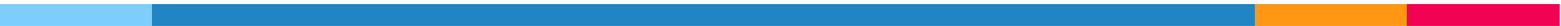


# Lessons Learned from Research to Improve Food Environments for Adults in Baltimore



Joel Gittelsohn, PhD

Center for Human Nutrition, Department of International  
Health

Johns Hopkins Bloomberg School of Public Health

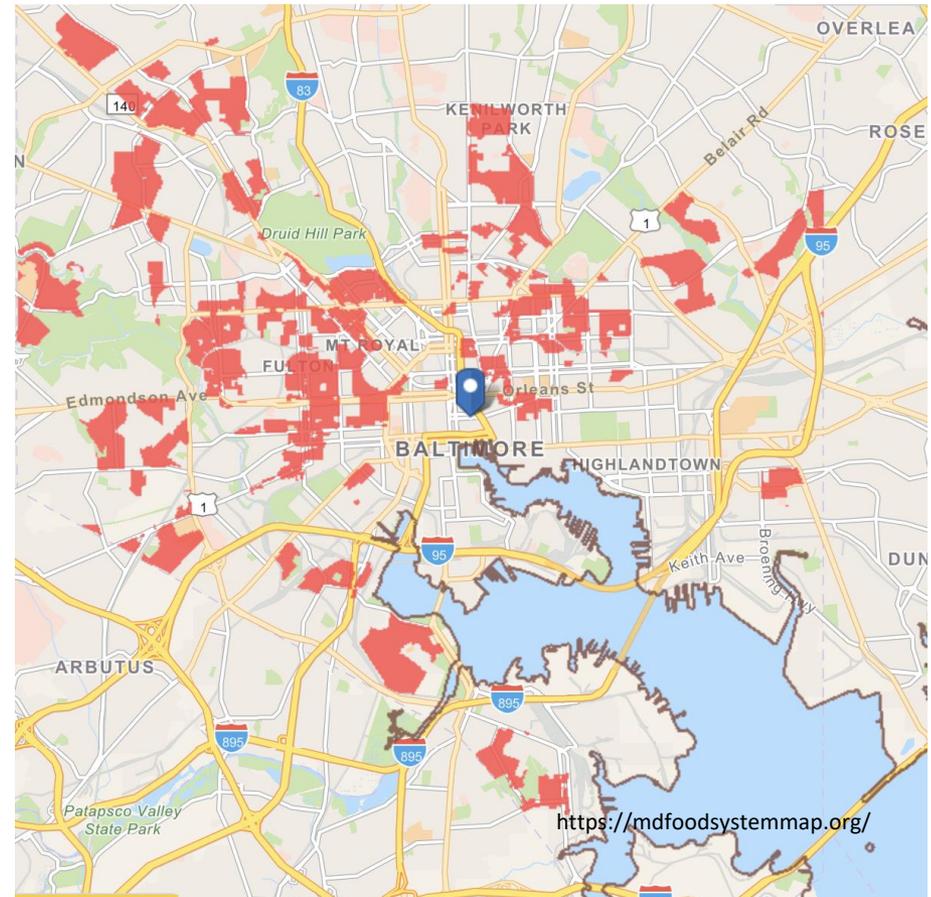
August 16, 2023

# Disclosures

- No relevant financial disclosures
- This work is funded by the National Institutes of Health, Robert Wood Johnson Foundation and the Center for Science in the Public Interest

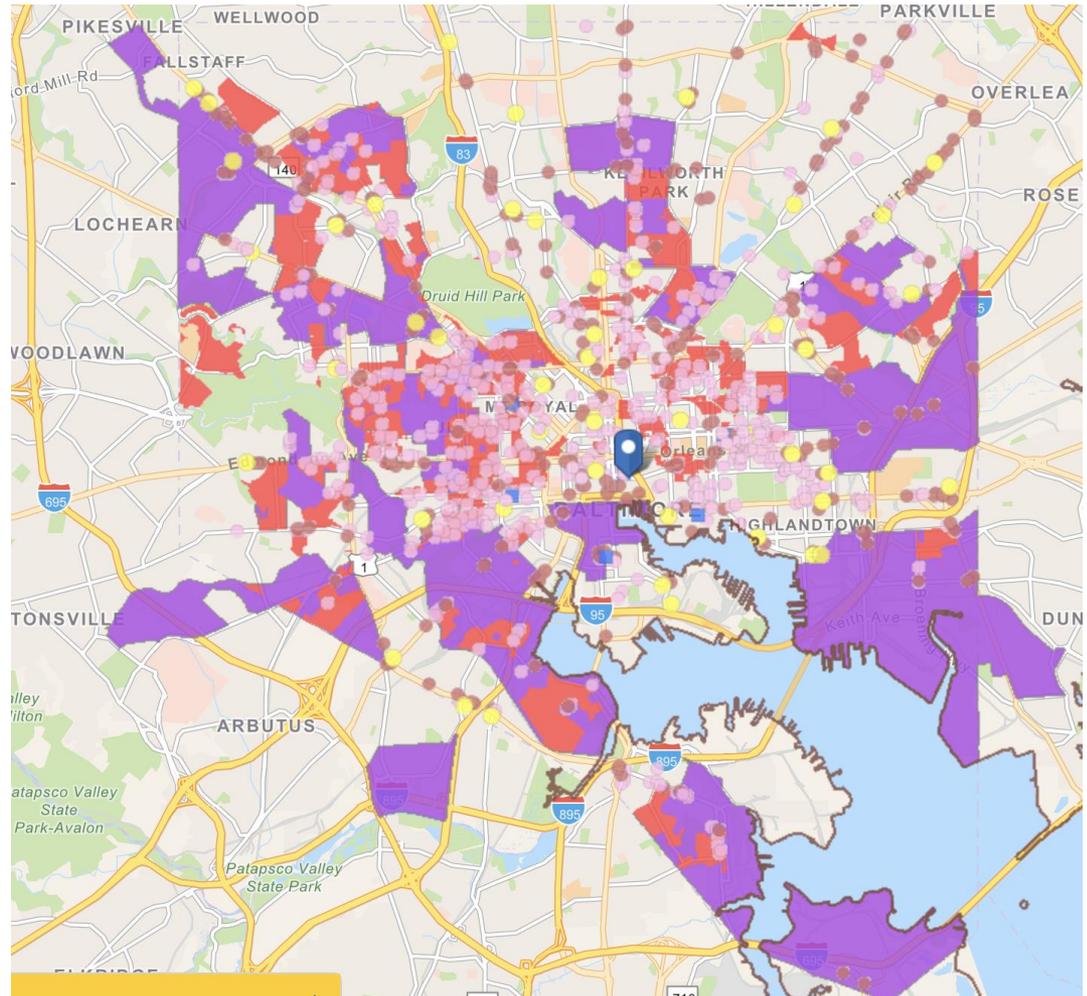
# Baltimore' Healthy Food Priority Areas: Absence of Healthy Foods

Healthy Food Priority Areas  
(HFPAs) in Baltimore City



# Baltimore' Healthy Food Priority Areas: Abundance of Unhealthy Foods

Corner stores, small grocery stores, carry out restaurants are very common





# How to improve food access in Baltimore?

- Availability
  - Increase healthy options
  - Decrease unhealthy options
  - Offer culturally appropriate options, preferred foods
- Price
- Location
  - Getting there (transportation)
  - Where foods placed in stores
  - Helping people find healthier choices by signage

# Our Previous Studies to Improve the Food Environment in Baltimore:

Past (2000-2018)

## Policy

City-, State-, National-Level  
Policymakers and Agencies

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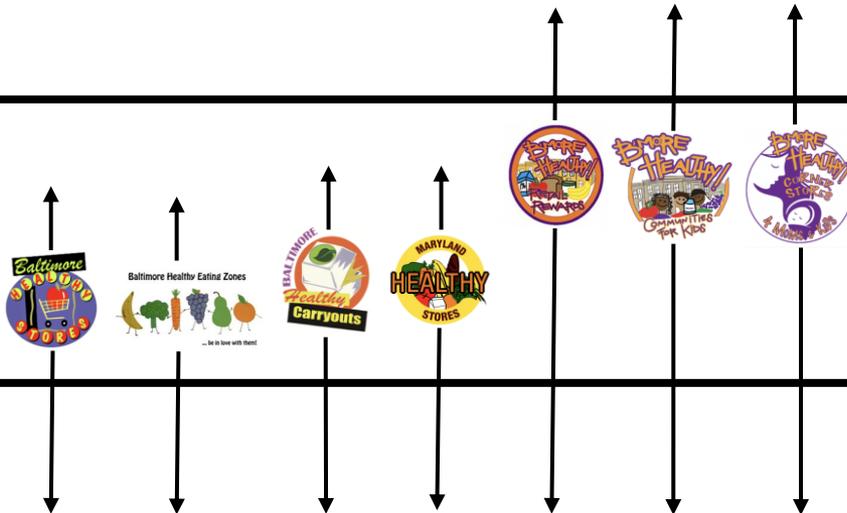
## Suppliers

Food Banks, Producers,  
Wholesalers, Distributors

---

## Sellers/Providers

Corner Stores, Dollar Stores,  
Grocery Stores, Carryouts,  
Food Pantries, Rec Centers



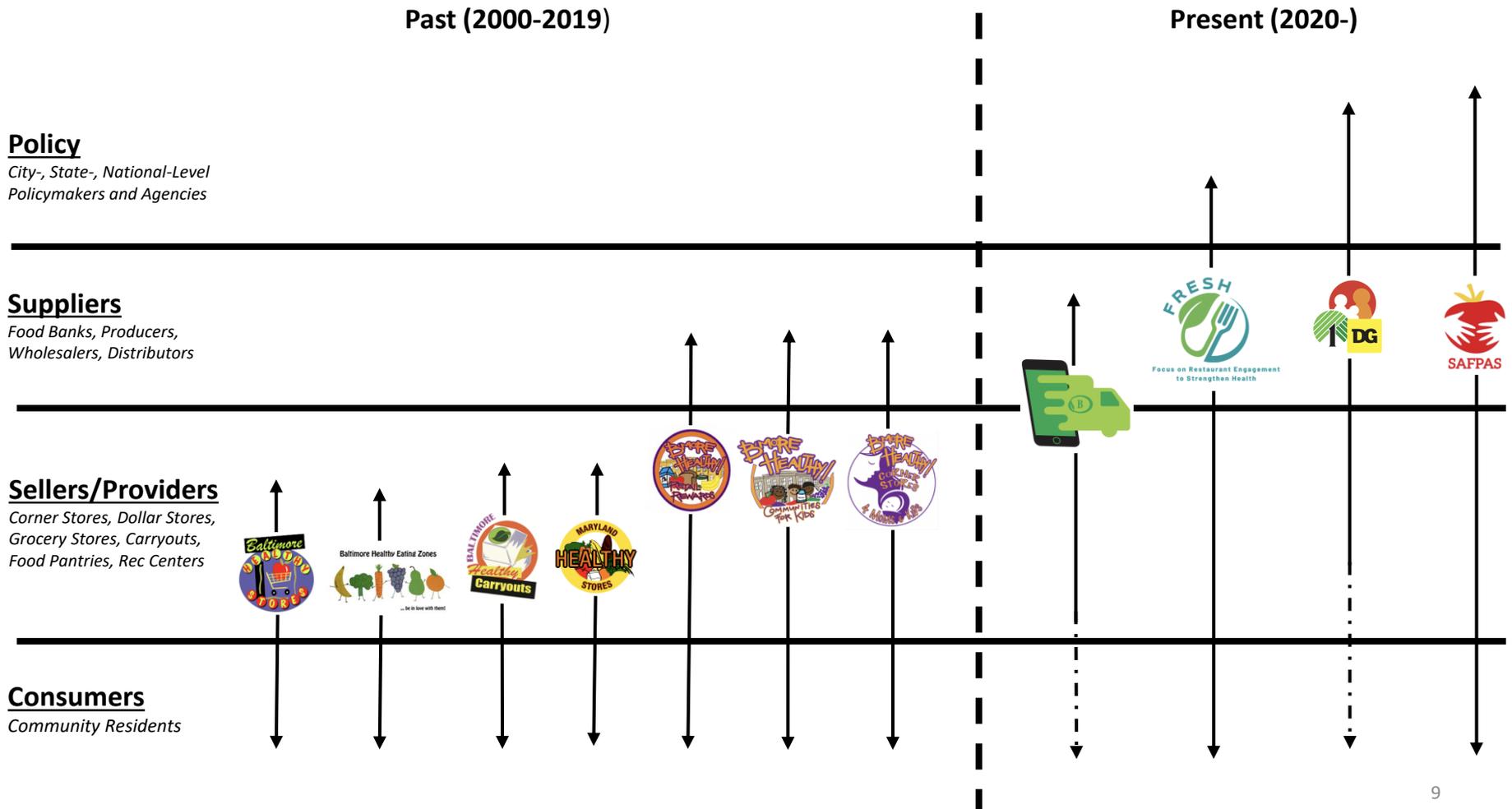
## Consumers

Community Residents

# Summary of Findings

- Food environment interventions can be effective addressing key risk behaviors for chronic disease in disadvantaged communities
- These interventions have been successful in improving access and consumption of healthy foods, and reduced obesity (in some cases)
- Should combine educational, environmental (access) and policy approaches when possible
- Community engagement, at multiple levels has been key

# Previous and Ongoing Studies to Improve the Food Environment in Baltimore:

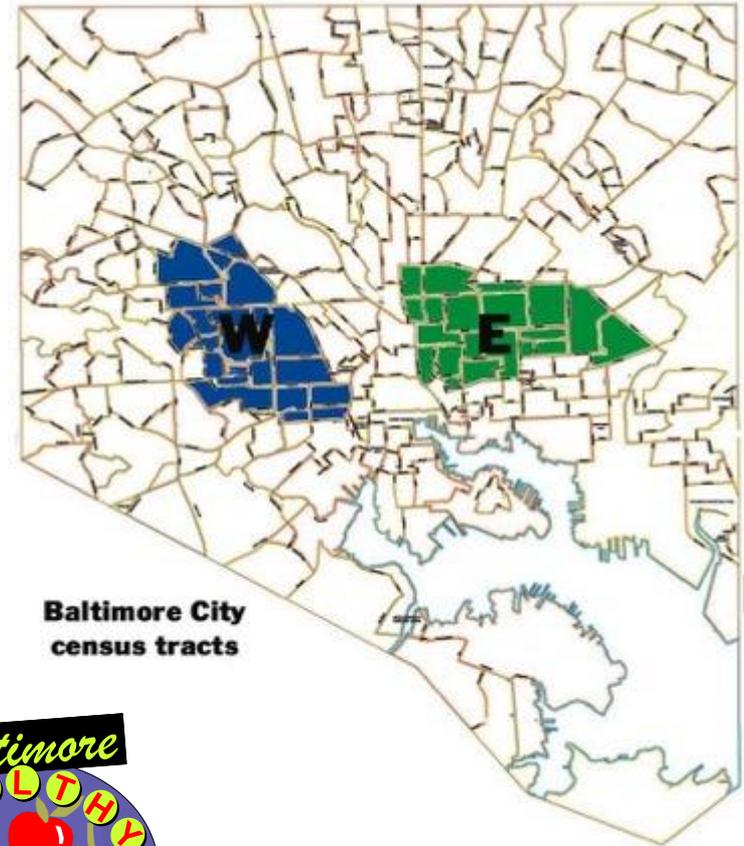


# Lesson Learned #1: Invest Heavily in Formative Research

- Mixed methods
- Triangulation
- Emergent, flexible design, multi-stage
- Usually 3-6 months depending on resources

# 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



# 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
  - → High consumer demand
- 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
  - → Low perceived consumer demand

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

<b>Food Item</b>	<b>Energy (%)</b>	<b>Food Item</b>	<b>Fat (%)</b>	<b>Food Item</b>	<b>Sugar (%)</b>
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
<b>Total</b>	<b>48.7</b>	<b>Total</b>	<b>59.8</b>	<b>Total</b>	<b>84.3</b>

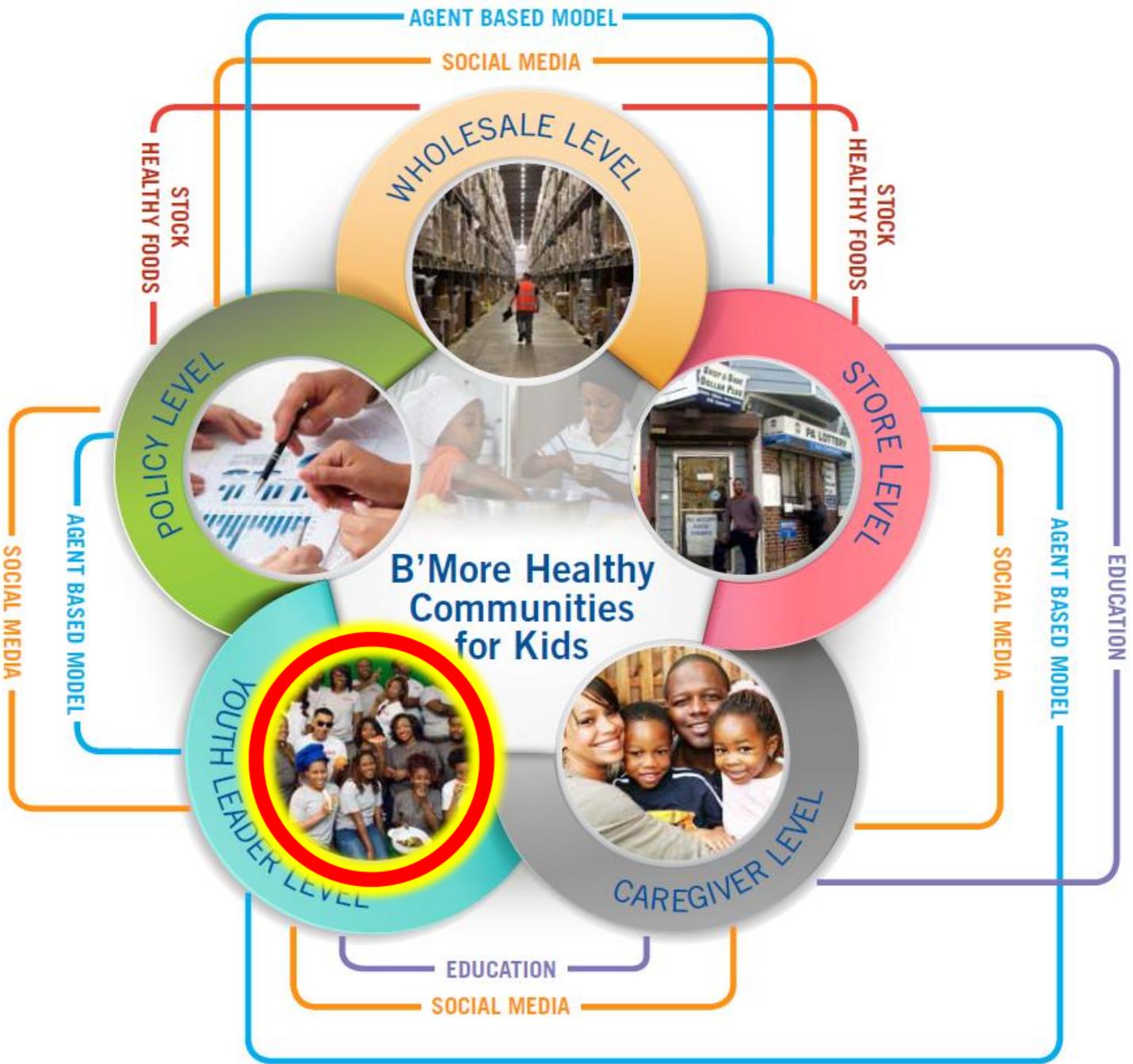
## Lesson Learned #2: Engage with communities for the long-term, and build your own experience

- Build ongoing relationships and partnerships
- Will assist with sustainability, but also with trust and rapport
- Build your own research group's experience base and capacity over time

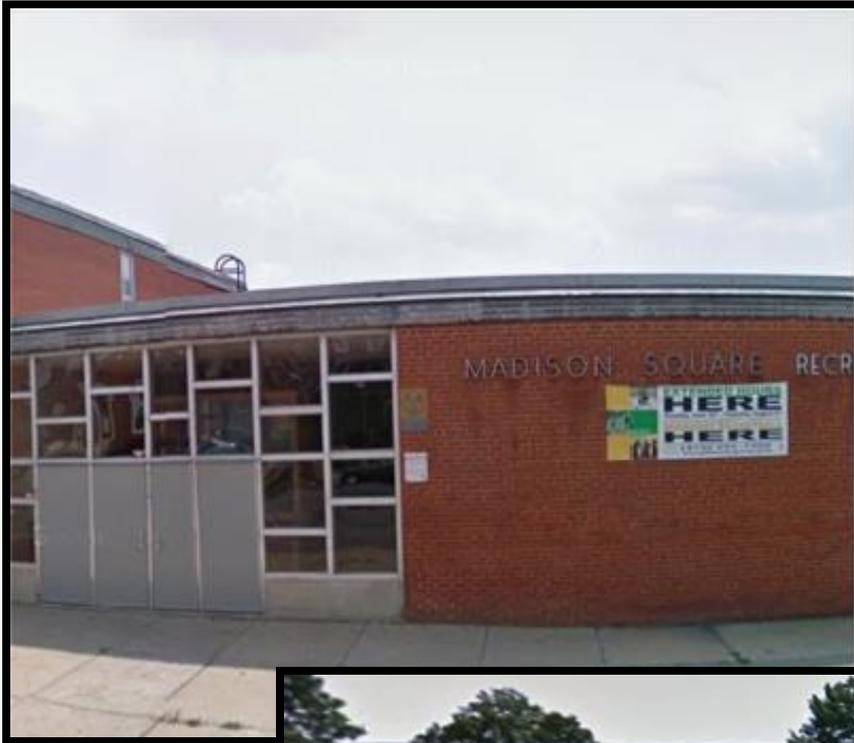
# Multi-Level, Multi-Component Intervention Trial in Baltimore



JOHNS HOPKINS  
GLOBAL OBESITY  
PREVENTION CENTER



# After-School Program in Baltimore Recreation Centers





## Meet the BHCK Youth Leaders!

- Baltimore HS and College students
- Intensively trained: nutrition and leadership skills
- Service learning hours and Incentives
- Mean BMI: 26.5 kg/m



# BHCK Youth-Leader Program

- 45-60 minute sessions with the children (ages 10 and up) conducted by youth-leaders in rec centers
- 14 nutrition sessions focus on 4 topics:
  1. Smart snacks
  2. Breakfasts
  3. Healthy cooking
  4. Smart drinks



- Sessions occur every other week for 6 months

# BHS → BHEZ → BHCK



Baltimore Healthy Stores

Subsidized products,  
POP with Corner  
Stores

Baltimore Healthy Eating Zones

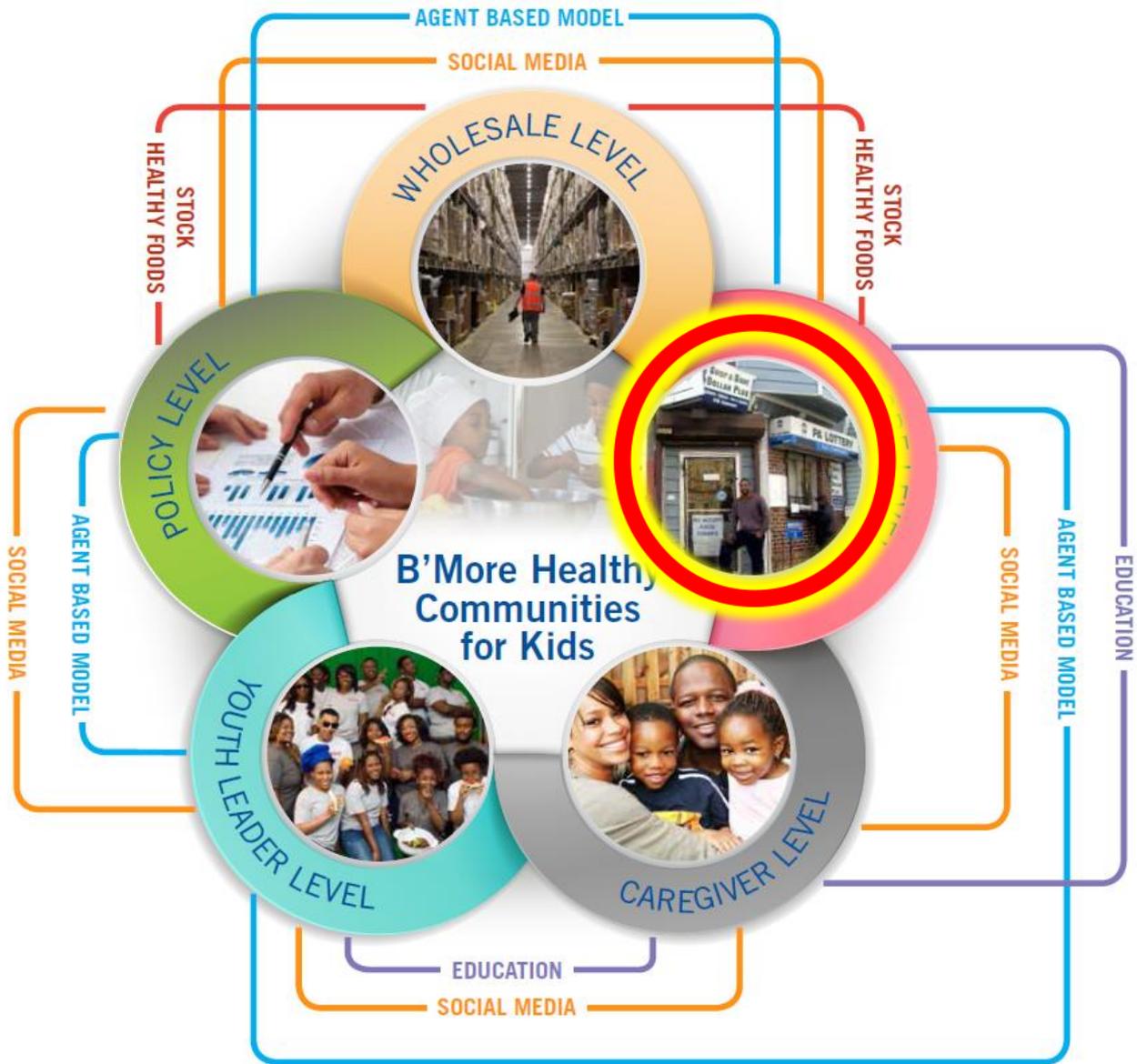
Recreation centers,  
corner stores, peer  
mentoring



B'More Healthy  
Communities for Kids

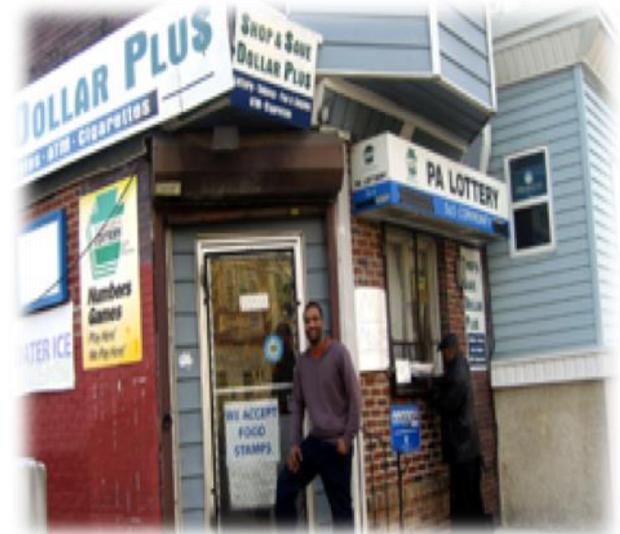
Recreation centers, peer  
mentoring, corner stores,  
carryouts, etc.





# Corner Stores and Carryouts

- Increase availability of healthier food and beverages using materials and incentives
- Increase demand for healthier food through point-of-purchase promotions
- Implement training modules for store owners
- Promote switch to lower-fat cooking methods in carryouts



# Store Owner Training Modules

- Required trainings for corner stores
  - Introduction to BHCK
  - Customer service strategies for success
  - Improving your store environment
- Required trainings for carryouts
  - Introduction to BHCK
  - Customer service strategies for success
  - How to keep your food safe, fresh, and healthy
- Optional trainings
  - Making your business profitable
  - How to get WIC in your store

<https://www.youtube.com/watch?v=fYb-r4u55qs>





# BHS, BHC → BHCK



Baltimore Healthy Stores

Subsidized products,  
POP with Corner  
Stores

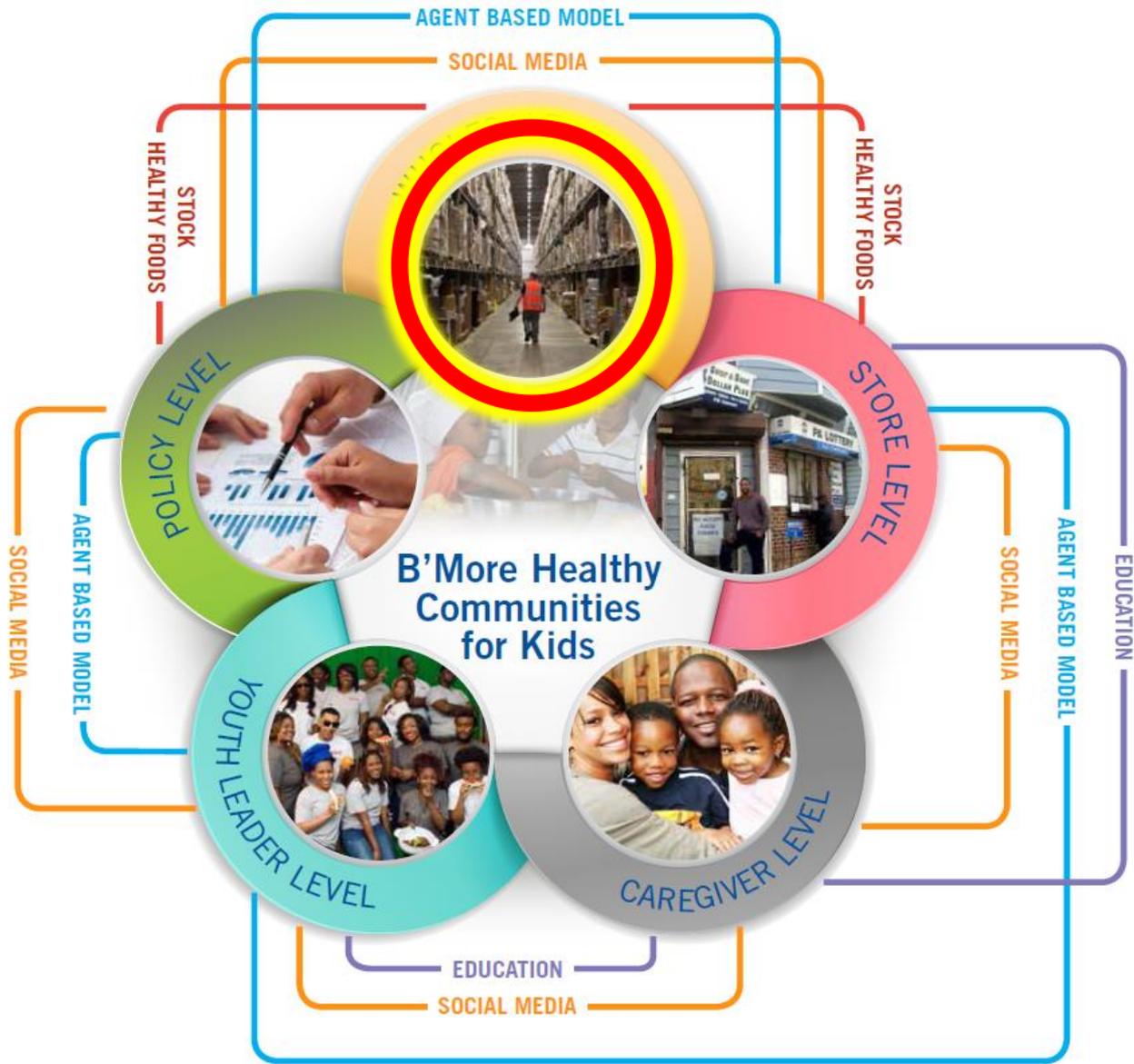


Baltimore Healthy Carryouts

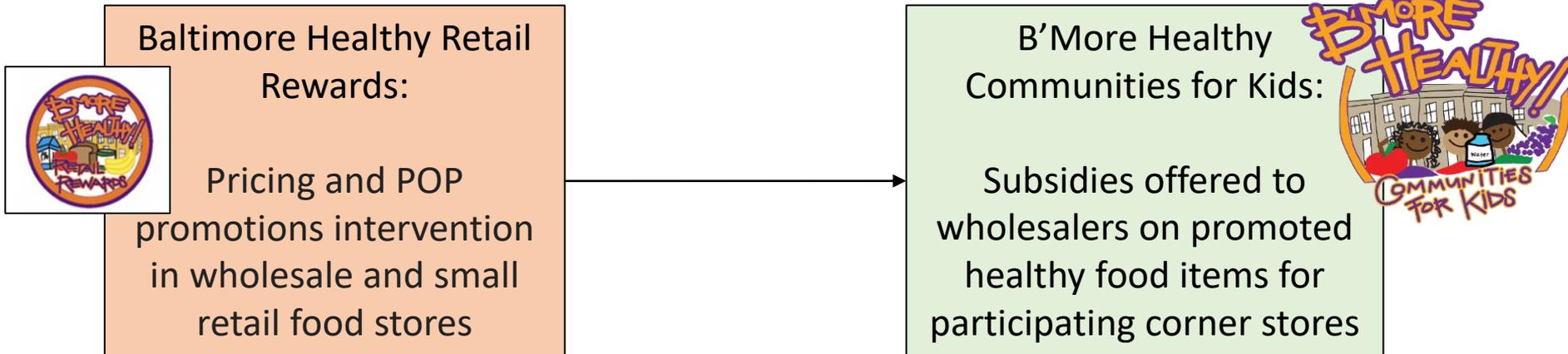
POP, menu redesign,  
new foods with  
Carryouts

B'More Healthy  
Communities for Kids  
Corner stores, carryouts





# BHRR → BHCK



# Wholesalers

- ▣ Increase stocks and sales of affordable healthy food options
- ▣ Promote BHCK supported food and beverages through signage
- ▣ Provide discounts on healthier food items to BHCK-participating corner store and carryout owners
- ▣ Three wholesalers participating



# Lesson Learned #3: Pay attention to intervention exposure, and work to make sure sufficient levels are achieved

- Achieving sufficient exposure is a great challenge for environmental interventions, which are typically passive
- Monitor intervention delivery
- Set standards for success
- Modify plans to achieve standards
- “Contamination” highly likely in environmental interventions

# Assessment of Exposure to BHCK

- Post-evaluation survey with intervention and comparison groups
- 
- Self-reported
  - Taste test

*“The BHCK project has done a number of taste tests in stores in the past year. Which of the following have you participated or seen in person?”*

- Interactive session
- Posters
- Giveaways
- Social media
- Carryout menu

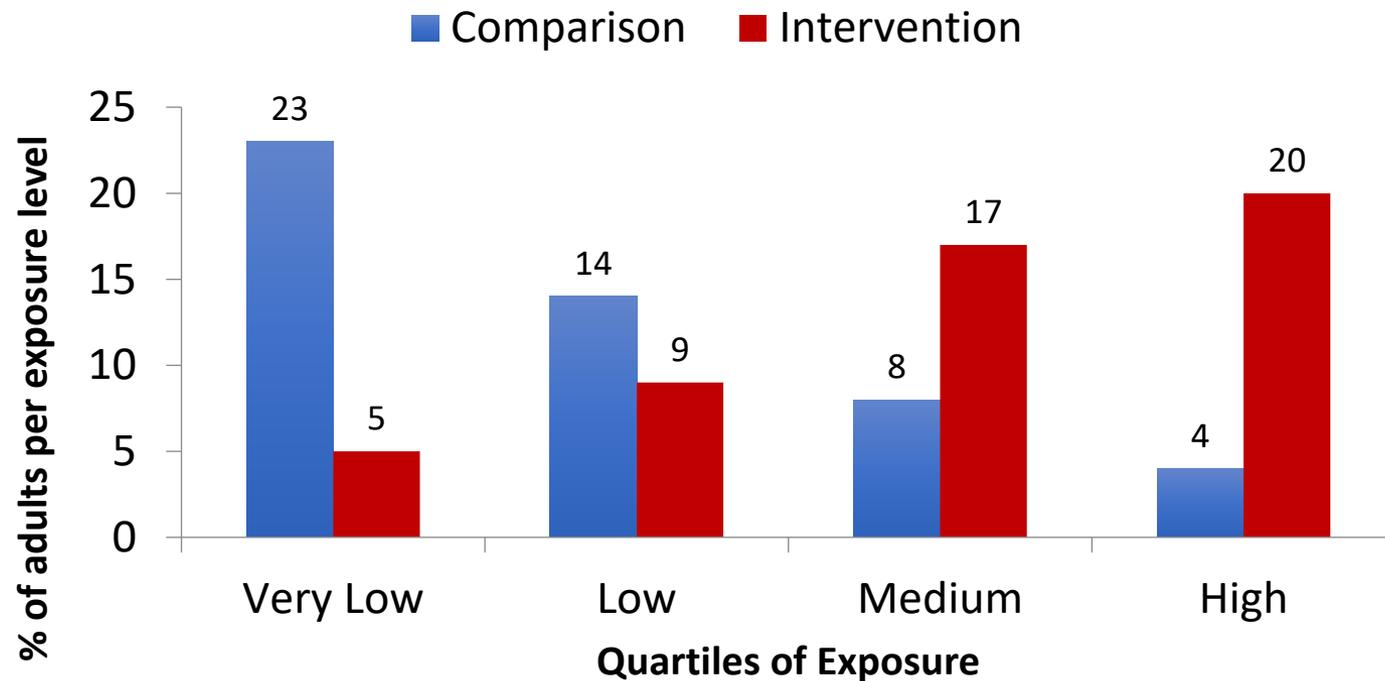


# Exposure Score

Intervention Material or Activity	Maximum Points	Re-scaled
<b>Seeing BHCK Logo in different places</b>	6	0-1
<b>Posters</b> (10 posters)	10	0-1
<b>Handouts</b> (9 handouts)	9	0-1
<b>Giveaways</b> (17 giveaways)	17	0-1
<b>Seeing shelf-label</b> in different stores	6	0-1
<b>Taste tests</b> (10 taste tests)	10	0-1
<b>Educational Display</b> (5 displays)	5	0-1
<b>Seeing redesigned menu</b> (8 menus)	8	0-1
<b>Purchased in a BHCK corner store</b> in the past 7 days	21	0-1

**Exposure Score**  
Range: 0-12  
Mean: 1.6

# Adult Exposure: Quartiles of Composite Score



# How to achieve sufficient exposure?

- Monitoring
- Regular comparison with set standards
- Corrections as needed

**Table II.** Description of sample BHCK high standards per component

Intervention component	Sample reach (set-standard)	Sample dose delivered (set-standard)	Sample Fidelity (set-standard)
Wholesalers	No. of wholesalers participating: (>2)	No. of in-person visits per phase: (>3) No. of emails per phase: (>4)	% of shelf labels correctly placed: (>75) No. of promoted food items included in circular per phase: (>10)
Corner stores	No. of child <sup>a</sup> interactions during interactive session: (>10) No. of adult <sup>b</sup> interactions during interactive session: (>20)	No. of food samples distributed per interactive sessions: (>20) No. of shelf labels on promoted foods positioned by BHCK team at the beginning of each phase: (>8)	No. of promoted foods stocked per phase: (>8) No. of training videos watched by the end of the intervention: (>5)
Carryouts	No. of child <sup>a</sup> interactions during interactive session: (>10) No. of adult <sup>b</sup> interactions during interactive session: (>20)	No. of food samples distributed per interactive session: (>20) No. of giveaways distributed per interactive session: (>20)	No. of foods cooked using lower fat methods (Phase 3): (>3) Proportion of healthy side options on menu (designated by green leaf): (>0.2)
Recreation centers (mentoring programme)	No. of children per session <sup>a</sup> : (≥10) No. of youth-leaders attending each session: (≥5)	No. of visits to rec centers/ week: (≥4) No. of giveaways distributed/ lesson: (≥12)	No. of youth leaders participating (entire intervention): (≥10) % of youth leaders attendance to trainings booster sessions: ≥90%
Social media/text messaging	No. of new followers/month (Instagram): (>450) % of families sign up for text messaging: (>80%)	No. of tweets made per week about BHCK project activities: (≥3) No. of Facebook posts about other levels (carryout, rec, stores, policy, etc.) per month: (≥30)	Average no. of Facebook shares/month: (≥5) % of text messages responses received from participants when questions are prompted: (≥30%)
Policy	No. of attendees per meeting: (≥25) No. of sectors represented at each meeting: (≥6)	No. of meetings per year: (≥4) No. of action items set per year: (≥16)	Total no. of action items achieved per year: (≥50%) No. of health-related issues put into any policymaker's agenda per meeting: (≥2)

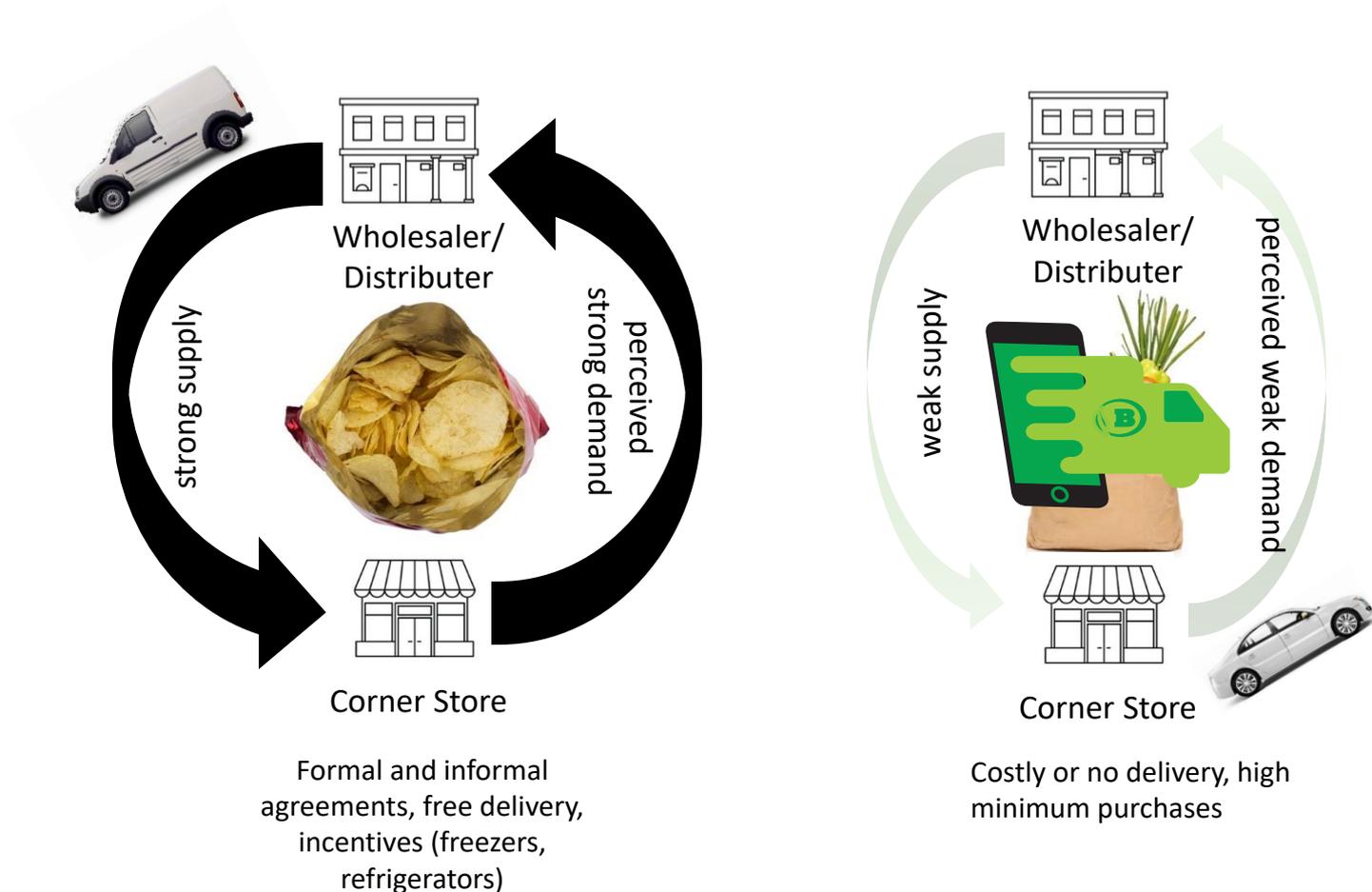
<sup>a</sup>Tracked number of children between 10 and 14 years old.

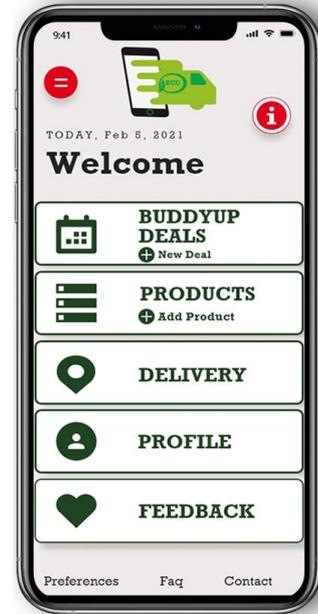
<sup>b</sup>Tracked number of adults >18 years old.

# Lesson Learned #4: Work at multiple levels of the food system

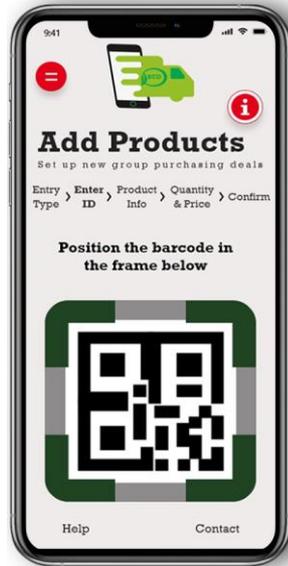
- Consumers
- Retailers (food sources)
- Suppliers (producers, wholesalers, etc.)
- Policymakers

# Distribution to Corner Stores in Baltimore: Type of Food Matters

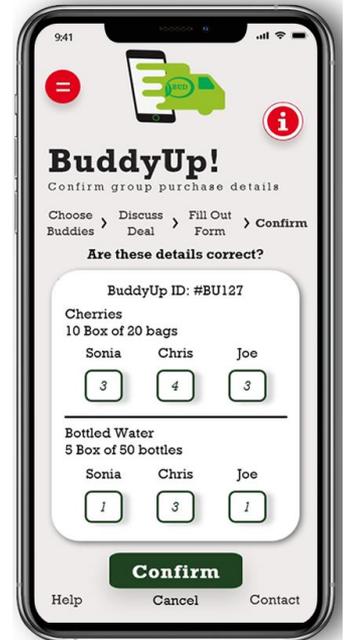




# BUD: Main Menu



# Suppliers: Add New Products



# Corner Store Owners: Join BuddyUp Deal (Collective Purchasing)



Splash  
Screen



Main  
Menu

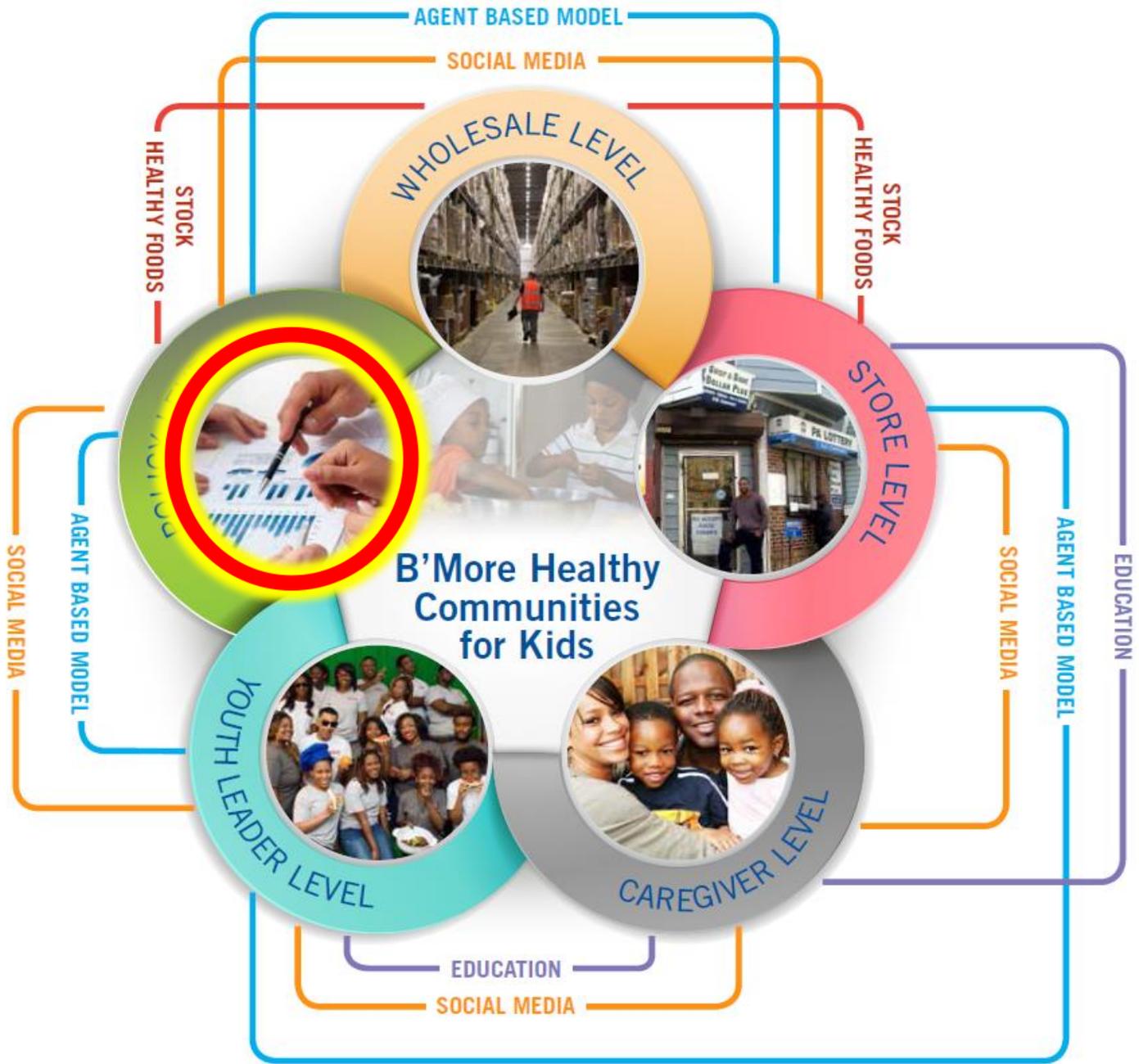


Locations

# Community Members: Locate BUD Stores and Give Feedback

# Lesson Learned #5: Consider working at the policy level to support environmental interventions

- To enhance sustainability
- To extend reach
- Note: Digital strategies could also work this way



# Policy

- Ten meetings with city stakeholders:
  - To develop and build the evidence base to support policies for a healthier food environment in Baltimore City
  - To sustain BHCK activities
- Develop simulation models to aid stakeholder decision-making

# Policy Working Group Meetings



Baltimore City Councilman Carl Stokes



Baltimore City Councilman Pete Welch



Baltimore City Councilman Bill Henry



Laura Flamm, City Health Dept.



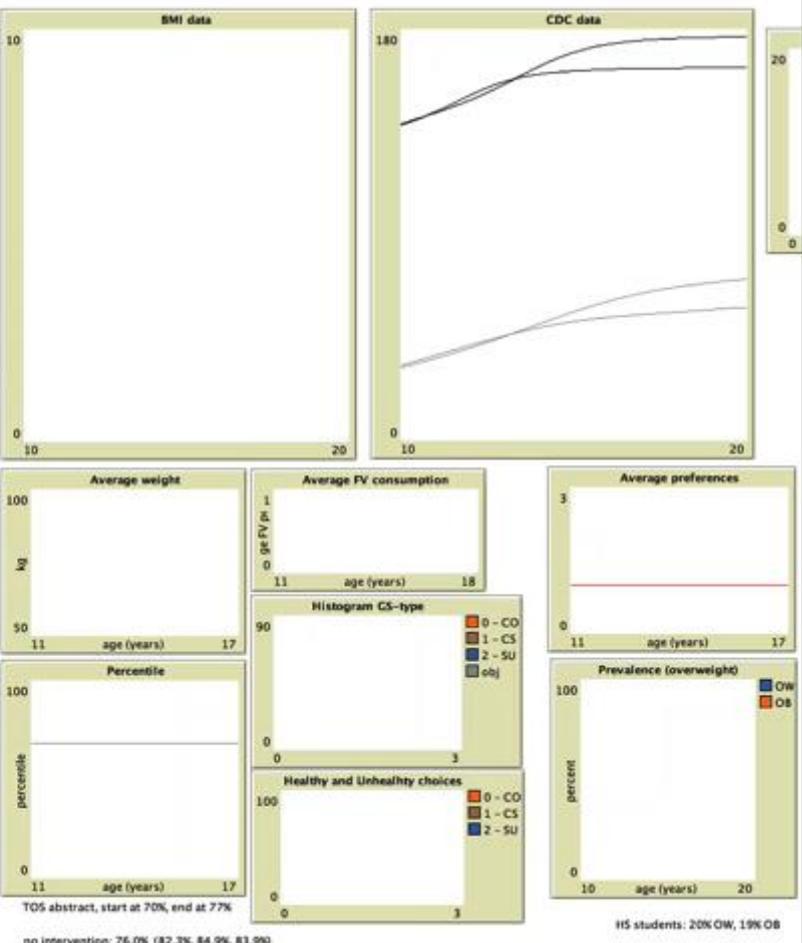
Katherine Klosek, The Family League



Holly Freishtat, City Food Policy Director

# BLIFE Model: Low income AA children after school food foraging

CS-preference = 2 makes the kids walk further. The BMI percentile is more stable if they always eat healthy.



# Testimony at Public Hearing: Property Tax Credits for Urban Agriculture

- Provide 90% tax credit to owners of vacant lots if they will convert them to urban farms
- BLIFE model modified to provide evidence for the bill



# Dollar Stores Policy Study

Funded by:  
Center for Science in the  
Public Interest

State & Local Policy  
Campaigns to Improve  
the Food Retail  
Environment

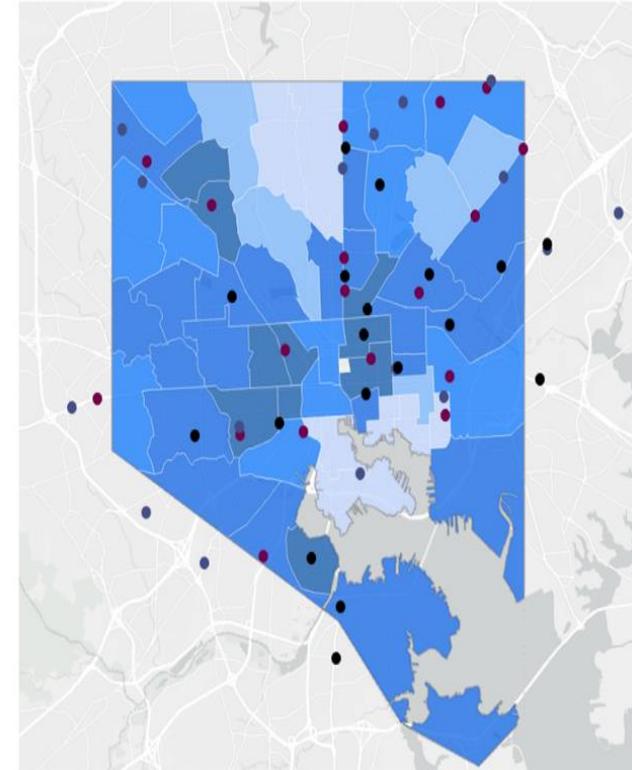
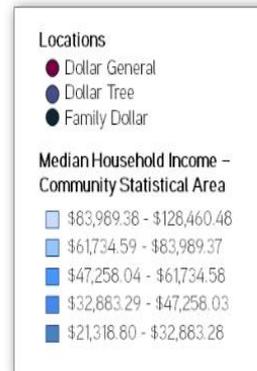


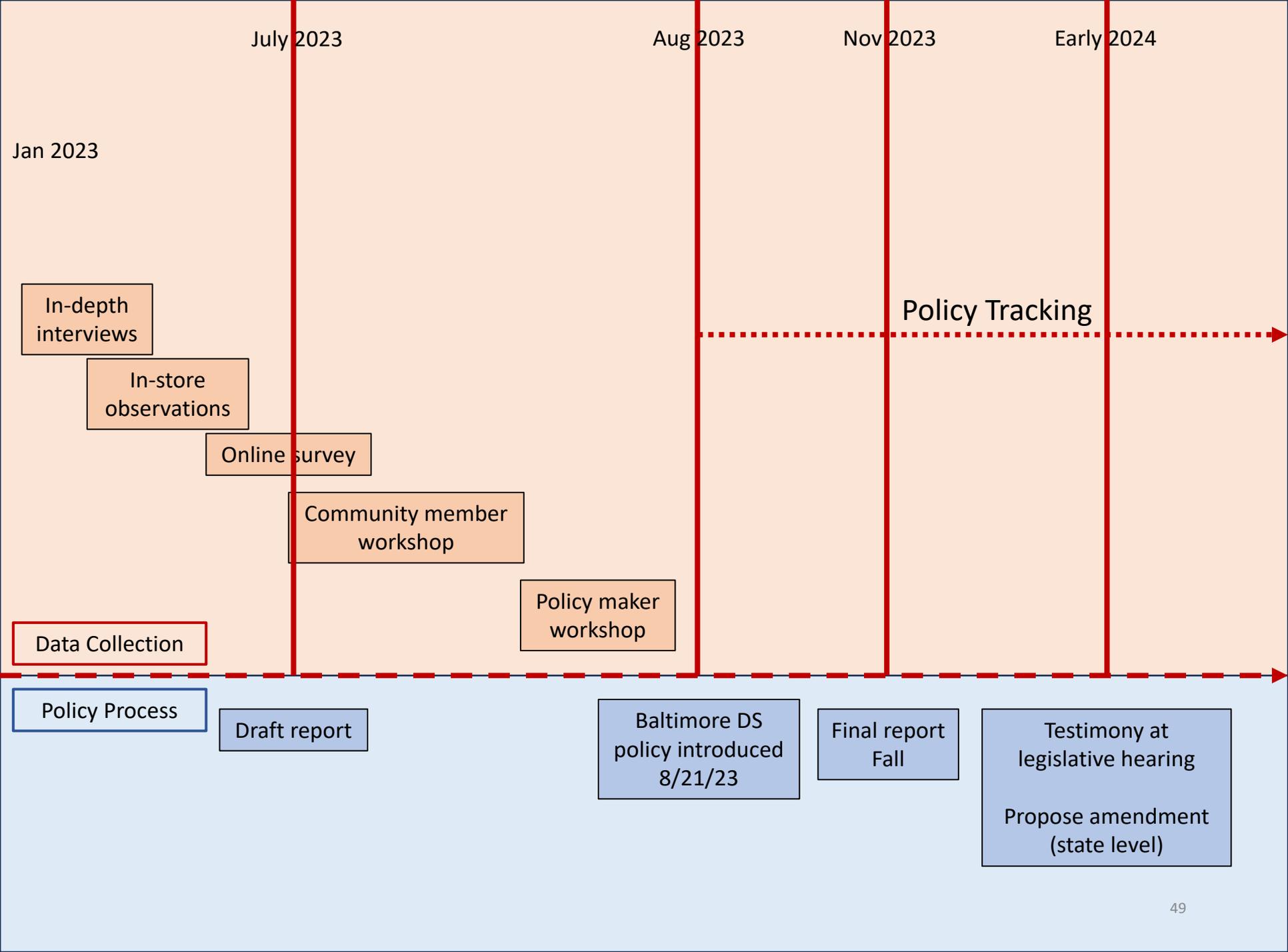
# Dollar Stores in Baltimore City



- 55 Dollar Stores in Baltimore City
- Many located in Healthy Food Priority Areas (HFPAs)
- Maryland Senate Bill 869
  - Requires study of Dollar Stores

Baltimore Dollar Store Locations By Median Household Income





# It's been a 20+ year journey to develop and test solutions to improve Baltimore's food environment!

- Formative research and community engagement crucial
- Make sure you have the capacity and experience to undertake this complex work
- Pay attention to exposure
- Work at multiple levels of the food system
- Policy approaches are one approach for expanding reach and sustainability

# Current Collaborator Team

## BALTIMORE/URBAN PROJECTS

Uriyoan Colon-Ramos, ScD  
Associate, GWU

Siyao Zhu, PhD

Antonio Trujillo, PhD  
Associate

Daniel Barnett, MD  
Associate

Audrey Thomas, CHES  
MSPH Student

Tak Igusa, PhD  
Professor

Julia Wolfson, PhD  
Associate

Lawrence Cheskin, MD  
Adjunct

Joel Gittelsohn, PhD  
Professor

Lexi Lightner, BA  
MSPH Student

Shuxian Hua, BS  
MSPH Student

Ayoyemi Tohe  
Oladimeji  
PhD Student

Veronica Velez-Burgess  
MSc, MA, INHC

Lisa Poirier, MHS  
Research Associate

Sydney Santos, BA  
MSPH Student

Samantha Sundermeir, MS, RDN  
PhD Candidate

Emma Lewis, MS  
PhD Candidate

## INDIGENOUS/RURAL PROJECTS

Brittany Jock, PhD  
Assistant, McGill

Jacqueline Swartz  
Field Coordinator

Yeeli Mui, PhD  
Assistant

Susan Gross, PhD  
Associate Scientist

Abbe McCarter  
MSPH Student

Marla Pardilla, MSW, MPH  
Field Coordinator

Michelle Estradé, MS, RD  
DrPH Candidate

Margarita Treuth, PhD  
Professor, UMES

# Connect with us!



@GlobalFoodMan  
@BmoreHealthyFoodSystems  
@Freshrestaurantinitiative  
[www.healthyfoodsystem.net](http://www.healthyfoodsystem.net)

[jgittel1@jhu.edu](mailto:jgittel1@jhu.edu)

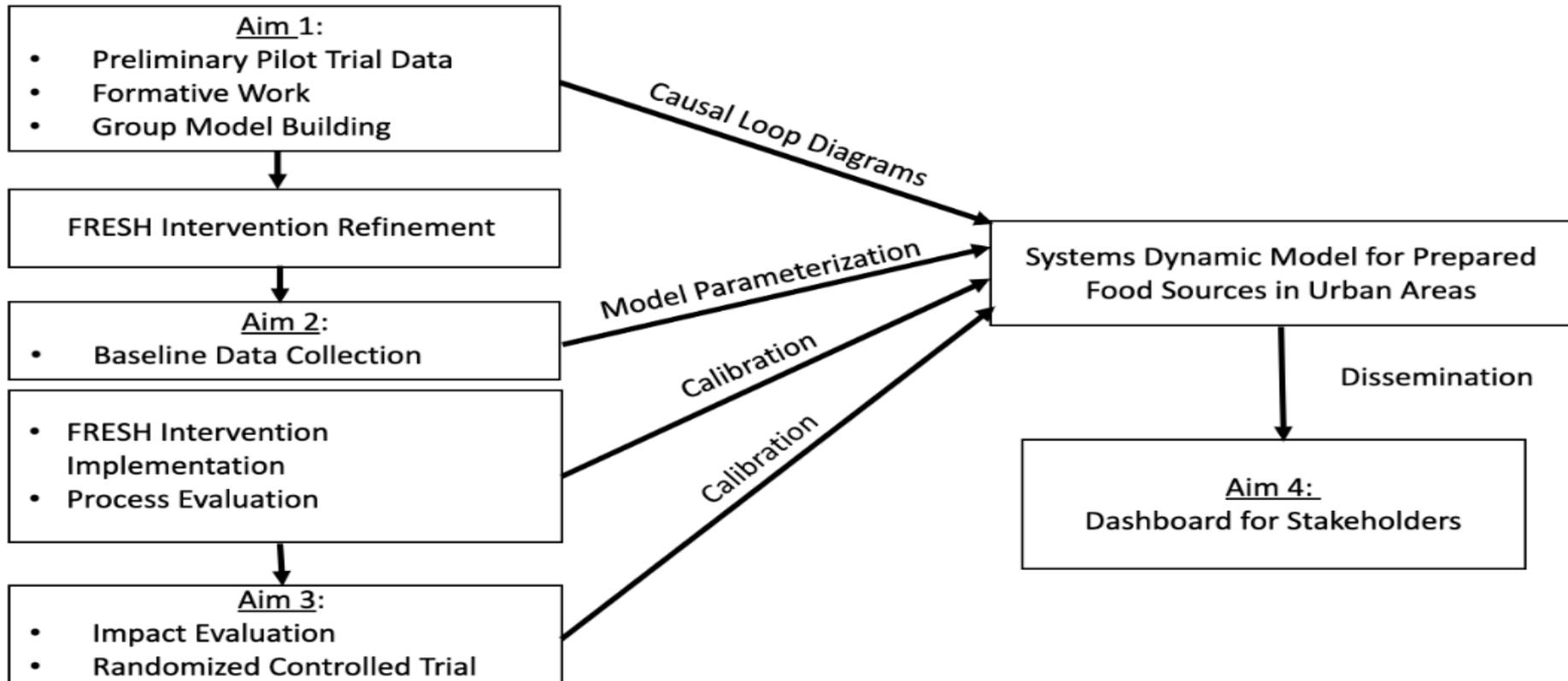


**Focus on Restaurant Engagement  
to Strengthen Health**

(NIH R01MD018022)

# Integration of FRESH Intervention Study Aims with the Systems Dynamic Model

Figure 1: Integration of FRESH intervention study aims with the systems dynamic model



# FRESH System Dynamics Model Dashboard, and Sample Output

## Restaurant System Dynamics Model

Welcome! Enter your parameters here:



Site (City, County)

Menu Labeling Policy : 1

Default Healthy Kids Beverages : 3

Health Department Inspection  
Frequency : 3



Neighborhood  
Characteristics

Density of Restaurants : 3

Proportion of Independently  
Owned Restaurants : 50%

Number of Residents : 2

Income : 2



Restaurant Characteristics

# Healthy Entrees and Sides : 2

Cook Training : 4

Food Access (suppliers carry  
items) : 2

Menu Redesign (healthy choice  
emphasized) : 5

Staff Trained : 3

# Customers/day : 75

Outputs:

Bar Plots

Line Plots

Customer Healthy Eating Index Score Over Time

