

The Role of Information and Incentives on COVID-19 vaccination in India

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Motivation

- COVID-19 vaccine uptake is one of the most important weapon to fight against COVID-19. However, vaccine take-up rates are still not high enough in many countries.
- India is one of the developing countries that shows high prevalence of vaccine hesitancy, around 30%. As of early November 2022, only about 70% (or 7 out of 10) have received both doses of the vaccine.
- This number also varies widely across states.

Motivation

- The situation can be better comprehended with an example:
- In an incident from Uttar Pradesh, villagers jumped in the river in an attempt to escape inoculation as they believed the vaccines to be poisonous injections (Times of India; May, 2021).
- In spite of several attempts by the district administrations to dispel the rumors surrounding vaccines and explaining the benefits of the vaccines, only 14 people could be vaccinated.

Motivation

- Let me give you another general example: The Universal Immunization Programme (UIP) was introduced in 1985 in an attempt to provide all Indian children with the vaccines recommended by WHO.
- Yet, the incidence of being fully immunized (captured in terms of receiving BCG, measles, and 3 doses each of polio and DPT vaccines) for children aged 12-23 months increased marginally from 43.5% in 2005-06 to 62% in 2015-16 (Government of India Visualizations, 2017).
- Reasons cited for not getting vaccinated were: time of vaccination not known, child considered too young, fear of side effects, no faith in vaccines or its efficacy, etc.

Context

- While Indians are not new to the concept of vaccines for children, vaccines for adults, particularly for COVID-19 is new to the Indian society and is steeped in rumors and misconceptions since its launch, with citizens lacking trust in vaccines, its efficacy and side effects.
- With new vaccines targeted towards adults, comes new challenges and issues.
- This is a new and uncharted area that has not been researched before and we have very limited understanding of the barriers to adoption and how to best promote large scale vaccination in the rural regions..

Recent literature

- Recent studies show that information provision through reliable sources can be quite effective in successfully affecting positive health behaviors during the pandemics such as social distancing, handwashing, and masking (e.g., Breza, et al., 2021; Siddique et al., 2021), fighting stigma and discrimination (Islam et al., 2021) as well as improving COVID-19 vaccination take-up rates (e.g., Dai et al., 2021).
- Cash incentives have been documented to increase vaccination and immunization in developed and developing countries: on HPV vaccine take-up in England (Mantzari et al., 2015), on Hepatitis B vaccine take-up in the UK and the U.S. (Tressler and Bhandari, 2019), however, failed to do so in the U.S. (Chang et al., 2021).
- The evidence on the impacts of conditional lottery incentives—opportunity for vaccine takers to win cash prizes through lottery—on vaccination take-up rates is rather mixed, depending on the method and outcome measured.

What we do

- Understand the effectiveness of providing financial incentives and information → COVID-19 vaccination take-up in a developing country context.
 - ... documenting evidence of these effects in developing countries is important because it can provide inputs for policy makers in devising effective strategies to increase vaccination rates.
- We test the effectiveness of cash and lottery incentives with the same expected money value in the same setting → COVID-19 vaccination take-up.
 - ... Others have tested the effectiveness of these incentives, but they do not offer real money to the respondents—they only ask how respondents will behave under hypothetical policies (Kim, 2021). We add to this strand of the literature but in the context of gifts similar to Banerjee et al. (2010).

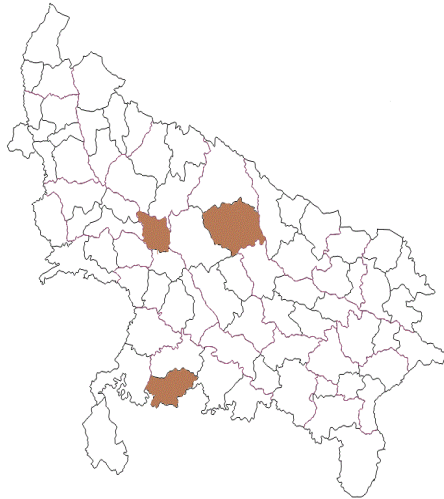
Study locations

- The study was conducted in three districts in the state of Uttar Pradesh with low vaccination take-up rates as of January 2022, following data from the Immunization Division, Ministry of Health & Family Welfare—Mahoba, Sitapur and Farrukhabad. The choice of Uttar Pradesh as the research locale is justified by the scope for reaching complete vaccination of the eligible candidates in the state, yet the presence of vaccine hesitancy.
- We combine administrative data along with village level information from the local networks to prepare the list of target locations (both rural as well as urban) and a list of eligible candidates from each location (aged 18+ -65 years and still unvaccinated at the time of the baseline survey).

Sample

- We only list adult individuals who are eligible for COVID-19 vaccine but who are still unvaccinated and exclude those who have serious comorbidities.
- We randomized a total of 8,065 individuals selected from the 884 locations. Randomization into the treatment and control groups was then done at the location level. 8,065 selected individuals identified from the 884 locations was thus randomised (using a computer program), with 295 locations in the pure control (T0), 103 in information campaign only (T1) arm, 124 locations in T2, 133 locations in T3, 118 locations in T4 and 111 locations in the T5 arm.

Study locations: Farrukhabad, Sitapur & Mahoba.



Timeline

The timeline of the project is from March - October 2022.

Piloting & Field
preparation
March 2022

Randomization & Intervention
July 2022



Baseline Survey
April-June 2022

Verification & Endline Survey
August-October 2022

The exact treatments are as follows:

- **Treatment 1** (T1: information only): Each participant under this treatment received basic information about the available COVID-19 vaccines and the benefits of having it for themselves and for their loved ones. The information was delivered verbally by trained fieldworkers to each participant based on a 1-page information sheet (maximum time taken to disseminate the information will be about 10-15 minutes) and the information was designed specifically for this study based on the information provided from reliable sources such as the WHO as well as the Ministry of Health and Family Welfare (MoHFW), Government of India.
- While the first treatment group received only the information treatment, the other four treatment groups received another additional intervention each.
- The **pure control group (T0)** on the other hand received no such information campaign about the vaccines or any specific incentives.

Financial incentives

- **Treatment 2 (T2):** Information + sure gift worth INR 400 (i.e., \$5 approx) conditional upon vaccination in order to incentivize them and to compensate them for lost daily wages due to travel and forgone earnings for additional day's work in case of any side effects that may arise. Our field staff gave respondents the gift within two weeks upon confirmation of vaccination (e.g., physical or digital vaccination certificate).
- **Treatment 3 (T3):** Information + participation in a lottery with a 5% chance of winning a gift worth INR 8,000 (\$100 approx), conditional upon vaccination. The expected value from this lottery was the same as the sure gift treatment (Treatment 2).
- We have assumed an exchange rate of 1USD=INR80.

Non-financial incentives

- **Treatment 4 (T4):** Information + Accessibility (helping them with registration/enrolment, travelling to get vaccinated, and reminding/encouraging them to get vaccinated at the right time via brief telephone reminders). In addition, a gentle and brief reminder was provided both through a phone call as well as a SMS about two weeks after the intervention is delivered. We helped the target group with the registration procedure and tracked their progress from registration to vaccination, reminding them to get vaccinated (all free of cost).
- **Treatment 5 (T5):** Information + campaign/motivation by eminent figures (“*Vaccine ambassadors*”) in the community (village elders, teachers, doctors). They campaigned and propagated information to address misconceptions related to the available vaccines. The selected individuals (leaders) were vaccinated themselves. Campaigning by vaccine ambassadors started around the same time with other treatments.

Information poster

GET VACCINATED AS SOON AS POSSIBLE, SAY GOODBYE TO THE EPIDEMIC

Vaccine protects
against corona



Vaccine protection
is for long-term



No substitute for
vaccine to eradicate
the epidemic



The vaccine increases the
body's immunity. It
significantly reduces the
risk of serious illness or
death due to corona.

Being infected with corona
first does not provide long-
term protection, only
vaccine gives long-term
protection.

The spread of corona
virus can be stopped only
if everyone is vaccinated.
There is no alternative.

Things to know: Some people may have mild side effects after getting the corona vaccine. Such as: fever, weakness, headache, muscle aches, nausea. However, these side effects, which are usually mild and go away with a day's rest. Medications for fever and pain can be taken if necessary.

In addition to vaccinations, follow the hygiene rules



ADB





Asian Development Bank




Ambassador myth & misconception poster

Coronavirus Vaccine

Some misconceptions and facts about vaccines

<p style="color: red; margin: 0;">Myth ✗</p>	<p style="margin: 0;">Fact ✓</p>
<p> Pregnant women and mothers who breastfeed their babies cannot get vaccinated.</p>	<p>There is no barrier to vaccination for pregnant women or those who are breastfeeding or wanting to have children. The vaccine is safe for them too.</p>
<p> Many died from vaccinations</p>	<p>This idea is not entirely correct. The vaccine is safe, it does not cause death.</p>
<p> No vaccine is needed if you had COVID earlier</p>	<p>According to the World Health Organization, those who have already been infected with the coronavirus should also be vaccinated</p>
<p> No need to wear a mask after vaccination</p>	<p>Wearing a mask, hand sanitizing and maintaining physical distance will be essential as long as there is an epidemic</p>



Get vaccinated || Keep yourself and your family healthy || Get rid of the epidemic

Financial incentive-sure vs lottery

Gift basket worth Rupees 400

XYZ Salt (1 Kg)



Sugar (1 Kg)



Mustard Oil (1 Lt.)



Arhar Dal (1 Kg)



One out of 20 individuals (if they got vaccinated) will get one of these gifts worth Rupees 8000!

LCD TV



Mixer + Dinner Set



Cooler



Inverter



Washing Machine



Mobile Phone



Financial incentive-sure vs lottery



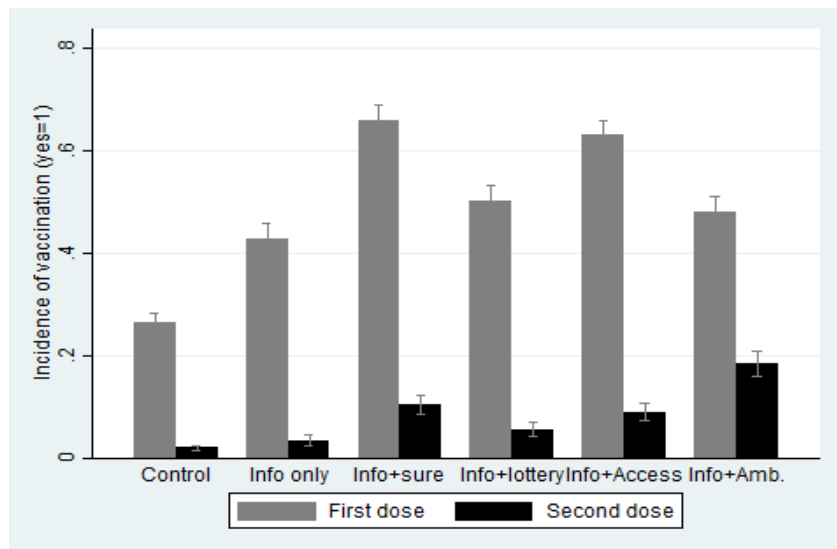
Econometric methodology

To investigate the effects of our treatments on our outcomes of interest, we will estimate the following econometric specification:

$$Y_{i,t=1} = \alpha + \beta_1 INFO_i + \beta_2 SURE_i + \beta_3 LOTTERY_i + \beta_4 ACCESS_i + \beta_5 VA_i + \delta Y_{i,t=0} + \tau X_i + \gamma S_i + \varepsilon_i \quad (1)$$

where $Y_{i,t=1}$ indicates a range of outcomes for individual i captured during the endline survey, including the vaccination take-up indicator. We include all indicator treatment variables: The pure control will be the base category. Standard errors ε_i are clustered at the village level.

Results: Incidence of vaccination



Results: Vaccination, registration status and intention

Variables of Interest	Vaccination dummy		Registered dummy	Intention dummy
	First dose	Second dose		
Info only (T1)	0.166*** (0.028)	0.008 (0.011)	0.089*** (0.014)	0.126** (0.054)
Info+sure payment (T2)	0.372*** (0.035)	0.078*** (0.012)	0.016* (0.008)	0.277*** (0.058)
Info+lottery (T3)	0.246*** (0.036)	0.034*** (0.009)	0.081*** (0.028)	0.209*** (0.050)
Info+Accessibility (T4)	0.353*** (0.034)	0.068*** (0.012)	0.021 (0.032)	0.038 (0.054)
Info+VA (T5)	0.187*** (0.041)	0.155*** (0.029)	0.015* (0.008)	0.169*** (0.049)
p-value (T2-T3)	0.00	0.00	0.01	0.31
p-value (T2-T4)	0.64	0.49	0.88	0.00
p-value (T1-T5)	0.64	0.00	0.00	0.49
p-value (T3-T5)	0.22	0.00	0.01	0.51
p-value (T1=T2=T3=T4=T5)	0.00	0.00	0.00	0.01
Observations	8,065	8,065	4,495	4,345
R-squared	0.158	0.077	0.118	0.277

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Conclusion

- Our interventions increased vaccine take-up:
- *Info+sure payment* > *Info+Accesability*> *Info+lottery* > *Info+VA* > *Only texts*
- Financial incentives as well information campaign can be quite effective.
- Sure payment is more effective than lottery.
- Effects persist even after the first dose.

Future work

- Understand spillover effects and heterogeneous treatment effects from each of the treatment arms.
- Focus on more outcomes such as compliance, subjective wellbeing, the role of personality, risk aversion and time preference of the respondents on their vaccine take-up behaviour.
- As we also rely on self-reported subjective wellbeing indicators, there could be social desirability bias.
- Data on social desirability scale (SDS) using 13-items (Crowne and Marlowe, 1960) collected at baseline for the whole sample is available. Will use this to understand if results vary by low and high SDS reports.
- Attrition in this study is as low as 1% and not much of a concern.