

# What is herd immunity?

Writer -Kaunain Sheriff M (Editor)

This article is related to General Studies-Paper-III  
(Sci & Tech)

Indian Express

19 March., 2020

**"UK has retracted under criticism after suggesting it would allow COVID-19 to pass through the population, so that herd community could be achieved. What is this concept, why was the strategy questionable?"**

Last week, the UK's Government Chief Scientific Adviser Sir Patrick Vallance hinted at a strategy that would allow the novel coronavirus to infect 60% of the country's population so that a degree of "herd immunity" could be achieved.

Following widespread criticism, and with Imperial College London projecting a dire scenario if the pandemic remains uncontrolled, the UK has now retracted — and is looking at self-isolation for the elderly.

## **What does herd immunity mean?**

Herd immunity refers to preventing an infectious disease from spreading by immunising a certain percentage of the population. While the concept is most commonly used in the context of vaccination, herd immunity can also be achieved after enough people have become immune after being infected.

The premise is that if a certain percentage of the population is immune, members of that group can no longer infect another person. This breaks the chain of infection through the community ("herd"), and prevents it from reaching those who are the most vulnerable.

However, the discussion on herd immunity to fight COVID-19 in the UK has not been based on this conventional definition. The UK government had wanted the entire population to be exposed to the novel coronavirus infection, so that the majority could develop immunity to COVID-19.

## **How does herd immunity work?**

The scientific principle is that the presence of a large number of immune persons in the community, who will interrupt the transmission, provides indirect protection to those who are not immune.

To estimate the extent of spread and immunity, epidemiologists use a measure called the 'basic reproductive number' ( $R_0$ ). This indicates how many persons will be infected when exposed to a single case; an  $R_0$  of more than 1 indicates one person can spread the infection to multiple persons.

Scientific evidence shows that a person with measles can infect around 12-18 persons; and a person with influenza can infect around 1.2-4.5 persons, depending on the season. On the basis of the available evidence from China, and according to various experts,  $R_0$  COVID-19 ranges between 2 and 3.

There are three ways in which an infection can spread in a community. The first scenario looks at a community that is not immunised. When two infectious cases, both with an  $R_0$  value of 1, are introduced, there is a possibility of the entire community being infected, with a few exceptions.

In the second scenario, there may be some persons who have been immunised; and only these immunised persons will not be infected when at least two infectious cases are introduced in the community.

The third scenario is when the majority of the community is immunised. So, when two infectious cases are introduced, the spread can take place only in exceptional cases, like in the elderly or other vulnerable persons. Even in such a situation, the immunised persons protect the non-immunised by acting as a barrier — which is herd immunity.

### **When do we know that a population has achieved herd immunity?**

It depends on multiple factors: how effective the vaccine for a given disease is, how long-lasting immunity is from both vaccination and infection, and which populations form critical links in transmission of the disease. Mathematically, it is defined on the basis of a number called “herd immunity threshold”, which is the number of immune individuals above which a disease may no longer circulate. The higher the  $R_0$ , the higher the percentage of the population that has to be immunised to achieve herd immunity.

Polio has a threshold of 80% to 85%, while measles has 95%. With the current data for COVID-19, experts have estimated a threshold of over 60%. That means more than 60% of the population needs to develop immunity to reach the stage of herd immunity.

### **Why is herd immunity as a strategy against COVID-19 questionable?**

It is very risky to seek herd immunity by allowing a large proportion of the population to get infected. Such a strategy at this stage, experts have underlined, would be based on many unknowns and variables.

To begin with, much about the behaviour of the pathogen is still unclear. There isn't enough statistically significant data to estimate conclusively how many persons can get the virus from a single infected person.

Second, it can take months, or even longer, to build group immunity to COVID-19. During that time, the need is to protect people who are at greater risk; the numbers so far indicate that people above 55, especially those with comorbidities like cardiovascular disease and hypertension, are the most vulnerable.

Third, while herd immunity may come about from a pandemic because the people who survive may develop immunity — they also may not — it is important to note that for COVID-19, we still don't know whether one can become immune to the virus. Nor is it clear whether a person who develops immunity will remain permanently immune.

The UK's original strategy to achieve herd immunity would put a huge burden on the healthcare system. Allowing the virus to pass through the population means a surge of patients, putting pressure on existing ICU and emergency beds. The UK was looking at 60% of the population getting infected, which could have happened rapidly. Epidemiologists stress “flattening the curve” — slowing the spread of an infection over a large population — and this cannot be achieved by allowing the virus to pass through the entire population.

### Expected Questions (Prelims Exams)

**Q. Recently, the UK has hinted of adopting a herd immunity strategy in context of the prevention from the corona virus. consider the following statements in the context of herd immunity:**

1. Herd immunity means to prevent infection by immunising a certain percentage of the population.
2. Herd immunity strategy is commonly adopted in the vaccination process.
3. Immunized populations in this system interrupt the chain of infection.

Which of the above statements are correct?

- (a) 1 and 2                      (b) 1 and 3  
(c) 2 and 3                      (d) All of the above

**Note:** Answer of Prelims Expected Question given on 18 March., is 1 (d)

### Expected Questions (Mains Exams)

**What does herd immunity mean? Does achieving herd immunity could be considered a practical step in fighting an epidemic? Discuss.**

**(250 words)**

**Note: - The question of the main examination given for practice is designed keeping in mind the upcoming UPSC main examination. Therefore, to get an answer to this question, you can take the help of this source as well as other sources related to this topic.**

Committed To Excellence