

PRESPECTIVE

COVID 19 Vaccination strategies in India- A Public Health perspectivePriyanka¹, Ekta Arora², Shibajee Debbarma³, Sanjeev Kumar Rasanias⁴

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Abstract

COVID-19 has emerged as one of the most challenging pandemics of the recent times. Although physical-distancing and other transmission-mitigation strategies have helped battling this virus in the most effective way, but this will also paradoxically leave the population without immunity to COVID-19 and thus susceptible to additional waves of infection. Thus, to return to pre-pandemic normalcy, safe and effective vaccination programme is required globally with robust vaccination strategies. This article pens down the important strategies being implemented globally for successful vaccination programme and critically reviewing them from public health perspective.

Keywords

COVID-19; Pandemics; Public Health; Vaccination

Introduction

COVID 19 Vaccination strategies in India- A Public Health perspective: COVID 19 has emerged as one of the most challenging and concerning pandemic in the present times. By August 2020, it lead to almost 20 million confirmed cases worldwide and over half-million deaths. (1) To curb the massive burden on health care system and high mortality, mass Vaccination drive was launched worldwide in 2021 and commenced in India on January 16, 2021. The Drug Controller General of India approved restricted emergency use of Covishield (Oxford-AstraZeneca vaccine) and Covaxin, produced by Bharat Biotech. India has also granted emergency use authorization to a third vaccine, Russia's Sputnik V vaccine, to which Dr. Reddy's Laboratories is the Indian partner conducting the clinical trials and holding the distribution rights for the vaccine.(2) Expansion of the country's vaccine manufacturing capacity and development of an expert digital system to address the challenge of vaccine administration are one of the main

targets focussed by the Government of India on an emergent and diligent basis.(3)

Need for robust Vaccination strategies: Although physical-distancing and other transmission-mitigation strategies implemented in majority of countries have successfully prevented most people from being infected, but these strategies will paradoxically leave them without immunity to COVID-19 and thus susceptible to additional waves of infection. The world will not return to its pre-pandemic normalcy until safe and effective vaccines become available and a global vaccination programme is successfully implemented.

As COVID-19 is new to humankind and the nature of protective immune responses is poorly understood, extent to which the vaccine strategies will be successful is still questionable. Therefore, it is coercive to develop various vaccine platforms and strategies simultaneously.

Strategies of vaccination: Access, affordability, advocacy and acceptance are the key parameters needed to strategize for a successful vaccination programme.(4)

1. **To reduce the burden on health care system:** Surveillance data from European Centre for Disease

Prevention and Control shows that up to 90% of deaths and 80% of hospitalisations have occurred in older adults and persons with underlying conditions.(5) In order to substantially decrease the burden on health care system, the vaccination of all older adults is considered to be the most efficient and effective approach.

2. **Focus on staggered age deployment approach:** Though increasing age is an important contributor to disease severity and mortality, some individuals at a younger age can also be susceptible to higher risk of severe disease due to known underlying health conditions. And being socially and economically active, these groups have generally low risk perception. So, staggered age deployment approach is also effective, starting from older age groups and gradually moving to younger ages, with substantial focus on younger individuals with comorbidities.(5)
3. **Disease elimination:** In COVID-19 elimination strategy, the focus shifts from protection of the most vulnerable groups like Health Care Workers to the targeting of the groups that have the highest level of contact with others, including young people and children. Also, it is inevitable that the virus will continue to escape natural and vaccine-induced immunity over time due to selective pressure. Therefore, it becomes mandatory to repeat boosters with updated formulations and that too for a substantial segment of the population.
4. **Community Engagement:** Nothing can be successful in community without building adequate trust and participation of the community. Thus, creating awareness with scientific content, engaging communities and empowering health personnel is an armed strategy towards vaccination.(6)
5. **Immunological Strategies:** A parenteral COVID-19 vaccine strategy capable of inducing a robust, durable response should provide a significant level of protection. A respiratory mucosal vaccine strategy that can induce response directly in the respiratory mucosa will be most effective in the early control of COVID-19.(7)
6. **Surveillance Strategies:** Serological surveys can help in identification of regions which are at most risk of resurgence. Population density, geographical, environmental, and other social determinants also need to be adjusted accordingly to make systematic comparisons of seroprevalence amongst different regions.(8)
7. **Communication Strategies:** Dissemination of authentic and timely information regarding vaccine candidates, efficacy, vaccine safety to encourage vaccine uptake and addressing vaccine hesitancy in the most scientific manner also holds utmost significance. This has been achieved by involving community leaders and mobilizers having social

influence, influential endorsements and establishing media rapid response cell at MOHFW.

Based upon the above strategies, WHO has proposed the following updated Global Vaccination Strategy for the remaining of 2021 and 2022.

- a. **Universal Global Vaccination Strategy-** This strategy would focus to mitigate future health risks and prioritize the most vulnerable groups receiving maximum benefit and then encouraging to vaccinate all populations.
- b. **All Adult Global Vaccination Strategy with Risk Mitigation –** This strategy will help in reducing burden on health care by following the upward trajectory to resume economic growth. Thus, prioritising the risk groups and encouraging countries to reach and vaccinate all adult population.
- c. **Older Adult Global Vaccination Strategy-** This strategy would help in maximum reduction in mortality by focussing on highest risk groups of 50+.(9)

Strengths of Vaccination strategies in Indian Settings:

Strong pre-existing infrastructure, immunization resources, technical expertise, more than 26000 cold chain points, and vast experience under Expanded Programme of Immunization are the segments that laid a robust foundation for carrying out COVID 19 vaccination in India at a massive scale.

Since, immunization guidelines suggest 30 min observation time to identify and manage any adverse event following immunization. So, door to door immunization is not a feasible approach in this setting. Thus, various outreach measures like establishing satellite vaccination centres, using large parking lots, and mobile vaccination facilities are currently being implemented to enhance coverage for those who don't have easy access to vaccination centres.

Challenges in Vaccination Strategies: Since, the vaccine development process has been accelerated owing to the deadly situation created by the pandemic, all the interim data is being published in real time. Thus, data regarding quality, efficacy and vaccine induced protective immunity is not available prehand. Moreover, all the vaccine candidates are undergoing trials in isolation, so comparative data is also not available to compare the effectiveness of different vaccine candidates. Thus, the safety and immunogenicity observed in COVID 19 vaccine trials is still in an inopportune stage to comment upon.(7) Increased demand of the vaccines has led to shortage of the vaccines and thus raising another challenge for the government to combat. Operational challenges like cumbersome registration process on the CoWIN app, delayed booking appointments are also worth mentioning here.

Another issue of Vaccine restlessness has emerged these days. This can be eliminated by focussed city coverage approach. This will help in achieving herd immunity at a

faster pace by focussing on high incidence regions first.(10)

Ramping the manufacturing, building ambient storage facilities, addressing vaccine wastage, access to appointment system, removing transport related barriers are other important challenges that need to be addressed upon at priority.(11)

Opportunities and threats to vaccination strategies: Robust Information Technology Platform, exhaustive training programmes followed by dry run, peculiar intersectoral coordination have emerged as opportunities to strengthen the current vaccination strategies.

As India has a trained manpower like midwives, auxiliary nurse midwives and Anganwadi workers, and they have a greater reach to the country interiors, these trained resources can play a crucial role in extending the success of vaccination programme in the rural India. Government can also engage the allied healthcare workforce including pharmacists and public health workers as they have a professional knowledge of maintaining the cold chain and handling the vaccines.(12)

Emergence of numerous deadly virus variants, laxity in following COVID appropriate behaviour and vested interests can prove to be threats to the successful vaccination programme.(13)

Way Forward: Preferential vaccination strategy for most vulnerable groups like elderly, people with comorbidities and people at greatest risk like Health Care Workers led to a great positive impact on vaccine rollout and reduction in mortality rates. (14)

For a swift vaccination roll out, both central and state governments should work unanimously to further ramp up the vaccination. The state quota for vaccines should be based on share of state specific rate of infections and should be regularly assessed to maintain dynamicity. Differential pricing also needs to be re-evaluated as it can create chaos, thus central procurement can be focussed upon. (15)

Targeted approach should be emphasized. The hotspots in states should be assessed and assisted for any vaccination related lag. Community in these hotspots should be educated and empowered to get vaccinated swiftly.(16)

Demand management and supply chain handling are the two parameters that hold the key to successful vaccination program. Hence, robust mechanisms to thrive these parameters need to be worked upon.(17)

Expanding the vaccine coverage to all groups even to children is another important landmark to cover. Various trials by different vaccine companies are underway like Bharat Biotech's Nasal Vaccine (BBV154), Covaxin, Zydus and Novavax.

Vaccination strategies require timely re-evaluation for a better tackling of the challenges. Thus, Post-marketing surveillance stands indispensable to account for vaccine safety and efficacy on a long-term basis.

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