



## Analysis Plan

Project Name: Increasing Pre- and Post-Natal Care Uptake Among Medicaid-Eligible Mothers

Project Code: 1710

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### Project Overview:

The Nurse Family Partnership model has been evaluated via three RCTs. The Coalition for Evidence Based Policy rates the program as having top tier evidence, and CO NFP is attempting to improve their take up rates with Medicaid referrals. Colorado has a particularly high migration rate, and ongoing resource constraints make connecting with eligible beneficiaries particularly difficult for social service agencies. Furthermore, CO NFP began receiving lists of probable NFP eligible-Medicaid members in 2015 with very limited member contact information, making connecting with eligible beneficiaries particularly challenging. The goal of this project was to test whether a postcard sent to those members prior to a telephone call would increase program uptake (relative to the current process, which involves a telephone call without a prior postcard).

### Outcome Variables to Be Analyzed:

The partnering organization provided the following outcome categories for each participant of this study:

- Already enrolled in another program
- Did not meet NFP criteria
- Duplicate
- Enrolled in NFP
- Invalid contact information
- Pending
- Program full
- Refused participation
- Transferred to another site
- Unable to locate

Appendix A provides comprehensive definition for each outcome distinction. The definitions were provided by the partnering organization.

As will be discussed later in this document, we will estimate both the intent-to-treat and the treatment-on-treated effects. We will include cases with the following outcomes (with notes in parentheses indicating whether each outcome is coded as take-up or no take-up):

- Already enrolled in another program (No Take-up)

- Did not meet NFP criteria (No Take-up)
- Duplicate (No Take-up)
- Enrolled in NFP (Yes Take-up)
- Invalid contact information (No Take-up)
- Refused participation (No Take-up)
- Transferred to another site (No Take-up)
- Unable to locate (No Take-up)

Not that we are excluding cases with “Pending” and “Program Full” outcomes from analysis. Our decision to exclude these cases was based on the fact that under a full implementation these particular outcomes might be at least partially preventable via adjustments to the program and, in any event, might not appear with the same relative frequencies as observed in our data..

To create our program take-up variable, we will define a “yes” take-up as those participants who received the “Enrolled in NFP” distinction. This indicates that the participant actively selected into the NFP program after receiving a phone call from a qualified nurse. Our take-up outcome is coded a “no” for all other distinctions.

### Statistical Models:

#### *Randomization Checks*

The dataset provided to use does not include any additional participant-level covariates to the test individual balance checks. However, we will implement checks to ensure that assignment to the treatment was not dependent on the individual months included within the dataset.

#### *Treatment Effects - Intent to Treat*

We will estimate the causal effect of the intent to treat using linear OLS regression. In our basic OLS specification, we will regress the outcome of interest (i.e., the indicator of NFP program take up) on an indicator variable for assignment to treatment (i.e., receiving the postcard intervention) and a set of month-by-month indicators because treatment was assigned within month (i.e., this is a block randomized experiment with month as the blocking variable).

Thus, our main regression specification is:

$$outcome_i = \alpha + \beta postcard_i + \mu_m + \varepsilon_i \quad (1)$$

where  $outcome_i$  is an indicator variable for the outcome of interest for individual  $i$ ,  $postcard_i$ , is an indicator variable equal to one if the respondent was randomized for assignment to treatment,  $X_i'$  is a vector of  $\mu_m$  are month fixed effects (dummy variables), and  $\varepsilon_i$  is an idiosyncratic error term. The coefficient on the treatment indicator variable is the estimate of the causal effect of the intent to treat.

### *Treatment Effects - Treatment on the Treated*

We will estimate treatment on the treated using an extension of Equation (1):

$$outcome_i = \alpha + \beta_1 postcard_i + \beta_2 phone_i + \beta_3(postcard_i * phone_i) + \mu_m + \varepsilon_i \quad (2)$$

where we add a binary indicator ( $\beta_2 phone_i$ ) which is equal to one for those where actually contacted by nurse through a phone call to make an active decision on services and zero if they did not have a documented phone contact. Additionally, we add an interaction term ( $postcard_i * phone_i$ ) which will provide the effect of the receiving the postcard of those individuals who were contacted by a qualified nurse and made an active decision on service take-up. The interactive coefficient is the estimate of the causal effect of the treatment on the treated. The remaining components of Equation (2) are the same as specified within Equation (1).

### *Standard Error Adjustments*

In our primary analysis, we will estimate heteroskedasticity robust standard errors. To complement our primary analysis, we will calculate HC2 standard errors and exact standard errors.

### **Inference Criteria:**

We will use standard inference criteria. We will use two-tailed tests and three threshold p-values: 1%, 5%, and 10%. Given the very small cost of the intervention and the prior evidence on the effect of the NFP program, any effect we can detect statistically is certainly policy relevant.

### **Data Exclusion:**

We will exclude observations that do not have a outcome distinction or where the outcome distinction is not aligned with the category definitions provided by the partnering organization.

### **Limitations:**

There are three main limitations of this study. First, the data provided does not include demographic variables and thus limits our ability to estimate heterogeneous effects. Second, individuals included in the study in its last few months (between April 2017 and July 2017) were assigned to treatment in one large batch in the final month, so the timecourse of treatment may have been different for many of them than for individuals included in the earlier months of the study. Additionally, this does not allow for us to precisely estimate a how treatment effects might vary by month although it will allow comparisons of April, May, June and July.

## Appendix A: Outcome Definitions



### Status Definitions for NFP Box Spreadsheets

**Unable to Locate:** The individual has not responded to attempts to reach her and will not be pursued any further. Possible cases:

1. No answer or call back when NHV attempted contact multiple times
2. Has been reached and expressed interest in the program but cannot be reached again
3. Set an appointment and didn't show up
4. Could not be reached prior to due date

**Invalid Contact Information:**

1. A call cannot be made because the number is missing digits, etc.
2. It is clear from one call that the client cannot be reached at the phone number provided because it is out of service, disconnected, a wrong number, a fax machine, etc.

**Enrolled in NFP:** This referral has enrolled in your site's NFP program.

**Did not meet NFP criteria:** This referral does not meet requirements to be served by Colorado NFP because she:

1. Has had a previous live birth
2. Lives (or is about to move) out of state
3. Lives in (or is about to move to) an area of Colorado not served by NFP
4. Was more than 30 days postpartum when the referral was received
5. Receives an income greater than 200% of the poverty level
6. Had a miscarriage
7. Is not pregnant

**Duplicate:**

1. This referral has already been received by NFP from another source (WIC, healthcare provider, school, etc.)
2. This referral was included in one or more previous months' Medicaid referral lists.

"Duplicate" indicates that this referral cannot be attributed to Medicaid, since this potential client had previously been received by the site. No information beyond a duplicate status (e.g. which nurse is working the referral, whether the referral has enrolled, where the referral was previously received from) is necessary.

If a referral is received **first** from Medicaid/PEAK, and later from another source, that should not be marked as a duplicate in your Box spreadsheet. In those cases, the final disposition of the referral should be filled in.

Kaiser referrals should never be given a status of "Duplicate." Kaiser requires a disposition from NFP even if the referral has been received from another source.

**Program Full:** Your site is in a state of transition or staff turnover, or has received an avalanche of referrals in recent months exceeding realistic capacity, and cannot accommodate this referral. This is regarded as a final disposition, and is not synonymous with wait-listing a client (which would still qualify as "Pending" until that client is either no longer eligible or has enrolled in the program). No further action will be taken with these referrals.

**Already enrolled in another program:** This referral is in another home-visiting program instead of NFP prior to being contacted by NFP. If the individual is not in another home visiting program but NFP reaches her and determines it best to refer her onward to another program, this status does not apply. In that case, the





## Status Definitions for NFP Box Spreadsheets

reason the client was referred outside of NFP should be the status, i.e. "Did not meet NFP criteria," "Refused participation," or "Program Full."

**Refused Participation:** The referral is pregnant with her first baby, but declined NFP services. This is applicable regardless of whether the refusal was prior to a first visit or after, and regardless of whether income eligibility has been verified.

**Pending:** This applies to any referral that has not reached a final disposition. This referral may be at any number of stages in your site's process, including but not limited to:

1. Newly received, not yet processed or assigned to a nurse
2. Prioritized to be called at a later time because due date is several months away
3. Assigned to a nurse who has not called yet
4. Attempted contact one or more times resulting in messages left
5. Reached but no definitive answer; client wants to check with someone else or do further research and plans to call the nurse back or the nurse will contact again
6. First visit scheduled but not yet enrolled
7. No-show at first visit
8. Nurse or site is currently at or above capacity; client is effectively wait-listed until a vacancy opens on the caseload

A "Pending" referral can be deemed "Unable to locate" when:

1. A nurse has tried to contact the referral and is neither intending to try again nor expecting a response.
2. The referral is 30 days or more past her expected due date. **Note:** if she was still eligible for the program when the referral was received, the designation should always be "Unable to locate," and not "Did not meet NFP criteria." IIK assumes that an attempt is made to reach any referral who is eligible when the referral is passed to the site.

### Transferred to another site

1. The individual lives in a different county than that covered by the NFP site it was originally sent to. Your site has passed this referral on to the appropriate site.
2. Your site is one of multiple sites serving an area and does not have the capacity to process the referral at this time, so the referral has been passed to another agency that is able to take it onto their caseload.

"Transferred to another site" indicates that the referral is now with another site in **Colorado**. If the referral is determined to live outside of Colorado and passed to a different state's NFP program, that referral does not qualify for Colorado NFP and should receive a status of "Did not meet NFP criteria."

**Note:** if you notice a referral has mistakenly made its way into your Box spreadsheet that is clearly not for your site – e.g. the address is in a different county, etc. – you can transfer that information to the other site on your own, making sure that the receiving site knows it is a Medicaid referral, and mark the referral as "Transferred to another site" in Box. The receiving site **must** then add that information into their own Box spreadsheet and make a note in the "Notes" column that the referral was received as a transfer.

**Alternatively,** you can call/email Stephanie (303-839-1808 ext. 104, [shelle@iik.org](mailto:shelle@iik.org)) to have the referral moved into another site's Box spreadsheet. This referral is then removed from your spreadsheet so no further action or status designation is needed, and Stephanie will notify the receiving site that they have a new referral in Box.