Environmental Interventions for Chronic Disease Prevention: The Healthy Stores projects

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Topics
- Impact of the food environment
- Approaches for changing the food environment
- Baltimore Healthy Stores and other urban environmental interventions
- Multi-institutional trials

Food Environment and Obesity
- Food availability associated with diet and youth BMI (French 2001)
- Reduced access to supermarkets is associated with higher BMI and chronic disease rates (Morland 2006, Bodor JN 2010)
- Distance of 1.76 miles or greater from home to grocery store was a predictor of increased BMI (Inagami et al 2006)
- More small stores and prepared food sources are associated with higher BMI and chronic disease rates (Bodor JN 2010; Maddock, 2004)

Ways to Change the Food Environment (1)
- Changing access to foods within retail food stores & prepared food sources by:
  - Decreasing availability of less healthy foods
  - Increasing availability of healthy foods in small stores
  - Changing the physical location of foods (e.g., store layout)
  - Store renovations (e.g., adding FV coolers)
  - Manipulating price

Ways to Change the Food Environment (2)
- Changing access to foods within neighborhoods by:
  - Building new supermarkets
  - Developing farmer’s markets
  - Improving transportation
- Changing setting for provision of information (e.g., POP promotions)

Food Environment and Obesity
- Small stores and carryouts sell mostly energy-dense foods and few foods for a healthy diet (Bodor JN 2010, Lee 2010)
- Prices of healthy foods in small stores are higher than in supermarkets (Franco 2009, Morland 2002)
- In low-income communities, food affordability is a strong predictor of diet and BMI among youth (French 2001)
Ways to Change the Food Environment (3)

- Policy
  - Setting store standards/requirements
  - Menu labeling
  - Rezoning
  - Taxes (E.g., SSB tax)

- Work in multiple settings/ institutions at the same time
  - Integrating interventions in food stores, restaurants, schools, worksites, etc.

Ways to Change the Food Environment (4)

- Other approaches:
  - Improving food networks (distributors, producers, retailers)
  - Improving local production (producers)
  - Increasing nutrient content of foods (manufacturers)
  - Changing packaging of foods (manufacturers)

Healthy Store Programs

Baltimore Healthy Stores Goals

- To increase availability and access to healthy foods for residents of Baltimore City.
- To promote these foods at the point of purchase
- To work in collaboration with community agencies, the city of Baltimore, and local food sources.

Exteriors of corner stores
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

Healthy Foods Availability, n=176 Baltimore stores (Franco et al 2008)

<table>
<thead>
<tr>
<th>Type of food stores (n=176)</th>
<th>Healthy Food Availability Index, mean (range 0-27)</th>
<th>Skim Milk, %</th>
<th>Fruit, % 1-25 ≥ 26</th>
<th>Vegetables, % 1-25 ≥ 26</th>
<th>Whole Wheat Bread, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supermarkets (16)</td>
<td>19.0</td>
<td>100</td>
<td>25 69</td>
<td>13 81</td>
<td>100</td>
</tr>
<tr>
<td>Grocery/ corner Stores (107)</td>
<td>4.4</td>
<td>25</td>
<td>43 3</td>
<td>57 3</td>
<td>8</td>
</tr>
<tr>
<td>“Behind the glass” stores (20)</td>
<td>2.0</td>
<td>0</td>
<td>0</td>
<td>0 0</td>
<td>0</td>
</tr>
<tr>
<td>Convenience stores (33)</td>
<td>3.8</td>
<td>36</td>
<td>33 0</td>
<td>21 0</td>
<td>24</td>
</tr>
</tbody>
</table>

Baltimore Healthy Stores round 1

- 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
Baltimore Healthy Stores Phases

- Phase 0: Teasers/Recruitment
- Phase 1: Healthy Eating for your Kids
- Phase 2: Cooking at Home
- Phase 3: Healthy Snacks
- Phase 4: Carry Out Foods
- Phase 5: Low Calorie Drinks

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 (on occasion)

Posters

- Educational Display
- Flyer
- Coupon

Interactive Sessions

Materials and training for Korean store owners

- Nutrition Education Booklet (Korean)
- Cultural Guidelines (Korean)
**BHS Evaluation Plan**

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Pre-</th>
<th>Mid-</th>
<th>Post-</th>
<th>Follow-Up</th>
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<tbody>
<tr>
<td><strong>Process Evaluation</strong></td>
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<tr>
<td>Store process evaluation</td>
<td>X</td>
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<td></td>
<td></td>
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<tr>
<td>Store owner process evaluation</td>
<td>X</td>
<td></td>
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<td></td>
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<tr>
<td>Cooking demo, taste test evaluation</td>
<td>X</td>
<td></td>
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<td></td>
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<tr>
<td>Cooking demo, taste test customer evaluation</td>
<td>X</td>
<td></td>
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<tr>
<td>Weekly interventionist progress report</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td><strong>Store impact and feasibility</strong></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Store impact questionnaire</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Bi-weekly food sales (corner)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>In-depth interviews</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Customer Impact and feasibility</strong></td>
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<tr>
<td>Employee Impact questionnaire</td>
<td>X</td>
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<tr>
<td>Food Frequency Questionnaire</td>
<td>X</td>
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<tr>
<td>Customer feasibility interviews</td>
<td>X</td>
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**Impact on Stocking and Sales**

<table>
<thead>
<tr>
<th></th>
<th>Stocking Score (range 0-10)</th>
<th>Sales Score (range 0-10)</th>
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<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td>Comparison</td>
</tr>
<tr>
<td>Baseline</td>
<td>5.9 ± 2.0</td>
<td>6.8 ± 1.6</td>
</tr>
<tr>
<td>Post-phase</td>
<td>8.3 ± 1.0</td>
<td>6 ± 1.8</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>7 ± 2.0</td>
<td>5.5 ± 1.5</td>
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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

**Will small food store interventions work in different settings?**

- Systematic review, Preventing Chronic Disease, in press
- 16 trials that met criteria
  - Focus on small food stores
  - Had impact data
- Findings
  - Significant effects for increased availability of healthy foods and improved sales of healthy foods
  - Significant effects for improved consumer knowledge and dietary behaviors

**Center of Excellence for Training and Research Translation**

- CDC supported center at UNC
- BHS listed as a Research-Tested Intervention
- Materials and training provided to city and state Health Departments through UNC obesity prevention course

**Baltimore Healthy Carryouts**

- 625 carryouts in Baltimore City
  - Phase 1: Menu labeling and signage
  - Phase 2: Introducing healthier sides & healthier beverages
  - Phase 3: Introducing healthy combo meal & reduced prices for healthier options
Phase 1: Modified menu boards and menu labeling

Before

Phase 2: Healthy sides and healthy beverages

- Currently available healthy sides & beverages
  - Collards, salads, fruit cups, soups, water, diet soda, 100% fruit juice
- New healthy sides introduced
  - Yogurt, fresh fruits, other cooked greens (turnip greens, kale), green beans, smoothies
- Provide healthier sides to intervention carryouts to help initial stocking

BHC Menu Board

After

Phase 2 Poster: “Healthy Sides”

- Phase 2 posters were distributed to the intervention carry outs to promote the purchasing of healthier side dishes such as soup, collard greens, salad, fresh fruit and water.
Phase 3. Healthy combo meal & Price manipulation

- Improving food preparation methods
  - Provide an indoor grill to implement grilled chicken tenders
  - Provide low-fat mayonnaise
- Healthy Monday promotion with price reduction
  - Formative research to understand what is an acceptable range to reduce prices
  - Owners agreed to reduce up to $1 per healthy entrée without compensation

Cooking preparation methods

Most carryouts only have deep-fryers and a microwave to cook foods. We purchased a grill to provide a non-fat cooking method.

BHC Evaluation of Carryouts

Will prepared food source interventions work in other settings?

- Systematic review, in preparation
- 11 trials that met criteria
  - Focus on prepared food sources
  - In community settings
  - Had impact data
- Findings
  - Feasibility and sustainability were high
  - Increased sales of healthy foods for most trials
  - Measures at the consumer level were generally lacking, but in some cases showed improved awareness and frequency of purchase of promoted foods.
Baltimore Healthy Eating Zones: Aims

- To develop, implement and evaluate an environmental program for low-income AA children by creating “healthy eating zones”.

- To determine if the program:
  - significantly improves children’s food-related psychosocial factors and food/beverage purchasing behaviors.
  - leads to significant improvements in young AA children’s food environment, including the increased availability of affordable healthy foods.
  - leads to significant changes in food consumption.

BHEZ Intervention Components

- Creation of “healthy eating zones” in and around 12+ Baltimore City recreation centers
- Worked with corner stores and carryouts
- Increasing availability of healthy food options
- Point of purchase signage
- Interactive sessions
- Use of peer educators
- Cooking classes for kids in recreation

Youth materials developed by Kids On The Hill

Interactive activities in food stores

Interactive activities in recreation centers

Evaluation Plan

- Pre-post evaluation
  - 242 youth-caregiver dyads (half intervention, half comparison)
  - Psychosocial factors
  - Food purchasing
  - Quantitative food frequency
  - Recreation center staff (n=12)
  - Changes to food availability in rec center, stores and carryouts
  - Store environmental checklists
  - Process evaluation
Early Results: Impact on Obesity

<table>
<thead>
<tr>
<th>Program Population</th>
<th>Reduced Significant Impacts Observed</th>
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<tbody>
<tr>
<td></td>
<td>Consumer psychosocial</td>
</tr>
<tr>
<td>Marshall Islands Healthy Stores</td>
<td>Pacific Islander adults</td>
</tr>
<tr>
<td>Apache Healthy Stores</td>
<td>American Indian adults</td>
</tr>
<tr>
<td>Zinahise-parse-in Ninomage-waan</td>
<td>First Nations adults</td>
</tr>
<tr>
<td>Healthy Foods Island (PI: R. Novotny)</td>
<td>Pacific Islander adults and children</td>
</tr>
<tr>
<td>Navajo Healthy Stores</td>
<td>American Indian adults</td>
</tr>
<tr>
<td>Baltimore Healthy Stores</td>
<td>African American adults</td>
</tr>
<tr>
<td>Healthy Eating Zones</td>
<td>African American youth</td>
</tr>
</tbody>
</table>

Report under review by Baltimore Planning and Health Departments

Dissemination and Expansion

- **Baltimore City Food Policy initiatives**
  - Healthy Carryout initiative with public markets
  - Multilevel Obesity Prevention Study (MOPS)
    - Food PAC, Wholesalers, corner stores, carryouts, recreation centers

What is OPREVENT?

- OPREVENT stands for Obesity Prevention Research and Evaluation of InterVention Effectiveness in NaTive North Americans
- OPREVENT is a program that combines communications, family, food store and worksite components for obesity and diabetes prevention for American Indian communities
OPREVENT Program Rationale

- It is better to:
  - Engage community members in program planning and implementation
  - Work in multiple places to reinforce healthy messages and increase exposure
  - Change environment to increase access to food and physical activity
  - Reach people at the point of decision
  - Plan for sustainability from the beginning

Who are the partners in the program?

- Five American Indian (AI) Communities
  - Schools and Families
  - Stores
  - Worksites
  - Wellness Centers
  - Diabetes Prevention Programs
- Johns Hopkins School of Public Health and local collaborators
- USDA University Extension

OPREVENT will have 4 programs

- Family program for families of children in grades 2-6
- Store program to increase availability of healthy foods and point of purchase promotion, including interactive sessions
- Worksite program to increase physical activity
- Communications program with events and media for reinforcement

Family Program

- Centered around 2nd – 6th grade health curriculum
- Main Focus
  - Healthy eating
  - Physical activity
  - Daaybways stories
  - Exercise breaks and physical activity
- Family packs to take the messages home
- Encouraging no chips and sugar-sweetened drink policies in schools
Store Component
- Promote stocking and purchase of healthier foods
- Interactive sessions with giveaways, taste tests
  - e.g. drain and rinse ground meat to make healthier hamburger soup
- Shelf labels
  - lower in fat, lower in sugar, higher in fiber healthy food choice
- Flyers, posters, educational displays, recipes

Worksite Program
- Format will depend on types of worksites that wish to be involved
- Emphasis on increasing physical activity
- Pedometer challenges one option

The “Big Idea”
- Reinforcing programs that happen at the same time
- Example.
  - Children learn about healthy snacks (family program)
  - Children encourage parents to purchase healthy snacks
  - Adults see signs for healthy snacks in stores and taste test during interactive sessions (store program)
  - Adult workers hear about healthy snacks on the job (worksite program)

OPREVENT Evaluation
- Process indicators
  - Schools, stores, worksites, health services
- Impact
  - Adult psychosocial factors, diet (FFQ), physical activity, BMI

Conclusions
- Healthy stores approach to changing the food environment appears to work in many settings
- Importance of addressing both supply and demand
- Need to work in multiple institutions, to achieve high exposure
- Importance of thinking beyond the initial trials – our job does not end there

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Thank you!

www.healthystores.org