ADDRESSING FOOD ACCESS BARRIERS: THE PROMISE AND POTENTIAL OF SMALL FOOD RETAILERS

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Topics

- Working with small stores to improve access to healthy choices in low income and low access communities
- Baltimore Healthy Stores
- Baltimore Healthy Carryouts
- B’More Healthy! Retail Rewards
- Future Directions

Educational versus Environmental interventions

- Educational interventions assist people in making choices among available options.
- Environmental interventions change the options.
- Educational and environmental interventions work well in combination (supply-demand).

Components of Access

- Availability
- Price
- Ease of obtaining
  - (transportation to get to store, finding food once you get to store)

Why work in food stores?

- Can reach the main food preparers/shoppers within a household
- Can increase the availability of affordable, culturally-acceptable healthy foods
- Often one of few community “centers” in some settings
- Food stores exist in most communities

Early Food Store Intervention Trials: Limitations

- Mostly in supermarkets, few in small stores
- Little work in small prepared food sources

- Limited formative research
- Little emphasis on participatory approaches
- Limited use of behavior change theory

- Few intervention strategies, with limited reinforcement/integration of activities
- Some addressed access, but few pricing

- Limited evaluation (e.g. lack of dietary assessments)
- Little process evaluation

(References: *Seymour et al 2004, Glanz et al 1995, Wechsler et al 2000, French and Stables 2005*)

What Is A Corner Store?

- A working definition for Baltimore:
  - <1000 square feet
  - 3 aisles or less
  - One cash register
- Limited selection of foods
  - A lot of “junk food”
- Customers mainly from immediate area
- Accessed on foot
- Diverse product mix

Adapted from a presentation by Karen Shore, The Food Trust

Why Corner Stores?

- They are already there
- Proximity to underserved residents
- Part of community
- Part of daily behavior patterns
- *Opportunity for health impact*
- *Opportunity for economic impact*

Adapted from a presentation by Karen Shore, The Food Trust

Opportunity for Health Impact

Corner Store Purchases:

- 356.6 kcal per purchase
- Students spent $1.07 on 2 items per purchase
- Baltimore children report spending >$3/day at corner stores when they use them
- 53% shop once a day
- 42% shop 2+ times a day
- Energy dense, low-nutritive foods and beverages

Data Source: Kelley E. Borradaile, Sandy Sherman, Stephanie S. Vander Veur, Tara McCoy, Brianna Sandoval, Joan Nachmani, Allison Karpyn, and Gary D. Foster **Snacking in Children: The Role of Urban Corner Stores** Pediatrics 2009 : peds.2009-0964v1-peds.2009-0964.

Opportunity for Economic Impact

- Grow local businesses
- Increase sales & profits
- Provide local jobs
- Encourage new skills
- Create new markets (e.g., suppliers)
- Promote neighborhood revitalization

Romano's Grocery
From Typical Corner Store to Neighborhood Anchor

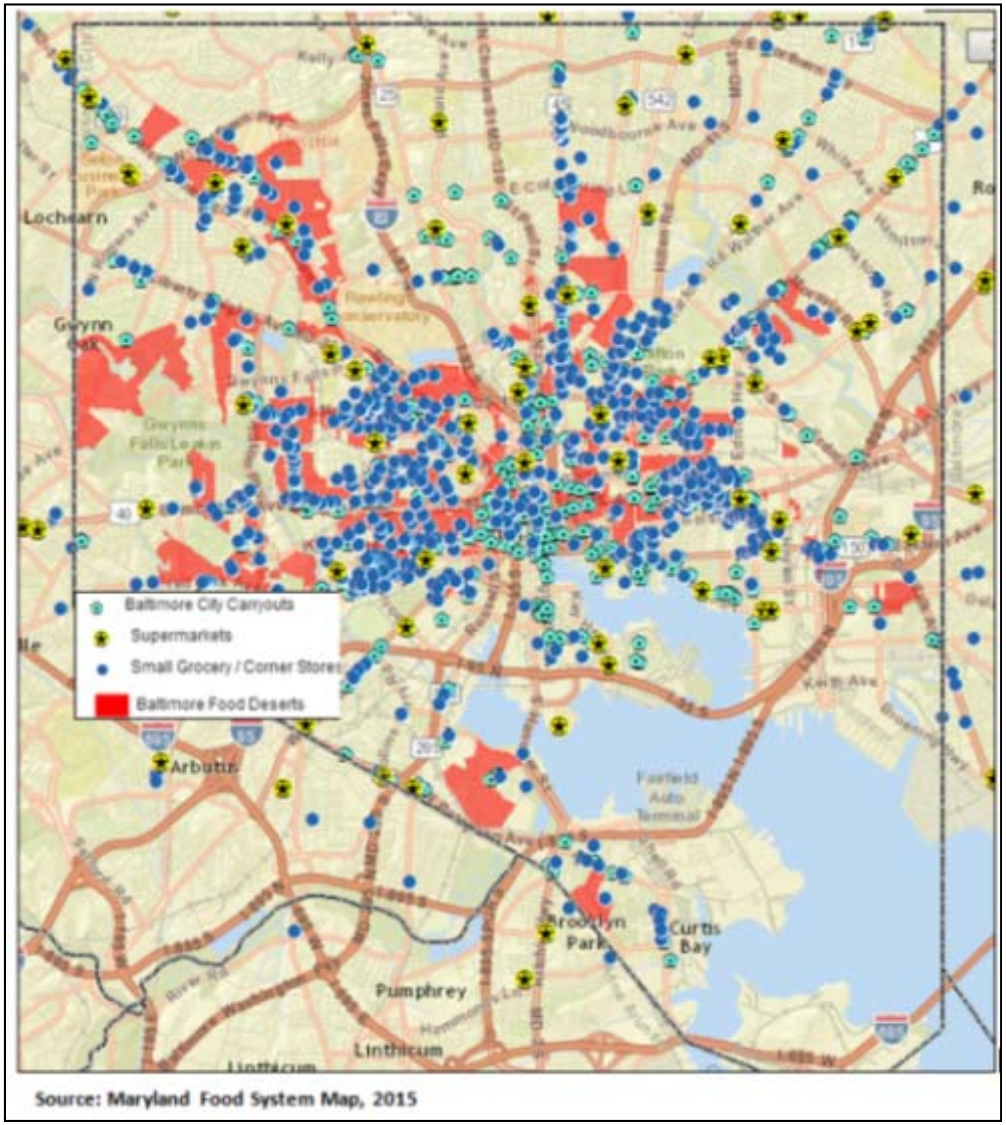
Adapted from a presentation by Karen Shore, The Food Trust

Baltimore-based small food source studies

- Baltimore Healthy Stores
- Baltimore Healthy Carryouts
- B’More Healthy! Retail Rewards

Baltimore City Food Environment

- 960 convenience food stores[11]
  - 652 ‘corner’ stores
- 52 supermarkets[11]
- Small stores are common food sources for urban residents[12]



Source: Maryland Food System Map, 2015

Key Issues from Interviews

- From Store Customers: *"I would love to buy/eat healthy foods but they are…"*
  - Too expensive
  - Not available in the stores I shop in
  - Are of poor quality in the stores I shop in

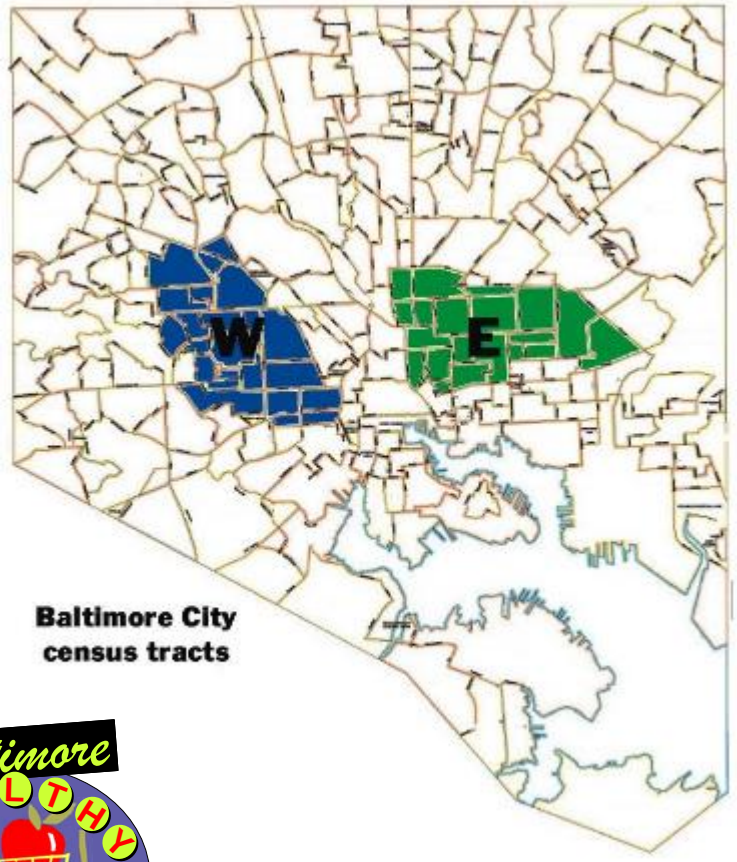
- From Store Owners/Managers: "*I would love to stock healthy foods but …"*
  - No one buys them
  - The last time I stocked (xxxxx) it just sat on the shelves

Top 10 sources of energy, fat and sugar of inner city adult Baltimore respondents (Sharma et al, 2009)

Food Item	Energy (%)	Food Item	Fat (%)	Food Item	Sugar (%)
Sodas	9.5	Chicken	12.1	Sodas	34.1
Chicken	8.2	Hot dogs, sausages	8.1	Sugary drinks (iced tea, punch)	15.2
Breads	6.0	Chips	6.3	Juices	9.0
Cake, donut and other pastry	4.2	Meat dishes	5.2	Sugar and syrup	8.3
Sandwiches and burgers	4.0	Margarine and butter	5.2	Cake, pastry and donut	4.2
Sugary drinks	3.8	Cake, donut and other pastry	5.1	Candies	4.1
Chips	3.7	Mayo, salad dressing, dips	4.9	Ice cream	3.2
Pasta dishes	3.3	Sandwiches and burgers	4.5	Cookies	2.5
Meat dishes	3.1	Cheese	4.3	Fruits	2.1
Candies	2.9	Eggs	4.0	Cereals	1.6
Total	**48.7**	**Total**	**59.8**	**Total**	**84.3**

Part 1. Working in Small Stores
Baltimore Healthy Stores

- East Baltimore: intervention area
- West Baltimore: comparison area
- Store sample
  - 2 supermarkets/area
  - 6-7 small stores/area
- Consumer sample
  - ~87 respondents/area

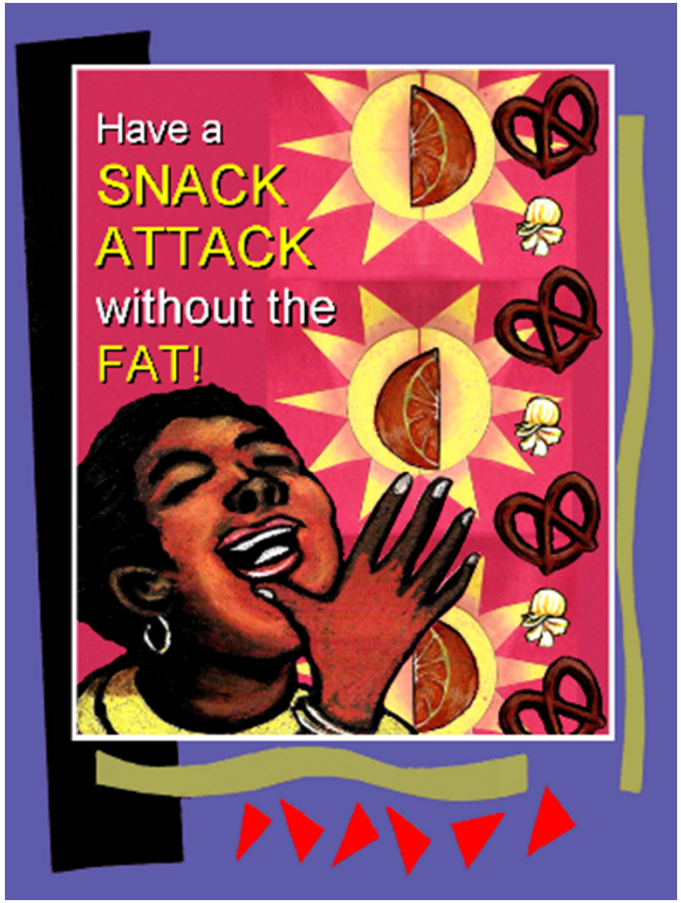


Community workshops

Increasing supply: Corner stores stock healthier foods

- 1-3 new foods per store per phase
- Start with "low-hanging fruit"
- Incentives
  - Stocking guidelines
  - Promotional materials to create demand
  - Incentive card to wholesaler
  - Provide small supply

Increasing Demand: Visual Materials

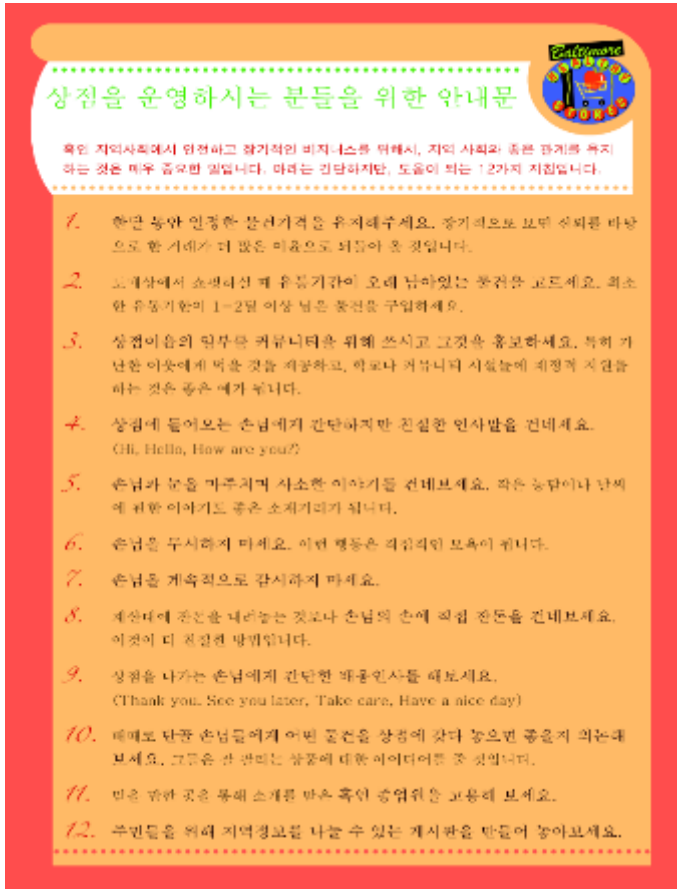


Interactive Sessions in large and small food stores

Materials and training for Korean American store owners

- Nutrition Education Booklet (Korean)

- Cultural Guidelines (Korean)



Impact on Stocking and Sales

	Stocking Score (range 0–10)			Sales Score (range 0–10)		
	Intervention	Comparison	Significance	Intervention	Comparison	Significance
Baseline	5.9 ± 2.0	6.8 ± 1.6	NS	4.4 ± 1.8	5 ± 1.5	NS
Post-phase	8.3 ± 1.0	6 ± 1.8	0.004	7.1 ± 2.0	5.8 ± 1.8	0.05
Post-intervention	7 ± 2.0	5.5 ± 1.5	0.009	6.4 ± 1.8	4.7 ± 1.5	0.003

Song et al, Public Health Nutrition, 2009

Consumer Results

- N=85 respondents measured pre and post
- After adjustment for baseline value, age, sex and SES:
  - Significant impact on food preparation methods and frequency of purchase of promoted foods
  - Positive trend for healthy food intentions

Gittelsohn et al, Health Education and Behavior, 2009

Lessons Learned

- We can get small stores to increase stocking of healthier foods, and show impact on consumer food choices
- Sustainability of small store interventions possible in Baltimore
- BUT: people in Baltimore's low income food environments get food from many places

Part 2. Changing the prepared food source environment:

Baltimore Healthy Carryouts

Baltimore Healthy Carryout Aims

- To develop, implement and evaluate a culturally appropriate multi-component carryout intervention to reduce risk factors for diet-related chronic diseases in a low income urban setting

  - Conduct formative research on the availability, pricing and consumption of carryout foods

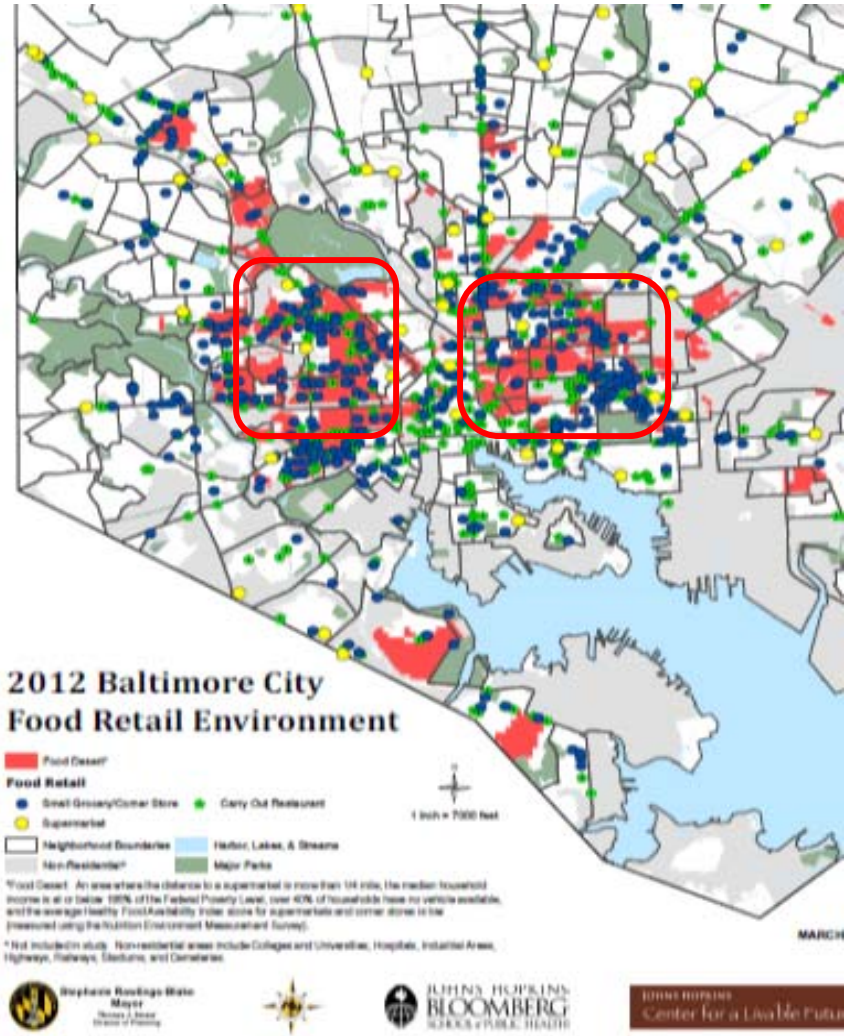
  - Develop culturally-appropriate intervention materials and implement the intervention is 4 stores

  - To evaluate a pilot trial of a carry-out intervention in eight local carry-outs (food sales, energy and fat intake, psychosocial factors)

Environmental Assessment

- A total of 144 Prepared Food Sources (PFSs) were observed (ground-truthing method) in low-income neighborhoods of Baltimore (Lee et al. 2010)
  - 72% carryouts (n=104)
  - 15% corner stores with deli/take-out
  - 10% Fast food restaurants
  - 5% Sit-down restaurants

Study Design: The BHC Pilot Trial



Intervention group
N= 4

1st generation Korean American owned carryouts (N=2)

African American owned carryouts (N=2)

Comparison group
N= 4

1st generation Korean American owned carryouts (N=2)

African American owned carryouts (N=2)

- **Matching variables : ethnicity, location, physical environment of the carry-out**

Intervention Phases

- Phase 1: Modified Menu Boards & Menu Labeling
- Phase 2: Healthy Sides & Beverages
- Phase 3: Affordable Healthy Combo Meals

Phase 1: Modified Menu Boards & Menu Labeling

Healthier options were highlighted with a leaf logo

Healthier menu options were also promoted with photos

Phase 2: Healthy Sides & Healthy Beverages

- Promoted currently available healthy sides & beverages
  - Collard greens, corn, salads, soups, water, diet soda, 100% fruit juice
- Introduced new healthy sides
  - Yogurt, fresh fruits, fruit cups, baked chips
- Provided initial stocks of healthy sides

Phase 3. Affordable Healthy Combo Meals

- Improving food preparation methods
  - Provide an indoor grill to implement grilled chicken

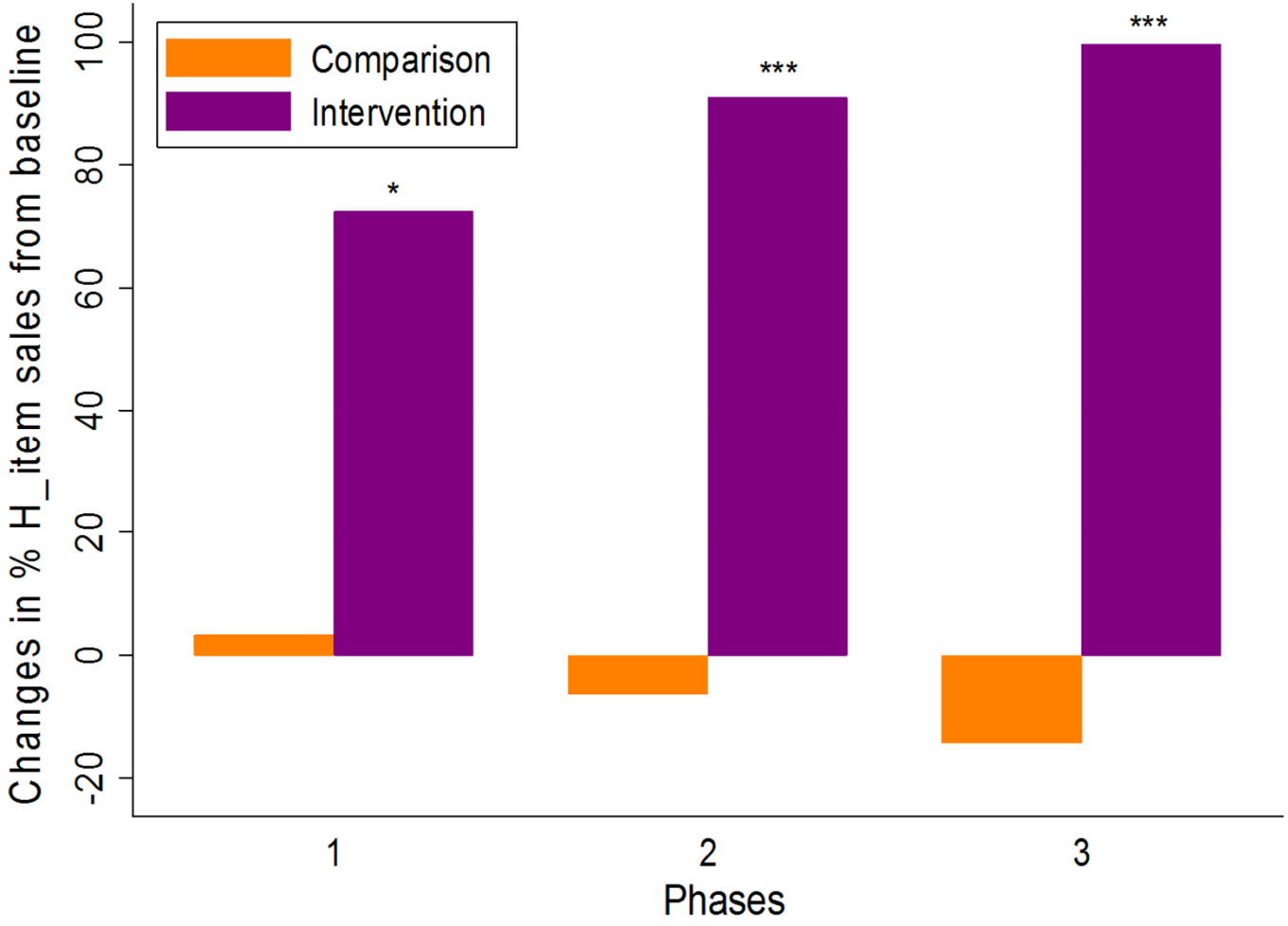
- Healthy combo meal promotion with price reduction
  - Owners agreed to reduce up to $2.50 per healthy combo meal without compensation
  - Combo meal with free baked chips

Point-of-Purchase Posters & Visual Materials

Evaluation Method: Sales

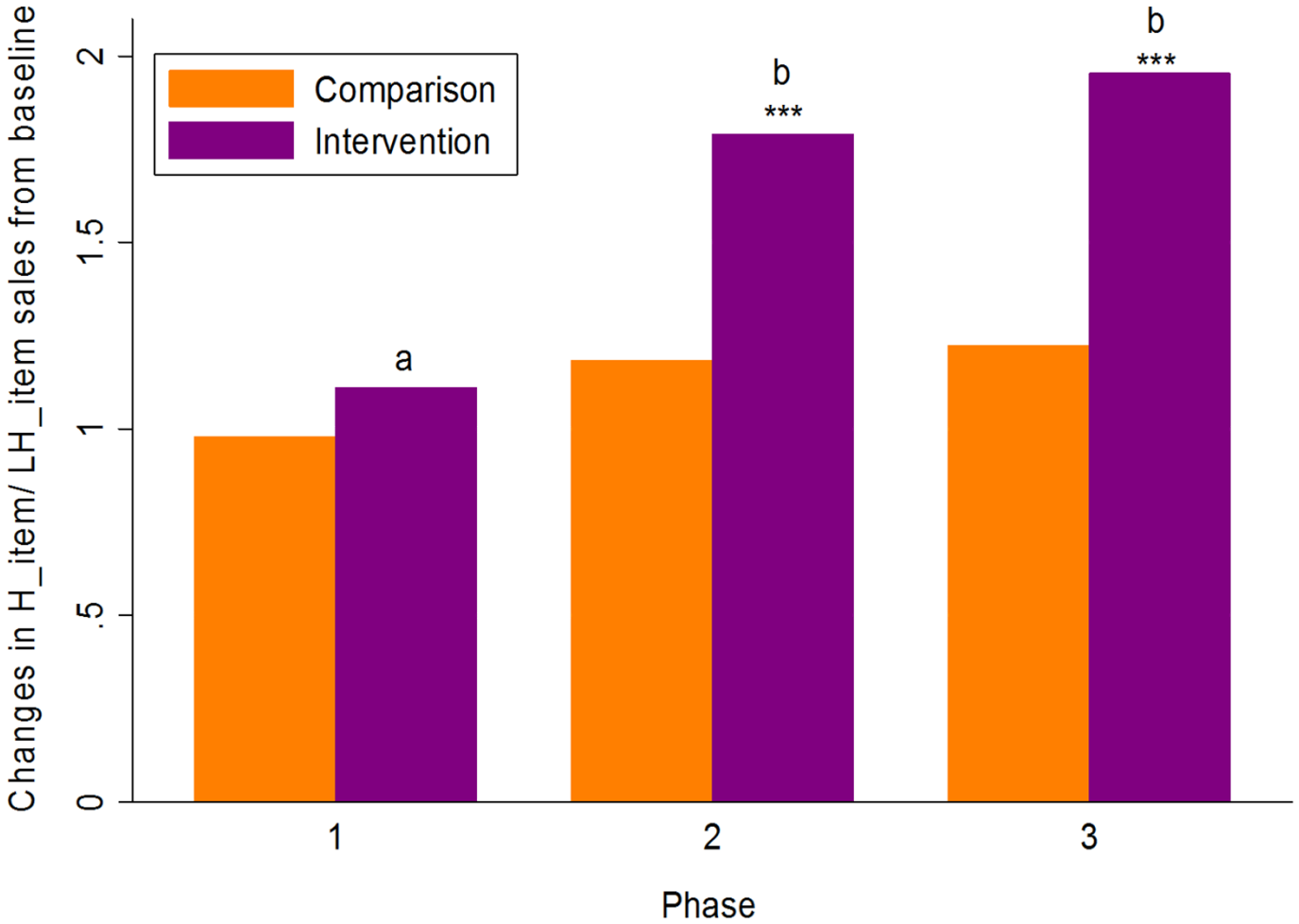
- Weekly sales receipt collection (February – September 2011, 32 weeks)
  - Trained data collectors visited carryouts every week
  - A total of 186,654 sales receipts were collected

Changes in percentage of healthy food sales from baseline by intervention phases



p<0.05, ***<0.001, Independent t-test comparing Intervention vs. Comparison
H_item: Healthy item sales

Changes in the ratio of healthy to less-healthy items sales from baseline

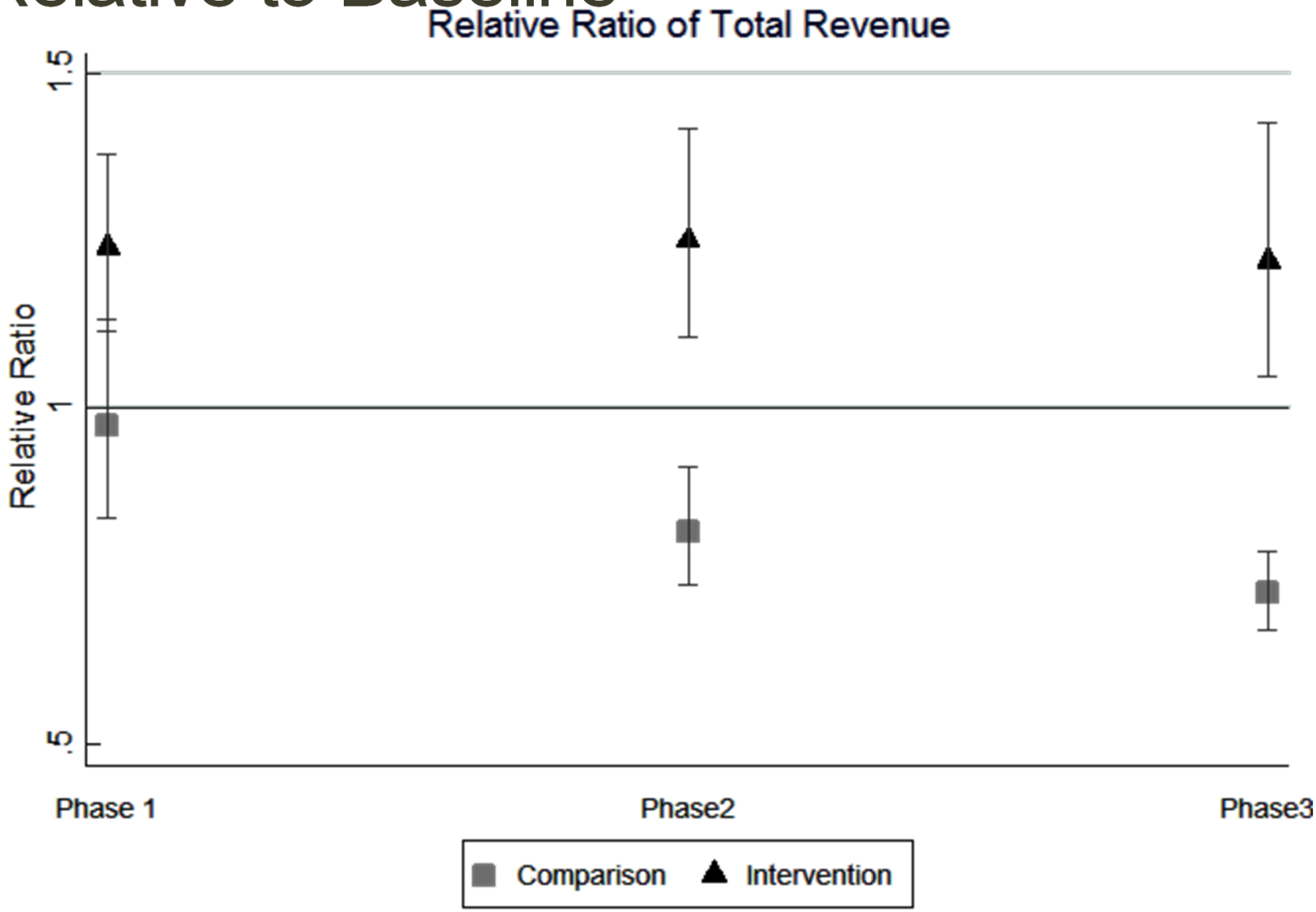


* p<0.05, ***p<0.001 comparing intervention to comparison, independent t-test

[abc]Different lettered superscripts indicate significant differences (p<0.05) across intervention phases

H_item: Healthy item sales, *LH_item*: Less-healthy item sales

Ratio of Gross Revenue at Each Phase Relative to Baseline



Baltimore's Famous

Healthy Choice

Caribbean Chicken

Chicken Leg w Salad & Rice

Rotisserie Chicken

Collard Greens

Look for the leaf for a fresh choice

Dinner Plates

Choice of 2 side orders

1. 1/2 Chicken _____
2. Breast _____
3. Leg _____
4. Wing _____
5. Teriyaki Chicken _____
6. Meat Loaf _____
7. Roast Beef _____
8. Spare Rib _____
9. Pork Chop
   - 1 piece dinner _____
   - 2 pieces dinner _____
10. Turkey Wing _____
11. Caribbean Chicken _____
12. Roast Ham _____
13. Chicken Steak _____

Fresh Choice!

_____

Rotisserie Chicken

- Whole Chicken _____
- 1/2 Chicken _____
- Breast _____
- Quarter Leg _____
- 4 Wings _____
- 4 Turkey Wings _____

Side Orders

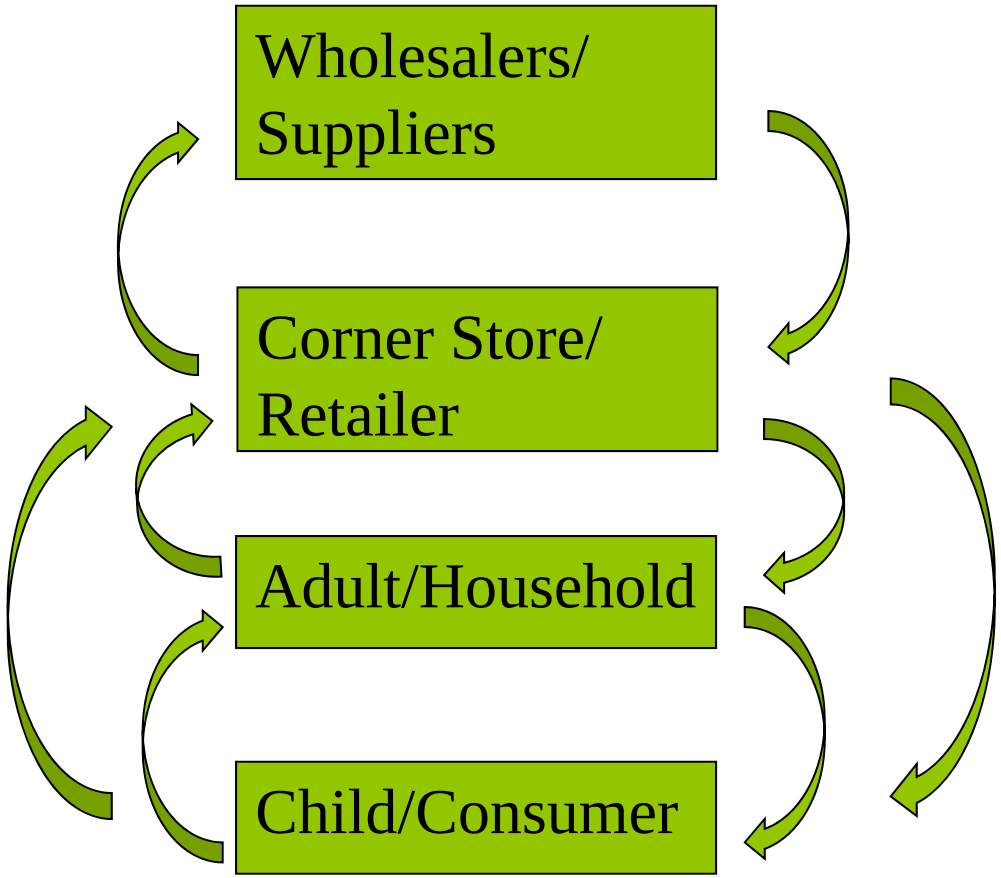
	S	M	L
Collard Greens			
Mashed Potatoes			
Rice			
Macaroni & Cheese			
Sweet Potato			
Corn			
Rice Pudding			
Bread Pudding			
Cabbage			
Salads			

Lessons Learned

- We can get small carryouts to change, and show impact on sales and consumer food choices

- Sustainability of carryout interventions possible in Baltimore

Food Environment of Corner Stores: Supply-Demand Relationship



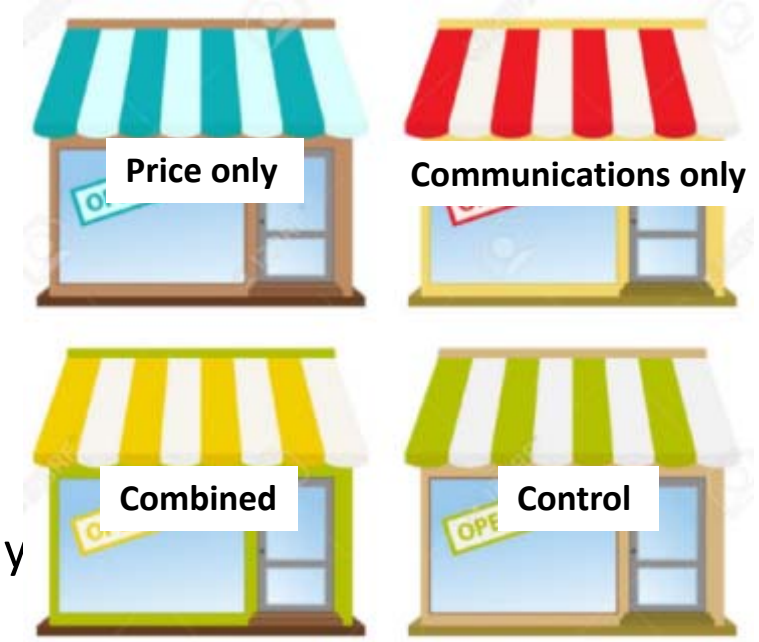
BUT: Can we intervene at wholesaler level? Can we influence price?

Part 3. B'More Healthy Retail Rewards

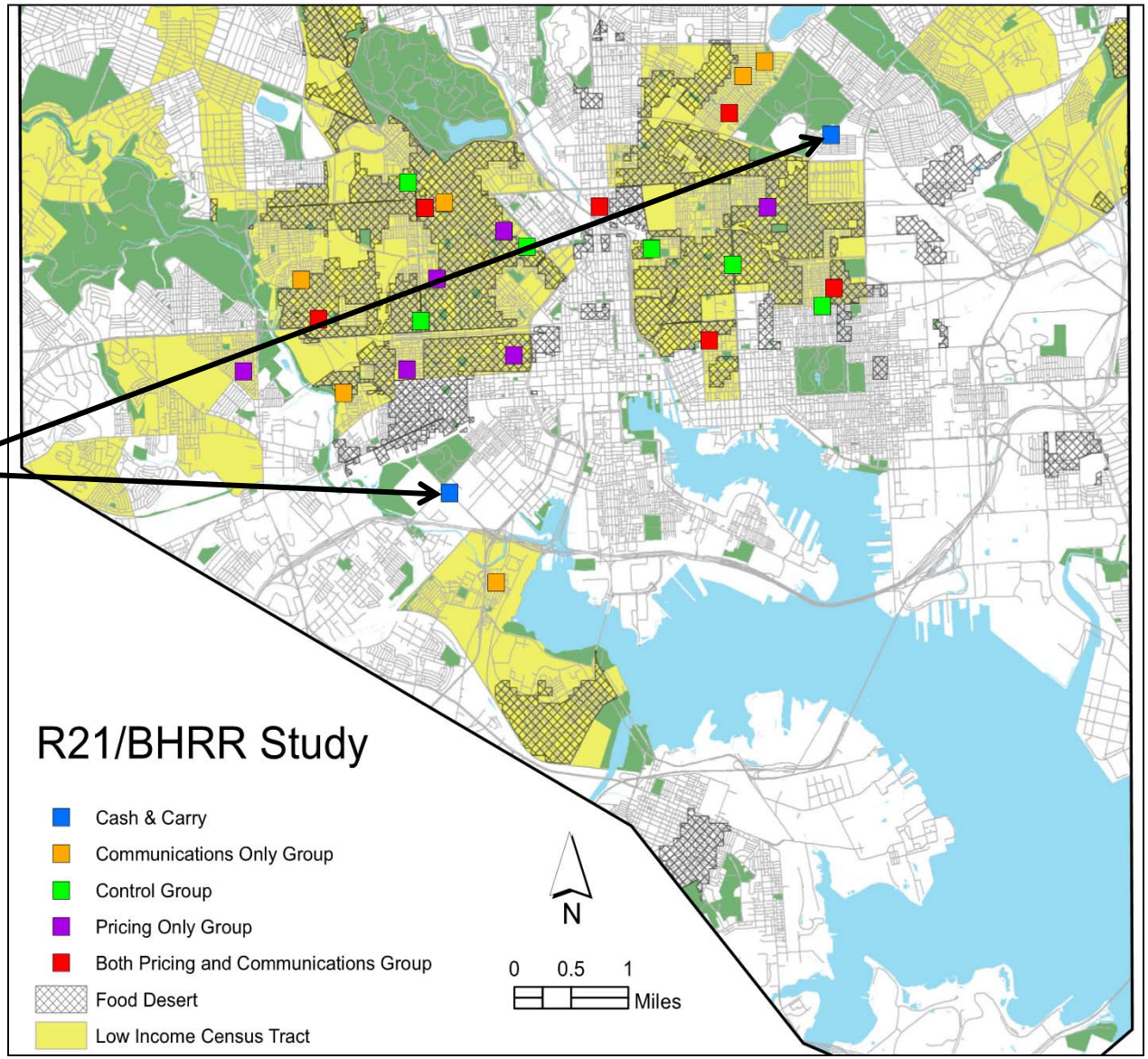
What is BHRR?

Study Design:

- 2 wholesale stores (1 company)
- 24 small corner stores:
  6 stores received a pricing incentive only
  6 stores received in-store communications only
  6 stores received both pricing & communications
  6 stores served as a control group (no intervention)
- 15 adult consumers per store (n=360)
- Healthier food and drinks were promoted in intervention stores and wholesalers for 6 months (Feb-Aug 2013).



Wholesaler recruitment



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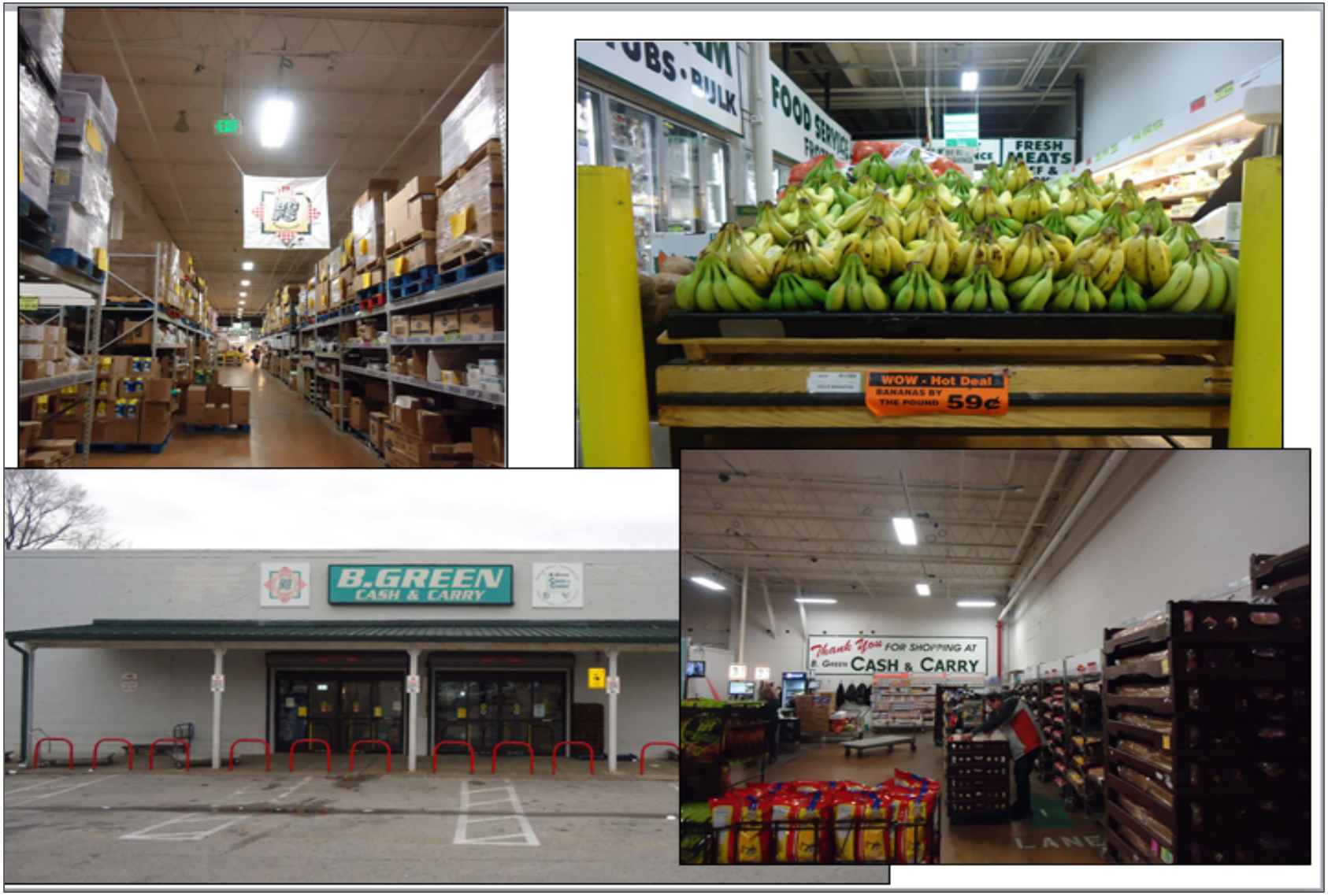
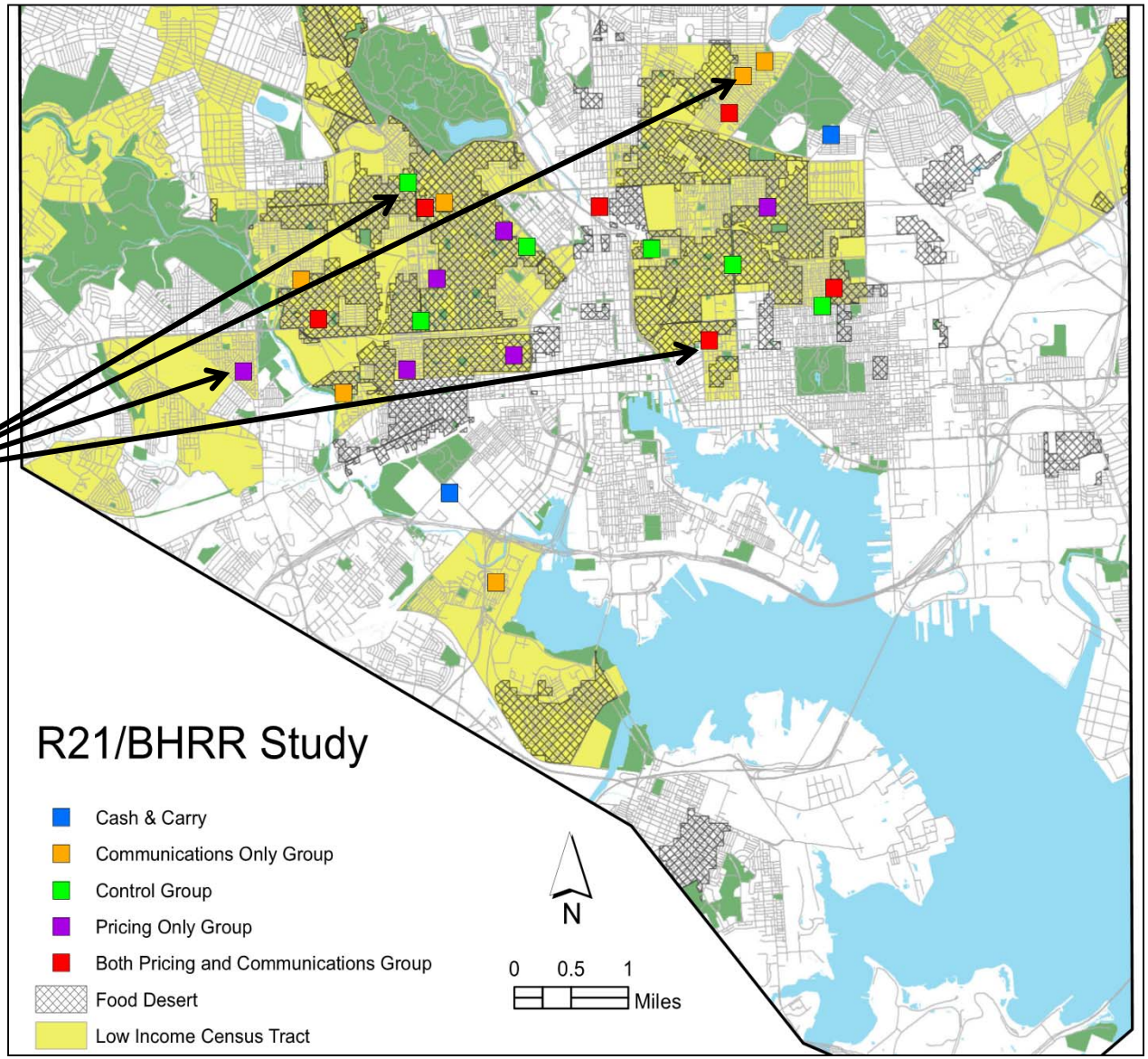
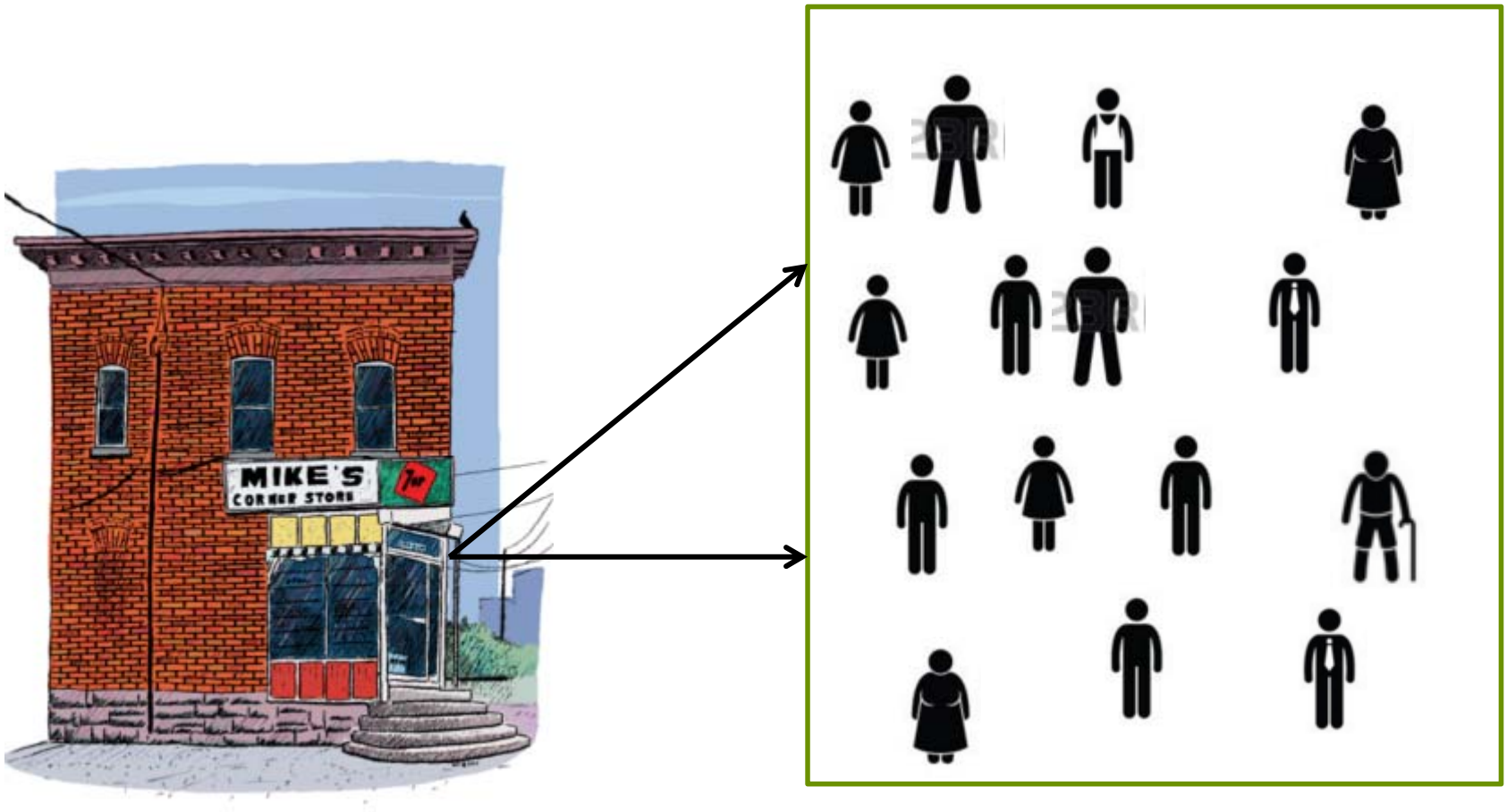


Store recruitment



Store recruitment

Customer recruitment



Source: http://www.colinwhite.ca/confectionaries/

Formative Research

Jan 2012 – Feb 2013	
Wholesaler	**Customer**
Direct in-store & participant observations (n=13)	In-depth interviews (n=9)
Intervention planning meetings (n=10)	Focus groups (n=2)
Store	
Direct in-store observations (n=17)	
In-depth interviews (n=17)	

Intervention - Promoted foods

Phase 1: Better Beverages

Phase 2: Healthier Essentials

Phase 3: Healthier Snacks



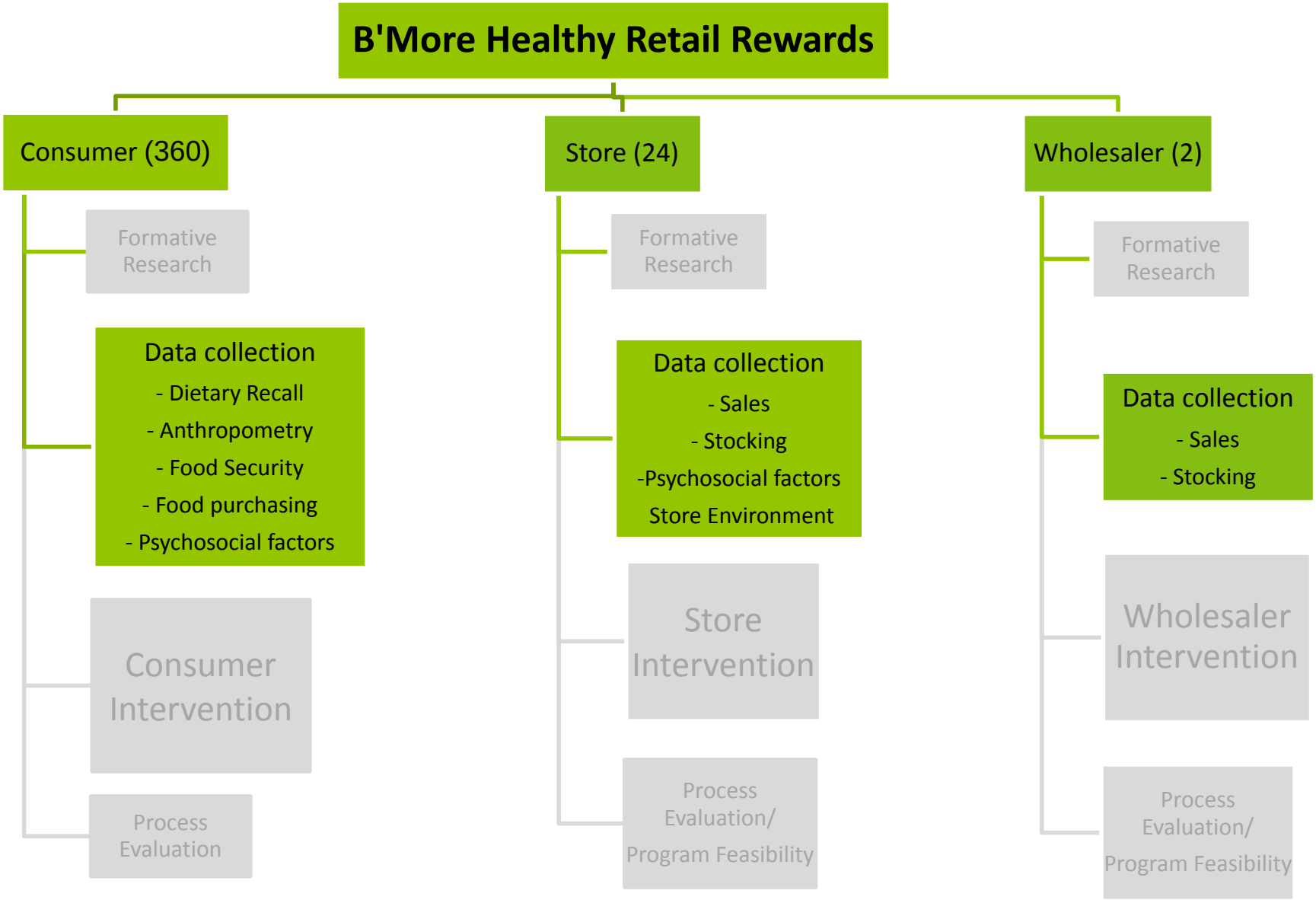

Intervention - Pricing Component

- BHRR grant funding used to cover reduced wholesale costs of promoted foods to the 12 pricing stores
- The amount of discount determined by wholesale & research staff and was based on:
  - Storeowner & consumer formative research
  - Price at competing wholesalers
  - Cost of unhealthier 'substitutes'
  - Discounts applied in prior pricing studies
- Stores received 10-30% discounts on promoted foods at checkout.
- In exchange for the discounts, pricing intervention stores agreed to:
  - Purchase promoted foods from B.Green and stock them in their stores
  - Pass the partial or full discount to their customers ("retail pass-through")

Intervention - Communications Component

- Storeowner Manual
- Door Signs
- Posters
- Handouts & Recipe Cards
- Giveaways
- Shelf Talkers & Labels
- Refrigerator or Freezer
- ‘Interactive Sessions’ (e.g., Educational Displays)

Data Collection



Intervention Implementation

6 months, Feb-Aug 2013

Phase	Promoted Food/Beverage
Phase 1: Better Beverages	1% Milk
Feb-Mar	Deer Park Water
	Pepsi Next*
	Coke Zero
Phase 2: Healthy Essentials	100% Whole Wheat Bread
Apr-May	Chunk Lite Tuna in water (Bumblebee, Starkist)
	Albacore Tuna in Water (smaller size*)
	Bird's Eye Frozen Vegetables *
	Hanover Frozen Vegetables*
	Essential Everyday Frozen Vegetables
Phase 3: Low Fat Snack Attack!	Bananas, Apples, Oranges
June-July	Quaker Oats low fat granola bars*
	Utz Plain or BBQ Baked Potato Chips*
***New item**	

Beverage Shelf Talkers & Posters

Phase 3 Shelf Talkers, Posters, & Refrigerators

Intervention Implementation

‘Interactive sessions’

Hypothesis 1

- **H1**: Intervention stores(owners) (n=18) would demonstrate significantly greater change (increase) in promoted food stocking, sales, and psychosocial factor scores compared to control stores from baseline to post-intervention.

Combined, P, C > Control

Hypothesis 2

- **H2**: Combined intervention stores(owners) (n=6) would see the greatest change (increase) compared to single intervention stores and control from baseline to post-intervention.

Combined > P, C, Control

Research Question

- Did pricing intervention storeowners (n=12) comply with the agreements of the performance-based allowance (stocking the item and retail pass-through)?

Store Impact Questionnaire (SIQ)

- Baseline data collection: Dec 2012-Jan 2013
- Post-intervention data collection: Nov 2013-Jan 2014
- SIQ is a pre-tested, standardized instrument used in prior Baltimore store-trials

Store Impact Questionnaire (118 questions)
Store and storeowner characteristics (9 questions)
Customer & employee attributes (7 questions)
Food acquisition & promotions (15 questions)
Food Stocking & Sales (27 questions)
Storeowner psychosocial factors (60 questions)

Intervention impact on promoted food stocking

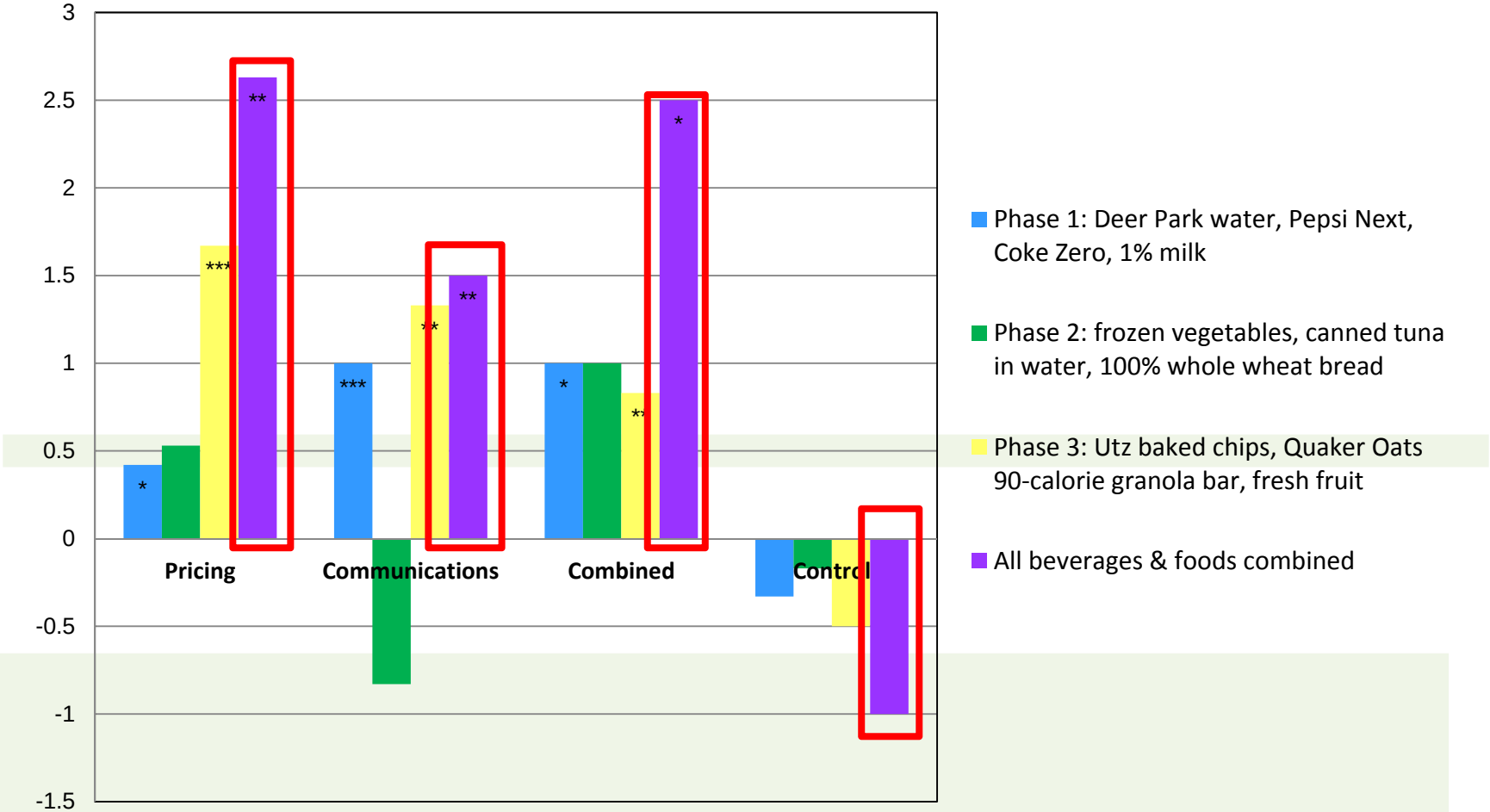
Measures	Pricing only			Communications only			Combined Pricing and Communications			Control	
	Baseline scores	Change from baseline	Diff. in Diff.[a]	Baseline scores	Change from baseline	Diff. in Diff.[a]	Baseline scores	Change from baseline	Diff. in Diff.[a]	Baseline scores	Change from baseline
Stocking score											
Phase 1 foods	1.2±0.4	0.4	0.8*	1.2±0.8	1.0	1.3***	1.7±0.8	1.0	1.3*	1.5±0.5	-0.3
Phase 2 foods	1.7±1.0	0.5	0.7	1.5±1.0	-0.8	-0.7	1.8±1.2	1.0	0.8	1.5±0.5	-0.2
Phase 3 foods	1.3±1.5	1.7	2.2***	1.0±1.1	1.3	1.8**	2.2±1.5	0.8	1.3**	1.2±0.8	-0.5
All foods combined	4.2±2.3	2.6	3.6**	3.7±1.6	1.5	2.5**	5.7±2.3	2.5	3.5*	4.2±1.6	-1.0

[a] Treatment effect estimates were derived from difference-in-difference analyses using linear generalized estimating equations with independent correlation structure and robust standard errors (change in intervention scores from baseline – change in control scores from baseline)

*p≤0.05 **p≤0.01 ***p≤0.001

Intervention Impact on Promoted Food Stocking

Change in promoted food stocking (score) from baseline



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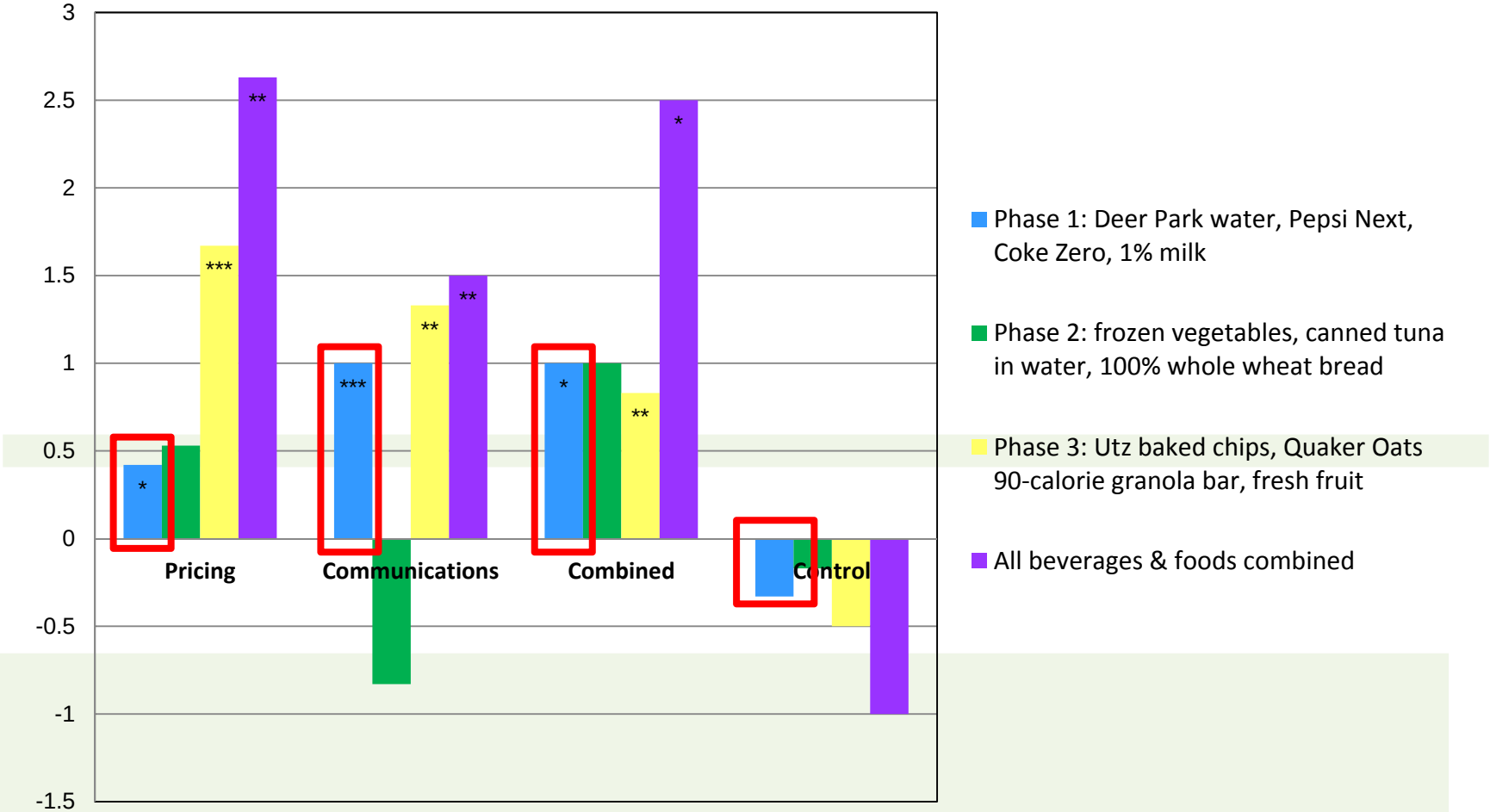

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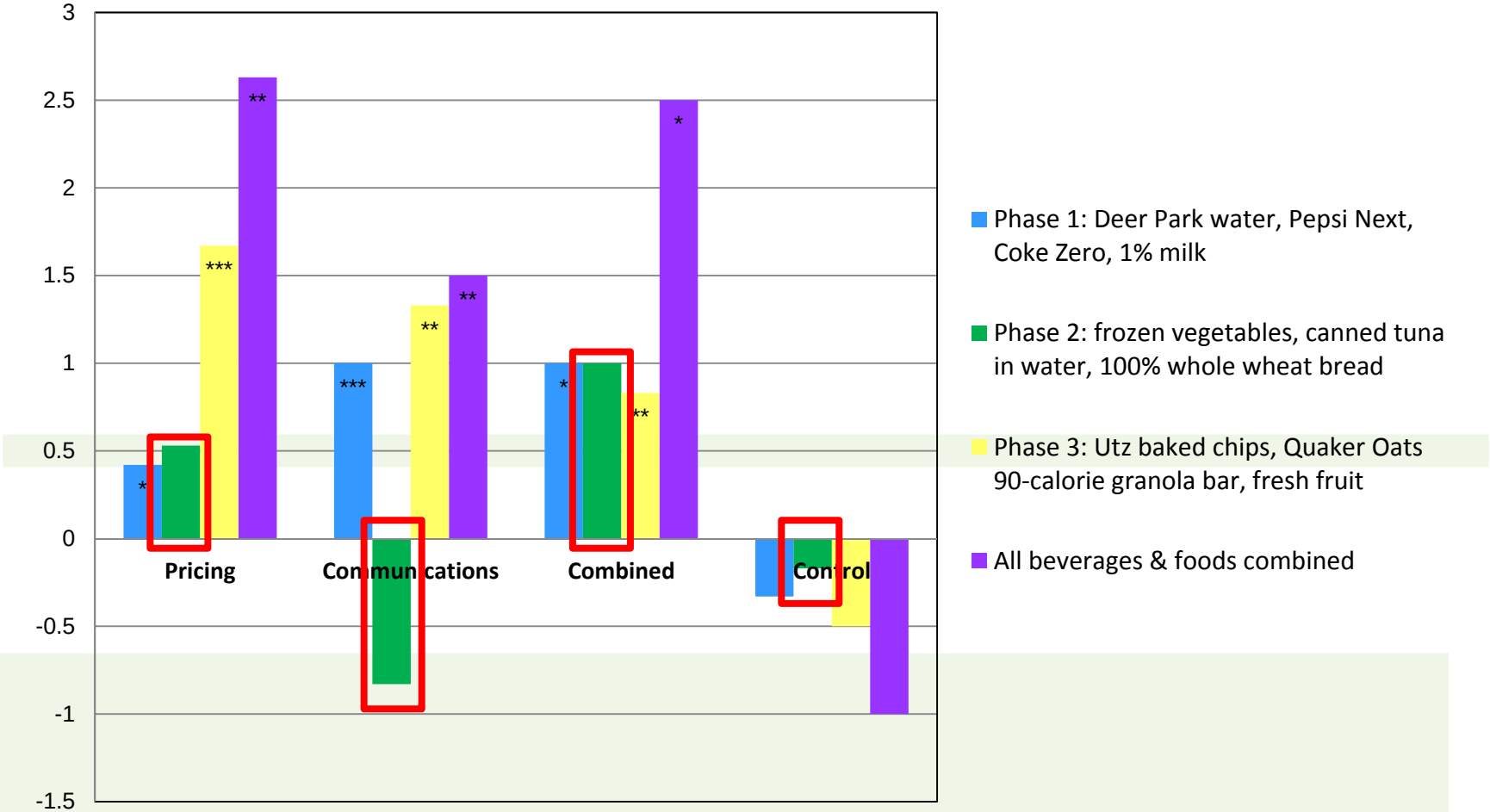

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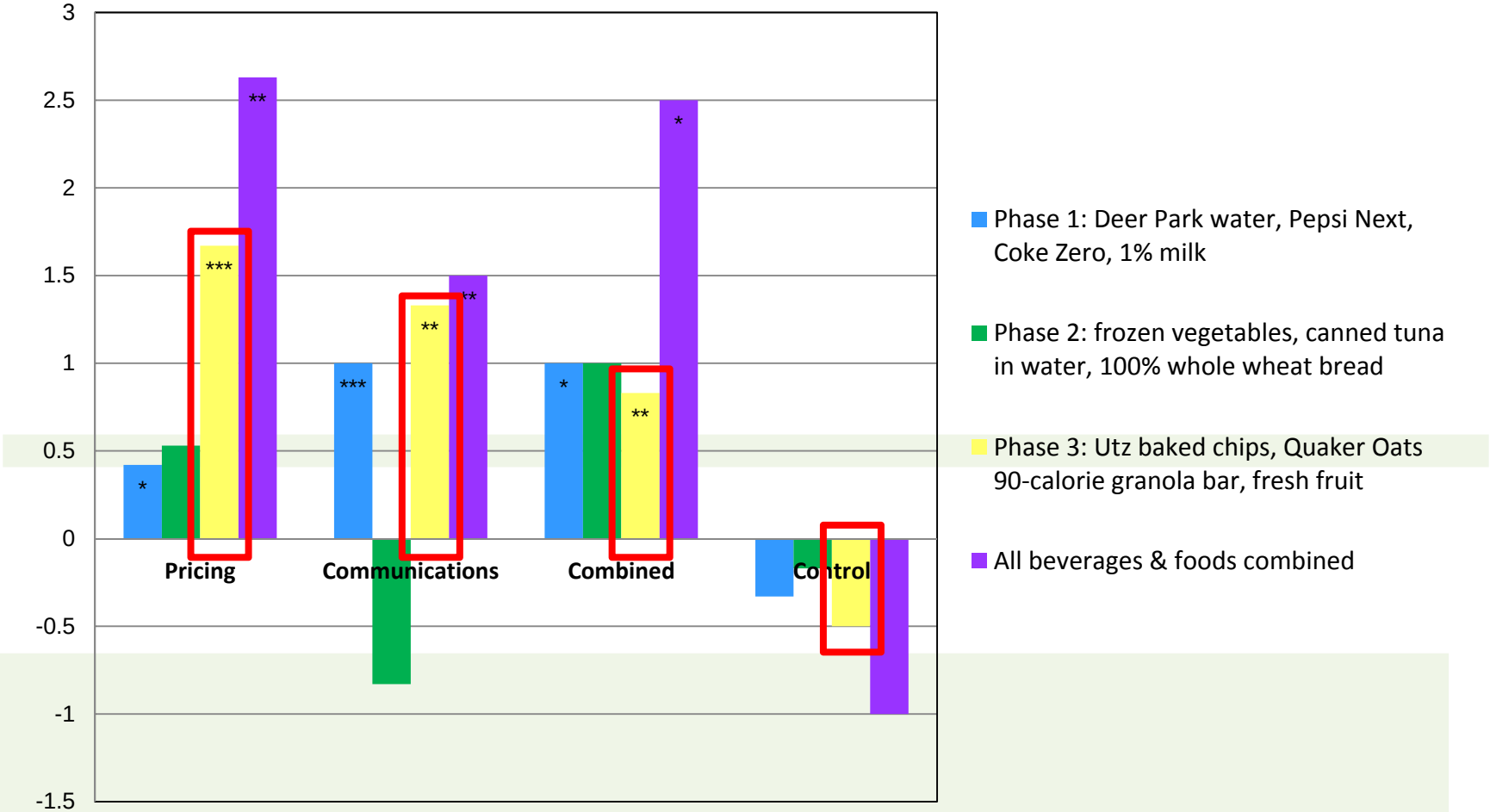

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Intervention impact on promoted food sales

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Sales (units)											
Phase 1 foods	15.7±12.9	5.1	3.3	22.7±29.3	-8.9	-10.7	10.0±5.0	7.7	5.9	14.6±10.3	1.8
Phase 2 foods	8.3±12.1	-6.1	-5.6	1.4±2.1	-0.9	-0.3	4.3±4.2	-1.1	-0.6	2.5±2.9	-0.6
Phase 3 foods	10.6±18.8	-0.9	3.6	5.7±8.0	-1.5	2.9	12.9±13.9	2.0	6.4*	9.6±8.7	-4.4
All foods combined	34.5±31.8	-2.0	1.2	29.8±29.2	-11.3	-8.1	27.2±18.3	8.6	11.8	26.6±13.1	-3.2

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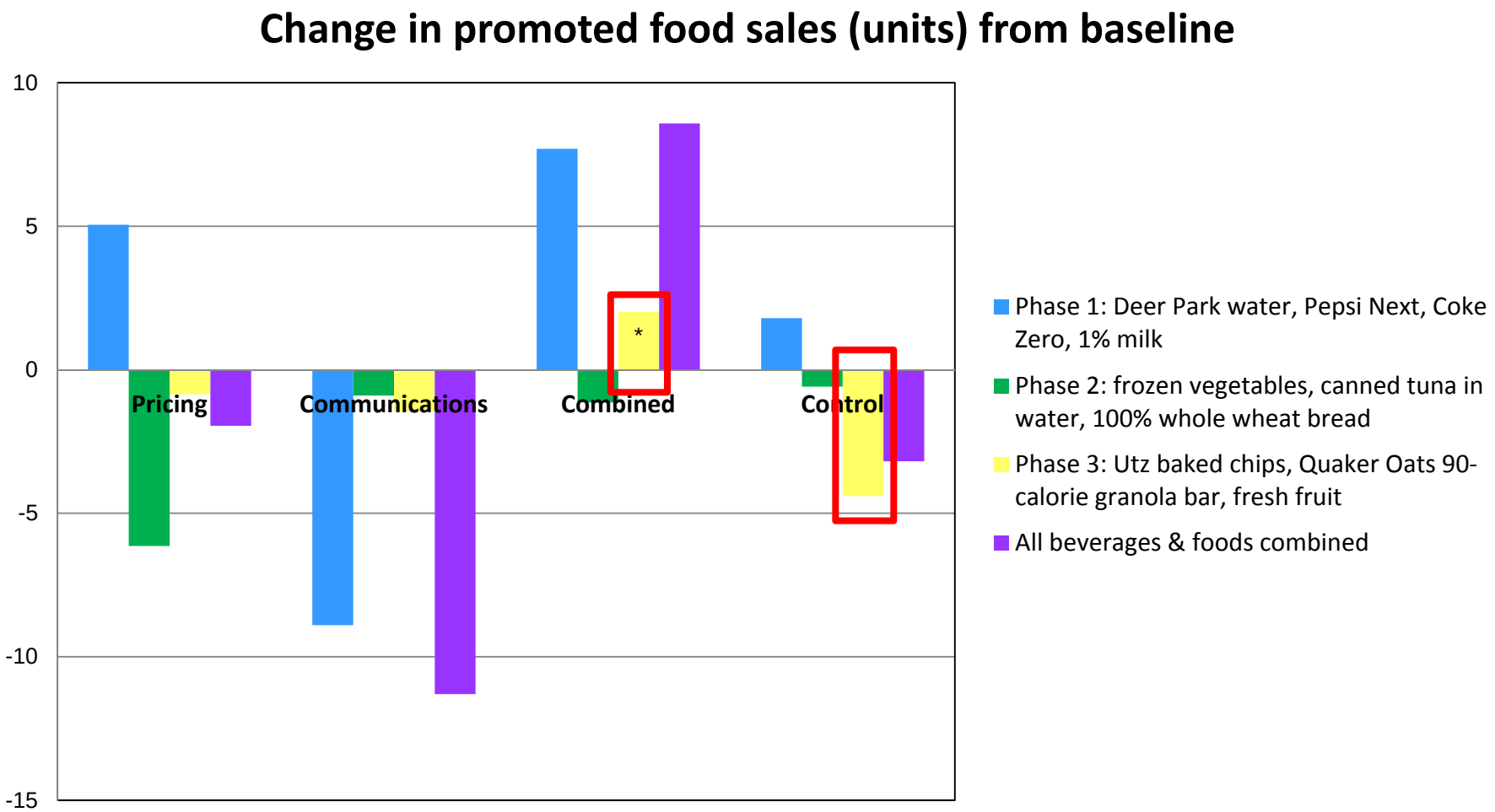
Intervention Impact on Promoted Food Sales



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*p≤0.05

Evidence of ‘retail pass-through’

- **Research question:** Did pricing intervention storeowners (n=12) comply with the agreements of the performance-based allowance?

Two requirements:

1. stocking the item
2. retail pass-through

Evidence of 'retail pass-through'

- **Research question (secondary):** Did pricing intervention storeowners (n=12) comply with the agreements of the performance-based allowance?

Two requirements:

1. stocking the item **YES – stocking increased in all price stores**

Evidence of 'retail pass-through'

- **Research question (secondary):** Did pricing intervention storeowners (n=12) comply with the agreements of the performance-based allowance?

Two requirements:

1. stocking the item **YES – stocking increased in all price stores**
2. retail pass-through?

Evidence of retail pass-through

Measures	Pricing only			Communications only			Combined Pricing and Communications			Control	
	Baseline scores	Change from baseline	Diff. in Diff.[a]	Baseline scores	Change from baseline	Diff. in Diff.[a]	Baseline scores	Change from baseline	Diff. in Diff.[a]	Baseline scores	Change from baseline
Promoted food price ($)											
Phase 1 foods	7.14±2.22	0.00	0.00	7.76±5.38	-0.55	-0.55	8.30±5.41	0.16	0.16	4.18±3.54	0.00
Phase 2 foods	7.64±3.33	0.16	0.09	4.27±2.53	0.02	-0.04	7.77±5.48	-0.40	**-0.47***	4.56±3.06	0.07
Phase 3 foods	1.76±0.82	0.15	0.14	1.23±1.16	0.17	0.16	2.46±1.61	0.02	0.01	1.63±2.21	0.01
All foods combined	16.55±2.12	0.31	0.24	13.26±8.57	-0.35	-0.43	18.52±11.72	-0.22	-0.30	10.38±6.50	0.08

[a] Treatment effect estimates were derived from difference-in-difference analyses using linear generalized estimating equations with independent correlation structure and robust standard errors (change in intervention scores from baseline – change in control scores from baseline)

[†]Baseline scores indicate the pooled prices of foods per phase of those foods that were stocked. If a food was not stocked at either time point, the price was given a value of 0 for both pre- and post- measurements so total change (Δ) was 0 for these foods. *p≤0.05

Evidence of 'retail pass-through'

- **Research question (secondary):** Did pricing intervention storeowners (n=12) comply with the agreements of the performance-based allowance?

Two requirements:

1. stocking the item YES – stocking increased in all price stores
2. retail pass-through?
   - **YES - For staple foods in the combined intervention group versus control**
   - **NO – For the other foods and intervention groups**

BHRR Summary

- All intervention groups saw significant increases in stocking of promoted foods compared to control.
- Statistically significant increases were found for healthier snack food sales in the combined intervention group compared to control.
- The increase in total snack sales was seen despite a lack of evidence of retail pass-through to customers in the combined group compared to control.

BHRR Conclusions

- While all intervention strategies motivated storeowners to stock, results suggest that combined approaches are more effective than either communications or pricing alone to increase sales.

- A combined strategy mimics the mechanism of an actual trade promotion, as food suppliers generally include structural and marketing materials to support the sales of their promoted products.[20]

- Marketing research has found that trade promotions, even when pass-through does not occur, leads to an increase in sales.[16]

Summary

- Working with small food sources to increase access to healthier foods and beverages is feasible
- Can lead to increased stocking and sales of these foods by small food sources
- Can lead to increased purchasing and consumption of these foods by consumers
- Important to combine environmental (supply) and educational (demand) strategies
- Feasible and important to work with wholesalers and distributors

Questions?

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Analysis

G1 = pricing only group (0,1)

G2 = communications only group (0,1)

G3 = combined group (0,1)

t = time (0,1)

GEE model

$$E[\text{stocking score}] = \beta 0 + \beta 1(t) + \beta 2(G1) + \beta 3(G2) + \beta 4(G3) + \beta 5(G1*t) + \beta 6(G2*t) + \beta 7(G3*t) + \boldsymbol{\varepsilon}$$

Main outcome: Intervention effects

β5 = Difference in the Δ between pricing only and control stocking score from baseline to post-intervention (diff-in-diff)

β6 = Difference in the Δ between communications only and control stocking score from baseline to post-intervention (diff-in-diff)

β7 = Difference in the Δ between combined and control stocking score from baseline to post-intervention (diff-in-diff)