

## Prioritising COVID-19 vaccination: an unprecedented conundrum

COVID-19 pandemic has taken the world by storm. On the day of writing this article, there were more than 1 million deaths worldwide attributed to the deadly infection. Despite being months into the pandemic and unprecedented global effort to develop an effective treatment against the virus, outcomes have been dismal. The global community now rests its hope on a safe and effective vaccine that could possibly end the pandemic and bring about normalcy.<sup>1</sup>

Indeed, with several vaccines now in third phase of clinical trials, it seems plausible we could soon have a vaccine against the SARS-CoV-2. The vaccine would have to stand tests of efficacy and safety through its trials and must prove safe in postmarketing surveillance as well. Also, while one vaccine is likely to be approved first, head-to-head trials of vaccine efficacy and safety among different candidates must take place as different vaccines become available.

Hasty deployment of a vaccine with low efficacy could prove catastrophic. It would allow the pandemic to accelerate unabated as the vaccinated population overestimates its protective immunogenicity and it could grossly undermine public trust in vaccine programmes. This would lead to a failure of any potential future safe and effective vaccination drive.

For any vaccine to be deployed in this critical situation, the WHO recommends a preferred efficacy of at least 70%, although a 50% efficacy may be acceptable. An efficacy of 50% has been suggested to be important for herd immunity and any greater efficacy would be welcome. A vaccine must preferably be effective for at least 1 year as per WHO. However, a 6-month effective period may be acceptable. The vaccine must have minimal doses (ideally two or less) and begin action within 2 weeks of administration for it to be rapidly effective and to minimise the need for revaccinations before all priority groups are vaccinated. We must also remember that higher doses of any vaccine would also mean greater

costs and logistic issues associated with cold chain storage, transport and procurement, which could compromise any effective vaccination programme, especially in resource-poor nations.

Questions regarding the comparison of different vaccine candidates would be raised once they are available. Comparing them solely on the basis of immunogenicity would be inadequate, and human challenge studies have been suggested. However, human challenge studies would not provide any data on other populations, particularly the elderly, which are under-represented in such studies. Multi-vaccine trials may be able to provide some data on safety issues. The WHO solidarity trials seek to address issues relating to rapid assessment of efficacy of multiple vaccines.<sup>2</sup>

While hoping that a low-cost and effective vaccine does become available, the next logical step would be prioritising the groups who would first receive a vaccine.

This is not an easy task. While authorities and professionals worldwide agree that the first people to get vaccinated would be healthcare professionals, with their immense risk of acquiring infection and transmitting it, they are still unclear as to who should be vaccinated next. It is a conundrum, a double-edged sword to say the least.

A plausible idea would be to vaccinate the elderly and high-risk groups first, particularly those with comorbidities, considering their high mortality from the disease. This would then require definition of what constitutes the elderly and what comorbidities would be prioritised.

Considering that any vaccine would not have enough doses immediately available, waning immunity in the elderly before everyone is vaccinated would become a concern.<sup>1</sup> Also, a large proportion of the young population not getting vaccinated and transmitting the virus would mean the pandemic would stay longer and claim perhaps more lives. For the pandemic to halt, those at greatest risk of transmitting it must be immunised to break the chain of infection.

At the same time, vaccinating the working population could deprive those at the greatest risk of dying from the disease from a potential life-saving intervention.

It remains to be seen how things take shape when an effective vaccine becomes available considering the unprecedented crisis that we are in. Critical policy making and judicious deliberations would be needed before such interventions are taken place. Whatever path is chosen, it will be closely scrutinised and both lauded and criticised across both sides of the equator.

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