Syracuse University
Maxwell School of
Citizenship & Public Affairs

Maxwell X Lab

Testing Support for Septic Tank Replacement Subsidies Results

Survey Design

This survey aimed to understand how homeowners who are 18 years of age or older, who live near a body of water in the Northeast region of the United States, and who own a septic tank respond to subsidy support for replacing their septic systems. All three of these conditions had to be met to remain in the study. Each survey respondent was randomly assigned to one of four groups:

1. Treatment group 1 - given information on a government program that provides a $5,000 subsidy for a $20,000 septic tank replacement cost (n=290)
2. Treatment group 2 - given information on a government program that provides a $10,000 subsidy for a $20,000 septic tank replacement cost (n=292)
3. Treatment group 3 - given information on a government program that provides a $12,000 subsidy for a $20,000 septic tank replacement cost (n=289)
4. Treatment group 4 - given information on a government program that provides a $16,000 subsidy for a $20,000 septic tank replacement cost (n=285)

The survey was administered virtually using Syracuse University's Qualtrics software. The survey was distributed starting August 31st, 2023. The last day data were collected was September 6th, 2023.

Survey Questions

The survey consists of thirteen items across three different categories: screener questions, demographic information, and experimental outcomes. See the Appendix for the complete survey. Screening questions ensured all participants were homeowners, had a septic system, lived near a body of water in New York, New Jersey, Massachusetts, New Hampshire, Maine, Connecticut, or Vermont, and were 18 years of age or older. We then asked demographic questions, including age, sex, race, income, education, and property type.

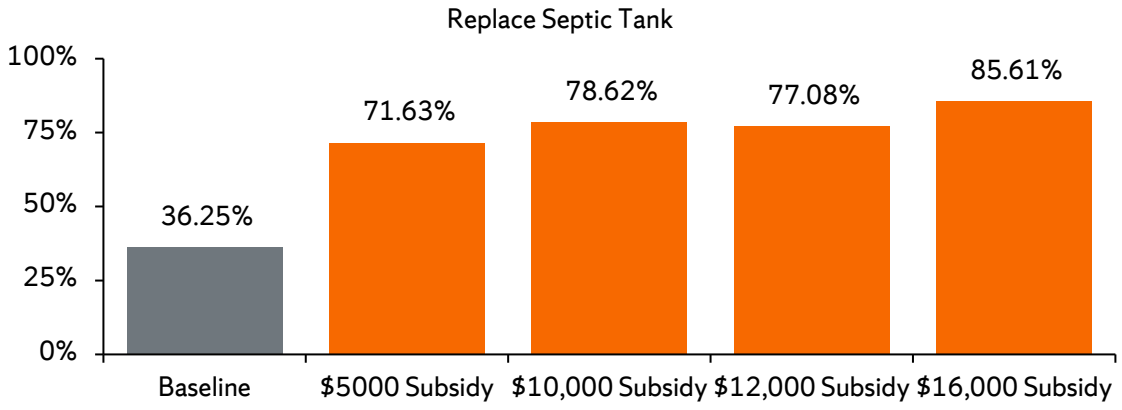
For the experiment, all respondents were given information about the consequences of older septic systems on nearby waterbodies and groundwater, the heightened risks of floods for those systems, and the approximate cost of getting a new septic system to prevent these consequences (see Appendix A for the survey). All respondents were then asked if they planned to replace their septic system in the next year (baseline). Also, each experimental group was asked to consider a septic system replacement subsidy program that would be implemented in the next year that would provide a grant toward the

cost of a new septic system. The respondents were informed that there would be an application process, but everyone who applies will receives the subsidy. Each group was told a different subsidy amount for the grant. All respondents were then asked to answer if they would consider replacing their septic system with the subsidy support (yes or no).

Results

The survey experiment suggests that without a subsidy, around a third of the respondents reported considering replacing their septic system within the year (see gray bar). However, after providing information on a possible subsidy to cover some proportion of the cost of replacing a septic system, respondents likelihood of replacing their system increased substantially. For those who were offered the lowest subsidy ($5,000), their reported likelihood of replacement more than doubled increasing from 36 percent to around 72 percent. One finds similar increases for all of the subsidy levels; in each case the subsidy more than doubles the reported likelihood of septic system replacement.

Figure 1.



We ran a series of regression models to determine if the size of the different subsidy amounts affected the likelihood of the respondent reporting that they intended to replace their septic system. Relative to those who were offered the $5,000 subsidy, only the respondents who were offered $16,000 reported a statistically significantly higher likelihood of replacing their septic system. This suggests that simply offering a $5,000 subsidy will increase the replacement level considerably and increases to $10,000 or $12,000 does not improve the reported likelihood of septic system replacement. While statistically, there is a small increase in the likelihood of septic system replacement at a $16,000 subsidy, the change may not be worth the additional cost for government agencies.

Income

In addition to the models run for the pooled sample reported above, we also partitioned the results by income level.

Outcomes varied across respondents in different income groups. Figure 2 shows the changes in responses regarding the likelihood of replacing their septic systems in the next year for respondents making less than $50,000 a year. Across the treatment groups, the baseline group means for respondents who made less than $50,000 a year were lower than reported in the full sample. Less affluent homeowners were less likely initially to replace their septic tanks without a subsidy with baseline replacement rates at 30%. After a subsidy amount was offered, less affluent homeowners in all treatment groups were substantially more likely to replace their system, similar to the results for the full sample. Figure 3 illustrates results for homeowners with income between $50,000 to $100,000 demonstrating similar patterns.

Figure 2.

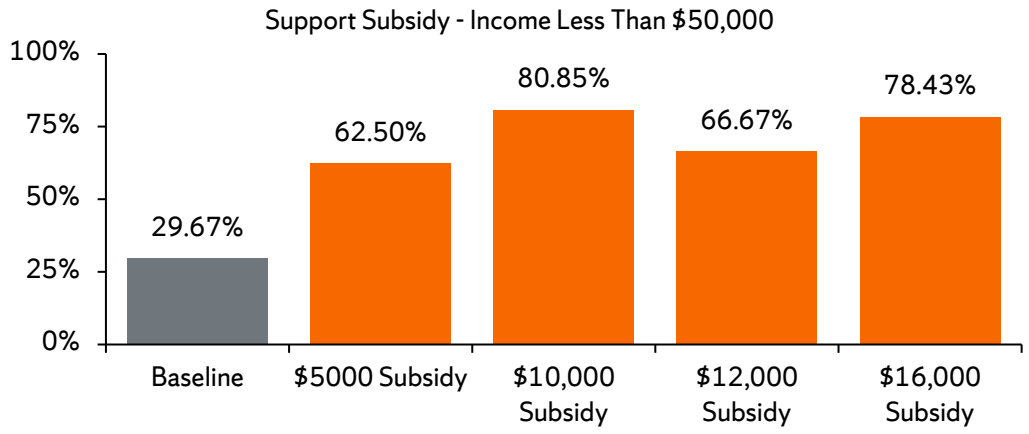


Figure 3.

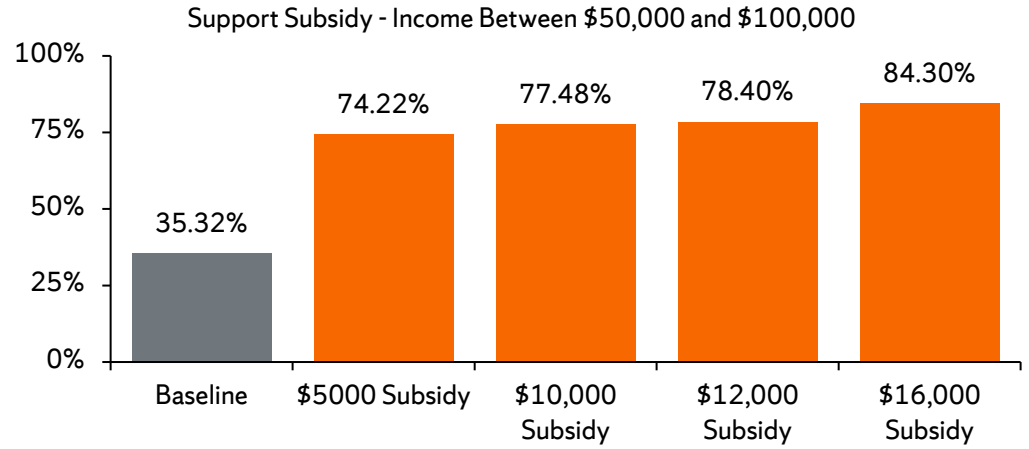
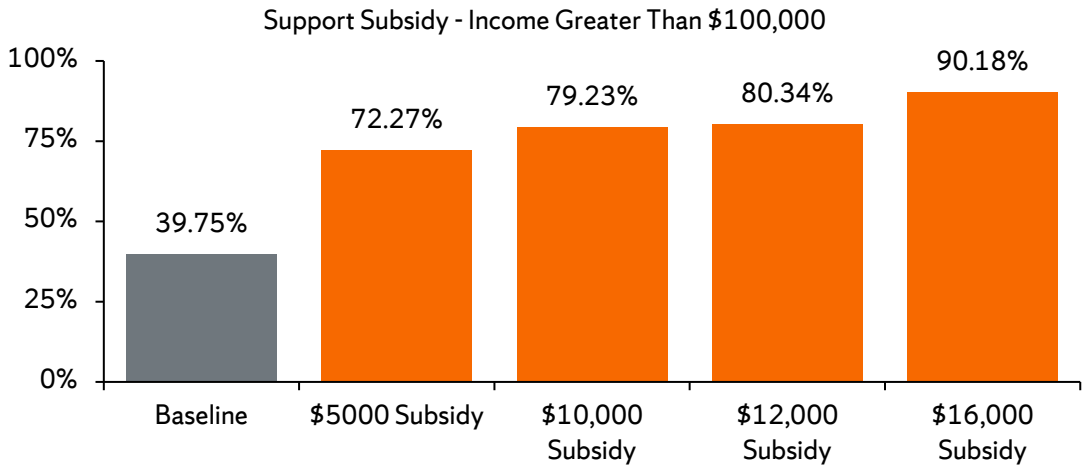


Figure 4 shows the changes in responses regarding the likelihood of replacing septic systems in the next year for respondents making more than $100,000 a year. Perhaps unsurprisingly, these more affluent

homeowners were more likely to report that they intended to replace their septic tank at baseline (40%). After a subsidy amount was offered, more affluent homeowners in all treatment groups were substantially more likely to replace their systems. Again, we see little difference in the change in likelihood of replacing the system beyond the $5,000 subsidy. However, for this group, 90% reported that they would replace their system if offered a $16,000 subsidy.

Figure 4.



Drinking Water

We also partitioned the results by respondent awareness of their drinking water source and how their septic system may impact the water source. Specifically, we asked respondents if they knew their source of drinking water, if they knew whether their septic system is located on or near a drinking water source, and if they were concerned about pollution from failing septic systems on their water source.

Figures 5, 6, and 7 below show the variation in responses by subsidy amount for participants. Figure 5 demonstrates that approximately 38% of respondents who were aware of their drinking water source reported that they will replace their septic system within the year. Similar to the previous results, the percentage of participants willing to replace their septic system nearly doubles when offered any subsidy amount. However, for participants that are not aware of their drinking water source, a much lower percentage report an initial willingness to replace their system, suggesting that simply informing them they reside near a drinking source may improve septic replacement rates. Providing a subsidy to this population has a large impact, as the percentage of participants willing to replace their system nearly triples at any subsidy amount offered.

Figure 6 presents findings on the willingness to replace septic systems for participants that have septic systems on or near their drinking water source compared to those who do not. Here, nearly 50% of the

respondents whose septic system is on or near their drinking water source, are willing to replace their system within the year. Providing a $16,000 subsidy jumps that percentage up to 90%. Providing a subsidy may push nearly all respondents with a septic system on or near a drinking water source to replace their systems. On the other hand, the baseline willingness to replace a septic system for respondents whose systems are not on or near a drinking water source is very low (16%). For this group, offering a subsidy has a very large impact. Offering a $5,000 subsidy triples the likelihood of this group of homeowners to replace their systems.

Figure 5.

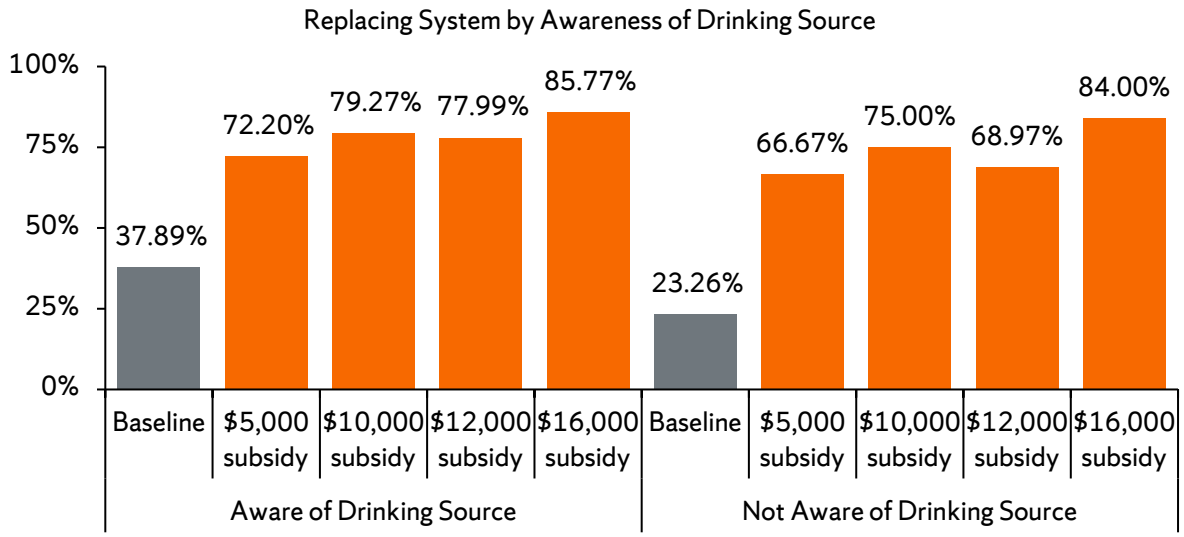


Figure 6.

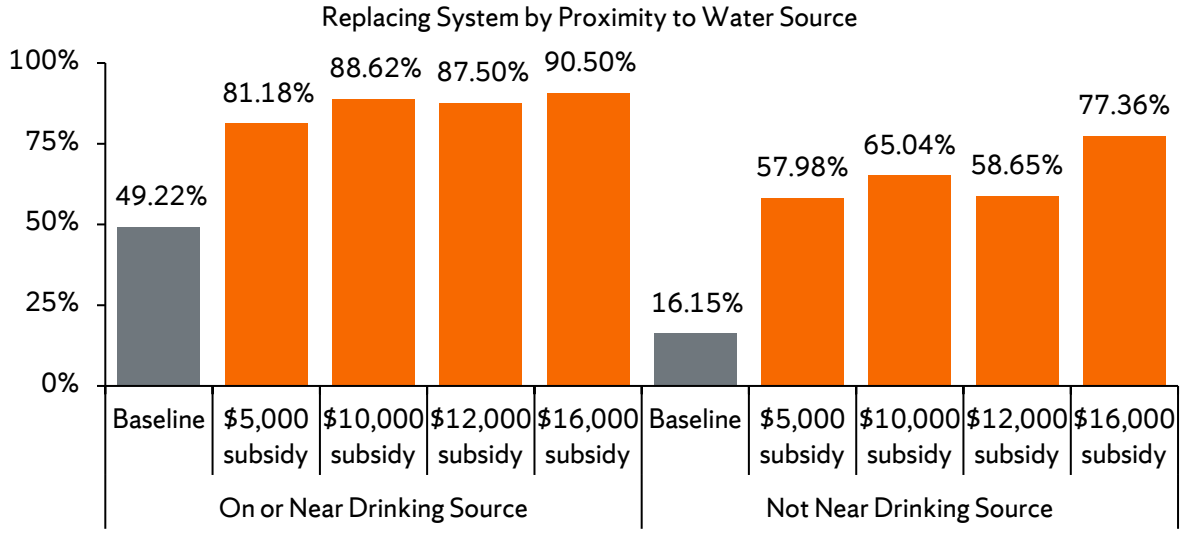
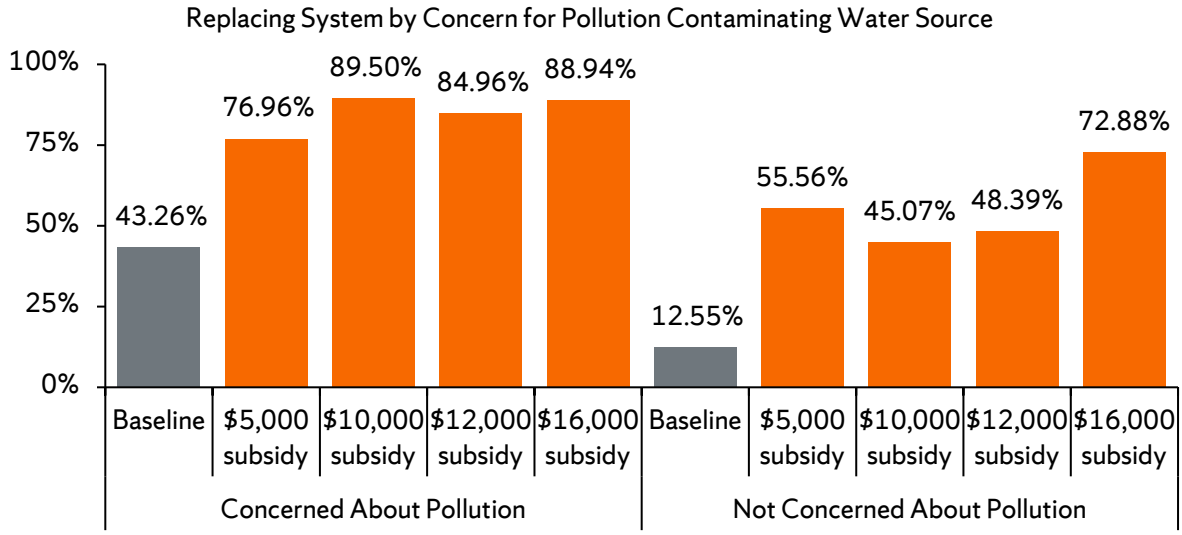


Figure 7 shows a similar pattern. Of respondents that are concerned about pollution from failing septic systems impacting their drinking water, 43% are willing to replace their systems within a year. After a subsidy is offered, this percentage doubles. Again, simply providing a subsidy of any amount, increases the likelihood of replacing septic systems. For respondents who are not worried about septic systems polluting the water source, only 13% were willing to replace their system within the year. Providing any subsidy to this group greatly increased their willingness to replace their septic systems.

Figure 7.



Findings

This study was designed to estimate the importance of subsidies to homeowners who have properties near a body of water when considering if they will replace their septic systems. Every respondent received information on the risks of outdated septic systems, and then were asked their likelihood of replacing their septic system without a subsidy, and with a subsidy. It is unclear how much the priming that was done in the introduction to the survey - the information on the consequences of flooding for those with older septic tanks- affected the baseline levels reported. As all experimental groups were given this information, the baseline levels reported may have been higher than would have been the case without the priming information.

In evaluating the impact of subsidy amounts on the likelihood of replacing septic systems, several findings surfaced:

1. At baseline, around a third of the full sample reported being likely to replace their septic systems in the next year.

2. Respondents who were offered a $5,000 subsidy were 38 percentage points more likely to replace their septic system relative to no subsidy. One finds similar increases for all of the subsidy levels; in each case the subsidy increases the reported likelihood of septic system replacement.
3. More affluent households had a higher baseline likelihood of replacing their systems in the next year. Providing any subsidy amount substantially increased their willingness to replace their septic system.
4. Only 23% of respondents who were not aware of their drinking water source were willing to replace their septic systems. Providing a subsidy to this group tripled the number of respondents willing to replace their system within the year. Subsidy amount did not matter.
5. Only 16% of respondents whose septic systems are not on or near a drinking water source were willing to replace their septic system. Again, providing a subsidy of any amount to this group tripled the number of respondents willing to replace their system within the year.
6. Findings reported in items 4-5 suggest that informing homeowners that they live near a drinking water source may increase septic system replacement without a subsidy.
7. Finally, only 13% of respondents who were not worried about the pollution impact of failing septic systems on drinking water sources were willing to replace their septic system. A $16,000 subsidy to this group led to a 60 percentage point increase in their willingness to replace their septic system.

Appendix A:

Septic System Subsidy Survey

My name is Leonard Lopoo, and I am a professor at Syracuse University. I am inviting you to participate in a research study.

I am interested in learning about families who live near bodies of water in New York, New Jersey, Massachusetts, New Hampshire, Maine, Connecticut, or Vermont and their use of septic tanks. In this survey you will be asked to read a vignette describing the impact of septic systems on waterbodies and groundwater, and your opinions on septic tank replacement. I am also interested in your opinions on possible subsidies to help with the cost of septic tank replacements. A subsidy is a partial payment from the government to reduce your total cost for septic replacement. This will take approximately 8 minutes of your time. Your individual responses will remain completely anonymous.

Involvement in the study is voluntary. This means you can choose whether to participate and that you may withdraw from the study at any time without penalty. If you have any questions, concerns or complaints about the research please contact Leonard Lopoo (lmlopoo@syr.edu).

Whenever one works with email or the internet, there is always the risk of compromising privacy, confidentiality, and/or anonymity. Your confidentiality will be maintained to the degree permitted by the technology being used. It is important for you to understand that no guarantees can be made regarding the interception of data sent via the internet by third parties.

By continuing, you are agreeing to participate in the survey and acknowledging that you are 18 years of age or older.

Thank you again; I really appreciate your help!

End of Block: Intro

Start of Block: Screener

Q2 Are you a homeowner?

- Yes
- No [If no, drop]

Q3 Do you live near a body of water in New York, New Jersey, Massachusetts, New Hampshire, Maine, Connecticut, or Vermont?

- Yes
- No [If no, drop]

Q4 Do you have a septic system?

- Yes
- No [If no, drop]

Q5 How old is your septic system?

- Less than 5 years old
- 5-10 years old
- 10-20 years old
- More than 20 years old
- Don't know

End of Block: Screener

Start of Block: Attention Screener

Q6 For this research project, careful attention to survey questions is critical! To show that you are paying attention, please select "I have a question."

- I understand
- I don't understand
- I have a question

Q7 You didn't select the correct answer to our last question. Your attention to the survey questions is very important to our research, so we'd like to give you another chance to respond. To show that you are paying attention, please select "I have a question."

- I understand
- I don't understand
- I have a question

Q8 You have answered our questions incorrectly. We can only accept surveys from people who are paying attention so we are ending this survey.

End of Block: Attention Screener

Start of Block: Demographic Questions

Q9 What is your age?

- Under 18 years old
- 18- 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65 - 74
- 75 - 84
- 85 or older

Q10 What is your race? You can select multiple.

- Hispanic or Latino
- White
- Black or African American
- Native Hawaiian or Other Pacific Islander
- Asian
- Native American and Alaska Native
- Other

Q11 What is your sex?

- Male
- Female
- Intersex
- Prefer not to say

Q12 Please check your highest level of education completed.

- No high school
- High school diploma or equivalent
- Associate degree
- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate degree

Q13 Please check the most appropriate category for your coastal property.

- Primary residence

- Vacation home (secondary home)
- Investment property (property you rent for additional income)

Q14 What was your total household income last year.

- Less than $25,000
- $25,000 - $50,000
- $50,001 - $75,000
- $75,001 - $100,000
- Greater than $100,000

End of Block: Demographic Questions

Start of Block: Survey Experiment Introduction

Q15 Properly maintained septic systems have little to no effect on nearby waterbodies and groundwater under normal conditions. However, older systems (20-30 years old), and systems that have not been regularly maintained (pumped out every 2-3 years), may discharge sewage directly into the groundwater. In this case, the wastewater is not treated to reduce pathogens or nutrient levels, which can negatively impact the quality of groundwater or nearby waterbodies. Additionally, flood events can more easily overwhelm older systems, leading to sewage back-ups and system failures. A new septic system usually costs around $20,000.

End of Block: Survey Experiment Introduction

Start of Block: Survey Experiment

Q16 Do you plan to replace your septic system in the next year?

- Yes
- No

[Treatment group 1]

Q17 Suppose your local government has a septic system replacement subsidy program for the next year that would provide a grant worth $5,000 toward the cost of a new septic system. There is an application process, but everyone who applies receives the subsidy. Would you apply and replace your septic system in the next year?

- Yes
- No

[Treatment group 2]

Q18 Suppose your local government has a septic system replacement subsidy program for the next year that would provide a grant worth $10,000 toward the cost of a new septic system. There is an application process, but everyone who applies receives the subsidy. Would you apply and replace your septic system in the next year?

- Yes
- No

[Treatment group 3]

Q19 Suppose your local government has a septic system replacement subsidy program for the next year that would provide a grant worth $12,000 toward the cost of a new septic system. There is an application process, but everyone who applies receives the subsidy. Would you apply and replace your septic system in the next year?

- Yes
- No

[Treatment group 4]

Q20 Suppose your local government has a septic system replacement subsidy program for the next year that would provide a grant worth $16,000 toward the cost of a new septic system. There is an application process, but everyone who applies receives the subsidy. Would you apply and replace your septic system in the next year?

- Yes
- No

End of Block: Survey Experiment

Start of Block: Drinking Water

Q22 Do you agree or disagree with the following statements?:

Q23 I know the source of my drinking water (such as a surface water body, residential well, or groundwater source).

- Agree
- Disagree

Q24 My septic system is located on or near a drinking water source such as a lake, pond, tributary leading to a drinking water source, or groundwater aquifer.

- Agree
- Disagree

Q25 I am concerned about pollution from failing septic systems impacting water quality in my community.

- Agree
- Disagree

End of Block: Drinking Water