Improving the Food Environment in Native Communities

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Topics

- Marla and Joel: Collaboration
- Food Environment in Native Communities
- Strategies for Changing the Food Environment
- Previous and ongoing work in Native communities
- Summary
Twenty years of collaboration...

- Pathways study, 1991–2000
- Navajo Healthy Stores, 2005–2011
- OPREVENT, 2010–2014
- OPREVENT2, 2015–Present
Many forms of collaboration

- Figuring out how to communicate with communities
- Presentations to communities
- Obtaining letters of support, tribal resolutions
- Navigating tribal and IHS IRBs
A Food Store–Based Environmental Intervention Is Associated with Reduced BMI and Improved Psychosocial Factors and Food-Related Behaviors on the Navajo Nation¹–³

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High levels of household food insecurity on the Navajo Nation.

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Abstract
Objective: To assess levels of and identify factors associated with food insecurity on the Navajo Nation.
Food Environment and Obesity

- Fewer supermarkets = more obesity (Morland et al 2006)

- Greater distance to grocery store = more obesity (Inagami et al 2006)

- More conveniences stores = more overweight (Morland et al 2006)

- More fast-food outlets = more obesity (Maddock, 2004; Sturm and Datar 2005)

- Disadvantaged minority populations have the least access to healthy foods
Food Environment in Native Communities

- Rural and remote communities
- Little or no public transportation
- Low access to supermarkets on reservation → food deserts
- High access to gas station stores, trading posts, fast food restaurants → food swamps

Emphasis and valuation of traditional foods
A big store does not mean only increased access to healthy foods...
Ways to Change the Food Environment (1)

- Changing access to foods **within stores** by:
  - Decreasing availability of less healthy foods
  - Increasing availability of healthy foods in small stores
  - Changing the physical location of foods within stores (store layout), renovations
  - Manipulating price

- Changing access to foods **within neighborhoods** by:
  - Building new supermarkets
  - Developing farmer’s markets
Ways to Change the Food Environment (2)

- Changing setting for provision of information (POP promotions)

- Many other ways:
  - Improving food networks (distributors, producers, retailers)
  - Improving local production
  - Increasing nutrient content of foods
  - Work with restaurants

- Influencing policy
  - Worksite policies, tribal legislation
  - Empowering community members to work with food sources
2001–2005

- Apache Healthy Stores
  - Changing the food environment
  - Partnering with communities from planning to evaluation
Apache Healthy Stores Goals

1. To implement a store-centered nutrition program on the White Mountain and San Carlos Apache reservations

2. To increase sales of healthy foods

3. To increase healthy food purchasing, preparation and diets of community members
Community Approaches Development Workshop

<table>
<thead>
<tr>
<th>Phase</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Teasers</td>
</tr>
<tr>
<td>1</td>
<td>Kickoff/Eating Healthy Snacks</td>
</tr>
<tr>
<td>2</td>
<td>Start the Day with a Healthy Breakfast</td>
</tr>
<tr>
<td>3</td>
<td>Cooking and Eating with Less Fat</td>
</tr>
<tr>
<td>4</td>
<td>Quick and Healthy Dinners</td>
</tr>
<tr>
<td>5</td>
<td>Drinking Healthy Beverages</td>
</tr>
<tr>
<td>6</td>
<td>Healthy Lunches and Snacks</td>
</tr>
</tbody>
</table>
Look for the Apache Healthy Stores logo when you shop

Starting in March...
taste test foods at this store!
Look for the Apache Healthy Stores shelf labels: Healthy Food Choice, Lower in Fat, Lower in Sugar.
Cooking Demos/Taste Tests
End-Cap Displays
Newspaper cartoons

Apache Healthy Stores
Eat Right, Be Strong, Live Long

DRAIN & RINSE GROUND MEAT

Eat Right, Be Strong, Live Long!
Culturally themed radio announcements
Evaluation

- Study Design: Quasi-experimental
  - WMAT Intervention areas: 4
  - SCAT Intervention areas: 2
  - WMAT Comparison areas: 4
  - SCAT Comparison area: 1

- Consumer Sample:
  - Main food shopper/preparer of the household
  - Baseline: 270 household respondents
  - Post-intervention: 176 of the same respondents
Apache Healthy Stores: Results

- **Process**
  - Individual: high dose
  - Store: high dose and reach, moderate fidelity
  - Community: moderate fidelity and reach

- **Exposure**
  - Intervention area respondents significantly more exposed to almost all intervention components
Impact on promoted foods: Number of times purchased in past month, n=184

* = p<0.10
** = p<0.05
Impact on diet, grams consumed/day

*Changes significant after adjustment for age, sex, education level, SES, baseline value*
Food store environmental intervention associated with modest improvements in:

- Food-related knowledge
- Healthy food purchasing
- Daily gram consumption of healthier food options
- Increased unit sales of promoted healthy food options

First food store intervention to show impact on diet
2006–2010

- Navajo Healthy Stores
  - Changing food sources in a large American Indian reservation
  - Enhancing sustainability
Healthy Stores Project
Navajo Healthy Stores Goals

- To reduce risk for obesity and other diet-related chronic disease by increasing the availability, purchase, and consumption of healthy foods on the Navajo Nation.

- To implement a self-sustained healthy food store program on the Navajo Nation in collaboration with local Navajo stakeholders and others.

- To evaluate the program’s impact on obesity and other outcomes.
Participants ranged in age from 18 to 89 years old

212 volunteers participated

Group size averaged about 15–25 persons

Provided a free meal and incentive pay (gift card) for participation

Participants: elderly, local chapter officials and staff, tribal council representatives, I.H.S. and tribal health care workers, community health representatives, grocery store staff, and others
# Navajo Healthy Stores Phases

<table>
<thead>
<tr>
<th>Ph #</th>
<th>Phase Name</th>
<th>Months</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Store recruitment</td>
<td>Nov 07 - Jan 08</td>
<td>Store recruitment</td>
</tr>
<tr>
<td>1</td>
<td>Healthy Beverage &amp; Breads</td>
<td>Feb 08 - Apr 08</td>
<td>Soda taste test</td>
</tr>
<tr>
<td>2</td>
<td>Healthy Cooking Methods; better potatoes</td>
<td>May 08 - Jun 08</td>
<td>Cooking eggs &amp; potatoes taste test</td>
</tr>
<tr>
<td>3</td>
<td>Healthier Luncheon Meats; Eat in Moderation</td>
<td>Jul 08 - Sep 08</td>
<td>Cooking with spray</td>
</tr>
<tr>
<td>4</td>
<td>Better; Healthier Meals</td>
<td>Oct 08 - Dec 08</td>
<td>Low fat meats rinse &amp; drain</td>
</tr>
<tr>
<td>5</td>
<td>Healthier Snacks &amp; Dessert</td>
<td>Jan 09 - Feb 09</td>
<td>Low fat, low salt snacks – chips</td>
</tr>
<tr>
<td>6</td>
<td>Planning Ahead; Healthy &amp; Affordable Meals</td>
<td>Mar 09 – May 09</td>
<td>Taste veggie &amp; fruit snacks, low fat dip</td>
</tr>
</tbody>
</table>
Navajo Healthy Stores

- Implemented by the Navajo Special Diabetes Program
- Training, materials, evaluation provided by the JHSPH team
- Goal: Sustainable and successful program
Working with Stores

- Encouraged to stock 3–4 healthy foods/beverages per phase (provided lists)
- Shelf labeling
- Interactive sessions in stores
Training of SDP field nutritionists
Navajo Healthy Stores Materials

- Interventionist MOP
- Educational display
- Flyers, Radio
- Announcements,
- Promotional items
- Poster
- Shelf labels
Working in the stores
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
Table 1. Psychosocial, behavioral, and anthropometric Individual Impact by Treatment Group (n=145)

<table>
<thead>
<tr>
<th>Scores</th>
<th>Change from baseline to post–intervention</th>
<th>Intervention (n=98)</th>
<th>Comparison (n=47)</th>
<th>P–value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge score, mean (SD)</td>
<td></td>
<td>2.25 (2.51)</td>
<td>2.24 (2.33)</td>
<td>0.99</td>
</tr>
<tr>
<td>Self–efficacy score</td>
<td></td>
<td>5.28 (10.79)</td>
<td>5.60 (11.19)</td>
<td>0.87</td>
</tr>
<tr>
<td>Intention score</td>
<td></td>
<td>2.47 (4.54)</td>
<td>1.27 (5.36)</td>
<td>0.19</td>
</tr>
<tr>
<td>Label reading score</td>
<td></td>
<td>0.19 (2.07)</td>
<td>0.62 (2.27)</td>
<td>0.27</td>
</tr>
<tr>
<td>Healthy cooking score</td>
<td></td>
<td>1.11 (3.45)</td>
<td>1.76 (3.19)</td>
<td>0.29</td>
</tr>
<tr>
<td>Healthy food getting freq</td>
<td></td>
<td>-5.67 (47.83)</td>
<td>-12.13 (51.60)</td>
<td>0.47</td>
</tr>
<tr>
<td>Unhealthy food getting freq</td>
<td></td>
<td>-9.67 (18.82)</td>
<td>-11.89 (25.84)</td>
<td>0.61</td>
</tr>
<tr>
<td>Perception of healthy foods score</td>
<td></td>
<td>1.45 (7.05)</td>
<td>-0.37 (6.57)</td>
<td>0.16</td>
</tr>
<tr>
<td>Shelf label–driven healthy food purchasing score</td>
<td></td>
<td>5.08 (5.06)</td>
<td>4.55 (5.50)</td>
<td>0.57</td>
</tr>
<tr>
<td>BMI (raw score)</td>
<td></td>
<td>-0.55 (3.26)</td>
<td>0.56 (3.07)</td>
<td><strong>0.06</strong></td>
</tr>
<tr>
<td>Obese (BMI&gt;30)</td>
<td></td>
<td>-7.49</td>
<td>4.35</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</td>
<td>0.40 (0.35)</td>
<td>0.33 (0.36)</td>
<td>0.29</td>
</tr>
<tr>
<td>score</td>
<td>Flyer score</td>
<td>0.29 (0.29)</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>0.20 (0.25)</td>
<td>0.12 (0.20)</td>
<td>0.08</td>
</tr>
<tr>
<td>Overall Exposure</td>
<td>2.28 (1.60)</td>
<td>1.69 (1.47)</td>
<td><strong>0.04</strong></td>
</tr>
</tbody>
</table>

a Mean scores are calculated from the sum of scores for all components, summed by treatment group.  
b Two-tailed significance testing using independent samples t test.
Table 3. Individual Impact by 4 Exposure Categories

<table>
<thead>
<tr>
<th>Exposure categories a</th>
<th>Very low (25%ile) (1)</th>
<th>Low (50%ile) (2)</th>
<th>Medium (75%ile) (3)</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>0.02</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>&lt;.0001</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>
Impact of Navajo Healthy Stores on diet-related psychosocial factors, behaviors and BMI

<table>
<thead>
<tr>
<th>Outcome variables a</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>β 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>

a. Adjusted for baseline value (except for shelf label-driven healthy food purchasing score), sex, age, education level, household size, and material style of life.
Conclusions

Healthy stores program on the Navajo Nation was:

- Successfully implemented by SDP staff with JHSPH support
- Associated with improved BMI, psychosocial factors and behaviors among those who were most exposed to the program
2009–2014

- OPREVENT
- Enhanced, multi-institutional program
Goal: To develop an effective obesity prevention program operating at multiple community institutions
OPREVENT stands for Obesity Prevention Research and Evaluation of InterVention Effectiveness in NaTive North Americans

OPREVENT was a program that combines communications, family, food store and worksite components for obesity and diabetes prevention for American Indian communities.
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
Keweenaw Bay Indian Community

Hannahville Indian Community
Community Workshops
Phases

Phase 1: May – June 2012
Phase 2: July – Sept. 2012
Phase 4: Jan – March 2013
Phase 5/6: April – May 2013

- Choose Wisely
- Set a Goal, Make a Plan
- One Step at a Time
- Make it Count, Make it Last
- Live Life in a Good Way & Celebrating the New You!
Posters

**Follow the 10% Rule!**

- Less than 10% Daily Value: Fat, Sodium
- Less than 10 Grams of Sugar
- More than 10% Daily Value: Fiber, Vitamins

**Nutrition Facts**
- Serving Size: 1 oz.
- Calories: 110
- Calories from Fat: 10
- % Daily Value:
  - Total Fat: 3g (2%)
  - Saturated Fat: 0g (0%)
  - Trans Fat: 0g
  - Cholesterol: 0mg (0%)
  - Sodium: 200mg (8%)
  - Total Carbohydrate: 24g (8%)
  - Sugars: 3g
  - Protein: 3g
  - Vitamin C: 0%
  - Fiber: 3%
  - Thiamin: 0%
  - Riboflavin: 0%
  - *Percent Daily Values are based on a 2,000 calorie diet.*

**Putting Portions into Perspective**

- **What's Served**
  - **Healthier Choice**
  - **Pay Attention to Portion Sizes**
  - **Living Life in a Good Way!**

**Make It Count!**

- Champion your future!
- Eat Healthy & Be Active Daily

**Make It Last!**

- Make healthy choices every day
- Make a plan
- Cook meals in advance
- Freeze meals for later

**Self**

- tart now, make it count, make it last
- engage your family, coworkers & community
- live Life in a Good Way
- focus on fitness – aim for 5 times a week

**Respect**

- reap the rewards of a healthier you
- at Healthy – remember the 10% rule
- et Smaller, Achievable Goals
- lan ahead and prosper
- exercise daily
- hoose Wisely
- ell yourself YOU CAN

**Make a Plan**

- Cook Double meals and freeze for later
Cooking Demos / Taste Tests
School/Family Component

- Centered around 2nd – 6th grade curriculum
- Focus on family habits:
  - Healthy food shopping/preparation
  - Healthy eating habits
  - Physical activity
  - Silversmith storybook
  - Activities and games
  - Exercise breaks and physical activity

Family packs w/ activities to take the messages home
words more loudly and more slowly, like she wanted them to remember them. “People were healthy.”

“Wait. Aunt Gladys, what do you mean? That everyone walked the good path?” asked Sally.

“We respected all the things around us. We lived life in a good way,” said Grandpa Hastin Chee. “In the old days, food was precious. Each person ate just the right amount. We didn’t eat so much that we’d feel too full.” He puffed up his cheeks and pushed out his stomach like a squirrel with too many nuts in his mouth and a full belly. Sally giggled.

“The foods were healthy, too. We drank lots of water, not soda. We helped our parents and grandparents work the land. We learned how to plant foods, take care of animals and haul water. We worked hard.”

Grandma agreed, “Yes, living in a good way, walking the good path, we helped one another, chose water to drink, and ate fresh vegetables that grew from our fields.”

Aunt Gladys spoke up, “Dad, tell them the story about healthy recipes from the harvest!”

“All right,” Grandpa Hastin answered. “But, let us wait for Naniboo. She should be here soon. But, children, when I start, pay close attention. There are important lessons to hear!” Grandpa winked.
Worksites
The “Big Idea”

- Reinforcing programs that happen at the same time

Example.
- Children learn about healthy snacks (school 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)
- All family members hear messages (community media)
### Table 1: Average OPREVENT interventionists contacts in stores, worksites, and schools per phase

<table>
<thead>
<tr>
<th></th>
<th>No. of visits</th>
<th>No. of brief participants (≤1 min.)</th>
<th>No. of long participants (&gt;1 min.)</th>
<th>No. of food samples given</th>
<th>No. of flyers given</th>
<th>No. of giveaways passed out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean/phase</td>
<td>162.8</td>
<td>522.8</td>
<td>955.4</td>
<td>477.2</td>
<td>1148.6</td>
<td>1004.4</td>
</tr>
</tbody>
</table>
OPREVENTI Preliminary Results: Impact

- No impact on BMI, weight for intervention vs comparison
  - When analyzed by sex, BMI of men showed a trend towards significance – reduction of 1.5 points ($p=0.076$)

- Reduction in WC for intervention versus comparison communities ($p<0.05$)
  - Participants in intervention communities showing greater reductions (-20.5 ± 27.7 cm in intervention vs. -12.5 ± 22.0 cm in comparison)
OPREVENT1 Results: WC Impact

- WC change was strongly associated with decreases in % body fat ($p=0.001$)

- Those highly exposed to the intervention showed a 16.6 cm greater decrease in WC compared to those with low exposure ($p=0.0009$)
OPREVENT1 Results: Impact

- No impact on physical activity
- Further impact analyses support positive trends ($p=0.10$) in improvement of knowledge, self-efficacy and intentions comparing pre and post data
- Dietary analyses underway
Some Lessons Learned

- Expensive: More stakeholders = more time and more costs
- Sustainability is a major issue – no single entity can take this on
- Need to increase intensity
- Need to focus more on physical activity
- Need to work at the tribal policy level
2015–Onwards

- OPREVENT2
  - Refine and repeat school, food store, worksite and community media interventions in 6 new AI communities in New Mexico and Wisconsin
  - New Features: Policy, Social Media
  - Enhance: PA component
  - Working with tribal policy makers to support, develop, implement and enforce policy at the tribal and institutional levels
Variation from community to community

Possibilities:

◦ Capacity-building workshops for local policy makers
◦ Training local stakeholders to implement OP2 program components
◦ Institutionalization
◦ Identification of policy champions
◦ Use of simulation modeling as a tool to engage and work with policy makers
Community Member, Teacher and Policymaker Workshops are underway...
Shelf Label S3-1 Reactions

Sample Comments from Participants:

• Good idea, I think this idea really works for me when I’m at grocery store. I believe it helps draw your eye to better "healthier" products
• yes! But maybe a re-design
• I really like the idea of the labels/ also the colors make it pop so I’d most likely be one to stop and look
• I think should be a wheat character instead of a heart guy
Logo L3 Reactions

Comments from Participants:

• Change colors, soften feathers
• Clustered. Colors hard to see. Feathers are bent?
• Jicarilla are basket makers need to show traditional basket. Like family is doing something together
• Medicine wheel, 4 quarters needed, bolder colors- red not orange
Summary

- Multiple challenges to working in the Native American food environment

- Multi-level, multi-component interventions needed in these settings

- Interventions to improve the food environment have been successful in improving access and consumption of healthy foods, and reduced obesity

- Community engagement, at multiple levels has been key, and needs to be expanded
Summary

- We need to be flexible and work with various institutions and media (including social media)

- To enhance sustainability, we need to work with policymakers
Thank you, any questions?

- www.healthystores.org

- Twitter, Instagram, Facebook: OPREVENT, globalfoodman