

# Building confidence in the COVID-19 vaccine in a polio-endemic country: strategic communication lessons from Pakistan

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**To cite:** Haq ZU, Yunus S, Jafri N. Building confidence in the COVID-19 vaccine in a polio-endemic country: strategic communication lessons from Pakistan. *BMJ Glob Health* 2024;**9**:e015200. doi:10.1136/bmjgh-2024-015200

**Handling editor** Seye Abimbola

Received 29 January 2024

Accepted 31 March 2024

## ABSTRACT

In a health emergency, governments rely on public trust in their policy, and anticipate its compliance to protect health and save lives. Vaccine hesitancy compromises this process when an emergency involves infections. The prevailing discourse on vaccine hesitancy often describes it as a static phenomenon, ignoring its expanse and complexity, and neglecting the exploration of tools to address it. This article diverges from the conventional perspective by explaining the case of Pakistan and its communication strategy for the COVID-19 vaccine. Decades of polio vaccine hesitancy, rooted in the country's fight against terrorism, constitute its history. On the other hand, the first-ever launch of typhoid conjugate vaccine involving 35 million kids during 2019–2021 was a success. Against this backdrop, the country considered vaccine hesitancy as a dynamic phenomenon, interwoven with the social ecology and the responsiveness of the healthcare system. Its communication strategy facilitated those willing to receive the vaccine, while being responsive to the information needs of those still in the decision-making process. In the face of both hesitancy and a scarcity of vaccine doses, the country successfully inoculated nearly 70% (160 million) of its population in just over 1 year. People's perceptions about the COVID-19 vaccine also improved over time. This achievement offers valuable insights and tools for policymakers and strategists focused on the demand side of vaccine programmes. The lessons can significantly contribute to the global discourse on improving vaccine confidence and bolstering global health security.

## INTRODUCTION

In a health emergency, governments rely on public trust in their policy, and anticipate its compliance to protect health and save lives.<sup>1</sup> Vaccine hesitancy—the delay in acceptance or refusal of vaccination services despite their availability—endangers trust when the emergency involves infections.<sup>2</sup> This is why in 2019, the WHO included it in the top 10 threats to global health.<sup>3</sup> Authors have widely discussed vaccine hesitancy during COVID-19; a total of 284 systematic reviews and over 5000 articles

## WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Vaccine hesitancy is 1 of the top 10 threats to global health. Studies often describe it as a static phenomenon, ignoring its complexity and the need for finding tools to address it.

## WHAT THIS STUDY ADDS

⇒ We distinguish between hesitancy for child and adult vaccination and demonstrate that targeted communications coupled with efficient service delivery can address this attitude, which is not static but exists on a continuum.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Immunisation programmes can better respond to vaccine hesitancy if their communication tools are informed by socioecological models. These models also provide an opportunity for further research to address communication challenges in a hyperconnected, globalised world.

on COVID-19 vaccine hesitancy are available on PubMed 4 years into the pandemic. The copious literature, however, has some striking omissions about the overall concept, its true prevalence, the underlying factors and potential solutions.<sup>4</sup>

Before the pandemic, vaccine hesitancy was mainly discussed as a barrier for parents and caregivers in considering vaccines for their children, whereas this must be differentiated from the adult vaccine hesitancy addressed in the COVID-19 literature.<sup>5</sup> Moreover, most studies use cross-sectional data to examine vaccine hesitancy as a static element,<sup>6</sup> ignoring the continuous interplay of factors that shape the acceptance or hesitancy, for example, community characteristics, the system's accessibility and efficiency, and the evolving context of disease and its vaccine.<sup>4 7 8</sup> Often, COVID-19 vaccine hesitancy is reported as a major cause of



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undervaccination in low-income and middle-income countries (LMICs), which may not be true.<sup>9 10</sup> Lastly, few offer tools that vaccine strategists can use to address this threat to global health.

How big of a problem is vaccine hesitancy? Studies about the COVID-19 vaccine from the UK and other high-income countries (HICs) suggest that the sentiment has not been as prevalent, as it was suspected.<sup>11–13</sup> Subpopulations with a higher hesitancy in some of these countries were minority ethnic populations, having low socioeconomic status and low access to services.<sup>12 14</sup> Data suggest that LMICs can achieve equal to or higher vaccination rates than HICs when adequate doses are available.<sup>15 16</sup> However, this does not mean health systems can be complacent about vaccine hesitancy. A recent analysis of global vaccination rates from 2015 to 2022 has reported declining confidence in child vaccination.<sup>17</sup>

Factors underlying the acceptance or hesitancy of a vaccine (both for children and adults) can vary in different settings. Among the European and North American populations, hesitancy has arisen from information about the unproven ill effects of thiomersal, or a scientist's wrong attribution of autism to certain vaccines.<sup>18</sup> Moreover, today's political polarisation and hyperbolic media, especially social media, fuel this hesitancy.<sup>19 20</sup> Among Africans, the distrust is entrenched in the deep inequalities that the Global North has caused them, the most recent being their lack of access to COVID-19 response measures, including tests, treatments and the vaccine.<sup>10</sup> In populations with a Muslim majority, along with other factors, faith-related concerns, for example, haram or halal, infuse hesitancy.<sup>21</sup>

Pakistan, still a polio-endemic country, has a history of vaccine hesitancy, rooted in the decades-old fight against terrorism.<sup>22 23</sup> As several studies indicate, the challenges heightened in the aftermath of a fake immunisation campaign in 2011, an incident followed by consistent killing of vaccine workers.<sup>23 24</sup> For the COVID-19 vaccine, the country also had to struggle for adequate doses—a factor that could cut people's enthusiasm. Yet, Pakistan vaccinated nearly 70% (160 million) of its population in just over 1 year. How did the country achieve this and what was the role of communication? In this paper, we share insights from Pakistan to answer the hesitancy-related questions for policymakers who focus on the demand side of vaccine programmes.

### Pakistan's unique context

While the country's public health system and its workers were regaining confidence in the wake of past occurrences, another incident during the national immunisation campaign in April 2019 in Peshawar further eroded the public trust.<sup>22</sup> On hearing fake news that hundreds of children were hospitalised because of expired vaccine, the local community, already unhappy about the change in the age of children for polio vaccine (5 years was replaced with up to 10 years), started mass protests and vandalism. The programme learnt that information like

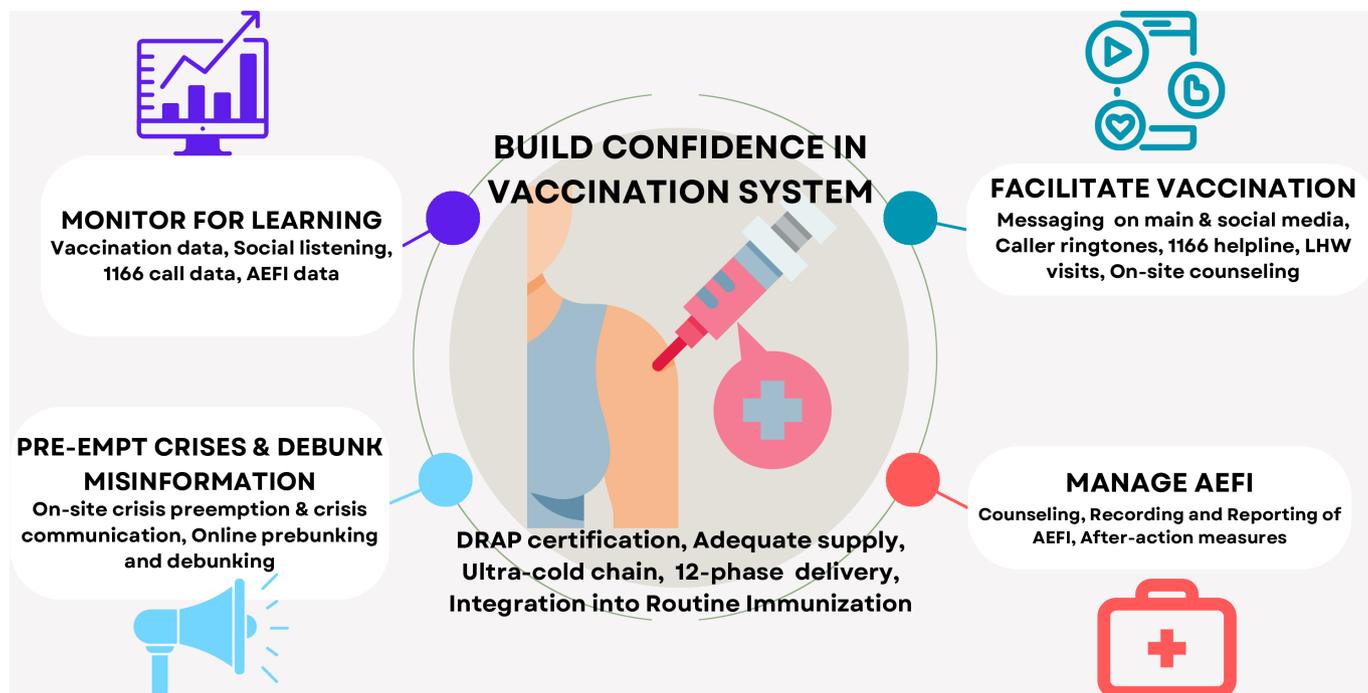
a change in age is not just for the health system and its workers, but for the whole community. Community-wide sharing of the information and feedback was necessary to ensure the community did not have a problem with the decision.<sup>25</sup>

The first-ever launch of typhoid conjugate vaccine (TCV) among children aged 9 months–15 years in the provinces of Sindh and Punjab (during 2019 and 2021, respectively), reaching a total of 35 million, also brought a unique experience.<sup>26</sup> The injection anxiety causing nausea and vomiting among a few children with their video going viral on social media brought important insights. One, older age children and adolescents could behave more fearfully than infants on seeing the injection needle, demanding a prior explanation as part of the management of adverse events following immunisation (AEFIs).<sup>27</sup> Two, the crisis communication strategy recommended that senior officials address crisis situations, but the process of realising the problem, its escalation to higher levels and the senior person's arrival at the site consumed time and diluted the effect. The system needed to respond to the crisis situation more quickly and frontline health workers (FLHWs) were better placed for this critical function.<sup>27</sup>

Formative studies about the COVID-19 vaccine informed that two-thirds of the Pakistanis were willing to receive the vaccine. The one-third who were unwilling had some concerns including the desire for more safety information, fear of side effects, uncertainty regarding efficacy and belief that those in greater need should get their shot first.<sup>28</sup> A small proportion also mentioned religion as a reason for not being willing to vaccinate at that point in time. This continuum of concerns has also been reported from other LMICs.<sup>4</sup> Qualitative analyses of vaccine behaviours have also explained how people can make rational or irrational decisions and how appropriate communications can help them.<sup>29 30</sup> Studies with health workers from Pakistan corroborated these findings and added that being transparent about vaccine delivery and providing complete and actionable information about logistics will be key.<sup>31</sup>

### STRATEGIC COMMUNICATION AND INFODEMIC MANAGEMENT

Through a seminal step, Pakistan's Ministry of National Health Services, Regulations and Coordination ensured the presence of the communication team at the decision table of the National Command and Operations Centre, the place where vaccine strategy evolved. The communication team had its hand on the community's pulse through information coming from lady health workers (LHWs), the call-in helpline, successive surveys and social listening arrangements. This allowed a feedback loop of knowing the community expectations, addressing them through policy decisions and then letting the community know of these decisions and the system's expectations about community behaviours.



**Figure 1** The centrepiece and the four complementing pillars of strategic communication. AEFI, adverse event following immunisation; DRAP, Drug Regulatory Authority of Pakistan; LHW, lady health worker.

Drawing upon lessons from the past vaccination campaigns, the learning from the country's own risk communication for COVID-19<sup>32</sup> and the global recommendations,<sup>33</sup> Pakistan's communication strategy (figure 1) comprised of a central theme of building confidence in the vaccine delivery, with four complementing pillars including behavioural facilitation, AEFI management, crisis communication and monitoring for learning. Aligned with Bronfenbrenner's socioecological model,<sup>34</sup> the strategy was sensitive to an individual's decision process that will be influenced by factors like discussions with family and friends, religious beliefs, advice from healthcare providers (HCPs), information on social media from sources all over the world and past memories of polio incidents. Following is a short description of each element of this strategy.

### A. The centrepiece

Communicating about all vaccine policy decisions that could build people's confidence in the vaccine and its safe and effective delivery was embedded as a centrepiece into the strategy. This included:

- ▶ *Publicising the vaccine authorisation by the national authority:* The Drug Regulatory Authority of Pakistan (DRAP) reviewed the data for each vaccine to ensure that evidentiary requirements for safety and efficacy are fulfilled before its approval. The formative discussions with HCPs informed that authorisation of the COVID-19 vaccine by DRAP is critical for its safety and acceptance. To satisfy this need, the authorisation of each vaccine was widely publicised.
- ▶ *Informing about adequacy of doses:* At the beginning of the campaign, the doses were in short supply. Pakistan

availed all opportunities for procuring the vaccine including from the COVAX facility, dose donations and the manufacturers. People were consistently informed about the arrival of the doses. Announcing the availability was important for those who, in the interest of others, were delaying their vaccination until the more deserving got it.

- ▶ *Maintenance of ultra-cold chain:* A key requirement of the mRNA vaccine was its storage at ultra-cold temperatures—a provision previously not available in the country. Given the warm weathers, the concern about vaccine storage was prevalent among HCPs and the wider population. The programme ensured that ultra-cold storage is not only maintained but also made visible by publicising on media.
- ▶ *Public information about phased administration:* The supply of vaccine doses in tranches necessitated that its administration is appropriately calibrated. The government, therefore, started by inoculating the HCPs, followed by old-age people. This sequencing resulted in 12 phases, each advertised on media. The potential recipients during that phase also received a specific text message with unique code and details including the date, time and location where they would receive the vaccine.
- ▶ *Integration with routine immunisation:* The rollout of the COVID-19 vaccine rested with the Expanded Programme on Immunisation (EPI), a programme previously responsible for immunising children. In rural areas, the delivery points were the same as those for children, making integration visible. The outreach for other campaigns (eg, TCV) also

promoted the COVID-19 vaccine by advising the people to get protected. The optimal COVID-19 vaccination was coordinated through all modes, that is, static, outreach and mobile vaccine delivery.

## B. The four pillars

1. **Messaging to facilitate vaccination:** This pillar fulfilled the information requirements of people for them to adopt a behaviour in an evolving situation. It comprised three streams: (a) Messages on mass and social media communicated the importance, safety and effectiveness, three factors that constitute vaccine confidence.<sup>17</sup> Specific information about when, where and how to get the vaccine was conveyed via mobile phone text messages. (b) Fully realising that new information leads to questions, which if not addressed become concerns; the team ensured a platform (1166 helpline) where people could call free of cost for answers to their questions. Religious scholars emphasised in media and Friday sermons that the vaccine is halal. (c) Education about how to manage information overload and decipher right information from wrong. This included messaging about the safety of the vaccine and being honest about potential problems. For example, Pakistan instantly responded to the age-specific side effects of the AstraZeneca vaccine announcing that young adults will not receive this vaccine. People were also advised not to pass on sensational or confusing information, rather call the helpline for fact-checking.
2. **Managing AEFIs:** Based on past learning that HCPs are the interface between the state and its people during the act of vaccination,<sup>35</sup> the HCP training was especially emphasised. A communication protocol was prepared for HCPs to inform vaccinees about the vaccine and its potential AEFIs before the vaccination. The protocol included standard statements to use during the vaccination, instructions for the mandatory 15-minute time that a recipient needed to spend at the facility after immunisation and the letter the vaccinee would receive. The letter bore instructions they should follow at home and the phone number on which to call in case of a question.
3. **Crisis pre-emption and crisis communication:** Preparing crisis communication plans is customary in emergencies, but even the well-resourced plans may not be deemed effective by the audience.<sup>36</sup> A significant pitfall is that such plans are top-heavy. For example, the first-ever checklist to assess this function designates the communication responsibility to health leaders and communication professionals.<sup>37</sup> The experience from Pakistan, however, was that FLHWs could play a more significant role in crisis management, including communication. The crisis communication for the COVID-19 vaccine thus had three elements: (a) pre-empt crises by explaining side effects prior to vaccination and monitoring for 15 min, afterwards; (b) address crisis if it emerges, using the 'AEFI' language (the difference was explained to staff between side ef-

fects, a term used for unwanted effects of a medicine and AEFI, an unwanted health incident after immunisation that may or may not be related to the vaccine)<sup>38</sup>; (c) neutralise a crisis by pre-bunking (providing information that puts misinformation in context when it strikes) and debunking (addressing falsehood) misinformation via the 1166 helpline, mainstream media and social media.

4. **Field and online monitoring:** Early in the pandemic, a WHO-convened meeting gave policy recommendations about communication strategies, including the use of reliable information that helps understand the circulating narratives and questions in communities.<sup>39</sup> Pakistan's own experience of using COVID-19 surveillance along with social listening data proved useful during the first year.<sup>32</sup> Aligned with this guidance and experience, data from three different sources were used to develop a triangulated picture to inform communication decisions. These included the overall vaccination trends, community narratives and questions emerging from social listening, community surveys, 1166 helpline calls and the AEFI monitoring data.

## OUTCOMES

Evidence generated by real-world implementation of an intervention is considered more robust than research-generated evidence because it focuses on populations as a unit and emerges from a complex, intersectoral world.<sup>40</sup> Pakistan's national vaccination data inform that due to challenges in procuring the vaccine early on, the country could administer only 2.5 million doses in the first 3 months of the campaign. Once it managed the procurement, the country went on to vaccinate 58% of its population by administering an additional 240 million doses in the next 12 months: an increase much higher than any other country in South Asia (table 1) having a similar context.<sup>41</sup>

People's perceptions about the COVID-19 vaccine also improved over time. The most robust knowledge, attitudes and practices data about the COVID-19 vaccine were independently collected by the Johns Hopkins University and their partners, from the adult Pakistani Facebook users, surveyed twice every month during 2021–2022.<sup>28</sup> A total of 167 033 (mean: 6186, range: 3829–9231) people participated over 1 year. Each time, those who were still unvaccinated (37% in the beginning to 5% in the end) were asked about their intentions to get vaccinated, and the reason if they did not intend to receive the vaccine. The most common reason for indecision was waiting for safety information which decreased by 20 percentage points during May 2021–May 2022. Similarly, all other reasons for hesitancy decreased over the year (figure 2), except for being unsure about vaccine efficacy and religious reasons, which increased by 2 and 6 percentage points, respectively. This small rise in the last two can be explained by breakthrough infections and occasional, politically motivated anti-vax statements

**Table 1** COVID-19 vaccine doses administered between May 2021 and June 2022 in five South Asian countries\*

Country	01 May 2021	01 Jun 2022	Absolute change	Relative change
Pakistan	2 533 935	242 121 765	239 587 830	+9455%
Sri Lanka	991 299	37 526 375	36 535 076	+3686%
Bangladesh	8 712 417	252 390 252	243 677 835	+2797%
Nepal	2 212 178	40 417 352	38 205 174	+1727%
India	153 626 325	1 722 801 450	1 569 175 125	+1021%

Source: Our World in Data.

\*The values shown for each date are the total number of vaccine doses administered in the 12 months preceding that date. All doses, including boosters, are counted individually.

of some religious leaders despite continued engagement with them.

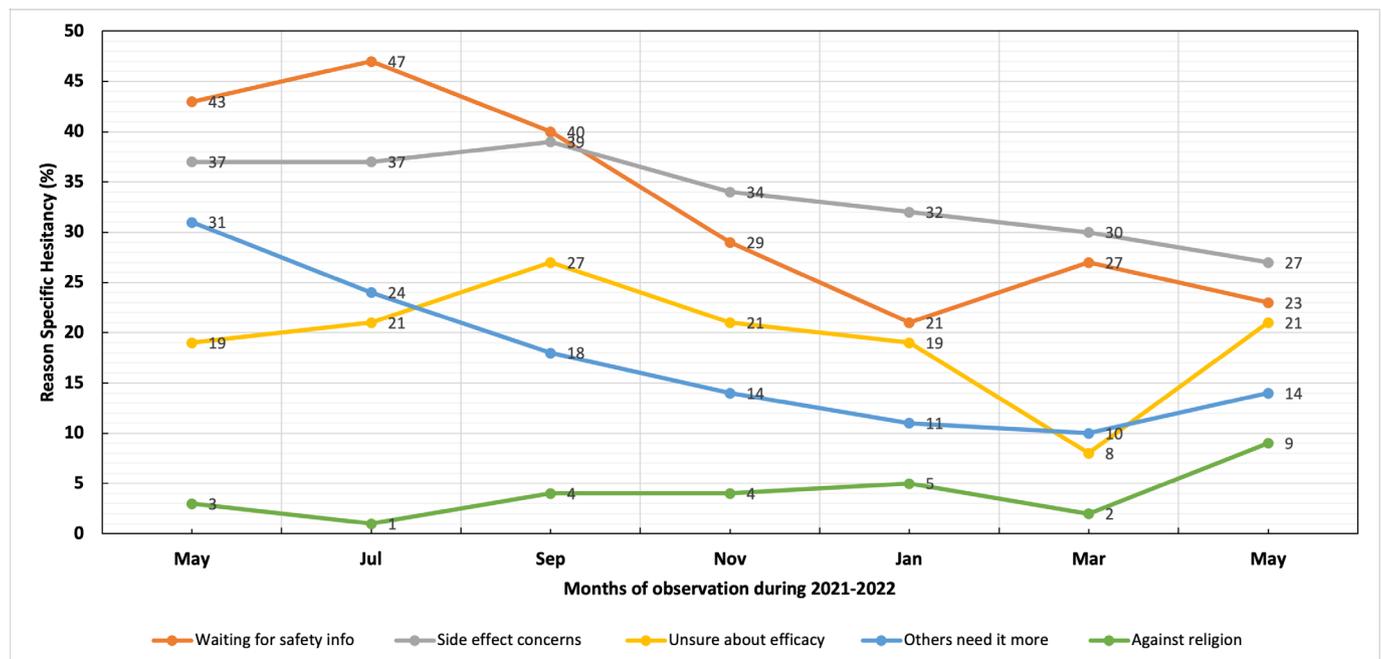
The AEFI rate during the first year was small. For 84 million doses administered during the first 8 months, 39 291 AEFIs were reported. The AEFI rate ranged from 0.27 to 0.79/1000 inoculations which is very low compared with ~4/1000 in the UK at that time. 24 serious AEFIs were also reported. The low rate may be due to a tendency to not report the usual side effects by the health workers in the country.<sup>42</sup>

## DISCUSSION

In this practice-based paper, we present elements of a strategic communication framework to improve confidence in the COVID-19 vaccine. Adding to the recent discussions that vaccine hesitancy is a continuum of concerns,<sup>4</sup> we suggest ways to tilt people's attitudes towards acceptance and away from hesitancy. With this strategy, a polio-endemic country of over 220 million and long history of vaccine hesitancy successfully achieved its COVID-19 vaccination targets in just over 1 year. The findings add

two elements to the global guidance. One, a confidence-building centrepiece aimed at keeping people informed about the policy decisions, which policymakers usually assume as 'science' that community may not need or understand.<sup>43</sup> Two, a mechanism to monitor and respond to people's reactions to an evolving vaccine delivery apparatus whereby those willing to vaccinate are reciprocated with a competent and welcoming vaccine delivery system, and those showing hesitancy are repeatedly reached to address their concerns and help them switch to the willing category.<sup>44</sup>

A recently published analysis of global trends in childhood vaccine coverage from 55 countries during 2015–2022 describes that vaccine confidence is declining globally. Three countries where it increased are the ones where the government vigorously communicated about a vaccine's importance, safety and effectiveness.<sup>17</sup> The centrepiece of Pakistan's strategy presented here adds to this by identifying the communication content and channels that can be used to enhance public confidence in all wheels of the system. Interestingly, in the same analysis,



**Figure 2** Trends (%) of reason-specific vaccine hesitancy in Pakistan (2021–2022).

the authors report a drop of 20% points in confidence for childhood vaccines in Pakistan. The high acceptance of the COVID-19 vaccine but a decline in child vaccination reinforces that hesitancy for self and for children must be approached separately.<sup>5</sup> This suggestion is corroborated by two recent studies on the COVID-19 vaccination from Taiwan and Saudi Arabia where parents willing to accept the COVID-19 vaccine for themselves were hesitant about getting their child a shot of the same vaccine.<sup>45 46</sup>

In 2018, based on studies conducted in Germany and the USA, experts proposed a 5-C framework (confidence, complacency, constraints, calculation and collective responsibility) to measure vaccination attitudes.<sup>47</sup> A 7-C framework by adding compliance and conspiracy to the 5 Cs was proposed in 2023 to enhance the COVID-19 vaccine uptake.<sup>48</sup> These frameworks have received some criticism because of their lack of attention to the complexity and nuances of vaccine hesitancy in Africa.<sup>4 49</sup> Pakistan's experience of keeping communication response in balance with the availability of doses adds a perspective from the Asian subcontinent: hesitancy is neither static nor just because of the recipient's attitudes—it can change over time and also depends on the system's performance.<sup>50</sup>

When Pakistan's communication strategy was being designed, Bronfenbrenner's theory of social ecology<sup>34</sup> seemed relevant. Retrospectively, it is more obvious that different ecological layers and their interplay were addressed to enhance vaccine acceptance. At the micro-level and meso-level, information about vaccine safety and effectiveness was provided, along with addressing the pro-sociality. Health workers and religious scholars were involved in generating a positive influence from the exosystem. Addressing misinformation about the vaccine and getting endorsements about the programme from global influencers (like the WHO) comprised the macrosystem while pre-empting the possible repercussions from past events (eg, polio debacles) attended the chronosystem. Consideration of this model to respond to the factors embedded in different ecological layers, influencing vaccine acceptance or hesitancy, can provide some helpful tools for context-based vaccine strategies in future.

All strategies can have their imperfections and Pakistan's was no exception. The strategy was mainly reliant on information mechanisms accessible to the literate populations. Those in rural areas were reached through LHWs and EPI vaccinators, but gaps may have been left leading to delays in information or inequities in vaccination. Second, during the first year of the rollout, the lack of evidence about vaccine safety among pregnant women truncated its relevance. Lastly, the behavioural data in this paper come from Facebook users and may not be representative of the entire population. However, this is the largest sample that consistently provided behavioural information on a biweekly basis over a period of 1 year. Moreover, it has been independently collected by a credible academic institution.<sup>28</sup>

## CONCLUSIONS

People who might be hesitant about their child's vaccination can be reasoned into their own vaccination through tailored, multimodal communication. The acceptance or rejection of life-saving interventions like vaccines is not just intrinsic to people, the adoption also depends on how the system appears and reaches out to them. For this, system should not only perform, but its performance should be manifestly visible to build public trust. Approaching the hesitancy on a sliding scale that can be addressed through influencers embedded in the socio-ecological layers is a helpful tool in building this trust. Health workers, especially those at the front line, are most critical in this social ecology and their communication can make or break a vaccination programme.

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**Acknowledgements** The authors acknowledge the contribution of Tou-Yen Tseng of Johns Hopkins Center for Communication Programs for her role in providing the COVID-19 KAP data for Pakistan.

**Contributors** ZUH, SY and NJ conceptualised the study. All authors contributed to the data acquisition and analysis, and successive phases of manuscript development, revision and finalisation. ZUH is ultimately responsible for the article content as a guarantor.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not applicable.

**Ethics approval** Not applicable.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available in a public, open access repository.

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