Design Document and Analysis Plan

Project Name: Using Letters and Emails to Increase Health Insurance Take-up in California's ACA Marketplace
Date Finalized: 6/18/2021

This document serves as a basis for distinguishing between planned (confirmatory) analysis and any unplanned (exploratory) analysis that might be conducted on project data. This is crucial to ensuring that results of statistical tests will be properly interpreted and reported. For the Analysis Plan to fulfill this purpose, it is essential that it be finalized and date-stamped before we begin looking at outcome data. Once this plan is finalized, a date is entered above, and the document is shared with the primary customer for the project.

Project Objectives

Use direct mail and email to increase ACA marketplace take-up among low-income Californians who submitted an application, were found eligible for a $1 per member per month (PMPM) Enhanced Silver 94 plan but had yet to enroll in a health insurance plan for the 2021 coverage year.

Evaluation Design

Test Arms / Treatment Conditions:

This is a randomized design among 44,000 households who submitted a Covered California application for the 2021 coverage year and were found eligible for a $1 PMPM Enhanced Silver 94 plan. Households were randomly assigned to one of three arms: (1) a Control group assigned to receive no letter or emails during the month of June 2021, a (2) a Generic outreach group assigned to receive a letter and email reminders about the availability of $1 plans, or (3) a Personalized outreach group assigned to receive a letter and email reminders informing them that they are eligible for a $1 PMPM Enhanced Silver 94 plan.

Total Number of Observations:

N = 44,000

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arm	Freq.	Percent	Cum.
Control	11,000	25.00	25.00
Generic	16,500	37.50	62.50
Personalized	16,500	37.50	100.00
Total	44,000	100.00	

Randomization / Assignment:

Randomization was done at the household level by Covered California staff.

Power:

The intervention will run for approximately four weeks in the month of June 2021. Given the short duration of the intervention, we expect the baseline health insurance take-up rate to be under 5 percent, based on prior evaluations among applicants referred by the Medicaid eligibility system. In a pairwise comparison (e.g. Control vs. Personalized treatment), we are

powered at the 80% level to detect a 0.5 percentage point difference in health insurance take-up rates.

Likely Effect Size:
Based on prior letter interventions on the ACA Marketplaces, we would expect to observe an ITT effect between 0.3pp and 1.3pp.

Data and Data Structure

This section describes variables that will be analyzed, as well as changes that will be made to the raw data with respect to data structure and variables.

Data:
We will use Covered California administrative data from the 2021 coverage year, which includes consumer demographics as well as eligibility and enrollment information. To complement this core dataset, we will also use CDPS risk scores and OSHPD encounter data from 2019.

Outcomes:
This randomized evaluation has three primary outcomes: (1) an indicator for whether the household selected a Covered California plan, (2) an indicator for whether the household selected an Enhanced Silver plan and (3) an indicator for whether the household's plan selection has a $1 PMPM net premium. We will measure outcomes at three points in time: the end of June 2021, the end of July 2021 and the end of August 2021.

Secondary outcomes will include plan effectuation, duration of coverage and estimated out-of-pocket expenses.

Quality Control Checks:
After carrying out the randomization, we checked for balance across several observable covariates, which indicated no significant differences across arms.

	Control	Generic	Personalized
Subsidy FPL %	122%	122%	121%
County-referred application	95%	95%	94%
English Language Preference	67%	67%	67%
Spanish Language Preference	28%	29%	29%
Has Email	63%	62%	62%
Head of Household Female	70%	70%	70%
Head of Household Age	42	42	42
N	11,000	16,500	16,500

Anticipated Limitations:
The main limitation with our design is that approximately 40% of households do not have an email address on file and thus cannot receive part of the treatment to which they were assigned.

Statistical Models & Hypothesis Tests

This section describes the statistical models and hypothesis tests that will make up the analysis — including any follow-ups on effects in the main statistical model and any exploratory analyses that can be anticipated prior to analysis.

Statistical Models:

Intent-to-treat: to estimate treatment effects, our primary analysis will be an intent-to-treat (ITT) specification, examining the effect of treatment assignment. We will estimate the effect of each treatment arm using ordinary least squares (OLS) regression. That is, we will regress the outcome of interest (e.g. take-up) for household i on the set of indicator variables for each of the treatment groups:

$$outcome_i = \propto + \beta_1 Generic + \beta_2 Personalized_i + \varepsilon_i$$

The coefficient β1 will be the estimate of the causal effect of the intent to treat of the generic letter and emails. The coefficient β2 will be the estimate of the causal effect of the intent to treat of the personalized letter and emails. To the extent there are differences across treatment arms, we will test for equality of coefficients.

While covariates are not required to obtain unbiased estimates, they can help improve precision, so we will also estimate covariate-adjusted regressions that includes the pre-treatment covariates in the balance table above.

Follow-Up Analyses:

We will explore treatment heterogeneity among the following observable characteristics:

- Whether the household has an email address on file
- Age (e.g. above or below the mean)
- Language preference (e.g. English vs. non-English)
- Prior health status based on OSHPD encounter data from 2019
- Recency of application submission

For all of the heterogeneity analyses, we will interact the categories above with the treatment indicators.

Inference Criteria, Including Any Adjustments for Multiple Comparisons:

Because we are examining a small set of outcomes, we will not perform any corrections for multiple hypothesis testing, and we will use two-tailed tests with p-values <= 0.05 to denote statistically significant effects.

Exploratory Analysis:

To the extent the treatments have an effect on primary outcomes, we will use two-stage least squares regression (2SLS) to estimate downstream effects:

- The impact of health insurance take-up on retention, for those who enrolled as a result of the intervention
- The impact of selecting an Enhanced Silver plan on out-of-pocket savings, for those who selected an Enhanced Silver plan as a result of the intervention