

## Design Document and Analysis Plan

Project Name: Nudging Take-up of \$1 Health Insurance Plans

Date Finalized: 1/14/2021

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 Objective**

Using an informational email nudge to reduce choice errors among new enrollees who are eligible for \$1/month Enhanced Silver plans but selected Bronze, Gold or Platinum plans, thereby paying an equal or higher net premium for a less generous plan

### **Evaluation Design**

#### **Test Arms / Treatment Conditions:**

This is a block randomized design where households enrolled in choice error plans as of mid-January 2021 were assigned to one of two arms: (1) a control group or (2) an informational email group. Households assigned to the email treatment will receive an email that encourages them to switch metal tiers (from Bronze, Gold or Platinum to Enhanced Silver) so as to pay less when accessing care. They are further encouraged to take action by 1/31/2021, the end of the 2021 Open Enrollment period.

#### **Total Number of Observations:**

N = 2,200 households enrolled in choice error plans as of mid-January 2021

#### **Randomization / Assignment:**

Randomization was done at the household level and we blocked on household income such that there are two blocks: (1) Eligible for a \$1/month Silver 87 plan but enrolled in Bronze or Gold and (2) Eligible for \$1/month Silver 94 plan but enrolled in Bronze, Gold or Platinum.

#### **Power:**

To arrive at an estimate for the minimum detectable effect (MDE)—and given that enrollees have a little more than one week to take action—we assume a baseline metal tier switch rate of 5 percent. We are powered at the 80% level to detect a 3 percentage point difference in Enhanced Silver enrollment rates.

#### **Meaningful Effect Size:**

In previous RCTs that used emails to induce plan switching, we observed intent-to-treat (ITT) effects between 0.8 to 2 percentage points. Given that there is no marginal cost to email outreach, any detectable increase in Enhanced Silver take-up would be meaningful.

#### **Likely Effect Size:**

Based on prior email nudges carried out by Covered California, we would expect to observe an ITT effect between 0-2 percentage points.

## 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.

### Outcomes:

The primary outcome of interest will be an indicator for whether a consumer is enrolled in an Enhanced Silver plan for the 2021 enrollment year by the end of the Open Enrollment period. Our secondary outcomes include net premium and an indicator for whether a consumer called the Service Center.

### Data:

We will use Covered California administrative data for this evaluation. We used the HBEX and DataMart tables to prepare the experimental population, and we will use these database tables for our Enhanced Silver take-up analysis. For the call rate outcome, we will use the SC\_DataMart tables.

### Quality Control Checks:

After carrying out the randomization, we checked for balance across several observable covariates (e.g. language spoken, age, income), which indicated there were no significant dissimilarities across treatment arms.

### Anticipated Limitations:

While this study is based on random assignment, there are three limitations. First, the population includes only those with a non-null email address, so results may not generalize to the 20% of Covered California households without an email address. Second, we expect there to be a small degree of one-sided noncompliance since some households with an email address may have either provided an invalid email or opted out of email communications earlier in the year. To address this, we will use email engagement data (i.e. who was sent emails) to identify compliers as part of a complier average causal effect (CACE) analysis. Third, due to the relatively small sample size, we are not well-powered to detect heterogeneous treatment effects.

## 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 the intervention using ordinary least squares (OLS) regression. That is, we will regress the outcome of interest (e.g. Silver enrollment) for household  $i$  on an indicator for the treatment groups:

$$outcome_i = \alpha + \beta_1 Email_i + \epsilon_i$$

The coefficient  $\beta_1$  will be the estimate of the causal effect of the intent to treat of the email. While covariates are not required to obtain unbiased estimates, they can help improve precision, so we will also estimate a covariate-adjusted regression that includes age, language preference, premium savings from switching and enrollment assistance type.

Because of differential benefits from switching, we will estimate separate regressions for each of the two blocks: \$1/month Silver 87-eligibles in Bronze or Gold and \$1/month Silver 94-eligibles in Bronze, Gold or Platinum.

Complier average causal effect: as noted above, we expect a small share of noncompliers among those households assigned to receive an email since some may have opted out of email communications or provided an invalid email address. Thus, to augment our ITT analysis, we will also estimate treatment effects based on treatment receipt (i.e. whether a consumer was sent the email), using two-stage least squares regression (2SLS).

### **Follow-Up Analyses**

Due to the small sample size, we are only powered to detect reasonably large main effects, so aside from block-level regressions, we do not intend to explore heterogeneous treatment effects by any other pre-treatment covariates.

### **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  $\leq 0.05$  to denote statistically significant effects.