

# **Investors search for a winner in the vaccine race**

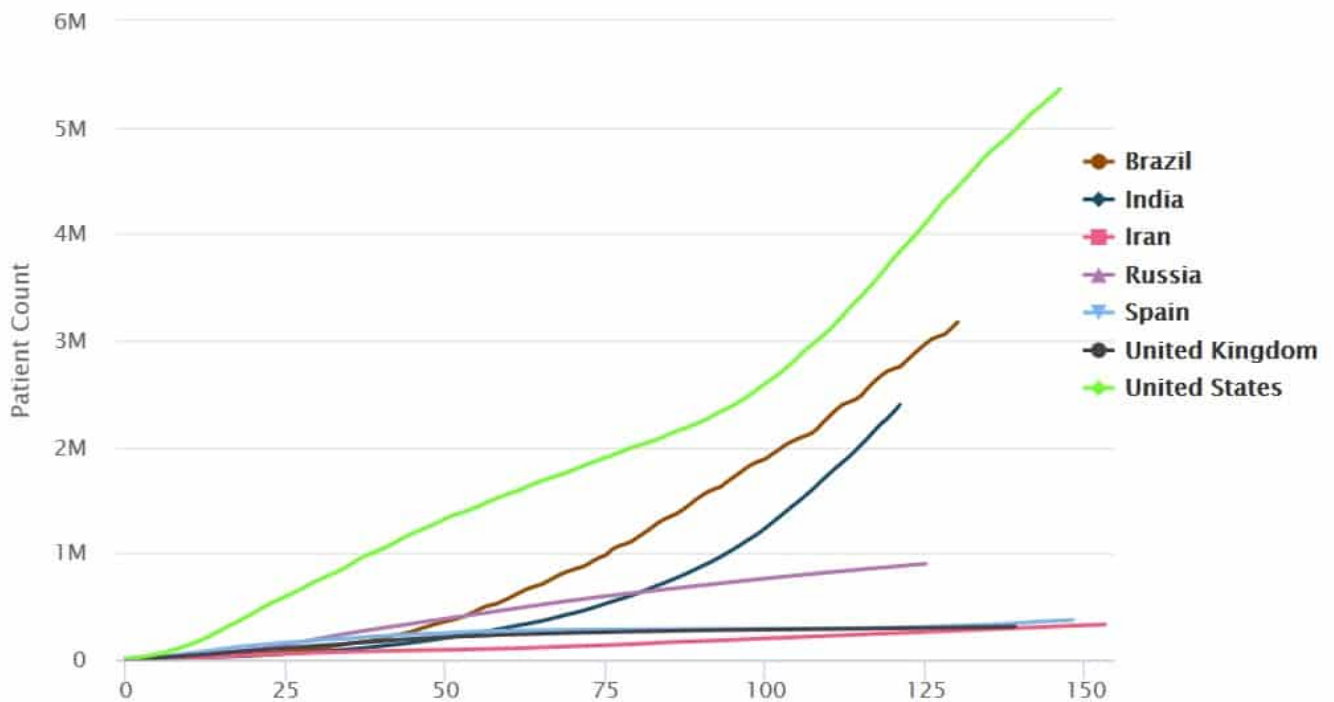
## **It's not just about who's first, but about who can deliver**

The race to develop a COVID-19 coronavirus vaccine is on. There are literally around 100 companies globally as well as numerous government organizations all rushing to get an effective and safe COVID-19 vaccine approved and ready for widespread use. After developing a vaccine comes testing (including 3 phases of human trials with bigger numbers in each phase), then FDA approval in the U.S., and finally production. Normally this process can take up to 10 years, but with the personal and global economic challenges of COVID-19, the goal is to have an effective and safe vaccine in 1-2 years, with the leading companies now moving into phase 3 human trials.

For investors the key question is which companies will win the race to produce a safe and effective vaccine, stopping the pandemic and allowing the global economy to return to some form of normality. Certainly with global cases at a staggering 20,810,774 and 746,411 deaths, the world desperately needs a cure. Worst hit countries are currently the USA, Brazil and India.

**Cumulative global COVID-19 cases by country as of August 12, 2020**

Cumulative number of cases, by number of days since 10,000 cases



Source: [www.worldometers.info](http://www.worldometers.info)

Today I look at which countries and companies are leading the COVID-19 vaccine race to see what may happen next.

## Russia

The world's press lit up this past week with Russia's President Putin's statement that Russia has registered the world's first Covid-19 vaccine, named 'Sputnik V'. While this was met with some skepticism and perhaps jealousy by the West, it appears that Russia is very well advanced and experienced with vaccines and in fact may likely end up with the world's first COVID-19 vaccine, in part due to their fast-tracked testing process. The Gamaleya vaccine (developed through the Russian Direct Investment Fund) began Phase 3 testing last week. Russian officials have said production is likely to start next month (Sept.) and the Health Ministry said mass vaccinations could begin by October, 2020.

The bigger question is who outside of Russia will use it? I highly doubt the western world will choose a Russian vaccine

over a western vaccine. Some industry bodies have called the Russian Covid-19 vaccine a Pandora's Box due to the shortened testing and the risks that come with it.

## **China**

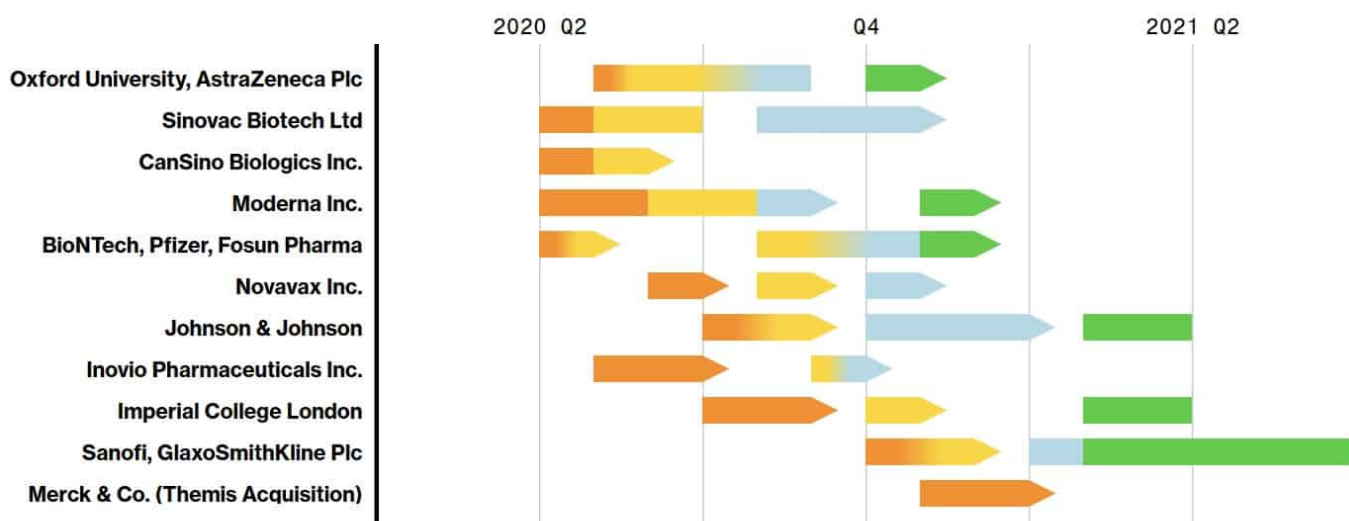
Many see China leading the global vaccine race. Reuters recently reported: "Chinese ventures are leading at least eight of the 26 global vaccine development projects currently testing on humans."

China's leading COVID-19 vaccine company is Sinovac Biotech Ltd. with their 'CoronaVac' vaccine. Their phase 3 trial in Indonesia with 1,620 human subjects is expected to end by December 2020. Sinovac's vaccine candidate is also being tested in other places around the world, including phase 3 trials in Brazil.

Last week it was announced that Shenzhen Kangtai Biological Products (SHE: 300601) will produce AstraZeneca Plc's prospective COVID-19 vaccine in mainland China (100m doses). A big plus for AstraZeneca to potentially gain access to the 1.4 billion person Chinese market.

## **Vaccine tracker timeline**

- Phase 1** Testing in small groups for safety
- Phase 2** Larger tests for effectiveness
- Phase 3** Large-scale efficacy and safety trials
- Approval** Allowed under emergency use authorization or other limited use authorizations.



Source: Bloomberg

## UK/Europe

Two of the big four global vaccine companies are headquartered in the UK or Europe. GlaxoSmithKline (GSK) is in the UK and Sanofi (SNY) is in France. Both will likely be front runners in Europe come late 2020 and they may even develop a joint venture vaccine. AstraZeneca (AZN) is the other main competitor who is headquartered in the UK.

## USA

The final two of the big four global vaccine companies are Pfizer (PFE) and Merck (MRK), both headquartered in the USA. In June it was reported that Trump “has selected its COVID-19 vaccine (five) finalists for Operation Warp Speed“. Naturally, four of the five are headquartered in the USA – Pfizer, Merck, Johnson & Johnson (JNJ) and Moderna (MRNA). The fifth was AstraZeneca. The goal of Operation Warp Speed is to deliver 300 million doses of a safe, effective vaccine for COVID-19 by

January 2021.

In terms of funding, the US government has given massive support to the following companies:

- March 30: HHS (U.S. Department of Health and Human Services) announced \$456 million in funds for Johnson & Johnson's candidate vaccine, with Phase 1 clinical trials set to begin this summer.
- April 16: HHS made up to \$483 million in support available for Moderna's candidate vaccine, which began Phase 1 trials on March 16 and received a fast-track designation from the FDA.
- May 21: HHS announced up to \$1.2 billion in support for AstraZeneca's candidate vaccine, developed in conjunction with the University of Oxford. The agreement is to make available at least 300 million doses of the vaccine for the United States, with the first doses delivered as early as October 2020 and Phase 3 clinical studies beginning this summer with approximately 30,000 volunteers in the United States.
- May 12: DoD and HHS announced a \$138 million contract with ApiJect for more than 100 million prefilled syringes for distribution across the United States by year-end 2020, as well as the development of manufacturing capacity for the ultimate production goal of over 500 million prefilled syringes in 2021.

Source: HHS.gov Fact Sheet

More recently, on August 11, 2020 President Trump announced a deal with Moderna for 100 million doses of coronavirus vaccine, said to be worth US\$1.53b.

**US vaccine spending – Trump's vaccine deals**

# U.S. VACCINE SPENDING

Trump's Vaccine Deals



\$1.5B to Moderna

\$1.2B to AstraZeneca

\$1.6B to Novavax

\$2B to GlaxoSmithKline

\$1.95B to Pfizer

Source: Bloomberg – Vaccine for All ‘Decent Amount’ of Weeks Away

## India

India is already a world-leader in vaccine production, currently producing ~60% of global vaccines. The Serum Institute of India may also do well as they have the world's largest vaccine manufacturing facility and they are now preparing to be capable of producing 1 billion COVID-19 vaccine doses pa. The Serum Institute already has a deal to produce a billion doses of a COVID-19 vaccine being developed by the University of Oxford and AstraZeneca. This places AstraZeneca in a very strong position to be able to reach the largest scale of all vaccine competitors.

**COVID-19 vaccines are already in phase 3 human trials in many parts of the world**



For an in depth list, top 5, and daily stock price performance of the global vaccine companies investors can search the daily InvestorIntel watchlists [here](#).

### **InvestorChannel's Covid-19 Watchlist Update for Wednesday, August 12, 2020**

**i** InvestorChannel's Covid-19 Watchlist Update for Wednesday, August 12, 2020, 16:30 EST  
**InvestorChannel's Watchlist**

- Mesoblast Limited (MESO) USD 11.81 (4.24%)
- AbbVie Inc. (ABBV) USD 95.51 (3.06%)
- Roche Holding Ltd. (RHHBY) USD 43.37 (2.85%)
- AstraZeneca PLC (AZN) USD 56.74 (2.83%)
- Regeneron Pharmaceuticals Inc. (REGN) USD 612.35 (2.25%)
- Athersys Inc. (ATHX) USD 2.31 (2.21%)
- Merck & Co., Inc. (MRK) USD 82.68 (2.19%)
- Sanofi Pasteur (SNY) USD 51.79 (1.91%)
- Cococrystal Pharma Inc. (COCP) USD 2.00 (1.52%)
- Bayer AG (BAYRY) USD 17.04 (1.43%)
- Pfizer Inc. (PFE) USD 38.33 (1.43%)
- Gilead Sciences Inc. (GILD) USD 68.84 (1.09%)

Source: InvestorChannel's Covid-19 Watchlist Update

**Closing remarks**



For now it looks like the Russians may beat the Chinese and be first to market with a COVID-19 vaccine, followed by the USA then Europe. This could happen as early as October or November this year, but will take time to scale up production, and there may be lingering questions about efficacy and safety. My view is that it will not matter so much who is first.

What will matter is where will countries buy their vaccine. I think the answer to this is fairly clear. Countries will buy first from their own national companies if possible, then after that from ally countries. The US will buy its vaccine not from Russia or China, but from US companies or US allies. We have already see this with President Trump announcing several deals and his top 5 companies (four from USA, one from UK) in Operation Warp Speed.

For investors it probably won't matter who wins the vaccine race, but more who can profit from it. The drug companies with good vaccines and more importantly good connections to wealthy countries (US, Europe, UK) and governments will be the likely financial winners.

While much is already priced in, the likely winners should be Moderna (US deal already for 100m doses), Pfizer Inc., Merck, Johnson and Johnson, and AstraZeneca Plc (which has a manufacturing capacity of 1b doses pa arranged with Serum, plus 100m in China). All have have begun late-stage testing for Covid-19 vaccines with initial results from some of the human trials expected in October/November. So we may start see a western vaccine as soon as November or December, with production scaling up in 2021.

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# The COVID-19 (Coronavirus) Vaccine Market Race Update for Tuesday, April 7th

Last week InvestorIntel reviewed the leading companies that are treating COVID-19 (coronavirus). This week we take a look at the vaccine companies, as there are currently **1,363,123 confirmed cases** and **76,383 deaths** from the coronavirus COVID-19 outbreak as of April 07, 2020, 13:24 GM.

The company (or companies) that win the COVID-19 vaccine race can look forward to millions if not billions in revenues, as most of the world's population would likely undergo COVID-19 vaccination, with governments likely to pick up the bill.

There are still multiple factors to consider, such as:

- Will a vaccine be found?
- Will it prove to be effective?
- Which company, and/or companies, will succeed to find the vaccine first?
- When will we get a successful vaccine?

The answers to all these questions are still unknown, however, the quote below gives a few clues as to what to expect.

CNBC recently reported:

*"The first human trial testing of a potential vaccine to prevent COVID-19 is "on track" with public distribution still projected in 12 to 18 months, which would be the "ultimate game changer" in the fight against the pandemic," White House health advisor Dr. Anthony Fauci said. "U.S. health officials have been fast-tracking work with biotech company Moderna to develop a vaccine to prevent COVID-19. They began their first human trials on a potential vaccine March 16."*

On March 30 Reuters reported:

*“The U.S. government has cut deals with Johnson & Johnson and Moderna Inc. and said it is in talks with at least two other companies to prepare them to produce massive quantities of coronavirus vaccines even before safe and effective ones become available.”*

## The anatomy of coronavirus

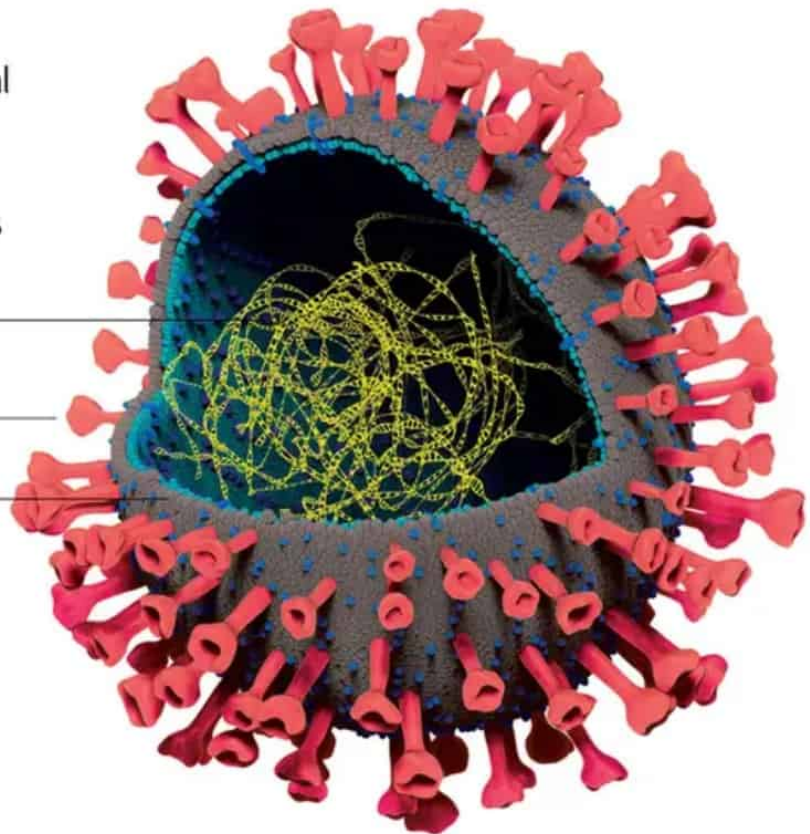
### Anatomy of a virus

The covid-19 virus has several features we may be able to target with drugs to break it down and stop it entering cells

RNA enclosed  
in protein

Spike protein

Lipid membranes



A cutaway of the structure of the new coronavirus

Source

## A look at the leading coronavirus vaccine companies (alphabetical order)

### BioNTech SE (NASDAQ: BNTX)

BioNTech has a COVID-19 vaccine called BNT162. BioNTech has licensed Chinese rights to its vaccine to Shanghai Fosun Pharmaceutical (Group) Co. Ltd. (OTC: SF0SF | HK: 2196), and

joined with Pfizer (NYSE: PFE) on ex-China markets, with clinical testing beginning in April 2020.

### **CanSino Biologics (OTC: CASBF | HK: 6185)/Beijing Institute of Biotechnology**

CanSino Biologics is a Chinese company currently conducting Phase 1 human clinical trials on their COVID-19 vaccine Ad5-nCoV, with trials set to end by December 2020. CanSino has a successful track record having previously developed an Ebola vaccine. CanSino's vaccine takes a snippet of coronavirus' genetic code and entwines it with a harmless virus.

According to CanSino, pre-clinical results showed that the vaccine can induce a strong immune response in animal models, with a good safety profile. CanSino has a head start being Chinese and access to testing on humans in Wuhan.

### **GlaxoSmithKline (NYSE: GSK) & Clover Biopharmaceuticals (private)**

GlaxoSmithKline is one of the world's largest vaccine manufacturers. Glaxo will provide its pandemic adjuvant to Clover Biopharmaceuticals for use as a COVID-19 vaccine candidate. An adjuvant helps the vaccine work better.

Chinese firm, Clover Biopharmaceuticals is working on a COVID-19 vaccine called 'S-Trimer' that targets the 'Spike' protein the coronavirus needs to enter host cells. Clover state they have in-house manufacturing that is capable to scale up production of S-Trimer to >100 m doses annually if needed.

### **Heat Biologics Inc. (NASDAQ: HTBX)**

Heat Biologics is developing a COVID-19 vaccine with the University of Miami Miller School of Medicine. Heat Biologics vaccine candidate has been added to the World Health Organization's 'draft landscape' of 41 candidate vaccines.

## **Inovio Pharmaceuticals Inc. (NASDAQ: INO)**

Inovio is working on a DNA vaccine called INO-4800. Inovio plans to start clinical trials in the U.S., China and South Korea in April, 2020. Inovio would be able to deliver one million doses by the end of 2020 with existing capacity. Inovio has already commenced small-scale manufacturing, and has received a US\$5 million grant from the Bill & Melinda Gates Foundation, as well as US\$9 million in funding from the Coalition for Epidemic Preparedness Innovations (CEPI). The Company has partnered with a Chinese manufacturer, Beijing Advaccine Biotechnology.

## **Johnson & Johnson (NYSE: JNJ)**

Last week it was announced that the U.S. government and Johnson & Johnson would co-invest about \$1 billion into vaccine research, development and clinical testing. These funds would be able to create enough manufacturing capacity to make more than 1 billion doses of a vaccine. Johnson & Johnson says it expects human clinical studies for its vaccine candidate to go ahead by September 2020 or earlier; and the vaccine to be available for emergency use in early 2021.

The UK is also running a human trial with J&J's COVID-19 treatments and vaccine, to be tested on health care workers.

## **Moderna Inc. (NASDAQ: MRNA)**

Moderna is working on their vaccine called mRNA-1273, with Phase 1 clinical studies having commenced in March 2020, and due to end in June 2020. Moderna is using a different approach by creating a vaccine that does not contain the virus. Instead, Moderna uses a new technique to make artificial messenger RNA (mRNA), which is similar to mRNA found in the coronavirus. The artificial mRNA gives instructions that prompt human cells to build a protein found on the surface of the virus. That protein should trigger a protective immune response and hence a successful vaccine. This has allowed

Moderna to skip animal trials, and move rapidly to human trials.

### **Novavax Inc. (NASDAQ: NVAX)**

Novavax has several vaccine candidates in pre-clinical animal studies. Novavax recently received a US\$4 million grant from CEPI to develop a COVID-19 vaccine. The Company plans to initiate a Phase I clinical study by June, 2020.

### **Sanofi Pasteur (NASDAQ: SNY | EURONEXT: SAN)**

Sanofi has a SARS-CoV FDA-approved vaccine; however their COVID-19 vaccine Phase 1 clinical trials won't be starting until March 2021.

### **Others**

Some other smaller companies working on a COVID-19 vaccine include:

- Altimune Inc. (NASDAQ: ALT)
- Arcturus Therapeutics Holdings Inc. (NASDAQ: ARCT)
- CureVac (private)
- Dynavax Technologies Corp. (NASDAQ: DVAX)
- ExpreS2ion Biotech Holdings (SS: EXPRS2)
- Generex Biotechnology Corp. (OTCQB: GNBT)
- iBio Inc. (NYSE: IBIO)
- ImmunoPrecise Antibodies (TSXV: IPA | OTCQB: IPATF)
- ISR Immune System Regulation (SS: ISR)
- Vaxart Inc. (NASDAQ: VXRT)
- Vaxil Bio Ltd (TSXV: VXL)

**A virus isn't a cell, isn't even considered alive. It's a nucleic acid (DNA or RNA) wrapped in a coat of proteins**



*Many viruses that plague humans have RNA as their genetic material. It's copied into DNA in our cells.*

Source

## Reference

For a list of details on 47 companies and organizations developing a coronavirus vaccine investors can view the Milken Institute report [here](#), and a WHO report [here](#).

## Closing remarks

The race is on to find a COVID-19 vaccine. It is still too early to predict a winner, or if a company will even succeed. For now, it appears that the leading three companies are Johnson & Johnson, Moderna, and CanSino Biologics; as they are at the clinical trial stage and the first two have been financially backed by the US Government.

Governments and regulatory bodies are playing their part by funding and speeding up approval processes for vaccine makers. Some may say this is risky but with daily global coronavirus deaths, the world cannot wait a year for a vaccine. A vaccine or successful treatment is urgently needed now, but we will most likely need to wait until early 2021 for a vaccine.