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Review Article

SARS-CoV-2 a public health emergency: challenges in vaccination in Indian setup

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ABSTRACT

WHO is working in collaboration with scientists, business, and global health organizations to fasten the pandemic response. India has approved two vaccines, Covishield and Covaxin for emergency use to fight COVID-19 pandemic in the country. Even when vaccinations are provided free of cost in PHCs, some social stigma always present in communities which make hardest-to-reach remote rural areas. Enhancing access to vaccination services, provider-based interventions and increasing community demand are some areas of concern. In spite of all recommendations, certain challenges like safety of vaccines, human rights and law, trust and prevention of distrust etc. remain to be solved before planning to introduce a new vaccine in the public health system. In the first phase of the vaccination drive, frontline workers nearly from both government and private sector will get vaccinated. These include cleaners, police and paramilitary, home guards, disaster management volunteers and other jawans in civil defence, and revenue officials associated with containment and surveillance. In the second and third stage, those above 45 years of age with comorbidities and then without comorbidities will be vaccinated. Later people in age group of more than 18 years will get vaccine.

Keywords: COVID vaccine, Covishield, Covaxin, Challenges

INTRODUCTION

Coronavirus disease 2019 (COVID-19) ranges from being asymptomatic for some and causing symptoms such as flu-like to acute respiratory distress syndrome (ARDS), pneumonia and mortality.[1] Wearing masks and social distancing will help in preventing exposure to the virus, but the ultimate solution are the vaccines which help the immune system to gear up and fight even after exposure to the virus. COVID-19 outbreak was declared as a pandemic by WHO on March 11, 2020.[2]

ORGANISATIONS WORKING ON COVID VACCINE IN INDIA

Bharat Biotech, Serum Institute, Zydus Cadila, Panacea Biotec, Indian Immunologicals, Mynvax and Biological E are among the domestic Indian pharma vaccine companies.[3] In addition to efficacy, safety has also been a major concern in the SARS-CoV-2 vaccine development.[4] For safe anti-COVID-19 measures and vaccination protocols, vigilant animal preclinical studies and strict observation of human clinical trials are of great significance.[5] Globally, over 274 candidate vaccines are in different stages of development as of 4 December 2020. The majority of vaccines in clinical evaluation will require a two dose schedule to be administered four weeks apart, and is need to be administered through the intramuscular route.[6]

All sanctioned vaccines need to undergo a logistic process so that the safety standards are up to the mark. WHO is working in collaboration with scientists, business, and global health organizations to fasten the pandemic response. International organizations such as the World Health Organization (WHO), Coalition for Epidemic Preparedness Innovations (CEPI), Gavi alliance, Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) and Bill and Melinda Gates Foundation (BMGF) are indispensable to guarantee the required funding for vaccines in the COVID-19 pandemic.[4] During the introduction of a potent and safe vaccine the people with the highest risk will be prioritized and public measures will take place side by side.[7]

Various COVID-19 vaccines are still in the making, like inactivated or weakened virus vaccines, protein-based vaccines, viral vector vaccines, and RNA and DNA vaccines.[8] It's too early to know the effect of these vaccines. It is reassuring, however, that available evidence show that most individuals healing from coronavirus infection develop immunity against reinfection for quite some time.[9]

CURRENT VACCINES DEVELOPED FOR COVID-19

India has approved two vaccines — Covishield and Covaxin — for emergency use to fight COVID-19 pandemic in the country. Covishield has been developed by the Oxford University scientists in association with the pharmaceutical company AstraZeneca. In India, its trial was undertaken by the Serum Institute of India (SII), which is also manufacturing the Covishield vaccine for public vaccination.

Covaxin has been developed by Bharat Biotech who has joined hands with the Indian Council for Medical Research (ICMR) - National Institute of Virology (NIV). The vaccine has been produced and developed in Bharat Biotech's BSL-3 (Bio-Safety Level 3) high containment facility.[10]

COVISHIELD

COVISHIELD vaccine has been given license for constrained use during emergency condition. The COVISHIELD vaccination schedule consists of two doses of 0.5 ml each. The second dose can be given 6-8 weeks after the first dose.[11] Oxford vaccine had an overall efficacy of 70%, but could be around 90% effective when administered as a half dose followed by a full dose a month later. COVID-19 Vaccine confirms 100% protection against severe disease, hospitalisation and death.[12]

COVAXIN

The Bharat Biotech COVID-19 Vaccine (COVAXIN) has been permitted for emergency usage.[13] The Covaxin phase 3 trials demonstrated 81% interim efficacy in preventing COVID-19 in those without prior infection after the second dose. Analysis from the National Institute of Virology indicates that vaccine-induced antibodies can neutralize the UK variant strains and other heterologous strains.[10]

Other vaccines under trial are BioNTech (mRNA-1273) - Pfizer, Moderna (BNT162b2), Janssen, Novavax , Sanofi Pasteur and GSK etc

CHALLENGES

Definitely there will be challenges faced for vaccination of adolescents which will vary with the specifics of each vaccine. Enhancing access to vaccination services, provider-based interventions and increasing community demand are some areas of concern. Those below the age of 60 years with dangerous co-morbidities will need to produce a medical certificate verifying severity of pre-existing conditions to be added in the government's ‘priority’ list for vaccination.[14]

Almost all the healthcare worker and frontline workers have taken 1st dose in phase 1. In India according to the latest census, more than 20 crore people are eligible for phase 2 of COVID-19 vaccinations in India. This includes more than 7 crore people in the 45-59 age group with morbidity conditions and 13.7 crore in 60+ age group.[15] From April 1, people above the age of 45 will not require a comorbidity certificate to get vaccinated.

Adult vaccination coverage in India is very difficult but possible. Vaccines of adults is very important given that >25% of mortality are due to infectious diseases. Many infectious diseases are more severe in older adults than younger adults because of their lifetime of exposure to carcinogens or other infectious diseases. Substantial improvements in adult vaccination are needed to reduce the health consequences of vaccine-preventable diseases.

Even when vaccinations are provided free of cost in PHCs, some social stigma always present in communities which make hardest-to-reach remote rural areas. To reduce inequalities in immunization for the senior citizens we need to develop and implement effective strategies to ensure immunization services can ‘reach every community’ and family, including the hardest-to-reach. Many innovative partnership strategies have been utilized in different countries to address challenges of the same nature. The collaboration of military institutions in the implementation of vaccine coverage in the response of pandemics. The most recent example is found in the global response to the Ebola outbreak experienced in Sierra Leone, Guinea,and Liberia.[16]

According to WHO, we must not put off getting vaccinated because of our concerns about new variants, and we must proceed with vaccination even if the vaccines may be somewhat less effective against some of the COVID-19 virus variants. As per the prediction, the 2nd wave of Covid-19 in India could last up to 100 days and peak in April, so vaccination is more effective tool .We need to use this tools to decline COVID 19 disease.[17]

HUMAN RESOURCES: TRAINING AND CAPACITY BUILDING

The victory of the vaccination depends on the quality of training of the human resources. With the pandemic situation the training modalities have shifted to the new normal which includes instructor led trainings through virtual platforms, self-learning training modules and combined approach. Trainings will be conducted for government and private institutions and the vaccination Officer, vaccinator officer, supervisors, cold chain handlers, data entry operators, medical officers, program managers. Pro-active involvement of the private sector is very important in this global vaccination spree, various outreach programs and collaborations with NGO's and public sector have been done to initiate this.

Joint planning with the military team and they were trained by municipal level officers supported by provincial level health supervisors the military teams should vaccinate the people by house to house visits and should conduct active case search as well as vaccine the inclusive criteria people. Each military group deployed had an officer in charge to supervise and coordinate support with the municipal technical team. One more field of the collaboration of the military partnership is their involvement in the implementation of independent monitoring of the polio campaign coverage.[16] The Refugees, asylum seekers, migrants and Old age home people should be considered for vaccination with high priority.

Even as chances of reinfection with COVID-19 are low, vaccination against COVID-19 is likely to protect people from severe symptoms if a fresh infection occurs after the immunity from the vaccine lapses. The government is now likely to bring on the vaccination drive to vaccinate 30 crore priority population in the first phase by July.[18]

As we are facing COVID-19 pandemic at present, we should learn to face other pandemics under the guidance from World Health Organisation, national and state level and other bodies.[19]

Infectious diseases such as guinea worm, trachoma, and yaws have been eliminated from India in recent years. It is because of the enthusiastic health workers and frontline workers. Innovation now a days is controlled by the market and do not have consistency in reaching the patients.[20]

TECHNOLOGICAL ASSISTANCE: CO-WIN

The COVID-19 vaccine intelligence network is the extension of the electronic vaccine intelligence network. This is a cloud-based solution for monitoring and systematic surveillance of the COVID-19 vaccination. It monitors the entire public health system starting from the vaccinator up to the national level. This helps in monitoring utilization, wastage of vaccine in the district, state and national level. By means of list of beneficiaries the session planning will be done by means of CO-WIN. A proper session site will have a waiting room, vaccination room and an observation room. Proper social distancing methods and SOP's will be followed in this setup.

REPORTING AND RECORDING

AEFI recording and reporting is equally important as the vaccine administration. All types of AEFI are recorded by means of CO-WIN which is automatically transferred to SAFE-VAC. The basic details are entered in CO-WIN by the vaccinator or the DIO through the district login. The DIO can sign in through the CO-WIN and access the SAFE-VAC related to COVID-19 vaccine and its effects, and enter details into CRF, PCIF, DCIF and upload the necessary documents. Once the investigation of AEFI is complete various members of the national and state AEFI committee asses the case as per the universally accepted causality assessment.

THE ONLY HOPE - TESTING, TRACING AND VACCINATING

The health effect the pandemic has been devastating so far. This pandemic might not come to an end until a vaccine is made available universally. Even though vaccines are in the making, the broader population is likely be vaccinated only in the latter half of next year. Until then, protective measures will continue to be our best hope. While India has undoubtedly made considerable strides in ramping up testing capacity, there is still a lot that can be done to bolster this further.[21]

TOOLS WE CAN USE TO MONITOR

V-safe is a smartphone-based tool that uses text messaging and web surveys to provide personalized health check-ins after you receive a COVID-19 vaccination. Through v-safe, you can promptly report to the CDC in case of any side effects after getting the COVID-19 vaccine. Depending on the replies, a member from CDC may call to check on you and gather more information. V-safe also gives reminder of a second dose of vaccination in case it is necessary.[2]

CONCLUSION

In spite of all recommendations, certain challenges like safety of vaccines, human rights and law, trust and

prevention of distrust etc. remain to be solved before planning to introduce a new vaccine in the public health system. Most vital of the issues is political commitment and will. Provided this is in the affirmative, other aspects such as administrative involvement, demand and supply of the vaccine, and ultimately the finances, need to be resolved in due course.

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