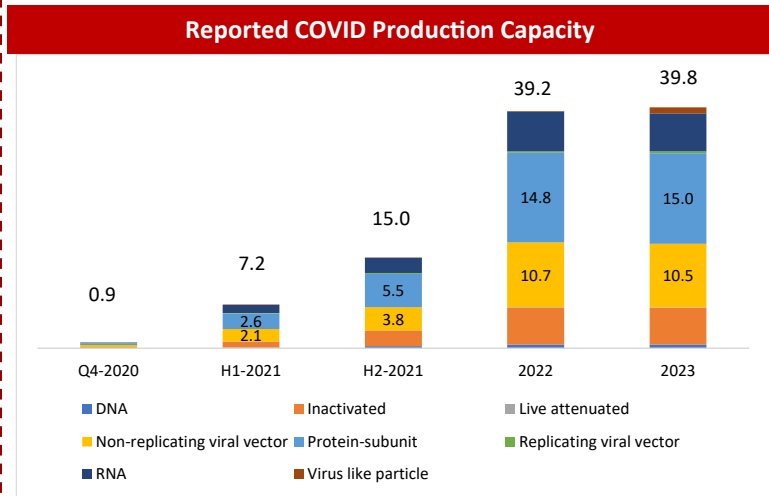


Source: SBI Research



Source: SBI Research

- ◆ The reported production capacity (per dose) stands at 22.2 billion in 2021, with the highest manufacturing occurring in the protein sub-unit technology platform followed by non-replicating viral vector technology platform. RNA and Inactivated technology platforms come next. Out of the reported production capacity of 22.2 billion, 13.74 billion doses' agreements have been formalized. Out of this, 9.34 billion doses are secured. If we look at the various stages of development, there are 15 vaccines approved for emergency use and 15 potential candidates in phase II/III or phase III stage of development. 4 others are in the regulatory review stage. (Refer *annexure*)
- ◆ Against this backdrop, states in India are floating global tenders for procurement of vaccines. The usual suspects would be the developers who have been given emergency use authorisation. Anhui Zhifei Longcom Biopharmaceutical, CanSino Biologicals, Beijing Institute of Biological Products (CNBG), Sinovac, Wuhan Institute of Biological Products (CNBG) are all Chinese companies and it will be interesting to see whether states will accept any bids from these given the strained geopolitical relations between India and China. Central government is in talks with global manufacturers with RNA technology viz. Pfizer and Moderna to supply coronavirus vaccines in the country. These have already entered into formalised agreements with other nations and as per UNICEF data, of all the vaccine doses with RNA technology (3.9 billion) have been secured by other nations (2.69 billion).
- ◆ These manufacturers are also increasing their production capacity and hopefully they will have some doses to spare beginning Q3 2021. Johnson and Johnson vaccines have faced bans in US and there are possible concerns about their safety. Thus, Indian states are in a fix as currently they are facing an inelastic supply curve at least in the near two months.
- ◆ If we look at the recent BMC tender floated, the deadline for which was 18th May, had to extend it till 25th May. The issue of storage and meeting the urgent supply requirements will act as a deterrent for vaccine manufacturers. It is in the interest of states and Centre to chalk out a cold chain infrastructure system quickly while simultaneously targeting international vaccine manufacturers through advance purchase agreements. Meanwhile improving the local supply of Covaxin and using other vaccine producing units for dedicated COVID-19 vaccine manufacturing is a sine qua non.



Source: SBI Research



Source: UNICEF

Global tender conditions			
Conditions	BMC EOI	Odisha	Uttar Pradesh
Bid security	NA	NA	160 Million INR
Performance security	1% of contract value	3 % of contract value	5% of the annual contract value
Advance Payment	No	30% of each purchase order	No
Storage condition	2-8 degree Celcius	2-8 degree Celcius	2-8 degree Celcius
Processing fees	Nil	Nil	Rs 5000
Whether neighbouring countries allowed bidding	No	NA	NA
Supply schedule	Within 3 weeks	Within 4 weeks to 17 weeks	Within 4 weeks

Source: SBI Research, NA- Not available

- ◆ This is because an inelastic supply curve and high demand can lead to high prices at which the goods are sold. If we look at the UNICEF website, the vaccine's reported price is in the range of \$2-\$40.
- ◆ If we construct simple scenarios with different price ranges, i.e., at \$5, \$10, \$20, \$30 and \$40, with the Rupee dollar exchange rate of 73, and assume that the expenditure of inoculation of 50% the vaccine expenditure for various Indian states would be in the range of Rs 0.2 billion for Sikkim (if the vaccine is procured at \$5 per dose) and Rs 671 billion for Uttar Pradesh (if the vaccine is procured at \$40 per dose).
- ◆ However, these represent extreme scenarios and the cost for each state will lie somewhere in between. If we map this scenario analysis with the budgeted FY22 total expenditure of 20 major states, at the highest price point, the vaccine procurement is 16% of the total expenditure for Bihar, 12% for states like Uttar Pradesh and Jharkhand. The lowest percentage is for Himachal Pradesh. But given the revenue loss that a two month lockdown could result in, this cost is less.
- ◆ However, the issue of capacity constraints remains. Also, with states entering directly into contracts with global vaccine developers, it leads to increased competition among states.
- ◆ Poorer states with high population would not be able to vaccinate themselves quickly. Meanwhile richer states will pay a much steeper price than if there was only one buyer which is the central government.
- ◆ Our best hope remains that the vaccines in regulatory trials and phase II/III and III are successful and are authorised for emergency use. (Refer annexure). Meanwhile Centre, in coordination with states, should enter into deals with these companies so that we vaccinate a sizeable population.
- ◆ Globally the EU Commission jointly with a Joint Negotiation Team carries out the negotiations with vaccine suppliers. The members of the Joint Negotiation Team – representing seven Member States - are appointed by a Steering Committee. The Steering Committee discusses and reviews all aspects of the Advanced Purchase Agreement (APA) contracts before signature. All EU Member States are represented in this Committee.
- ◆ All Member States have endorsed this approach, which is at the heart of the EU Vaccines Strategy. At the European Council in June 2020, the Member States of the European Union mandated the Commission to organise the joint procurement of vaccines. As a result, the European Commission has started talks with the most promising vaccine manufacturers and has secured a portfolio of more than 2.6 billion doses.

Cost of Vaccination and Revenue Loss						
State	Expenditure impact					Loss of Revenue (Rs Billion)
	Price(\$5)	Price(\$10)	Price(\$20)	Price(\$30)	Price(\$40)	
Himachal Pradesh	2.7	5.4	10.8	16.1	21.5	43.0
Punjab	11.0	22.1	44.1	66.2	88.3	151.9
Uttarakhand	4.1	8.3	16.6	24.8	33.1	69.5
Haryana	10.7	21.4	42.8	64.2	85.6	221.8
Rajasthan	28.8	57.6	115.1	172.7	230.3	299.6
Uttar Pradesh	83.8	167.7	335.3	503.0	670.6	543.3
Bihar	44.7	89.3	178.6	267.9	357.2	189.3
West Bengal	35.7	71.4	142.9	214.3	285.8	377.7
Jharkhand	14.0	27.9	55.8	83.8	111.7	90.2
Odisha	16.6	33.3	66.5	99.8	133.0	146.5
Chhattisgarh	10.7	21.4	42.8	64.2	85.7	95.8
Madhya Pradesh	30.7	61.3	122.7	184.0	245.4	283.0
Gujarat	25.3	50.7	101.3	152.0	202.7	470.0
Maharashtra	45.2	90.5	181.0	271.5	362.0	745.3
Andhra Pradesh	19.2	38.4	76.9	115.3	153.8	280.0
Karnataka	24.3	48.6	97.3	145.9	194.6	425.6
Kerala	12.9	25.9	51.7	77.6	103.4	219.1
Tamil Nadu	27.8	55.7	111.3	167.0	222.7	575.0
Telangana	13.7	27.4	54.9	82.3	109.8	288.7
Total	462.1	924.3	1848.5	2772.8	3697.1	5515.1

Source:SBI Research

15 worst affected countries with the highest number of COVID-19 cases						
Country	Total cases (mn)	Death Rate%	Active Ratio %	Total vaccinations doses (Mn)	Total Vaccination /100 Population	People fully vaccinated per 100 Population
United States	33.80	1.8	17.5	275.54	83.2	37.6
India	25.77	1.1	12.2	187.01	13.8	3.1
Brazil	15.82	2.8	6.6	54.33	25.6	8.2
France	5.92	1.8	10.5	29.67	43.9	13.5
Turkey	5.15	0.9	2.4	26.54	31.5	13.4
Russia	4.97	2.4	5.4	24.52	16.8	6.8
United Kingdom	4.45	2.9	0.9	57.36	84.5	30.3
Italy	4.17	3.0	7.4	28.38	46.9	15.0
Germany	3.63	2.4	5.5	41.50	49.5	11.8
Spain	3.63	2.2	5.6	22.59	48.3	15.7
Argentina	3.41	2.1	9.7	10.19	22.6	4.5
Colombia	3.16	2.6	3.7	7.54	14.8	5.7
Poland	2.86	2.5	6.2	16.37	43.3	12.7
Iran	2.79	2.8	15.8	2.33	2.8	0.4
Mexico	2.39	9.3	10.9	23.30	18.1	8.3

- ◆ India has been the second worst affected countries from Covid with total cumulative infections just below that of the US. Even though India has so far given 187 million doses but considering its population this is not enough as is clearly visible by total vaccination/100 population which is low at 13.8.
- ◆ However, if we consider the fact that EU had already entered into contracts for vaccine procurement well in advance, European countries have been able to vaccinate less than 50% of their population, it seems that vaccination drive might pick up pace once the supply becomes streamlined in June-July.

ANNEXURE

Vaccine Dashboard						
Product/Pipeline Table				Formalized Doses(billion)		
Vaccine developer	Vaccine name	Vaccine platform	Development stage	Secured	Optioned	India's share(%)
Anhui Zhifei Longcom Biopharmaceutical/Institute of Microbiology Chinese Academy of Sciences (IMCAS)	Recombinant SARS-CoV-2 vaccine	Protein subunit	Emergency Use	0.00		
AstraZeneca/SK Bioscience	Vaxzevria	Non-replicating viral vector	WHO Emergency use listing	2.14	0.50	8%
AstraZeneca/University of Oxford	Vaxzevria	Non-replicating viral vector	SRA Emergency Use			
Serum Institute of India	Covishield	Non-replicating viral vector	WHO Emergency use listing			
CanSino Biologicals	Ad5-nCOV	Non-replicating viral vector	Emergency Use	0.04	0.00	
Gamaleya Research Institute	Sputnik V	Non-replicating viral vector	Emergency Use	0.72	0.00	14%
Janssen Pharmaceuticals	Ad26.COV 2.5	Non-replicating viral vector	WHO Emergency use listing	1.16	0.43	
Beijing Institute of Biological Products (CNBG)	BBIBP-CorV	Inactivated	WHO Emergency use listing	0.20	0.03	
Bharat Biotech/Haffkine	Covaxin	Inactivated	Emergency Use	0.02	0.00	64%
Chumakov	Covi-Vac	Inactivated	Emergency Use	NA		
Sinovac	CoronaVac	Inactivated	Emergency Use	0.50	0.03	
Wuhan Institute of Biological Products (CNBG)	Inactivated SARS-CoV-2 vaccine	Inactivated	Emergency Use	NA		
BioNTech/Pfizer	Comirnaty	RNA	WHO Emergency use listing	1.86	0.52	
Moderna	mRNA-1273	RNA	WHO Emergency use listing	0.83	0.47	
Vector Institute	EpiVacCorona	Protein subunit	Emergency Use			
Insitute of Medical Biology	Inactivated SARS-CoV-2 vaccine	Inactivated	Phase III	Agreements not yet formalized		
Research Institute for Biological Safety Problems	QazCovid-in	Inactivated	Phase III			
Valneva	VLA2001	Inactivated	Phase III	0.10	0.09	
Biokangtai (Beijing Minhai)	Inactivated SARS-CoV-2 vaccine	Inactivated	Phase III	Agreements not yet formalized		
Center for Genetic Engineering and Biotechnology	CIGB-66	Protein subunit	Phase III			
Finlay	Soberana 2	Protein subunit	Phase III			
Zyudus Cadila	ZyCov-D	DNA	Phase III			
AnGes Biopharmaceutical	AG301	DNA	Phase II/III			
Inovio Pharmaceuticals	INO-4800	DNA	Phase II/III			
Clover Biopharmaceuticals/Dynavax	SCB-2019	Protein subunit	Phase II/III			
COVAXX	UB-612	Protein subunit	Phase II/III	0.14		
Medigen	MVC-COV1901	Protein subunit	Phase II/III	Agreements not yet formalized		
Serum Institute of India	Covovax	Protein subunit	Phase II/III			
LEUKOCARE/ReiThera/Univercells	GRAd-COV2	Non-replicating viral vector	Phase II/III			
Shifa Pharmed	CovIran Barakat	Inactivated	Phase II/III			
Gamaleya Research Institute	Sputnik Light	Non-replicating viral vector	Regulatory review			
CureVac	CVnCoV Vaccine	RNA	SRA Regulatory review	0.30	0.18	
Medicago	Coronavirus-Like Particle COVID-19 vaccine	Virus-like Particle	SRA Regulatory review	0.08		
Novavax	NVXCoV-2373	Protein subunit	SRA Regulatory review	0.52	1.66	
Sanofi/GSK	SARS-CoV-2 subunit vaccine	Protein subunit	Phase II	0.73	0.50	

Source:SBI Research, NA-Not available

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