**Design Document and Analysis Plan**

Project Name: Outreach and Maintenance of Medicaid Enrollment: Evidence from Wisconsin’s Navigator Program

Date of Pre-Analysis Plan: July 14, 2022

This document serves as a basis for distinguishing between planned (confirmatory) analysis and any unplanned (exploratory) analysis that might be conducted on project data. Documenting these planned analyses is crucial to ensuring that the 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.

Contents

[**1. Project Objective and Research Questions** 3](#_Toc108707492)

[**2. Evaluation Design** 4](#_Toc108707493)

[**2.1 Overview** 4](#_Toc108707494)

[**2.2 Background on Medicaid redetermination** 5](#_Toc108707495)

[**2.3 Study Sample** 6](#_Toc108707496)

[**2.4 Treatment Arms** 6](#_Toc108707497)

[**2.5 Power and Effect Size** 8](#_Toc108707498)

[**3. Data and Key Variables** 9](#_Toc108707499)

[**3.1 Data Sources** 9](#_Toc108707500)

[***Data File 1: Medicaid claims and CARES enrollment files*** 9](#_Toc108707501)

[***Data File 2: Access Tables*** 10](#_Toc108707502)

[***Data File 3: DHS reports to Covering Wisconsin*** 10](#_Toc108707503)

[**3.2 Key Variables** 10](#_Toc108707504)

[**3.3 Treatment of Missing Data** 12](#_Toc108707505)

[**4. Balance Checks** 12](#_Toc108707506)

[**5. Risks and Mitigation** 13](#_Toc108707507)

[**6. Statistical Models & Hypothesis Tests** 13](#_Toc108707508)

[**References** 16](#_Toc108707509)

[Appendix: Sample Table Shells 20](#_Toc108707510)

[**Table 1: Balance Tests** 20](#_Toc108707511)

[**Table 2: Effect of Intervention on Application and Enrollment Outcomes** 23](#_Toc108707512)

[**Table 3: Effect of Intervention on Characteristics of Enrollees** 25](#_Toc108707513)

**1. Project Objective and Research Questions**

***Overview and Project Objective.*** For many government safety net programs, beneficiaries must regularly demonstrate eligibility to avoid losing benefits. The objective of this field experiment is to identify the effect of outreach strategy on beneficiaries’ maintenance of Medicaid enrollment. The topic is timely because an upcoming policy change after the end of the COVID-19 public health emergency (PHE) will increase demonstration of eligibility requirements for Medicaid beneficiaries nationwide. The experimental population includes an estimated 168,000 cases (members of a household who applied for Medicaid together) in Wisconsin enrolled in fee-for-service Medicaid who must renew or lose their coverage after the end of the public health emergency. The implementing organization is Covering Wisconsin, the navigator organization contracted by the Wisconsin Department of Health Services to conduct outreach to these beneficiaries. Experimental arms will vary the number of outreach messages (1 vs. 2) and the modality of assistance offered (texting with a chatbot vs. calling a hotline to speak with an assister). This research will identify novel, scalable outreach methods to help low-income people maintain access to benefits.

***Research Questions.*** The research questions are as follows:

1. **What are the enrollment and application impacts of sending Medicaid enrollees 1 vs. 2 messages to connect them with assistance?**

*Hypothesis 1:* The enrollment and application effects of receiving 2 identical messages will be higher than the enrollment and application effects of receiving 1 message. The basis of this hypothesis is prior data suggesting repetition increases the impact of outreach in other contexts.1–5

1. **How does modality of assistance offered (connecting with a chatbot via text vs. speaking with an assister by telephone) impact application rates, enrollment rates, and the composition of enrollees?**

*Hypothesis 2:* Varying the method to connect with assistance will not have a detectable impact on the number of people applying to maintain their coverage for or maintaining Medicaid enrollment. The basis of this hypothesis is that while some people will find answers to their questions more quickly via chatbot, others will not wish to interact with algorithms or lack the necessary literacy.6,7

*Hypothesis 3:* Inviting recipients to receive assistance by telephone rather than chatbot will change the composition of Medicaid enrollees by disproportionately increasing application rates and maintenance of enrollment for people in vulnerable groups, including people who are members of racial/ethnic minority groups, prefer a language other than English, are older than 50, had lower baseline income, or higher baseline Medicaid health care costs. The basis of this hypothesisisour research showing coverage impacts of telephone based assistance for people in some of these groups.8

**2. Evaluation Design**

## **2.1 Overview**

This field experiment will test methods to increase maintenance of Medicaid enrollment by connecting beneficiaries with navigators, a group of professionals publicly funded since 2014 to help consumers enroll in coverage.9 The intervention will be implemented by Covering Wisconsin, a navigator grantee with a staff of more than a dozen professional assisters. Covering Wisconsin was contracted by the Wisconsin Department of Health Services (DHS) to conduct outreach to fee-for-service Medicaid beneficiaries after the end of the PHE.

As detailed further below in section 2.4, the intervention arms will vary the frequency of outreach messages (1 or 2 repeated text messages) and the modality of assistance offered (texting with a chatbot vs. calling a hotline to speak with an assister); the chatbot can also be used to schedule a call with an assister. These interventions will be repeated after the renewal window closes for people who lost their coverage. All beneficiaries will also be mailed standard letters by DHS.

Wisconsin administrative data will be used to measure the application rates and maintenance of Medicaid enrollment over the 12 months following each case group’s redetermination deadline, as well as changes in the composition of Medicaid enrollees after the redetermination deadlines have passed. See section 3.1 for a detailed description of the data.

**2.2 Background on Medicaid redetermination**

Each year, millions of low-income individuals must demonstrate their eligibility for safety net programs to avoid losing their benefits.10,11While the goal of this requirement is to restrict benefit receipt to those who are eligible, the associated time and hassle costs mean many eligible individuals do not complete the required processes. Compliance costs reduce benefit receipt across a range of safety net programs.12–18 Data from Illinois suggest that 80% of people disenrolled from Medicaid lost their coverage because they did not return the requested information.19

An upcoming policy change will increase demonstration of eligibility requirements for the Medicaid program, placing beneficiaries at risk of losing coverage.20During the COVID-19 public health emergency (PHE), the federal government’s maintenance of eligibility meant that states did not require Medicaid beneficiaries demonstrate their eligibility regularly, because they generally could not be disenrolled.21 During this period, Medicaid enrollment increased by 25% nationally.22–24 Once the PHE ends, states will have 14 months to redetermine the eligibility of their entire caseload of Medicaid beneficiaries.25 It is estimated that 16 million people nationwide will lose Medicaid coverage during this process, even though Wisconsin data suggest that 90% of beneficiaries will still be Medicaid eligible.11,22

The majority of people disenrolled from Medicaid do not transition to another identified insurance and become uninsured.26,27 Losing Medicaid reduces access to care and raises the risk of impoverishment due to medical debt.28–32 Despite evidence on the impacts of outreach on new Medicaid enrollment, little is known on how to support maintenance of enrollment.1,33 In Centers for Medicare and Medicaid Services materials for states about the PHE Medicaid policy, there is limited guidance on outreach to enrollees during the redetermination process.34 To avoid loss of coverage among eligible individuals, it is crucial to identify strategies to help enrollees complete redetermination.

**2.3 Study Sample**

The study population includes all fee-for-service Medicaid beneficiaries in Wisconsin, except those who prefer a language other than English or Spanish or who lack a cellular phone number.

***Total Number of Observations.*** According to data from Wisconsin DHS and Covering Wisconsin, cellular phone numbers are missing for only 4% of the fee-for-service Medicaid population and the experimental population will include 224,000 beneficiaries, about 25% of whom prefer Spanish. Our analysis of data from Wisconsin fee-for-service Medicaid enrollees found a case to individual ratio of 0.75, suggesting there will be 168,000 cases (members of a household who applied for Medicaid together).

**2.4 Treatment Arms**

This is a four-arm research design. The experimental arms will vary the number of outreach messages (1 vs. 2) and the modality of the assistance offered (texting with a chatbox vs. calling a hotline to speak with an assister) to a list of beneficiaries whose redetermination window begins. Sample message content of the text messages is as follows, with the bracketed Call to Action text varying across arms: “Hi, this is nonprofit Covering WI, for the WI Dept of Health Services. Time to renew your BadgerCare or Medicaid! To get free, local help, [*Call to Action*] or visit www.coveringwi.org. STOP to end.” The treatment arms will be as follows:

**Arm A:** These consumers will receive one message connecting them with a chatbot. The Call-to-Action text will be “text COVER to 920-###-####.”

**Arm B:** These consumers will receive a message connecting them with a chatbot using the same Call-to-Action text as arm A. Two weeks after the initial message, they will receive an additional reminder message.

**Arm C:** These consumers will be prompted to speak with an assister by calling a hotline. The Call-to-Action text will be “call ###.”

**Arm D:** These consumers will be prompted to speak with an assister by calling a hotline using the same Call-to-Action text as arm C. Two weeks after the initial message, they will receive an additional reminder message.

There will be a second round of randomization for people who lost their Medicaid because of the redetermination process. These consumers will receive a message text such as the following: “Hi, this is nonprofit Covering WI, for the WI Dept of Health Services. Lost your health insurance? To get free, local help, [*Call to Action*] or visit coveringwi.org. STOP to end.” The group will be split into additional treatment arms with varied number of messages (1 vs. 2) and modality (texting with a chatbot vs. calling a hotline to speak with an assister), as in the first round of messaging.

***Assignment Process.*** Assignment to treatment arms A through D will occur monthly over the 12-month period after the PHE, to ensure each beneficiary receives outreach at the beginning of their two-month redetermination window assigned by the state. Each month, Wisconsin DHS will provide Covering Wisconsin a list of the beneficiaries whose redetermination window begins. Randomization for people in each group of monthly renewals will be clustered by case (e.g., members of a household who applied for Medicaid together) to address potential spillovers.

Cases will be assigned to treatment arms in equal numbers. Randomization will be stratified by preferred language, Medicaid eligibility category at baseline (children, aged, SSI, pregnant, parents, adult without dependent children), whether there are enrolled adults over 50 or enrolled children at baseline, and tribal membership; for each stratification variable, missing data will be its own stratification category. Table 1 shows the number of cases in each arm for the first randomization.

|  |
| --- |
| **Table 1. Assignment of Beneficaries to Treatment Arms** |
|  | **Number of Messages** |
| **Suggested Modality for Assistance** | **1st Message Only** | **1st Message + Reminder Message After 2 Weeks** |
| Connecting with a chatbot via text. (Call to Action: “text COVER to 920-###-####.”)  | Arm A: ~42,000 cases | Arm B:~42,000 cases |
| Speaking with an assister by calling a hotline. (Call to Action: “call ###”) | Arm C:~42,000 cases | Arm D:~42,000 cases |

There will be a second round of randomization to determine outreach strategy for people who lost their Medicaid coverage during the redetermination process. As in the first round of randomization, cases will be assigned to receive outreach messages that vary in the calls to action (text vs call) and messaging frequency (1 vs 2 messages). The assignment process for this second round of randomization will follow the same process described above.

**2.5 Power and Effect Size**

Power analysis suggests the study is powered to detect reasonable and decision-relevant impacts on Medicaid enrollment and the composition of enrollees.

***Key Assumptions.*** Our analysis of recent Medicaid claims suggest about 90% will be eligible, so we characterize the study population as a “likely eligible” population similar to Wright et al.’s study of likely Medicaid-eligible adults.1,22 Based on findings from Wright et al.’s sample with low-touch outreach, we assume that between 38 and 41% of the sample will remain enrolled in Medicaid after receiving a single text message reminder.1 We also assessed power to detect changes in the composition of the enrollee population, including language preference (our baseline data suggest 25% prefer Spanish) and a binary outcome that is unitary for 50% of the population and zero otherwise (e.g., above vs. below median income, or above vs. below median baseline Medicaid health care costs as a measure of health care need).

***Minimum Detectable Effect Size.*** The study has 80% power to detect a 0.66 percentage point change in enrollment rates, a 0.59 percentage point change in the proportion of enrollees preferring Spanish and a 0.68 percentage point change in the health care needs of enrollees due to changes in outreach repetition or suggested modality for contact. For comparison, prior studies found a 2 percentage point increase in SNAP recertification after receipt of a text message;35 a 3 percentage point increase in Medicaid take-up among a likely eligible group and 14.3 percentage point increase in take-up among a waitlist group after enhanced outreach;1 a 18 percentage point increase in SNAP take-up after receiving a postcard with an assistance hotline number;5 and a 22 percentage point increase in EITC take-up after a second reminder message.36

We will consider the intervention to have a meaningful effect if we detect a statistically significant difference in our key outcomes (e.g. application and enrollment increases) between the treatment arms of the RCT. Other measures of the success of the intervention will include whether the dollarized benefit from the increases in take-up exceeds the cost of implementing the intervention, and whether the intervention is particularly effective for harder-to-reach segments of the population.

**3. Data and Key Variables**

This section describes data and variables that will be analyzed.

**3.1 Data Sources**

We will combine multiple data files for the project to measure treatment assignment, the timing of each beneficiary’s enrollment window, and application and enrollment outcomes.

***Data File 1: Medicaid claims and CARES enrollment files***

**Summary of Information**: This is a comprehensive extract that includes every beneficiary that had Medicaid coverage in Wisconsin at the end of the public health emergency, along with attributes such as:

* + Start date of Medicaid coverage and end date of Medicaid coverage, if applicable
	+ Demographic factors (gender, age, race/ethnicity)
	+ Income at the time of first application to Medicaid (measured as of March 2020 or the first month of this Medicaid enrollment spell, whichever is later)
	+ Reason for Medicaid eligibility at baseline (children; aged; SSI; pregnant; parents; adults without dependent children)
	+ Health care costs paid by Medicaid, 2020-2021
	+ Any visits and number of visits (overall and for the following visit types: emergency, outpatient, inpatient, dental, mental health, or psychiatric), 2020-2021
	+ Number of chronic conditions according to Chronic Conditions Warehouse algorithm, 2020-2021
	+ End date of Medicaid coverage, if applicable

**Universe of File and Unit of Analysis / Record Granularity:** One record for each person with fee-for-service Medicaid coverage in Wisconsin at the end of the public health emergency.

***Data File 2: Access Tables***

**Summary of Information:** An extract of application data:

* Application date to redetermine/renew coverage

Outcome from the application, if available (denied because of lack of eligibility, denied for administrative reasons, accepted)

**Universe of File and Unit of Analysis / Record Granularity:** One record for each application received during the redetermination period.

***Data File 3: DHS reports to Covering Wisconsin***

**Summary of Information:** This data provides information on the characteristics of beneficiaries whose Medicaid redetermination window has just begun in the current calendar month. These characteristics include:

* Location (address, county of residence, county of administration)
* Cell phone number if available for each individual in the case
* Medicaid eligibility category at baseline for each individual in the case
* Age of each individual in the case
* Tribal membership for each individual in the case
* Case information (case number, PIN number)
* Language preference for each individual in the case

**Universe of File and Unit of Analysis / Record Granularity:** Fee-for-service Medicaid beneficiaries whose Medicaid redetermination window has just begun in the current calendar month.

**3.2 Key Variables**

***Outcomes of Interest****.* The primary outcome ismaintenance of Medicaid enrollment, measured on the individual level over the 12 months following each person’s redetermination deadline (e.g., at 1, 3, 6, 9, and 12 months; successful redetermination at 12 months). Secondary outcomes focus on application activities and outcomes, measured using the following categories: no application filed; application filed but denied due to lack of eligibility; application filed but denied due to administrative reasons; application accepted. Application outcomes will be measured at 1, 3, 6, 9, and 12 months after each person’s redetermination deadline. When analyzing data from the second round of outreach (i.e., for people who had already lost their coverage), outcomes will be measured at 1, 3, 6, 9, and 12 months after at the time of the receipt of outreach messages.

***Variables Used in Heterogeneity Checks.*** We will conduct two types of heterogeneity analyses: a) stratifying the data into pre-specified groups, and b) assessing changes in the composition of Medicaid enrollees after the redetermination deadlines have passed, described further in section 6 below. The goal of these analyses is to assess whether the impact of the intervention varies for consumers who may face different barriers to enrollment or differ in other observable characteristics, to support improved targeting of the intervention in the future. These groups include:

* Racial/ethnic minority groups (Black, Hispanic, tribal members, any other minority group)
* People who prefer a language other than English
* Age category (<18, 18-49, 50-64, 65+), and average age for the composition analysis
* People living in rural areas
* People with below median baseline household income; number of enrolled childless adults with baseline household income over 50% of FPL; number of enrolled children with baseline household income over 200% of FPL; average baseline income of enrollees, for the composition analysis
* People with above-median Medicaid-covered baseline health care costs (e.g., total costs during the continuous coverage period); average baseline health care costs (raw and logged), for the composition analysis
* People with longer vs. shorter duration of prior Medicaid enrollment (quartiles of enrollment duration at the end of the public health emergency, and whether or not enrolled long enough to have been required to do a prior redetermination)
* People with Medicaid-covered usage of inpatient care during the public health emergency period
* People with Medicaid-covered usage of mental health or psychiatric care during the public health emergency period
* People with chronic conditions, measured using the Chronic Conditions Warehouse algorithm using their claims during the public health emergency period

***Covariates Used in Multivariable Modeling.*** Due to the randomization, adjustment for confounders is not required for our statistical models to obtain unbiased treatment effects. To improve power, however, we will include covariates in multivariable modeling that are predictive of our outcomes of interest. We propose to include location (county of residence) fixed effects, eligibility category at baseline, language preference (English, Spanish, missing), income at baseline (under 50% FPL, 50-100% FPL, 100-200% FPL, over 200% FPL, missing), whether or not had been in Medicaid long enough at baseline to have been required to a prior redetermination, and age of the individual. We will drop covariates in robustness checks.

**3.3 Treatment of Missing Data**

In the baseline model, we will model missingness using an indicator variable to avoid listwise deletion. In a robustness check, we will use listwise deletion to eliminate missing data on covariates of interest.

**4. Balance Checks**

Since random assignment is a key feature of our study, we will take great care in verifying the random assignment. We will check balance across all observable variables included in the Covering Wisconsin data at the time of randomization, and again check balance on the covariates and stratification variables used in the model that we subsequently obtain from the administrative data. Any unbalanced variables in the administrative data will be included as covariates in the model in robustness checks.

**5. Risks and Mitigation**

COVID-related risk is minimal as outreach will take place remotely. The sample size could be smaller than anticipated, but the study will have sufficient power to detect a 1.5 percentage point impact on Medicaid enrollment if the sample is as small as 20% of our anticipated size. For ethical reasons, all randomized participants will receive outreach; while we believe the comparisons across study arms will produce policy-relevant findings, we will also use a difference-in-differences analysis of a matched sample to compare enrollment changes in our sample vs. comparable Medicaid managed care beneficiaries who will not receive outreach from Covering Wisconsin. While spillovers are possible, our plan to randomize by cases mitigates spillover risk within households. Finally, some beneficiaries will not be eligible for Medicaid; those rejected from Medicaid will receive additional messages from Covering Wisconsin that may affect enrollment in marketplace insurance as well. Regardless, our research suggests 90% of the sample will be Medicaid eligible, so our proposed outcome of Medicaid enrollment remains highly relevant.22

**6. Statistical Models & Hypothesis Tests**

We will examine the effects of assignment to each intervention arm on each outcome using an intent-to-treat (ITT) analysis. Our basic estimating equation will be of the form:

$$Y\_{i}=β\_{1}(Treatment A)\_{i}+β\_{2}(Treatment B)\_{i}+ β\_{3}(Treatment C)\_{i}+β\_{4}X(Treatment D)\_{i}+X\_{i}γ+ε\_{i} (1)$$

Where:

* $Y\_{i}$ represents the outcomes of interest (application and enrollment outcomes);
* $X\_{i}$ represents a vector of pre-specified covariates measured at baseline, listed in section 3.2;
* $(Treatment A)\_{i}$ is an indicator variable for individual *i* being assigned to treatment groupA (one message, call to action encourages sending a text);
* $(Treatment B)\_{i}$ is an indicator variable for individual *i* being assigned to treatment groupB (two messages, call to action encourages sending a text);
* $(Treatment C)\_{i}$ is an indicator variable for individual *i* being assigned to treatment groupC (one message, call to action encourages placing a call); and
* $(Treatment D)\_{i}$ is an indicator variable for individual *i* being assigned to treatment groupD (two messages, call to action encourages placing a call).

This model omits the constant term to avoid perfect collinearity.

The $β\_{n}$ will be the estimate of the causal effect of being randomized to a given treatment group, compared to Arm A, on our outcomes of interest, $Y\_{i}$. The research questions will be tested using hypothesis tests about combinations of the coefficients on these treatment arm indicators.

* To address Research Question 1 on the impacts of repeated messages, we will test whether the pooled outcomes for arms A and C are the same as the pooled outcomes for arms B and D:

$$β\_{1}+β\_{3}= β\_{2}+β\_{4}$$

* To address Research Question 2 on the impacts of modality of assistance, we will test whether the outcomes with one message (two messages) are the same for a message that emphasizes a text vs. emphasizes a call:

$$β\_{1}= β\_{3}$$

$$β\_{2}= β\_{4}$$

* We will test whether repeated messages moderate the impact of modality on the outcomes of interest:

$$β\_{3}-β\_{1}= β\_{4}-β\_{2}$$

* Finally, we will assess the impact of a repeated message outreach separately for the two different modalities ($β\_{1}= β\_{2}$ and $β\_{3}= β\_{4}$ as two separate hypotheses.)

In robustness checks, we will use logit or probit models to model binary outcomes. We will not perform any corrections for multiple hypothesis tests, and we will use two-tailed tests with p-values <= .05 to denote statistically significant effects. Standard errors will be clustered by case for all models.

In addition to the impact of the interventions on maintenance of enrollment, we are also interested in the effect of assignment to given treatment group on the characteristics of the marginal enrollee who applies for coverage or receives continued coverage because of the intervention. This analysis will repeat the model above but define the outcome variable to be a baseline characteristic of an individual (for example, a baseline measure of their household’s income). This approach to analyzing the characteristics of the marginal person affected by an intervention has been used in prior work.5

We will re-estimate model (1) using data only from the second round of outreach, e.g., outreach targeting people who lost their Medicaid coverage during the redetermination process. The primary analysis will focus on the same hypothesis tests listed above, but reframing the follow-up time horizon to start after the second round of outreach occurred. In a secondary analysis, we will use interaction terms between first-round and second-round treatment arms to assess whether, e.g., randomization to the chatbot outreach arm in the second round was disproportionately effective for people who had been randomized to the call outreach arm in the first arm or vice versa.

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# Appendix: Sample Table Shells

## **Table 1: Balance Tests**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Text with chatbot | Text with chatbot + reminder | Speak with an assister via call hotline | Speak with an assister via call hotline + reminder | *F-test p-value* |
|  | (1) | (2) | (3) | (4) | (5) |
| *Panel A: Variables in the Covering Wisconsin data* |
| Prefer a language other than English |  |  |  |  |  |
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|  **Age**  <18 18-4950-6465+ |  |  |  |  |  |
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|  Live in a rural area |  |  |  |  |  |
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| *Panel B: Variables in the administrative data* |
| Age  |  |  |  |  |  |
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|  |  |  |  |  |
| Female |  |  |  |  |  |
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|  |  |  |  |  |
| **Race/ethnicity** Non-Hispanic WhiteHispanicNon-Hispanic BlackTribal Membership |  |  |  |  |  |
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| **Duration of coverage at baseline**Q1 (shortest duration)Q2Q3Q4 (longest duration) Enrolled long enough to have been required to do a prior redeterminationNot enrolled long enough to have been required to do a prior redetermination |  |  |  |  |  |
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| **Income at baseline**Below median household incomeEnrolled childless adults with baseline household income > 50% FPLEnrolled children with baseline household income >200% FPL |  |  |  |  |  |
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| **Reason for Medicaid eligibility at baseline**ChildrenAgedSSIPregnant ParentsAdult without dependent children |  |  |  |  |  |
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| Health care costs paid by Medicaid, 2020-2021 |  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Any Medicaid Visits During 2020-2021**OverallEmergencyOutpatientInpatient DentalMentalPsychiatric |  |  |  |  |  |
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| **Number of Medicaid Visits During 2020-2021**OverallEmergencyOutpatientInpatient DentalMentalPsychiatric |  |  |  |  |  |
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| Number of chronic conditions according to Chronic Conditions Warehouse algorithm, 2020-2021 |  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Pooled F – stat** | . |  |  |  |  |
| ***p-value*** | *.* |  |  |  |  |
| ***N*** | *.* |  |  |  |  |

## **Table 2: Effect of Intervention on Application and Enrollment Outcomes**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Treatment  | Text with chatbot | Text with chatbot + reminder | Speak with an assister via call hotline | Speak with an assister via call hotline + reminder | *p*-value for hypothesis test, columns (1) + (3) = (2) + (4) | *p*-value for hypothesis test, columns (1) = (3) (2) = (4) | *p*-value for hypothesis test, columns (3) - (1) = (4) - (2) | *p*-value for hypothesis test, columns (1) = (2) | *p*-value for hypothesis test, columns (3) = (4) |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| First Round of Outreach (During Redetermination Window) |
| *No application filed by end of redetermination deadline* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Application filed by end of redetermination deadline but denied due to lack of eligibility* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Application filed by end of redetermination deadline but denied due to administrative reasons* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Application accepted* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Maintenance of Medicaid enrollment at 1 month after enrollment deadline* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Maintenance of Medicaid enrollment at 3 months after enrollment deadline* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Maintenance of Medicaid enrollment at 6 months after enrollment deadline* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Maintenance of Medicaid enrollment at 9 months after enrollment deadline* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Maintenance of Medicaid enrollment at 12 months after enrollment deadline* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Successful redetermination after 12 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Second Round of Outreach (After Already Lost Coverage) |
| *Regained coverage 1 month after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regained coverage 2 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regained coverage 2 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regained coverage 3 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regained coverage 6 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regained coverage 12 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Maintenance of Medicaid enrollment at 3 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Maintenance of Medicaid enrollment at 6 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Maintenance of Medicaid enrollment at 9 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Maintenance of Medicaid enrollment at 12 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Successful redetermination after 12 months after outreach* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Sample Size |  |  |  |  |  |  |  |  |  |

## **Table 3: Effect of Intervention on Characteristics of Enrollees**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Treatment | Text with chatbot | Text with chatbot + reminder | Speak with an assister via call hotline | Speak with an assister via call hotline + reminder | *p*-value for hypothesis test, columns (1) + (3) = (2) + (4) | *p*-value for hypothesis test, columns (1) = (3) (2) = (4) | *p*-value for hypothesis test, columns (3) - (1) = (4) - (2) | *p*-value for hypothesis test, columns (1) = (2) | *p*-value for hypothesis test, columns (3) = (4) |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| **Panel A: First round of outreach, applied for coverage by 1 month after redetermination deadline** |
| *Race/ethnicity* |  |  |  |  |
| Any racial/ethnicity minority group |  |  |  |  |  |  |  |  |  |
| Black |  |  |  |  |  |  |  |  |  |
| Hispanic |  |  |  |  |  |  |  |  |  |
| Tribal members |  |  |  |  |  |  |  |  |  |
| *Language preference* |  |  |  |  |
| Prefer Spanish |  |  |  |  |  |  |  |  |  |
| *Age in years*  |
| Average |  |  |  |  |  |  |  |  |  |
| <18  |  |  |  |  |  |  |  |  |  |
| 18-49 |  |  |  |  |  |  |  |  |  |
| 50-64 |  |  |  |  |  |  |  |  |  |
| 65+ |  |  |  |  |  |  |  |  |  |
| *Urban/rural (proportion)* |
| Live in rural areas |  |  |  |  |  |  |  |  |  |
| *Income* |
| Average baseline income of enrollees |  |  |  |  |  |  |  |  |  |
| Below median household income |  |  |  |  |  |  |  |  |  |
| Enrolled childless adults with baseline household income >50% FPL |  |  |  |  |  |  |  |  |  |
| Enrolled children with baseline household income >200% FPL |  |  |  |  |  |  |  |  |  |
| *Healthcare spending* |
| Average baseline health care costs (raw) |  |  |  |  |  |  |  |  |  |
| Average baseline health care costs (logged) |  |  |  |  |  |  |  |  |  |
| *Healthcare usage (proportion)* |
| Medicaid-covered usage of inpatient care during the public health emergency period |  |  |  |  |  |  |  |  |  |
| Medicaid-covered usage of mental health or psychiatric care during the public health emergency period |  |  |  |  |  |  |  |  |  |
| Chronic conditions, measured using the Chronic Conditions Warehouse algorithm using their claims during the public health emergency period |  |  |  |  |  |  |  |  |  |
| *Reason for Medicaid eligibility at baseline* |
| Children |  |  |  |  |  |  |  |  |  |
| Aged |  |  |  |  |  |  |  |  |  |
| SSI |  |  |  |  |  |  |  |  |  |
| Pregnant |  |  |  |  |  |  |  |  |  |
| Parents |  |  |  |  |  |  |  |  |  |
| Adult without dependent children  |  |  |  |  |  |  |  |  |  |
| *Duration of coverage at baseline* |
| Q1 |  |  |  |  |  |  |  |  |  |
| Q2 |  |  |  |  |  |  |  |  |  |
| Q3 |  |  |  |  |  |  |  |  |  |
| Q4 |  |  |  |  |  |  |  |  |  |
| Enrolled long enough to have been required to do a prior redetermination |  |  |  |  |  |  |  |  |  |
| Not enrolled long enough to have been required to do a prior redetermination |  |  |  |  |  |  |  |  |  |
| **Panel B: First round of outreach, enrolled at 6 months after redetermination deadline** |
| *Race/ethnicity* |  |  |
| Any racial/ethnicity minority groups |  |  |  |  |  |  |  |  |  |
| Black |  |  |  |  |  |  |  |  |  |
| Hispanic |  |  |  |  |  |  |  |  |  |
| Tribal members |  |  |  |  |  |  |  |  |  |
| *Language preference* |  |  |
| Prefer Spanish |  |  |  |  |  |  |  |  |  |
| *Age in years*  |  |  |  |  |  |  |  |  |  |
| Average |  |  |  |  |  |  |  |  |  |
| <18  |  |  |  |  |  |  |  |  |  |
| 18-49 |  |  |  |  |  |  |  |  |  |
| 50-64 |  |  |  |  |  |  |  |  |  |
| 65+ |  |  |  |  |  |  |  |  |  |
| *Urban/rural (proportion)* |
| Live in rural areas |  |  |  |  |  |  |  |  |  |
| *Income* |
| Average baseline income of enrollees |  |  |  |  |  |  |  |  |  |
| Below median household income |  |  |  |  |  |  |  |  |  |
| Enrolled childless adults with baseline household income >50% FPL |  |  |  |  |  |  |  |  |  |
| Enrolled children with baseline household income >200% FPL |  |  |  |  |  |  |  |  |  |
| *Healthcare spending* |
| Average baseline health care costs (raw) |  |  |  |  |  |  |  |  |  |
| Average baseline health care costs (logged) |  |  |  |  |  |  |  |  |  |
| *Healthcare usage (proportion)* |
| Medicaid-covered usage of inpatient care during the public health emergency period |  |  |  |  |  |  |  |  |  |
| Medicaid-covered usage of mental health or psychiatric care during the public health emergency period |  |  |  |  |  |  |  |  |  |
| Chronic conditions, measured using the Chronic Conditions Warehouse algorithm using their claims during the public health emergency period |  |  |  |  |  |  |  |  |  |
| *Reason for Medicaid eligibility at baseline* |
| Children |  |  |  |  |  |  |  |  |  |
| Aged |  |  |  |  |  |  |  |  |  |
| SSI |  |  |  |  |  |  |  |  |  |
| Pregnant |  |  |  |  |  |  |  |  |  |
| Parents |  |  |  |  |  |  |  |  |  |
| Adult without dependent children  |  |  |  |  |  |  |  |  |  |
| *Duration of coverage at baseline* |
| Q1 |  |  |  |  |  |  |  |  |  |
| Q2 |  |  |  |  |  |  |  |  |  |
| Q3 |  |  |  |  |  |  |  |  |  |
| Q4 |  |  |  |  |  |  |  |  |  |
| Enrolled long enough to have been required to do a prior redetermination |  |  |  |  |  |  |  |  |  |
| Not enrolled long enough to have been required to do a prior redetermination |  |  |  |  |  |  |  |  |  |
| **Panel C. Second round of outreach, enrolled at 6 months after outreach** |
| *Race/ethnicity* |  |  |
| Any racial/ethnicity minority groups |  |  |  |  |  |  |  |  |  |
| Black |  |  |  |  |  |  |  |  |  |
| Hispanic |  |  |  |  |  |  |  |  |  |
| Tribal members |  |  |  |  |  |  |  |  |  |
| *Language preference* |  |  |
| Prefer Spanish |  |  |  |  |  |  |  |  |  |
| *Age in years*  |
| Average |  |  |  |  |  |  |  |  |  |
| <18  |  |  |  |  |  |  |  |  |  |
| 18-49 |  |  |  |  |  |  |  |  |  |
| 50-64 |  |  |  |  |  |  |  |  |  |
| 65+ |  |  |  |  |  |  |  |  |  |
| *Urban/rural (proportion)* |
| Live in rural areas |  |  |  |  |  |  |  |  |  |
| *Income* |
| Average baseline income of enrollees |  |  |  |  |  |  |  |  |  |
| Below median household income |  |  |  |  |  |  |  |  |  |
| Enrolled childless adults with baseline household income >50% FPL |  |  |  |  |  |  |  |  |  |
| Enrolled children with baseline household income >200% FPL |  |  |  |  |  |  |  |  |  |
| *Healthcare spending* |
| Average baseline health care costs (raw) |  |  |  |  |  |  |  |  |  |
| Average baseline health care costs (logged) |  |  |  |  |  |  |  |  |  |
| *Healthcare usage (proportion)* |
| Medicaid-covered usage of inpatient care during the public health emergency period |  |  |  |  |  |  |  |  |  |
| Medicaid-covered usage of mental health or psychiatric care during the public health emergency period |  |  |  |  |  |  |  |  |  |
| Chronic conditions, measured using the Chronic Conditions Warehouse algorithm using their claims during the public health emergency period |  |  |  |  |  |  |  |  |  |
| *Reason for Medicaid eligibility at baseline* |
| Children |  |  |  |  |  |  |  |  |  |
| Aged |  |  |  |  |  |  |  |  |  |
| SSI |  |  |  |  |  |  |  |  |  |
| Pregnant |  |  |  |  |  |  |  |  |  |
| Parents |  |  |  |  |  |  |  |  |  |
| Adult without dependent children  |  |  |  |  |  |  |  |  |  |
| *Duration of coverage at baseline* |
| Q1 |  |  |  |  |  |  |  |  |  |
| Q2 |  |  |  |  |  |  |  |  |  |
| Q3 |  |  |  |  |  |  |  |  |  |
| Q4 |  |  |  |  |  |  |  |  |  |
| Enrolled long enough to have been required to do a prior redetermination |  |  |  |  |  |  |  |  |  |
| Not enrolled long enough to have been required to do a prior redetermination |  |  |  |  |  |  |  |  |  |