

Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a Confirmed

- ☐ ☒ The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement
- ☐ ☒ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
- ☐ ☒ The statistical test(s) used AND whether they are one- or two-sided
Only common tests should be described solely by name; describe more complex techniques in the Methods section.
- ☒ ☐ A description of all covariates tested
- ☐ ☒ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
- ☐ ☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
- ☐ ☒ For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
Give P values as exact values whenever suitable.
- ☒ ☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
- ☒ ☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
- ☒ ☐ Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection

The database of not-yet-vaccinated Rhode Islanders who had previously taken a COVID test was provided to The Policy Lab by the Rhode Island Department of Health (RIDOH) based on its administrative data systems. The outcomes, vaccinations, were also provided by RIDOH using its own administrative systems. The randomization was conducted using python. Code available in <https://github.com/thepolicylab/COVID-SMSExperiment>. Each day of the study the randomized id numbers were provided to RIDOH who used the Code Red SMS messaging system to send the text messages.

Some descriptive analyses rely on publicly available data from the US Census Bureau and Department of Housing and Urban Development, Rhode Island GIS. Some data from the Board of Elections of Rhode Island required scraping from their website. The code to pull and aggregate this data is also available at <https://github.com/thepolicylab/COVID-SMSExperiment>.

Data analysis

Code for data analysis is available in the public github repository: <https://github.com/thepolicylab/COVID-SMSExperiment>

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

The aggregated datasets generated during and/or analysed for the main findings of the current study are available at <https://github.com/thepolicylab/COVID-SMSEperiment>. Some of the exploratory analyses used ZIP code level data. To protect privacy, we cannot publicly post individual-level data or ZIP code level data. Qualified researchers with a valuable research question and relevant approvals including ethical approval can request access to the de-identified data about this trial from the corresponding author. A formal contract will be signed and an independent data protection agency should oversee the sharing process to ensure the safety of the data.

Demographic data for some of our exploratory analyses came from the US Census Bureau, the US Department of Housing and Urban Development, the Rhode Island Geographical Information System, and the Rhode Island Board of Elections. Copies of this data, and where necessary the code that retrieved the data, are available at <https://github.com/thepolicylab/COVID-SMSEperiment>.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://www.nature.com/documents/nr-reporting-summary-flat.pdf)

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	This is a quantitative randomized control trial.
Research sample	The Rhode Island Department of Health (RIDOH) maintains separate databases of individuals who have been vaccinated and tested for COVID-19. Our study population is the difference of these lists (tested but not yet vaccinated) matched through a series of quasi-identifiers and excluding people under 18 when tested (final N = 142,428).
Sampling strategy	We used this entire database. We did not sample.
Data collection	Data were collected by RIDOH using their administrative data systems: vaccinations (the outcome of the analysis) are reported to RIDOH from almost all providers in the state (some providers, such as Veterans Affairs hospitals, are not required to provide data). Exploratory supplementary analyses using ZIP code level census data used publicly available data on those geographic units merged onto the main database.
Timing	May 25, 2021 through June 21, 2021
Data exclusions	No data were excluded from the analysis. Note that the process of merging outcomes ("vaccinated or not") onto the main dataset involved some matching (using three letters of first names, last names, and phone numbers where available). So, some duplicated observations were excluded en route to a clean set of data with one row per participant.
Non-participation	If anyone declined SMS messages from the Rhode Island Department of Health, it occurred before the start of this study. The vaccination outcome information was also collected by RIDOH as a part of its legal obligations to the state.
Randomization	The Policy Lab randomly assigned 8 active messages and 1 control message to subjects with probabilities that varied by iteration (roughly, week of the study), and also by day within iteration (with the same probabilities). Goal of the study was both to 1) learn which messages were more effective so that RIDOH might use them to help overcome vaccine hesitancy at a low cost and 2) increase overall vaccination. Thus we combined a fixed probability randomization within block (day of the study) with an partially adaptive randomization (for weeks 2 and 3). Randomization occurred using python and the adaptive algorithm withheld a proportion ϵ of the pool for each week for fixed, equal probability randomization and $(1 - \epsilon)$ for adaptive randomization using the Thompson sampling approach. In weeks 1 and 2, $\epsilon = 0.25$. For week 3, $\epsilon = 0.33$. See https://github.com/thepolicylab/COVID-SMSEperiment for the code used for randomization, data cleaning and merging, and analysis.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

Methods

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☐	☒ Human research participants
☐	☒ Clinical data
☒	☐ Dual use research of concern

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Human research participants

Policy information about [studies involving human research participants](#)

Population characteristics

The Rhode Island Department of Health (RIDOH) maintains separate databases of individuals who have been vaccinated and tested for COVID-19. Our study population is the difference of these lists (tested but not yet vaccinated) matched through a series of quasi-identifiers and excluding people under 18 when tested (final N = 142,428).

Recruitment

RIDOH maintains this database as a part of its COVID surveillance duties.

Ethics oversight

The study was deemed exempt by RIDOH's IRB.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Clinical data

Policy information about [clinical studies](#)

All manuscripts should comply with the ICMJE [guidelines for publication of clinical research](#) and a completed [CONSORT checklist](#) must be included with all submissions.

Clinical trial registration

Study protocol

Data collection

Outcomes