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## Let us talk about Herd Immunity and its challenges for COVID-19

Transcript;

Herd immunity is defined as the resistance to the spread of an infectious disease within a population that is based on pre-existing immunity of a high proportion of individuals from previous infection or vaccination.

"The level of vaccination needed to achieve herd immunity varies by disease."

The chances are that herd immunity is far fledged when the adapted immune response lasts only for a few months, as in the case of Covid-19.

Cows, buffaloes protect their growing young ones well in the herd to prevent attacks from predators.

Humans do not need this herd immunity protection of the young ones, but the idea or the concept suits well when most people are vaccinated against a current disease process, the minority of people get the protection without being immunized through passive immune process. The immunologists call this 'Herd immunity'.

With more and more variants, the chances are that people's immune system may decline, and yearly booster shots may be needed, and the chances for herd immunity may not come for a long time.

Herd immunity can be reached when enough people in the population have recovered fully from a disease and have developed protective antibodies against future infection.

For herd immunity to occur, 60-70 % of the people need to be vaccinated and free of recurrent disease. The immunologists and virologists will be in a dilemma to achieve herd immunity that may not come with continuous recurrent variants through mutations of the SARSCoV2.

Prof Miles Davenport, the program head of the Kirby Institute's infection analytics program at the University of New South Wales in Sydney, says "the concept of herd immunity is that once it's achieved, then you will not have circulation of virus in the community".

The question is, can we achieve that goal to attain herd immunity?

The definition of the concept is clear. When the greater proportion of the population is vaccinated against COVID, estimated as 60% and 70%, there should be sufficient antibodies produced, and an infected person with fair quantum of antibodies the opportunity to infect others are less, and gradually halting the spread.

Will the present vaccine's efficiency be good enough for future variants to be destroyed by the adaptive immune system to over 60-70% of the population, and that is the question?

If that is the case, herd immunity is far fledged.

An associate professor in Kirby's immunovirology and pathogenesis program, Stuart Turville, says even small changes in the virus could have an impact on the immune response. With the rollout of the vaccine, there was an attitude by some that the virus could be "cornered," he says.

"Having worked with viruses for a while, one thing is clear. Be prepared for them to surprise you," he says. Covid-19 has already proven this with new variants of concern emerging around the world.

"We are really just at the start of even understanding them," professor says. "A lot of the knowledge we have from 2020 may not be applicable with these new variants, for example, the ages they infect, the mortality rates. We need to keep an eye on them."

These are extracts from the article written by Melissa Davey to the Guardian.

Is vaccination the answer?

The head of the Kirby Institute's biosecurity program, Prof Raina MacIntyre, believes herd immunity in Australia is possible. But only with mass vaccination. In a preprint paper published in December, MacIntyre and her colleagues wrote that using a vaccine with up to 90% efficacy, herd immunity could be achieved by vaccinating 66% of the population.

"A vaccine with less than 70% varying vaccine efficacy cannot achieve herd immunity and will result in ongoing risk of outbreaks," the paper said. "For mass vaccination, distributing at least 60,000 doses per day is required to achieve control. Slower rates of vaccination will result in the population living with Covid-19 longer, and higher cases and deaths."

For successful herd immunity to occur, at least 60-70% of the population should be cured through vaccinations or having inflicted, recovered from the disease.

In a situation where some becomes likely to get Covid after having been vaccinated and can yet still, in some cases, get Covid after you get vaccinated, would hinder herd immunity to happen.

Herd immunity occurs only when a large portion of a community – the herd becomes immune to the disease, making the spread of disease from person to person unlikely. A percentage of the population must be capable of getting the disease for its spread. This is called a threshold proportion.

If the proportion of the population that is immune to the disease is greater than this threshold, the spread of the disease will decline. This is known as the herd immunity threshold.

What percentage of a community needs to be immune to achieve herd immunity? It varies from disease to disease. The more contagious a disease is like Covid, the greater the proportion of the population that needs to be immune to the disease to stop its spread. For example, the measles is a highly contagious illness. It is estimated that 94% of the population must be immune to interrupt the chain of transmission.

Vaccine hesitancy also may delay herd immunity to occur. Some people may not want to have the vaccinations, for religious reasons, or the fear of getting major complications like the cerebral-venous thrombosis, though occurred in 4 cases a million.

If the proportion of vaccinated people in a community is below the herd immunity threshold, a contagious disease could continue to spread.

Uneven vaccine rolls out.

The distribution of COVID-19 vaccines has greatly varied among and within countries. If one community achieves a high COVID-19 vaccination rate and surrounding areas do not, outbreaks can occur if the populations mix.

Pfizer has its own data showing that immunity against the coronavirus declines in vaccinated people over time, particularly in the elderly, but some scientists and health officials have cautioned that only the company has seen that data so far.

Pfizer officials have begun to worry that data out of Israel showing declining effectiveness could cause some people to believe its vaccine is not effective.

They have also grown concerned there could be outbreaks in nursing homes and among other vulnerable populations as the delta variant surges in the United States and have worried about waiting too long to administer boosters, according to a person familiar with some of the discussions.

Pfizer expected to brief U.S. officials in coming days on the need for a booster shot. The debate about a booster shot comes as global anxiety rises about the spread of the highly transmissible delta variant, which has become the most prevalent strain in the United States. It also reflects ongoing concerns about vaccine hesitancy and the fairness of potentially giving Americans a third shot when much of the world lacks access to vaccines.

With all these issues, it is most unlikely that we could expect an iota of herd immunity for many years. That is the situation.

Hope this video talk was useful.

Raise your sleeve and get the jabs soon.

Stay safe and goodbye for now.