



Challenges to mass immunization against COVID-19 in Pakistan: A lower-middle income vaccine-hesitant country

Syed Zaki Muhammad¹, Nafhat Shaikh², Dayab Asad³, Noor Fatima⁴

¹Dow University of Health Sciences, Karachi, Pakistan

²Liaquat University of Health Sciences, Jamshoro, Pakistan

³Jinnah Sindh Medical University, Karachi, Pakistan

⁴Liaquat National Hospital and Medical College, Karachi, Pakistan

Outbreaks of diseases caused by emerging viruses continue to pose a great threat to human existence. Outbreaks by Influenza, Zika, Ebola, and the most recent one of coronavirus disease (COVID-19) are a reminder of our vulnerability [1]. The rapid spread of COVID-19, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), across the globe, compelled the World Health Organization (WHO) to announce it as a pandemic in March 2020 [2]. Since then, the virus has claimed over four million lives and there are at present over 200 million active cases worldwide [3].

Vaccine hesitancy has been a critical challenge in Pakistan to date, which is a prime barrier against eradicating vaccine-preventable diseases. The people of Pakistan have expressed a similar hesitancy towards polio immunization programs.

Until now, eight new variants of SARS-CoV-2 have been identified [4]. Vaccination against pathogenic viruses has proven to be the best strategy to control their spread. Hence, vaccine development was initiated very early in the pandemic, resulting in availability of vaccines against SARS-CoV-2. Different vaccines developed employ different mechanisms for generation of an immune response, however, all of the vaccines have proven to be highly effective against the virus. The trials conducted, have concluded that the vaccines have great efficacy in reducing the severity of symptoms, rate of hospitalization, and death [5].

Unfortunately, even after tremendous efforts by the government of Pakistan, Pakistani population has shown reluctance against COVID-19 vaccines. Pakistan started its COVID-19 vaccination program in February 2021 and so far only 16.7% of the population is recorded to be fully vaccinated [6]. Vaccination is the only way to contain this deadly virus and its widespread acceptance remains a worrying issue.

Vaccine hesitancy has been a critical challenge in Pakistan to date, which is a prime barrier against eradicating vaccine-preventable diseases. The people of Pakistan have expressed a similar hesitancy towards polio immunization programs for decades now, due to which Pakistan remains one of the only two countries to harbor poliovirus. In 2019, wild poliovirus outbreaks were reported in polio-free regions of Pakistan with 149 positive cases, displaying a sharp resurgence [7]. Pakistan's immunization coverage has remained perpetually low;

however, the province of Sindh shows the lowest immunization coverage with only 35% of its population receiving vaccination under the Expanded Program of Immunization (EPI) [8]. This suboptimal vaccine coverage explains why despite the availability of safe and effective vaccines, the under-5 mortality rate in Pakistan is as high as 71.34 deaths per thousand live births [9].

In 2019, WHO declared vaccine hesitancy to be one of the 10 major threats to public health worldwide [10]. This has added to increased crumbling of an already fragile health care system of Pakistan. The only solution to

curb this deadly virus is mass immunization and acquiring herd immunity. Therefore, it is of utmost importance to identify the factors that contribute towards vaccine hesitancy and address them strategically. A significant factor that seems to affect vaccine acceptance in Pakistan is misinformation and conspiracy narratives promulgated against COVID-19 vaccines [11]. With the beginning of vaccination campaigns, dissemination of misinformation regarding vaccines was taken up by mass media. In a study of 427 participants, carried out in Islamabad, about 52.3% of the participants obtained fake information from the print and live news media, while 23.7% were influenced by social media [12]. Various conspiracy theories like the virus being bioengineered and introduction of surveillance microchips to control human beings via vaccines infiltrated social networking sites [13]. In addition, the circulation of anti-vaccination content regarding vaccine safety, inefficacy, myths about consequent infertility



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and other inaccurate beliefs also induced anti-vaccine behavior in the general public. This led to many people defying the very existence of the virus or the seriousness of the situation. These conspiracy narratives were more profoundly seen in rural areas of Pakistan.

Religious factors have also had a detrimental impact on vaccine uptake. Some religious leaders argue that the vaccines are not 'Halal' and forbidden by Shariah. Moreover, a great deal of mistrust regarding vaccines is found within the communities who believe that vaccines are a Western conspiracy to eradicate Muslims [11]. A survey by Gallup Pakistan reported that out of 46% Pakistanis who were willing to get vaccinated, 42% did not prefer Western-made vaccines [14]. Politicization of the vaccine has further created confusion within the public and has fueled the idea that the government is using the virus as a mere excuse for receiving funds. Furthermore, safety concerns play a significant part in decreasing vaccine uptake. Speculations about the efficacy and side effects account for the unwillingness towards vaccination [15]. Some rumors even claim that the vaccine itself contains active virus. Khan ZA et al conducted a survey that showed 4.9% of the participants feared falling seriously ill within six months of vaccine administration while 39% were confident of contracting the virus right after [15].

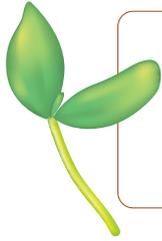
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What ultimately transpires from these aforementioned reasons is that there is a lack of confidence regarding vaccines amongst the population. The first step towards solving this problem would be gaining the trust of the people by assuring them that the vaccines are not only effective in preventing infections from the virus but also do not have any serious side effects which could affect an individual in an adverse manner. This can only be achieved by creating awareness amongst the masses. For that, advertisements, and podcasts, featuring health care professionals who address concerns of people should be run on different platforms. Influencers on social media can share their vaccination experience and encourage

people to get vaccinated. Education regarding the importance, side effects, and even the different types of vaccines produced by different pharmaceutical companies should be given in all educational institutions. Furthermore, religious, and cultural leaders should be tasked to promote the process of vaccination. In remote areas where there are no or few digital facilities available, the local doctors can play their parts in inculcating a positive mindset among the population. These local doctors tend to be well known and more trusted amongst the community due to which their word will have greater impact on the people to motivate them to get their shots.

However, only gaining confidence might not be enough. A large proportion of people show rigid unwillingness towards vaccination. In this case, provision of incentives can prove to amplify acceptance rate. Incentives could include vaccination facilities in multiple neighborhoods, allowances from employers, and discounts at

retail outlets. Vaccination cards must become a requirement for day-to-day activities. Instead of only large-scale vaccination centers, small scale centers, but in greater quantities should be set up in every neighborhood to make the vaccination process more convenient. The current vaccination process which involves booking an appointment via text message also needs to be revised, it should be made appointment free especially in the rural areas where digital facilities are not readily available. More importantly, in order to generate vaccine acceptance in the general population, local statistical data that shows efficacy, safety, and survival rates associated with COVID-19 vaccines, should be openly available and with public reach.



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Correspondence to:

Syed Zaki Muhammad, MBBS
Dow Medical College, Dow University of Health Sciences
Baba-e-Urdu Road
Karachi
Pakistan
syedzakimd@gmail.com