

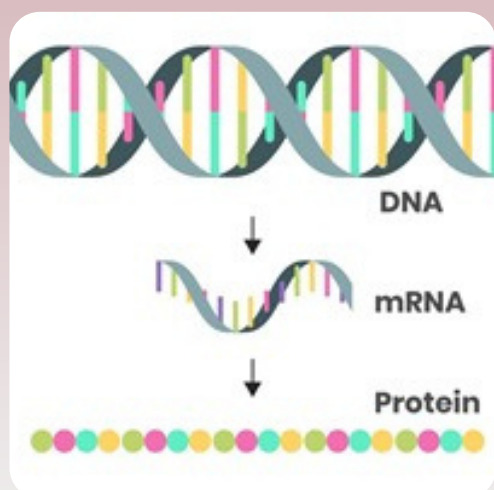
BIO-COTIDIE

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COVID-19 VACCINES

HOW ARE COVID-19 VACCINES DIFFERENT?



Proteins carry out almost every function in the human body. As a result, our body cells constantly manufacture them, by making a single stranded copy of DNA which is known as messenger RNA (mRNA). Information on how to make one type of protein is held by each mRNA. Protein gets made as the cell follows the instruction by reading the mRNA. This concept helped the development of the new Covid-19 vaccines called the mRNA vaccines. The researchers began with the genetic sequence of the virus and focused primarily on the spike protein. Instead of purifying the protein in the lab, they identified the part of the genetic sequence that creates it and synthesized the mRNA which was used as the vaccine. This saved a bucket load of time and money as synthesizing mRNA is a fast process.

The body cells began to read the mRNA once they're inserted in the body and thus start making harmless spike proteins of their own which the body's immune system takes note of and sounds the alarm when it recognizes any foreign threat. This forms the working principle of the new covid-19 vaccines from Pfizer-BioNTech and Moderna. These vaccines do have a caveat which is that the mRNA is very fragile and needs to be delivered inside fatty barrier for it to not break. They must also be kept in very low temperatures.

The Covid-19 vaccines from AstraZeneca and Johnson & Johnson work similarly but use DNA instead of mRNA as it's more stable. It does have its own drawback. Researchers use a harmless virus as a carrier to the DNA into the body but overtime the body develops resistance to that virus which might make the future doses less and less effective.

But overall, these groundbreaking new fundamental ways of making vaccines is what differentiate the Covid-19 vaccines from the rest.

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WHAT ARE VACCINE EFFICACY RATES?

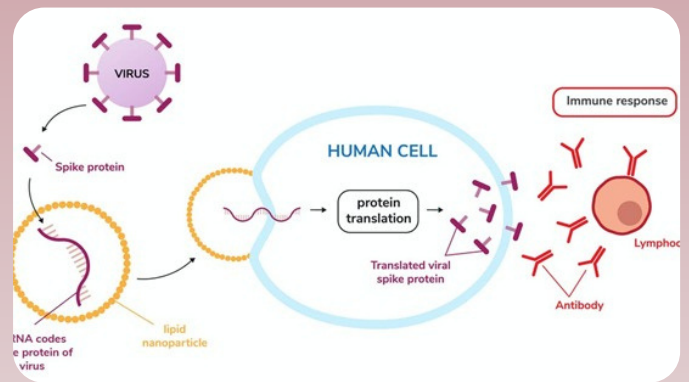
The efficacy rate of a vaccine is calculated in large clinical trials, when tens of thousands of people become tester for the vaccines. Those people are divided into two groups- half that get a vaccine and half that get a placebo. After this, they're allowed to go out and live as usual while scientists in the mean time continue monitoring them that whether or not they get Covid-19 over the next few months.

For example, in the trial conducted by Pfizer/BioNtech, there were 43,000 participants out of which 170 were found to be covid positive. The efficacy of a vaccine is determined by how those participants get reduced into each of these groups. If there were an even split among the 170 participants, that would mean you're just as likely to get sick with the vaccine as without it which makes the efficacy 0%. If all 170 participants got reduced in the placebo group, and zero people who got the vaccine fell sick, the vaccine would have an efficacy of 100%.

With this particular trial, there were 162 participants in the placebo group, and just eight in the vaccine group. It means those who had the vaccine were 95% less likely to get Covid-19 which invariably means that the vaccine had a 95% efficacy.

This means that each vaccinated person is 95% less likely than a person without a vaccine to get sick, each time they're exposed to Covid-19. The efficacy rate of all the vaccines is calculated in the same way.

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WHY SHOULDN'T WE COMPARE EFFICACY RATES?

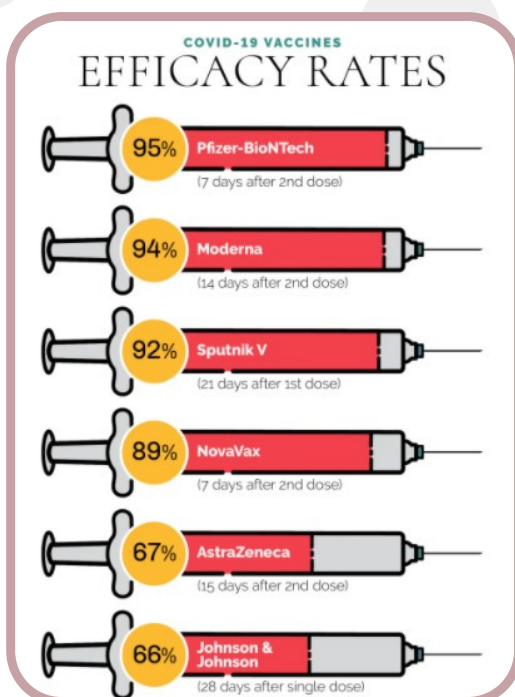
One of the biggest considerations is that we need to look at the time when these clinical trials were performed. The Moderna trial was done completely in the US, in the summer, when there were less opportunities for participants to get infected. The Pfizer/BioNTech trial was US based as well and was conducted right around the same time. Johnson & Johnson, held their US trials at the time when the opportunities for the participants to get infected was much higher i.e., participants were more exposed to the infection. Most of the J & J trial took place in other countries as well, primarily South Africa and Brazil, two of the many countries that were affected by the infection the most. Not only the case rates were high, but the virus itself was different. The trials took place as variants of Covid-19 emerged (B.1.351 variant first identified in SA and P2 variant first identified in Brazil) and became dominant infections in these countries. Despite the variance in virus variants, the Johnson & Johnson still significantly abridged the virus infections. If you're trying to make evaluations between vaccines, they need to have been studied in the same trial, with the same inclusion criteria, in the same parts of the world, at the same time. The goal of a vaccine program for Covid-19 is not necessarily to get to 'Covid zero,' but it's to remove its ability to cause serious disease, hospitalization, and death.

The best-case scenario is, you don't get sick at all. The worst case is death. In between, there's being hospitalized, severe-to-moderate symptoms, or having no symptoms at all. In the absolute best circumstances, vaccines give you protection all the way to no symptoms at all. But realistically, that isn't the main objective of Covid-19 vaccines. The real purpose is to give your body enough protection to cover possibilities of death, being hospitalized or having severe symptoms.

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WHY COVID-19 VACCINES ARE IMPORTANT AND WHY YOU SHOULDN'T BE SCARED OF THE SIDE EFFECTS?

Arguably the most important part of the vaccine development process is in the human trials. This is where the scientists confirm the effectiveness and safety of the vaccine on a large scale. But before reaching here, a vaccine has to pass the crucial first phase.

Many of the new Covid-19 vaccines are more likely to cause these kinds of side effects than we might be used to such as pain, fatigue and headaches. Particularly after the second dose. Most people will feel a little pain in their arm. Many will be tired and get headaches. Obviously, having no side effects is desirable. But with the spike protein of the coronavirus, it really does elicit some side effects. But that's totally normal.

Our immune system contains white blood cells that fight the invading virus or bacteria, communication cells that organize the response, and antibodies that search for and identify the enemy. When, say, a virus attacks our body, our immune system attacks back. Our body increases blood flow to get more of these battle cells in circulation. Our temperature might go up, too, as one of the tactics our body has to help kill the invaders. And after our white blood cells destroy the virus, they produce antibodies that will identify the virus should it reappear in the future, and remember how to fight it. They're how we gain immunity. This response is actually what gives us a lot of the symptoms we feel when we catch, for example, the common cold. But the cold virus doesn't give us fever, or a runny nose, or body aches our immune system does while fighting the virus. And triggering this system, without actually getting us sick, is how vaccines work.



The design of the vaccines is such that it provides us with the same immunity as we'd while fighting actual virus. This is done particularly well by the new range of Covid-19 vaccines. The messenger RNA vaccines are quite good at stimulating our immune system. That's why we have ninety-five percent efficacy. That's right — a 95% chance of being protected against Covid-19 invariably makes them some of the most effective vaccines ever created by man.

But that also means they're really good at activating our immune system. Which means our body will increase blood flow to where that vaccine is, which is why pain at the injection site is so common. Our body might even think, better turn up the heat, and then we get a fever, or the chills. According to expert opinion, having side effects is a sign of the vaccine actually working.

The most important fact out of these is that after being vaccinated, the number of deaths from Covid-19 recorded have been zero and moreover, hospitalization number due to Covid-19 have also reduced to zero. Thus, proving that vaccines are extremely important.

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VIDEO LINKS:

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