# Serological Survey in Delhi - Herd Immunity

## What is the issue?

- A recent serological survey in Delhi found the presence of coronavirus-specific antibodies in about 23% of the samples tested.
- Here is a look on the purpose of the survey and the link with "herd immunity."

## What is a serological survey?

- The serological survey is meant to detect whether the person being tested had developed antibodies against a virus/bacterium.
- The antibodies are proteins produced by the immune system to fight external organisms like viruses that try to enter the body.
- These are produced only after the infection has happened.
- So, these are specific to the attacking virus or bacterium.
- The presence of antibodies, therefore, is an indication that an infection by that particular virus or bacterium has already occurred.
- Subsequent attempts to infect the body can be thwarted by these antibodies.

- **Vaccine principle** - Vaccines work in a similar manner.
- They inject harmless doses of a virus or a bacterium inside the human body.
- This triggers the production of antibodies by the immune system.
- These antibodies can then fight off an actual attack by those viruses or bacteria.

## What is the purpose in Covid-19 case?

- Information about the extent of spread is very important for authorities to make decisions and plan containment measures.
- But in the context of the Covid-19 pandemic, it is not possible to test everyone.
- It is not clear how many people in the population are infected.
- This is especially because most of the patients do not show any symptoms of the disease.
- So, the serological survey was carried out to assess how widespread Covid-19 could have become.
- Detecting antibodies in random sets of people is an indirect way of estimating the extent of disease spread in a community.

## What were the results?

- The survey found coronavirus-specific antibodies in about 23% of the roughly 21,000 people who were tested.
- This means that these many people had, at some point or the other, been infected.
- Since random people were tested, it indicated that the spread of the disease was much wider than what diagnostic tests suggest.
- [In Delhi, about 14% of those who have been tested for the virus have turned out positive.]
- The results are being interpreted to suggest that about 46 lakh people in Delhi could so far have been infected, and that "herd immunity" could be approaching.

## What is the need for caution?

- Serological surveys are quite useful for the limited purpose of assessing the spread of infection.
- However, scientists caution against drawing such broad conclusions (as herd immunity).

- **Antibodies and Immunity** - The mere presence of antibodies does not mean that the person is protected against the disease.
- The amount of antibodies present, and whether it includes what are known as "neutralising antibodies" are also important.
- These are the ones that actually fight the disease.
- Serological surveys are not designed to assess either the quantity of antibodies or detect the presence of neutralising antibodies.

- Also, studies have indicated that the "neutralising antibodies" could lose their effect after 4 months.

- **Herd immunity** - Clearly, the presence of antibodies and protection against the disease are very different questions.

- So, any talk of "herd immunity" at this stage is not only premature but also misplaced.
- The coronavirus is still evolving and can undergo several mutations.
- Given this too, it is too early to talk about permanent protection.

## What then is herd immunity?

- Herd immunity is a stage of an epidemic in which some members of a population group remain protected from infection.
- This comes as a result of a majority of those around them having already

developed immunity, either through vaccination or because they have been infected earlier.

- So, everyone in the population group does not need to get infected before the epidemic is over.
- Once a certain proportion of population gets infected, and thus builds immunity, the epidemic begins to slow down and eventually stop.



## What is the challenge here though?

- **Proportion** - The problem is that no one clearly knows what percentage of the population needs to be infected before herd immunity kicks in.
- It is different for different diseases, and different population groups.
- In general, herd immunity is unlikely to happen before at least half the population is infected.
- E.g. in the case of measles, herd immunity is reached only when 85% to 90% of the population attains immunity.
- In some other diseases, the threshold could be lower.
- For Covid-19, different studies have suggested that between 55-70% of the population would need to be infected before herd immunity would develop.
- But it is extremely difficult to determine the level of disease spread necessary for herd immunity when the epidemic is still raging.
- **Understanding** - Herd immunity is mentioned in very loose terms these days.
- This concept can be applied in very specific situations only.
- For example, herd immunity would apply only in closed population groups, those that are cut off from neighbouring societies.
- Thus, talk of herd immunity in Delhi is pointless if there is a free movement of people in and out of the city.
- Every parameter in this calculation is dynamic and evolving; so only after the epidemic is over, it is possible to reliably estimate at what point herd immunity took over.

**Source: The Indian Express**

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