

Coronavirus

Small firms, big prize: the Covid-19 vaccine race

If coronavirus hangs around, Big Pharma may find it is worth its while to be more involved, says *Hannah Uttley*

As panic about coronavirus spreads and the threat of a global pandemic looms closer, the pharmaceutical industry is racing to come up with a solution. This is not an altruistic initiative. Vaccines are big business for drugs firms. Global sales of vaccines totalled \$54bn (£42bn) last year and have almost doubled since 2014. Immunisations, one of the most cost-effective public health innovations, are said to prevent up to 3m deaths every year.

It is expensive and time-consuming, with the average vaccine costing about £400m to develop and taking as long as 15 years to bring to market. Firms also risk being unable to develop a solution quickly enough to combat the spread of an infection. This is a gamble some are willing to take.

Merck, GlaxoSmithKline, Sanofi and Pfizer account for 85pc of vaccine sales. GSK has made its adjuvant technology available to Chinese

biotech firm Clover Biopharmaceuticals as part of a programme funded by the Coalition for Epidemic Preparedness Innovations. Adjuvants can be added to a vaccine to boost a patient's immune reaction against a virus.

Pfizer says it has identified some antiviral compounds that may have the potential to inhibit Covid-19, while Sanofi is working on repurposing some of its previous development work on a vaccine for Sars.

So far, efforts to develop a solution to treating or limiting the spread of the deadly infection have been largely limited to smaller pharma firms.

Michael Breen, director of infectious diseases at analytics firm GlobalData, says: "There's a lot of new technologies out there for vaccines that are still unproven, and those are the companies that seem to be leading the charge. Really, GSK is the only one [of the large firms] that has announced that they're going to be throwing their hat in the ring."

Among those working on a vaccine is a group run by Prof Sarah Gilbert at Oxford University's Nuffield Department of Medicine, using the same technology they used to generate a prototype inoculation for the 2012 Middle East respiratory syndrome (Mers) outbreak.

The university has agreed a contract with drug discovery research firm IRBM's Italian manufacturer Advent Srl to produce the first batch of a novel

Lessons from the past Sars work put to good use

When the Sars outbreak in 2003 infected 8,000 people and took the lives of almost 800 worldwide, a global race among Big Pharma to develop a groundbreaking vaccine was widely expected. But eight months after the first case of the

virus, the outbreak had all but fizzled out; a Sars vaccine has still never materialised.

Experts say drug firms will look back at epidemics and science to find the best way to respond to the latest outbreak, Covid-19.

Adam Barker, healthcare

analyst at Shore Capital, says: "There were vaccines in development for Sars and they got to a certain stage, but before they underwent extensive testing the Sars virus just went away."

Sanofi was one of the main players pursuing a vaccine and is repurposing its

work to find a treatment for Covid-19. Barker says the highly contagious nature of the strain makes the pursuit of a vaccine even more important. "There is a chance that one day this virus could go seasonal, like flu, so it could flare up every winter."

coronavirus vaccine for clinical testing. The vaccine "seed stock" has been produced at the university's clinical biomanufacturing facility, and transferred to Advent, which will initially produce 1,000 doses for the first clinical trials of the vaccine.

Heidi Kingdon Jones, IRBM global vice-president of business development, says: "The key is to develop a manufacturing process that is superfast without cutting any corners. And that's the challenge."

Elsewhere, Pennsylvania-based Inovio has a vaccine in the animal testing stages, while the Migal Research Institute in Israel says it will begin human testing within eight to

10 weeks. Of the runners and riders in the race to develop an inhibitor, Boston biotech Moderna appears to be leading the pack. The firm has sent vaccine vials off to US government researchers who will launch the first human tests of the treatment.

However, observers have reservations about the capacity of small firms to develop a vaccine on such a significant scale.

"The truth is most of the companies that look like they might be ahead in terms of a foot race, none of them have marketed products, none of them have successfully developed a vaccine," says GlobalData's Breen. "And these technologies are largely unproven."

Alan Carr, a pharma analyst at US investment bank Needham, adds: "Moderna is still a development stage company. Because the company is so young and it doesn't have any vaccines on the market yet, it doesn't have the manufacturing infrastructure in place."

Access to funding is another key hurdle in vaccine development, particularly among smaller firms with less access to capital. For the time being, organisations searching for a treatment to combat the coronavirus are largely dependent on their own coffers and any funding from government and non-profit organisations.

The UK Government has so far pledged £40m to finding a vaccine, with the Wellcome Trust offering a further £10m.

Institutional investors are more cautious.

Needham's Carr says: "It's not clear yet whether this coronavirus is going to be around for the long term. The longer it persists and the more it spreads, the more likely a commercial opportunity exists."

Analysts at AllianceBernstein reckon an effective treatment would be worth £27bn to the industry.

However, others are more pessimistic on the likelihood of this outcome.

"Over the last 20 years or so, I don't think any of the vaccines for the major outbreaks have been commercially

relevant," says Carr. The last blockbuster vaccine to hit the industry was almost 20 years ago when Merck developed its HPV vaccine Gardasil. The treatment continued to bring in more than £1bn in sales annually.

While developing a vaccine for a viral outbreak that could dissipate within months may seem like a thankless task, experts point out that even when the virus dies down, vaccines from the past can be used to develop new ones.

"One of the things you can absolutely guarantee is that we will see more coronaviruses," says Adam Barker, a healthcare analyst at Shore Capital. "What they do is get into your body by using something called a spike protein on the surface and a lot of vaccines have antibodies that target that spike protein. So if you make a vaccine against this coronavirus and a new spontaneous virus arrives five years later your vaccine might actually have some utility against that."

If nothing else, Carr says the current work being carried out by various pharma firms is a good indicator for public health officials of who will be able to move fastest in future epidemics.

He adds: "If this doesn't turn into something that is a widespread, long-term chronic problem, it at least gives us insight into these technologies for the next situation, which might be bigger."

The vac-scene

\$1 \$44 Return for every dollar invested in vaccination in the world's 94 lowest-income countries



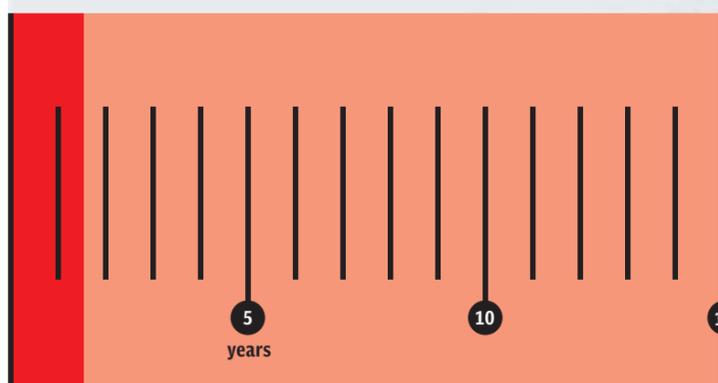
85pc Share of vaccine market dominated by GSK, Sanofi, Merck and Pfizer



9pc Annual growth of vaccine market globally



3m Average number of deaths prevented each year by immunisations



12-18 months
Time experts say a vaccine for coronavirus could take

10-15 years
Average vaccine development time

£400m
Average cost to bring a vaccine to market

£35bn
Value of the vaccine market worldwide