Generating Rural Options for Weight-Healthy Kids & Communities (GROW HKC)

Presented by:
Patrick Abi Nader, MS and Jenny Jackson, MS, RD
May 10, 2013

Research supported by the National Research Initiative of the USDA National Institute of Food and Agriculture, grant 2011-68001-30020.
Discussion Roadmap

- GROW HKC project overview
- Nutrition and Physical Activity Environments
  - School-level
  - Family-level
- Discussion
Combined Prevalence of Overweight and Obesity among Children and Adolescents Aged 6 to 19 Years

Ogden et al., JAMA, January 2010
Barriers to Obesity Prevention

• Achieving energy balance is an individual level expectation with multi-level level challenges.

• Individual, family, community level factors impact our health behaviors.
GROW HKC Theoretical Framework

Healthy, Active Rural People and Places

- Individual
- Families and Social Networks
- Organized Groups
- Community Policies and Practices
- Regional, State, and Federal Rules and Policies

Coalition Building
Community Participatory Research, Education, and Mobilization
Planning & Advocacy

Multi-Level, Multi-Sector Social Ecological Model

Attributes of People
Attributes of Place

Adapted from Maibach et al, APHA Annual Meeting 2007
Over 30% of US children are overweight and nearly 16% of them are obese.
While Oregon’s rates may be slightly lower (24.3%), we still fall far short of the federal 5% childhood obesity goal.
The prevalence of childhood overweight and obesity is higher among children living in rural areas (36% vs. 30%).

Rural and remote communities face unique social and structural challenges that can have an impact on healthful eating and physical activity different from those found in urban places.
GROW HKC Specific Aims

<table>
<thead>
<tr>
<th>Aim One</th>
<th>Aim Two</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To explore and model</strong> the <em>rural obesogenic environment</em>.</td>
<td><strong>To plan, implement, and evaluate</strong> a multi-level intervention.</td>
</tr>
<tr>
<td><strong>Settings:</strong> Rural communities in OR, WA, CO, NM, NV, AZ</td>
<td><strong>Settings:</strong> rural <em>home, school,</em> and <em>community in 3 OR Counties</em></td>
</tr>
<tr>
<td><strong>Approach:</strong> Extension ‘Train-the-Trainers’ using CBPR</td>
<td><strong>Approach:</strong> Bring energy equation into balance using CBPR and evidence-informed activities</td>
</tr>
<tr>
<td><strong>Mechanism:</strong> HEAL MAPPS</td>
<td><strong>Mechanism:</strong> Change the food and PA behavioral environments</td>
</tr>
<tr>
<td><strong>Deliverable:</strong> Interactive database, analysis and application tools</td>
<td><strong>Deliverable:</strong> Improved BMI among rural children aged 5-8 years old</td>
</tr>
</tbody>
</table>
GROW HKC Oregon Counties
All communities are low income
- defined by elementary schools with > 50% of student population eligible for free/reduced meals

Intervention efforts directed toward:
- Community, School, Family Home
Framework for Action: Health Impact Pyramid

- Child & Family Direct Education Delivery
- Family Home, School, Community
  - Situational, Physical, Policy Environment

Socioeconomic Factors

- Clinical Interventions
- Long-lasting protective interventions
- Changing H, S, C, Environments to Optimize Defaults
- Direct Education
<table>
<thead>
<tr>
<th>Intervention Level/Setting</th>
<th>Baseline Assessments, Buy-In, &amp; Build Capacity</th>
<th>Sep 2013-Aug 2015 Multi-level/sector Implementation</th>
<th>Sep 2015-Aug 2016 Post Assessments; Stabilize &amp; Sustain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child &amp; Family</td>
<td>Recruit</td>
<td>BMI; PA; Diet</td>
<td>BMI; PA, Diet</td>
</tr>
<tr>
<td>Family Home</td>
<td>FNPA/Family SOC; Engagement; Info Campaign</td>
<td>FNPA/FSOC Family home NPA context changes</td>
<td>FNPA/FSOC GROW HKH evidence-based program disseminated</td>
</tr>
<tr>
<td>School</td>
<td>SNPA; BMI, coalition; develop work plan; GROW HKC events</td>
<td>SNPA (mentored self-audit); School NPA contextual changes</td>
<td>SNPA GROW HKS evidence-based program disseminated</td>
</tr>
<tr>
<td>Community</td>
<td>HEAL MAPPS; coalition; develop work plan; SM campaign</td>
<td>Community NPA contextual changes</td>
<td>HEAL MAPPS GROW HKC evidence-based program disseminated</td>
</tr>
</tbody>
</table>
School Environment

- School Nutrition and Physical Activity Assessment of the Environment (SNPA)
- Whole School BMI
  - Gender
  - Grade
Baseline Prevalence of Overweight and Obesity by Gender (n=1737)

- Overweight or obese (≥ 85th %ile):
  - Boys: 36%
  - Girls: 34%

- Obese (≥ 95th %ile):
  - Boys: 19%
  - Girls: 17%
Proportion of Obese Children by Grade – All Schools

<table>
<thead>
<tr>
<th>Grade:</th>
<th>K</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Assessed</td>
<td>276</td>
<td>287</td>
<td>324</td>
<td>284</td>
<td>322</td>
<td>244</td>
</tr>
<tr>
<td>Mean BMI Percentile</td>
<td>65.7</td>
<td>67.5</td>
<td>69.3</td>
<td>65.7</td>
<td>69.2</td>
<td>69.7</td>
</tr>
<tr>
<td>p-value $^{1,2}$</td>
<td>-</td>
<td>0.216</td>
<td>0.047</td>
<td>0.489</td>
<td>0.057</td>
<td>0.048</td>
</tr>
<tr>
<td>Proportion Overweight / Obe</td>
<td>0.31</td>
<td>0.30</td>
<td>0.35</td>
<td>0.33</td>
<td>0.39</td>
<td>0.41</td>
</tr>
<tr>
<td>p-value $^{1,2}$</td>
<td>-</td>
<td>0.415</td>
<td>0.145</td>
<td>0.280</td>
<td>0.020</td>
<td>0.008</td>
</tr>
<tr>
<td>Proportion Obese</td>
<td>0.13</td>
<td>0.16</td>
<td>0.16</td>
<td>0.19</td>
<td>0.22</td>
<td>0.23</td>
</tr>
<tr>
<td>p-value $^{1,2}$</td>
<td>-</td>
<td>0.158</td>
<td>0.150</td>
<td>0.027</td>
<td>0.002</td>
<td>0.002</td>
</tr>
</tbody>
</table>

$^{1}$ All p-values were calculated using Kindergarten as the reference group.
School Nutrition and Physical Activity Assessment (SNPA)

- **Background**
  - Assess change in the school environment
  - Develop measure

- **Theoretical Framework**
  - Stage of Community Readiness/Stage of Change

- **Policy**
- **Situation**
- **Environment**

No progress or backing up occasionally is not unusual

[Diagram showing stages of Community Readiness: Not Ready Yet, Thinking about it, Preparing for Action, Taking Action, Maintaining a Good Thing for Life]
Purpose of the SNPA

1) **Assess** school resources and readiness to implement environmentally-focused interventions

2) **Plan and implement** partnerships and programs to change school contexts

3) **Evaluate** effectiveness of school-level program and policy efforts to increase resources and readiness to support school nutrition and physical activity behaviors
SNPA Overview

- **Physical Activity (N=16)**
  - Indoor PA/Active Play Space
  - Fixed Outdoor Features/Space
  - Shelter & Shade Structures
  - Surface and Surface Markings
  - Neighborhood Features
  - Portable Equipment
  - PA & Wellness Policy
  - Structured Physical Education

- **Nutrition (N=11)**
  - Safe & Adequate Meal Service Area
  - School Meals
  - Healthy Food & Beverage Practices
  - Promoting Water Consumption
  - Nutrition & Wellness Policy
  - Health & Nutrition Education

Each item is scored and the tool provides a baseline measure that is sensitive to change. The SNPA also works as an intervention strategy identifying areas of “opportunity” to improve the SNPA environment.
### Data Sources, Informants, and Criteria

#### Category: Policy Environment

**Area of Interest 16: Structured Physical Education**

<table>
<thead>
<tr>
<th>Required Data Sources:</th>
<th><strong>Time</strong></th>
<th><strong>Informant:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Observation</td>
<td>10:30 AM/PM</td>
<td>PE Teacher</td>
</tr>
<tr>
<td>Interview</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Document Review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other, please specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PE Teacher**

**Description:**
The school has a structured physical education/physical activity program that is coordinated and/or instructed by trained/credentialed physical educator(s).

**Criteria:**

- **A** – The school has a trained/credentialed Physical Education Teacher.
- **B** – Students participate in a minimum of 150 minutes of structured physical activity education per week.
- **C** – Physical education instruction is based on a written and sequential physical activity education curriculum that is consistent with state/national standards for physical education (see appendix).

Assess & mark all criteria using [-] for does not meet, [■] for meets, and [+], for exceeds the standard.
Scoring the Areas of Interest

Criteria:
Neighborhood features include the following:

- Safe roadways with sidewalks, bicycle lanes, and clearly marked crosswalks
- Traffic calming features such as speed humps, chicanes, and curb extensions
- Signage that supports safe, active transport to and from school
- Bicycle storage racks
- Pathways to playgrounds and athletic facilities that avoid vehicular traffic

Next, use the scale to assign a level of implementation and readiness score. Each level is grounded by a description of the strength (quantity and quality) of criteria supported by data sources (observation, interview, document review). The scale description elaborates each level providing a numerical range for meeting criteria as well as a description explaining how and why the level is determined. In other words, when assigning a score for the Area of Interest, consider both the quantity and quality of how the criteria are met. Mark your response in the corresponding box after reviewing the scale descriptions.

<table>
<thead>
<tr>
<th>Level One</th>
<th>Level Two</th>
<th>Level Three</th>
<th>Level Four</th>
<th>Level Five</th>
</tr>
</thead>
<tbody>
<tr>
<td>No/very few criteria met</td>
<td>Some criteria met</td>
<td>At least half of criteria met</td>
<td>Most to all of criteria met</td>
<td>All and more criteria met</td>
</tr>
</tbody>
</table>
SNPA School Report can be leveraged to:

- secure grant funding
- document school-level changes resulting from national, state, and/or district policies
- evaluate school wellness, health and performance factors & practices

---

**Wellness Success**

**Physical Activity**
- Physical Environment
  - School playgrounds meet or exceed recommended safety standards for design, installation, and maintenance.
- Situational Environment
  - Twenty minutes of recess is offered each day.
- Policy Environment
  - The school grounds are open to students, their families, and the community for access to physical activity.

**Nutrition**
- Physical Environment
  - The school provides students with a clean, safe, and pleasant cafeteria.
- Situational Environment
  - Nutritious breakfast and lunch programs are provided and are fully accessible to all students.
- Policy Environment
  - Drinking water is available to students free of charge at all times during the school day.

---

**Opportunities for Improvement**

**Physical Activity**
- Investigate options for dividing the cafeteria during lunch time so that any unused space can be utilized for recess/physical activity.
- Provide opportunities to participate in physical activity breaks in addition to recess on a daily basis.
- Consider creating a wellness subcommittee for physical activity.

**Nutrition**
- Enhance the cafeteria with decorative elements or objects that add visual and/or auditory interest and appeal.
- Ensure all classrooms consistently arrive at the cafeteria in time for students to enjoy the full 20 minute lunch period.
- Create a policy on using food as a reward, reinforcement, or punishment for students.
GROW HKC Schools - Baseline
SNPA, Nutrition, and Physical Activity Scores

Schools by County

<table>
<thead>
<tr>
<th>Clackamas</th>
<th>Columbia</th>
<th>Klamath</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clackamas River</td>
<td>Molalla</td>
<td>Hudson Park</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clatskanie</td>
</tr>
<tr>
<td>Chiloquin</td>
<td>Bonanza</td>
<td></td>
</tr>
</tbody>
</table>

SNPA Score

- SNPA
- Physical Activity
- Nutrition
GROW HKC Schools - Baseline Nutrition Environments

Schools by County

Clackamas

Columbia

Klamath

Clackamas River

Molalla

Hudson Park

Clatskanie

Chiloquin

Bonanza

Physical Environment

Situational Environment

Policy Environment

SNPA Score
GROW HKC Schools - Baseline
Physical Activity Environments

SNPA Score

- Physical Environment
- Situational Environment
- Policy Environment

Clackamas River | Molalla | Hudson Park | Clatskanie | Chiloquin | Bonanza

Clackamas | Columbia | Klamath

School by County
Family Home Environment

- Family Stage of Change (FSOC)
- Family Nutrition and Physical Activity Assessment (FNPA)
- Family PA
  - Accelerometers
- Family Diet
  - Recall and/or home audit
Family Stage of Change (FSOC)

Based on:

- Family Nutrition and Physical Activity survey (FNPA)\(^1\)
- Transtheoretical model of change\(^2\)
- Most importantly the need:
  1. To improve our understanding of the change process at the family level
  2. To identify the appropriate resources to provide support for the families in their health behaviors

1- Ihmels et al., 2009
2- Prochaska, 1984
### FNPA

**Already validated measure (Ihmels et al., 2009)**

**Used to predict obesogenic environment**

**It is a useful tool to measure home policies around 10 domains**

**Table 1 Ten Family Nutrition and Physical Activity domains**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Description of questions from the FNPA screening tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast and family meal</td>
<td>Does the child eat breakfast and does the family eat a meal together?</td>
</tr>
<tr>
<td>Modeling of nutrition</td>
<td>Does the family watch TV while eating and do they eat fast food during the week?</td>
</tr>
<tr>
<td>Nutrient dense foods</td>
<td>Does the family eat prepackaged food or do they use fresh foods and fruits and vegetables?</td>
</tr>
<tr>
<td>High calorie beverages</td>
<td>Does the family drink soda and Kool-Aid or 100% fruit juices and low fat milk?</td>
</tr>
<tr>
<td>Restriction and reward</td>
<td>Does the family use food as a reward and do they restrict unhealthy foods?</td>
</tr>
<tr>
<td>Parent modeling physical activity</td>
<td>Do the parents participate in physical activity and does the family participate or play together?</td>
</tr>
<tr>
<td>Child’s physical activity</td>
<td>Does the child participate in physical activity and organized sports?</td>
</tr>
<tr>
<td>Screen time</td>
<td>How many hours of screen time does the child get?</td>
</tr>
<tr>
<td>TV in bedroom</td>
<td>Does the child have a TV in his bedroom and do the parents monitor the screen time?</td>
</tr>
<tr>
<td>Sleep and schedule</td>
<td>How many hours does the child sleep and is there a bedtime routine?</td>
</tr>
</tbody>
</table>
Transtheoretical Model of change (TTM)

This model enables us to characterize the stage of change.
**Family Stage of Change (FSOC)**

**Tadaaaaaaaaaaaa**

**Statement 1:** We eat meals as a family together.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Almost always</th>
<th>Always</th>
</tr>
</thead>
</table>

- Does your family **plan to eat more meals** together?
  - Yes □
  - No □

- Does your family **plan to eat more meals** together in the **next 6 months**?
  - Yes □
  - No □

- Has your family been eating **most or all meals** together as a family for **at least 6 months**?
  - Yes □
  - No □

- Check how many meals you eat together in an **average week**.
  - 0 meals □
  - 1-5 meals □
  - 6-10 meals □
  - 11-15 meals □
  - 16 or more meals □
  - I Don’t Know □
FSOC Validity Study

• First round of Data collection
  – 121 responses
  – Correlations between FSOC and similar FNPA items. Ranged from (ranged from 0.41 to 0.78)

• Only one item was below 0.51. This item was adjusted
What’s happening now?

• School environment
  – SNPA pilot test, fall 2012
  – SNPA in GROW HKC schools, spring 2013
  – Child BMI measurement, fall 2012 and spring 2013

• Family environment
  – Family recruitment, spring 2013
  – 2nd phase of the validity study:
    • English and Spanish versions of the survey are being pilot tested.

Generating Rural Options for Weight (GROW) Healthy Kids and Communities is a 5-year, multi-level research project that seeks to inspire children, families, schools, and communities to create opportunities to eat healthfully and be physically active most every day.

Our overarching goal is to prevent overweight and obesity in rural children. GROW Healthy Kids and Communities uses evidence-based research, community-engagement methods and tools, and innovative technology to explore the obesogenic rural environment and develop strategies that families and communities can use to lead a healthy lifestyle.

http://extension.oregonstate.edu/growhkc/
Next Steps

• Fall Data Collection
  – Child BMI
  – Family and child PA
  – Family and child Diet
  – FNPA/FSOC

• Fall Intervention Activities
  – PA Tool Kits
  – Play facilitators
  – Other?
  – School-level strategies will emerge from SNPA data
  – Family-level strategies will emerge from FNPA/FSOC data

Balanced Energy Physical Activity Toolkit
Grow HKC Research Team

• Principal Researchers
  – Deborah John, PhD
  – Kathy Gunter, PhD

• Co-Researchers
  – Melinda Manore, PhD, RD
  – Gail Langellatto, PhD
  – Lena Etuk, MS

• Research Assistants
  – Patrick Abi Nader, Alinna Ghavami, John Hicks, Jenny Jackson, Brendan Klein

• State and County Partners
Questions and Discussion