

How long before a vaccine protects us against the Omicron Covid variant?

Written by Administrator

Saturday, 27 November 2021 19:45 -

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This may yet prove the pandemic's final scare. But if we need to tailor a jab to a new variant it will take 100 days. Here's how it could happen.

Tom Whipple 26/11/2021

We will need 100 days. From the moment a decision is taken that a tweaked vaccine is necessary, that is how long Albert Bourla, the chief executive of Pfizer, has said it will take for the first regulatory-approved needle to get into the first waiting arm. And that decision — to tailor a vaccine to a new variant — is now looking more likely than ever. Of all the mutations in the variant discovered in South Africa, it is the ones that threaten immunity that worry government scientists the most. There are many, many unknowns. This could yet prove to be nothing more than the pandemic's final scare. But if there is a possibility this variant can find a chink in the immune armour built up at such cost, we now have a way to get ahead of it.

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Making the decision

Virology moves fast these days. On Tuesday morning this week, no one in the world knew about this variant. By Wednesday lunchtime it was being discussed at the highest levels in South Africa. By Thursday afternoon, Britain [was shutting down travel](#) and asking for samples. Some things cannot be rushed, though. It takes time to culture a virus, and South African laboratories will need at least a week to make enough to share with foreign partners. Of course, it's possible that South Africa has already sent some unwittingly, kept incubated in a passenger on a long-haul flight. If so, we might just get some a little sooner. When we do, it will go to the laboratory at Porton Down. Here, it will be tested against blood from vaccinated people. How will the blood respond? How will the antibodies bind? Pfizer worked on a vaccine specific to the Delta variant, then decided it was not necessary — the original vaccine was good enough. But if the immunity evasion of

[Omicron](#)

is as big as some fear, this time the decision might be different.

Day 0

The Pfizer, Moderna and Oxford jabs are less a vaccine than a chassis, into which we can slot the engine of our choice. We already know the genetic code of the virus — all we have to do is tweak it out and a laboratory will have made a prototype vaccine. That we can do this is a miracle of technology; it is also only the beginning. The challenge is not making one vaccine but making a billion, and getting it approved. While this is going on, we will be racing against time. If the variant is worrying enough to merit a new vaccine then the corollary is we cannot keep it out for long. While laboratory work is going on, the first cases will inevitably appear in the UK. The purpose of the travel ban is to buy time, in part to boost as fast as we can: reduced immunity is still a lot better than no immunity. But we will still be facing a new wave of infections.

Day 33

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There is a point in the manufacturing process that is less like a production line, more like animal husbandry. You have to coax cells to respond. Biologists talk about making them “happy” or “comfortable”. For the Oxford-AstraZeneca vaccine in particular, this became fiendishly complex. There were times in the pandemic where one factory had double the output of another apparently identical set-up, simply because the cells were responding better. Pfizer

and Moderna are easier. They might get easier still. One of the trickiest parts of making the vaccines involves constructing a DNA “template” from which their crucial RNA is made. This has been largely done using a biological process. During the pandemic Touchlight, a billion-dollar British biotech start-up, built a factory that promises to make synthetic DNA at scale, doing away with the vagaries of biology. It is just one new asset the country has gained.

Quietly, Britain has become a vaccine-producing nation. Three years ago, we had almost zero bulk vaccine manufacturing capacity. During the pandemic, that has changed dramatically — vaccines have gone from being part of the globalised capitalist market to a matter of national security. If necessary, we can now make the vaccine here.

In Darlington, at the Centre for Process Innovation, we can use the DNA templates to make RNA. In Leek in Staffordshire, we have a factory that can make the little globules of fat in which it is transported. There is now a choice of places where we can fill and finish, putting the two together, all under the aegis and expertise of Pfizer.

Its guidance is not all we will need big pharma for. The variant may undermine the vaccines but it does nothing to blunt the effectiveness of antivirals. As, inevitably, a winter wave grows, the two drugs the UK has bought could be critical in keeping people out of hospital.

Day 66

Normally, there is a process. You invent a vaccine, you trial the vaccine, then you make the vaccine. In the pandemic, we did all three together. The same will happen with variant vaccines. Even as the fill-finish order is being made, a more ad-hoc production process will be used to get the vaccine into trials. This time, though, we won't need tens of thousands of people. Nor will we need to wait for enough to be infected to prove the vaccine efficacy. “Using an existing “platform” for a new vaccine would speed the regulatory process dramatically,” Stephen Evans, from the London School of Hygiene and Tropical Medicine, said. It means the Medicines and Healthcare products Regulatory Agency (MHRA) will be more confident on safety and on effectiveness — confident enough it can rely on proxy measures of effectiveness. How many T-cells do people make? How many antibodies? It could take four to eight weeks to get the data, says Evans — although in the past the MHRA has asked for two months of data after the second jab. Approval could, just, be squeezed into Bourla's 100-day timescale.

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Day 100

In an unassuming surgery, as happened over a year earlier with Margaret Keenan, a Briton is invited to become the first to receive a variant vaccine. Spring is here, and the third year of the pandemic is well under way. But inside their body updated antibodies are forming, against an updated threat. Once again, the nation watches in expectation and hope. This time, though, their audience is less triumphant, a little more cynical and a lot more tired.