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COVID19 VACCINE PRODUCTION IN INDIA – CHANGING MARKET SCENARIO

Nandini Jagannarayan, Department of B.Com (Banking & Insurance), Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College, Ghatkopar (west)

Dr. A.Indira, Visiting Faculty, Somaiya Vidyavihar University, Mumbai Consulting Economist, Board Member, Centre for Budget and Policy Studies, Bengaluru 560003.

Email id: indira.ananth@gmail.com ; nandini.gopaldaswamy2012@gmail.com

Abstract

India is in the midst of a severe second wave of Covid-19. As per the Global Commission for Post-Pandemic Policy by mid-April of 2021, India had manufactured nearly 17 percent of all Covid-19 vaccine doses globally. It was the world's fourth-largest producer, after China (about 36 percent), the United States (about 22 percent) and the European Union (more than 17 percent). Even so, following a shortage of vaccines and with insufficient local production, Government of India decided to import more foreign vaccines with quicker approval process for vaccines accepted in US/EU markets. India is currently using made-in-India vaccines, namely, Covishield manufactured by Serum Institute India and Covaxin of Bharat Biotech in its COVID-19 immunisation programme. The shortcoming in the production of vaccines and its dissemination within the country urges one to understand who the local producers are and how the market is playing out. This paper looks at the evolving market structure of vaccine production in India in the textbook framework of an oligopoly market. We use secondary data sources and daily newspaper briefs.

Keywords: Vaccine Production, demand saturation, producer behaviour, oligopoly, economies of scale

Introduction

Vaccinations are important to build immunity against infectious diseases. Pharmaceutical companies seek approval to produce and package vaccinations as sought in the given country. It is necessary that vaccines are sufficiently in supply and administered as per the requirement. Vaccines normally require years of testing and additional time to produce at scale. But in an unparalleled scenario, scientists during the current pandemic have developed a coronavirus vaccine in record time.

The Indian pharmaceutical industry is the world's third largest in terms of volume and thirteenth largest in terms of value. It has evolved from export of simple active pharmaceutical ingredients (APIs) to becoming one of the largest generic drug exporters to global markets. API industry is ranked the third largest in the world, and the country contributes approximately 57 per cent of APIs to pre-qualified list of the WHO. India has one of the largest production capacities of vaccines in the world. Indian vaccine manufacturers, including Serum Institute India, Bharat Biotech, Panacea Biotech, Sanofi's Shanta Biotech, Biological E, Hester Biosciences and Zydus Cadila, have an installed capacity to manufacture 8.2 billion doses of different vaccines per year. India's manufacturing cost is estimated to be 33 per cent lower than that of the U.S. and half of Europe enabling it to manufacture high-quality medicines at competitive prices. India also has a large growing workforce of trained and skilled workforce to support establishment of largescale pharmaceutical manufacturing projects.

During the first wave of Covid 19, India through its Vaccine Maitri Programme not only sent medical teams to countries in the neighbourhood, but also exported more than 66 million doses of COVID-19 vaccines to 95 countries worldwide. Of these about 10 million were grants from the government, 20 million were sent as part of the global COVAX facility, and the rest 36 million were commercial exports. But the sheen seems to be off with the coming of the second wave in February 2021. The country was seen gasping for breath, while India was the second nation after the US to have vaccinated over 20 crore cumulatively against Covid-19, in a period of 130 days between January and April 2021. This included 15,71,49,593 first dose and 4,35,12,863 second dose of

COVID-19 vaccines. The Cowin dashboard of May 31, 2021 showed that only 4.31 crores (0.04%) of the Indian population (approx. 139 crores) were fully vaccinated with the required two doses.

The slow uptake and the subsequent suddenness of the severity of the crisis draws attention to the production capacity of the vaccines in India. Hence this paper looks at the number of companies producing the vaccine and the changing scenario from the perspective of textbook framework of the oligopolistic market structure.

Methodology and data

The paper used secondary data gathered from various reports, policy briefs and news media.

Review of literature

Oligopoly is the most prevalent form of market organisation in the manufacturing sector across industrial nations, including India. One of the main features include only a few firms selling a homogenous or differentiated product. This follows that the action of each firm affects the other firms in the industry and vice-versa. This interdependence or rivalry influences the actions of the firms when deciding its prices, degree of product differentiation and level of advertising to undertake. Being an imperfect market, the behavioural response of the consumers which in turn influences the decisions of the producers (players) impacts the overall responsiveness of the players and the market as a whole.(Salvatore, 2015). The extant literature has also captured this in the various studies.

On the one hand, price comparison is a basic element of competition in the market. Price is usually a focal point in consumer thinking and deciding on transactions. Hence obfuscating prices can be detrimental to consumers. Therefore, it is vital for policymakers to know how transparent pricing is in reality. Commercial practices involving price in transparency can be detrimental to consumer decision making and may be associated with market failure. So, legislative intervention to ensure price transparency is sometimes warranted. Perfect price transparency allows comparing offers of multiple suppliers. It must be meaningful transparency. (Boom, 2011)

It is seen that uncertainty about prices affects the budget consumers allocate for purchasing a product and consumer price thresholds (Mazumdar, T., Jun, S.Y , 1992). In case of medical treatments and price competition between branded and generic medicines, demand price elasticity is low because of the presence of a third party that pays for medical treatments (public or private insurance coverage). Therefore, reference pricing is better understood as a demand side instrument in that it ultimately seeks to increase the elasticity of demand and increase price competition between branded originator products and generic or close substitute therapies (Caves and et al, 1991).

On the other hand, regulation produces performance effects. The influence of regulation critically depends on how small business agents, and the stakeholders with whom they interact – including actual and prospective customers, suppliers, competitors, infrastructure providers and regulatory authorities – adapt to regulation. (Kiching and et al, 2011)

Discussion

Vaccine Scenario in India

As per the Global Commission for Post-Pandemic Policy by mid-April of 2021, India had manufactured nearly 17 percent of all Covid-19 vaccine doses globally. It was the world's fourth-largest producer, after China, the United States and the European Union.

India is currently using made-in-India vaccines, namely, Covishield manufactured by Serum Institute India and Covaxin of Bharat Biotech in its Covid-19 immunisation programme, making it a duopolistic market. Government of India was the only buyer, making it a monopsony.

Covaxin and Covishield are both similar vaccines made using inactive/modified versions of the virus. Both have been found to be effective, matching WHO standards and prompting definite immune responses.

The Serum Institute of India (SII), in partnership with the Oxford University, UK and Astrazenca, pioneered the manufacturing of Covid vaccines. Covishield is a viral vector vaccine that uses an adenovirus found in Chimpanzees, ChAD0x1, to deliver spike proteins and mount a tolerable immune response in response to a live virus. The trials were completed in November 2020. SII has been supplying Covidshield since January 2021. It was found to have an efficacy rate of 70%, which could be further scaled up to 90% if the dosing is given half a dose, followed by a full dose a month later. The tolerability and protection have also been found to be well-suited and thought to reduce the risk of symptomatic infections and speed up recovery timelines, which has been much talked about recently.

Hyderabad based Bharath Biotech, in partnership with CSIR(Council for Scientific and Industrial Research) and then later with ICMR(Indian Council for Medical Research) manufactures Covaxin which is fully made, developed and produced in India. It uses an inactive viral strain. It makes use of a dead virus that drafts an immune response. Its major trials were completed in February 2021. As per interim results and clinical studies, the Bharat Biotech vaccine was found to carry over 78% efficacy. Additionally, there has also been clinical evidence that suggests that Covaxin could reduce severity and mortality risk by a whopping 100 per cent.

Price wise, Serum Institute of India marked Covishield to be sold at ₹300 for the government, while it would be sold for ₹600 to private facilities. In comparison, Covaxin was slightly expensive and the public would have to bear the cost. For state governments, it was to be marketed at ₹400, while for private hospitals and facilities, to be priced at ₹1200.

Increased demand and supply

There was a sudden surge in Covid 19 cases with the coming of a second wave from February 2021. This happened together with reports of wastage of vaccines across the country due to vaccine hesitancy, poor delivery systems and scarcity of medicines. The problem was compounded with a surge in demand with the government broadening the eligibility norms for the vaccination to all age groups and a supply shortage.

During the first wave, the companies seemed to have considered that each would keep their output constant giving them leeway to alter the prices to meet the demand. The supply to the Indian market was constant, given that SII had promised to export its vaccines to other countries and had accordingly taken advances from other buyers too.

The government at this stage agreed to open up the market to newer players. Government of India approved the Sputnik V and opened door for foreign vaccines to enter India quickly. Dr. Reddy's has imported Sputnik V doses starting this quarter.

The government also made detailed purchase plans for the vaccines and released 100% advance of ₹1732.50 crore to Serum Institute of India (SII) for 11 crore doses of Covishield vaccine for the months of May, June and July. Additionally, 100% advance of ₹ 787.50 crore was released to Bharat Biotech India Ltd (BBIL) for 05 crore Covaxin doses for the months of May, June and July. Apart from Hyderabad's Bharat Biotech facility, three public sector companies, including Mumbai's Haffkine Biopharmaceutical Corporation Ltd, Hyderabad's Indian Immunologicals Limited and Bulandshah's Bharat Immunologicals and Biologicals Limited, were also given the nod to produce Covaxin.

Table 1: Vaccine dose availability in India

Vaccines	Production / availability (doses in crores) August – December 2021	Status
Covishield	75.0	11 cr doses in May-July
Covaxin	55.0	5 cr doses in May-July
Bio E sub unit vaccine	30.0	In phase 3 trials
Zydus cadila DNA vaccine	05.0	In last stage of Phase 3

SII – Novavax	20.0	Approval pending
BB Nasal Vaccine	10.0	In phase 1-2 trials
Genova mRNA vaccine	06.0	In phase 1-2 trials
Sputnik vaccine	15.6	Available next week
Total	216.0	

Source: <https://scroll.in/article/995202/will-india-really-have-enough-vaccines-to-cover-the-entire-population-by-the-end-of-2021>

The government has earlier launched several new initiatives like New Drug and Clinical Trial Rules, 2019, easing of FDI norms and Make in India to support local manufacturing. These have been further streamlined and fast-tracked as of June 2, 2021. As per the reports 55 drugmakers were offered a total of Rs.15,000 crores in production-linked incentives for six years through FY2029 to boost manufacturing of medicines, in-vitro diagnostics and their raw materials in India.

Also the Union Government decided to decentralize operations for easy procurement of vaccines by asking States to take control and devise local strategies to mitigate the problems. However when the state governments called for bids, the larger international companies were not agreeable to dealing with or supplying directly to the States. This was partly in fear of indemnity clauses and issues.

Resource constraints

Even as the producers have started to ramp up production, vaccine manufacturers have highlighted shortage of key raw materials which is holding back production ramp up. There was an escalation in costs of raw materials. The main reason behind the surge was anticipated shortages of raw material, owing to the suspension of cargo services by China. This resulted in in the hoarding of stocks raising artificial prices.

The severity of the second wave forced an urgent diversion of supply of oxygen from production facilities to hospitals in several cities to help patients. This reduced supply of oxygen for raw material manufacturing within the country.

Also none of the manufacturing plants were working on full manpower capacity, because either the employees or their family members are infected with Covid.

New players and market share

Supply constraint may ease with foreign vaccines entering the market. Given the recent capacity ramp up announcements by both Serum Institute India and Bharat Biotech, and the recent approval for Sputnik V, total monthly supplies would also increase by August 2021. Serum Institute India is expected to increase its monthly capacity from 70m to 100m over next few months whereas Bharat Biotech to increase its capacity up from 7-8m currently to 50 m by June and 60-70m by September 2021. Sputnik V has already reached and is available in the market since May 2021. This would initially be through imports and later would be produced within the country. It is expected that Cadila and Johnson & Johnson and Pfizer would also be launched in the coming months.

At this juncture, being the first movers, both Serum Institute India and Bharat Biotech are the key beneficiaries. They could be expected to occupy a large market share in the current year 2021 given huge capacities and early entry in the Indian market. Sputnik V, with its imports and local manufacturers, should be the next biggest player with 10-15% value share. New players would share the remainder.

With respect to other major players from across the world, such as Pfizer, Moderna, Cadila and Johnson and Johnson, their share in the market would evolve as they react to India's requirements as also the position taken on issues of regulation in India.

The payback that the companies expect could be short-run. But considering the mutating virus and as the medical fraternity learn more, there is a possibility for a multiyear opportunity in India and to export to other markets.

Also keeping in mind the large population and the number of necessary doses required and other supplementary medications there is a large profit that could be expected in the long run. In such a case, the government could also look to renegotiate the prices with which the vaccination programme will be undertaken.

Table 2: Estimated figures after opening up of the vaccine import to foreign producers

Vaccine wise Prophylactic > Market penetration Broad Approval/ availability			India treated patients, prophylactic ('000) Number of people vaccinated vaccine wise	
Vaccines	2020	2021	2020	2021
SII/AZN/Oxford (AZD1222)	0.0	27.0	0	351,438
Bharat Biotech vaccine (Covaxin)	0.0	2.5	0	32,541
Moderna vaccine (mRNA- 1273)	0.0	0.0	0	0
PFE/BioNTech vaccine (BNT162)	0.0	0.5	0	6,508
Sputnik V/Dr. Reddy's/others	0.0	2.5	0	32,541
Cadila vaccine (ZyCoV-D)	0.0	1.0	0	13,016
JNJ Vaccine/Biological E	0.0	0.5	0	6,508
Other (Novavax)	0.0	0.0	0	0
Total		34		

Source: BofA Global Research

Evolving scenario

In the severity of the crisis in the months of April and May 2021, local suppliers of various vaccine manufacturers have started to make arrangements to ship the vaccines.

With the opening up of vaccines sales from various manufacturers and decentralised procurement design, there is a free market at work. New private players are entering market to provide vaccinations, just as premium hotels linking up with premium corporate hospitals to cater to the richer class. Once again, it would be the poor who would find it difficult to manoeuvre the market, because of unregulated prices ruling at various vaccination centres. The charges of getting vaccinated ranges between Rs 850 and Rs 1250. Some private players also have priced it at Rs 3000 per person.

Further local manufacturers could collude to curtail production to procure higher prices in the local markets. The foreign manufacturers may also follow the model of tying up with certain hospitals.

Again with the intended shifting of production of a part of Serum Institute India to UK as per media reports, it may raise the price of its vaccines. Serum Institute could well use its price leadership to sway the market. It seems it has already achieved economies of scale. At this stage, Bharath Biotech has lesser penetration in the market as also has a smaller production capacity.

Conclusion

Clearly the duopolistic nature of the market with only two players has changed to give place to more players. The products are differentiated making it a differentiated oligopoly. Price is an important criterion that will play a role in the acceptance and market share for each of the individual vaccines. There will remain a non-price competition based on how the companies would want to market their vaccines.

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