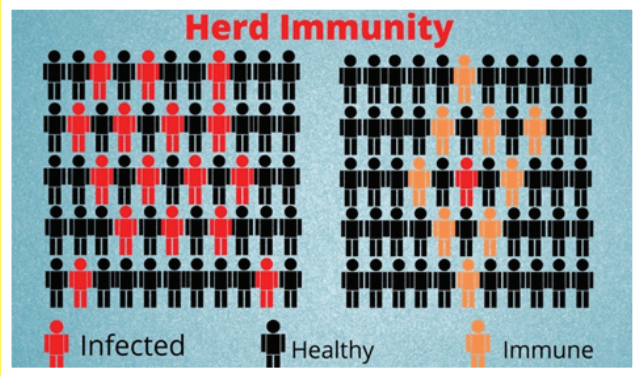
Herd Immunity



According to the World Health Organization, 'Herd Immunity' is the indirect protection from an infectious disease that happens when a population is immune (to a virus) either through vaccination or immunity developed through the previous infection. To achieve herd immunity against a disease, a large amount of the population must be either infected or vaccinated. The percentage of the population which needs to be infected or vaccinated varies with the disease. For instance, to achieve herd immunity against measles approximately 95% of the population needs to be immune to the system, for polio it's about 80%.

For COVID-19, most estimates and studies during the last year projected the threshold at 60-70% of the population for achieving herd immunity. But after more than a year of the COVID-19 pandemic, some data scientists are suspecting whether herd immunity will be achieved any time soon due to several factors like vaccine hesitancy, the emergence of new variants and delayed vaccination of children.

The World Health Organization supports achieving herd immunity through vaccination, not by severe infections in the public. The spread of infectious disease in the public creates a medical crisis and causes a large number of avoidable deaths. Herd immunity must be achieved by protecting people through vaccination. Vaccination trains the immune system of people to identify the virus and fight against it without making people sick, thus breaking the infection chain.

Antigens

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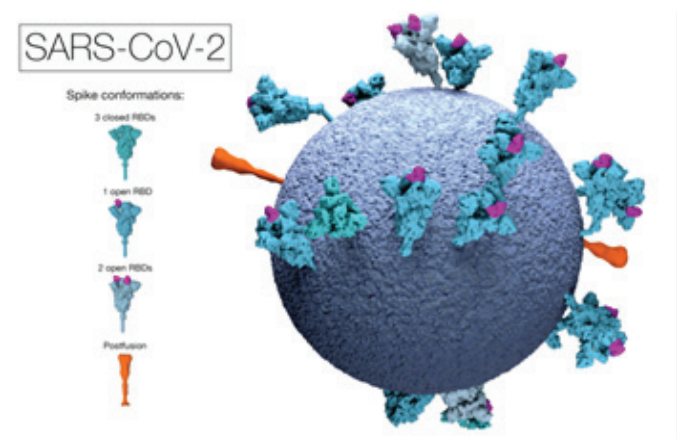
Antigens are molecules capable of triggering an immune response against viral infection. The antigens may be proteins, polysaccharides, lipids or nucleic acids. Antigens have a distinct molecular structure which is identified by our immune system. In the case of SARS-CoV-2, the nucleocapsid phosphoprotein and spike glycoprotein act as antigens. These antigens are also used in rapid testing devices to confirm viral infection.

Antibodies



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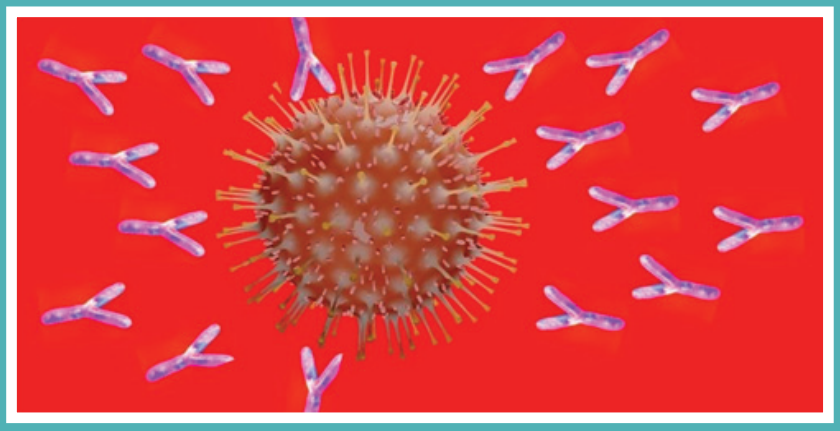
To fight against the viral attack, our immune system produces molecules that bind to the antigens of the viruses and prevent them from entering into the human cells. These molecules are called antibodies. In the case of COVID-19 infection, the immune system produces IgG and IgM antibodies. It takes two to three days for our immune system to produce antibodies after the COVID-19 infection.

Sero-surveillance



Serological tests are also known as antibody tests. Antibodies are the protein molecules generated by the immune system of a person against any specific disease. Our body takes approximately 2-3 days to generate antibodies after infection. In the case of COVID-19, IgG and IgM antibodies protect us from further infection. These antibodies are found in the blood of a person. During serological surveys, these antibodies are searched in the serum of the blood of people.

Sero-surveillance is considered as the gold standard for measuring the immunity of a population or group. It estimates the antibody levels in the population of a specific group against infectious disease. Sero-surveillance is a very important tool to fight an endemic or pandemic as it provides estimates of hospitalizations, mortality and immunization coverage in a population. Governments conduct sero-surveillance from time to time among the population to gauge the current status of immunization among the public.