Take-up and Targeting: Experimental Evidence from SNAP

Amy Finkelstein
MIT, J-PAL and NBER

Matthew J. Notowidigdo
Northwestern, J-PAL and NBER

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J-PAL
ABDUL LATIF JAMEEL POVERTY ACTION LAB
NORTH AMERICA

Motivation

- Enrollment in many safety net programs is not automatic: individuals must apply and demonstrate eligibility.
  - Incomplete take-up is common
  - Typical explanations: lack of knowledge, transaction costs, stigma
- Frequent policy goal: increase take-up
  - Calls to increase awareness of eligibility and simplify application process
- Research questions:
  - Take-up: What are the barriers to take-up?
  - Targeting: Who are the marginal applicants deterred by these barriers?
    - **Neoclassical theory** suggests that they are relatively well off (e.g., Nichols and Zechkauser 1982)
    - **Behavioral theory** argues exact opposite (e.g., Mullainathan and Shafir 2013 “Scarcity”)
  - What are normative implications of information/assistance interventions?
    - Develop an economic model with (1) fiscal externalities from processing applications and labor supply responses and (2) possible misperceptions of expected benefits from applying

Overview of this paper

- RCT in 2016 on 30,000 elderly individuals in PA, likely eligible but not enrolled in SNAP (food stamps; means-tested program)
  - **Information only**: informs of likely eligibility
  - **Information plus assistance**: also provides help with application
  - **Control group:** status quo
- "Information only" increases enrollment less but is more cost-effective
  - 9-month enrollment: 6% (control); 11% (info only); 18% (info + assistance)
    - Applications increase proportionally – i.e., no increase in approval rate
    - Cost per additional enrollee: ~$20 (info only); ~$60 (info + assistance)
- Both interventions **decrease targeting** in a similar manner:
  - Marginal applicants and enrollees are "less needy" than average enrollees: lower benefits (progressive formula), better health, etc.
  - Simple model clarifies when the targeting properties of interventions do (and do not) affect social welfare

Related Literature

- Barriers to take-up
  - Providing information on eligibility matters in some settings (EITC, Bhargava and Manoli 2015), but not others (FAFSA, Bettinger et al. 2012)
  - Reduced transaction costs increases take-up in many settings
    - FAFSA, SSDI (Deshpande and Li 2017), WIC (Rossin-Slater 2013), CCT (Alatas et al. 2016)

- Targeting properties of interventions
  - Existing literature focuses only on application costs and has mixed results
  - Conditional cash transfer program in Indonesia (Alatas et al. 2016)
    - Active application requirement (vs automatic screening by government) results in poorer enrollees, but marginal increase in application costs has no impact on targeting
  - Closing of SSDI application offices (Deshpande and Li 2017)
    - Reduces share of enrollees with least severe disabilities (conditional on eligible), but also share with low education levels and low pre-application earnings

- SNAP experiments
  - Daponte et al. (1999) study the role of “lack of information”
  - Schanzenbach (2009) study assistance from tax preparers in CA

Outline

1. Setting and Background
2. Empirical approach: Data and Randomization
3. Empirical results: Take-up and Targeting
4. Model and Normative Implications
5. Conclusions

1. Setting and Background

Supplemental Nutrition Assistance Program (SNAP)

- **Large social safety net program**, widely available to low-income households
  - During Great Recession, 1-in-7 individuals on SNAP
  - $70 billion in expenditures in 2015 (roughly same as EITC, more than SSI and TANF)
- **Incomplete take-up**, especially among elderly
  - About 80 percent take-up overall
  - About 40 percent take-up for elderly who are focus of our study
- **Complicated eligibility rules** and application process
  - Eligibility and benefit amount depends on income, other program receipt, household characteristics, expenditures on shelter and health care…
  - Not feasible for state to determine eligibility without an application
    - e.g., “household”, resources, and expenses definitions unique to SNAP

Application and Enrollment Process

- **Enrollment steps:** complete application, provide necessary documents for verification, participate in interview (in person or on phone).
  - Required documentation includes (for each HH member): identifying information, resources and income, and expenses.
  - Applications can be submitted by mail, by fax, in person, or online.
  - State has 30 days to process an application.
    - Successful applicants access benefits electronically using plastic EBT cards. These cards can be used to buy food at authorized stores.

- **Application costs** (rough estimates):
  - Application takes about 5 hours to complete (Ponza et al. 1999)
  - Annualized administrative costs to government (including both eligibility determination, processing applications, and ongoing administrative costs) is ~$130 per application (Isaacs 2008). This is ~10% of average annual benefits paid to recipients.

Design of Interventions

- **Partnered with Benefits Data Trust (BDT),** a non-profit focused on helping individuals access public benefits in multiple states.
  - BDT has submitted >500,000 benefit applications since 2005
  - Observational study by Mathematica found BDT's SNAP outreach was most cost effective of six different nationwide approaches studied
- **Identify likely eligible SNAP non-participants**
  - BDT receives data from PA state on individuals 60+ non receiving SNAP but enrolled in Medicaid and therefore likely income-eligible for SNAP
  - This forms the basis for our study sample
- **Randomized 30,000** individuals into three equally-sized groups:
  - Information only treatment
  - Information plus assistance treatment
  - Status quo control group

“Information Plus Assistance” Treatment

- BDT conducts outreach by (1) informing individuals of likely eligibility **(“information”**) and (2) assisting them in applying for benefits (**“assistance”**).

- **Information component:** letter and a follow-up postcard that:

1. Emphasizes likely SNAP eligibility: “Good news! You may qualify for help paying groceries through the Supplemental Nutrition Assistance Program (SNAP)”
2. Highlights typical benefit amount: “Thousands of older Pennsylvanians already get an average of $119 a month to buy healthy food”
3. Provides phone number to apply: “We want to help you apply for SNAP! Please call the PA Benefits Center today. It could save you hundreds of dollars each year”

- Messages sent from Secretary of PA Department of Human Services

Standard outreach materials: info plus assistance arm

Letter

pennsylvania
DEPARTMENT OF HUMAN SERVICES

Sample A. Sample
2 Logan Square, Ste 550
Philadelphia, PA

Dear Sample A. Sample,

Good news! You may qualify for help paying for groceries through the Supplemental Nutrition Assistance Program (SNAP).

We want to help you apply for SNAP!

We are working closely with the PA Benefits Center to help you get SNAP. Thousands of older Pennsylvanians already **get an average of $119 a month** to buy healthy food.

Please call the PA Benefits Center today.
It could **save you hundreds of dollars each year.**

Sincerely,

Ted Dallas
Secretary of the Pennsylvania
Department of Human Services

Ted Dallas
Secretary of the Pennsylvania
Dept. of Human Services

Beneficiary ID#:
########

Apply now!

Call us at **1-800-528-9594**
Monday - Friday
9:00AM – 5:00 PM

The call is free.
Our friendly staff
will help you.

PA benefits center
(XXX)

Postcard

PA benefits center

Dear Pennsylvania Resident,

We haven't heard from you!

Our records show you may qualify to receive help paying for groceries through the Supplemental Nutrition Assistance Program (SNAP).

Don't miss this opportunity! We are working with the PA Benefits Center to make sure you get the help you deserve.

- Thousands of older Pennsylvanians already **get an average of $119 a month** to buy healthy food.
- It is FREE to apply for SNAP.
- You may be able to apply using a simple fast track application.

Apply for SNAP now!

Call us for FREE at: **1-800-528-9594**
Monday - Friday, 9:00 AM - 5:00 PM

Call the PA Benefits Center today. It won't take long and could **save you hundreds of dollars each year.**

Sincerely,

Ted Dallas
Secretary of the Pennsylvania
Department of Human Services

Envelope

pennsylvania
DEPARTMENT OF HUMAN SERVICES

PA Benefits Center
PO Box 34699 , Philadelphia, PA 19101

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- Messages sent from Secretary of PA Department of Human Services

“Information Plus Assistance” Treatment

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- **Assistance component** begins when individual calls BDT phone number. BDT then:

  1. Asks detailed questions so that BDT can populate application
  2. Advises applicant on what documents need to be submitted and receives and verifies documents
  3. Submits application on behalf of applicant

- **Designed to** make process easier and more successful
  - BDT collects detailed information on income and expenses to try to get maximum benefit for which individual is eligible

“Information Only” Treatment

- **Information component only**
  - Treatment consists solely of letters and follow-up postcards

- **Virtually identical layout and language** as in “Information Plus Assistance” letters and postcards
  - But directed to call Department of Human Services (vs PA Benefits Center)
  - Same language, though
    - “We want to help you apply for SNAP! Please call the Department of Human Services” [instead of: PA Benefits Center] today. It could save you hundreds of dollars each year”

Outreach materials

2. Empirical Approach: Data and Randomization

Construction of study population

- **Study population:** individuals age 60 and older enrolled in Medicaid but not in SNAP (but likely eligible given Medicaid eligibility)

- **Outreach list** from state of ~230k individuals age 60+ enrolled in Medicaid on October 31, 2015
  - Includes flag for SNAP enrollment as of that date
    - Also includes demographic characteristics of Medicaid enrollees + Medicaid program information
  - Also received 2015 Medicaid claims data
    - Measures health care utilization and health prior to 2016 intervention

- **Study population:** after exclusions, 31,888 not on SNAP
  - Exclude those in long term care, in Philly, on SNAP, previous BDT outreach

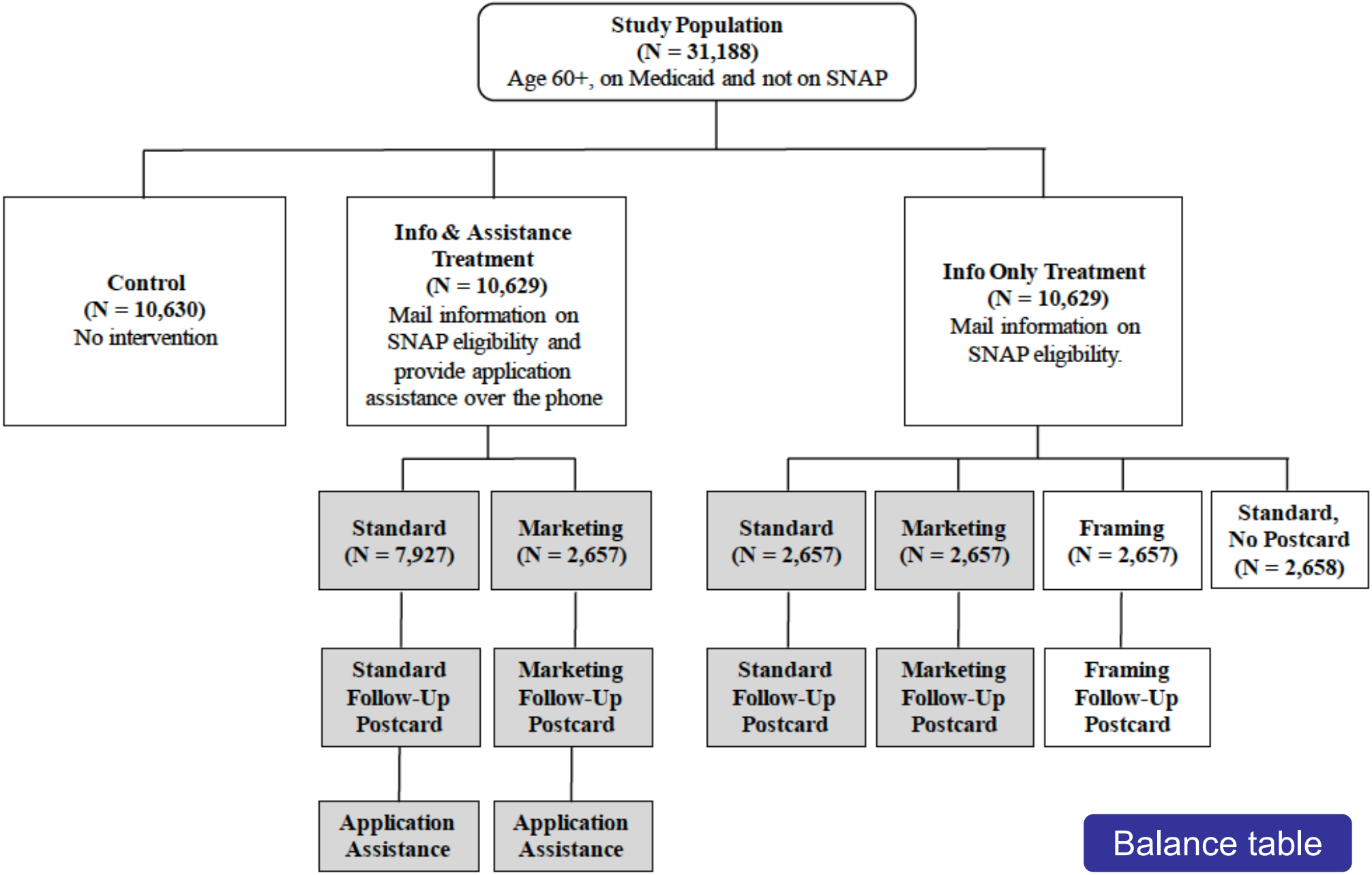
Study population

	After Exclusions from Outreach List		
	Receving SNAP	Not Receiving SNAP	Study Population
	(1)	(2)	(3)
Observations (N)	84,038	59,885	31,888
Age (as of October 31, 2015)	69.77	71.42	68.83
Share Age 80+	0.15	0.23	0.16
Male	0.36	0.36	0.38
Share White	0.79	0.79	0.75
Share Black	0.11	0.07	0.08
Share Primary Language not English	0.03	0.03	0.04
Number of Hospital Days (annual, 2015)	1.24	1.88	2.16
Number of Chronic Conditions (2015)	5.08	4.70	5.45

Experimental Design

- Randomized ~30k into 3 equally-sized groups:
  - Control + Info Only" Treatment + "Info Plus Assistance" Treatment
- Sub-treatments in presentation and frequency of information
  - In general, had no impact
  - Baseline analysis pools the sub-treatments within each treatment
    - Excludes two "info only" sub-treatments not in "Info plus Assist"
- Outreach letters randomly distributed across 11 weekly batches
  - Mailed January 1 2016 to March 16 2016
    - Follow-up postcards sent eight weeks later
  - Less than 1 percent of outreach materials returned to sender
- Baseline study period: outcomes in 9 months after outreach
  - Once enrolled, typically don't have to recertify for 2 years

Experimental Design



Balance table

Data on Behavioral Responses to Intervention

- Enroll in SNAP
  - Provided by state (PA DHS) for all three arms
- Apply for SNAP within 9 months of outreach
  - Provided by state for all three arms
- Call into phone number provided on outreach materials
  - Controls: Mechanically zero
  - “Info plus assistance” treatment: recorded by BDT
  - “Info only” treatment: use “call forwarding service” to track calls to DHS
    - Call service isn’t always successful at recording study ID (vs. BDT)
    - Report raw call rate and an “adjustment” for this under-recording

Data on Characteristics

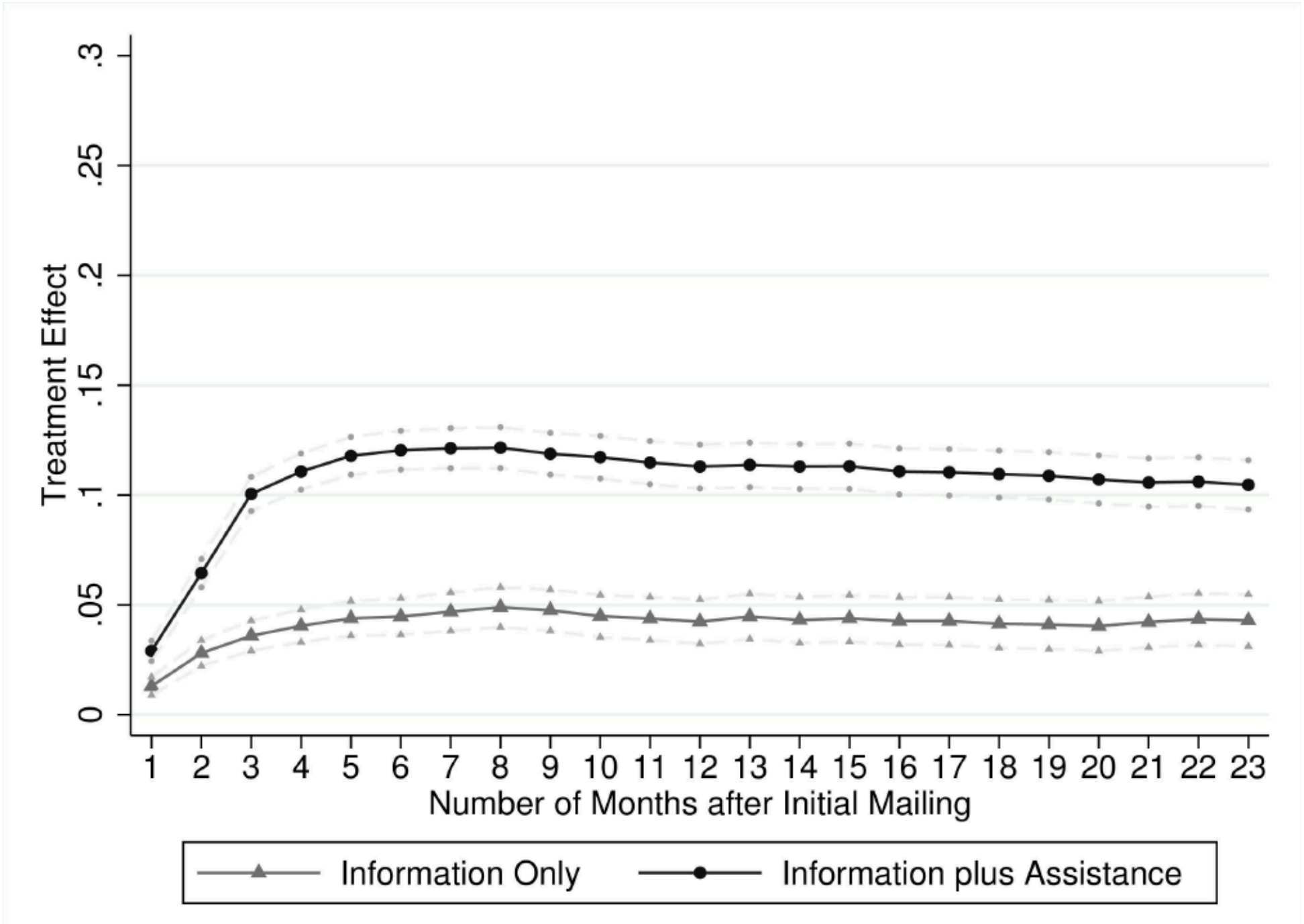
- Enrollee monthly benefit amount (if enroll during study period)
  - Provided by State
  - SNAP Progressive benefit formula: lower benefits → "better off" enrollee
- Pre-outreach demographics and health characteristics
  - From Medicaid enrollment file (outreach list) and Medicaid claims files
- Predicted benefit amount
  - Predicted using pre-outreach demographics and health characteristics
- Analysis of characteristics selects on endogenous outcome of "applied" or "enrolled"
  - Comparison of average characteristics of enrollees or applicants across arms reveals characteristics of marginal individual induced to apply or enroll

3. Empirical Results: Take-up and Targeting

Behavioral Responses to Interventions

	Control	Information Plus Assistance	Information Only	P Value of Difference (Column 2 vs 3)
	(1)	(2)	(3)	(4)
SNAP Enrollees	0.058	0.176 [0.000]	0.105 [0.000]	[0.000]
SNAP Applicants	0.077	0.238 [0.000]	0.147 [0.000]	[0.000]
SNAP Rejections among Applicants	0.233	0.255 [0.202]	0.266 [0.119]	[0.557]
Callers	0.000	0.301 [0.000]	0.267 [0.000]	[0.000]
Adjusted Callers	0.000	0.301 [0.000]	0.289 [0.000]	[0.142]
SNAP Applicants among Callers	0.000	0.602 [0.000]	0.313 [0.000]	[0.000]
SNAP Applicants among Non-Callers	0.077	0.081 [0.324]	0.086 [0.063]	[0.363]
Observations (N)	10,630	10,629	5,314	

Time pattern of behavioral response: enrollment



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Behavioral Responses: Summary

- Enrollment:
  - “Info only” increases enrollment from 6% (controls) to 11%
  - “Information plus assistance” increases enrollment to 18%
  - Full effect by ~6 months and persists out to (at least) 12 months
    - Treatments seem to generate new enrollment vs “move forward in time” enrollment that would otherwise happen
- Interventions increase applications proportionally to enrollment
  - No decline (perhaps slight increase) in rejection rate
- Call in rates (“sign of interest”) similar (~30%) in both arms
  - Conditional on calling in, application rate is much higher with assistance (80%) than with information only (50%)
  - Share of people who apply without calling similar to controls
    - Suggests all marginal applicants affected by interventions call in response to outreach materials

“Info only” may be more cost effective

- BDT’s approximation of marginal costs of intervention:
  - Information only: ~$1 per outreach individuals (primarily mailing costs)
  - Information plus assistance: ~$7 per outreach individual
- Implied cost per enrollee:
  - Information only: ~$20
  - Information pus assistance: ~$60
- Above costs do not include public (state) processing costs and private time costs of application
- States benefit financially from encouraging take-up, even if they bear whole intervention cost as well as processing costs
  - Feds finances SNAP benefit: average of ~$1,300 / year per new enrollee
  - Total cost (to state + BDT) per new SNAP enrollee is <20% of benefits

Inattention Evidence: “No reminder” sub-treatment

- Sub-treatment with no follow up reminder postcard
  - Implemented as sub-treatment of “Information only” treatment

- **Reminders matter: responses decrease by 20% w/o reminder**
  - Standard “Information only” treatment: 30% call, 15% apply, 11% enroll
  - No reminder sub-treatment:
    - Calls are 7 percentage points lower
    - Application rate is 3 percentage points lower
    - Enrollment rate is 2 percentage point lower
  - Cost per enrollee similar with and without reminder

- Possible Interpretation: inattention / forgetfulness
  - Similar to Bhargava and Manoli (2015) who find – in EITC take-up intervention – a similar second reminder letter, just months after first, increased EITC take-up by 14 percentage points.

Characteristics of marginal applicants & enrollees

- Application success rate similar [already shown]

- Marginal applicants and enrollees “less needy” than average enrollee
  - Marginal enrollees have 20-30% lower monthly benefits
    - Implies higher net resources given progressive benefit formula
  - Marginal enrollees and applicants:
    - Have lower predicted benefit amount (based on heath and demographics)
    - Are healthier
    - Are older, more likely to be white, and more likely to have English as primary language

- Targeting similar across the interventions
  - Enrollee (or applicant) characteristics are similar in the two intervention arms

- Within each intervention arm, applicant and enrollee characteristics are similar

Enrollee Benefits and Predicted Benefits

	Control	Information Plus Assistance	Information Only	P Value of Difference (Column 2 vs 3)
	(1)	(2)	(3)	(4)
Benefit Amount	145.85	101.32 [0.000]	115.38 [0.000]	[0.013]
Share $16 Benefit	0.178	0.357 [0.000]	0.299 [0.000]	[0.012]
Share $194 Benefit	0.189	0.143 [0.012]	0.157 [0.150]	[0.421]
Share $357 Benefit	0.056	0.039 [0.115]	0.050 [0.681]	[0.285]
Share Missing Benefit	0.075	0.028 [0.000]	0.043 [0.019]	[0.139]
Predicted Benefit for Enrollees w/ Actual Benefit	140.11	102.63 [0.000]	112.67 [0.000]	[0.070]
Predicted Benefit for All Enrollees	138.65	103.73 [0.000]	114.18 [0.000]	[0.056]
Observations (N)	613	1,861	559	

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Demographic and health characteristics (enrollees)

	Control	Info Plus Assistance	Info Only	P Value of Difference (Column 2 vs 3)
	(1)	(2)	(3)	(4)
Panel A - Demographics				
Share Age 80+	0.07	0.14 [0.000]	0.12 [0.005]	[0.085]
Male	0.39	0.38 [0.444]	0.41 [0.446]	[0.104]
Share White	0.71	0.78 [0.001]	0.78 [0.004]	[0.958]
Share Black	0.11	0.10 [0.834]	0.07 [0.011]	[0.004]
Share Primary Language not English	0.06	0.03 [0.002]	0.05 [0.242]	[0.067]

Demographic and health characteristics (enrollees)

	Control	Info Plus Assistance	Info Only	P Value of Difference (Column 2 vs 3)
	(1)	(2)	(3)	(4)
Panel B - (Annual) Health Care Measures, 2015				
Total Medicaid Spending ($)	10,238	8,603 [0.208]	9,532 [0.661]	[0.459]
Total Number of Visits and Days	14.78	9.92 [0.008]	10.91 [0.059]	[0.466]
Weighted Total Number of Visits and Days	6,902	3,479 [0.012]	4,151 [0.068]	[0.457]
Number of Chronic Conditions	6.54	5.37 [0.005]	5.43 [0.019]	[0.879]
Observations (N)	613	1,861	559	

4. Model and Normative Implications

Goals of economic modelling exercise:

- Clarify conditions under which targeting properties are relevant for calculating social welfare impact of an info/assistance intervention
- Provide formula that can be used to evaluate the social welfare impact of “information / assistance” interventions
- Show how to accommodate many indirect/spillover effects of SNAP (fiscal externalities, labor supply responses, health effects, etc.)
- Relate SNAP program to other tax/transfer policies that have received more attention in public economics literature (e.g., EITC, in-kind transfers)

5. Conclusions

Conclusions

- Both information and transaction costs are barriers to take-up
  - Information only: increases enrollment by 5 ptg points (off base of 6%)
  - Information plus assistance: increases enrollment by 12 ptg pts
  - “Information only” may be more cost effective

- Interventions “decrease targeting”: Marginal applicants and enrollees are “less needy” than average enrollees in control: lower monthly benefits, lower predicted monthly benefits, better health

- Simple model clarifies conditions under which targeting properties of interventions are relevant for welfare

- Results consistent with existence of optimization frictions that are greater for needier individuals, suggesting welfare gains of our interventions are increasing in their targeting efficiency

Thank You!

Take-up Model: Set up

- Individuals choose whether to apply for safety net program:
  - Applications are either rejected or approved; if approved, applicants are enrolled and receive either low level of benefits b_L or high level of benefits b_H

- Two types of individuals, $j = l$ or h:
  - Individual of type j has income y_j, with $y_l > y_h$
  - If type-j individual applies, accepted with prob π_j, rejected with prob $(1 - \pi_j)$
  - Conditional on application being accepted, expected benefit is B_j. Assume that $\pi_l B_l < \pi_h B_h$
  - Individuals may misperceive probability of acceptance π_j as $(1 + \epsilon_j)\pi_j$

- Application costs:
  - Private cost of applying c with distribution within each type: $f_j(c)$
  - [Fiscal externality] Public cost g_j for each application processed to determine eligibility

Application decision and private welfare

- Individual applies if perceived expected benefit exceeds cost: $(1+\epsilon_j)\pi_j B_j > c$

$$
\begin{aligned}
V_j &= E[u()|apply] + E[u()|\neg apply] \\
&= \int_0^{(1+\epsilon_j)\pi_j B_j} (\pi_j u(y_j + B_j - c) + (1-\pi_j)u(y_j - c)) f_j(c)dc + \int_{(1+\epsilon_j)\pi_j B_j}^{\infty} u(y_j) f_j(c)dc \\
&\approx u(y_j) + \int_0^{(1+\epsilon_j)\pi_j B_j} u'(y_j)(\pi_j B_j - c) f_j(c)dc
\end{aligned}
$$

Social welfare

- Utilitarian social welfare function defined as sum of total private welfare minus public cost of

$$W = \underbrace{V_l + V_h}_{\text{Private Welfare}} - \underbrace{[(\pi_l B_l + g_l)A_l + (\pi_h B_h + g_h)A_h]}_{\text{Public Costs (Benefits, Application Costs)}} \quad (2)$$

  - V_j is total private welfare of type-j
  - g is public c$A_j = 1 - F_j((1+\epsilon_j)\pi_j B_j)$ ation (regardless of outcome)
  - A_j is total # of applications from type-j individuals and is defined as:

Definition of Treatments (T) and Targeting

- Define treatments (T)
  - "Information only": reduces misperceptions ($dT = d\varepsilon$).
  - "Information plus assistance": reduces misperceptions and private application costs ($dT = d\varepsilon, -dc$)

- Define high-benefit targeting: $e = E_H/(E_H + E_L)$
  - Share of enrollees who are high benefit (i.e. low resource)
  - Treatment T improves **benefit-targeting** if $de/dT > 0$
    - i.e. if treatment increases share of enrollees who are high benefit

- We refer to "targeting property" of treatment as how it changes benefit targeting

Proposition 1. *Let $\mu_j \equiv -u'(y_j)\epsilon_j(\pi_j B_j)$, which equals the marginal utility of income times the expected benefit of applying times the misperception of the application acceptance probability. The effect of the Information Only treatment on welfare is given by the following expression:*

$$\frac{dW}{dT}^{Information\ Only} = \underbrace{\mu_l \frac{dA_l}{dT} + \mu_h \frac{dA_h}{dT}}_{Change\ in\ Private\ Welfare} - \underbrace{\left[(\pi_l B_l + g)\frac{dA_l}{dT} + (\pi_h B_h + g)\frac{dA_h}{dT}\right]}_{Change\ in\ Public\ Cost} \quad (3)$$

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- No private welfare effects for marginal applicants (envelope theorem). Therefore, targeting properties are opposite to "folk wisdom"
- "Info only" reduces social welfare if it raises number of applications
- "Info plus assistance" impact on social welfare ambiguous
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Targeting & social-welfare impacts

- In neoclassical case, saw already that targeting property had no relationship to private welfare impact of intervention
- In misperceptions case we obtain following result:

Proposition 2. *Holding constant the change in applications due to an intervention, the change in social welfare in response to an improvement in targeting* $(de/dT > 0)$ *from either intervention (Information Only or Information Plus Assistance treatment) is given by the following expression:*

$$\frac{\partial}{(de/dT)}\left(\frac{dW}{dT}\right)\Big|_{\frac{dA}{dT}} = [(\mu_h - \mu_l) - ((\pi_h B_h + g_h) - (\pi_l B_l + g_l))]\,(E_H + E_L)\frac{(E_H + E_L)}{E_H(\pi_{lL} - \pi_{hL}) + E_L(\pi_{hH} - \pi_{lH})} \tag{5}$$

Proof: *See Appendix E.*

- $u'(y_j)$ and $\pi_j B_j$ are higher for H-types
- But, welfare gain from intervention also depends on ϵ_j which could have any relationship with type

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Parameterizing the model

- To simplify parametrization, collapse distribution of benefits to either \$16/mo or \$178/mo (\$388 and \$4,272 over 24 mos)
- Assume acceptance rate same for everyone of 0.75. Thus, expected benefits from applying are \$290 and \$3,200 for each type.
- Assume $g_l = g_h = \$267$

- Assuming time cost of applying (5 hours) is valued at twice minimum wage, and assuming non-time costs are zero, then back out ϵ_j for marginal individuals, delivers $\epsilon_l = -0.75$ and $\epsilon_h = -0.98$

[Alternatively, assuming no misperceptions implies the non-time costs of applying is \$3,100 for high-benefit types]

Normative analysis: MVPF

- Can follow Hendren (2016) to derive expression for MVPF
- In misperceptions case we obtain following result:

$$MVPF^{Information\ Only} = \frac{-\epsilon_h(\pi_h B_h)\frac{dA_h}{dT} - \epsilon_l(\pi_l B_l)\frac{dA_l}{dT}}{(\pi_h B_h + g_h)\frac{dA_h}{dT} + (\pi_l B_l + g_l)\frac{dA_l}{dT}}.$$

$$MVPF^{Information\ Only} = \frac{0.98(\$3,200)0.04 + 0.75(\$290)0.03}{(\$3,200 + \$267)0.04 + (\$290 + \$267)0.03} = 0.85$$

$$MVPF^{Information\ Plus\ Assistance} = \frac{-\epsilon_h(\pi_h B_h)\frac{dA_h}{dT} - \epsilon_l(\pi_l B_l)\frac{dA_l}{dT} - (A_h + A_l + \frac{dA_h}{dT} + \frac{dA_l}{dT})\frac{dc}{dT}}{(\pi_h B_h + g_h)\frac{dA_h}{dT} + (\pi_l B_l + g_l)\frac{dA_l}{dT}}.$$

make assumptions about individual utility functions or social welfare functions. The MVPF comes from a marginal expansion of our intervention as the ratio of marginal benefits to marginal costs

- Intuition is that private welfare change is expressed as money metric (MU of consumption for marginal individual)
- Hendren (2016) reports MVPF for EITC of ~0.9 and SNAP of 0.5-0.7 for non-elderly

Normative analysis: Role of targeting

- To see the role that targeting plays in the MVPF, we calculate the "Info Only" MVPF separately

$$MVPF_h^{Information\ Only} = \frac{-\epsilon_h(\pi_h B_h)\frac{dA_h}{dT}}{(\pi_h B_h + g_h)\frac{dA_h}{dT}} = \frac{0.98(\$3,200)0.04}{(\$3,200+\$267)0.04} = 0.90$$

$$MVPF_l^{Information\ Only} = \frac{-\epsilon_l(\pi_l B_l)\frac{dA_l}{dT}}{(\pi_l B_l + g_l)\frac{dA_l}{dT}} = \frac{0.75(\$290)0.03}{(\$290+\$267)0.03} = 0.39$$

- Conditions of Proposition 2 being satisfied => Policies that are especially effective at targeting *h* types will have higher overall MVPF

Take-up Model: Set up

- Individuals choose whether to apply for safety net program:
  - Applications are either rejected or approved; if approved, applicants are enrolled and receive either low level of benefits b_L or high level of benefits b_H

- Two types of individuals, $j = l$ or h:
  - Individual of type j has income y_j and if type-*j* individual applies, receives b_L with probability π_{jL} , b_H with probability π_{jH} , and is rejected with probability $1 - \pi_{jL} - \pi_{jH}$
  - Thus, conditional on application being accepted, expected benefit is $B_j = (\pi_{jL} b_L + \pi_{jH}\ b_H)/\ \pi_j$ where $\pi_j = \pi_{jL} + \pi_{jH}$
  - Individuals may misperceive probability of acceptance π_j as $(1 + \epsilon_j)\pi_j$

- Application costs
  - Private cost of applying *c* with distribution within each type: $f_j(c)$
  - Public cost *g* for each application processed to determine eligibility [fiscal externality]

Overview of model and normative results

- Use take-up model to explore normative implications of interventions
  - Individuals optimally apply or not, given beliefs about expected benefits
  - Individuals may have accurate beliefs about expected benefits **("neoclassical" case)** or biased beliefs **("misperceptions")**
  - Fiscal externality on government from processing cost of application

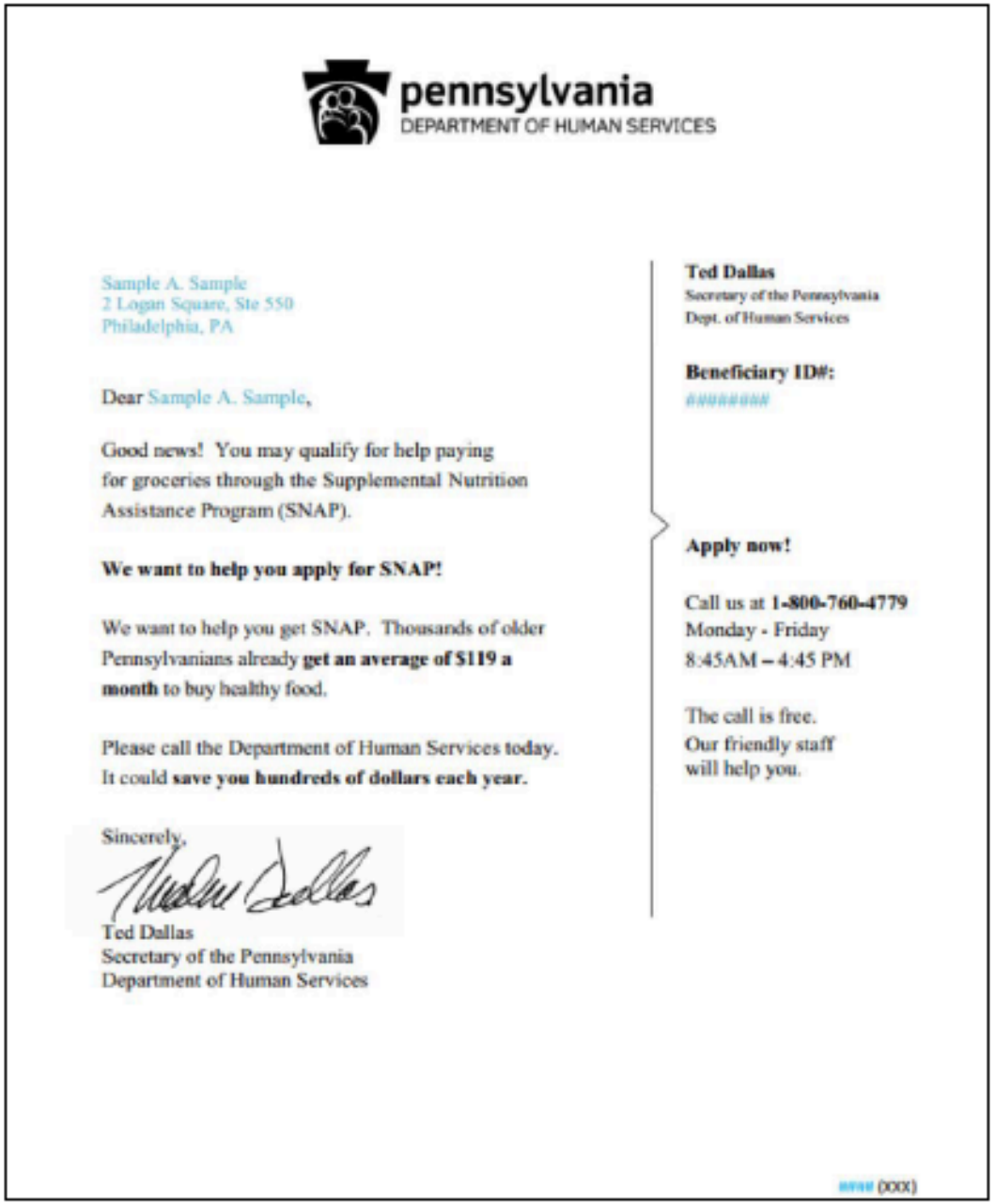
- Neoclassical case
  - For marginal applicants, no impact on private welfare (envelope theorem) => Targeting properties of intervention irrelevant for social welfare
  - "Information only" reduces social welfare if it increases applications
  - "Info plus assistance" social welfare impact ambiguous: benefits to infra-marginal applicants vs. application cost to gov't from marginal applicants

- Misperceptions case (with under-estimated expected benefits)
  - Marginal applicants now have private welfare gains if under-estimated expected benefits
  - No general relationship between improvements in targeting and impact of interventions on social welfare

Appendix Slides

Standard outreach materials: info only arm

Letter



pennsylvania
DEPARTMENT OF HUMAN SERVICES

Sample A. Sample
2 Logan Square, Ste 550
Philadelphia, PA

Dear Sample A. Sample,

Good news! You may qualify for help paying for groceries through the Supplemental Nutrition Assistance Program (SNAP).

We want to help you apply for SNAP!

We want to help you get SNAP. Thousands of older Pennsylvanians already **get an average of $119 a month** to buy healthy food.

Please call the Department of Human Services today. It could **save you hundreds of dollars each year.**

Sincerely,

Ted Dallas
Secretary of the Pennsylvania
Department of Human Services

Ted Dallas
Secretary of the Pennsylvania
Dept. of Human Services

Beneficiary ID#:
########

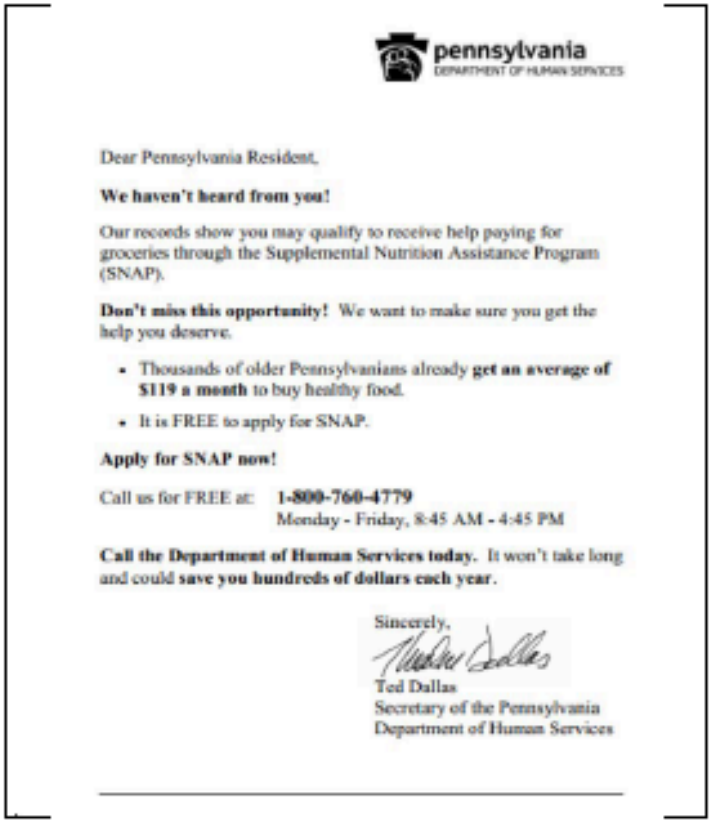
Apply now!

Call us at **1-800-760-4779**
Monday - Friday
8:45AM – 4:45 PM

The call is free.
Our friendly staff
will help you.

(XXX)

Postcard



pennsylvania
DEPARTMENT OF HUMAN SERVICES

Dear Pennsylvania Resident,

We haven't heard from you!

Our records show you may qualify to receive help paying for groceries through the Supplemental Nutrition Assistance Program (SNAP).

Don't miss this opportunity! We want to make sure you get the help you deserve.

- Thousands of older Pennsylvanians already **get an average of $119 a month** to buy healthy food.
- It is FREE to apply for SNAP.

Apply for SNAP now!

Call us for FREE at: **1-800-760-4779**
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Call the Department of Human Services today. It won't take long and could **save you hundreds of dollars each year.**

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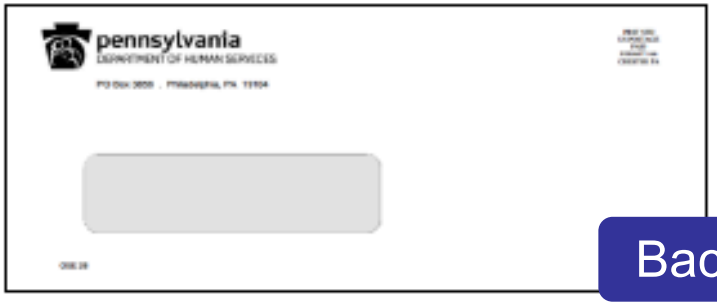
Envelope



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Balance table

	Control	Information Plus Assistance	Information Only	P Value of Difference (Column 2 vs 3)
	(1)	(2)	(3)	(4)
Age (as of October 31, 2015)	68.80	68.80 [0.975]	68.93 [0.425]	[0.434]
Share Age 80+	0.16	0.16 [0.861]	0.17 [0.349]	[0.459]
Male	0.38	0.38 [0.702]	0.38 [0.965]	[0.718]
Share White	0.76	0.75 [0.089]	0.76 [0.634]	[0.330]
Share Black	0.08	0.08 [0.281]	0.07 [0.371]	[0.079]
Share Primary Language not English	0.04	0.04 [0.574]	0.04 [0.377]	[0.191]
Number of Hospital Days (annual, 2015)	2.09	2.29 [0.378]	1.93 [0.473]	[0.152]
Number of Chronic Conditions (2015)	5.46	5.44 [0.808]	5.34 [0.336]	[0.475]
F Statistic		0.664	0.560	0.746
P Value		[0.814]	[0.911]	[0.742]
Observations (N)	10,630	10,629	5,314	

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