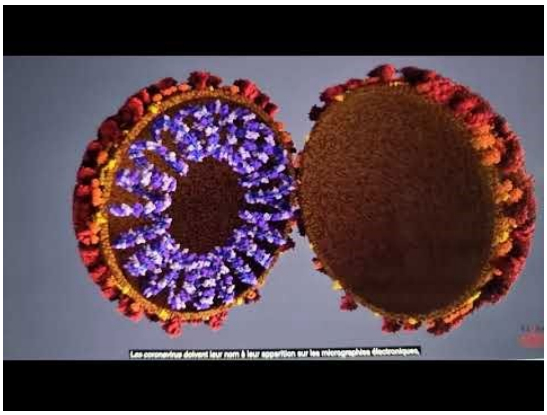

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Variants of concern and vaccine effectiveness

Transcript: Viruses are constantly changing, and this includes SARS-CoV-2, the virus that causes COVID-19. These genetic variations occur over time and can lead to the emergence of new variants that may have different characteristics.

Today, let us discuss the deadly variants that are spreading globally from the SARS virus, and the effectiveness of the response from the COVID-19 vaccines and your body immune system.

Vaccine effectiveness means how well the specific vaccine works in the real world. The word efficacy applies only in trial situations.

In the UK to date vaccine rollouts, infections, daily deaths, and total deaths are as follows:

When people are vaccinated the chances of getting the COVID-19 is 90 % less: so, the effectiveness is 90%. This also means that if you are not vaccinated the chances of getting the COVID is 100 %.

Putting in another way, for every 100 unvaccinated people who ends up with the Covid infection, only 10 would have been expected to get ill, had they had the jab.

So, it is advisable to be vaccinated because your chances of getting the virus when exposed is 90% less.

That explains what ‘effectiveness’ of the vaccine means.

Vaccine jab failures could be due to the problems with the vaccine, more so due to weak immune system in some people due to age, having chronic debilitating conditions, especially chronic obstructive airway disease (COPD), and generally being unhealthy from bad lifestyles, such as smoking, alcohol, and poor nutrition.

We use the term ‘Immunocompromise’ in a broad sense meaning that your immune system is weaker than expected and not functioning properly. The immune system is in your lymphatic system, army of certain specific lymphatic cells works against foreign proteins like the bacteria, viruses and other things that might cause an infection.

Now let us talk of the cells in the immune system. This system is covered by the lymph glands and the lymphatic channels a network for the distribution of lymph in the body.

The lymphatic cells in the gland contain immune cells called lymphocytes. They produce the B- cells, and the cytotoxic T- cells and Helper T- cells, and the macrophages a kind of large white blood cells. B-cells and T- cells are also white blood cells.

There are the -T cells (thymus cells) and B cells (bone marrow- or bursa-derived cells) are the major cellular components of the adaptive immune response. T cells are involved in cell-mediated immunity, and they recognize infected cells and kill them. whereas B cells are primarily responsible for immunity through the antibodies. In short, the B-cells are antibody producing cells. These antibodies recognize SARS-CoV-2 virus and prevent infection.

Macrophages swallow up and digest germs and dead or dying cells. They do leave behind part of the invading germs, in this situation the COVID -19 virus, called ‘antigens. The body identifies antigens as dangerous and stimulates antibodies to attack them.

The body keeps a few T-lymphocytes, called ‘memory cells’, that go into action quickly if the body encounters the same virus again.

When the familiar antigen, i.e., the COVID-19 virus in this situation, B cells produce antibodies to attack them.

The experts are not certain how long these memory cells protect a person against the virus that causes COVID-19.

With the number of deadly variants that are been circulating with mutations, the consensus is that you may need a booster shot of the vaccine after a period.

Now let us discuss how the COVID virus enters the body and cause damage.

COVID virus enters the cells lining the airway in the respiratory tract. Infection begins when a spike protein binds to an ACE-2 receptor cells on the surface of a human cell, allowing it to pass into the cell.

So, the spike has the key to unlock and enter the cells.

Within the body cells the virus starts replication by releasing its RNA. Coronaviruses are large, enveloped RNA viruses.

The virus then starts replicating in the infected lining cells and release copies into the body.

Now the infected cells with the replicating virus release cytokines, proteins that act as signals or alarms.

During replication, the virus releases its RNA into the cells, which uses the instructions to produce copies of the virus.

This is the birth of the variants, and the viruses mutate constantly, and new variants or copies of the virus are formed, through a process of replication.

When a virus spread among people in many countries, the likelihood of the virus mutating increases. The more opportunities a virus spreads, the more it replicates- and more opportunities it must undergo changes.

That is exactly the plight of Covid virus, creating hundreds of variants, but only a few are deadly, and now given Greek names, to avoid the regional stigma.

What is the difference between the original SARS Cov-2 virus compared to the variants, and why are we so concerned about the variants?

Coronavirus variants are to be named after letters of the Greek alphabet instead of their place of first discovery, the World Health Organization has announced, in a move to avoid stigma.

The WHO has named four variants of concern, known to the public as the UK/Kent (B.1.1.7), South Africa (B.1.351), Brazil (P.1) and India (B.1.617.2) variants. They will now be given the letters Alpha, Beta, Gamma, and Delta respectively, to reflect their order of detection, with any new variants following the pattern down the Greek alphabet.

These new variant of SARS -CoV-2 is estimated to be up to 70% more transmissible than the previous circulating form of the virus.

Deborah Dunn-Walters, a professor of immunology at the University of Surrey, says: “If you think of the population having a whole range of different levels of immunity, then where you set the bar in the range will determine the percentage protection figures.”

The current approved vaccines available against Covid-19 seem to give some protection against the new virus variants, because the antibodies formed in our body seem to neutralize the N-Terminal domain of the spike protein that is responsible for the production of the variants in the spiked Corona virus.

So, the antibodies you make in your body with the jab will be effective against the variants that are now mutating.

In the event, that any of these vaccines prove to be less effective against one or more variants, it will be possible to change the composition of the vaccines to protect against these variants, within a short period.

Why does the coronavirus change to form variants?

Variation of the virus occurs when the RNA viruses evolve and change gradually. Robert Bollinger from the Harvard School of Medicine explains: All RNA viruses mutate over time, some more than others. For example, flu viruses change often, which is why doctors recommend that you get a new flu vaccine every year."

That variant, now known as B.1.1.7, quickly became the most common version of the coronavirus in the United Kingdom, accounting for about 60% of new COVID-19 cases in December. It is now the predominant form of the coronavirus in some countries.

Different variants have emerged in Brazil, California, and other areas. A variant called B.1.351, which first appeared in South Africa, may have the ability to re-infect people who have recovered from earlier versions of the coronavirus. It might also be somewhat resistant to some of the coronavirus vaccines in development. Still, other vaccines currently being tested appear to offer protection from severe disease in people infected with B.1.351.

Now can we prevent future new variants of the COVID-19 virus?

Stopping the spread at the source remains key. Current measures to reduce transmission – including frequent hand washing, wearing a mask, physical distancing, good ventilation and avoiding crowded places or closed settings – continue to work against new variants by reducing the amount of viral transmission and therefore also reducing opportunities for the virus to mutate.

In conclusion, we all need to have the vaccine to protect ourselves to minimize the chances of getting COVID-19 infection. Now the problem is when will the whole population in a country will be vaccinated.

Because of the delays in vaccination programs, the endemic will last for another few years, sad to mention.

Meanwhile stay safe.
Hope this video talk was useful.

Goodbye for now.