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Chapter

Hesitancy for COVID-19 Vaccines and Its Implications for Routine Immunisation

Mohan Kumar and V.L. Surya

Abstract

Vaccine hesitancy is a continuum, conditional on confidence (on vaccine or healthcare authorities), complacency, structural or psychological constraints, calculation or evaluation, vaccination convenience, and aspects pertaining to collective responsibility. The present chapter documents hesitancy to COVID-19 vaccination; and elaborates on factors that contribute to both hesitancy (barriers and concerns) and acceptance (enablers) rates, disaggregated by populations. We also discuss the multimodal nature of the COVID-19 pandemic and its vaccine hesitancy-related implications on routine immunisation. The pandemic and related movement restrictions or other mitigation measures, partial or complete suspension of vaccination clinics or fear of COVID-19, stress, anxiety, and depression may have limited parents’ access to avail routine immunisation vaccines for their children. Also, the impact of COVID-19 vaccine hesitancy is not limited to pandemic vaccines but may continue to extend to routinely recommended vaccines.

Keywords: COVID-19, vaccine hesitancy, routine immunisation, vaccine confidence

1. Introduction

Immunisation, a key primary healthcare component and an indisputable human right, is a public health achievement of the 20th century saving millions of lives every year. Vaccines and immunisation programmes currently prevent 3.5 to 5 million deaths every year from diseases like diphtheria, tetanus, pertussis, influenza, and measles. Also, they have prevented major epidemics of life-threatening diseases since the beginning of their widespread use in the 1900s underpinning global health security. Vaccines are now available to prevent more than 20 life-threatening diseases and are a vital tool in the battle against antimicrobial resistance.

The history of public concerns about and questioning vaccines, however, is as old as vaccines themselves. Modern communication systems have only accelerated anxieties about vaccine safety and its regulation. This has resulted in pockets of people who are reluctant or refuse recommended vaccination(s), or who chose to delay some vaccines. The SAGE Working Group on Vaccine Hesitancy documented that any delay in acceptance or refusal of vaccination despite the availability of vaccination services is
vaccine hesitancy. It is complex and context-specific, varying across time, place, and vaccines. Interestingly, the Working Group retained the term ‘vaccine’ rather than ‘vaccination’ hesitancy, although the latter more correctly implies the broader range of immunisation concerns [1].

It is important to monitor the reasons why a substantial number of people hesitate to receive recommended vaccinations. This allows identification of important trends over time and designing and evaluation strategies to address vaccine hesitancy and thereby increase vaccine uptake. Empirical and theoretical frameworks that assess vaccine hesitancy focus primarily on confidence in vaccines and the system that delivers them. It is essential to acknowledge that confidence covers trust in vaccines including concerns about vaccine safety, trust in healthcare workers delivering the vaccine, and in those making the decisions to approve of vaccines for a population. Vaccination behaviour can be explained by complacency (not perceiving diseases as high risk), constraints (structural and psychological barriers), the calculation (engagement in extensive information searching), and aspects pertaining to collective responsibility (willingness to protect others). These are the five main personal determinants for vaccine hesitancy [2]. To add to it would be vaccination convenience. The physical availability of vaccines, geographical accessibility, affordability and willingness-to-pay, ability to understand or comprehend that is, language and health literacy and ability of the immunisation services to appeal may affect vaccine uptake. In addition, the actual or perceived quality of the service and the degree to which vaccination services are delivered at a time and place within a cultural context that is convenient and comfortable may also affect the decision to be vaccinated and could lead to vaccine hesitancy.

Vaccine hesitancy is a continuum with those who accept all with no doubts and refuse all vaccines with no doubts as extremes (Figure 1). This may include a proportion who accept or completely refuse vaccines but are unsure. Between the extremes are those vaccine-hesitant individuals who accept some, delay or refuse some vaccines. While high levels of hesitancy lead to low vaccine demand, low levels of hesitancy do not necessarily mean high vaccine demand [3].

Figure 1. Vaccine hesitancy continuum.
2. Determinants of vaccine hesitancy

Provided that vaccine hesitancy is complex and context-specific it may be influenced by historic, socio-cultural, psychosocial, family, environmental, health system or institutional, economic, or political factors. Apart from these contextual factors, individual or group and vaccine or vaccination-specific concerns may also determine vaccine hesitancy. Taking about individual and group influences, they may arise from personal or social or peer perceptions of the vaccine (Table 1) [3].

3. COVID-19 vaccine hesitancy

COVID-19 vaccine hesitancy is real. In a meta-analysis that computed the overall COVID-19 vaccine acceptance rate across the US, the vaccine acceptance was as low as 12% and higher up to 91% [4]. Similarly, in a community-based sample of the American adult population, it was found that the likelihood of getting a COVID-19 immunisation was 52% very likely and 22% not likely or not, with individuals having lower education, income, or perceived threat of getting infected being more likely to report that they were not likely to not going to get COVID-19 vaccine (that is, vaccine hesitancy) [5]. A multi-country study of six Southeast Asian countries showed that the majority (84%) would accept COVID-19 vaccines. However, the variation between countries was significant with the lowest rates reported in Vietnam (27%) and the highest rates reported in Russia (72%) [6]. The disparities in inter-regional and inter-country (even within countries) COVID-19 vaccine hesitancy has been well documented. In a global cross-sectional study that included participants from seventeen countries across regions, it was found that participants from China (95.3%), Australia (96.4%), and Norway (95.3%) were most likely to get COVID-19 vaccination. However, participants from United States (29.4%), Japan (34.6%), and Iran (27.9%) were least likely to get vaccinated or in other words likely to be vaccine hesitant [7]. In a nationwide survey reported from India, only 30% of adults had no issue with the COVID-19 vaccine or vaccination [8]. This finding corroborates with the neighbouring nation Bangladesh where the reported prevalence of vaccine hesitancy was 46.2% [9]. The overall prevalence of COVID-19 vaccine hesitancy among Chinese adults was modest at 8.4% (95% CI, 8.09 to 8.72) for primary vaccination and 8.4% (95% CI, 8.07 to 8.70) for booster vaccination [10]. COVID-19 vaccine hesitancy has been particularly higher among older people (27.0%, 95% CI 15.1 to 38.9) [11].

3.1 Quantifying COVID-19 vaccine hesitancy

A literature search revealed few efforts aimed at quantifying vaccine hesitancy in the population [12, 13]. Firstly, the vaccine hesitancy index (VHI) was constructed using population characteristics aligned with factors identified by an Office for National Statistics (ONS) survey analysis; the factors included in the index were population under fifty, the proportion of Black or African or Caribbean ethnic population, children under five, population with less than degree level qualification and rental housing (social or private as a proportion of the total population) [14]. This was an improved version of the earlier published COVID-19 vulnerability index (VI) that considered income domain indicators and long-term illness [15].
<table>
<thead>
<tr>
<th>Determinants of Vaccine Hesitancy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contextual factors</strong></td>
</tr>
<tr>
<td>• Communication and media environment (including social media)</td>
</tr>
<tr>
<td>• Influential leaders (local or central), immunisation programme gatekeepers and anti- or pro-vaccination lobbies</td>
</tr>
<tr>
<td>• Historical influences</td>
</tr>
<tr>
<td>• Religion/culture/gender/socio-economic</td>
</tr>
<tr>
<td>• Socio-cultural/psychosocial</td>
</tr>
<tr>
<td>• Family</td>
</tr>
<tr>
<td>• Perception of the pharmaceutical industry</td>
</tr>
<tr>
<td>• Politics</td>
</tr>
<tr>
<td>• Health and other related policies</td>
</tr>
<tr>
<td>• Geographic barriers</td>
</tr>
<tr>
<td><strong>Individual and group factors</strong></td>
</tr>
<tr>
<td>• Personal, family and/or community members’ experience with vaccination (ranging from local pain or swelling to high grade fever, to anaphylaxis)</td>
</tr>
<tr>
<td>• Knowledge and/or awareness</td>
</tr>
<tr>
<td>• Beliefs and attitudes in relation to health and disease prevention</td>
</tr>
<tr>
<td>• Perceived or heuristic risks and benefits</td>
</tr>
<tr>
<td>• Health system and healthcare providers – trust and personal experience</td>
</tr>
<tr>
<td>• Immunisation as a social norm versus not needed or harmful</td>
</tr>
<tr>
<td><strong>Vaccine and vaccination-related factors</strong></td>
</tr>
<tr>
<td>• Epidemiological and scientific evidence in relation to risks and benefits</td>
</tr>
<tr>
<td>• Organisation structure of the vaccination programme and its mode of delivery (for example, routine programme or mass vaccination campaign)</td>
</tr>
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<td>• Introduction of a new vaccine or new formulation or a new recommendation for an existing vaccine</td>
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<td>• Vaccination schedule</td>
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<td>• Mode of administration (for example, oral or intramuscular injection)</td>
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<td>• Reliability and/or source of supply of vaccine and/or vaccination equipment</td>
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<td>• The strength of the recommendation and/or knowledge base and/or attitude of healthcare professionals</td>
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<tr>
<td>• Direct and indirect costs</td>
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Table 1.
Determinants of vaccine hesitancy.
3.2 Predictors of COVID-19 vaccine hesitancy

The data relating to the safety and efficacy of vaccines against COVID-19 are largely from high-income countries. In addition, the rapid pace of vaccine development has been highlighted in the literature as the primary reason for COVID-19 vaccine hesitancy. A COVID-19 vaccination acceptance and hesitancy survey including data from 15 survey samples covering 10 low- and middle-income countries (LMICs) in Asia, Africa, South America, Russia (an upper-middle-income country) and the United States reported that there was considerably higher willingness to take a COVID-19 vaccine in LMIC samples (mean 80.3%; median 78%; range 30.1%) compared with the United States (mean 64.6%) and Russia (mean 30.4%). The primary reason for acceptance was explained by interest in personal protection against COVID-19, whereas concerns in relation to side effects resulted in hesitancy [16]. It is, however, important to note that reported intentions may not always translate into vaccine uptake [17]. These findings corroborate a study conducted by Africa Centres for Disease Control and Prevention, in partnership with the London School of Hygiene and Tropical Medicine, in 15 African nations. More than three-fourths (79%) of respondents in Africa would be vaccinated against COVID-19 if it were deemed safe and effective. This may be explained based on lived experience in LMICs, where many vaccine-preventable infectious diseases are still a leading cause of morbidity and mortality, resulting in a higher perceived need for or value of vaccines [18]. However, in contrast, many people including medical professionals from high-income countries have not seen the devastating effects of these diseases in their respective countries. This is because they have successfully eliminated or eradicated numerous vaccine-preventable diseases. As a consequence resulting in altered risk calculations, complacency and limited collective responsibility about vaccination decision-making [18, 19]. In a survey among the United Kingdom (UK) adults that assessed their religious and political beliefs as well as their eagerness, willingness, and hesitance to take various global COVID-19 vaccines it was found that social media use does have an effect on perceived knowledge about vaccines as well as on vaccine hesitancy (especially Twitter!). People also express concerns over the trustworthiness of foreign vaccine production and testing protocols [20].

Evidence shows that 38%, 21%, 13%, and 11% variance in COVID-19 vaccine hesitancy can be explained by vaccine confidence, vaccine complacency, sociodemographic, and other psychological factors respectively [21]. Right-wing political affiliation, higher risk propensity, and less negative mental health effects of the COVID-19 pandemic were the principal sociodemographic and psychological determinants of COVID-19 vaccine hesitancy. Other sociodemographic determinants include younger age, women, race, and employment status. However, this particular study failed to examine the variance explained by vaccine convenience factors like availability, accessibility, affordability, willingness to pay, language, and health literacy [21]. Similarly, the willingness to vaccinate among Chinese adults was associated with gender (being women), higher levels of education, married residents, increased washing hands, never smoking, a higher score of health condition, increased wearing masks, higher level of convenient vaccination, increased social distance, disease risks outweigh vaccine risk, lower level of vaccine conspiracy beliefs, and a higher level of trust in doctor and developer [10].

In a study that assessed the intention to vaccinate for different effectiveness scenarios and side effects using the health belief model, it was found that the probability of rejecting a vaccine or indecision in relation to vaccine uptake were associated with
the severity of COVID-19. This includes, but not limited to, adverse side effects and effectiveness of the vaccine; decreased fear of contagion, perceived benefits including immunity, and the protection of oneself and the social environment; available information, specialists’ recommendations; action signals, such as responses from one’s family and the government; and susceptibility, including the contagion rate per 1000 population. The vaccine scenarios used in the study revealed that the individuals preferred less risky vaccines in terms of fewer side effects, rather than effectiveness [22].

In a cross-sectional study that aimed at determining the predictors of COVID-19 vaccine hesitancy among pregnant women it was found that, vaccine hesitant women are younger and further along in pregnancy. COVID-19 vaccine hesitant pregnant women also reported hesitancy for influenza and Tdap vaccines. Vaccine hesitancy was associated with lack of information to take an informed decision, personal long term side effects, short and long term side effects on the pregnancy, and harmful ingredients in the vaccine [23].

In a qualitative analysis that explored the intention to receive or not receive COVID-19 vaccine among Malaysians using an integrated framework of theory of reasoned action and health belief model, it was found that the predictors of vaccine hesitancy were age, religious beliefs, subjective norms, susceptibility, attitude, and vaccine confidence or trust [24]. In contrast to the findings of a global survey from seventeen countries which reported increasing vaccine hesitancy with increase in age [7], this study reported that the vaccine hesitancy was higher among those young, primarily driven by perceived (low) risk of COVID-19. The study also stressed the importance of social influence; an individual is more likely to get vaccinated if one or the other in his/her closest circle is either vaccinated or intend to get vaccinated [24].

A population based cross-sectional study from Germany reported predictors of COVID-19 vaccine hesitancy among adults more than or equal to 18 years of age. Regression analysis showed that the odds of willingness to get vaccinated were lower for females in comparison to males; however, participants of older age group, higher education, health literacy, and adherence to preventive measures increased the odds of willingness to get vaccinated [25].

Vaccine hesitancy or say vaccine acceptance, be in at individual level or societal level is driven by complex factors. The Royal Society of Canada Framework (an adapted version of Hasnan and Tan framework) discusses COVID-19 vaccine acceptance as shown in Figure 2. The four major domains of factors that influence vaccine acceptance are immunisation knowledge (highlighting the importance of vaccine related reliable information, that is, easily accessible, up-to-date, and accurate tailored for each target group), healthcare workers, people in place (in accordance with the goal of the World Health Organisation Immunisation Agenda 2030) and the health care system (highlighting the role of immunisation programmes, health legislations and policies) [26]. Each of these major domains influence each other and none of these stand alone; the intersections are highlighted in white boxes. The blue circle illustrate the broader context under which each of the major domain is influenced, which includes, but not limited to, education, control of infection, communication, and communities [27, 28].

4. Implications for routine immunisation

The implications of the COVID-19 pandemic and its vaccine hesitancy against routine immunisation is multi-modal – one, the pandemic and related movement
restrictions or other mitigation measures, partial or complete suspension of vaccination clinics or fear of COVID-19, stress, anxiety, and depression may have limited parents access to avail routine immunisation vaccines for their children [29, 30]. In a data triangulated from global, country-based, and individual-reported sources during the pandemic period, it was found that there was a decline in the number of administered doses of diphtheria pertussis tetanus-containing vaccine (DTP3) (33% fewer doses in April 2020) and the first dose of measles-containing vaccine (MCV1) (9–57% fewer doses) in the early part of 2020 [31]. The primary reason reported by WHO regional offices were substantial disruption to routine vaccination sessions, and in particular, related to interrupted vaccination demand and supply, including reduced availability of the health workforce. Similarly, a systematic review reported a decline or delay in vaccination at the time of the COVID-19 pandemic, highlighting the need for a sustained catch-up program, especially in low- and middle-income countries [32].

Secondly, the impact of COVID-19 vaccine hesitancy is not limited to pandemic vaccines but may continue to extend to routinely recommended vaccines. Though certain studies found increased vaccine confidence in parents for routine childhood vaccines as compared to the COVID-19 vaccine, certain studies highlight the concern of COVID-19 vaccine hesitancy rubbing off on routine immunisation vaccine hesitancy [33–36]. In a study that attempted to understand the impact of the pandemic on routine childhood vaccine hesitancy, it was found that the routine childhood vaccine hesitancy increased during the COVID-19 pandemic, mainly due to increased risk perception [37, 38].

It is the need of the hour to leverage COVID-19 vaccination awareness campaigns to include routine immunisation call-to-action messages [39]. Clear communication between public health authorities, providers, and the general public, and from providers to parents or caregivers on the value, safety, and necessity of routine immunisation will remain a critical piece to help alleviate concerns and address vaccine hesitancy. Engaging local leaders in the community may help resonate with public health messages related to the importance of routine vaccines, especially when the discussion around public health becomes tainted with political and/or
non-medical aspects. In this process of communication, it is important to maintain a delicate balance between what is known and acknowledging the uncertainties that remain. Easing societal restrictions where possible, taking the necessary steps to reach standard marketing authorization, offering a fixed monetary reward as an incentive, involving physicians in the vaccination campaign, and focusing on vaccine effectiveness while communicating risks clearly and transparently are recommended as measures to reduce vaccine hesitancy [40].

Overall, the strategies include offering pre-structured, pre-tested communication from community trusted sources such as healthcare providers, local representatives, and authorities. It should be ensured that they are culturally relevant, accessible and in multiple languages. It is important to improve the accessibility of population to vaccines and vaccine related information. This should be made possible through adoption of flexible, context specific delivery models. The success of these strategies are rested with training and education of those involved and community engagement. It is necessary to involve youth ambassadors, healthcare workers, community champions and faith leaders to raise knowledge and awareness on vaccinations. Vaccination of friends, relatives and household members should be celebrated; an approach of community immunity should be fostered; aided by locally developed action plans with a continuous, open, and transparent dialogue [41].

5. Conclusion

The implications of contextual factors, individual and group factors, vaccine, and vaccination related factors on vaccine hesitancy is long recognised. However, the additive or multiplicative, multi-modal implications of COVID-19 vaccine hesitancy on routine immunisation is less recognised. It is the need of the hour to leverage COVID-19 vaccination awareness campaigns to include routine immunisation call-to-action messages with effective monitoring and evaluation aided by implementation research strategies. The areas that should be strengthened to restore and maintain vaccine confidence includes trust in health care provider–patient encounters, public health messaging, vaccine mandates, diversity, inclusion, and representation in health sectors, and industry influence on health care.
References


