

The Purpose of a Vaccine

What is the issue?

- The whole world awaits a COVID-19 vaccine as the last resort to control the pandemic.
- In this context, it is important to examine the challenges vaccination poses to qualify as a 'public health intervention' in India.

What purposes does vaccination serve?

- Vaccinations have a dual purpose.
- **Individual level** - First is the ability to develop immunity by producing antibodies among those individuals who have taken a vaccine shot.
- In the midst of a pandemic, the popular perception for vaccination is that it safeguards oneself from the disease.
- It is this individualistic need that generates a huge demand for vaccines in the market.
- So, in the absence of government intervention, it will be affordable only for those who can pay for them.
- **Herd immunity** - The second and more crucial purpose of vaccination is to achieve [herd immunity](#) in a population.
- This is achieved by ensuring a threshold coverage.

What is threshold coverage?

- It is the proportion of population that needs to be covered for vaccination so that the entire population is protected.
- The threshold coverage for any disease in a given population is based on -
 - i. the vaccine efficacy in a population
 - ii. the rate of spread of infection through it, also known as infectivity rate
 - iii. the natural immunity that already exists in the population due to prior exposure to the same disease or through cross infections
- The threshold coverage is estimated to be around 60% for COVID-19 vaccine to achieve population-level immunity.
- However, this should ideally vary, depending on different stages of the pandemic.

What are the considerations for vaccination?

- There can be individual as well as population-level considerations while introducing a vaccine amid a pandemic.
- **Individual level** - The concerns raised in the context of individual prevention include vaccine efficacy.
 - It refers to the probability that an individual, if vaccinated, can prevent the onset of infection.
- Equally important is the probability of adverse reactions that can arise among individuals.
- Both these parameters must be considered even to qualify vaccines as potential candidates for a public health intervention.
- **Population level** - There are several other complex economic, social, ethical and systemic factors that need to be looked into.
- Already, concerns are raised about the economic resources needed to make the vaccine available for a large population.
- In this context, some of the considerations include the following:
 - whether to charge or not for vaccination
 - the ability of an already weakened health system to take on the vaccination drive that is expected to cover the entire population
 - the cost of ensuring necessary support services including cold chains
 - human resources required for effective vaccine delivery
- Besides these, the most difficult ethical question posed is about who should be prioritised and the basis for such prioritisation.
- Equally relevant is the projected proportion of the population that may face adverse reactions and the ability of the health system to respond to those.
- Another aspect specific to the COVID-19 vaccine is the duration of protection provided.

What is the case with India?

- In the Indian context, it is not clear what outcome is expected of a population-based vaccination programme for COVID-19.
- The most dominant argument is that health workers need to be covered on a priority basis, and then the elderly.
- One of the arguments posed for targeting health workers is that it would protect the health system from collapsing due to COVID-19.
- If this is so, the health system cannot be confined to only health workers.
- A majority of stakeholders, even in terms of mere numbers, are always the patients and their caregivers.
- Second, and more crucial, is the goal of population-level immunity.
- The very purpose of it will be defeated if only a specific population group is targeted, when the pandemic can infect all groups similarly.
 - In New Zealand, preparations are on for a countrywide immunisation

programme with a goal of covering the whole population with a threshold coverage.

What should the way forward be?

- It is not to be forgotten that it took India more than 13 years to declare eradication and achieve population-level immunity for a disease like polio, which targeted only children.
- So, like other public health programmes, it is safe to demonstrate the success of COVID-19 vaccination in a small population, like a block or a district, before scaling it up for the national level.
- If population-level immunity is not the focus, then the key purpose of COVID-19 vaccines will be to ensure individual immunity.

Source: The Hindu

