

「Pfizer COVID-19 vaccine candidate '90% effective', and what's next?」

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U.S. drugmaker Pfizer and partner BioNTech lifted spirits worldwide this week with word that its vaccine candidate, BNT162b2, was found to be more than 90% effective in preventing COVID-19 on November 9.

The vaccine is the first to be tested in the United States to generate late-stage data. Pfizer released an early analysis of the results showed that among 43,538 participants, only 94 cases of coronavirus infection were confirmed. The effectiveness is far surpassing the 50% benchmark set by health overseers such as the U.S. FDA and the WHO. For months, researchers have cautioned that a vaccine that might only be 60% or 70% effective. [1]

This is a vaccine was developed using mRNA technology which, in this case, is coded to tell the cells to recreate the spike protein of the novel coronavirus which allows the virus to invade human cells. Once the mRNA is injected into the body, the cells will use its instructions, creating copies of the spike protein, which is in return expected to prompt the immune cells to create antibodies to fight it. In other words, the mRNA trains the immune system to target the spike protein instead of using bits of virus to provoke an immune response. [2]

Unlike several other vaccine candidates, mRNA vaccines are synthetically developed — they don't need the virus to be cultivated and replicated, just the code for the most crucial part that the body's immune system is to target. Therefore, it is relatively safe. Another advantage is that they can be manufactured at a large scale in bioreactors which means it can be manufactured quickly.

So far Pfizer and BioNTech have reported no serious safety concerns from their vaccine. Before running the current large-scale study, the companies ran smaller clinical trials starting in May that were specifically designed to detect warning signs about the vaccine's safety. They tried out four versions of their vaccine and selected the one that produced the fewest cases of mild and moderate side effects, such as fever and fatigue. [3,4]

As COVID-19 cases are climbing to horrifying new heights in the United States, this encouraging news buoyed stock markets and various industries as the public finally saw a glimmer of hope. However, Pfizer only released a small amount of information in a press release. People yet don't know how long protection from this vaccine could last, neither know if it stops people from getting infected or just stops them from feeling sick if they catch the virus. Most experts say even when a vaccine is widely available, additional measures like masks will still be necessary until the public health threat has subsided. "This will not

replace hygienic measures — it will be an adjunct to hygienic measures,” said Dr. Paul Offit, a professor at the University of Pennsylvania and a member of the F.D.A.’s vaccine advisory panel. “You owe it to others to make sure you wear a mask.” [3.4]

But while there are a number of reasons to remain cautious, there's at least one big practical hurdle to overcome. Matt Hancock, the Health Secretary of U.S., spoke of the "mammoth logistical operation" of transporting the Pfizer/BioNTech vaccine from its point of manufacture to patients. That's because it cannot be removed from a temperature of -70C more than four times. And that temperature is much lower than what the average home freezer can reach. Most other vaccines do not require anywhere near such low storage temperatures, so there is not a widespread infrastructure already in place. [5]

Reference:

1. Prabha Raghavan, 11 Nov, 2020. "Explained: What next for Pfizer's coronavirus vaccine?" *The Indian Express*.
2. SARAH ELIZABETH RICHARDS, 10 Nov, 2020. "Pfizer vaccine results are promising, but lack of data 'very concerning,' experts say" *National Geographic*.
3. Kena Betancur and Agence France, 10 Nov, 2020. "Pfizer's Covid Vaccine: 11 Things You Need to Know" *The New York Times*.
4. 10 Nov, 2020. "Pfizer and BioNTech's vaccine poses global logistics challenge" *BBC News*
5. Zoe Kleinman, 11 Nov, 2020 "Covid vaccine: How will we keep it cold enough?" *BBC News*.

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