

Analysis Plan

Project Name: Increasing Medicaid renewals with text message reminders

Project Code: 2406

Date Finalized: 9/9/2024



Project description

Overview

This project aims to incorporate evaluation into the Having a Child and Early Childhood Life Experience notification service pilot, which is part of a broader government-wide customer experience effort centered on life experiences. The Life Experience project is leveraging evaluation and quantitative data analysis to generate insights about real customer experiences with government services. Specifically, the notification service pilot seeks to improve customer experience for families, reduce administrative burdens, and increase eligible families' access to benefits.¹

Our goal is to generate actionable evidence on ways to make text message reminders about benefits programs more effective, especially for families with children. OES will collaborate with the Having a Child Life Experience team, the TTS Public Benefits Studio team running Notify.gov, and Norfolk Department of Human Services (Norfolk DHS) to evaluate the effectiveness of text message reminders to promote timely Medicaid renewals. A family's Medicaid renewal deadline depends on when they enrolled in the program. Every month, some eligible families do not renew their Medicaid coverage before their renewal deadline. Families who miss the deadline are disenrolled from Medicaid, which limits access to healthcare services and can create additional burdens on families to reapply for coverage. Norfolk DHS is committed to ensuring families remain enrolled in Medicaid and continue to receive healthcare coverage and aims to use the Notify.gov product to support this goal.

Intervention and evaluation design

The target population for this evaluation is Medicaid recipients in the city of Norfolk, Virginia who are eligible to renew their Medicaid and are not renewed automatically through Virginia's ex-parte renewal process.² We expect this intervention to run monthly for five months between June and November 2024. Norfolk DHS currently sends clients three reminder texts with information about where they can submit their applications and when their applications are due.

¹ <https://www.performance.gov/cx/life-experiences/having-a-child-and-early-childhood/>.

² Ex-parte is the process whereby states automatically renew clients' Medicaid coverage by verifying their eligibility with available administrative data (e.g., tax/wage information or information from other means-tested programs). The ex-parte renewal process is intended to reduce administrative burden on caseworkers and Medicaid recipients. Approximately 53% of Norfolk DHS clients were renewed through the ex-parte process during Norfolk's texting pilot.

All clients in the evaluation will be sent the three “business-as-usual” reminder text messages during their renewal windows. These messages convey information about clients’ renewal deadlines and where they can submit their applications. Norfolk DHS will send reminder messages on the first day of the application window (60 days before the renewal deadline), on the 30th day of the application window (30 days before the renewal deadline), and on the 45th day of the application window (15 days before the renewal deadline). All three reminders will contain the same content. The content of these messages is shown below:

“Norfolk DHS: Hi [first name], your household’s Medicaid coverage is expiring. To keep getting Medicaid, you must complete your renewal by [date]. You can renew online at commonhelp.virginia.gov. You can also renew over the phone on weekdays 7am-6pm at 1-855-635-4370 or drop your renewal application off at the local agency.”

The intervention will consist of two parts: a “credibility” text establishing the legitimacy of the texting program and a pre-call text combined with a proactive phone call from a Norfolk DHS outreach team member. We will randomize eligible Medicaid clients at two points during their two-month renewal window, treating each randomized group as its own sample.

Before a cohort’s renewal window opens (on the 1st of each month), all eligible clients in that cohort will be randomized into one of two groups using complete randomization: a Credibility Text group and a No Credibility Text group.

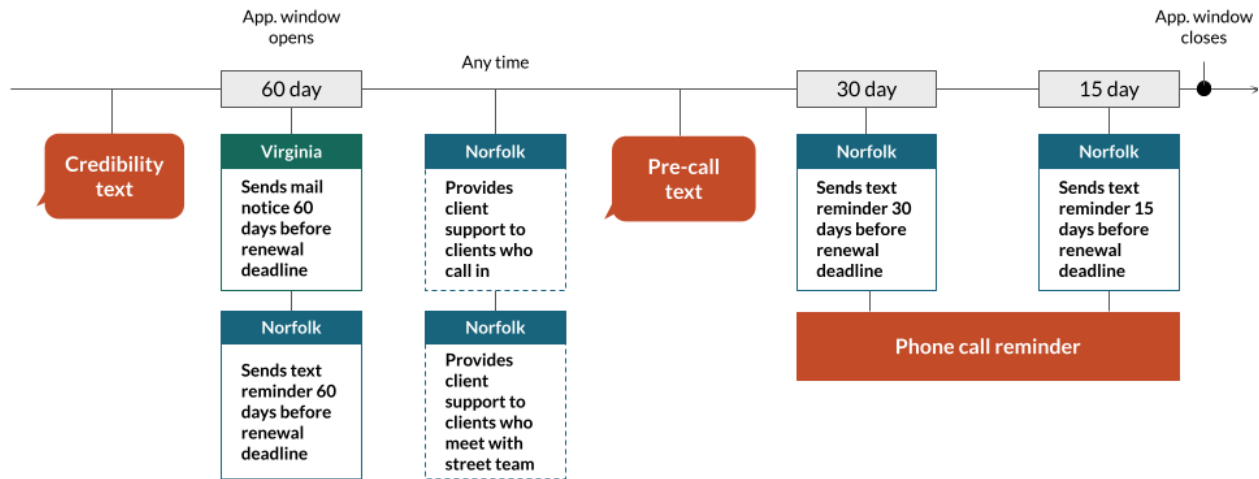
On the 30th day of a cohort’s renewal window, eligible clients who have *not* already submitted a Medicaid renewal application will be randomized once again to one of two groups: a Phone-call Outreach group consisting of a pre-call text message and a proactive outreach call and a No Phone-call group, who will receive neither the pre-call text nor an outreach call. Norfolk DHS’ outreach team has indicated that they have the capacity to call 20% of clients who have *not* submitted a renewal application by day 30³; as a result, we will randomize 20% of these clients to the Phone-call Outreach group and assign the remaining clients to the No Phone-call group. Due to the potential effect of the Credibility text on the number of clients who submit a renewal application before day 30 (and are therefore eligible to be randomized), we will block the second stage of randomization on whether a client was sent the Credibility text during the first randomization period.

³ Prior to the evaluation, Norfolk DHS’ outreach team was placing phone calls to the first 5% of clients who appeared on the state-generated 30-day text list. Norfolk DHS’ outreach team was using these calls as a form of quality control for the 60-day, 30-day, and 15-day text messages. The intervention expands on this outreach by expanding the number of calls being placed, randomizing who receives the calls, and sending a pre-call text to call recipients.

Table 1. Treatment outreach components and theories of change

Component	Content	Theory of change
Credibility text	Norfolk DHS: We will be sending text messages to remind you to renew your Medicaid by [Mon XX]. Check your mail next week for your Medicaid application packet. We will only send you text messages from this Norfolk DHS phone number (###-###-####).	Norfolk DHS' current reminder messages provide information about how to submit a renewal application. The Credibility text will provide additional information to establish the credibility of Norfolk DHS' texting outreach.
Pre-call text message	Norfolk DHS: Hi [first name], our outreach team will be calling you soon to see how you are doing with your Medicaid renewal and ask about our new texting outreach. If you have questions about your renewal, our team can connect you to someone who can help.	This text message will serve as an alert that Norfolk plans to call clients to remind them about their renewals and see if they need support. This text also serves as a reminder in itself and may make clients more likely to answer Norfolk's outreach calls.
30- and 15-day phone calls	<p>Norfolk's outreach calls will contain several components:</p> <ul style="list-style-type: none"> • The Norfolk outreach team callers will be prompted to explain where clients can call to ask specific questions and what materials they might want to have ready before they apply. • The callers will also ask clients whether they have any procedural or policy questions, whether they received the Medicaid renewal text, whether they already submitted a renewal application, whether the text prompted them to renew (if the client already submitted an application), whether they are planning to submit a renewal application (if the client has not already submitted an application), and whether the renewal options are clear. Clients' responses will be recorded in a spreadsheet maintained by the Norfolk DHS outreach team. 	Norfolk support staff will call clients about their renewals as a higher-touch reminder. These calls can direct clients to additional resources and reinforce the credibility of earlier outreach. Ideally, the outreach calls will move the needle for clients who are less trusting of text message communication.

Figure 2. Timing for intervention outreach



Preregistration details

This Analysis Plan will be posted on the OES website at [oes.gsa.gov](https://www.socialscienceregistry.org/) before outcome data are analyzed. In addition, this project will be pre-registered in the AEA RCT Registry at <https://www.socialscienceregistry.org/>.

Hypotheses

This project’s main objective is to learn whether the intervention increases the timeliness and likelihood of Medicaid renewals.

- Our primary hypothesis for the Credibility text is that clients who receive the Credibility text will be more likely to submit their Medicaid renewal within the first 30-days of the application window compared to clients who do not receive the credibility text (ITT).
- Our primary hypothesis for the Phone-call outreach is that clients who receive the pre-call text message and proactive outreach call will be more likely to submit their Medicaid renewal within the final 30 days of the application window compared to clients who do not receive either form of outreach (ITT).

We will examine several secondary hypotheses related to whether the Credibility text and Phone-call outreach affect client behavior. These include the effect of the intervention on:

- Whether the client’s renewal was ultimately approved or denied;
- The date the client’s application was processed;
- The interaction between the Credibility text and Phone-call outreach on both secondary outcomes.

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 source(s):

OES will work with Norfolk DHS and Notify.gov’s parent organization, TTS’ Public Benefits Studio, to manage and process data for this evaluation. Norfolk DHS will share data on its texting program from before the evaluation period (November 2023 - May 2024), and for the months the evaluation is fielding (June 2024 to November 2024). These data will come from several sources outlined in the table below.

Table 2. Evaluation data sources

Data	Source	Description	Purpose
VACMS Clients by Benefit Service	Extracted from VACMS data warehouse, shared by Norfolk DHS	Case reports pulled by Norfolk DHS to determine who receives texts each month. Includes the following variables: <ul style="list-style-type: none"> • Case number • Client ID number • Client’s renewal deadline • Client’s phone number • Client’s initial application date • Whether client was flagged as needing follow-up (i.e., client had not submitted application within 30 days and again at 15 days) 	Randomization, covariates, outcome
VACMS Client Case Address Report	Extracted from VACMS data warehouse, shared by Norfolk DHS	Case report pulled by Norfolk DHS containing characteristics of text recipients. Includes: <ul style="list-style-type: none"> • Case number • Client ID number • Type of Medicaid coverage (e.g., PG Medicaid) • Household composition (e.g., number of children in the household) • Age at time of application • Race/ethnicity • Zip code of residency where client submitted 	Randomization, covariates

		their application	
Client overdue list	Extracted from VACMS, shared by Norfolk DHS	Case reports pulled by Norfolk DHS containing information about client renewal submissions. Includes: <ul style="list-style-type: none"> • Case number • Client ID number • Indicator for whether client did not submit a renewal application by their application renewal deadline. 	Outcome
Outreach data	Collected and shared by Norfolk DHS	Call logs collected by Norfolk DHS containing information about Norfolk outreach calls. Includes: <ul style="list-style-type: none"> • Case number • Client ID number • Date(s) client was called by Norfolk DHS • Whether client number was reachable • Whether client answered • Whether client requested application help • Whether client was referred to additional resources • Client responses to phone call questions 	Outcome, monitoring
Notify.gov text message send reports	Compiled by Notify.gov, shared by Norfolk DHS	Text Message data from Notify.gov delivery dashboard. Includes: <ul style="list-style-type: none"> • Case and client ID numbers for clients who were sent text messages • Date that text messages were sent • Phone numbers for clients who were sent text messages • Delivery status of texts (e.g., delivered, failed) • Phone carrier 	Monitoring

Outcomes to be analyzed:

The primary outcomes for this evaluation are:

- A dichotomous indicator set to one if a client submitted a renewal application within the first 30 days of their renewal window; and set to zero otherwise; and
- A dichotomous indicator set to one if a client submitted a renewal application in the last 30 days of their renewal window; and set to zero otherwise.

The secondary outcomes for this evaluation are:

- Whether the client submitted a renewal application at any point during their renewal window;
- Whether the client's renewal application was approved or denied; and
- The date the client's application was processed.

Imported variables:

Random assignment

- A dichotomous indicator for whether the client was assigned to the Credibility text group; and
- A dichotomous indicator for whether the client was assigned to the Phone-call outreach group.

Experimental design variables

- Our randomization blocks to determine who is in the Phone-call outreach group will be based on the categorical indicator for whether the client was assigned to the Credibility text group at the beginning of their application window.

Additional covariates

- A categorical variable capturing a cohort's renewal month.
- A categorical variable capturing whether an applicant previously received PG Medicaid.
- A categorical variable capturing whether or not an applicant has children in their household.
- Client zip code
- Client race
- Client age at time of applying

Transformations of variables:

Transformed variable	Description	How it was constructed
Outcome variables		
Application completed – first 30 days	Binary variable equal to 1 if the client was not flagged for additional follow-up 30 days after their renewal window opened; 0 else	Coded based on whether a client appears on the 30-day send list generated by Virginia CMS (appearing on this list means a client <u>has not</u> yet applied to renew their Medicaid by day 30)
Application completed – first 45 days	Binary variable equal to 1 if the client was not flagged for additional follow-up 45 days after their renewal window opened; 0 else	Coded based on whether a client appears on the 15-day send list generated by Virginia CMS (appearing on this list means a client <u>has not</u> yet applied to renew their Medicaid by day 15)
Application completed – last 30 days	Binary variable equal to 1 if a client’s application submission date falls within the last 30 days of their renewal window; 0 else	Coded based on whether a client’s application submission date falls within the last 30 days of their application window as logged in the Virginia CMS client overdue list.
Application completed - ever	Binary variable equal to 1 if the client submitted a Medicaid renewal application at any point during their renewal window; 0 else	Coded based on whether a client’s renewal application was coded as a 1 for either of the two measures above.
Application approval	Binary variable equal to 1 if a client’s Medicaid renewal application was approved; 0 else	Coded based on a client’s approval decision in the Virginia CMS client renewal report data. Clients who do not appear in this dataset (i.e., who did not submit an application) will be coded as a 0.
Time to submission	Continuous variable capturing the number of days between the date a client’s renewal window opened and the date their renewal application was received.	Coded by calculating the difference in days between the date an application was submitted and the date a client’s application window opened.
Demographic variables		
Renewal month	Series of categorical binary variables capturing the month a client’s renewal application was due	Coded by extracting the month from the renewal deadline datetime variable in Norfolk’s monthly text spreadsheets.

PG Medicaid	Binary variable equal to 1 if an applicant previously received PG Medicaid; 0 else	Coded based on whether a client was flagged as receiving PG Medicaid in the client case address report.
Child in household	Binary variable equal to 1 if an applicant is flagged as having at least one child in their household; 0 else	Coded based on whether a client's application has a value of at least 1 for the "number of children" field in the client case address report.

Transformations of data structure:

To analyze the data from the evaluation, we will need to merge data from the various sources into one dataset based on the client's case number or phone number. One or both pieces of information are included in each data source. The final dataset will be structured at the client/phone number level.

Data exclusion:

We do not intend to exclude any data from this analysis.

Treatment of missing data:

We do not anticipate any missing data for our primary outcomes. The sample includes all applicants who are eligible for renewal, and if they do not complete the renewal, this is itself an outcome.

Descriptive statistics, tables, and graphs

Descriptive statistics

We plan to conduct the following descriptive statistics to be reported to the agency partners, though these will likely not be including in the OES abstract:

- Overall submission rates across the full sample during the intervention period
- Submission rates across different modes (i.e., online, in-person, or via mail)
- Submission rates for different subgroups of applicants (e.g., applicants with children, applicants enrolled in PG Medicaid)
- Client age
- Client race

Graphs

- We will create two bar charts (or a single bar chart with two panels). The first chart/panel will show the probability of submitting a renewal application by day 30 with two bars comparing the Credibility text group and the No credibility text group. The second chart/panel will show the probability of submitting a renewal application by the end of the

renewal period comparing the Phone Call outreach group and the No Phone Call outreach group. Both graphs will be formatted according to OES guidelines with 95% confidence intervals.

- Using data from before the evaluation period began, we will visualize whether there were spikes in application submissions following text message sends. This will be reported to the agency partners but will likely not be included in the OES abstract.

Statistical models and 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:

This evaluation will contain two phases, which we intend to model separately using an intention-to-treat (ITT) analysis as our primary specification. The first phase will use Ordinary Least Squares (OLS) regression to estimate the impact of being assigned to the Credibility text group on the likelihood of submitting an application within the first 30 days of a client’s renewal window. For this phase we propose a fully-adjusted model (primary specification) and an unadjusted model (robustness check), as described below:

$$y_i = \beta_0 + \beta_1 \text{credibility_text}_i + \varepsilon_i \quad (1) \text{ Unadjusted model}$$

$$y_i = \beta_0 + \beta_1 \text{credibility_text}_i + X_i + \gamma_i + \varepsilon_i \quad (2) \text{ Adjusted model}$$

Where:

- y_i is a binary indicator capturing whether a client submitted a Medicaid renewal application within the first 30 days of their renewal window in month t ;
- β_0 is the intercept
- $\text{credibility_text}_i$ is a binary indicator capturing whether a client was randomly assigned to the Credibility Text group
- X_i is a vector of client-level baseline characteristics collected from clients’ original Medicaid applications, including:
 - *pg_medicaid*, a binary variable capturing whether a client received PG Medicaid
 - *age*, an integer for the applicant’s age in years reported in their initial application
- γ_i are fixed effects for the month a client’s renewal application was due, and;
- ε_i is the idiosyncratic error term.

The second phase of the evaluation will use OLS regression to estimate the impact of being assigned to the Phone Call Outreach group on the likelihood of submitting an application within the final 30 days of a client’s renewal window. We will also include a fully-adjusted model (primary specification) and unadjusted model (robustness check) for this phase.

$$y_i = \beta_0 + \beta_1 phone_outreach_i + \beta_2 credibility_text_i + \beta_3 phone_outreach_i * credibility_text_i + \varepsilon_i \quad (1) \text{ Unadjusted model}$$

$$y_i = \beta_0 + \beta_1 phone_outreach_i + \beta_2 credibility_text_i + \beta_3 phone_outreach_i * credibility_text_i + X_i + \gamma_i + \varepsilon_i \quad (2) \text{ Adjusted model}$$

Where:

- y_i is a binary indicator capturing whether a client submitted a Medicaid renewal application within the last 30 days of their renewal window in month t;
- $phone_outreach_i$ is a binary indicator capturing whether a client was randomly assigned to the Phone Call Outreach group
- $credibility_text_i$ is a binary indicator capturing whether a client was randomly assigned to the Credibility Text group during the first phase of randomization, and
- $phone_outreach_i * credibility_text_i$ is the interaction term for being assigned to the Phone Call Outreach group and having been earlier assigned to the Credibility Text group.

For both covariate-adjusted models, we will use Lin-adjusted covariates per OES guidance that involve an interaction between the treatment indicator and the covariates.

Confirmatory analyses:

We have two confirmatory analyses (one for each phase of the evaluation):

- Phase 1: We will use the fully-adjusted OLS model to estimate the effect of the credibility text on the outcome of whether or not the application is submitted in the first 30 days of the application window. Our primary parameter of interest (β_1) for this model captures the causal effect of the Credibility text on submitting an application within the first 30 days of a client’s renewal window. We test the following null hypothesis:

$$H_{applied_first30} : \beta_1 = 0$$

- Phase 2: We will use the fully-adjusted OLS model to estimate the effect of the phone call for the outcome of whether or not the application is submitted in the last 30 days of the application window. Our primary parameter of interest (β_1) for this model captures the

causal effect of the Phone Call Outreach on submitting an application within the last 30 days of a client's renewal window. We test the following null hypothesis:

$$H_{applied_last30} : \beta_1 = 0$$

Exploratory analysis:

We plan to conduct the following exploratory analyses:

- We will use OLS regression to assess the impact of the credibility text controlling for phone call outreach on applications over the entire application window and on application approvals
- We will use OLS regression to assess the impact of the credibility text and the phone call (separately) for the outcome of the date the client's application was processed, in order to assess whether the interventions led clients to submit their applications more promptly.
- We will analyze heterogeneity in the interventions' effects based on whether clients have children or have been enrolled in PG Medicaid, as these variables are relevant to the Having a Child Life Experience portfolio. We will do this by interacting these subgroup indicator variables with indicators for the treatments and including the same outcomes as described in the primary analyses.
- We will estimate the effect of the interaction between the two factors by interpreting the coefficient on the interaction term in our phase two model. This coefficient β_3 represents the difference in the effect of the phone call between clients who received the credibility text and those who did not.

Inference criteria, including any adjustments for multiple comparisons:

We have two primary outcomes in this evaluation, but these two outcomes will be used to measure the effectiveness of two separate treatments, so we will not need to adjust for multiple comparisons. We will reject the null hypothesis that there is no significant difference in application submission rates between conditions at a significance level of $p = 0.05$.

Limitations:

The main limitation we anticipate is whether our sample size is sufficient to precisely estimate the effect of the phone call outreach. Norfolk DHS' outreach team has indicated they are willing to call 20% of clients who still have not submitted an application by Day 30 of their renewal window, up to a maximum of 200 calls per month (i.e., if 20% of the total number of clients on the 30-day list exceeds 200 clients/calls, Norfolk DHS' outreach team would call 200 clients instead of the full 20%).

Link to an analysis code/script:

N/A