

## The Global Vaccine Competitions: An Overview of COVID-19

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### **Abstract**

*The COVID-19 is a global pandemic; the development of vaccine has triggered competitions amongst global players, playing a vital role in evaluating the ongoing crisis in global markets. This paper intends to analyse the ongoing COVID-19 vaccine competitions and its impact at global level.*

**Keywords:** Global Vaccine Competitions, and COVID-19.

### **Introduction**

The initial outbreak of the novel corona virus had started in China's, Wuhan on December 2019, with the initial classification of COVID-19 as a pandemic to it being an ongoing public health emergency, elevating and accelerating the deeply inbuilt challenges and conflicts across the globe. The COVID-19 has imbibed a spirit of distress at global level.

Throughout this global pandemic, COVID 19 has exposed the ways in which people as a whole access, perceive and respond to vagaries in their communities, political structures and societies. The major impact includes a paradigm shift from liberalized world order to social distance world order in global political economy. The social distancing world order has reduced transnational activities such as people to people contact, trade, migration etc., i.e., from nation to nation. This shift has instigated a green signal in global political economy paving way for the old concept of protectionism in the areas of trade, and people to people relations.

The COVID-19 pandemic has exacerbated underlying geopolitical tensions between recognised global powers. We have seen this in Donald Trump's referencing of COVID-19 as 'Chinese Virus'. China's recent expulsion of American journalist from reporting on COVID-19 in China, and in terms over Russia's misinformation campaign impacting global responses to combat covid-19. However, it is critical to understand via the study of politics, history and economy, the longstanding tensions between the state actors. COVID-19 has become the most recent arena where by the competing practices, politics, and ideologies of states play out

and conflict across an international backdrop of rising state centric populism, anti-globalization, and authoritarianism (WHO News Report, 2020).<sup>1</sup>

The global efforts to contains the numbers of infections and to end the crucial pandemic will be unprecedented on scale, labour resources intensive, and must be designed with a long term planning and preparedness focus to respond to future pandemic after COVID-19 (WHO News Report, 2020).<sup>2</sup>

Currently there are over 169 COVID-19 vaccine development projects, where 26 of these are in the human trial phase. World Health Organisation (WHO) is working in collaboration with scientist, business and global health organisations at an accelerated rate to speed up the pandemic response. When a safe and effective vaccine is found, COVAX (led by WHO, GAVI and CEPI) it will facilitate the equitable access and distribution of these vaccines to protect people of all countries, people most at risk will be prioritized (WHO News Report, 2020).<sup>3</sup>

### **COVID 19 Vaccine Developments: An Overview**

The US, China, India, Russia, Thailand, Bahrain, UAE, UK, Columbia etc are, 30 countries around the world are engaged in research to find vaccine to shield their population from the COVID-19. Universities, pharmaceutical companies, research industries and government laboratories in those countries are working on 133 feasible vaccinations accreting data from WHO and research completed (Ren, 2020).<sup>4</sup>

Overall, the US is in lead with 39 research projects, either independent or in partnership with other countries, same way the Chinese institutions and companies are working on 20 projects. This seems to provide evidence for US-China competition on vaccine development. The countries like US, and China, have their hegemonic position in pharmaceutical R& D wherein these nations are hesitant due to its influence of being a prestigious factor at the global level. The advantages positions like well and established laboratories, largest

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<sup>1</sup><https://www.who.int/news-ro>

<sup>2</sup>[www.blogs.bmj.com](http://www.blogs.bmj.com)

<sup>3</sup>[www.blogs.bmj.com](http://www.blogs.bmj.com)

<sup>4</sup><https://www.scmp.com/business/article/3088568/explainer-who-are-global-competition-develop-coronavirus-vaccine>

investment on health and expenditures, MNC's on pharmaceutical industries are the major advantages on above countries (Ren, 2020).<sup>5</sup>

Of the 39 US research projects underway, of them have advanced beyond the 'preclinical phase', which means testing has been carried out on humans. China is working on the five of those vaccine developments, while the US is working on three. In the late May, a study published in the Lancet said the phase one trial of a potential COVID-19 vaccine developed by Chinese top military virologist showed promising results. Major General Chen Wei who lead the research team said the ability to trigger immune responses does not necessarily indicate that the vaccine will protect humans from COVID-19.<sup>6</sup>In the case of China, four Chinese COVID-19 vaccine candidate have started international phase-3 clinical trials, accordingly the state has initiated joint prevention and control mechanism against COVID-19.<sup>7</sup> Some of the phase-3 trials are expected to complete the first round of vaccination in early September, with preclinical data expected as early November 2020. Phase-3 trials are usually involving thousands of people to verify the safety and effectiveness of the vaccines which are key to their market approval (XINHUANET Reports, 2020).<sup>8</sup>

The Bill and Melinda Gates foundations contribution to the global vaccines development effort focuses on providing intensive vaccinations to produce enough COVID-19 vaccine to meet the needs of developing nations once they are approved by regulators (Ren, 2020).<sup>9</sup>

The UK is also being the part of vaccine competitions in global level, another lead in vaccine development being developed by UK based pharmaceutical giant AstraZeneca. Another jointly arranged vaccine development with two countries India, and UK, world's largest vaccine maker Serum Institute of India announced on June 4, the 750 Million USD funding deal for UK Drug maker AstraZeneca. This will double the company's global capacity to produce a Covid-19 vaccine candidate being developed by Oxford university researcher to two Billion USD closes (Ren, 2020). In the case of UK, university of Cambridge announced on the late August 2020 that a newly developed SARS –Cov-2 vaccine candidate has received funding support from the British government and could start clinical trials in late

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<sup>5</sup><https://www.scmp.com/business/article/3088568/explainer-who-are-global-competition-develop-coronavirus-vaccine>

<sup>6</sup><https://www.scmp.com/business/article/3088568/explainer-who-are-global-competition-develop-coronavirus-vaccine>

<sup>7</sup>[www.sinoptic.ch](http://www.sinoptic.ch)

<sup>8</sup>[http://xinhuanet.com/english/2020-08/29/c\\_139326931.html](http://xinhuanet.com/english/2020-08/29/c_139326931.html)

<sup>9</sup><https://www.scmp.com/business/article/3088568/explainer-who-are-global-competition-develop-coronavirus-vaccine>

Autumn or early next year. The programme is collaboration between the University of Cambridge spin-out company DIOSynVax, and the university hospital Southampton NHS (National Health service) foundation trust.<sup>10</sup>UK prime Minister Boris Johnson hosted a summit on vaccine development with international leaders on 04<sup>th</sup> June 2020, It is expanding to attempt to raise at least \$ 7.4 billion primarily to help the world's poorest nations in vaccine (Deutsche Welle News Report, 2020).<sup>11</sup>

Another competition in vaccine development is Switzerland based coalition for epidemic preparedness innovations which the Bill and Melinda Gates foundation co-founded in 2016 and along with GAVI vaccine alliance.<sup>12</sup>

The milestone in the vaccine development, The Pan American Health Organisation (PAHO) /WHO representative on Columbia highlighted the historical advancement taking place in the development of COVID-19 vaccines, with currently more than 200 experienced vaccines being developed. The PAHO/WHO representative explained that the PAHO vaccine namely Revo/Ving fund can be used as a strategic tool for the purchase and distribution in the Americas as a vaccine against COVID-19 when these became available. The PAHO member states will be able to benefit from the organization's technical experience, as well as from its decade of experience in the safe distribution of vaccines. The organisation will also ensure that the process will be as inclusive as possible with an equitable distribution of vaccine among participant countries. The safety of vaccine is a serious matter and WHO has established a committee that will use established criteria, including safety to help the prioritization of global investments in the development and procurement of vaccines (WHO News on PAHO, 2020).<sup>13</sup>

The vaccine was registered (namely Sputnik V) in Russia in the month of August, before gone through large scale of trials. The researchers at the Gamaliel national Research centre for Epidemiology and Microbiology in Russian received approval on August 26 to do a phase-3 trial, which is expected to have 40000 volunteer, as per a press release from the

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<sup>10</sup>[www.thestar.com.my](http://www.thestar.com.my)

<sup>11</sup><https://www.dw.com/en/germany-plans-coronavirus-vaccine-development-eu-alliance-report/a-53681991>

<sup>12</sup><https://www.scmp.com/business/article/3088568/explainer-who-are-global-competition-develop-coronavirus-vaccine>

<sup>13</sup><https://www.who.int/news-room/feature-stories/detail/colombia-secures-covid-19-vaccines-through-who-paho>

Lancet.<sup>14</sup> The Researchers are already distributing the vaccine to high risk groups, according to Kirill Dmitriev, head of Russian Direct Investment Fund (RDIF), which is financing Russian vaccine research (CNN News Report, 2020).

The Gamalei is using adeno virus in their covid-19 vaccine, this is the same approach used in the vaccine developed by the university of Oxford and Astra Zeneca.<sup>15</sup>The adeno virus delivers genetic material for the spike protein that sits atop the virus that causes covid-19, and that genetic material is designed to generate an immune response to the virus. Dimitriev, CEO of the RDIF, said the trial results confirm the ‘high safety and efficacy’ of the vaccine, adding in a stated on 12/09/2020 (that results are ‘powerful response to sceptics of who unreasonably criticised the Russian vaccine (Cohen, 2020).

Russia has previously said it plans to begin mass vaccination of citizens in October and the country’s health ministry has said the country’s frontline medical staff and teachers will be first to be vaccinated.<sup>16</sup> More than 5000 people have already signed up to participate in the trials, asserts Sobyenin, who spoke during a video conference with Russian president Vladimir Putin. In addition, without completing phase 3 trials, Russia has not proven to the world Sputnik V works, though Dimitriev has previously said several countries in Latin America, the Middle East and Asia have experienced interest in procuring vaccine (Cohen, 2020).

In the case of Spain, the first phase -2 coronavirus clinical trial on human beings in Spain gets underway on 13<sup>th</sup> September 2020, in partnership with pharmaceutical company Janssen in charge of development at La Paz and La Princesa hospital in Madrid and Marguie of Valecilla hospital in Santander. The Janssen vaccine is being tested on 190 volunteers from two groups, one composed of people aged 18 to 55 and other with people 65 and over, preclinical results have shown it provides very good protection against coronavirus because it stops the replication of the virus at different levels in the airways said Janssen (Majorca Daily Bulletin, 2020).<sup>17</sup>

In the case of Italy, the phase one of the clinical trial of an Italian –developed, GRAD-Covz coronavirus vaccine kicked off in the last week of August with incubation, the first officials

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<sup>14</sup>[www.albanyherald.com](http://www.albanyherald.com)

<sup>15</sup>[www.albanyherald.com](http://www.albanyherald.com)

<sup>16</sup>[www.albanyherald.com](http://www.albanyherald.com)

<sup>17</sup><https://www.majorcadailybulletin.com/news/local/2020/09/14/72177/human-covid-vaccine-trials-begin-spain.html>

and scientist said. The experimental publicity vaccine has been developed by Italian biotech company ReiThera in collaboration with a team of scientist at the National Institute of Infection Diseases (INMI) at Rome's Spallanzani hospital(XINHUANET News Reports).<sup>18</sup>

In the case of US, the pharmaceutical company Pfizer and German company BioTech have released additional phase-1 safety and immunogenicity data from their ongoing study of their vaccine candidate against COVID-19.<sup>19</sup> In older adults aged between 65 and 85, the vaccine candidate elicited a neutralizing GMT 1.6 times the GMT of the same panel, demonstrating strong immunogenicity in younger and older adults(XINHUANET News Reports).<sup>20</sup>

In the case of Australia, development of COVID-19 vaccine has shown promising results in preclinical testing, raising hopes for its potential effectiveness and manufacturability. The university of Queensland (UQ) released results of animal trials of its vaccine candidate on August last week to the international society for vaccines. UQ's 'Molecular claim vaccine works by locking on to the normally unstable, perfusion proteins on the surface of the virus, along the body's immune system to respond more effectively(XINHUANET News Reports).<sup>21</sup>

In the case of UAE, ministry of health and prevention has announced an 'emergency approval' for use the COVID-19 vaccine. "in less than six weeks since the study began, 31000 volunteers representing 125 nationalities have participated in the clinical trials Phase 2. The side effects which have been reported so far are mild and expected, like and other vaccine, and no major side effects have been reported- the authority said. The clinical results in the ongoing study are encouraged in terms of antibody production in the body. The vaccine has been tested on 1000 volunteers suffering from chronic diseases and no complication occurred (Sebugwaawo, 2020).

In the case of Qatar, Sidra medicine, a member of Qatar foundation, is working with an international research consortium in the ongoing global race to find a safe and effective vaccine to tackle the COVID-19 virus.<sup>22</sup> The international team has developed a uniquely powerful humanised mouse model that closely represents the pathology and immunological responses developed by human patients: with the potential to bring about an enhanced and

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<sup>18</sup>[http://xinhuanet.com/english/2020-08/29/c\\_139326931.html](http://xinhuanet.com/english/2020-08/29/c_139326931.html)

<sup>19</sup>[www.thestar.com.my](http://www.thestar.com.my)

<sup>20</sup>Ibid.,

<sup>21</sup>Ibid.,

<sup>22</sup>[www.thepeninsulaqatar.com](http://www.thepeninsulaqatar.com)

safe SARS-Cov-2 vaccine. The mouse models play critical role in vaccine development as they are utilised as tools to evaluate immune responses against all types of agents influencing the immune system, while the method is well established within biomedical research, there is currently limited understanding in how the immune system responds to COVID-19 (Gulf Times News Report, 2020).<sup>23</sup>

In the case of Bahrain, the Bahrain's phase -3 vaccine trials are to be carried out in collaboration with stakeholders from UAE, Sino-pharma's China National Biotech Group (CNBG), and artificial intelligence and cloud computing company group 42.<sup>24</sup> The vaccine will be tested on 6000 citizens and expatriate volunteers in Bahrain (Bhatia, 2020).

In the case of Iran, it would start producing the anti-viral agent Remdesvir for the treatment of coronavirus patients on August 2020, Health Minister Saeed Namaki says, according to Iran press news agency. According to Rouhani (President of Iran) says more than 25 million Iranians have contracted the coronavirus and 14000 may have died due to the illness, based on an "Estimated Scenario" from a health ministry research report. Restrictions were re-imposed for a week in Tehran, including banning religious and cultural functions, closing boarding schools, Cafes, Indoor pools, annual parties, and zoos from 19 July, 22 cities and downs in the South Western Khuzestan province will be under the three-day lockdown, Reuters reported (Bhatia, 2020).

In the case of Brazil, Brazilian lab and hospital group (DASA S.A) said on 9<sup>th</sup> September 2020, it has agreed to conduct clinical phase 2 and 3 trials in Brazil for covid-19 vaccine development by COVAXX, a unit of privately owned United Biomedical INC. The officials said with the partnership DASA would secure the first 10 million doses of the potential vaccine for the private market on Brazil and COVAXX will make available an additional 60 million doses for the Brazilian public health market(The Peninsula News Report, 2020).<sup>25</sup>

In the case of Turkey, it is using the latest technology in vaccine studies and working on best practices. Eleven different studies are being conducted, and (some are at the) stage of animal

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<sup>23</sup><https://gulf-times.com/story/672417/Sidra-Medicine-supports-safe-development-of-Covid->

<sup>24</sup>[www.meed.com](http://www.meed.com)

<sup>25</sup><https://www.thepeninsulaqatar.com/article/09/09/2020/Brazil-lab-DASA-to-do-tests-for-COVID-19-vaccine-being-developed-by-COVAXX>

trials. It is an extra ordinary sources (in such a short time). They hope that vaccine will be found in the first quarter of 2021(Trent News Agency Report, 2020).<sup>26</sup>

In South African case, it is ready to host human trials of COVID-19 vaccine candidate NVX-COV2373, produced by the American company NOVAVAX. The drug is based on stimulating an immune response to confer protein against covid-19. A total of 2904 volunteers aged between 18-46 years old will be randomly chosen for the trials(Asfan News Reports, 2020).<sup>27</sup>

The case of South Korea has allowed GenexineInc, a local bio technology firm to conduct a phase-1 human trial of its potential coronavirus treatment drug. The government will spend 27.2 trillion won for research and development up 12.3% from this year(Korea Times News, 2020).<sup>28</sup>

In the case of Singapore, Singapore's Duke-Nus medical school is collaboration with US biotechnology company, Arcturus Therapeutics, to co-develop a COVID-19 vaccine. The school supported the pre-clinical studies by conducting rapid screening of potential vaccine candidates for effectiveness and safety, and by conducting animal trials. Phase-1 human clinical trials for this vaccine started in early August at the Sing Health Investigational Medicine Unit (IMU)(Bio Spectrum Asia Edition Report, 2020).<sup>29</sup>

In the case of Malaysia, it also pursuing its own vaccine development programmes. Health minister Dr.Adhan Baba announced in August 2020, the development of an inactivated vaccine against the covid-19 where Malaysia's Institute of Medical Research (IMR) is leading the research(Malaya Mail News Report, 2020).<sup>30</sup>

In the case of Japan, it had agreed with 'British drug maker AstraZeneca PLC, to produce 120 million doses of potential coronavirus vaccine being developed with the University of Oxford. Similarly, Japan has also agreed with Pfizer INC, and its German Partner Bio-N tech

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<sup>26</sup><https://en.trend.az/world/turkey/3282614.html>

<sup>27</sup>[https://en.as.com/en/2020/09/01/latest\\_news/1598914463\\_859998.html](https://en.as.com/en/2020/09/01/latest_news/1598914463_859998.html)

<sup>28</sup>[http://www.koreatimes.co.kr/www/nation/2020/09/119\\_295466.html](http://www.koreatimes.co.kr/www/nation/2020/09/119_295466.html)

<sup>29</sup><https://biospectrumasia.com/news/54/16670/singapore-releases-covid-19-vaccination-strategy.html>

<sup>30</sup><https://www.malaymail.com/news/what-you-think/2020/08/14/long-wait-for-malaysia-as-a-hub-for-covid-19-vaccine-trials-ameen-kamal/1893986>

SE to receive 120 million doses of their potential vaccine, providing its development proves successful(Business Insider India, 2020).<sup>31</sup>

In the case of Germany, Germany is working with three European Union states on a vaccine procurement plan. The UK is set to host a global summit on vaccine development. Health minister, Jens Spahn wrote in connection along with his counter parts from France, Italy and the Netherlands to announce that they have joined to “achieve the fastest and best possible outcome in negotiations with key players in the pharmaceutical industry”. Germany is eager to involve the EU, wherein they will have vaccine access faster than China or the United States, who may attempt to control purchase of any potential vaccines. The four EU countries may hold talks with other Non-EU members on working together for vaccine procurement including Singapore, the UK and Japan. The EU also preparing to use a 2.4 Billion Euro fund to make advance purchase of vaccines, Reuters news agency reported. The use of the emergency fund is yet to be officially announced(Deutsche Welle News Report, 2020).<sup>32</sup>

In the case of New Zealand, The Malaghan Institute of Medical Research, University of Otago and Victoria University of Wellington, will help to lead efforts to secure a covid-19 vaccine for New Zealand as part of newly established vaccine alliance Aotearoa New Zealand. In May 2020, a \$ 37 million covid-19 vaccine strategy was announced to ensure New Zealand has access to a safe and effective vaccine at the earliest opportunity.<sup>33</sup> From that, the government has allocated \$ 10 million towards local research and development, charging the group with establish a national covid-19 vaccine evaluation platform and development candidate(University of Otago, 2020).<sup>34</sup>

In the case of Canada, it is near the front line to get millions of doses, of four of the most promising COVID-19 vaccines in development, but the federal government does not plan to make getting vaccine mandatory, federal cabinet ministers said on August 31, 2020. The procurement minister Anita Anand announced new deals with Maryland based biotech company Novavax for Canada to buy as many as 76 million doses of its experimental vaccine

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<sup>31</sup><https://www.businessinsider.in/international/news/japan-may-offer-free-covid-19-vaccine-to-all-its-citizens-report/articleshow/77886885.cms>

<sup>32</sup><https://www.dw.com/en/germany-plans-coronavirus-vaccine-development-eu-alliance-report/a-53681991>

<sup>33</sup><https://www.otago.ac.nz/news/news/otago742820.html>

<sup>34</sup><https://www.otago.ac.nz/news/news/otago742820.html>

candidate, all up to 38 million doses of the vaccine in development by Johnson and Johnson's pharmaceutical company Janssen Inc (Rabson, 2020).<sup>35</sup>

In the case of Cuba, leading enterprise group in Cuba's biotechnology and pharmaceutical industry Bio Cuba Farma reports having received permission to begin clinical trials of a Cuban candidate vaccine of producing a strong immune reaction to a SARS –Cov-2 infection. They identified as FINLAY-FR-1, the vaccine project led by the Finley vaccine institute, the centre for molecular Immunology –both affiliated with Bio Cuba Farma – with the collaboration of University of Havana's Chemical and Bimolecular synthesis. The laboratory, has satisfactorily conducted the drugs development stage and preclinical studies in animals, producing the scientific findings required, to support authorised by Cuba's centre for state control of medication, Medical equipment and devices (CECMED) to conduct clinical trials.<sup>36</sup> More than 600 volunteers are also expected to be enrolled during the whole clinical trial process across the country. However, the country has taken a long horizon and is not expect the results of its human trials before February next year. In addition to its own vaccine, the country has pinned its hope on support from its long-time ally with Russia where generally approved covid-19 vaccine Sputnik V will be mass produced(Bernama Radio News).<sup>37</sup>

In the case of Israel, Israel claimed that it already has in hand a “Excellent” vaccine against the coronavirus pandemic, but it has to go through regulatory process which are set to begin with human trials following the autumn holidays.<sup>38</sup> Israel's defence minister Benny Gantz visited the Israel institute of Biological Research (IIBR) where, he met with its Director Prof.ShmuelShepira to receive an update on the purpose on work to develop covid-19 vaccine(Times of India News, 2020).<sup>39</sup>

In the case of Egypt, Egypt health and population ministry announced that starting September, it would open volunteer registration for third phase of the coronavirus vaccine clinical trials, done in cooperation with the Chinese government and UAE health care company G42(Egypt Independent Report, 2020).<sup>40</sup>

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<sup>35</sup>[www.tricitynews.com](http://www.tricitynews.com)

<sup>36</sup>[www.en.granma.cu](http://www.en.granma.cu)

<sup>37</sup>[https://www.bernama.com/en/general/news\\_covid-19.php?id=1872381](https://www.bernama.com/en/general/news_covid-19.php?id=1872381)

<sup>38</sup>[https://www.bernama.com/en/general/news\\_covid-19.php?id=1872381](https://www.bernama.com/en/general/news_covid-19.php?id=1872381)

<sup>39</sup><https://timesofindia.indiatimes.com/world/middle-east/israel-claims-excellent-vaccine-in-hand-set-to-start-human-trials/articleshow/77395192.cms>

<sup>40</sup><https://egyptindependent.com/egypt-to-start-receiving-volunteers-for-covid-19-vaccine-trials/>

Mexico has signed memorandum of understanding with Johnson and Johnson, along with Chinese companies Biological Inc., and Walvax biotechnology Company Limited. According to Foreign minister of Mexico, highlighting growing anxiety and “vaccine diplomacy” around the world as developing countries jostle to get timely access to treatments and vaccines(Reuters Report, 2020).<sup>41</sup>

In the case of Pakistan, its drug watch dog has approved phase-3 clinical trial of COVID-19 vaccine developed in collaboration with Chinese company (Adenovirus type 5 vector) developed by Can Sino Bio and Beijing Institute of Bio technology China (CBIS).

The latest development of COVID-19 vaccine 12 vaccine projects is conducted human trials. The vaccine called Pfizer, USA based company in connection with German Bio Pharmaceutical called Biotech discovered vaccine assured 90% recovery against corona virus. The Chinese company Fossen also be the part of this project. The another project linked with US based company Moderna collaboration with National Institute of Health of USA are developed vaccine which offer to ensure 94.55% of success on to contain corona virus. Canada, Japan, Qatar are already approached to them. The next project from British-Swedish Company namely called Astra Zanecca in collaboration with University of Oxford, Serum Institute, Pune are developed, they expected to produce 10 crores of vaccine doses in the next year. The Gamaliel products, called Sputnik -5, also assured 92% success against the corona virus. The next millstone project under Indian Council of Medical Research in accordance with Hyderabad based Bharath Bio Tech also in the final trials on vaccine competitions.in the latest development of Chinese vaccine, Chinese academy of Military Medical Science in connection with Cansino Biologics are developed vaccine, Similarly Wuhan Institute Biological Products in connection with Chinese government company Sino Pharmdeveloped a vaccine against the corona virus. They are in the third trials which conducted in Peru, UAE, and Morocco. The another initiative taken by Chinese government company Sino Pharm collaboration with Beijing Institute of biological products developed COVID-19 vaccine. The another intuitive from China, developed a vaccine by Sino-Vacc Bio Tech, also in the final trials on global vaccine competition. The Australian company Mardoc Children’s Research Institute developed a vaccine, which are in third trials stage. The US based company Johnsen and Johnsen company in accordance with Beth Israel Deneks Medical Centre are developed anther vaccine in the global market. The another project from

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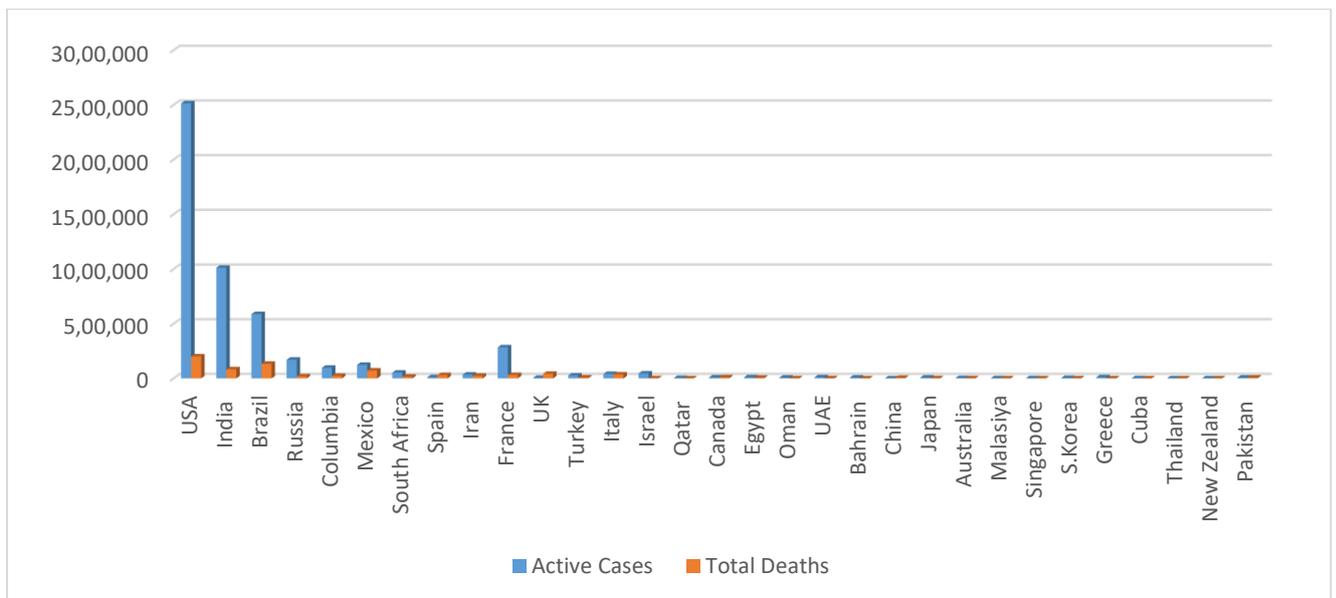
<sup>41</sup><https://in.reuters.com/article/health-coronavirus-mexico-vaccine-idINKCN257210>

USA, Novax company developed another vaccine against corona virus, which also expect to produce 10 crores doses in the USA on first quarter of next year.

To conclude that, the above development shows vaccine competition in global level, no vaccine assured 100%, the major facts on vaccine development can't be followed minimum time period of vaccine development. The most vaccine has some type of disadvantages like side effects, inappropriate temperature on storage etc. So that development of vaccine leads to global competition on the basis of country to country, companies to companies, institute to institute bases etc.

**Figure 1**

**COVID-19 Expansion in Global Level**



Source: WHO updated data COVID-19 as on 16/09/2020,  
<https://www.worldometers.info/coronavirus/>

In the above figure 1 also give pictures on recent development on COVID-19 expansion in global level. The United States have in the first position on active cases of coronavirus, i.e. 2514237 and deaths rate 200770 respectively. As a result, US isin urgent need to develop COVID-19 vaccine to tackle this death rates and active cases. So they also initiated 39 research projects, either independently or in partnership with other countries. The US also trying their hegemonic position in pharmaceutical field along with their advance laboratory facilities. Donald Trump election campaign on COVID-19 vaccine have been playing a significant role on COVID-19 vaccine development in USA. The US-China vaccine development competition also visible in the global affairs.

In India, cases are increases day by day, the active cases reported are 1011445, and death rate are in 83208. After USA, India holding second position in COVID-19 cases, in future India seems to overtake USA on coronavirus case. In the case of vaccine development, human clinical trials for vaccine for COVID-19 have been initiated with approximately 1000 volunteers participated in the exercise for each of the two indigenously developed vaccine candidates, the ICMR said. Since India is one of the largest vaccine producers, it is the country's 'moral responsibility' to fast-track vaccine development process, according the ICMR.<sup>42</sup>

In the case of China, COVID-19 case is quite stable and controlled active cases are below 1000, and deaths rates are in 4634. Chinese institutions and companies are working on 20 projects. The coronavirus vaccines being developed in China may be ready for use by the general public as early as November or December, an official with the Chinese Centre for Disease Control and prevention (CDC) said. The China has strongly contained COVID-19, the recent data on active cases bellow 1000, and death rates 4634 shows that their significant efforts on this process.

In the case of Russia first country in the world to announce a COVID-19 vaccine. The Russian government claims that people must do everything to avoid new quarantines and restrictions. Twelve regions are still in the red zone, and many restrictions remain in force all over the country. Mask, social distancing, temperature checks, closed offices, and remote work and study remain integral parts of Russian reality. Some countries have already opened their air spaces for Russia including Turkey, the UK, Switzerland, Tanzania, Egypt, UAE, and the Maldives. The active cases of Russia with regards to COVID-19 was 170488, and

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<sup>42</sup>[www.icmr.com](http://www.icmr.com)

deaths rate 18917. Russia holding 4<sup>th</sup> position in COVID cases report, gradually declining their positive cases.

The case of Brazil, is similar like India, and USA. The number of cases increases day by day. The active cases have been reported at 587868, and death rates are in 133355. Brazil holds third position in global coronavirus cases. They also develop their vaccine with support of privately owned United Biomedical namely called as COVAXX. The situation is similarly worse like USA, and India to contain this virus on mass population.

The active cases of Mexico (123741), France (283952), Columbia (97324) and death rates are in 71678, 31045, 23288 respectively. The countries like South Africa (52754), Iran (34683), Italy (40532), Israel (45145), Turkey (26540) active cases reported.

The other dimension in the COVID-19 expansion on countries like Spain (11193), Canada (8234), Egypt (9916), UAE (9924), Greece (9921), Bahrain (6596), Oman (6028), Japan (6676), Pakistan (5936) active cases are reported.

The countries like South Korea (2827), Qatar (2841), Australia (2229), Singapore (603), Malaysia (668), Thailand (116), New Zealand (79) are reducing their active cases at minimal level.

## **Conclusion**

The leading COVID-19 vaccine candidates have progressed to advanced stages of clinical development at exceptional speed, many uncertainties remain given the lack of robust in clinical data so far. Moreover, given the highly unusual circumstances associated with developing a vaccine during the evolution of a novel global pandemic, probability of success benchmarks for traditional vaccine development are likely to underrepresent the risks associated with delivering a licensed vaccine for COVID-19. The most advanced candidates are expected to begin reporting data from pivotal studies over the coming months, which if positive will be used to support accelerated licensure of the first COVID-19 vaccines. Such data will also provide valuable insights for the field and inform ongoing and future development activities aimed not only at controlling the current global pandemic, but also for effective long-term immunization strategies against the disease.

To overall conclude that the COVID-19 vaccine competitions determined its market potentialities in global level. The quest in search of vaccine has triggered competitions among the nations, institutions, companies, and universities at global level. The raise in the number

of COVID cases and COVID death has resulted a fluctuation in the market demand and supply of Corona vaccine in the global market. The ideological difference among the nation states has effected the development of COVID-19. The ideological differences in various economic system led to differences in their contributions towards public health care expenditure which is one of the reason effecting the development COVID-19 vaccine. The private companies having entrusted with the task of development of corona vaccine in liberal economies like US, UK, and Italy, which can trigger profit making potential among these companies, whereas the development of such vaccine when entrusted to public institutions in countries like China, Cuba, Russiacanensure fair and equitable distribution of the vaccine. Apart from this public private partnership in developing nations can also contribute to global completion of vaccine.

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