Evaluating the Impact of Temporary Rental Assistance

Analysis Plan

1. Overview

This study involves a collaboration with a mid-sized city's housing stability department, which administers a temporary rental assistance program. This program provides up to six months of assistance to eligible applicants, including rental arrears, current month's rent, and up to one future month's rent. In addition, assistance may be used towards late fees, attorney fees, rental bonds, or other fees incurred in the eviction process. This study will evaluate the effect of rental assistance on households' housing stability, likelihood of eviction, likelihood of homelessness, and other socioeconomic outcomes such as self-reported financial security and health.

2. Research Questions

We aim to answer the following research questions:

1. Does receiving rental assistance improve housing stability among vulnerable populations?
2. Does receiving rental assistance reduce the likelihood of eviction among vulnerable populations?
3. Does receiving rental assistance reduce the likelihood of homelessness among vulnerable populations?
4. Does receiving rental assistance improve socioeconomic indicators like self-reported financial security and health among vulnerable populations?

3. Hypotheses

On RQ1-4, we hypothesize that households who receive rental assistance will have improved outcomes compared to households who do not receive rental assistance (i.e., greater housing stability, lower likelihood of eviction or homelessness, better perceived socioeconomic outcomes).

4. Study sample

Our sample will comprise all households who apply to the temporary rental assistance program during the study period and who meet its eligibility criteria. A household is eligible if:

- It has not previously received assistance from the program in 2025
- It has not applied to a similar program administered by the city in conjunction with the local public school system.
- Its income is at or below 80% Area Median Income (AMI)
- Its primary residence is within the program's eligible geographic boundary
- It self-reports experiencing financial hardship

- It has received a formal "Demand for Compliance or Right to Possession," the first step in eviction initiation, or is further along in the eviction process

The housing stability department will accept applications starting from the third Tuesday of each month. Depending on available funding and the number of previously accepted applications, the department will either collect a fixed number of applications or collect applications for a fixed period of time each month. Overall, the program is expected to collect about 475 applications each month.

Implementation timeline

We anticipate that the study will run for a minimum of one year, beginning January 2025, for an estimated total sample of at least 5,500. Survey data collection will begin in April 2025 for the three-month follow-up survey, and October 2025 for the nine-month follow-up survey.

Exclusions

We will exclude applicant households that fail to meet the initial eligibility criteria defined above, as well as duplicate applications from the same household in the same month. A household will be included in the randomization (and therefore the evaluation) if they submit at least one eligible application. In other words, a household that submits one ineligible application and one eligible application will still be included.

5. Experimental design

Intervention

In this study, the 'treatment' group will be eligible to receive the rental assistance program. Rental assistance consists of up to 6 months of financial assistance to cover rental arrears, current month's rent, and up to one future month's rent. In addition, assistance may be used towards late fees, attorney fees, rental bonds, or other fees incurred in the eviction process. Rental assistance payments are typically made directly to applying households' landlords – though in some cases, they may be paid directly to the applicant household.

Applicants randomized to the 'control' group will not be eligible to receive the rental assistance in the month they apply. All households – regardless of experimental condition assignment – can receive any other services the city offers.

All applicant households – regardless of whether they are randomized to the 'treatment' or 'control' group – will be administered a follow-up survey at two timepoints: (1) three months after their initial application; (2) nine months after their initial application.

Randomization strategy

In a stratified, clustered randomization, household applicant clusters will be randomly assigned to either the treatment or control condition. Randomization will be stratified by application priority. Priority is determined by four variables[1]:

- *Homelessness:* Experience of homelessness in past 2 years
- *Mobility:* Mobility (i.e., moved in past 2 years)
- *Income:* Household has income ranging from 0-30% of local AMI
- *Serial Eviction:* Faced 3 or more eviction filings since 2022

The first three variables are collected in the initial rental assistance application. The last variable comes from matching rental assistance application data to local county court records data. For each application, we use the variables to calculate a priority score as follows:

Priority Characteristics	**Likelihood of Randomization to Rental Assistance**
No Priority Indicators OR only *Mobility*	40.0 %
Only *Income*	47.5 %
Only *Homelessness* OR Only *Serial Eviction* OR (*Income* AND *Mobility*)	50.0 %
(*Homelessness* OR *Serial Eviction*) AND One Other Criteria	55.0 %
Three or More Criteria	60.0 %

If a household submits more than one eligible application in a given month, we will randomize the application that corresponds with the highest priority level.

Clustering approach

Data will be provided at the application-level. To account for the possibility that individuals (or multiple individuals from the same household) submit multiple applications within a given month or across months over the course of the study, we will define household clusters, which we presume to represent a single applicant household. These clusters will be formed by grouping five variables: (1) Street Address; (2) Applicant Name; (3) Applicant Date of Birth; (4) Applicant Email; and (5) Applicant Phone Number. Fields (2) and (3) will

[1] For the first three months of the study, we will only use the first three variables (*Homelessness, Mobility,* and *Income*) to determine application priority.

be considered for all adult members listed under a given application.[2] Applications matching on at least three of these five indicators will be grouped together in the same "Household."

We will re-cluster the full sample of applications (i.e., all applications received to date) each month when new applications are added to the sample.

Repeated observations

Because the study will run for at least a year, we anticipate seeing multiple applications from some households both within and across months. When there are multiple applications from the same household in the same month, the application with the highest priority level will be selected for randomization and surplus duplicate applications will be excluded.

Applicants that re-apply in a given month, but have been previously randomized in prior months, will be clustered together with their previous application(s). These applications from households that applied in previous months will be treated differently depending on their original experimental condition assignment. Households that receive rental assistance in a given calendar year are not eligible to receive rental assistance again through the end of the following calendar year (i.e., households receiving rental assistance in January 2025 are not eligible for assistance again until January 2027). Thus, in any given month, any application from a household that applied previously and was assigned to the treatment group will be excluded from (re-)randomization.

Households that are assigned to the control group are eligible to re-apply in subsequent months (as many times as they want). Each month a control group household re-applies, they will be re-randomized. In this case, the priority level will be determined by the new application. If in any given month, they are randomized to the treatment group, they will then be ineligible for randomization in subsequent months as described above.

Due to possible differences in application details used for clustering (e.g., address, email, phone), the monthly re-clustering process may result in a limited number of new household clusters that group together previously separate household clusters, with potentially different treatment statuses (i.e., because two previously observed distinct clusters are re-clustered together when new applications – and thus, new household data/information – are added to the sample). If this occurs, we will consider the household cluster to have received treatment if any of the included applications were ever assigned to treatment.

Balance

Each month, we will check for balance on the following characteristics for the newly enrolled portion of the sample (using this month's randomized treatment status) and for the

[2] Children (i.e., < 18 years old) will not be considered when clustering households such that, e.g., two applications from different parents living at different addresses but listing the same children will be considered to come from distinct households.

full sample over time (using original treatment status, if a household has been randomized more than once):

- (Calculated) Age of the Primary Applicant
- Gender of Primary Applicant (Female, Male, Other gender)
- Race of Primary Applicant (White, Black/African American, Other/Multiracial, Decline to Answer)
- Ethnicity of Primary Applicant (Not Hispanic/Latino, Hispanic or Latino, Decline to Answer)
- Total Household Size (self-reported)
- Number of Children in Household (self-reported)
- Household Total Monthly Income (self-reported)
- Number of months applied (newly enrolled); Number of months applied prior to original randomization (full sample)
- Number of Months of Rent Owed (0 or 1, 2, 3, 4, 5, 6, 7 or more)
- Eviction Stage (Received a rent demand, Received a summons to appear at County Court, received an eviction notice posted to their door from the Sheriff's Department)

Since each stratum is associated with its own assignment ratio, the overall sample is expected to be unbalanced on characteristics that determine priority level, as well as correlated variables. Balance tests will therefore include fixed effects for each priority-level stratum.

If the newly randomized group is unbalanced on any characteristic ($p < 0.05$), not including the stratum variables, we will re-randomize this group. We will also monitor balance in the full sample over time and adjust our re-randomization procedure and threshold to try to minimize imbalances over time.

6. Outcomes and Data

We have 10 main outcomes, drawn from county court data, county Homeless Management Information System (HMIS) data, and program follow-up survey data:

1. Eviction filing (county court data)
2. Eviction execution (county court data)
3. Homelessness (HMIS data)
4. Housing mobility (survey data)
5. Housing insecurity: Housing instability (survey data)
6. Housing insecurity: Missed or partial rent payment (survey data)
7. Housing insecurity: Confidence in ability to pay future rent (survey data)
8. Financial insecurity (survey data)
9. Food insecurity (survey data)
10. Mental health (survey data)

In addition, we have 6 secondary outcomes:

1. Time-to-eviction (county court data)
2. Housing insecurity: Received a demand for rent or eviction notice (survey data)
3. Housing insecurity: Reported experiences of homelessness (survey data)
4. Housing insecurity: Reported one or more indicator of housing instability (survey data)
5. Self-reported perception of program fairness (survey data)
6. Self-reported perception of program benevolence (survey data)
7. Self-reported perception of overall program application experience (survey data)

All outcomes will be constructed at the *household-level*, by taking the "worst" outcome for the measure over all individuals associated with a given household cluster (e.g., for the eviction filing outcome, we will consider a household to have faced a new eviction filing if any household member listed under the application is matched to an eviction filing record).

Outcomes will be constructed based on the time from the *first* randomization (with treatment status likewise defined by the *first* randomization) for households that apply and are randomized multiple times during the study period.

Table 1 describes each outcome in more detail.

Table 1. Outcome construction and definitions

Outcome	Definition	Construction	Data source
Primary outcomes			
Eviction filing	A binary indicator for whether an eviction is filed against an applicant household *after* randomization (the first step in the eviction process)	1 = At least one eviction filing in the (a) three months; (b) six months; (c) nine months; and (d) twelve months following the *first randomization date*, defined by matching a filing to a households' address and/or member name(s).	County Courts Data
Eviction execution	A binary indicator reflecting any writ of restitution has been issued against the tenant *after* randomization (the final step in the formal eviction process).	1 = At least one writ of restitution issuance or execution in the (a) three months; (b) six months; (c) nine months; and (d) twelve months following the *first randomization date*.	County Courts Data
Homelessness	A binary indicator for whether any member of an applicant household engages with any homelessness services in the county	1 = At least one encounter (i.e., presence of an enrollment record) with the county's Continuum of Care in the (a) three months; (b) six months; (c) nine months; and (d) twelve months following the *first randomization date*.	HMIS data

Outcome	Definition	Construction	Data source
Housing mobility	A binary indicator for whether a household's survey respondent reported that they have moved since the month of their initial application.	1 = Respondent selects "Yes" for the question "Since [month of first application], have you moved?" in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Housing insecurity: Housing Instability	A binary indicator for whether a household's survey respondent reported not currently having a stable place to live, based on a three-item survey measure.	1 = Respondent selects "I have a place to live today, but I am worried about losing it in the future" or "I do not have a steady place to live" for the question "What best describes your current living situation?" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Housing insecurity: Missed or Partial Rent Payment	A binary indicator for whether a household's survey respondent reported that they missed or made a partial rent payment since the month of their initial application.	1 = Respondent selects "Missed or made a partial or late rent payment", for the question "Since [month of first application], have you: (select all that apply)" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Housing insecurity: Confidence in Ability to Pay Rent	A binary indicator for whether a household's survey respondent reported low or no confidence in their ability to pay rent.	1 = Respondent selects "Slight confidence" or "No confidence" for the question "How much confidence do you have in your ability to pay next month's rent?" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data

Outcome	Definition	Construction	Data source
Financial insecurity (continuous)	A continuous measure of the household survey respondent's confidence in their ability to pay for a financial emergency.	Continuous measure taking integer values 1 to 10, reverse coded from the survey item "On a scale from 1 (not at all confident) to 10 (extremely confident), how confident are you that you could find the money to pay for a financial emergency that costs about $400?" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Financial insecurity (binary)	A binary indicator reflecting the household survey respondent's confidence in their ability to pay for a financial emergency.	1 = Respondent selects rating less than 5 for the survey item "On a scale from 1 (not at all confident) to 10 (extremely confident), how confident are you that you could find the money to pay for a financial emergency that costs about $400?" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Food insecurity (binary)	A binary indicator reflecting the household survey respondent's self-reported ability to eat enough of the kinds of food the household wanted to eat in the past month.	1 = Respondent selects "Sometimes not enough to eat" or "Often not enough to eat" for the question "For the past month, which of these statements best describes the food eaten in your household?" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data

Outcome	Definition	Construction	Data source
Food insecurity (continuous)	A continuous measure reflecting the household survey respondent's self-reported ability to eat enough of the kinds of food the household wanted to eat in the past month.	Continuous measure taking integer values 1 to 4, where 1 = "Enough of the kinds of food I (we) wanted to eat", 2 = "Enough, but not always the kinds of food I (we) wanted to eat", 3 = "Sometimes not enough to eat", and 4 = "Often not enough to eat" for the question "For the past month, which of these statements best describes the food eaten in your household?" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Mental health (binary)	A binary indicator reflecting the household survey respondent's self-reported feelings of nervousness, anxiety, or being on edge in the past two weeks.	1 = Primary applicant selects "More than half the days" or "Nearly every day" for the question "Over the last 2 weeks, how often have you felt nervous, anxious, or on edge" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Mental health (continuous)	A continuous measure reflecting the household survey respondent's self-reported feelings of nervousness, anxiety, or being on edge in the past two weeks.	Continuous measure taking integer values 1 to 4, where 1 = "Not at all or less than 1 day", 2 = "A couple days", 3 = "More than half the days", and 4 = "Nearly every day" for the question "Over the last 2 weeks, how often have you felt nervous, anxious, or on edge" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Secondary outcomes			
Time-to-eviction	A continuous measure of the time (in days) between a household's initial application and a new eviction filing (the first step in the eviction	Continuous measure of the number of days between a household's *first randomization date* and the date of the first *post-randomization* eviction filed in the County Court against the applicant household.	County Courts Data

Outcome	Definition	Construction	Data source
	process) associated with that household.		
Housing insecurity: Received a demand for rent or eviction notice	A binary indicator for whether a household's survey respondent reported that they received a rent demand or an eviction notice since the month of their initial application.	1 = Respondent selects "Received a rent demand or an eviction notice", for the question "Since [month of first application], have you: (select all that apply)" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Housing insecurity: Reported experiencing homelessness	A binary indicator for whether a household's survey respondent reported that they experienced homelessness since the month of their initial application.	1 = Respondent selects "Experienced homelessness", for the question "Since [month of first application], have you: (select all that apply)" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Housing insecurity: Reported one or more indicator of housing instability	A binary indicator for whether a household's survey respondent reported experiencing one or more indicator of housing instability since the month of their initial application.	1 = Respondent selects one or more of nine response options ("Temporarily stayed at someone else's home because of a loss of housing, an economic hardship, or a similar reason"; "Missed or made a partial or late rent payment"; "Received a rent demand or an eviction notice"; "Missed or made a partial or late utility payment"; "Received a utility shut off notice"; "Spent time in a healthcare facility"; "Spent time in a detention facility"; "Had difficulty paying for other necessities in order to pay housing costs"; "Experienced homelessness") for the question "Since [month of first application], have you: (select all that apply)" included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Self-reported perception of program fairness	A binary indicator capturing whether a household survey respondent believes	1 = Respondent selects "Strongly Agree" or "Agree" for the question "To what extent do you agree or disagree: I was treated fairly when applying for the	Follow-Up survey data

Outcome	Definition	Construction	Data source
	they were treated fairly when applying for the rental assistance program.	rental assistance program", included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	
Self-reported perception of program benevolence	A binary indicator capturing whether a household survey respondent believes that rental assistance program staff are acting in their best interests	1 = Respondent selects "Strongly Agree" or "Agree" for the question "To what extent do you agree or disagree: I trust that the people who work for the rental assistance program are acting in my best interests", included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Self-reported perception of overall program application experience	A binary indicator capturing whether a household survey respondent believes that the overall rental assistance application process was positive.	1 = Respondent selects "Strongly Agree" or "Agree" for the question "To what extent do you agree or disagree: Overall, my experience applying for the rental assistance program was positive", included in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively.	Follow-Up survey data
Robustness check outcomes			
Eviction judgement (any evidence)	A binary indicator for whether there is any administrative or self-reported evidence that a household was evicted	1 = primary measure of eviction judgement is equal to one OR the primary applicant reports "I was evicted after an eviction hearing" since the month of their initial application in the (a) three-month and (b) nine-month follow-up survey of applicants, fielded three and nine months following the *first randomization date*, respectively	County Courts Data; Follow-Up survey data
Homelessness (any evidence)	A binary indicator for whether there is any administrative or self-reported evidence that a household member	1 = primary measure of homelessness is equal to one OR the primary applicant reports "Experiencing homelessness" since the month of their initial application in the (a) three-month and (b) nine-month follow-up survey of	HMIS data; Follow-Up survey data

Outcome	Definition	Construction	Data source
	experienced homelessness	applicants, fielded three and nine months following the *first randomization date*, respectively	

7. Analyses

a. *Analytic sample*

The analytic sample for primary analyses will include all household clusters who are randomized at least once during the course of the study.

b. *Unit of analysis*

As noted above, outcomes will be constructed at the household level and will be defined by taking the "worst" outcome value over all individuals associated with a given household cluster (if applicable). In particular,

i. For eviction filing and eviction execution outcomes based on County Courts data, we will consider a household to have faced an eviction filing/execution if any member across applications associated with the household cluster is linked to an eviction/filing in the County Courts data.

ii. For outcomes based on HMIS data, we will consider a household to have experienced homelessness if any member across applications associated with the household cluster is linked to an HMIS enrollment record.

iii. For outcomes based on follow-up survey data, in the rare case that surveys are fielded to multiple members of the same household cluster[3], we will reconcile as follows:

1. **Housing mobility**: we will consider a household to have moved if any survey respondent in the household cluster indicates that they have moved since their initial rental assistance application was submitted.
2. **Housing instability**: we will consider a household to have unstable housing if any survey respondent in the household cluster indicates that they do not currently have a stable place to live.
3. **Missed or partial rent payment**: we will consider a household to have missed or made a partial rent payment if any survey respondent in the household cluster indicates that they have missed or made a partial rent payment since their initial rental assistance application was submitted.
4. **Confidence in ability to pay rent (binary)**: we will consider a household to have low confidence in their ability to pay future rent if the minimum response provided by any survey respondent in the household cluster to the question, "How much confidence do you have

[3] A single household would only receive multiple follow-up surveys in the event that (a) multiple members of the household applied to the program and were initially clustered separately; (b) these household members *were not* reclustered together prior to fielding of the three-month or nine-month follow-up survey; and (c) these household members *were* reclustered together after fielding the three-month or nine-month follow-up survey.

in your ability to pay next month's rent?" is "No confidence" or "Slight confidence".

5. **Financial insecurity (continuous)**: we will use the *minimum* response provided by any survey respondent in the household cluster to the question "On a scale from 1 (not at all confident) to 10 (extremely confident), how confident are you that you could find the money to pay for a financial emergency that costs about $400?"
6. **Financial insecurity (binary)**: we will consider a household to be financially insecure if the minimum response provided by any survey respondent in the household cluster to the question "On a scale from 1 (not at all confident) to 10 (extremely confident), how confident are you that you could find the money to pay for a financial emergency that costs about $400?" is less than 5.
7. **Food insecurity (continuous)**: we will use the *maximum* response provided by any survey respondent in the household cluster to the question "For the past month, which of these statements best describes the food eaten in your household?", where the lowest response is "Enough of the kinds of food I (we) wanted to eat" and the highest response is "Often not enough to eat".
8. **Food insecurity (binary)**: we will consider a household to be food insecure if the *maximum* response provided by any survey respondent in the household cluster to the question "For the past month, which of these statements best describes the food eaten in your household?" is "Sometimes not enough to eat" (3) or "Often not enough to eat" (4).
9. **Mental health (continuous)**: we will use the *maximum* response provided by any survey respondent in the household cluster to the question "Over the last 2 weeks, how often have you felt nervous, anxious, or on edge?", where the lowest response is "Not at all or less than 1 day" and the highest response is "Nearly every day".
10. **Mental health (binary)**: we will consider a household to have poor mental health if the *maximum* response provided by any survey respondent in the household cluster to the question "Over the last 2 weeks, how often have you felt nervous, anxious, or on edge?", is "More than half the days" (3) or "Nearly every day" (4).

c. *Missingness*

Because all outcomes are based on linking outcome data to randomization data, we anticipate that all outcomes will have some degree of missingness:

- For outcomes based on County Courts data and HMIS data, analyses will be conducted on the full sample of households. Households who are not observed in the linked data will be assumed to have *not* experienced the associated outcome (e.g., we assume that households who are not observed in the County Courts eviction filings data have not received an eviction filing).
- For outcomes based on follow-up survey data, primary analyses will be conducted for the subsample of households who respond to each survey wave.

- Additional analyses of the "Housing mobility" and "Housing insecurity: Experiencing Indicators of Insecurity" outcomes based on the nine-month follow-up survey will extrapolate outcomes where possible based on responses to the three-month follow-up survey (e.g., a household who responds to the three-month follow-up survey and indicates that they have moved will be included in this secondary analysis, even if they do *not* respond to the nine-month follow-up survey.)

d. *Statistical models for each RQ*

Main Analysis:

Given expected two-sided non-compliance (i.e., due to households initially assigned to the control group who are later re-assigned to treatment and households assigned to treatment who do not end up receiving rental assistance) we will calculate a two-stage least squares (2SLS) estimator as follows:

$$(1)\ \textbf{First Stage}:\ RA_h = \gamma_0 + \gamma_1 TREAT_h + \boldsymbol{X'}_h\gamma_2 + \delta + \nu_h$$

$$(2)\ \textbf{SecondStage}: Y_{h,t} = \beta_0 + \beta_1 \widehat{RA_h} + \boldsymbol{X'_h}\beta_2 + \delta + u_h$$

where $Y_{h,t}$ is the outcome measure Y (i.e., each of the outcomes described in Table 1) for household h at time t from the initial randomization date, where $t \in \{3\ months, 6\ months, 9\ months, 12\ months\}$; $TREAT_h$ is a binary indicator for household h's initial random assignment to the treatment group; RA_h is an indicator variable for whether an applicant household receives rental assistance at any point; $\boldsymbol{X}_h$ is a vector of observable household characteristics, including month-of-initial randomization fixed effects; and δ are randomization priority strata fixed effects.

Household characteristics included in $\boldsymbol{X}_h$ are: primary applicant race, primary applicant ethnicity, total household size, number of children in the household, number of months of rent owed, and eviction stage at time of application. All household characteristics and randomization priority strata will be defined based on the first randomized application.

Our parameter of interest in the second stage regression, β_1, will be interpreted as the effect of receiving rental assistance on a given outcome, relative to not receiving rental assistance. We will use robust standard errors in all analyses, and we will reject the null hypothesis that rental assistance has no effect on outcomes if $p < 0.05$. The key exclusion restriction is that there is no effect of initial treatment assignment on the outcome measures, except through the effect of assignment on receipt of rental assistance. Otherwise stated, we have to assume that there is no effect of losing the initial assignment lottery and re-applying for rental assistance in a subsequent month

– i.e., the effect of treatment is the same whether it's received in month 1 or after reapplying in month 2.

Secondary Analyses:

In additional analyses, we will estimate the effect of ever receiving rental assistance using the following model:

$$(3)\ Y_{h,t} = \alpha_0 + \alpha_1 EVTREAT_h + \boldsymbol{X'_h}\alpha_2 + \delta + u_h$$

where $EVTREAT_h$ is an indicator for whether the household was *ever* randomly assigned to treatment and all other parameters are defined as before. Outcomes will continue to be defined as above – that is, based on the time from *initial* randomization.

The key assumptions for this model to produce unbiased estimates are (a) the effect of treatment is the same whether it is received the first time one applies or after a subsequent application; and (b) there are no unobservable differences between the types of people that apply more than once and those that only apply a single time.

Because (b) is unlikely to hold true, we will also conduct the following sensitivity analyses:

$$(3)\ Y_{h,t} = \alpha_0 + \alpha_1 TREAT_h + \boldsymbol{X'_h}\alpha_2 + \delta + u_h$$

$$(4)\ Y_{h\in H_1,t} = \alpha_0 + \alpha_1 TREAT_h + \boldsymbol{X'_h}\alpha_2 + \delta + u_h$$

Where (3) is an intention-to-treat (ITT) analysis including all households h who are randomized according to their initial random assignment status $TREAT_h$; and (4) is an ITT analysis including only those households $h \in H_1$ who apply for the rental assistance program in only one month during the course of the study.

e. Robustness check on household definition

To ensure our results are not sensitive to our clustering approach, we will conduct robustness checks for all analyses with outcomes constructed using a more liberal approach to household clustering, whereby applications are clustered together as a single household if they match on at least two of the five household indicators: (1) Street address; (2) Applicant Name; (3) Applicant Date of Birth; (4) Applicant Email; and (5) Applicant Phone Number. As above, outcomes will be constructed by taking the maximum value at the cluster-level. Initial treatment assignment will be defined based on the maximum value of the earliest assignment month, and household characteristics will be drawn from the application associated with the earliest randomized application.

8. Exploratory Analyses

a. Heterogeneous treatment effects

We will evaluate RQs 1-4 to estimate heterogeneous effects of treatment on households using an interacted 2SLS approach:

(5) **1st Stage**: $\widehat{RA_h * SG_h} = \gamma_0 + \gamma_1 TREAT_h + \gamma_2 SG_h + \gamma_3 (TREAT_h * SG_h) + \boldsymbol{X'}_h \gamma_4 + \delta + \nu_h$

(6) **2nd Stage**: $Y_{h,t} = \beta_0 + \beta_1 \widehat{RA_h} + \beta_2 SG_h + \beta_3 (\widehat{RA_h * SG_h}) + \boldsymbol{X'_h} \beta_4 + \delta + u_h$

where SG_h takes the form of an indicator variable(s) used to distinguish moderators of interest. Analyses will be conducted for the following moderators:

- *Priority level:* categorical variable for priority level, defined by the probability of assignment to the treatment group (40%, 47.5%, 50%, 55%, 60%)
- *Race/Ethnicity:* categorical variable for race/ethnicity with levels: (non-Hispanic) White, (non-Hispanic) Black, Hispanic, and (non-Hispanic) Other race
- *Child vs. no child households:* indicator for presence of children in the household
- *Household income:* continuous measure of total monthly household income
- *Census tract characteristics:* including but not limited to:
    - Median rent
    - Inequality (Gini index)
    - Rate of households receiving SNAP/cash assistance
    - Level of eviction severity, reflecting terciles of the number of eviction filings per 100 households from 01/01/2024 – 01/01/2025
- *Prior Experience with Eviction:* an indicator for whether a member of the household faced an eviction filing more than 90 days prior to their first randomization[4]
    - *Serial Evictee status:* an indicator for whether the household members have (collectively) faced 3 or more eviction filings in the 2 years prior to their first application.
- *Prior experiences of homelessness:* an indicator for whether the household self-reports experiencing homelessness in the 2 years prior to their application OR whether a member of the household is matched to HMIS homelessness services enrollment data in the 2 years prior to their application.

[4] Many applicant households are expected to have a pre-randomization eviction filing, given that a household must have received a formal "Demand for Compliance or Right to Possession", or be further along in the eviction process to be eligible. This subgroup is thus restricted to those with an eviction filing 90 or more days prior to their first randomization, to capture possible heterogeneous effects for those who have prior experience with the eviction process (i.e., those who are *not* experiencing the eviction process for the first time).

9. Power calculations

Constraints: power = 0.8, alpha = 0.05

For binary outcomes:

Outcome	**N**	**Base rate** (percentage)	**MDE** (percentage points)
Eviction filings (court data)	N=5500	27%*	3.29 pp
Eviction executions (court data)	N=5500	16%*	2.67 pp
Homelessness (HMIS data)	N=5500	14%^	2.52 pp
Housing mobility (survey data)	N=5500	48%^	3.77 pp
Unstable housing (survey data)	N=880	72%^	8.83 pp
Housing insecurity experiences (survey data)	N=880	80%^	8.06 pp
Low confidence in ability to pay rent (survey data)	N=880	60%^	9.38 pp
Financial insecurity	N=880	63%[!]	9.30 pp
Food insecurity	N=880	14%[†]	5.91 pp
Poor mental health	N=880	48%[#]	9.35 pp

* Base rate assumed based on rate for 2024 applicants
^ Base rate assumed based on 2024 applicant survey data
[!]Base rate assumed based on national statistics from the Federal Reserve
[†] Base rate assumed based on national statistics from the Food Research and Action Center
[#] Base rate assumed based on Collinson et al.

For continuous outcomes:

Outcome	**N per group**	**MDE**
Financial security	N=880	0.19 SD

10. IRB approval

This study was approved by the Harvard University IRB, protocol #24-1554.