Determinants of and Strategies for COVID-19 Vaccine Acceptance: A Rapid Evidence Synthesis

Key Policy Considerations & Recommendations

Key determinants of vaccine acceptance were

- Risk perception and severity of illness
- Gender, occupation, education, income, place of residence, certain occupations and religious beliefs – these tend to be associated with population sub-groups neglected by the health system
- Vaccine effectiveness, side effects, perceptions of safety (including exposure risks while getting vaccinated), misinformation and affordability
- Endorsement from health provider and employers
- Communication and public engagement
- Most centrally, trust in government and pharmaceutical companies

No evidence was found assessing strategies or interventions. Multipronged strategies were recommended, and include

- At the overall systems level
  - Addressing **historic issues and sensitivities**, particularly in pockets where vaccine acceptance may be heterogenous
  - Minimisation of vaccine-related **costs**
  - Measures to **ensure infection control** and reduce infection spread
  - Increase in availability of human resources and **vaccine delivery capacity,** including innovations to improve pre-registration access
- **Engagement** directly with communities by **mobilisers and frontline workers, as well as providers s**haring knowledge and encouraging vaccination in their personal networks
- Clear, consistent and **transparent communication** regarding service availability, risks, and benefits through general and/or intensive campaigns with
  - **engagement of community leaders, celebrities and influencers,** as well as health and scientific experts to build awareness, and
  - Tailoring **messaging according to health, scientific and general literacy of sub-populations** using traditional and social media, as appropriate.

What is a rapid evidence synthesis?

A rapid evidence synthesis is a rapid review of evidence in a **systematic manner to inform decision-making that is tailored to context**. These are on-demand and with reference to a specific health policy and systems decision. This **rapid evidence synthesis integrates multiple types and levels of evidence.**

Why was this rapid evidence synthesis conducted?

This was prepared on request from the National Health Systems Resource Centre **to examine evidence onhe determinants of and strategies for COVID-19 vaccine acceptance and hesitancy. The review was conducted in 3 days.**

Suggested citation

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Introduction

The COVID-19 pandemic has caused significant morbidity and mortality globally, across multiple waves. The recent situation in India has been grim. Evidence suggests that the spread of the virus can be mitigated through physical distancing, non-pharmaceutical interventions like use of face masks / shields and maintaining hand hygiene, and in advanced cases of morbidity, therapeutics. The risk of outbreaks and disruption to societal and economic activity likely remains until effective vaccines are administered to prevent hospitalisation and limit infection. Emerging evidence also suggests that even a single dose of some COVID vaccines reduces infection rates across population groups. Therefore, it is essential to ensure equitable access to vaccines within and across all nations.

Several novel vaccines were developed in rapid response to the urgent need for a long-term solution to curb the spread of COVID 19 infection. Some COVID-19 vaccines have now been authorised or approved for human use, with some in the late stages of clinical development. The speedy rollout of vaccines is essential for complete economic reopening and recovery across the country. The latest data from Government of India's COWIN portal reports that so far 150 million doses of vaccine have been administered with 25 million individuals having received both the doses. Vaccine hesitancy has been reported anecdotally, although the prevalence of this phenomenon remains to be rigorously studied in India, particularly as the second wave mounts. India is phasing this summer into opening vaccines to all adult populations of age group 18 years and above, and vaccine acceptance will be critical.

The Rapid Evidence Synthesis team at the George Institute for Global Health and the Knowledge Management Division (KMD) of the National Health Systems Resource Centre (NHSRC) have collaborated to identify evidence on the determinants of vaccine acceptance and hesitancy, interventions that can promote vaccine acceptance, and also review relevant literature that contextualises this evidence in light of the ongoing pandemic crisis in India.

Based on discussions and a scoping brief provided to the requester, this rapid evidence synthesis (RES) addresses the following objectives:

- What are the **determinants** of COVID-19 vaccine acceptance and hesitancy?
- What **interventions** have been shown to improve COVID-19 vaccine acceptance and reduce hesitancy?
- What **contextual** considerations related to the aforementioned are relevant for India's COVID scenario?

Methodology

This RES integrated multiple types and levels of evidence to inform decision making to plan and develop resources and prepare for covid-19 vaccine uptake. The review team conducted the RES and submitted the report in three days.

Based on an initial scoping of the literature, we determined that we can employ the World Health Organization's (WHO's) Measuring Behavioral and Social Drivers of Vaccination (BeSD) Increasing Vaccination Model (see Figure 1, below).(1) Using this model as a starting point, we looked supply side determinants (drawing on what the model calls 'practical issues' of availability, accessibility/convenience, affordability/cost and incentives, acceptability/satisfaction and quality/service quality as well as intervention fatigue and related factors; and other vaccination related factors at the systems level) as well as demand side determinants (grouped under peoples thoughts and feelings such as risk perception, confidence, trust and safety concerns; as well as social processes.

Figure 1. Adapted Measuring Behavioral and Social Drivers of Vaccination (BeSD) Increasing Vaccination Model to develop RES

DEMAND	*SUPPLY*
Population perception and concerns	Availability, accessibility, acceptability, affordability, quality
Population motivation and orientation (eg. demographic characteristics, political affiliation)	Supply side dimensions of vaccination experience such as consent, privacy, doctor-patient and other relationships
Social and health system processes	
Features of campaign rollout, provider recommendation, social norms, gender norms, information sharing, rumour and misinformation	

Source: RES Team, based on World Health Organization 2020(1)

With concurrence of collaborators/requesters at the NHSRC, we conducted a comprehensive search of the published (in PubMed, Health Systems Evidence and EMBASE databases) and grey literature. A search protocol was developed based on the framework above and the objectives – i.e. emphasis on determinants, interventions and context. We also searched for grey literature, for example, available government advisories/orders, reports and guidelines related to vaccine uptake. We restricted the search to studies published in the English language, with no search date limits applied. Also, references of included studies were screened and thorough hand searching of relevant websites of different government, multinational agencies and COVID-19 resource aggregators was undertaken.

Data synthesis was carried out through simple extraction templates and review of findings through iterative discussion between three members of the RES team and NHSRC colleagues. The final output was a narrative summary of the included studies. For objectives 1 and 2, evidence was laid out organised by sections corresponding to

our framework. For objective 3, we synthesized evidence based on a deep dive into India specific data and a supplementary review of Indian guidelines and literature.(2, 3) Annexures to the report consist of details on search strategies and a list of websites searched. We also provided an inventory of relevant guidelines on vaccine uptake during public health emergencies drawing specifically on the grey literature search.

Results

Fifteen documents were identified and included in the report.(1-15) The records included two systematic reviews,(14, 15) one rapid review,(9) six cross-sectional surveys,(4-6, 10, 12, 13) five reports,(1-3, 7, 8) and one opinion piece.(11) The study selection process is presented in Appendix 3. Studies were conducted in Bangladesh, Brazil, India, Nigeria, Pakistan, South Africa, Zimbabwe, and Vietnam. Detailed characteristics of included records is provided in Appendix 4. An inventory of relevant guidelines on COVID-19 vaccine acceptance and uptake is provided in Appendix 5. The team also identified 11 studies from a pre-print server (https://www.medrxiv.org/), and the list of citations is provided in Appendix 6. These articles are not peer-reviewed and cannot be used to inform or guide decision-making. Hence, these studies were not included in the main findings of the report. However, a brief summary of the studies relevant to the South Asian context is provided.

Determinants of COVID-19 vaccine acceptance, and hesitancy

The prevalence of COVID-19 vaccine acceptance in a population-based study conducted in India was 74.5% that included 742 survey respondents randomly sampled from the general population.(12) In an opinion polling conducted in India, a high vaccine acceptance rate of 87% was reported in adults, aged between 18 to 74 years.(13) These indicated a relatively high rate of COVID-19 vaccine acceptance, similar to the rates reported in other middle-income countries, including Brazil and South Africa.(12) Several reasons for COVID-19 vaccine hesitancy were also reported across studies. A summary of the key findings on the determinants of COVID-19 vaccine acceptance and hesitancy is provided below.

Population perception and concerns

Studies reported that **public perception of vaccination's relative risks and benefits** is a significant obstacle to vaccine acceptance. We found that greater susceptibility and severity of illness was associated with greater odds of vaccine acceptance among healthcare workers.(10)

Population motivation and orientation

Studies suggested that the COVID-19 vaccine hesitancy was associated with gender, attitudes and source of information about the vaccine. Significant associations were reported between **gender** (male), **occupation** (health care workers), and higher **education**, and COVID-19 vaccine acceptance, (4, 5, 10). **V**accine hesitancy was reportedly higher among females compared to male respondents, both in the general population and healthcare workers.(4, 5, 10) Higher education level (graduate and postgraduate level) and income were associated with COVID-19 vaccine acceptance.(4, 5) Studies from Bangladesh and Vietnam reported that being female, married, and lesser education had a significant negative impact on the participants' intention to be vaccinated.(4, 10) **Religious beliefs** were also associated with vaccine hesitancy, as reported in a review from Pakistan.(11)

In a study in Bangladesh, vaccine hesitancy differed significantly across geographical locations. **Residents of slum, semi-urban, and rural areas** were more resistant to vaccine acceptance than those living in the cities. Almost 40% of the slum dwellers were hesitant to vaccinate against COVID-19. Occupations such as agriculture, day-labour, and homemakers showed a low prevalence of vaccine acceptance. Further, respondents who were divorced, separated, or widowed were found twice more likely to be vaccine-hesitant than single or unmarried. Respondents' education level and income were associated with COVID-19 vaccine acceptance.(4) A study from Vietnam reported differences in COVID-19 vaccine acceptance across occupations. Those who

were staff and received COVID-19 information from relatives had lower vaccine acceptance rates than doctors who did not receive information from their relatives. Receiving information from relatives lead to more significant misconceptions and fear about vaccines and their efficacy.(10) One study also referred to literature indicating that an individual's political beliefs may influence perceptions of the vaccine, its efficacy and safety, and the willingness to accept it, although this was not specifically studied.(13)

Availability, accessibility, acceptability, affordability, quality

The effectiveness and risk of severe side-effects of COVID-19 contributed to vaccine hesitancy in a study from Vietnam.(10) Findings from a study conducted in Nigeria revealed that unreliability of clinical trials, high cost, and vaccine safety were some of the top reasons for COVID-19 vaccine hesitancy.(5) Another study from Bangladesh reported the importance of affordability: almost three quarters of the participants were willing to vaccinate against COVID-19 with a safe, effective and free vaccine, as against 46.5% if there was a minimum fee.(4) Concerns about the safety of the vaccine were reported in several studies, given the unprecedented speed with which pharmaceutical companies developed COVID-19 vaccines.(4, 5, 7, 8, 13, 15) In a survey conducted by the WHO, it was reported that respondents had concerns regarding the risk of COVID-19 exposure when seeking vaccination.(7)

Supply side dimensions of vaccination experience (consent, privacy, doctor-patient and other relationships)

Findings suggest that a strong recommendation from a health care provider or an influential community member can increase motivation to vaccinate. Knowledge from friends, family members, or social network contacts who choose not to become vaccinated may decrease motivation.(1, 5, 10, 13, 14) In a survey, it was found that men in India were more likely to accept their employer's recommendation for COVID-19 vaccine uptake.(13) We did not find extensive information about consent or privacy in our rapid review.

Social and health system processes (Features of campaign rollout, provider recommendation, social norms, gender norms, information sharing, rumour and misinformation)

Perceived secrecy and inadequate communication addressing fears and concerns pertaining to the COVID response can increase vaccine hesitancy in the population. Suboptimal science communication, lack of public engagement, or lack of trust in governments and pharmaceutical companies contribute to vaccine hesitancy.(5, 7, 8, 12, 13, 15) A study reported that strong physician recommendations supported COVID-19 vaccine uptake.(10) One study reported that there could be unvaccinated or under-vaccinated people within larger communities of vaccinated individuals, calling this "hyper-local" heterogeneity. It was noted that greater understanding and engagement in these pockets would be required to allay specific fears or concerns of such groups.(13)

Strategies to improve COVID-19 vaccine acceptance and decrease hesitancy.

Given the complexity of vaccine hesitancy and insufficient evidence on strategies to address, decision-makers should tailor solutions to the target population and consider determinants for reluctance in the relevant context. Findings from the studies suggest that there is **no one-size-fits-all approach to vaccine hesitancy or acceptance**. For instance, higher education is associated with greater acceptance in some (high income) countries and not in others (across income groups)(13) . The evidence on strategies to address vaccine hesitancy from LMICs is limited. **We found no studies assessing interventions or strategies to address COVID vaccine acceptance/hesitancy**; rather we relied on recommendations from studies of determinants. Given the time frame (of our process but also of vaccine development in the context of COVID), this is to be expected: it is a critical area of future research.

This section summarises the key findings on the strategies to improve COVID-19 vaccine acceptance and decrease hesitancy.(1-10, 13-15). A great deal of emphasis in the literature is placed on social and health system processes; accessibility, acceptability, affordability, and quality overall; as well as in relation to the vaccine experience.

Overall, a multi-pronged strategy has been recommended to address vaccine hesitancy and promote vaccine uptake. Strategies to address vaccine hesitancy include engagement of community leaders, community mobilisation, mass media campaigns, training and education of health care professionals, nonfinancial incentives, and efforts to increase general knowledge and awareness about vaccines and vaccination.(1)

Social and health system processes (Features of campaign rollout, provider recommendation, social norms, gender norms, information sharing, rumour and misinformation)

- Trust in governments was strongly associated with vaccine acceptance and contributed to public compliance with vaccination.(12, 14) It was further noted that **addressing historic issues** breeding distrust and being sensitive to religious and philosophical beliefs was important – it is key in a pandemic to not blame the victim.(13)
- Influential **opinion leaders, including celebrities (including social media influencers)**, were recommended to promote COVID-19 vaccination acceptance and uptake. Health and scientific experts should communicate appropriate information on the safety and efficacy of vaccines.(2, 9, 11)
- **Intensive campaigns to address the risk perception** of COVID-19 infection were recommended to promote vaccine acceptance, alongside Strategies that convey the emotional and immediate economic benefits of the COVID-19 vaccine (8)

- Vaccine **communication strategies** that consider the **level of health, scientific and general literacy** in populations increase vaccine acceptance (12) bearing in mind diversity of audiences – i.e. younger, female, ethnically or linguistically diverse. (8)
- **Traditional media** (e.g. television, radio, newspapers, etc) and **social media** platforms have raised public awareness of the benefits of the COVID-19 vaccine.(8, 9)

Availability, accessibility, acceptability, affordability, quality

- Community mobilisers and frontline workers have **engaged with the community** through community consultations, faith leaders and religious meetings. The use of simple non-medical terms during community engagement has helped increase vaccine acceptance.(2, 8, 9, 11, 12)
- Incentives to **address vaccine-associated cost**s such as travel costs or workday loss have increased the chance of vaccine acceptance.(4)
- Ensuring that transportation and COVID-19 vaccination centres are secured with **adequate infection control measures** to address fears related to COVID infection spread.(7)
- Increasing vaccine delivery capacity through online registries to **increase available human resources** was reported as an important strategy. (9)

Supply side dimensions of vaccination experience (consent, privacy, doctor-patient relationship)

- **Clear, consistent, and transparent information** on how vaccines are developed, how they work, their effectiveness, and side effects is associated with greater confidence in COVID-19 vaccines.(1, 2, 9, 12, 15)
- It was recommended that health care **providers share personal knowledge** about being immunised and immunising with their family members or relatives to encourage vaccine uptake.(10)

LMIC RELEVANT DATA FROM PREPRINTS: A SNAPSHOT

We also reviewed data from surveys conducted between June 2020 and March 2021 that were placed for peer review in the form of pre-prints.(16-21) While this literature has not undergone peer review, we have included findings here with the caveat that findings and analysis may change. and papers be revised in the coming period.

Studies reiterate the need for strategies to address various factors that influence vaccine hesitancy in several LMICs. Two surveys from India(18, 20) and one from Pakistan(21) showed that the vaccine hesitancy was on the lower side, both in the general population (17%) and in health care workers (10.6% and 0.05%, respectively). Surveys from Bangladesh showed that the prevalence of vaccine hesitancy ranged between 32.5% and 41%.(16, 19) A multinational study conducted in LMICs in Africa, South Asia, and Latin America reported that the average **acceptance across studies was 80.3%.**(17) The **average acceptability in India was 84.6%,** with no sex-related significant differences (females had 80.8% prevalence and males 85.6% prevalence of acceptability; data for other genders was not assessed).(17)

Hesitancy was high among respondents who were males, over age 60, unemployed, from low-income families. On the other hand, unwillingness increased with the increased **negative attitudes** towards vaccine and conspiracy beliefs towards the COVID-19 vaccine, related to the **perceived severity** of the COVID-19 **and perceived benefits** of COVID-19 vaccination. All the studies identified several contributing factors to vaccine hesitancy, which included **pre-existing indecisiveness, cultural and religious beliefs, lack of trust in the scientific enterprise** of medicine and public health, and lower levels of awareness.

Vaccine hesitancy tended to decrease with increasing knowledge and awareness about the vaccine and the vaccination process. A few studies reported that the respondents wanted a cheap vaccine or a free vaccine from the government. **Adopting vaccination practices by healthcare workers** plays a crucial role in motivating the general population through example. The main reason expressed for willingness to take such a vaccine was to protect oneself. The most common reasons offered by those unwilling to take the vaccine were **concerns about safety (side effects) and efficacy**. Across all contexts, **health care workers were the most trusted source** of information about vaccines. Clear communication by the government, using the experience of health care workers as trusted sources of medical information, was recommended to ensure the success of a national vaccination strategy.

Contextual considerations for India's COVID scenario

It first bears mentioning that a number of studies have found acceptance levels in the overall Indian population to be above 75% and as high as 84.6%. **Some population groups, women, those with lower education and certain religious groups have been found to have greater hesitancy** in the Indian context. Studies did not explore the **causes or contexts of this hesitancy** further; more research is required to better understand the reasons why these groups have hesitancy (as it is also the case that these groups are known to be more neglected by the health system). It is possible that the phenomenon of **"hyper-local" resistance**, i.e. pockets of hesitancy in otherwise well vaccinated populations may emerge as a challenge as long as the health systems features are in place. This has been seen – but also overcome – in the case of childhood and other types of immunisation in the country, with variations reported geographically.(22, 23)

Prior experience and the evidence we have found suggests **the centrality of trust** – which can play a role in increasing acceptance (i.e. providing assurance and increasing confidence) but also propagating hesitancy (i.e. trusted persons denounce vaccines or spread misinformation). (1, 5, 10, 13, 14) This is highly salient in the Indian context.

The Indian Government has a Vaccine Communication Strategy that lays out a number of recommended practices. These include using social influence or endorsements from experts and official voices; establishing media rapid response cells to counter misinformation, and empowering community mobilisers and frontline workers to engage communities through consultations, leaders, and other community subgroups and institutions like youth (groups), self-help groups, civil society organisations, panchayats and community platforms. **Open, accurate, and continuous communication** within and across populations in India – through appropriate channels, languages and stakeholders, is essential for vaccine acceptance. A social media analysis from September to December 2020 pointed out that among the concerns voiced by Indian citizens were skepticism over the nationality of the vaccine, over the vaccine trials, and health after taking the vaccine, the fear of death, rapid development of the vaccine, allergic reactions, distrust of pharmaceutical companies and their data, as well as the speed with which vaccine development had occurred.(24) With the scenario now rapidly evolving, it is likely that some of these perceptions have changed, but as flagged by authors then, and now, **some misperceptions and superstitions** were also included in this messaging and need to be both flagged and countered.

Communication, as our review points out, is necessary but not sufficient to address vaccine acceptance in the Indian context. Communication is part of a broader program of vaccine rollout which in turn is embedded in a larger armamentarium of public health measures instituted to respond to COVID. Most of the studies that assess determinants of COVID vaccine hesitancy assume that safety/quality and availability considerations are taken care of. If there are doubts on this aspect of vaccine delivery – specifically

concerns around **availability, affordability, and safety** (including safety while obtaining the vaccine itself(7)) - evidence suggests that acceptance may be lowered. For instance, support for vaccine registration may be required for the many Indians who lack access to digital technology, as has been raised by India's Supreme Court.

Indeed, there is a critical need for further research on **vaccine rollout strategies** that accommodate and account for but also go beyond issues of vaccine acceptance and are of relevance to the scale of COVID burden in India, its larger demographic and epidemiologic characteristics as well as health system features at state and central level.

Absent LMIC strategies, we may consider adaptation of approaches used in other (HIC) settings like Israel, where a recent paper concludes that (emphases added):

> the impact of a vaccine depends not only on its effectiveness but also on factors such as vaccine coverage and allocation to different groups. These factors should be carefully considered in determining vaccination rollout strategies. For example, vaccinating individuals at the highest risk for severe morbidity is indisputably of high importance. However, **prioritizing individuals who are not considered as being at a high risk but are more prone to transmit the disease** (such as individuals working in health-care settings or in confined spaces with close proximity to others) should also be considered. Strategies to increase vaccination rates, especially in younger and healthier individuals who are more reluctant to be vaccinated, are also advised. The Israel ministry of health tried to tackle this in various creative ways, including the **opening of vaccination centres at night**, **removing the need for pre-registration**, **setting up 'vaccine carts'** in nature reserves on weekends and offering incentives such as free meals. Finally, it should be emphasized and communicated to the public that vaccination does not confer full protection, especially following the first dose, and that continued **adherence to public health prevention guidance** is still important for those vaccinated. **Informing the public of the initial results** of real-life impact and effectiveness in real time is also important, as these positive signals may increase public trust and initiate a positive-feedback loop towards higher vaccination rates. (25)

In the Indian case, creative ways of reaching those who may present reluctance could be considered, piloted and evaluated. For example, diagnostic facilities could offer registration as an add on service for routine care. Further, the linkage of program data and existing records for national programs (eg. Family Planning Register, Non-Communicable Diseases family cards, treatment cards for other conditions) to COVID registration for eligible groups could be considered. Finally, facility workers at the community level (such as Sub Health Centres and Health and Wellness Centres) may be granted privileges to enrol/register all those who visit for other health care needs, and based on information provided by family members.

Limitations

This review is subject to limitations. Studies retrieved from the databases may not provide the most up-to-date public opinions due to the publication process. However, this approach was taken to provide a concise summary of the evidence on COVID-19 vaccine hesitancy in the LMIC context within a short period. Further, the inclusion of studies may not be exhaustive. The methodological quality of the included studies was not evaluated, which may impact the reliability of the conclusions. The included studies mainly were cross-sectional surveys that provided snapshots of vaccine hesitancy status in different countries, with various sampling strategies. Also, different approaches were used to evaluate the willingness to accept COVID-19 vaccines in multiple studies. Some surveys used a Likert scale and some binary response of yes/no. Fine-grained comparisons of vaccine acceptance rates between different studies were not possible.

Despite the limitations of the reviewed research, the consistency of the findings from many studies furnishes an understanding of COVID-19 vaccine acceptance and hesitancy. There is a lack of evidence on formal evaluation of strategies to address vaccine hesitancy and increase vaccine uptake. There is an urgent need to test strategies using pre-and post-test studies to reduce vaccine hesitancy and increase vaccine uptake in LMICs.

Conclusion

This RES contributes to the evidence base for vaccine acceptance and hesitancy, with some policy implications for LMIC context, particularly in India. Studies suggest high acceptance for the most part; localised strategies to address concerns and misinformation are required that engage the community and are based in broader trust-building and vaccine delivery system-strengthening activities. Further inquiry into best practices for this, as well as adaptation of known strategies and approaches from within India are recommended.

Policy Implications

- This RES lays out evidence from LMICs, including India, in relation to a (WHO) framework to understand COVID vaccine acceptance and hesitancy.
- It contextualises evidence – including from pre-prints- to make recommendations (see below).
- It expands the scope of response to vaccine acceptance and hesitancy beyond vaccine communication strategies , which , as evidence suggests, are necessary, but not sufficient.

Policy Recommendations

Policy-makers at national and subnational levels may consider the following key determinants of vaccine acceptance – which likely shape strategies

- Risk perception and severity of illness
- Gender, occupation, education, income, place of residence, certain occupations and religious beliefs – these tend to be associated with population sub-groups neglected by the health system
- Vaccine effectiveness, side effects, perceptions of safety (including exposure risks while getting vaccinated), misinformation and affordability
- Endorsement from health provider and employers
- Communication and public engagement
- Most centrally, trust in government and pharmaceutical companies

No evidence was found assessing strategies or interventions. Multipronged strategies were recommended, and include

- At the overall systems level
    - Addressing **historic issues and sensitivities**, particularly in pockets where vaccine acceptance may be heterogenous
    - Minimisation of vaccine associated **costs** borne by the public
    - Measures to **ensure infection control** and reduce infection spread
    - Increase in availability of human resources and **vaccine delivery capacity,** including innovations to improve pre-registration access
- **Engagement** directly with communities by **mobilisers and frontline workers, as well as providers s**haring knowledge and encouraging vaccination in their personal networks – in the Indian context, this should include support for vaccine registration especially for those with access constraints.
- Clear, consistent and **transparent communication** regarding service availability, risks, and benefits through general as well as intensive campaigns with
    - **Engagement of community leaders**, celebrities, as well as health and scientific experts to build awareness, and
    - Tailoring **messaging according to health, scientific and general literacy of sub-populations** using traditional and social media, as appropriate.

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