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Mini Review

Covid-19 Pandemic: Is it a Challenge or Opportunity for Pharmaceutical Industry around the Globe?

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Abstract:

In this opinion article, authors emphasized the role of pharmaceutical industries or organizations, the way forward to deal efficiently with pandemics such as covid-19 and various aspects of supply chain management are discussed so as to reach the vaccine to the last end user.

Keywords: covid-19; covax; pharmaceutical industry; WHO; Patent; pandemic

Introduction

The Corona virus is a highly contagious and life-threatening disease that has spread into 208 countries (509 million confirmed cases and over 6.23 million deaths as on 27th April 2022) and had been initially traced in Wuhan City of China and it has started spreading into several countries by January 2020 [1]. The novel Corona virus disease (SARS n-Cov/ COVID-19) is declared as a pandemic by the World Health Organization (WHO) on 11th March 2020. Industries like transport, aviation, hospitality, education and software services were worst hit by the pandemic during all the waves across the world [2]. In contrast to this, healthcare, pharmaceuticals, and active pharmaceutical ingredients (API) have grown phenomenally during the pandemic waves. The new COVID-19 variants are surpassing existing vaccine shields with modified genetic structure affecting human cells having different intensities.

USA, India, Brazil, France, UK, Russia, Germany, Turkey, Italy and Spain alone contributed to approximately 60% of the global cases and 55% of the global deaths reported during 2019-till date [3]. The USA, Brazil and India have passed through an aggressive phase of the Delta wave in 2021. Consequently, a sudden pull in the demand resulted in massive imbalances in the pharmaceutical supplies for protective goods, testing devices, pharmaceutical medicines and life support devices, that formed bottlenecks and which were further affected by transport delays in the flow [4].

In fact, China, being the world's largest supplier of API was affected by lockdown disruptions in the supply chain due to the COVID-19 outbreak, which has further intensified healthcare crisis across the globe [5]. The pandemic forced the countries engage in macroeconomic policy initiatives to combat with raising cases and mortality by making their healthcare more agile, to reduce its adverse effect on economies in terms of productivity, employment and incomes [6]. Life saving technologies like 3D printing, flexible manufacturing, big data analytics, e-healthcare and IoT played a key role in combating the corona virus. In addition to these technologies, distance education, e-gaming, video conferencing, OTT, internet streaming and digital payments had a high momentum during the COVID pandemic [7].

Many research studies revealed that the COVID-19 waves would continue to hit the countries until herd immunity is attained, or the population is fully immunized with effective vaccines. It was an extraordinary task for the pharmaceutical companies to develop a corona vaccine while battling with multiplying COVID-19 cases. In this complex pandemic environment, companies have to conduct quick trials within the scheduled time, get approvals from national and international authorities for its use and launch the vaccine across the globe with decentralized manufacturing facilities. Ever since the corona was declared as pandemic, the international pharma giants Astra Zeneca-Oxford University (Covishield), Gamaleya Research Institute (Sputhnik-V), Pfizer (BioNTech), Moderna (Moderna vaccine), Bharth Biotech (Covaxin) and Sinovac biotechnology (Sinovac) had invested in vaccine development with their associates across the world. Academic collaborations between Oxford University and Astra Zeneca for the development of low price vaccine, is a ray of hope for the third world countries across the globe

until the pandemic subsides [8]. Economically strong countries are placing bulk order for immunization of their population on a priority basis whereas Third world countries majorly depend on funds from WHO (COVAX) initiatives. The relaxing patent for COVID-19 inventions was echoed by India and South Africa in various international forums, and could get the sympathy of more than 100 countries but failed to obtain the support of developed nations. The idea of a patent waiver for the COVID vaccine is not sweet for developed nations and pharma companies. It is obvious notion of the pharma industry that why expensive technology could be made available to competitors for a cheaper price [9].

The WHO accorded an Emergency use license (EUL) to 10 vaccine makers under 35 brand names comprising of mRNA, protein subunit, non-replicating viral vector, DNA and live attenuated methods, which are expensive in manufacturing [10]. However, COVAX is a WHO initiative to provide vaccine for all population as soon as they are available. This initiative offers vaccine support to at least 20% of any country's population. To attain this goal, companies need to overcome production bottlenecks, shortage of raw materials, manufacturing equipment, lockdown disruptions and shortage of storage capacities. Companies need to raise their investment in manufacturing, scaling up capacities and need to establish collaboration with local manufacturers. Storage conditions of Pfizer and Moderna vaccines are complex, as they have to be stored at -30 ^{0}C-70 ^{0}C compared to remaining vaccines. Due to this reason, many countries, with insufficient cold logistics, opted for other vaccines despite their efficacy. This storage constraint could slow down the distribution efficiency of vaccines.

Oxford-Astrazeneca vaccines have a presence in 185 countries including their Indian collaborator SII. Pfizer's BioNtech vaccine has its presence in 166 countries and Sputnik V & Light is sold in 74 countries. Jhonson & Jhonson Ad26.Cov2.s vaccine is licensed in 107 countries. China's Sinopharm has a presence in 89 countries and Sinovac has a presence in 54 nations. Indonesia, Brazil, Pakistan, Turkey and Iran are large users of Sino Pharm vaccine. The WHO data reveals that until now, the Third world countries, more specifically the countries in Africa, East Mediterranean and Western Pacific region are far from vaccine availability [11]. Nearly 90 countries have not even immunized their population with single dose, this issue needs to be addressed immediately. The length of immunity protection offered by certain vaccines is questionable. In such cases, booster doses will be made mandatory and this will further increase the pressure on vaccine production.

As per the WHO covid-19 treatment protocols, the anti-viral and antiviral-property drugs like tocilizumab, remdesivir, favipiravir, ceftrioxome, azithromycin, methylprednisolone, ivermectin and hydroxychloroquine are widely used in the COVID treatment [12]. However, these medicines are of acute shortage during the global waves, which have become more expensive during peak times. Parallel black markets have emerged in a few countries. Most of the anti-viral drugs are authorized EUL, and added to treatment protocols. Therefore, companies were unable to draw on advanced production and sourcing raw materials. Moreover, the most of the drugs have practical uselessness or proven benefit, so being regularly monitored by US FDA, WHO or other competent authorities whether to add in covid treatment protocol medicines or not.

Way Forward

The performance of the pharma industry is exceptionally good in meeting demand to a larger extent. The road ahead for the pharma industry is to make COVID-19 vaccines and medicines available to a large population in a short period of time. It is highly indispensable to relax the IPR & Patent framework in this critical time, considering COVID-19 as a special case. A low cost and affordable access to copy rights and manufacturing rights need to be granted across the globe to produce vaccines for all countries in less time [13]. WTO and Free trade agreement members should ensure that no tariffs are imposed on COVID-19 related medical supplies.

A 'Strategic Drug Reserves' (SDR) has to be created centrally, in a de-central manner, to meet the contingencies for upcoming COVID-19 waves and to respond quickly to future pandemics. These SDRs are to be made available in geographical regions, even country wise also, so that in the event of outbreaks, it will be easier to reach the outbreak affected countries logistically, medically within a short span of time. A special focus has to be made on the African continent, which is amounting for 1.3 billion population and the vaccination process is far slower than other continents.

The pharma API makers need to strengthen their production capacities for which the international aid and governmental policy initiatives are highly essential. The investment channels, including foreign investments, need to be relaxed to finance COVID-19 vaccine and drug makers. The cold logistics are highly essential for a few vaccine varieties, shortage of cold infrastructure will become barriers for vaccine distribution in developing and undeveloped nations.

The need of the hour for the pharmaceutical industry is to have collaborations, strategic alliances with host country companies in order to have agile, highly responsive, competitive and cost effective production and distribution chains. The pharma industry has to restructure their business models with an object to calibrate their process, methods and systems to enhance their innovation, production and supply chains self-sufficient for global needs in the present and future. Pharma companies should adopt the latest technologies like AI, IoT, and the block chain to make drug distribution safer to end users with information on traceability [14].

The industry is passing through a phenomenal change during the pandemic times. The industry is repositioning itself by strengthening its systems, processes and channels for superior delivery of COVID pharmaceuticals to end-users. However, it needs a booster dose to act beyond their capabilities relating to simplification of copy rights, manufacturing rights, automatic clearance of investment channels, promotions.

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