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