Incentivizing Self-Protection From Wildfires

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PRELIMINARY AND INCOMPLETE

Abstract

This paper reports on a field experiment to incentivize homeowners to reduce their susceptibility to wildfire property damage. In partnership with a local fire district in Jackson County, Oregon, we delivered randomized treatments designed to encourage residents to utilize existing programs to increase wildfire resilience. We find that financial incentives led to significant increases in requests for free defensible space inspections, but information-only treatments did not. Surprisingly, doubling of the financial incentive from $250 to $500 did not further increase takeup. Takeup was higher for high-value homes and areas with lower social vulnerability indices, but mostly uncorrelated with wildfire hazard. These findings can inform future wildfire resilience programs and speak to the potential importance of financial incentives for achieving efficient adaptation.

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1 Introduction

Natural disaster losses as a share of GDP in the United States increased by a factor of five from the 1960's to the 2020's.[1] Efficient adaptation to these escalating risks will require greater takeup of protective investments and behaviors that have been shown to be cost-effective yet are not widely adopted.

Among weather disasters, wildfires are one of the fastest-growing perils. Wildfire risk can be mitigated at low cost by managing vegetation and other flammable material near homes to establish "defensible space" (Cohen 2000; Syphard, Brennan, and Keeley 2014). Despite a proliferation of information and outreach campaigns, takeup of these self-protective investments is low.[2] Local governments across North America are increasingly deploying outreach and incentive programs to overcome barriers to investment in defensible space, but there has been limited empirical validation of these programs or the underlying economic frictions that limit takeup.

We ran a randomized field experiment to evaluate the effects of monetary and non-monetary interventions on encouraging homeowners to invest in defensible space. We partnered with Jackson County Fire District 3 (JCFD3), a local fire protection district in Southern Oregon. Homeowners (N = 4,662) were assigned at random to either a control group or one of several treatment groups: A) an "Information" group that received a letter encouraging them to contact JCFD3, B) a "Moral Suasion" group that received the same information plus information about the community benefits of protecting their homes, C) a

1. Our World in Data based on EM-DAT, CRED / UCLouvain, Brussels, Belgium – www.emdat.be (D. Guha-Sapir) – processed by Our World in Data.

2. For example, 62% of homes studied by James R. Meldrum et al. (2015) have overgrown or unmaintained vegetation within 30 feet and 94% have other combustibles (firewood, propane tanks, etc.) within 30 feet.

"$250 Subsidy" group that was offered a $250 reward if they contacted JCFD3 and passed a defensible space assessment, and D) a "$500 Subsidy" group that was similarly offered a $500 reward.

The primary outcome we consider is whether a household got in touch with JCFD3 to request a defensible space assessment during the treatment period. Contact rates are nearly zero in the absence of our experimental outreach. The two non-financial interventions (Information and Moral Suasion) have slightly increased response rates relative to the control group, but neither is statistically different. By contrast, nearly 10% of the subsidy groups get in touch with JCDF3. Surprisingly, the $250 group initiates contact a slightly higher rate than the $500 group.

We also examine how takeup rates varied with home and area characteristics. Residents of homes with higher assessed values were more likely to respond to the treatment offers, as well as residents in areas that ranked lower on Oregon's Social Vulnerability Index. Surprisingly, residents of higher wildfire risk areas were no more or less likely than residents in lower wildfire risk areas. Finally, a neighbor nudge treatment designed to notify homeowners when their neighbors contacted JCFD3 to encourage them to do so as well was ineffective at encouraging further participation.

The development of our experiment was guided by existing research on self-protection from wildfire and other natural disasters. Most previous work in this area is qualitative and survey-based, reporting correlations between survey responses, homeowner characteristics, and reported or observed mitigation behavior. These studies identify a range of factors including risk perception, neighbor spillovers, social context,

aesthetic preferences, past wildfire experience, and financial barriers as possible factors affecting these self-protection decisions (e.g., Hannah Brenkert–Smith and Flores 2006; McGee, McFarlane, and Varghese 2009; Brenkert-Smith, Champ, and Flores 2012; McCaffrey et al. 2011; Olsen et al. 2017). We are aware of only one previous study that has used a randomized experiment to study wildfire risk behaviors (James R Meldrum et al. 2021). That study measures the effect of an information nudge on visits to an informational website, but does not measure program participation or creation of defensible space.

Our results are also relevant to current policy discussions about the potential importance of financial incentives in achieving efficient adaptation to wildfire risk. Technological progress and policy changes are increasing the degree to which property insurers can factor defensible space into premiums, though such risk-based pricing is still imperfect (Boomhower et al. 2024). Policymakers are also exploring large-scale subsidy programs to reward defensible space investments.[3] The importance of risk-based pricing or subsidy programs in driving takeup of defensible space will depend on the price sensitivity of homeowner behavior.

2 Context

Wildfire risk to a given home can be reduced through investments in wildfire-resilient construction (home hardening) and through maintenance of vegetation and other flammable materials around the home (defensible space). While home hardening retrofits are usually pro-

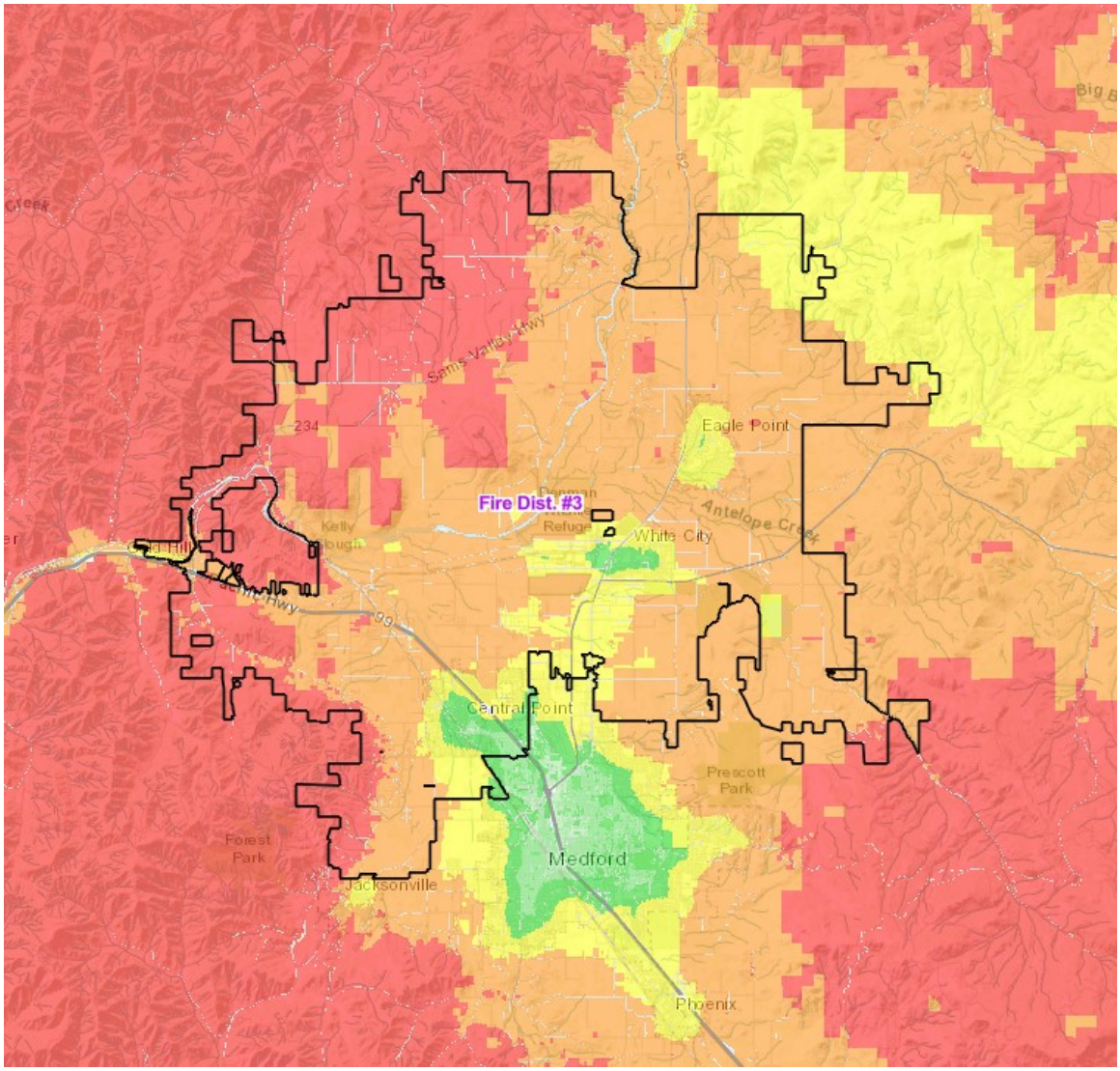
3. In 2024 (one year after conclusion of our study), the Oregon State Fire Marshall began offering a $250 subsidy statewide to homeowners who receive an inspection and complete required mitigation actions. https://oregoncapitalchronicle.com/briefs/state-fire-marshal-offers-250-grants-to-renters-homeowners-for-wildfire-defensible-space/

hibitively expensive for already-built homes (Baylis and Boomhower 2021), creating defensible space is comparatively inexpensive and cost-effective. Defensible space is defined as the buffer around a home where grass, shrubs, wooden structures, and other flammable materials could ignite a home during wildfire conditions, and the creation of defensible space is associated with higher home survival rates during wildfires (Cohen 2000; Syphard, Brennan, and Keeley 2014). Increasing defensible space has become a priority for state and local governments in the American West. Federal, state, and community programs encourage homeowners to ensure that their home has adequate defensible space, but the success of these programs has been mixed. Even in California, one of the few jurisdictions where compliance is required by law, compliance rates range from 30% in Marin County to nearly 100% in Santa Barbara County (Petek 2021).

Our study location is the jurisdiction of JCFD3 in Jackson County, Southern Oregon. District 3 includes the area surrounding Medford, though not the urban core of Medford itself. Figure 1 maps the different areas administered by JCFD3 staff. Jackson County was the home of the highly destructive Almeda Drive and Obenchain fires in 2020 that destroyed hundreds of structures and very nearly included the city of Medford.

In Oregon, creating defensible space has become a legislative priority. Senate Bill 762, an omnibus wildfire bill, included provisions for a new hazard map that would require homeowners to clear space in specific areas. Conversations with the Oregon State Fire Marshal's office indicate that a large number of properties would not be compliant with proposed defensible space requirements. As in California, policymakers

Figure 1: Jackson County Fire District 3 Wildfire Risk Map



Notes: Map of Jackson County Fire District 3 (JCFD3), 2022. Black outline is the JCFD3 service area. Colors indicate levels of wildfire risk, where green indicates no or low risk, yellow indicates moderate risk, orange indicate high risk, and red indicates extreme risk. All homes included in this study were in high or extreme risk areas. Source: JCFD3 staff.

believe that programs that assist homeowners in providing defensible space will be essential to achieving public support. The existing evidence to guide the design of such programs is limited.

3 Experiment Design

The evaluation tests the effectiveness of information and price-based interventions in increasing investment in defensible space. The study sample for the pilot includes homes in high fire-hazard areas of Jackson County. A key focus of this pilot study is to refine measurement methods and identify promising interventions to be tested at larger scale in a full experiment.

3.1 Treatment Group Assignment

In the spring and summer of 2023 and in partnership with staff from JCFD3, we tested the following pilot interventions: (1) an "Information" treatment that includes information on wildfire risk and suggested actions to improve wildfire resilience, as well as an offer of a free home assessment; (2) a "Moral Suasion" treatment that included the same information as the Information group, but language that emphasized the moral responsibility of the residents to protect their homes in order to reduce spillover risk to their neighbors, (3) a "$250 Subsidy" group that received a similar message as the Information group, except that it also included an offer of $250 for successfully passing a defensible space inspection (to be confirmed on a follow-up in person inspection), and (4) a "$500 Subsidy" group that received a similar offer but with a larger subsidy of $500.

All contact with respondents was initiated through flyers or sent by

Figure 2: Map of Gold Hill

Notes: Map shows treatment assignment for parcels in Gold Hill, a neighborhood on the western edge of JCFD3. Colors indicate treatment assignment, which is randomized by home clusters (10 adjacent homes on the same streets).

postal mail detailing the information or subsidy offer they received. The flyers and letters sent to each group were virtually identical aside from the changes needed to convey either the moral suasion element or the subsidy offer. The Appendix includes reproductions of all of the materials sent to treated households. The remaining households were the control group, and did not receive any additional contact but remained free to get in touch with JCFD3 of their own accord.

To ensure that relatively few neighbors received different treatment assignment, we randomized among home clusters, which we defined as sets of 10 adjacent homes on the same street. Figure 2 zooms in on a neighborhood in our study area called Gold Hill. Parcels are shaded according to their treatment assignment.

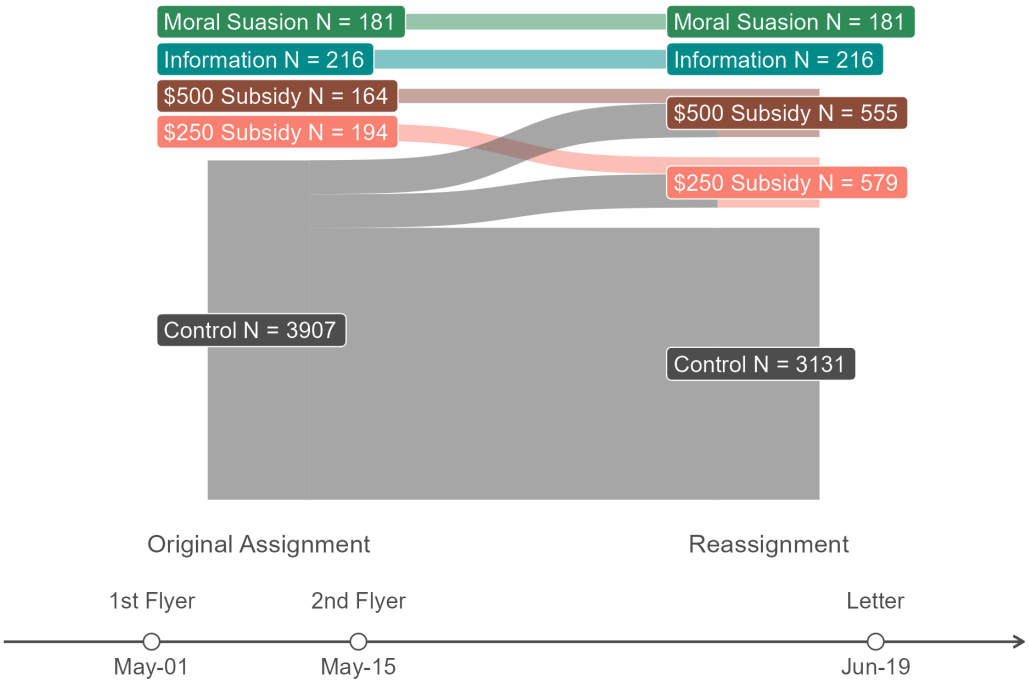
3.2 Timeline

The first round of contact was through flyers sent to each treated household in both April and May, and a final followup letter in July. In June, since we had sufficient budget available, we increased the size of the treatment group by enrolling additional households at random from the control group into the subsidy groups. No additions were made to the Information or Moral Suasion groups. The analysis presented below considers a household to be in the treatment group if it was either assigned to that group initially or during the reassignment. A household is in the control group only if it only was never assigned to a treatment group.

3.3 Neighbor Nudge Treatment

In addition to overall treatment group assignment, the field experiment also incorporated a "Neighbor Nudge" treatment that was based on a just-in-time randomization of neighbors of homes in the treatment group that contacted JCFD3 during the study period. Once a household contacted JCDF3, their neighbors (other homes in the same home cluster) became candidates for an additional followup letter noting that their neighbors had been in touch with JCFD3 and encouraging them to get in touch as well. 25% of homes in the candidate home clusters actually received the followup letter. We include a copy of the follow up letter in the Appendix.

Figure 3: Experiment Timeline



Notes: Figure shows timeline of experiment and randomization of homes into treatment groups. Initial assignment of homes is given by the boxes on the left and second assignment on the right. Originally treated homes remained in their treatment groups during the re-assignment, and a subset of control households were added to the $500 and $250 subsidy groups. Originally assigned treatment group homes received the first and second flyers as well as the letter, while the reassigned homes only received the letter.

3.4 Summary Statistics

The experiment included 4,662 households, 3,131 of which were in the control group throughout the study. Table 1 reports summary statistics for the entire sample. The study sample included only residential properties that faced "high" or "very high" wildfire risk. The average home in the sample was 3.8 acres and worth around $490,000, and had a Social Vulnerability Index (SVI) of 0.4.[4] In the Appendix, we document that these observables were well-balanced across control and treatment groups. Census data available at the block group level show that 82% of residents own their homes, the median age was 50, around 25% of the population had a bachelor's degree or higher, and median annual earnings were $41,000.

4. Following Senate Bill 762, researchers at Oregon State University created a wildfire-specific Social Vulnerability Index for the state of Oregon. That dataset is available here: .

Table 1: Descriptive Statistics

	Mean	SD	P5	Median	P95
Variables (Homes = 4,662)					
Risk value	0.372	0.227	0.148	0.301	0.741
Assessment value	488	291	222	415	947
SVI	0.402	0.267	0.0193	0.34	0.805
CBG Owner prop.	0.824	0.0808	0.716	0.828	0.925
CBG Median age	50.3	11.5	34.8	47.1	67.2
CBG Bachelors+ prop.	0.252	0.125	0.0775	0.263	0.408
CBG Median earnings	40995	9358	33689	39780	48136
Treatment Groups					
Group	N				
Control	3,131				
$250 Subsidy	579				
$500 Subsidy	555				
Information	216				
Moral Suasion	181				

Notes: Table shows descriptive statistics for the sample. Fire risk score is the level of wildfire risk for the home. Assessment value is the total home assessed value, in thousands of dollars. SVI is the Social Vulnerability Index for the Census Block containing the home (TODO: Check this). CBG owner prop. is the proportion of people who own their homes in that Census Block Group (CBG). CBG Median age is the median age of the Census respondent and, CBG Bachelors+ prop. is the proportion of people with a Bachelor's degree or higher in the CBG, and CBG median earnings is the median household earnings in that CBG.

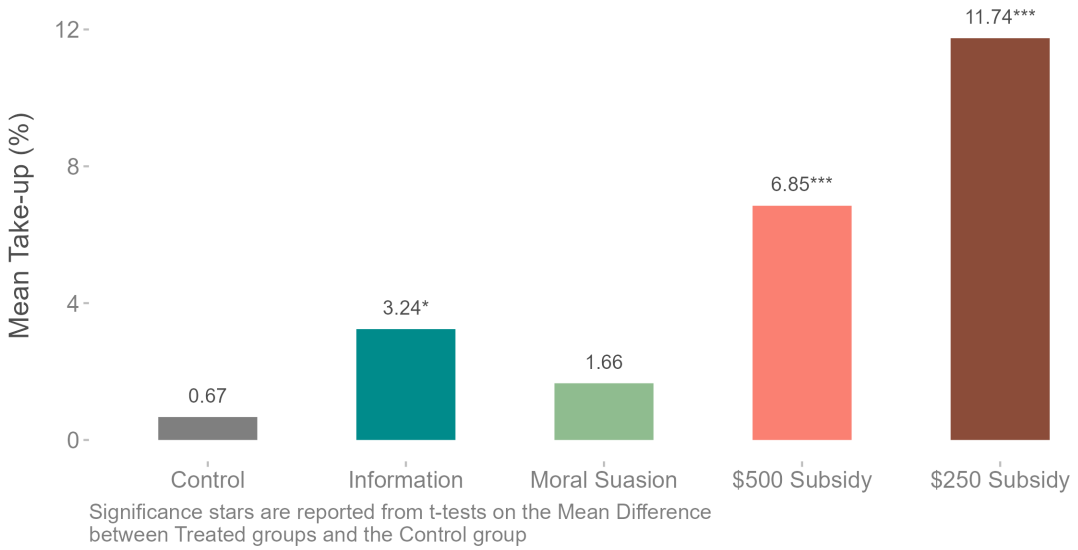
4 Findings

This section describes the findings of the experiment. Section 4.1 reports average treatment effects and the timing of responses by treatment groups, Section 4.2 documents differential response rates by home or neighborhood characteristics, and Section 4.3 shows estimate of the effects of a followup neighbor nudge on takeup.

4.1 Effects of Treatment on Takeup

The primary outcome in this experiment is an indicator for whether households got in touch with JCFD3 during the treatment period. Whenever a household contacts JCFD3, either by web form or by phone call, their contact information is stored in a database managed

Figure 4: Takeup by Treatment Group



Notes: Figure shows average takeup rates by treatment group. The height of each bar is the mean takeup rate (in percentage points) among that group, where takeup is measured as contacting JCFD3 after the treatment period began. Stars indicate statistical significance for a t-test between the control group and the given treatment group. *** p<0.01; ** p<0.05; * p<0.10.

by JCFD3 staff. We match between that database and our original list of assigned household to identify which households got in touch with JCDF3.

Figure 4 summarizes rates takeup by treatment group. Each bar plots the average takeup rates among each set of homes.

Fewer than 0.6% of control homes, who did not receive a letter or a flyer, contacted JCFD3 during the treatment period. This is consistent with the prior experience of JCFD3 staff. Homes that received the baseline information treatment contacted JCFD3 significantly more, although their contact rate was still low at about 3%. Less than 2% of the homes that received the additional moral suasion element in their contact materials got in touch with JCFD3, and their rate was not statistically distinguishable from the control group. Homes in the subsidy groups were much more likely to contact JCFD3. 12% of the homes

who received the $250 subsidy offer contacted JCFD3 during the treatment period. This estimate is statistically sharply different from the control group takeup rate. Finally, 7% of the homes in the $500 subsidy offer group contacted JCFD3. This estimate is also statistically different from the control group at well below conventional p-value cutoffs, and statistically different – and importantly, lower – than the contact rate among the $250 group. That a lower offer yielded a higher contact rate is a puzzling finding and one we discuss in detail in Section 5.

We next document the timeline of responses to the treatment group contacts. Figure 5 shows the cumulative takeup rates by group during the treatment period. In this figure, we separate the originally assigned treatment group homes from the subset of homes (originally in the control group) that were reassigned to the subsidy groups in late June. As we describe above, this latter group did not receive the initial two flyers, only the followup letter.

The top panel shows cumulative takeup rates for the originally assigned treatment homes. Response rates remain low throughout the sample for the Control, Information, and Moral Suasion groups, though the Information group seems to respond most strongly to the flyers. The Subsidy offer groups show an analogous but more pronounced pattern: relatively muted responses to the first and second flyers, and a sharp uptick with the receipt of the letter. Most of the contacts occur within a fairly short (one to two week) period after the receipt of the letter, with only a handful of households contacting JCFD3 in August and none after the start of September. One explanation for the larger effect of the letter on takeup rates than the flyers is that the letter was viewed as more credible by households. Several individuals who requested an

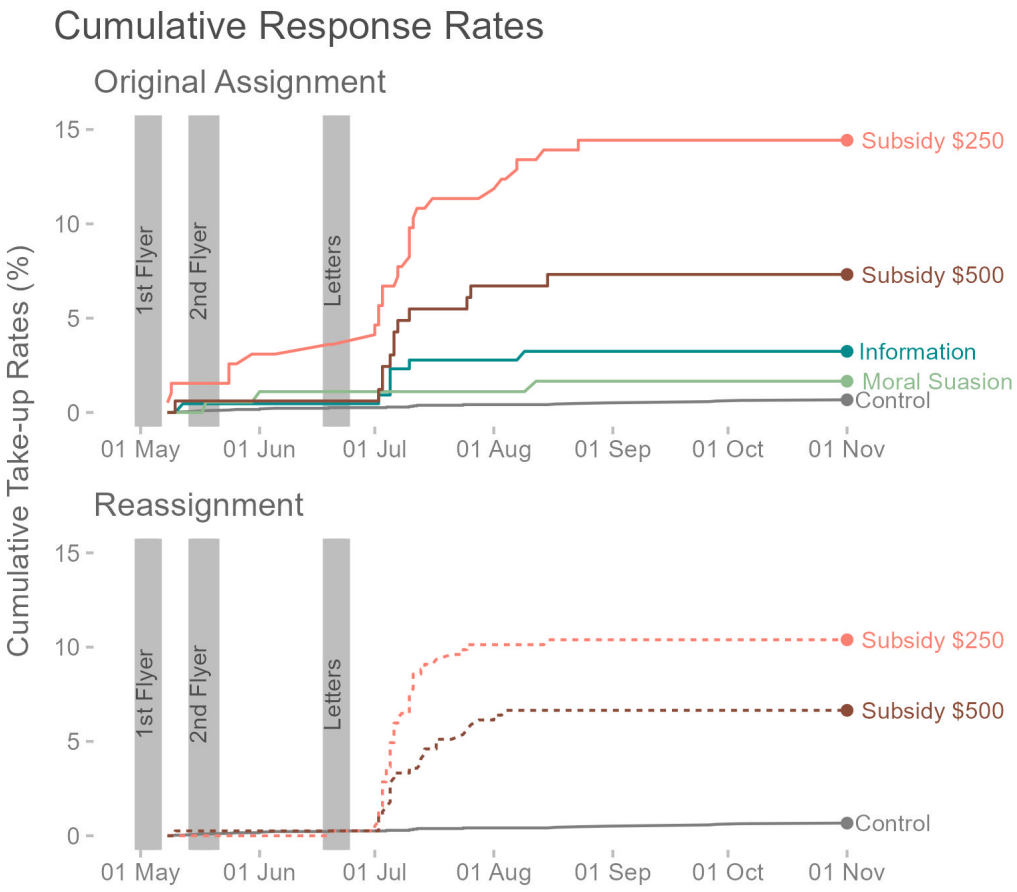


Figure 5: Cumulative Take-up Rate over Time

Notes: Figure shows takeup rates by date, where takeup is measured as contacting JCFD3 after the treatment period began. The top panel follows the set of households originally assigned to treatment groups, and the bottom panel follows the households reassigned to the subsidy groups later in the experiment. The control group in both panels are households that were always assigned to control.

assessment commented that they found the letter, which was signed by JCFD3 chief, more credible than glossy flyers they originally received.

The bottom panel shows the evolution of cumulative response rates for households that were assigned into the subsidy groups in June (the reassigned treatment households). Since reassigned households did not receive either the first or second flyer, it is unsurprising that they also did not respond during the first period. Once they received the letter, response rates again increased rapidly up in the few days after the letter was sent out and plateau by the start of August.

4.2 Heterogeneity in Subsidy Takeup

This section considers differential takeup rates by observable household characteristics. Since takeup rates were highest among the subsidy groups, we focus this analysis on the subsidy group and combined the $250 and $500 groups for parsimony. For this exercise, we define categorical variables for households as follows: "Large Parcel" indicates homes with above-median lot size, "High Risk" indicates homes facing above median wildfire risk score among the sample, "High Value" indicates homes with above-median total assessed value, and "High SVI" indicates homes in Census Block Groups (CBGs) with an above-median SVI (i.e., these homes are in areas that are more socially vulnerable). We estimate versions of the following model, where H stands in for the catogorical indicator variables defined above:

$$\text{Takeup}_i = \text{Subsidy}_i + \sum_H \text{Subsidy} \times H_i + \tag{1}$$
$$\text{Information}_i + \text{Moral Suasion} + \sum_H H_i + \varepsilon_i$$

Table 3 documents the findings. Column (1) estimates a model without interactions for comparison. The findings are similar to those shown in Figure 4, except that the subsidy groups are combined. As before, the subsidy groups respond most strongly relative the control group, followed by the Information group, followed by the Moral Suasion group (whose response is small and not statistically different from zero).

Column (2)–(5) add controls for all of the dimensions of heterogeneity, and each one includes one of the indicators of heterogeneity. Column (2) interacts the subsidy offer with an indicator for having an above-median lot size, since larger lot sizes may make adherence with defensible space requirements more challenging. We observe slightly less takeup (around 2%) in percentage terms for these households, but the difference is not statistically different from zero. Column (3) interacts the subsidy offer with having a home facing above-median wildfire risk. Perhaps surprisingly, these households are no more likely to contact JCFD3 when they receive a subsidy offer.

Column (4) estimates the interaction effect of having a home with high assessed value. Here we find a large differential effect for the subsidy offer on high home value households: these households are around 4.5% more likely to respond, roughly an 80% increase on the response rate for lower value homes. This could be for several reasons, including that higher value homes are likely to be occupied by households with

Table 2: Effect of Subsidy Offer on Takeup

	(1)	(2)	(3)	(4)	(5)	(6)
Subsidy	8.71***	9.93***	9.22***	6.62***	11.4***	10.0***
	(1.08)	(1.47)	(1.37)	(1.24)	(1.94)	(2.11)
Subsidy × Large Parcel		-2.03				-2.98
		(1.95)				(2.07)
Subsidy × High Risk			-0.667			0.638
			(2.17)			(2.24)
Subsidy × High Value				4.49**		5.16***
				(1.90)		(1.97)
Subsidy × High SVI					-4.39*	-4.54*
					(2.28)	(2.32)
Moral Suasion	1.16	1.43	1.31	1.21	1.24	1.30
	(1.24)	(1.25)	(1.26)	(1.26)	(1.25)	(1.23)
Information	2.95**	2.79**	2.76**	2.92**	2.67**	2.89**
	(1.37)	(1.33)	(1.34)	(1.34)	(1.35)	(1.34)
Large Parcel		-0.235	-0.690	-0.652	-0.790	-0.086
		(0.577)	(0.615)	(0.610)	(0.609)	(0.524)
High SVI		-1.23*	-1.22*	-1.28*	-0.224	-0.238
		(0.671)	(0.670)	(0.663)	(0.468)	(0.463)
High Risk		0.738	0.874	0.824	0.752	0.737
		(0.643)	(0.544)	(0.653)	(0.640)	(0.477)
High Value		1.51**	1.51**	0.370	1.54**	0.253
		(0.648)	(0.646)	(0.424)	(0.645)	(0.419)
City FE	✓	✓	✓	✓	✓	✓
Risk class FE		✓	✓	✓	✓	✓
Property class FE		✓	✓	✓	✓	✓
Observations	4,662	4,624	4,624	4,624	4,624	4,624
R^2	0.05	0.06	0.05	0.06	0.06	0.06
Dependent variable mean	2.9	3.0	3.0	3.0	3.0	3.0

Notes: Table shows the effect of receiving a subsidy offer on takeup. Takeup is measured as contacting JCFD3 after the treatment period began. Subsidy is an indicator for a household receiving either the $250 or $500 subsidy offer. Large Parcel is an indicator for a parcel with above median lot size. High Risk is an indicator for a home with above median wildfire risk. High Value is an indicator for a home with above median assessed value. High SVI is an indicator for homes in Census Tracts with above median SVI, i.e., are measured as more socially vulnerable. City fixed effects control for the city of the home address, Risk class is the categorical wildfire risk class, and Property class is the property type. Standard errors clustered by home cluster. *** p<0.01; ** p<0.05; * p<0.10.

more financial resources and that the potential cost of the loss of the home is larger for these households.

Column (5) interacts the indicator for Subsidy offer with the High SVI indicator, which, as a reminder, refers to a home being in a CBG where social vulnerability is measured as above median, i.e., homes

in these areas are more socially vulnerable. In our study region, this roughly corresponds to areas within JCFD3 that are less wealthy and older on average. Similar to the previous estimate, we find here that it is the less socially vulnerable homes that respond more strongly to the subsidy offer. Homes in above-median SVI areas are around 4.4% less likely to respond.

Finally, column (6) includes all interactions in the same regression to test for whether correlations between one or more of these dimensions could help explain what we find. In this case, the estimates are relatively stable when we include all of the interactions together. Larger and higher risk parcels are not statistically any more or less likely to take up, while households in higher value home and in areas with lower levels of social vulnerability are considerably more likely. If anything, the magnitudes of the interacted effects are slightly larger in column (6) than in columns (4) and (5).

4.3 Effects of the Neighbor Nudge

The final analysis we conduct focuses on the subset of homes who were eligible for the neighbor nudge treatment described in detail in Section 3.3. As a reminder, these are already-treated homes in the same home cluster as a neighbor who took up the treatment. Of these homes, around one quarter received a separate follow-up letter noting that one of their neighbors had contacted JCFD3 and inviting them to do so as well. Table 3 documents the results.

Column (1) estimates the effect of a nudge without any additional controls. We do not see any additional effect of the neighbor nudge treatment on takeup. Column (2) includes controls for SVI, acreage,

Table 3: Neighbor Nudge Treatment on Takeup

	Takeup (percentage)	
	(1)	(2)
Neighbor nudge	-0.310	1.53
	(2.75)	(2.87)
SVI		-3.39
		(5.21)
Acreage		0.027
		(0.285)
Risk value		19.0*
		(11.1)
Assessment value		0.009
		(0.006)
City FE		✓
Risk class FE		✓
Property class FE		✓
Observations	531	526
R^2	0.00003	0.04
Dependent variable mean	6.0	6.1

Notes: Table shows the effect of receiving the neighbor nudge treatment on takeup. The sample for these regressions is the set of homes who were eligible to receive an additional letter notifying them that their neighbors had been in contact with the fire district. The outcome variable is an indicator variable for the respondent contacting the district. Neighbor nudge is an indicator for whether they were actually contacted. SVI is the Oregon Social Vulnerability Index, Acreage is the lot acreage, Risk value is the wildfire risk, and assessment value is the assessed value of the parcel. Standard errors clustered by home cluster. *** p<0.01; ** p<0.05; * p<0.10.

risk, and home value. Again, we do not observe a statistically significant effect of receiving a neighbor nudge.

5 Discussion

The field experiment we report on here is a first step towards improving the effectiveness of community outreach for wildfire preparedness. We briefly summarize the findings of this field experiment in hopes of assisting researchers, policymakers, and wildfire professionals as they consider their options for incentivizing fuel management in the many

areas facing increasing wildfire risk.

The first clear finding is that financial incentives matter when it comes to encouraging takeup. Notably, this is in direct contrast to anecdotal claims made by several of the households in the experiment, who reported that their decision to contact JCFD3 was not in response to the financial offer but because it was, to paraphrase, the right thing to do.[5] Nevertheless, on average, the group of household who received the incentive offer were considerably more likely to respond.

Secondly, the larger takeup rate for households who received the smaller ($250) subsidy offer compared to those who received the larger ($500) subsidy offer is unexpected. We speculate that this may reflect a credibility effect: $500 is a large, round number, and could be more likely to be interpreted as a sum that indicates some kind of "catch". This credibility explanation is consistent with the much larger response rates we observed during the weeks directly after sending out the letter (signed by the JCFD3 Fire Chief) in comparison response rates in the weeks after we sent previous glossy flyer. Whether such a difference in response rates between subsidy offers is likely to persist for other contexts or for similar types of offerings is not obvious. If the credibility problem could be adequately solved, we expect that households would become more likely to respond to the larger financial incentives.

Finally, that takeup of the subsidy offer appears to be higher among wealthier households and households facing lower levels of social vulnerability highlights a key area of concern for wildfire damage mitigation in lower-income and higher vulnerability areas. It suggests that policymakers interested in targeting households in these categories, who

5. One respondent directly requested that their incentive be redirected to efforts to support firefighters facing hardship.

likely have fewer available resources (financial and otherwise) for fuel management may need to expend additional effort to reach them.

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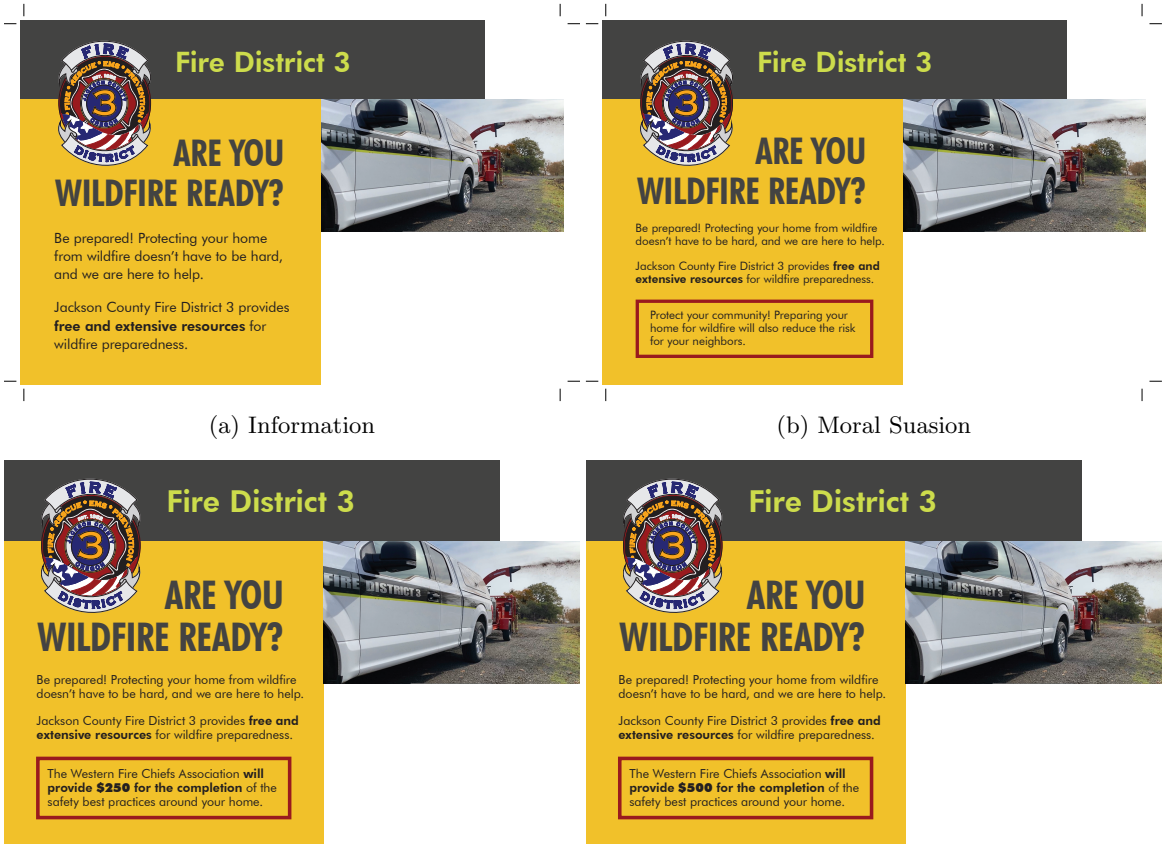
Online Appendix to "Incentivizing Self-Protection From Wildfires"

Patrick Baylis, Judson Boomhower, and Bob Horton

A Contact Materials

Figure A.1: Treatment Flyers



(a) Information

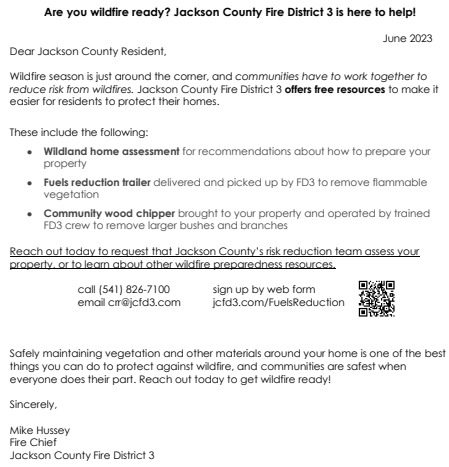
(b) Moral Suasion

(c) $250 Subsidy

(d) $500 Subsidy

Notes: Figure shows flyers that were mailed to homes in treatment groups.

Figure A.2: Treatment Letters



Are you wildfire ready? Jackson County Fire District 3 is here to help!

June 2023

Dear Jackson County Resident,

Wildfire season is just around the corner, and *communities have to work together to reduce risk from wildfires.* Jackson County Fire District 3 **offers free resources** to make it easier for residents to protect their homes.

These include the following:

- **Wildland home assessment** for recommendations about how to prepare your property
- **Fuels reduction trailer** delivered and picked up by FD3 to remove flammable vegetation
- **Community wood chipper** brought to your property and operated by trained FD3 crew to remove larger bushes and branches

Reach out today to request that Jackson County's risk reduction team assess your property, or to learn about other wildfire preparedness resources.

call (541) 826-7100
email crr@jcfd3.com

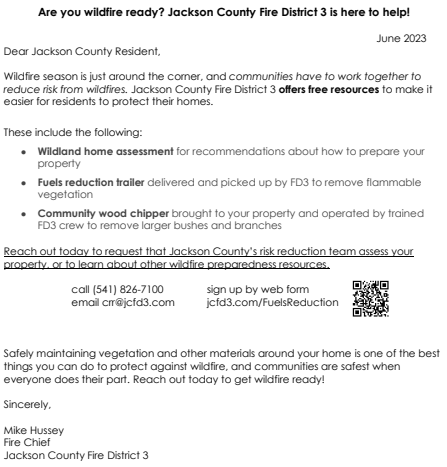
sign up by web form
jcfd3.com/FuelsReduction

Safely maintaining vegetation and other materials around your home is one of the best things you can do to protect against wildfire, and communities are safest when everyone does their part. Reach out today to get wildfire ready!

Sincerely,

Mike Hussey
Fire Chief
Jackson County Fire District 3

(a) Information & Moral Suasion



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Mike Hussey
Fire Chief
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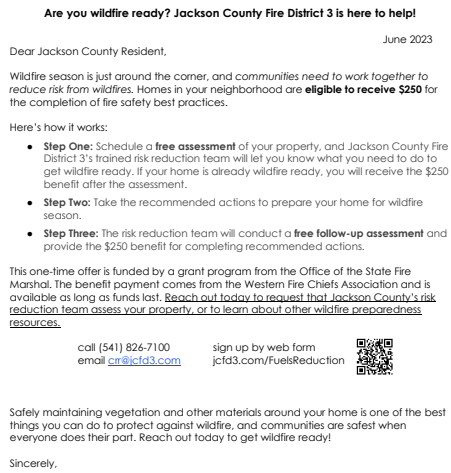
(b) Moral Suasion



Are you wildfire ready? Jackson County Fire District 3 is here to help!

June 2023

Dear Jackson County Resident,

Wildfire season is just around the corner, and *communities need to work together to reduce risk from wildfires.* Homes in your neighborhood are **eligible to receive $250** for the completion of fire safety best practices.

Here's how it works:

- **Step One:** Schedule a **free assessment** of your property, and Jackson County Fire District 3's trained risk reduction team will let you know what you need to do to get wildfire ready. If your home is already wildfire ready, you will receive the $250 benefit after the assessment.
- **Step Two:** Take the recommended actions to prepare your home for wildfire season.
- **Step Three:** The risk reduction team will conduct a **free follow-up assessment** and provide the $250 benefit for completing recommended actions.

This one-time offer is funded by a grant program from the Office of the State Fire Marshal. The benefit payment comes from the Western Fire Chiefs Association and is available as long as funds last. Reach out today to request that Jackson County's risk reduction team assess your property, or to learn about other wildfire preparedness resources.

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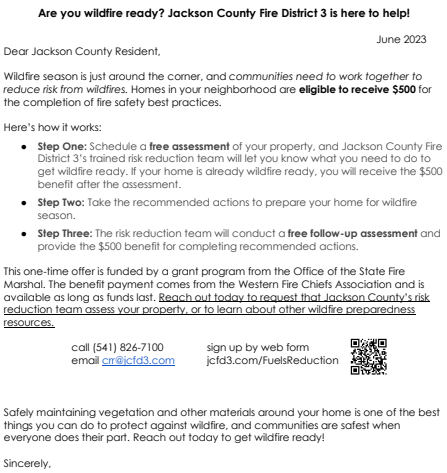
Sincerely,

Mike Hussey
Fire Chief
Jackson County Fire District 3

(c) $250 Subsidy



Are you wildfire ready? Jackson County Fire District 3 is here to help!

June 2023

Dear Jackson County Resident,

Wildfire season is just around the corner, and *communities need to work together to reduce risk from wildfires.* Homes in your neighborhood are **eligible to receive $500** for the completion of fire safety best practices.

Here's how it works:

- **Step One:** Schedule a **free assessment** of your property, and Jackson County Fire District 3's trained risk reduction team will let you know what you need to do to get wildfire ready. If your home is already wildfire ready, you will receive the $500 benefit after the assessment.
- **Step Two:** Take the recommended actions to prepare your home for wildfire season.
- **Step Three:** The risk reduction team will conduct a **free follow-up assessment** and provide the $500 benefit for completing recommended actions.

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Sincerely,

Mike Hussey
Fire Chief
Jackson County Fire District 3

(d) $500 Subsidy

Notes: Figure shows letters (third mailing) that were mailed to homes in treatment groups.

B Supporting Exhibits

Table B.1: Balance by Treatment Group

		Information		Moral Suasion		Subsidy 250		Subsidy 500	
	Control	Mean	SMD	Mean	SMD	Mean	SMD	Mean	SMD
Acreage	4.1	3.5	0.09	2.4	0.21	3.8	0.04	3.3	0.13
Fire risk	0.38	0.37	0.07	0.32	0.30	0.37	0.04	0.34	0.18
Social vulnerability index	0.38	0.38	0.00	0.40	0.06	0.44	0.21	0.48	0.37
Land value (1k$)	220	240	0.22	170	0.63	240	0.14	220	0.08
Improvement value (1k$)	270	310	0.14	250	0.07	260	0.04	230	0.15
CBG owner prop.	0.82	0.81	0.11	0.83	0.14	0.83	0.04	0.83	0.03
CBG median age	51	50	0.03	48	0.24	51	0.01	48	0.27
CBG bachelors+ prop.	0.25	0.29	0.29	0.22	0.25	0.25	0.04	0.24	0.07
CBG median earnings	41000	45000	0.32	39000	0.28	40000	0.12	39000	0.24
Distance to S. Obenchain	15000	17000	0.27	17000	0.31	14000	0.07	13000	0.17

SMD is the Standardized Mean Difference of each treated group compared to Control groups

Notes: Table reports control and treatment group means and standardized mean differences (SMDs) for respondent covariates. SMDs are the differences in means between the given treatment group and the control group for that covariate, divided by the average standard deviation of the covariate in those groups.

Table B.2: Assessment Criteria Pass Rates Among Failing Households

Assessment Criteria	Fraction Passing
Flammable vegetation removal	0.63
Debris removal	0.42
Tree spacing	0.75
Debris spacing	0.67
Fire-resistant plants spacing	0.75
Firewood and lumber spacing	0.65
Combustible vegetation spacing	0.98
BBQ tanks spacing	0.96
Observations	57

Notes: Table reports proportion of households who passed each assessment criteria among households who did not pass the initial assessment.