

## **Supplementary Information for:**

Persuading U.S. White evangelicals to vaccinate for COVID-19:  
Testing message effectiveness in fall 2020 and spring 2021

**This PDF file includes:**

**S1 Study 1 Extended Methods**

**S2 Study 2 Extended Methods**

**S3 Study 1 Weighting Analysis Extended Methods**

# S1 Study 1 Extended Methods

## Treatments

### *Untreated Control*

What are the costs and benefits of bird feeding?

It is difficult to assess the costs and benefits of bird feeding because it is difficult to compare the health of birds without access to feeders with birds that are frequent feeders. Only one study was able to obtain some sound results. That study found that any benefits of feeding only appear to occur sporadically under extreme climactic conditions. No research has been able to demonstrate a cost. Aside from costs and benefits to birds, there is a cost of benefit to humanity. The costs are obvious—the expense of bird feeding supplies.

The benefits include learning more about birds and the joy of connecting with the natural world. Bird feeding provides a direct, intimate view of the natural world for more than 50 million Americans who feed the birds in their yards. It is most popular in winter, when birds seem to need the most help. Some people worry that birds will suffer unless they make great efforts to keep the feeder filled, but research indicates that most birds do not depend on feeders.

### *Baseline Informational Control*

To end the COVID-19 outbreak, it is important for people to get vaccinated against COVID-19 whenever a vaccine becomes available. Getting the COVID-19 vaccine means you are much less likely to get COVID-19 or spread it to others. Vaccines are safe and widely used to prevent diseases and vaccines are estimated to save millions of lives every year.

### *Community Interest + Reciprocity (C.I.R.)*

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Stopping COVID-19 is important because it reduces the risk that members of your family and community could get sick and die. COVID-19 kills people of all ages, and even for those who are young and healthy, there is a risk of death or long-term disability. Remember, every person who gets vaccinated reduces the risk that people you care about get sick. While you can't do it alone, we can all protect everyone by working together and getting vaccinated.

### *Community Interest (C.I.R.) + Embarrassment*

To end the COVID-19 outbreak, it is important for people to get vaccinated against COVID-19 whenever a vaccine becomes available. Getting the COVID-19 vaccine means you are much less likely to get COVID-19 or spread it to others. Vaccines are safe and widely used to prevent diseases and vaccines are estimated to save millions of lives every year.

Stopping COVID-19 is important because it reduces the risk that members of your family and community could get sick and die. COVID-19 kills people of all ages, and even for those who are young and healthy, there is a risk of death or long-term disability. Remember, every person who gets vaccinated reduces the risk that people you care about get sick. While you can't do it alone, we can all protect everyone by working together and getting vaccinated.

Imagine how embarrassed and ashamed you will be if you choose not to get vaccinated and spread COVID-19 to someone you care about.

### *Not Bravery*

To end the COVID-19 outbreak, it is important for people to get vaccinated against COVID-19 whenever a vaccine becomes available. Getting the COVID-19 vaccine means you are much less likely to get COVID-19 or spread it to others. Vaccines are safe and widely used to prevent diseases and vaccines are estimated to save millions of lives every year.

Soldiers, fire-fighters, EMTs, and doctors are putting their lives on the line to serve others during the COVID-19 outbreak. That's bravery. But people who refuse to get vaccinated against COVID-19 when there is a vaccine available because they don't think they will get sick or aren't worried about it aren't brave, they are reckless. By not getting vaccinated, you risk the health of your family, friends, and community. There is nothing attractive and independent-minded about ignoring public health guidance to get the COVID-19 vaccine. Not getting the vaccine when it becomes available means you risk the health of others. To show strength get the vaccine so you don't get sick and take resources from other people who need them more, or risk spreading the disease to those who are at risk, some of whom can't get a vaccine. Getting a vaccine may be inconvenient, but it works.

### *Trust in Science*

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Getting vaccinated against COVID-19 is the most effective means of protecting your community. The only way we can beat COVID-19 is by following scientific approaches, such as vaccination. Prominent scientists believe that once available, vaccines will be the most effective tool to stop the spread of COVID-19. The people who reject getting vaccinated are typically ignorant or confused about the science. Not getting vaccinated will show people that you are probably the sort of person who doesn't understand how infection spreads and who ignores or are confused about science.

### *Personal Freedom*

To end the COVID-19 outbreak, it is important for people to get vaccinated against COVID-19 whenever a vaccine becomes available. Getting the COVID-19 vaccine means you are much less likely to get COVID-19 or spread it to others. Vaccines are safe and widely used to prevent diseases and vaccines are estimated to save millions of lives every year.

COVID-19 is limiting many people's ability to live their lives as they see fit. People have had to cancel weddings, not attend funerals, and halt other activities that are important in their daily lives. On top of this, government policies to prevent the spread of COVID-19 limit our freedom of association and movement. Remember, each person who gets vaccinated reduces the chance that we lose our freedoms or government lockdowns return. While you can't do it alone, we can all keep our freedom by getting vaccinated.

## **Participants**

We identified respondents from a previous experiment fielded on a nationally representative sample who identified as White, non-Hispanic, and evangelical Christians. Of these respondents, 54% of them identified as female, they have a median age of 55 years (25<sup>th</sup> percentile: 41, 75<sup>th</sup> percentile: 66), 44.7% of had at least a two-year college degree, and 70.8% of the sample self-

identified as a Republican or a Republican leaner. The sample had a mean of 0.62 (SD = 0.20) on a scale ranging from 0 to 1 in vaccine confidence and had received, on average, 2.6 (SD = 2.19) flu shots within the past five years.

## Analysis

We use OLS regression with robust Huber-White standard errors to estimate the effect of each treatment on the three outcomes of interest: vaccination intent, advise a friend, and judgment of someone who is not vaccinated. We estimate the models using the statistical computing software R version 4.1 and the estimatr package.

Each model includes the following covariates:

- Age, entered as categories (18-30; 31-45; 46-60; 61-75; 76+)
- Gender, (Male, Female)
- Household Income, categories provided by YouGov, with a separate indicator for choosing not to supply income/missing)
- Education, entered as categories (No high school, high school graduate, some college, 2-year degree, 4-year degree, post-graduate degree)
- Partisanship, Indicators for each of the 7 standard partisanship categories (Strong Republican, Weak Republican, Lean Republican, Independent/Other/Missing, Lean Democrat, Weak Democrat, Strong Democrat)
- Employment, entered as indicator variables (Working at home, working outside home by choice, Working outside home because required, not working is the excluded category)
- Flu shot, entered as a continuous variable, in the last 5 years, how many times have you gotten the seasonal flu vaccine (flu shot)? (0, 1, 2, 3, 4, 5)
- Vaccine Confidence Scale, the 8 items below will be combined into an additive index and recoded to range from 0 to 1, with 1 indicating more confidence in vaccines.
  - For the following questions, indicate your level of agreement or disagreement using one of the following options: Scored 0 (Strongly disagree), .25 (Somewhat disagree), .5 (Neither agree nor disagree), .75 (Somewhat likely), and 1 (Extremely likely).
  - 1. Vaccines are necessary to protect the health of people close to my age.
  - 2. Vaccines do a good job in preventing the diseases that they are intended to prevent.
  - 3. Vaccines are safe.
  - 4. If I do not vaccinate myself, I may get a disease and cause other people close to my age to get the disease.
  - 5. People receive too many vaccines.
  - 6. If I vaccinate myself, I may have serious side effects.
  - 7. In general, medical professionals in charge of vaccinations have my best interests at heart.
  - 8. I have a good relationship with my healthcare provider.
- Covid risk factors scale
  - Public health officials have determined that people with the following conditions are at greater risk of severe illness if they contract COVID-19. Do you have any of the following conditions? Please select all that apply.
  - Chronic lung disease or moderate to severe asthma
  - Hypertension/high blood pressure
  - A serious heart condition (other than high blood pressure)
  - Immunocompromised, such as:
    - Being treated for cancer
    - Received a bone marrow or organ transplant
    - Have an immune deficiency
    - Have poorly controlled HIV/AIDS
    - Prolonged use of corticosteroids or other immune weakening medication
  - Regular smoker
  - Body mass index [BMI] of 40 or higher

- Diabetes
- Chronic kidney disease requiring dialysis
- Impaired liver function
- None of the above

### **Outcome Measurement**

#### *Vaccine Intent*

How likely are you to get a COVID-19 vaccine within the first 3-months of it becoming available to you?

- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely

#### *Advise a friend*

How likely are you to advise a close friend or relative to get vaccinated against COVID-19 once a vaccine becomes available?

- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely

#### *Judging Non-vaccinator*

Now, we would like you to think about a friend or relative who chose not to receive the COVID-19 vaccine when it is available. What would you think of this person? Are they...

1. Trustworthy
2. Selfish
3. Likeable
4. Competent
5. Intelligent

- Not at all
- Slightly
- Somewhat
- Mostly
- Very

## S2 Study 2 Extended Methods

### Treatments

#### *Untreated Control*

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#### *Community Interest + Reciprocity (C.I.R.)*

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Stopping COVID-19 is important because it reduces the risk that members of your family and community could get sick and die. COVID-19 kills people of all ages, and even for those who are young and healthy, there is a risk of death or long-term disability. Remember, every person who gets vaccinated reduces the risk that people you care about get sick. While you can't do it alone, we can all protect everyone by working together and getting vaccinated.

#### *Community Interest + Reciprocity (C.I.R.)*

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#### *Doctors*

To end the COVID-19 outbreak, it is important for people to get vaccinated against COVID-19 whenever a vaccine becomes available. Getting the COVID-19 vaccine means you are much less likely to get COVID-19 or spread it to others. Vaccines are safe and widely used to prevent diseases and vaccines are estimated to save millions of lives every year.

Think about the people you trust to take care of your health. Family doctors are getting vaccinated and vaccinating their own families. Talk to your doctor today! More than 95% of family physicians think every adult should get vaccinated as soon as they can.

### *Liberty*

To end the COVID-19 outbreak, it is important for people to get vaccinated against COVID-19 whenever a vaccine becomes available. Getting the COVID-19 vaccine means you are much less likely to get COVID-19 or spread it to others. Vaccines are safe and widely used to prevent diseases and vaccines are estimated to save millions of lives every year.

By getting vaccinated we can get the government off our back! Let's stop the lockdowns, mask mandates, and needless restrictions on our religious liberty. If we are vaccinated, the excuse used to control our lives go away.

### *Trump Hero*

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President Trump bypassed Washington bureaucrats and created Operation Warp Speed which produced a safe and effective vaccine that the FDA approved before he even left office. He and Melania got vaccinated in January, and 95% of doctors have gotten or plan to get vaccinated too. Get vaccinated: Protect your family, your community, and yourself.

## **Participants**

YouGov recruited a sample that met all of the following criteria: 1) White, 2) evangelical Christian, 3) non-hispanic, and 4) unvaccinated. A majority, 58%, of these respondents were female, they had a median age of 56 years (25<sup>th</sup> percentile: 43, 75<sup>th</sup> percentile: 64), 43.5% of them had at least a 2-year college degree, and 81.7% self-identified as a Republican or a Republican learner. This sample had a mean on the vaccine confidence scale that ranges from 0 to 1 of 0.46 (SD = 0.19) and received an average of 1.41 flu shots (SD = 1.91) in the past five years.

## **Analysis**

We use OLS regression with robust Huber-White standard errors to estimate the effect of each treatment on the three outcomes of interest: vaccination intent, advise a friend, and judgment of someone who is not vaccinated. These models included the covariates described above in the Study 1 Analysis section with the exception of the employment covariates. We estimate the models using the statistical computing software R version 4.1 and the estimatr package.

## **Outcome Measurement**

### *Vaccine Intent*

How likely are you to advise a close friend or relative to get vaccinated against COVID-19?

- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely

*Advise a friend*

How likely are you to advise a close friend or relative to get vaccinated against COVID-19?

- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely

*Judging Non-vaccinator*

Now, we would like you to think about a friend or relative who chose not to receive the COVID-19 vaccine. What would you think about this person? Are they...

1. Trustworthy
  2. Selfish
  3. Likeable
  4. Competent
  5. Intelligent
- 
- Not at all
  - Slightly
  - Somewhat
  - Mostly
  - Very



### **S3 Study 1 Weighting Analysis Extended Methods**

We used the survey package in the statistical computing software R to create weights for Study 1 to more closely match the characteristics of the White evangelical population that remained unvaccinated in spring 2021. Specifically, we used the data from Study 2 to create bins for age (18-44, 45-64, or 65+), gender (not female or female), education (high school or less, some college, or 4-year college graduate or more), party identification (Democrat, Independent, or Republican), general vaccine confidence (low or high), and past flu vaccination (0, 1-3, or 4-5). We then implemented the rake function in the survey package to create sample weights for Study 1 such that respondents who more closely match those in the Study 2 would be given more weight in the analysis. We then re-estimated the models described above in S1 with the inclusion of these weights.