Making it Happen: Designing, Implementing, and Evaluating PSE Interventions

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NCCOR National Collaborative on Childhood Obesity Research

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Natural Experiments

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NYU Grossman and NYU Wagner
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NYU Langone Health

Disclosures

Nothing to disclose

Natural experiments: Why are they useful to study childhood obesity and nutrition?

- Natural experiments are a research methodology that takes advantage of an already occurring phenomena and works to rigorously study it
- Particularly useful when randomization is not possible: as close to causal analysis as possible
- Useful because there have been multiple P/policies happening and it is important to study them well

How is a natural experiment done?

- Determine changes in the area that implemented the policy
- Determine changes in a comparison area that did not implement the policy (that otherwise looks like the other area!)
- See if the change in one area is different than the change in another
- Referred to as a difference-in-difference design

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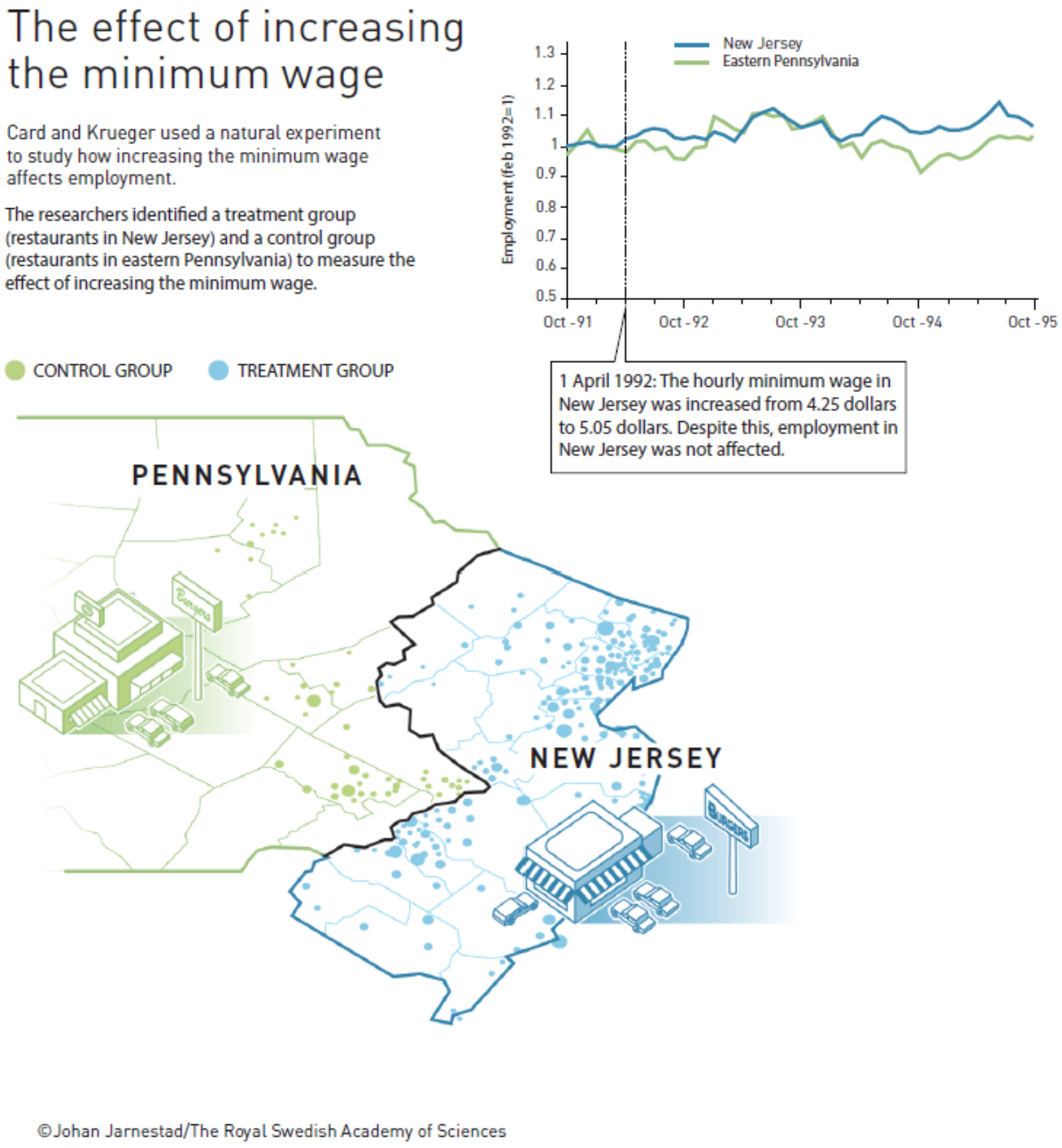
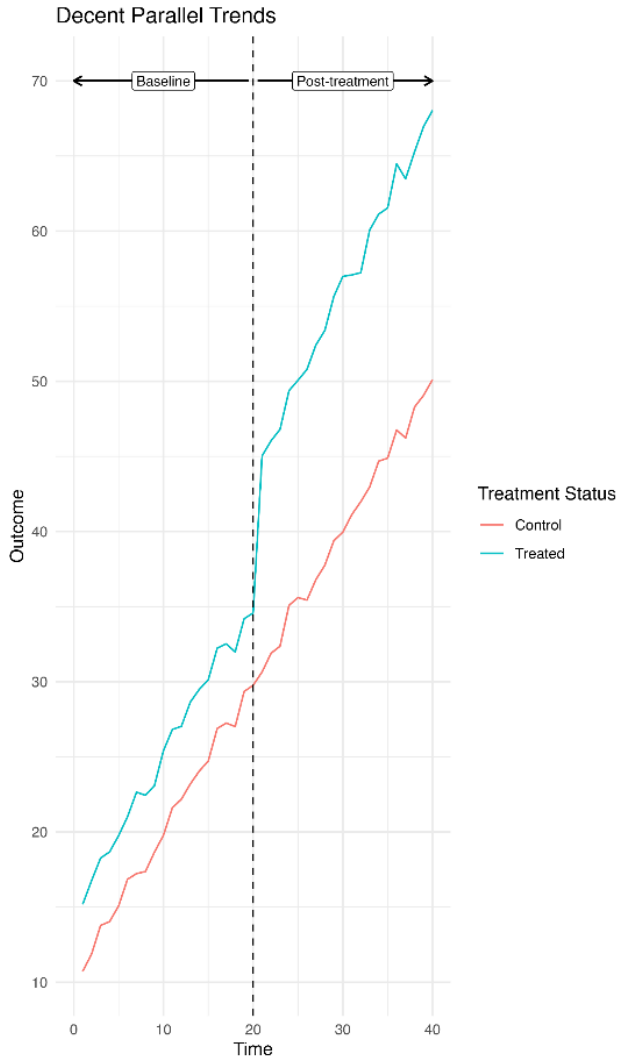
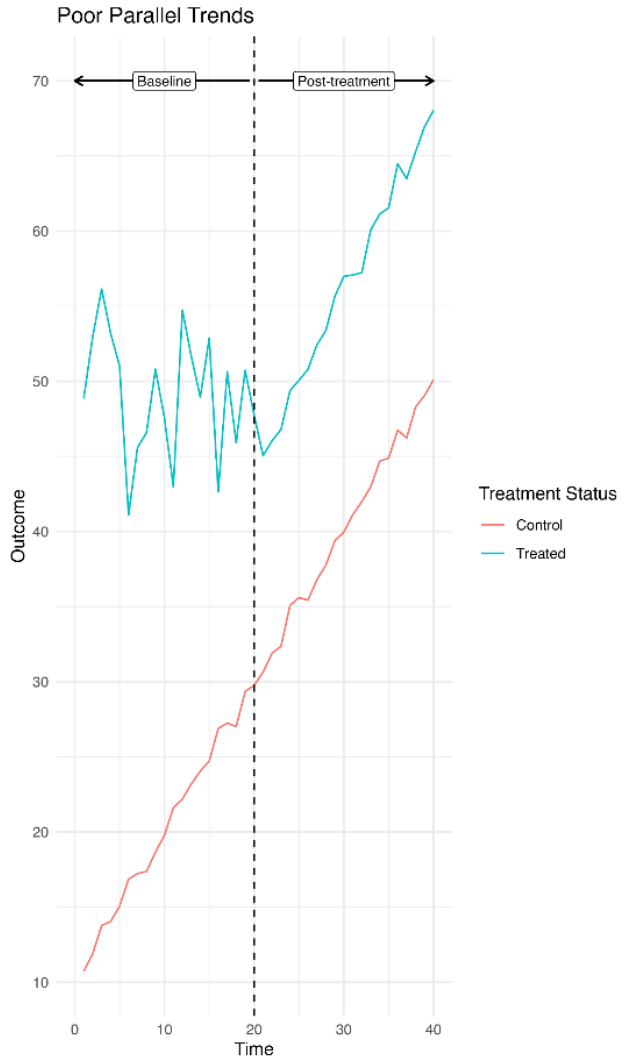
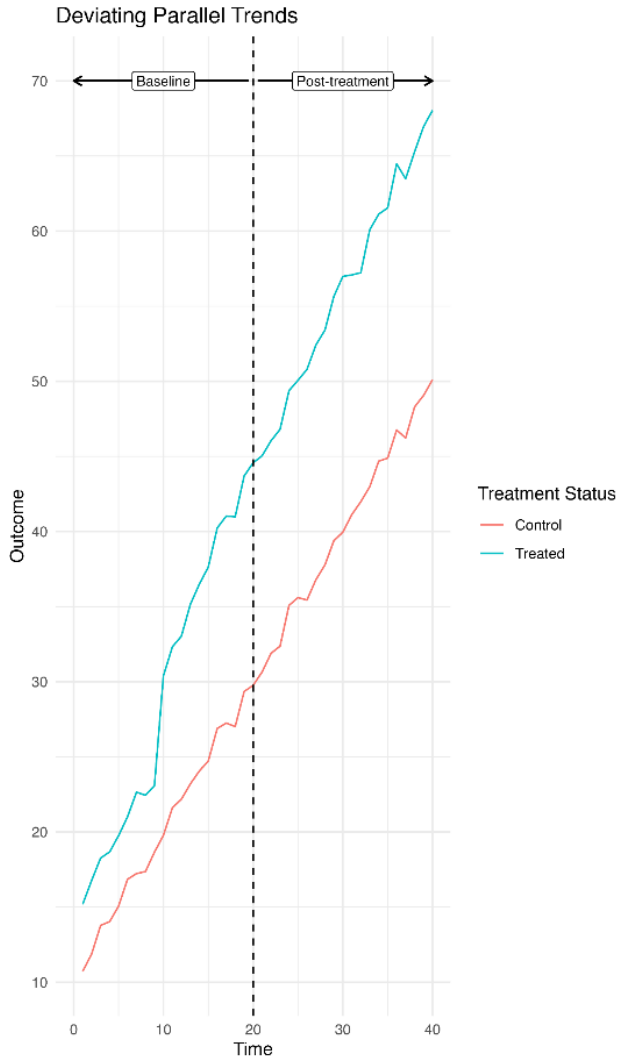


Comparison group is critically important

- Choose carefully
- Need something that gets as close to randomization as possible
- The comparison groups must have similar trends as the treatment group for the outcomes of interest







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When and why might we use natural experiments?

Uses

- When you can't, or it isn't feasible to, randomize
- That is most of what we're talking about with respect to obesity policies

Benefits

- Can understand how a policy works in the "real world"
- If done well, can approximate some of the benefits of a randomized design

Limitations to consider

Data considerations

- Do you have or can you get data on key outcomes of interest?
- Can you get data over time?

Types of data, particularly power considerations

- Original data collection?
- Secondary data?

Do you have a good comparison group?

Are the baseline trends really the same?

Generalizability?

Example 1:
Menu labeling

Two studies:

- Individually collected receipts outside fast food restaurants
- Used transaction-level data from a large national chain

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Example 1:
Menu labeling

Individual data collection: Collected 3,239 intercept surveys with receipts

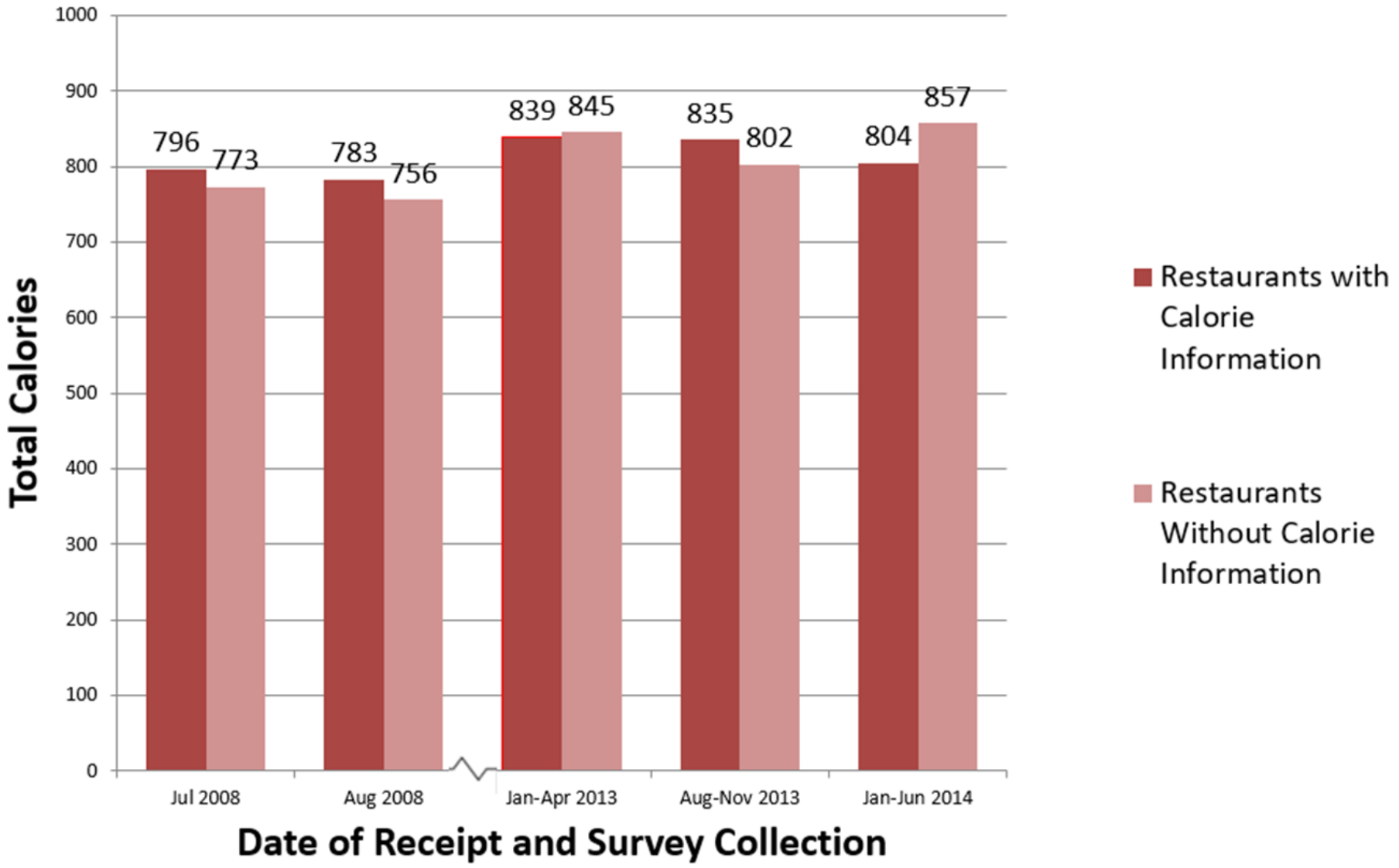
Study 1: New York City labeling law, 1,156 surveys and receipts (Comparison: Newark)
Study 2: Philadelphia labeling law, 2,083 surveys and receipts (Comparison: Baltimore)

Study 1: https://doi.org/10.1377/hlthaff.28.6.w1110
Study 2: https://doi.org/10.1002/oby.20550

Example 1: Menu labeling

Individual data colle

Study 1: New York City labeling
Study 2: Philadelphia labeling la



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Example 1:
Menu labeling

Transaction/sales data: >5.2 billion transactions

Studied 474 locations that implemented labeling, each restaurant with its own well-matched comparison from across the nation

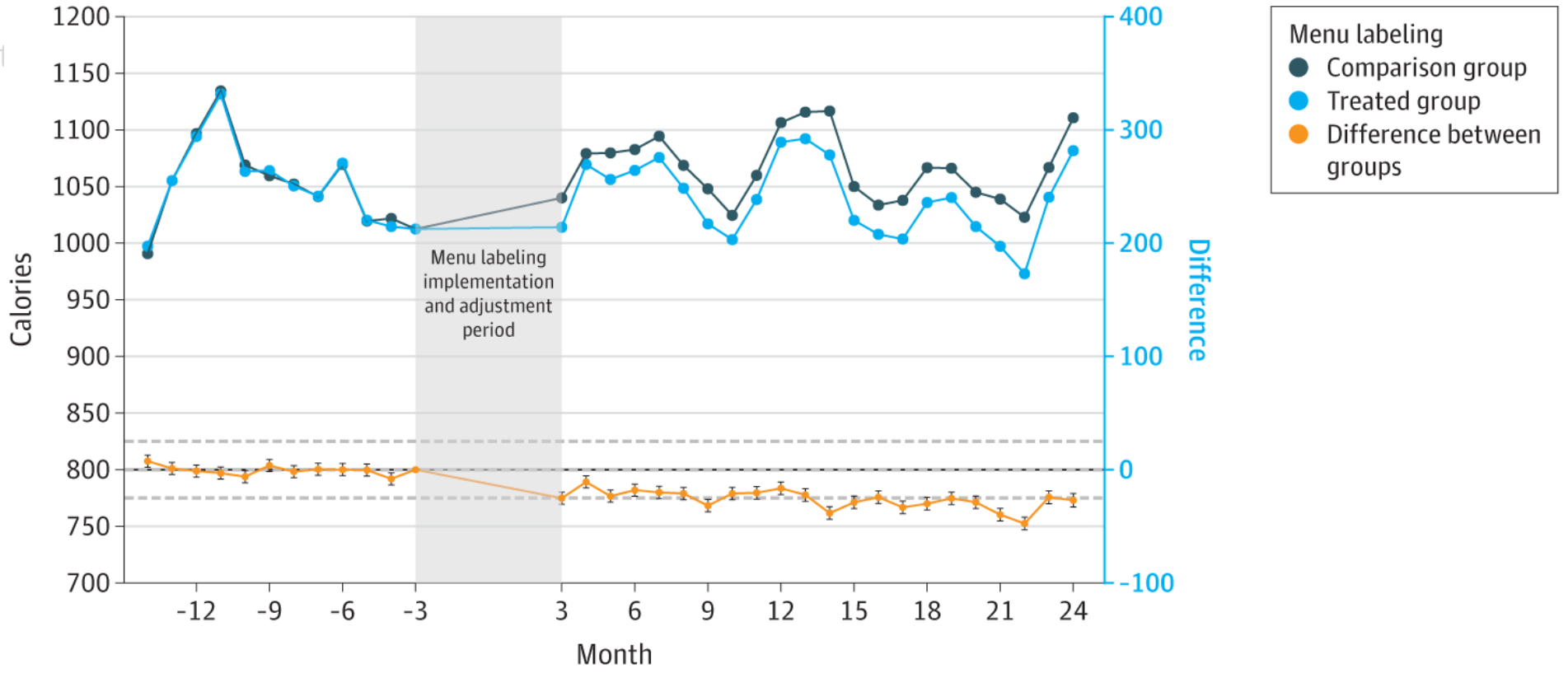
https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2812966

Example 1: Menu labeling

Transaction/sales da

Studied 2,329 locations that
across the nation

DID, first year (95% CI)	DID, second year (95% CI)	DID, postperiod (95% CI)
-19.2 (-20.2 to -18.2)	-29.2 (-30.4 to -28.0)	-24.6 (-25.7 to -23.6)



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Example 2:
New supermarkets

Two studies:

- Individually collected surveys around a store that opened as a result of city tax credits
- Administrative data (measured BMI on all NYC public school children) to study 8 stores that were opened or renovated as a result of city tax credits

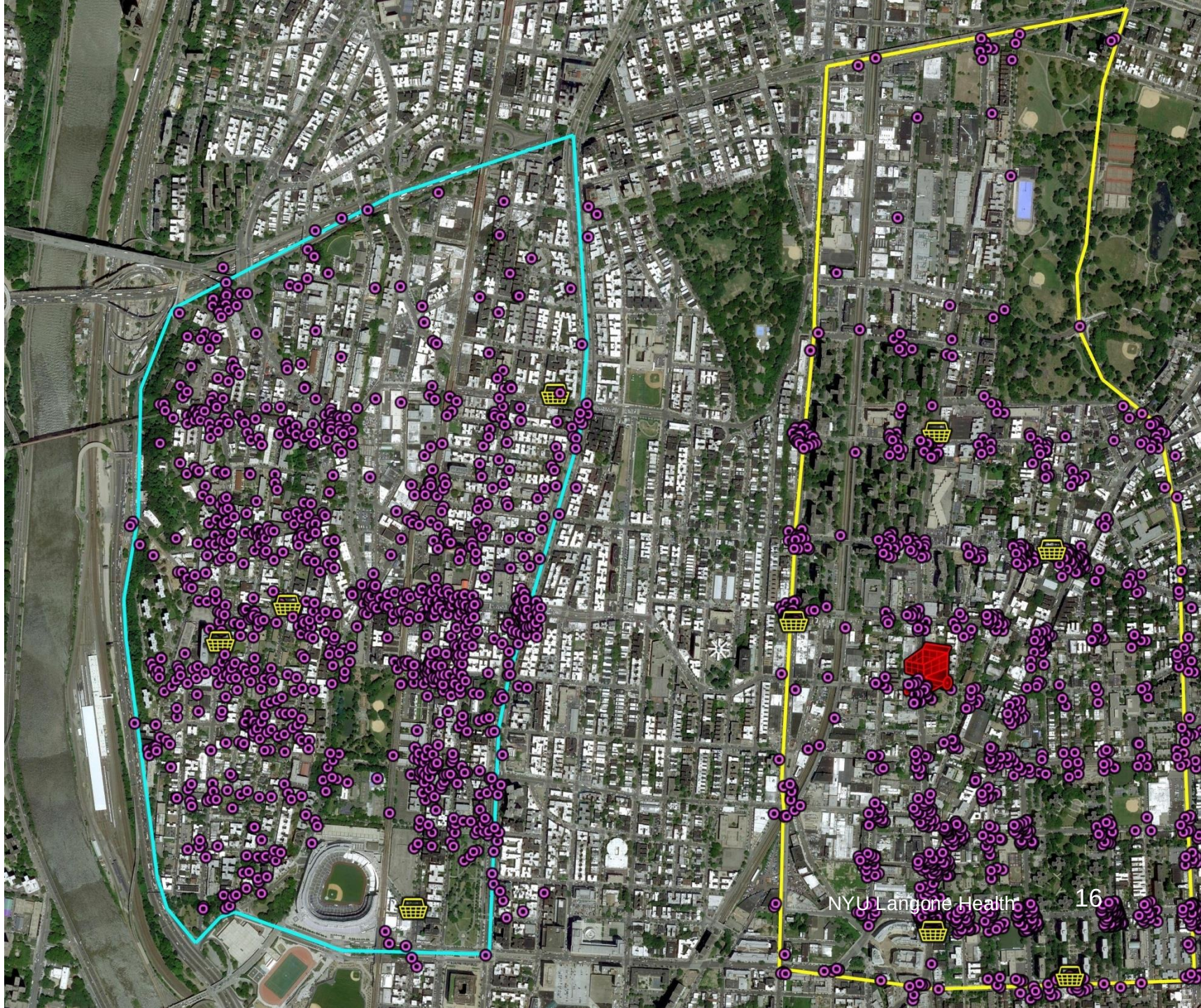
https://jamanetwork.com/journals/jamapediatrics/fullarticle/2792042
https://doi.org/10.1017/S1368980015000282

Example 2: New supermarkets

Collected 6,220 street-intercept surveys and 1,984 follow-up dietary recalls by phone

Data collected before, just after and one year after store opened

Results: No change overall, but some change in fruit/vegetables purchasing for those near store



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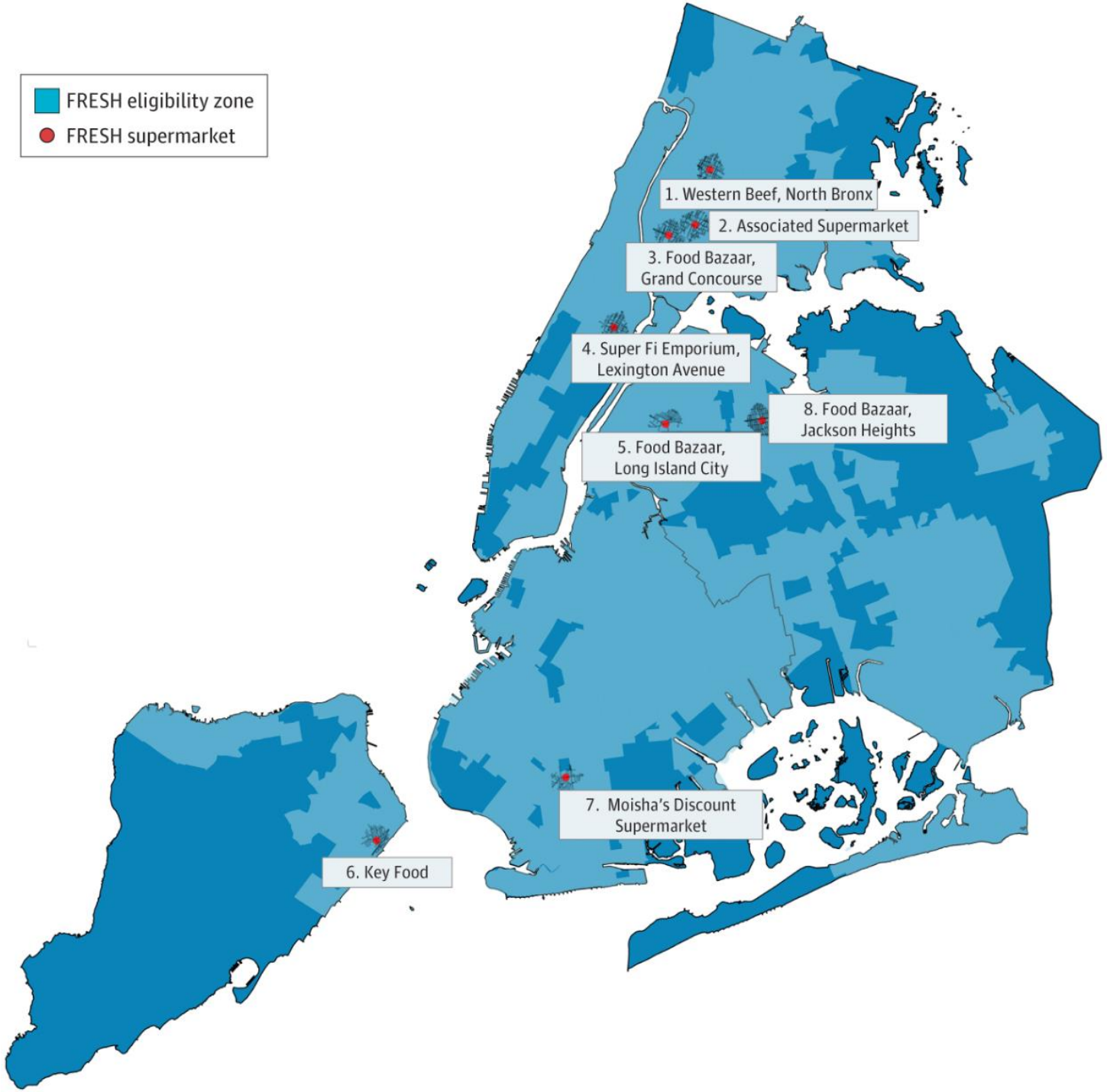
Example 2: New supermarkets

Child-level BMI data: look for changes in BMI before and after new supermarkets opened.

Results: Lower BMI z-score and likelihood of obesity among students who lived within 0.50 miles of new stores compared with students who lived further away in eligible areas.



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Example 2: New supermarkets

Child-level BMI data: l
BMI before and after n
opened.

Decreases in BMI z-sc
of obesity significant a
lived within 0.50 miles
compared with studen
away in eligible areas.

Table 3. Difference-in-Differences Model Results at 3- to 12-Month Follow-up, Overall and by Project Type[a]

	Mean (SD)					
	Treatment group		Control group		Difference-in-differences estimate (95% CI)	
	Baseline	Follow-up	Baseline	Follow-up	Unadjusted	Adjusted
BMI *z* score						
All FRESH supermarkets	0.75 (1.15)	0.70 (1.15)	0.75 (1.10)	0.74 (1.10)	−0.03 (−0.05 to −0.02)[b]	−0.04 (−0.06 to −0.02)[b]
New FRESH supermarkets	0.72 (1.16)	0.68 (1.18)	0.72 (1.11)	0.71 (1.12)	−0.03 (−0.06 to −0.002)[c]	−0.07 (−0.11 to −0.03)[b]
Renovation FRESH supermarkets	0.77 (1.14)	0.72 (1.13)	0.77 (1.09)	0.76 (1.09)	−0.04 (−0.06 to −0.02)[b]	−0.03 (−0.06 to −0.01)[e]
Obesity, %						
All FRESH supermarkets	24.3 (42.9)	23.3 (42.3)	23.3 (42.3)	23.3 (42.3)	−0.01 (−0.02 to −0.001)[c]	−0.01 (−0.02 to −0.002)[c]
New FRESH supermarkets	24.0 (42.7)	23.6 (42.5)	22.7 (41.9)	22.5 (41.8)	−0.001 (−0.01 to 0.01)	−0.02 (−0.03 to −0.003)[c]
Renovation FRESH supermarkets	24.6 (43.1)	23.0 (42.1)	23.8 (42.6)	23.9 (42.6)	−0.02 (−0.03 to −0.004)[d]	−0.01 (−0.02 to 0.001)

Abbreviations: BMI, body mass index; FRESH, Food Retail Expansion to Support Health.

[a] Effect sizes were estimated using a difference-in-differences model with an unobserved time-invariant student-level fixed effect and adjusting for the time-varying individual-level characteristics, census tract–level characteristics, and food environment variables described in Table 2. The sample includes 54 728 students (n = 109 456 student-year observations), including residentially stable students who were enrolled in nonspecial education or noncharter schools and resided in a FRESH-eligible area in academic years 2009-2016, with nonmissing residential address data, at least 1 BMI measurement within 12 months before the month a FRESH supermarket opened, and at least 1 BMI measurement 3-12 months after the month a FRESH supermarket opened.

[b] $P < .001$.

[c] $P < .05$.

[d] $P < .01$.

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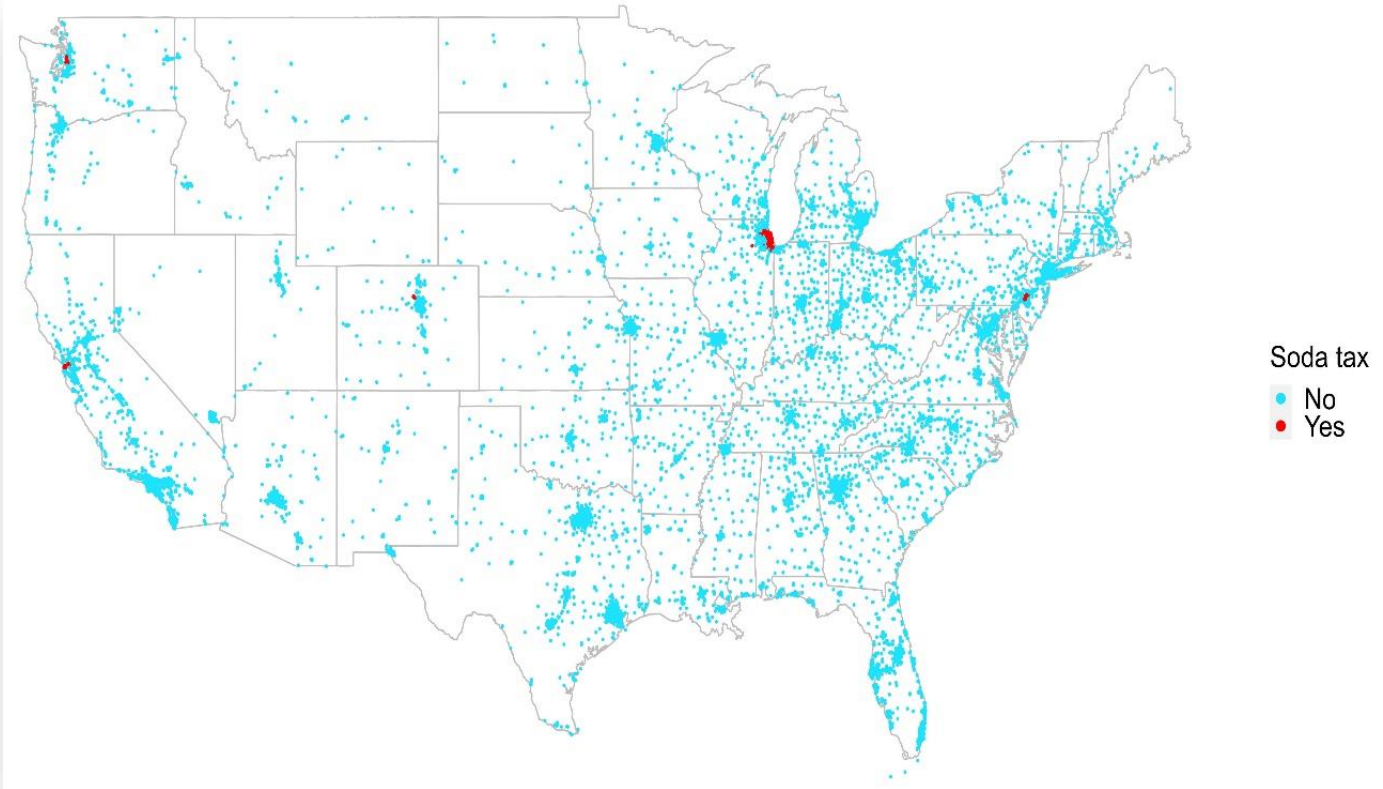
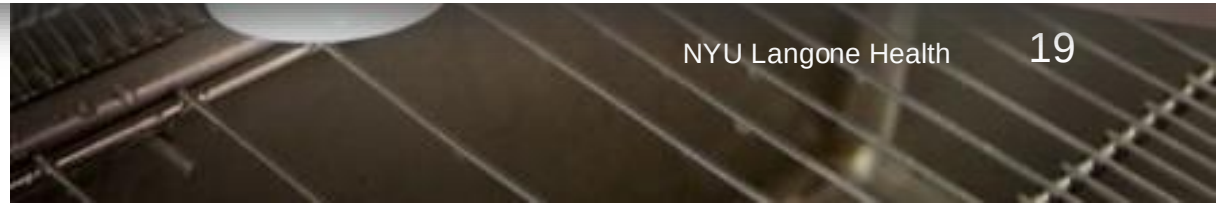
Example 3: Soda taxes

- Used transaction-level data from a large national chain to examine change in purchasing after taxes were implemented
- Studied 5 localities that implemented taxes
- Results still under review, though no substantial change in purchasing





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Example 4:
Social media restrictions (with Marie Bragg)

- Many states now implementing restrictions on social media use by children

- Original data collection, at large scale: Screen recordings from 700 adolescents just at baseline


THE TEXAS TRIBUNE

INVESTIGATIONS GUIDES NEWSLETTERS

DONATE Voting Guides Texas Elections Student Cell Phones School Funding Speaker's Race

Texas parents gain new tools to control their teen's social media use

A new law gives parents more power over a child's actions on social media, but only if the parent knows about the account.

BY POOJA SALHOTRA SEPT. 9, 2024 5 AM CENTRAL

SHARE REPUBLISH

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Reflections on natural experiments for obesity policy: Why we need them

- We must continue to do work to understand the potential role of policies before they are implemented (lab experiments, modeling work, thoughtful non-causal studies)

- That said, this work does not substitute for needing to understand how policies will play out in real world settings

- This makes natural experiments incredibly important

- These are powerful tools that we should be using more

Reflections on natural experiments for obesity policy: Why we need them

- These are hard studies to do well
- Comparison group: Serious considerations must be given to getting this right, with appropriate parallel trends
- Data Type: These studies are very hard to do with primary data collection
  - Obesity and nutrition impacts are small from most policies (though at scale)
  - To have the right power, you need a lot of data
- Increased funder attention to these studies welcome and appreciated
- Also need more / better large scale administrative data and better use of what we have

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Thank you

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- Aetna Foundation

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Thank you!

FOOD4MOMS: Community Co-Design and Pilot Implementation of a Produce Prescription Program (PRx) for Pregnant Latinas

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NCCOR National Collaborative on Childhood Obesity Research

OPUS Obesity-Related Policy, Systems, and Environmental Research in the US

Disclosures

- I do not have any conflicts of interest to declare.

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- Funder: USDA GusNIP Program

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- Katina Gionteris, Wholesome Wave, Program and Data Manager
- Amber Hromi-Fiedler, Yale School of Public Health

Background

- Food and nutrition insecurity during gestation is a risk factor for poor pregnancy outcomes (Mckay, 2022; Laraia, 2022)
- Food insecurity is higher among Hispanic immigrant pregnant women and among Hispanic families of young children (Gross, 2019, Varela, 2023)
- PRx programs that combine fruit and vegetable incentives with nutrition education increase fruit and vegetable intake and improve security status (Brooks, 2023)

Objectives

- Co-design with the community a PRx program for pregnant low-income Hispanic women
- Pilot test the co-designed program
- Assess the impact of the PRx on produce purchases and intake

Community Engaged Methods

Co-Design Phase (n=21)	Iterative partners' input
Pilot Feasibility Phase (n=60)	PRx program testing and customer satisfaction
Impact Evaluation Phase (n=90)	Program for dissemination

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wholesome wave | Hispanic Health Council | Yale School of Public Health | Griffin Health | PRC Prevention Research Centers

OPUS Obesity-Related Policy, Systems, and Environmental Research in the US

Co-Design Methods

- Selection criteria:
  - Hispanic
  - Living in the City of Hartford and pregnant or with a child under two years of age
- Recruitment:
  - Hispanic Health Council (HHC) Maternal & Child Programs
  - The Supplemental Nutrition Program for Women, Infants, and Children (WIC)

Co-Design Methods

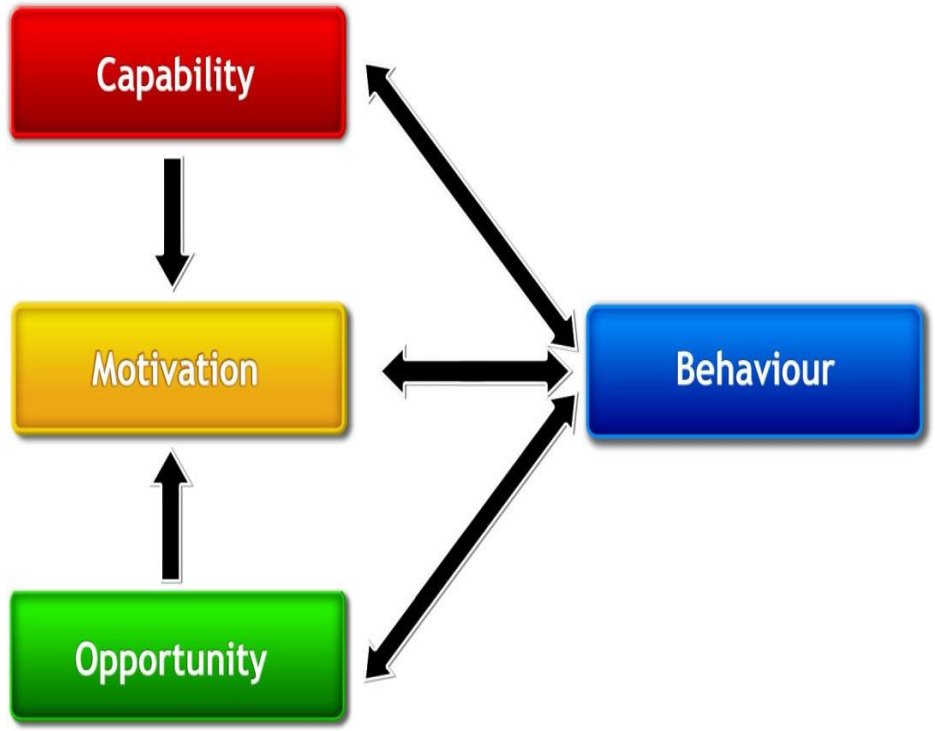
- Listening Sessions
- Consented and administered a brief socio-demographic survey
- Used a semi-structured guide with open-ended questions:
  - Participant's knowledge and perspectives on nutrition
  - Feedback from previous session
  - Design of each program step, including recruitment methods, incentives options
  - All listening sessions were moderated by a one bilingual facilitator
  - Participants were paid $25 for their time

Food4Moms Program Impact Pathway (PIP)

Community Outreach → Screening & Recruitment → SNAP-Ed Nutrition education at HHC → PRx enrollment → PRx redemption → PRx purchases → PRx intake

F4Ms PIP Mapped to COM-B Model

- **Capability**
  - Easy to redeem PRx
  - Practical nutrition education/skill building
- **Motivation**
  - Baby/Mother's health
  - $100 per month for 10 months
- **Opportunity**
  - Neighborhood supermarkets
  - Home delivery
  - Nutrition education at trusted CBO



https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-6-42/figures/1

Listening Sessions Participant's Characteristics

	LS1 n =8	LS2 n=9	LS3 n=4
Hispanic %	100%	100%	100%
Age (mean)	31.6	32.2	30.0
Pregnant	50%	56%	50%
Children under 2 years old	50%	44%	50%
Language spoken			
Only Spanish	87.50%	22%	75%
Only English	12.50%	22%	0%
English/Spanish	0	56%	25%

1. **Importance of consuming fresh produce during pregnancy**

   Participants recognized the importance of eating healthy during pregnancy

   “I'm here because nutrition is important to me, both for this baby that is going to be born as well as for my daughter and for everyone in my family.” (CD Listening session 1)

2. **Importance of having a Produce Prescription Program for pregnant women**

   “I think it is very good. Well, I think it is an initiative to begin to nourish ourselves much better if we did not do it before, because now we are going to benefit ourselves and our baby.” (CD Listening session 3)

   “Not everybody has a food stamp (SNAP) but most people have a WIC. It’s not enough money for veggie and fruit. You can spend it all for one week, and the other two weeks you’re running out.” (CD Listening session 2)

3. Incentives

"It is a very good amount for any family, as a help, well I don't know if it is enough, but for me it is good because the way things are now, all the vegetables [prices] have gone up too much and there are some families, some mothers don't work, only the father works; so, the money is not enough but it (the incentive) is a great help…" (CD Listening session 1)

Referring to using a debit card for incentives:

"Well, in my case, I already have WIC for my little one, so it makes it more feasible for me to do my shopping at Walmart or Stop & Shop. I can also choose what I need and keep track of what is missing." (CD Listening session 3)

4. Nutrition Classes

"I know that usually, they say that in the first trimester these discomforts should pass; I'm six months and I'm still the same, with the same discomforts… there should be very good information respect to that." (CD Listening session 1)

"I was suffering from low iron, and I am still suffering from it; so, if I sit down and they (the nutrition class) give me the orientation, look, this is what you can eat … or they give you ideas of things that can help you to have good iron before delivery, it is important. I think it is very essential that they offer it." (CD Listening session 1)

Final Program Details Resulting from Listening Sessions

- PRx incentives:
  - $100 per month for 10 months
  - Different options, e.g., Fresh Connect, Home Delivery
- Nutrition education sessions
- Enrollment during first or second pregnancy trimester

Community Engaged Methods

	Co-Design Phase (n=21)	Iterative partners' input	✓
	Pilot Feasibility Phase (n=60)	PRx program testing and customer satisfaction	✓
	Impact Evaluation Phase (n=90)	Program for dissemination	**Almost done**

Pilot Study Preliminary Results

- ⇧ PRx redemption rates
- ⇧ nutrition education sessions attendance
- ⇧ client satisfaction

Conclusions

FOOD4MOMS is an example of how person-centered co-designs can support high PRx uptake and compliance

Thank you!

From Clicks to Behavior Change:
Improving Equity in Food Access through Online Grocery

Angela Trude, PhD

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Disclosures

- None

The Grocery Gap

1.9 million households live far from a supermarket and do not own a vehicle

Particularly low-income neighborhoods, communities of color, and rural areas

Barriers to Heathy Eating

Among > 4,000 SNAP-recipients:

- Far distance to a store
- Lack of transportation
- Affordable prices

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Online Grocery Shopping

Brings groceries to people:
Potentially addresses barriers imposed by food deserts

Other barriers:

Payment methods and fees

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How to Promote Equity in Online Food Access?

1. Framework
2. Literature Review
3. Community Involvement
4. Intervention Strategy
5. Co-benefits

Equity in online healthy food access

1 Framework

The Getting to Equity in Obesity Prevention Framework

Kumanyika S (2017) *NAM Perspectives* | Kumanyika S (2019) *AJPH*

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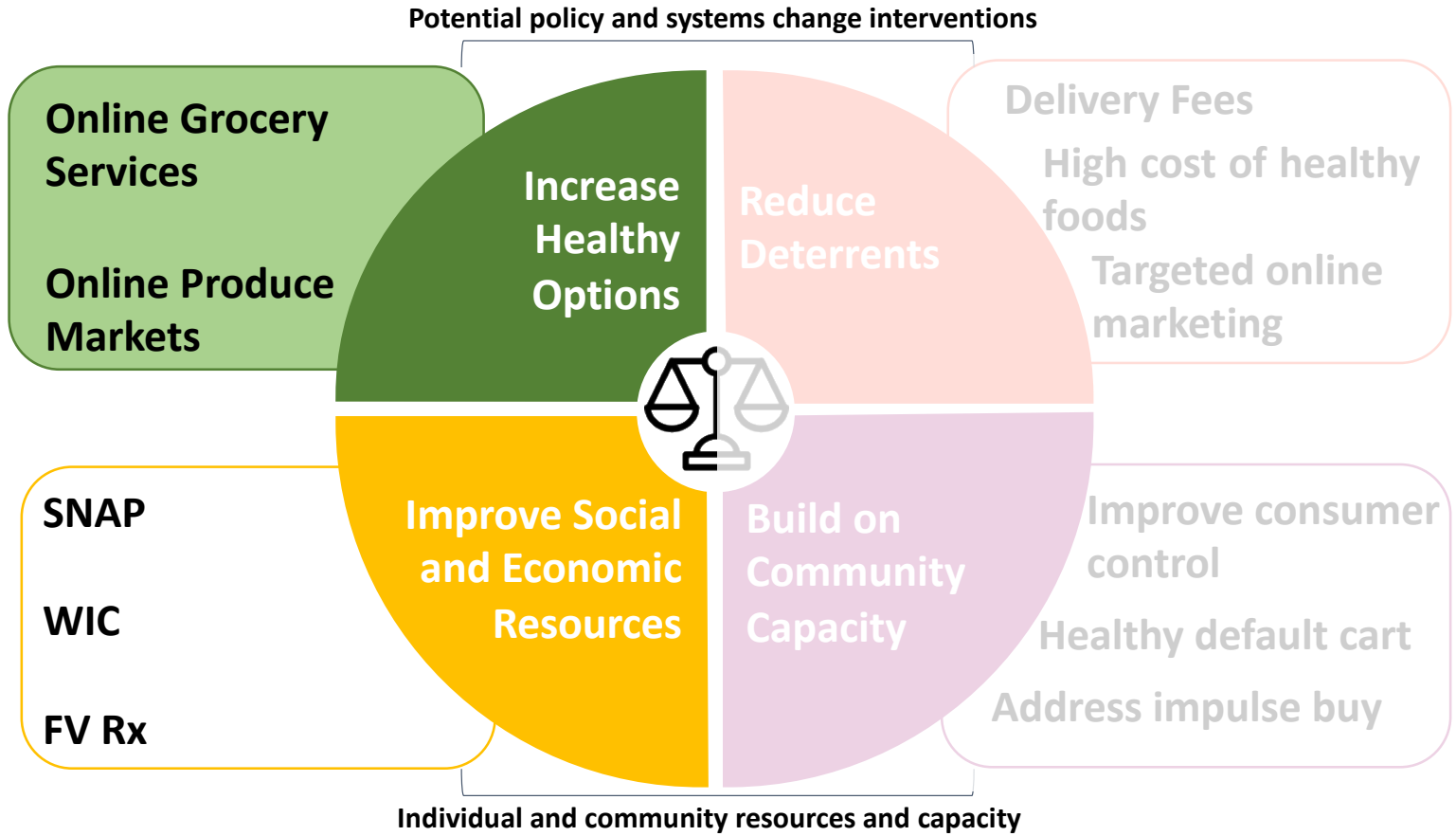
2 Literature Review



Trude ACB, Lowery C, Ali S, Vedovato GM (2022) *Nutrition Reviews*

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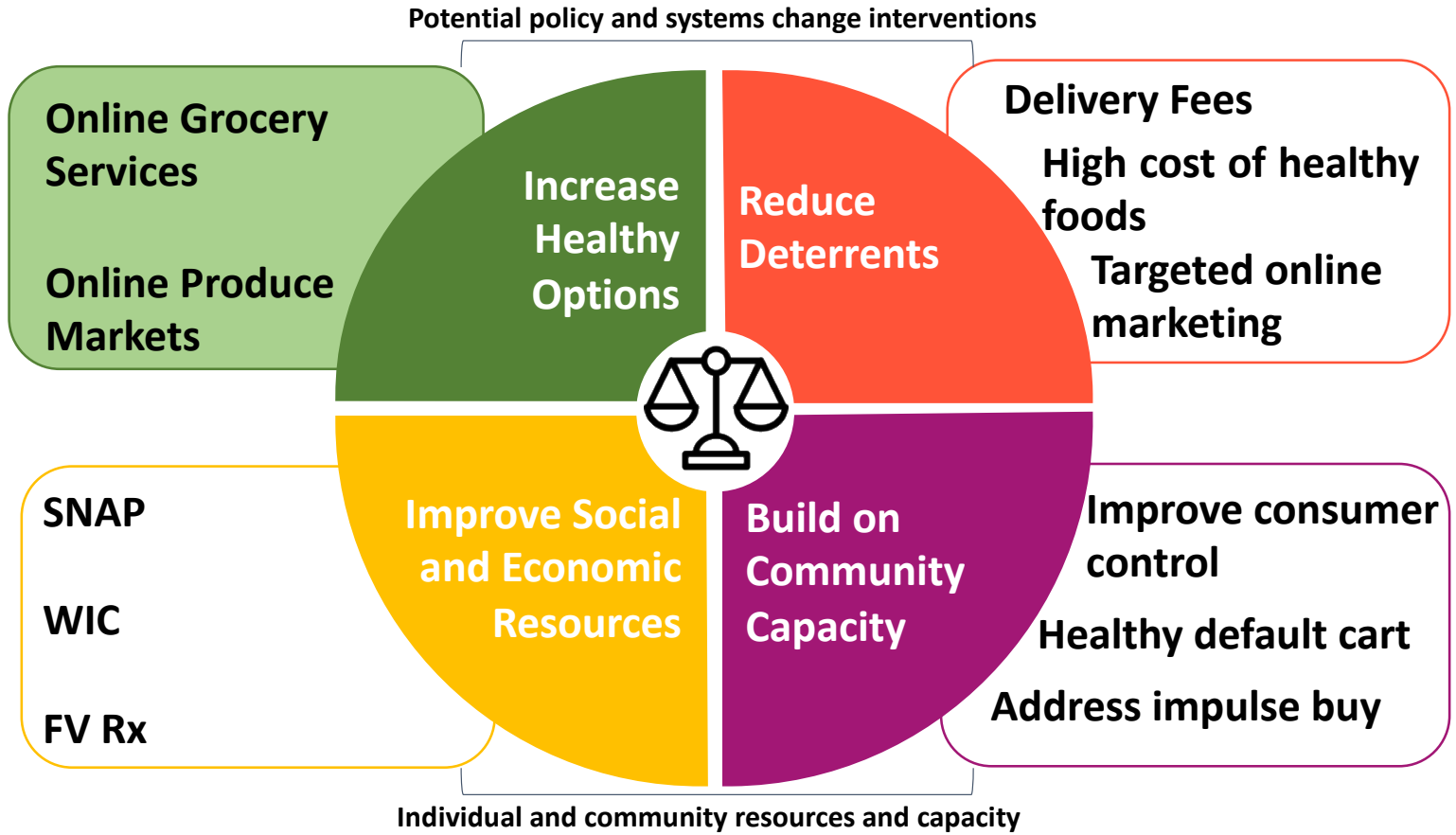

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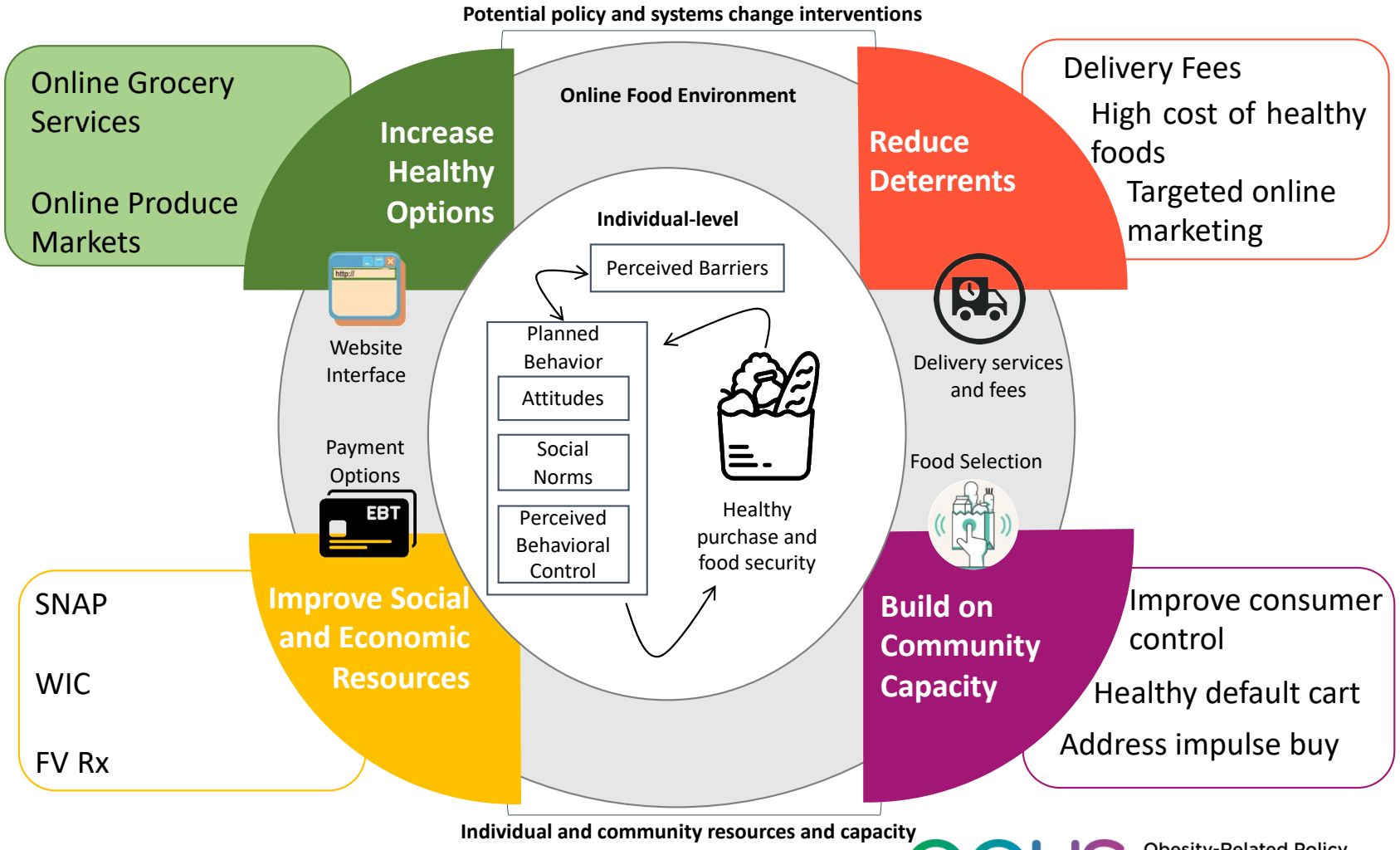

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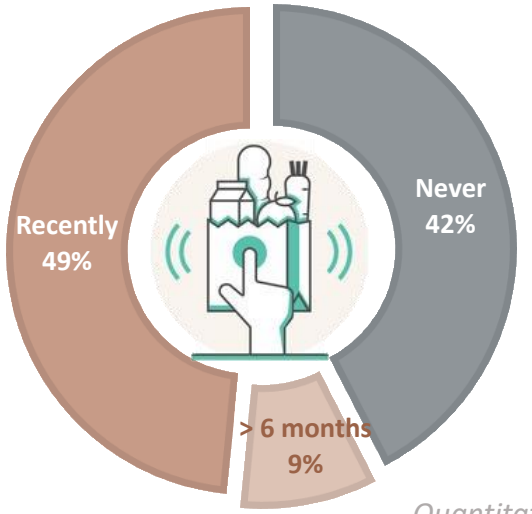
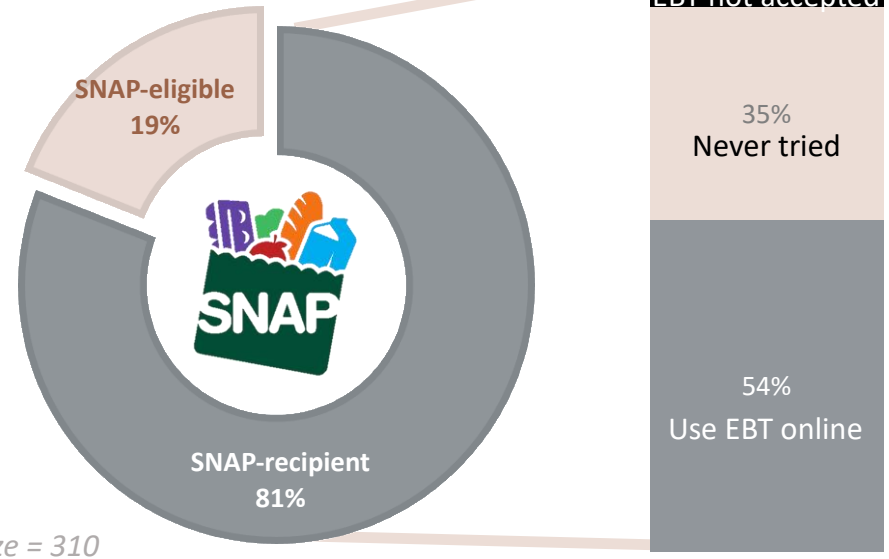
3 Community Consultation & Involvement

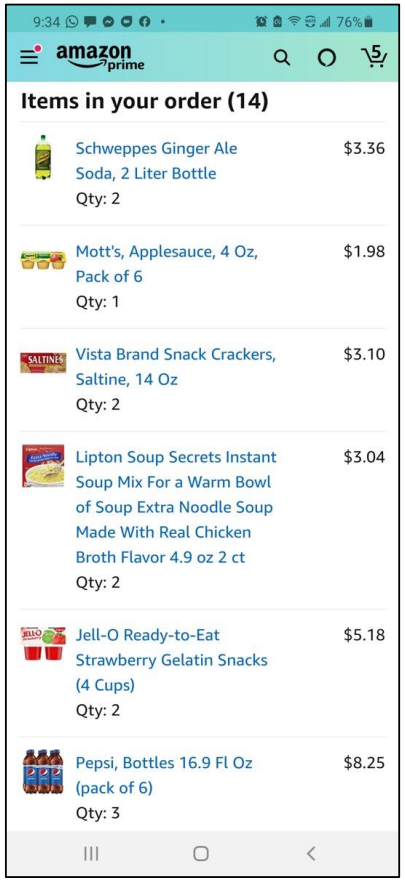
Have you bought groceries online?

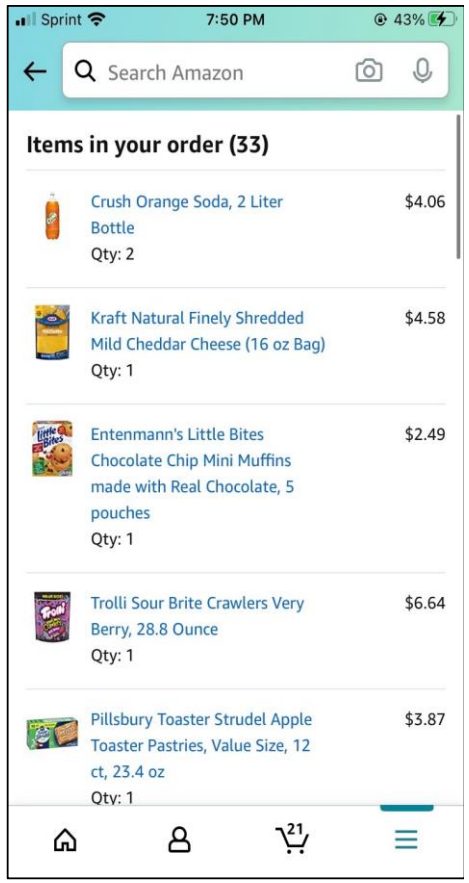


Majority SNAP-recipient



Quantitative sample size = 310





Amazon

Trude ACB et al. (2022) *Appetite* | Ali SH, Lloyd-Montgomery J, Lowery CM, Vedovato GM, Trude ACB (2022) *J Nutr Educ Behav*

3 Community Consultation & Involvement

Trude ACB et al. (2022) *Appetite* | Ali SH, Lloyd-Montgomery J, Lowery CM, Vedovato GM, Trude ACB (2022) *J Nutr Educ Behav*

3 Community Consultation & Involvement

- Improve access to services, foods
- Flexibility in methods of receiving food
- More payment and cost-saving options
- Facilitate better shopper interactions
- Control in item selection
- Meal planning support
- Enhance SNAP services

Trude ACB et al. (2022) *Appetite* | Ali SH, Lloyd-Montgomery J, Lowery CM, Vedovato GM, Trude ACB (2022) *J Nutr Educ Behav*

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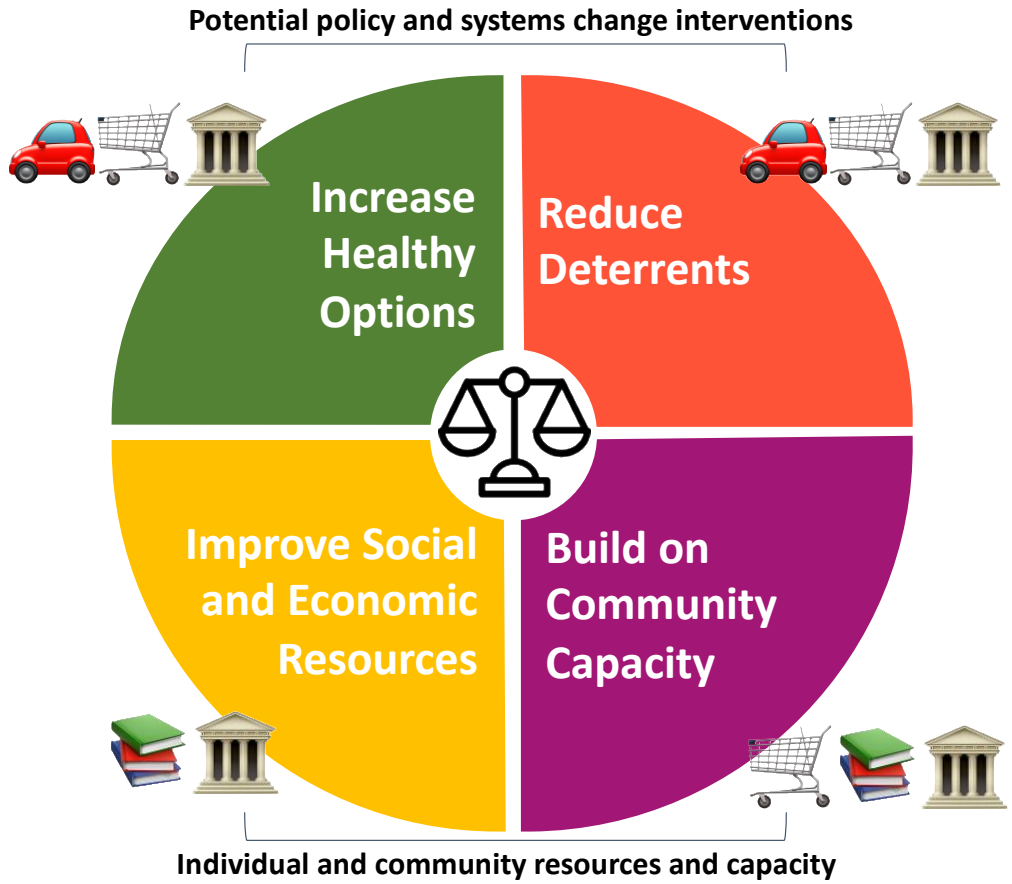

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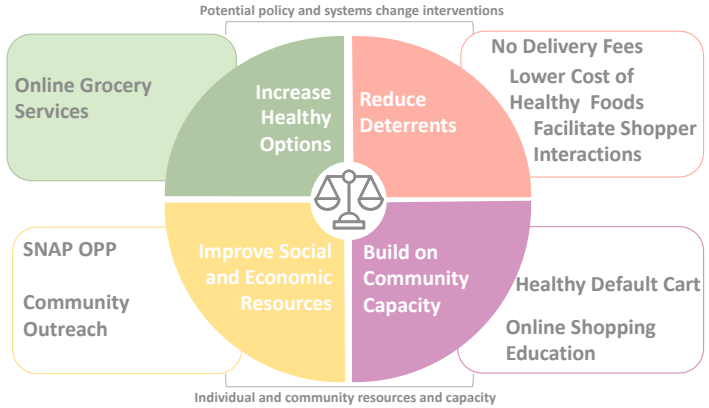
4 Intervention Strategy

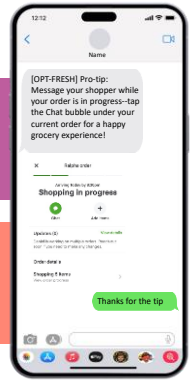


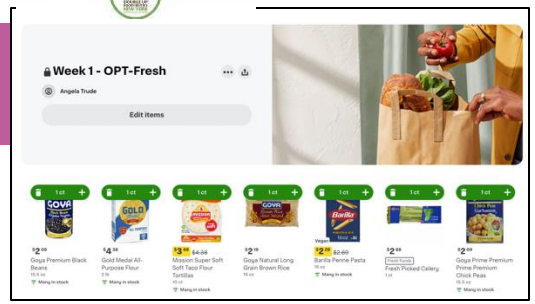
Context

- Online Grocery Services
- SNAP OPP
- Community Outreach
- No Delivery Fees

Intervention

- Online Shopping Education
- Facilitate Shopper Interactions
- Lower Cost of Healthy Foods
- Healthy Default Cart





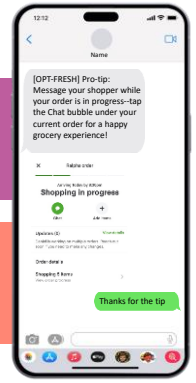
4 Intervention Strategy

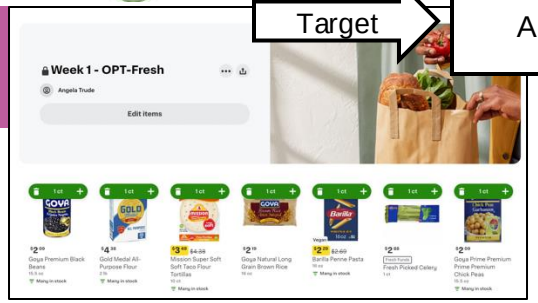
Context

- Online Grocery Services
- SNAP OPP
- Community Outreach
- No Delivery Fees

Intervention

- Online Shopping Education
- Facilitate Shopper Interactions
- Lower Cost of Healthy Foods
- Healthy Default Cart





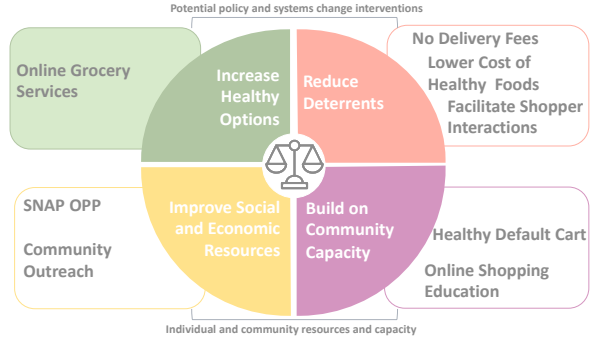
Proximal Mediators

- Target → Perceived Behavioral Control
- Target → Loss Aversion → Intentions to Purchase FVL
- Target → Automatic Thinking → Perception of Fewer Impulse Purchases

Outcomes

- Household FVL Purchase
- Intake of FVL
- Household Food Security

5 Co-Benefits and Impact



- Behavior change
- Nutrition education
- Access to service
- Digital literacy

- Sales
- Costumer loyalty
- Software technologies

- Cost of program
- Adoption
- Scalability
- Evidence-based policies

- Resources
- Adoption
- Scalability
- Public health practices

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Summary and Next Steps

- Use of an equity-oriented framework and community involvement to inform the design and evaluation of the PSE intervention.
- Consider mechanisms of hypothesized effects to identify which “ingredients” of the PSE intervention are most important for success.
- Impact of a PSE intervention beyond health-related outcomes.
- Identify interested parties to plan and evaluate complementary benefits of the PSE intervention.
- Next steps: implement and evaluate a larger intervention trial that promotes equity in online healthy food access.

Reflections

Online grocery sites only in English

Online grocery not yet in neighborhood stores

Online targeted marketing

Questions?
Contact me at

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Thank you!