Pre-analysis plan:
The impact of incentives for vaccination on future vaccination behavior, attitudes, and morals

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20 December 2021

1) Motivation

We study the long-term impacts of offering monetary incentives for vaccination on future vaccination uptake, safety perceptions, and morals. To do so, we exploit the setting of an earlier study that offered payment to people for getting a first dose of a COVID-19 vaccine (Campos-Mercade et al., 2021), which provides us with random variation in exposure to monetary incentives. We match the data with Swedish registry data on vaccination uptake for the unincentivized second dose. We then survey study participants about their willingness to take a third dose of the COVID-19 vaccine (booster shot), moral values related to vaccination and risk and benefit perceptions of vaccinations.

2) Design

To address our research questions, we focus on the participants in the *Incentives*, *Control* and the *No reminders* conditions of Campos-Mercade et al. (2021).[1] First, we examine whether these individuals did or did not get a second dose of a COVID-19 vaccine using data from Swedish administrative registers. Second, we conduct a survey with the participants.

2.1) Administrative data

We will be able to match our survey responses with administrative data on vaccination uptake. For all participants we will see whether and when they received a first and second dose of a COVID-19 vaccine. We will first investigate whether individuals got a first dose of a COVID-19 vaccine, as in Campos-Mercade et al. (2021), but with a longer follow-up period. The main purpose of this analysis is to provide background

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[1] As in the *Control* condition, the *No reminders* condition did not include any interventions to increase vaccination uptake. The main difference between the *Control* and *No reminders* conditions was that the *Control* condition included reminders to get the vaccine. To increase power, we will therefore pool the data from the *No reminders* and the *Control* conditions. We will then compare this pooled data with the data from the *Incentives* condition. This approach is valid if the first dose vaccination uptake is the same in the *Control* and *No reminders* condition, which is what Campos-Mercade et al. (2021) find. We will replicate their analysis, looking at a longer time horizon (see paragraph 2.1). If we find significant differences in first dose vaccination uptake between the *Control* and *No reminders* condition in the longer run, we will drop the *No reminders* condition for all subsequent analyses.

information. We will then look at vaccination uptake for the unincentivized second dose, which is the focus of our analysis using administrative data:

- **Uptake second dose (<u>main administrative data outcome measure</u>):** Did the participant get the unincentivized second dose of a COVID-19 vaccine? (0/1)

2.2) Survey

Norstat, a well-established Swedish survey company, sends the survey to participants in the *Incentives*, *Control*, and *No reminders* conditions of Campos-Mercade et al. (2021).

We elicit the following three **<u>main survey outcome measures</u>**:

- **Uptake booster shot:** Are you planning to take a third dose of COVID-19 vaccine (booster shot) when it becomes available to you? (Yes/No)
- **Perceived safety and efficacy**: Average answer to the following 3 items (Scales: 5-point Likert scale):[2]
  - In general, COVID-19 vaccines are safe
  - I am worried about the side effects from COVID-19 vaccines (reverse coded)
  - COVID-19 vaccines are highly effective at protecting my health
- **Moral values and norms:** Average answer to the following 3 items (Scales: 5-point Likert scale):
  - I am willing to take the personal costs of getting a COVID-19 vaccine (e.g., time, discomfort, mild side effects) for the greater good of society
  - I think people have a civic duty or a moral obligation to get a COVID-19 vaccine
  - In general it is seen as odd and not socially appropriate to not take the COVID-19 vaccine

We elicit the following **behavioral secondary outcome** measures:

- **Reminder:** We offer you to send you a reminder email when the third dose of a COVID-19 vaccine becomes available for people in your region and age group. The reminder will include information on where to sign up for a vaccination appointment and will be sent by Norstat. Would you like to get the reminder? (Yes/No)

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[2] In the following, "average answer" refers to: We standardize each individual item (subtract the mean and then divide it by the standard deviation), add the items and divide the result by the number of items. We then standardize the resulting index to make the results across indices comparable.

- **Link click:** Click here to get information about when the third dose of a COVID-19 vaccine (booster shot) will be available for you in your region. (0/1)
- **Donation GAVI:** Participants are asked to divide SEK 100 between themselves and the Global Alliance for Vaccines and Immunization (GAVI). GAVI, collects donations to provide COVID-19 vaccines in areas with otherwise limited access to vaccination. This question counts for 10 participants. (Donation of: 0 kr, 10 kr, 20 kr, …, 100 kr)
- **Donation NIO:** Participants are asked to divide SEK 100 between themselves and the New Incentives Organization. The New Incentives Organization is an NGO that attempts to increase vaccination uptake for diseases such as measles by paying people for getting the vaccines. Their sole mission is to "use cash transfers to increase immunization rates." Therefore, all donations send to this NGO are used for paying people for vaccination. This question counts for 10 participants. (Donations of: 0 kr, 10 kr, 20 kr, …, 100 kr)

We elicit the following **secondary survey outcome** measures:

- **Flu shot:** Have you taken a flu shot in the last five months? (Yes/No)

- **Trust:** Average answer to the following three items (Scales: 5-point Likert scale). When it comes to the COVID-19 vaccine process, I trust:
  - the pharmaceutical or drug companies
  - the researchers studying the effects of the vaccines
  - the Public Health Agency of Sweden
- **Attitudes towards paying people to get vaccinated:** Average answer to the following 2 items (Scales: 5-point Likert scale):
  - Financial rewards for vaccinating against COVID-19 are unethical
  - I would support the introduction of monetary payments of SEK 500 for those who get vaccinated (or are already vaccinated) against COVID-19
- **Decision quality:** Average answer to the following 2 items (Scales: 5-point Likert scale):
  - Consider your decision on whether to get a first dose of the COVID-19 vaccine or not. Do you regret the decision that you made?
  - Consider your decision on whether to get a first dose of the COVID-19 vaccine or not. Did you gather enough information to feel well informed about the benefits and risks of the vaccine?
- **Coercion**: Consider your decision on whether to get a first dose of the COVID-19 vaccine or not. When deciding to get a first dose of the COVID-19 vaccine or not, did you feel forced to take or not take the COVID-19 vaccine? (Scales: 5-point Likert scale)
- **Externalities parents:** [Consider only people that said that they have 1 or 2 living parents.] Has at least one of them taken a first dose of the vaccine? (Yes/No)
- **Externalities partner:** [Consider only people who said that they have a partner.] Has the partner taken a first dose of the vaccine? (Yes/No)

We also elicit a series of **explorative measures** (see Appendix).

3) Analysis

3.1) Main analysis

We will study whether the Incentives condition (see Campos-Mercade et al., 2021, for details) affects our outcome measures (see Section 2). We compare the outcome measure in the *Incentives* condition with the outcome in the *Control* and *No reminders* conditions using OLS. To do so, we regress the outcome variable y_i on a treatment condition dummy:

$$y_i = b_0 + b_1 1(\text{Incentives})_i + b_2 X_i + e_i$$

where y_i are the outcome measures discussed in Section 2, $1(\text{Incentives})_i$ has a value of 1 if participant i is in the *Incentives* treatment condition and a value of 0 otherwise, X_i is a vector of control variables consisting of: gender, age, region, interactions between age and region, being in an at-risk group for COVID-19, civil status, children in the household, employment status, education, parents' place of birth, and income (we code all these variables exactly in the same way as in Campos-Mercade et al. 2021). The parameter e_i is an individual specific error robust to heteroscedasticity. We will use a two-sided test to examine whether b_1 is statistically significantly different from zero.

4) Data collection and sample size

4.1) Data collection
The surveys are collected through an online survey with the help of the Swedish survey company Norstat. We aim at recruiting as many participants in the *Incentives*, *Control* and *No reminders* conditions of Campos-Mercade et al. (2021) as possible. We expect around 3000 participants to participate in the survey.

4.2) Exclusion criteria
We only include participants from Campos-Mercade et al. (2021) who were in the *Incentives*, *Control* and *No reminders* conditions.

4.3) Power
We expect that we will have around 700 observations in the *Incentives* condition and 2300 observations in the *Control* and *No reminders* conditions. This would give us 80% power to detect an effect size (= Cohen's d) of about 0.12 for our outcome measures, meaning that we could detect small effects.

References

Campos-Mercade, P., Meier, A. N., Schneider, F. H., Meier, S., Pope, D., & Wengström, E. (2021). Monetary incentives increase COVID-19 vaccinations. Science, Vol 374, Issue 6569, pp. 879-882.

Appendix of additional exploratory measures

- How likely are you to get a flu shot next season (fall 2022 through spring 2023)? (Slider 0-100%)

- If you had a newborn, would you follow the child vaccination plan (including e.g. vaccinations against measles and polio) from the Swedish healthcare system? (Yes/No)

- When there is an approved third dose against COVID-19 (booster shot): Suppose a third dose of COVID-19 vaccine is available to you. To increase the uptake of the vaccine, assume that your region pays SEK 100/500[3] for everyone who takes the vaccine (including you). Would you take a third dose of a COVID-19 vaccine? (Response scale from 1 = No, clearly not to 5 = Yes, clearly)

- Did you donate blood in the last 4 months? (Yes/No)

- In general, vaccines given to children, such as the measles vaccine, are safe for healthy children (5-point Likert scale)

- Taking a COVID-19 vaccine is cumbersome and causes some discomfort. (5-point Likert scale)

- Vaccinations against COVID-19 should be mandatory for health workers (5-point Likert scale)

- I would support the introduction of regulated monetary payments for blood donations (5-point Likert scale)

- Did you get offered payment in form of a gift card or cash for vaccinating against COVID-19 (e.g., by your company, by an organization, or by researchers)? (Yes/No) If yes: What was your reaction in terms of thoughts and feelings when you got offered payment for vaccinating against COVID-19? Name your most important reactions in one sentence.

- From 0% to 100%, what do you think are the chances that you will be offered monetary payments by the government to take a third shot of a COVID-19 vaccine? (Slider 0-100%)

- Once the third dose is available to you, how long do you plan to wait before getting it? (Response scale: less than 1 month, between 1 to 2 months, between 2 to 3 months, between 3 to 4 months, more than 4 months, I will never get it)

- Currently, 85% of adult Swedes got a first dose of the COVID-19 vaccine. Suppose that in Spring 2021 Sweden would have attempted to increase COVID-19 vaccination uptake by paying people SEK 200 for getting vaccinated. What do you think, what share of Swedes would have gotten a first of the COVID-19 vaccine in that case? (Slider 70%-100%)

- Did you get a COVID-19 vaccine? (Yes/No)

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[3] We will ask this question twice, once for SEK 100 and once for SEK 500. We will randomize the order in which we ask these two questions