Community-based interventions for chronic disease prevention: Approaches for changing the food environment

Joel Gittelsohn, PhD

Center for Human Nutrition
Johns Hopkins Global Center on Childhood Obesity
Johns Hopkins Bloomberg School of Public Health

November 8, 2013
AICR’s 2013 Annual Research Conference on Food, Nutrition, Physical Activity and Cancer
November 7-8, 2913
Hyatt Regency Bethesda
Name of Speaker: Joel Gittelsohn

DISCLOSURE

No Relevant Financial Relationship
Topics

- Changing the Food Environment
- American Indian communities
  - Navajo Healthy Stores
- Baltimore
  - Part 1. Working with small food stores
  - Part 2. Working with prepared food sources
  - Part 3. Multi-institutional interventions
- Summary and Lessons Learned
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 refrigeration units for produce)
  - 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)
Ways to Change the Food Environment (3)

• Policy
  ▫ Setting small store criteria/standards
  ▫ 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)
Navajo Healthy Stores Goals

• To increase the access to healthy foods in local stores on the Navajo Nation

• To provide culturally appropriate nutrition education so people can make healthy choices at the POP

• To teach healthy cooking methods (skills)

• To increase purchase and consumption of foods low in fat and sugar, high in fiber, and low in sodium

• To partner with NNSDP and local stores to create a sustainable program
Intervention Approach

• Goal: Locally implemented and sustained intervention
• Implementation entirely by Navajo Special Diabetes Program staff
• Training, printing, materials, some management support provided by JHU
• Capacity-building
  ▫ Workshops (targeting interventionists, supervisors and administrators)
  ▫ Intervention development, Evaluation, Data Analysis, Grant-writing (total: 32+ hours)
Overall NHS Intervention Plan

- 6 phase intervention program
- 14 months
- Work in both large and small food stores
- Each phase focused on key foods and behaviors
- Reinforcement with in-store materials interactive sessions, and community media
Navajo Healthy Stores Materials

Interventionist MOP

Educational display

Posters

Shelf labels

Flyers, Radio Announcements, Promotional items
Evaluation

- **Process**
  - Interventionist logs
  - In-depth interviews/brief survey with key stakeholders (n=39), program documents

- **Impact (assessed pre and post)**
  - Store environment checklists
  - Store impact questionnaires
  - Consumer impact data
    - Adult impact questionnaire, Food frequency questionnaire, Intervention exposure form, BMI
Findings
<table>
<thead>
<tr>
<th>Scores</th>
<th>Change from baseline to post-intervention</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention (n=98)</td>
<td>Comparison (n=47)</td>
<td></td>
</tr>
<tr>
<td>Knowledge score, mean (SD)</td>
<td>2.25 (2.51)</td>
<td>0.99</td>
</tr>
<tr>
<td>Self-efficacy score</td>
<td>5.28 (10.79)</td>
<td>0.87</td>
</tr>
<tr>
<td>Intention score</td>
<td>2.47 (4.54)</td>
<td>0.19</td>
</tr>
<tr>
<td>Label reading score</td>
<td>0.19 (2.07)</td>
<td>0.27</td>
</tr>
<tr>
<td>Healthy cooking score</td>
<td>1.11 (3.45)</td>
<td>0.29</td>
</tr>
<tr>
<td>Healthy food getting freq</td>
<td>-5.67 (47.83)</td>
<td>0.47</td>
</tr>
<tr>
<td>Unhealthy food getting freq</td>
<td>-9.67 (18.82)</td>
<td>0.61</td>
</tr>
<tr>
<td>Perception of healthy foods score</td>
<td>1.45 (7.05)</td>
<td>0.16</td>
</tr>
<tr>
<td>Shelf label-driven healthy food purchasing score (post-inter)</td>
<td>5.08 (5.06)</td>
<td>0.57</td>
</tr>
<tr>
<td>BMI (raw score)</td>
<td>-0.55 (3.26)</td>
<td>0.06</td>
</tr>
<tr>
<td>Obese (BMI&gt;30)</td>
<td>-7.49</td>
<td>0.16</td>
</tr>
</tbody>
</table>
Table 2. Exposure to Intervention Components by Treatment Group

<table>
<thead>
<tr>
<th>Score a (mean,SD)</th>
<th>Intervention (n=98)</th>
<th>Comparison (n=47)</th>
<th>p-value b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logo score</td>
<td>0.55 (0.29)</td>
<td>0.47 (0.31)</td>
<td>0.20</td>
</tr>
<tr>
<td>Shelf label score</td>
<td>0.20 (0.18)</td>
<td>0.12 (0.14)</td>
<td>0.01</td>
</tr>
<tr>
<td>Taste test score</td>
<td>0.25 (0.29)</td>
<td>0.13 (0.21)</td>
<td>0.01</td>
</tr>
<tr>
<td>Poster score</td>
<td>0.39 (0.35)</td>
<td>0.31 (0.31)</td>
<td>0.15</td>
</tr>
<tr>
<td>Education display score</td>
<td>0.40 (0.35)</td>
<td>0.33 (0.36)</td>
<td>0.29</td>
</tr>
<tr>
<td>Flyer score</td>
<td>0.29 (0.29)</td>
<td>0.20 (0.27)</td>
<td>0.06</td>
</tr>
<tr>
<td>Giveaway score</td>
<td>0.20 (0.25)</td>
<td>0.12 (0.20)</td>
<td>0.08</td>
</tr>
<tr>
<td>Overall Exposure Score</td>
<td>2.28 (1.60)</td>
<td>1.69 (1.47)</td>
<td><strong>0.04</strong></td>
</tr>
</tbody>
</table>

a. ‘Newspaper article score’ and ‘Radio announcement score’ are not included
b. Two-tailed t test.
Table 3. Individual Impact by 4 Exposure Categories

<table>
<thead>
<tr>
<th>Exposure categories a</th>
<th>Very low (25%ile)</th>
<th>Low (50%ile)</th>
<th>Medium (75%ile)</th>
<th>High (4)</th>
<th>p-value for ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>36</td>
<td>36</td>
<td>37</td>
<td>36</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Number of intervention store visits in last 30 days (mean, SD)</td>
<td>3.69</td>
<td>6.47</td>
<td>9.43</td>
<td>11.94</td>
<td></td>
</tr>
<tr>
<td>Change in food intention score</td>
<td>0.14</td>
<td>1.43</td>
<td>3.35</td>
<td>3.32</td>
<td>0.02</td>
</tr>
<tr>
<td>Shelf label-driven healthy food purchasing score</td>
<td>0.17</td>
<td>2.06</td>
<td>7.03</td>
<td>10.33</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Change in BMI</td>
<td>-0.09</td>
<td>1.03</td>
<td>-0.00</td>
<td>-1.76</td>
<td>0.01</td>
</tr>
<tr>
<td>Change in Overweight OR obese (%)</td>
<td>0.00</td>
<td>5.79</td>
<td>5.40</td>
<td>-22.22</td>
<td>.0002</td>
</tr>
<tr>
<td>Change in Obesity (%)</td>
<td>0.00</td>
<td>1.51</td>
<td>0.00</td>
<td>-17.68</td>
<td>0.02</td>
</tr>
</tbody>
</table>
### Table 4. Impact of NHS Exposure on diet-related psychosocial factors, behaviors and BMI (Regression)

<table>
<thead>
<tr>
<th>Outcome variables&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Food intention score</th>
<th>Healthy Cooking score</th>
<th>Healthy food getting score</th>
<th>Shelf label-driven healthy food purchasing score</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ß of exposure score</td>
<td>0.59</td>
<td>0.41</td>
<td>10.22</td>
<td>2.51</td>
<td>-0.67</td>
</tr>
<tr>
<td>P-value of Exposure score</td>
<td><strong>0.02</strong></td>
<td><strong>0.02</strong></td>
<td><strong>&lt;.0001</strong></td>
<td><strong>&lt;.0001</strong></td>
<td><strong>0.002</strong></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.27</td>
<td>0.13</td>
<td>0.26</td>
<td>0.63</td>
<td>0.68</td>
</tr>
</tbody>
</table>

<sup>a</sup> Adjusted for baseline value (except for shelf label-driven healthy food purchasing score), sex, age, education level, household size, and material style of life.
NHS Summary of Findings

• No significant changes were found between intervention and comparison respondents in outcome key variables

• However, comparison respondents heavily exposed to the intervention in this community-based trial

• After adjustment, respondents who were more exposed to the intervention had significantly:
  ▫ Increased food intentions
  ▫ Healthier cooking methods
  ▫ Increased frequency of purchase of healthier foods
  ▫ Reduced BMI
Baltimore City Food Environment
Corner stores
Behind the glass
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 for planning
Increasing supply: Corner stores stock healthier foods

- **1-3 new foods per store per phase**

- Start with “low-hanging fruit”

- **Incentives/Information**
  - Stocking guidelines
  - Promotional materials to create demand
  - Incentive card to wholesaler
  - Provide small supply
Increasing Demand: Visual Materials

Have a SNACK ATTACK without the FAT!

Quench Your Thirst with Water

SAVE MONEY, DRINK WATER!

33-44 cents per quart
20 cents per quart

DID YOU KNOW?

1. Really quenches your thirst
2. Keeps up your body fluids so you perform better
3. Far cheaper and better for your health than soda

ADVANTAGES OF WATER

Water has zero calories and costs less than soda. Why not go for the water when you’re thirsty?

SAVE MONEY & CALORIES BY CHOOSING WATER!

Baltimore Healthy Stores O & A

Aren’t diet sodas only for people with diabetes or other health conditions?

No, diet sodas are for anyone who wants to consume less sugar or calories. This includes diet sodas that can include any health-conscious person.

How much sugar is in your soft drink?

Diet sodas and water are a great option. I recommend a glass of water instead.

The Baltimore City Department of Social Services can help you get food stamps, temporary cash assistance and medical care. Just call 1-800-351-6000 to find out if you qualify for your local social services center. To find your local center, call 2-1-1.

HOW MANY CALORIES ARE YOU DRINKING?

No Sugars... No Calories

1 teaspoon of sugar = 19 calories
2 teaspoons of sugar = 38 calories

9 teaspoons of sugar = 150 calories

Healthier choices: water, unsweetened tea, unsweetened coffee
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

<table>
<thead>
<tr>
<th></th>
<th>Stocking Score (range 0-10)</th>
<th>Sales Score (range 0-10)</th>
</tr>
</thead>
<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>
</tr>
</tbody>
</table>

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
Baltimore Food Policy Advisory Committee (Food PAC)

- Early 2009: Baltimore City Food Policy Task Force develops report with recommendations

- Late 2009: Holly Freishtat, MS, CN, named Baltimore City Food Policy Director

- Early 2010: Baltimore Food PAC forms, begins to implement recommendations of the task force
Plan for Baltimore Cornerstore Criteria Program

- Collaboration between Baltimore City Health Department, Food PAC, local retailers, JHU CHN

- Integrate with planned Staple Foods Program

- Primary Incentives:
  - Promotional signage for Healthy Food Options
  - New produce displays (or other small renovations)
Part 2. Changing the prepared food source environment: Baltimore Healthy Carryouts
Background: Prepared Food Consumption Patterns

- Americans spend nearly half of their food dollars eating out (USDA 2011)

- 77% of foods eaten away from home comes from fast food restaurants and carryouts (USDA 2011)

- Prepared foods are typically calorically dense and higher in fat and have been associated with increased BMI and weight gain. (Pereira et al 2005, Duffey et al 2007, Beydoun et al 2011)
Prepared Food Sources in East and West Baltimore

• A total of 144 Prepared Food Sources (PFSs) were observed 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

*Carryouts*: Food establishments selling ready-to-eat food and beverage for off-premises consumption (Zoning Code of Baltimore City. 1-123.1)
Exterior & Interior of Carryouts
Study Design: The BHC Pilot Trial

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

- Owners were reluctant/concerned about changing what they sell
- Many do not have resources to change menu boards
- Allowed us to build rapport/trust with owners
Phase 1: Modified Menu Boards & Menu Labeling

![Image of menu board]

**Healthier options were highlighted with a leaf logo**

**Healthier menu options were also promoted with photos**

---

### Carry-Out Menu

<table>
<thead>
<tr>
<th>Hot Sandwiches</th>
<th>Chicken Wings</th>
<th>Salads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheese Steak $</td>
<td>3 Wings $</td>
<td>Garden Salad $</td>
</tr>
<tr>
<td>Chicken Cheese Steak $</td>
<td>4 Wings $</td>
<td>Grilled Chicken Salad $</td>
</tr>
<tr>
<td>Mushroom Cheese Steak $</td>
<td>5 Wings $</td>
<td>Chef Salad $</td>
</tr>
<tr>
<td>Shrimp Cheese Steak $</td>
<td>6 Wings $</td>
<td></td>
</tr>
<tr>
<td>Sukiyaki $</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BLT $</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grilled Cheese $</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheese Burger $</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double Cheese Burger $</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacon Cheese Burger $</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheese Fish $</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grilled Chicken $</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lake Trout and Cheese $</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grilled Turkey and Bacon $</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cold Sandwiches

<table>
<thead>
<tr>
<th>Cold Cut $</th>
<th>Italian Cold Cut $</th>
<th>Turkey and Cheese $</th>
<th>Turkey Bacon $</th>
<th>Ham and Cheese $</th>
<th>Chicken Salad $</th>
<th>Chicken Bacon Salad $</th>
<th>Tuna Salad $</th>
<th>Turkey Club $</th>
<th>Ham Club $</th>
</tr>
</thead>
</table>

*Look for the leaf for a fresh and delicious choice!*

**Try these fresh options!**
Menu Analysis: Definition of Healthy Items

- Two Registered Dietitians reviewed the menu recipes & observed cooking methods at baseline

- Calculated total calories and fat (g) using USDA National Nutrient Database (db.nal.usda.gov)
  - Healthy Entrée: <600kcal and <20g of fat
  - Healthy Side dish: <200kcal

- Total of 47 healthy items & Total of 119 less-healthy items

- Grilled chicken sandwich (350kcal, 15g fat) vs. Four fried chicken wings (780kcal, 52g fat)
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
Evaluation Method

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

- One intervention carryout did not follow the protocol - excluded from the analysis
Aggregate Variables

Healthy Items (H_itemj)
- Low-fat sandwiches
  - Grilled chicken
  - Turkey ....
- Sides
  - Fresh fruits
  - Salads
  - Cooked greens....

Less-healthy Items (LH_itemj)
- High-fat sandwiches
  - Chicken fillet (deep-fried)
  - Cheese fish fillet
- Sides
  - French fries
  - Western fries....

※Excluded beverages because often owners did not write down beverage-only sales to the receipts
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

Different lettered superscripts indicate significant differences ($p<0.05$) across intervention phases

$H_{\text{item}}$: Healthy item sales, $LH_{\text{item}}$: Less-healthy item sales
Ratio of Total Revenue at Each Phase Relative to Baseline

![Graph showing relative ratio of total revenue across different phases with comparison and intervention markers.](image-url)
Impact of Baltimore Healthy Carryouts exposure on Purchasing Behavior (Random-effects logistic regression)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Outcome at post-intervention evaluation</th>
<th>Unadjusted</th>
<th>Adjusted$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention Exposure Score$^a$</td>
<td>Purchasing Behavior</td>
<td>4.79 (1.02)</td>
<td>4.94 (1.10)</td>
</tr>
<tr>
<td>Demographic Characteristics</td>
<td>Purchasing Behavior</td>
<td>0.69 (0.39)</td>
<td>0.66</td>
</tr>
<tr>
<td>Female</td>
<td>1.002 (0.021)</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>Age centered at 40</td>
<td>1.41 (0.93)</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>Overweight (25&lt;BMI&lt;30)</td>
<td>2.10 (1.36)</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>Obese (BMI&gt;30)</td>
<td>0.75 (0.43)</td>
<td>0.93</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least college or more</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD of the random intercept</td>
<td>0.0015</td>
<td>0.0007</td>
<td></td>
</tr>
<tr>
<td>Estimated residual ICC of the latent response</td>
<td>0.0000</td>
<td>0.0000</td>
<td></td>
</tr>
</tbody>
</table>

$^a$ Intervention exposure score is defined to account for exposure to intervention materials

$^b$ Adjusted for sex, age, BMI and education level, p ≤ 0.05
Policy linkages
Part 3. Multi-institutional Approaches
Baltimore Healthy Eating Zones Pilot

- Creation of “healthy eating zones” in and around 6 Baltimore recreation centers (with 6 comparison)
- Worked with corner stores and some carryouts
- Increasing availability of healthy foods
- Point of purchase signage
- Interactive sessions
- Peer educators
- Cooking classes for kids in recreation centers
- Recreation center staff training

Funded by RWJ HER, Round 2
Youth materials developed by Kids On The Hill
Interactive activities in recreation centers
Early findings

- Intervention youth had greater exposure to the intervention than comparison youth.

- Intervention youth significantly improved food-related outcome expectancies (p=0.02) and knowledge (p<0.001).
## Early Findings: Impact on Obesity

<table>
<thead>
<tr>
<th>Changes in obesity</th>
<th>By Direct Exposure</th>
<th>By Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Med</td>
</tr>
<tr>
<td>BMI Percentile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(entire sample)</td>
<td>-1.74</td>
<td>1.44</td>
</tr>
<tr>
<td>BMI Percentile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Baseline BMI&gt;85)</td>
<td>-1.2</td>
<td>-2.85</td>
</tr>
<tr>
<td>BMI Percentile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Baseline BMI&gt;85, Girls only)</td>
<td>-1.1</td>
<td>N/A</td>
</tr>
</tbody>
</table>
• Multi-level, multi-component obesity prevention trial

• Goal: to improve *access to* and *demand for* healthier foods in 30 low income, African American neighborhoods in Baltimore City

• Target population: youth ages 10-14 and their families
BHCK: GIS Map of Study Zones
B’more Healthy Communities for Kids: Intervention Levels

Urban Farms

Wholesalers

Baltimore Food Policies

Recreation Centers

Carryouts

Corner Stores

Families, Peers
Baltimore Food Policies

- Work with key stakeholders to support policies for a healthier food environment in Baltimore City, and to sustain BHCK activities
- Develop policy briefs and evidence-base
- Develop systems science models to aid policy makers
B’More Healthy Communities for Kids: Intervention Levels

- Urban Farms
- Wholesalers
- Recreation Centers
- Carryouts
- Corner Stores
- Families, Peers

Baltimore Food Policies
Urban Farms

- Get urban farm produce into cornerstores
- Develop marketing plan/materials for hyper-local produce in corner stores and carryouts
- Develop recipes using local produce
B’More Healthy Communities for Kids: Intervention Levels

Baltimore Food Policies

Urban Farms

Wholesalers

Recreation Centers

Carryouts

Corner Stores

Families, Peers
Wholesalers

- Increase stocks of healthy food options
- Reduced pricing of healthier foods
- Implement labeling system for “BHCK Supported Foods” at wholesale stores
- Training
B’More Healthy Communities for Kids: Intervention Levels

- Urban Farms
- Wholesalers
- Recreation Centers
- Carryouts
- Corner Stores
- Families, Peers

Baltimore Food Policies
Recreation Centers

- Youth leaders
- Nutrition education and skills using Kids Cook Monday Curriculum
- Interactive sessions, giveaways
- Posters and other visual materials
- Nutrition video series
B’More Healthy Communities for Kids: Intervention Levels

Urban Farms

Wholesalers

Baltimore Food Policies

Recreation Centers

Carryouts

Corner Stores

Families, Peers
Carryout and Corner Stores

- Increase access to healthier foods
- Increasing demand for healthier food
  - Marketing with posters, shelf talkers, and text-messages
  - Redesigning menus
  - Taste-tests & interactive sessions
- Video trainings for small food source owners
- Healthy stores certification program
B’More Healthy Communities for Kids: Intervention Levels

Urban Farms

Baltimore Food Policies

Wholesalers

Recreation Centers

Carryouts

Corner Stores

Families, Peers
Families and Peers

- Social media campaign (Text messaging)
- Posters, signage
- Interactive sessions in different community locations
Study sample

• 720 children
  ▫ 3 dietary recalls, psychosocial factors, food getting, food preparations, BMI, food source usage

• 720 adult caregivers
  ▫ Demographics, psychosocial factors, food getting, food preparation, food security, BMI, food source usage

• 3-5 small stores and carryouts per recreation center area
  ▫ Stocking and sales, psychosocial characteristics
“Testing” Policy Solutions with Agent-Based Modeling
Agent Based Modeling (ABM) to “test” policy solutions

• Purpose 1: To simulate effects of different intervention strategies
  ▫ Example. Increasing healthy foods in corner stores

• Purpose 2: To facilitate exchange of ideas
  ▫ Highly visual
  ▫ Intuitive and interactive
Model components

- Individuals: school children, ages 10-14
- Features of the Food Environment: school, rec center, corner stores, carryouts
- Activities: walking, exercise, eating
ABM Example: Simulation of District 9, Baltimore City

- Homes
- Food sources
- Frederick Ave
- W. Pratt St
- Wilkens Ave
- S Smallwood St
- CHILDREN GOING TO:
  - Home
  - Food sources
  - Samuel FB Morse School
  - Rec center
ABM for design of the BHCK intervention
ABM: internal calculation of average energy balance

Energy Balance

- energy (kcal)
- time

Snacking
Physical activity
Simulated risk for obesity (monthly average)

pre-intervention

with increased quality of food offerings at corner stores
Summary and Lessons Learned

- Programs to implement mixed environmental-behavioral change interventions have shown success in improving psychosocial factors, food-related behavior and in some instances obesity in rural and urban settings.

- Strong need to evaluate policies/programs to improve the food environment.

- Systems science modeling provides one approach to simulate program effects and engage policy-makers.
Summary and Lessons Learned

• Environmental interventions involve developing relationships with communities and many key stakeholders over time

  • Community engagement and planning

  • Multi-phase programs needed

  • Academic/university partner working with local agencies and policy makers
Summary and Lessons Learned

- Achieving adequate exposure is critical in environmental interventions
  - Many environmental interventions are not intensive
  - Need to combine strategies that work with different stakeholders simultaneously