



Generating Rural Options for Weight (GROW) Healthy Kids and Communities

Deborah H. John, PhD* and Katherine Gunter, PhD, Project Directors

Lena Etuk, MS, Gail Langellotto, PhD, and Melinda Manore, PhD, Co-Project Directors

The goal of the GROW Healthy Kids and Communities is to prevent obesity in rural children.



College of Public Health and Human Sciences

Extension Family and Community Health

AIM OVERVIEW

AIM ONE

To explore and model the rural obesogenic environment in Oregon and five Western states (WA, NV, NM, ID, and CO) and inform eXtension Communities of Practice.

Objective 1: Create a community-informed profile of the rural environment that models attributes that support (make easier) or hinder (make harder) habitual healthful eating and physical activity among children and families.

Objective 2: Develop an interactive, virtual learning application to inform, educate, and support public and private sector practitioners, educators, and policy makers with rural obesity prevention efforts.

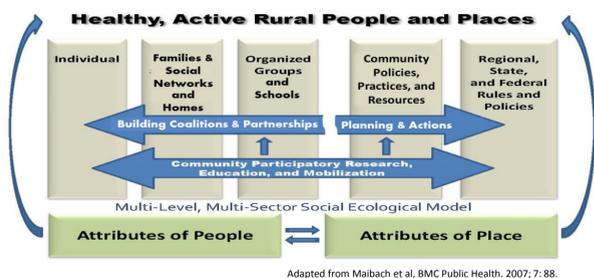
AIM TWO

To plan, implement, and evaluate a multi-level intervention in Oregon targeting home, school, and community behavioral settings to promote healthful eating and increase physical activity, and thus improve body mass index among rural elementary school-age children.

Objective 3: Evaluate the impact of a comprehensive multi-level intervention to promote healthful eating and increase physical activity on overweight and obesity (change in BMI) among rural kindergarten through 5th grade children.

Objective 4: Evaluate the effects of intervention strategies on changes in home, school, and community nutrition and physical activity environments.

FRAMEWORK



Target Audiences

- Rural children (ages 5-8 years when enrolled), enrolled in SNAP-Ed eligible public schools grades K-5 and their adult caregivers
- Family caregivers and homes
- School administrators, educators, and staff and schools
- Rural community people and geographic place

AIM ONE

WESTERN REGION LEVEL

Research Design

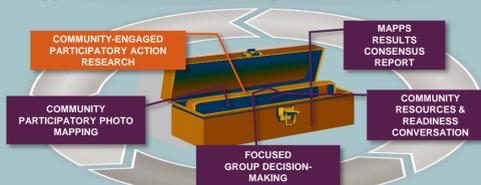
Participatory research approach employing qualitative nested community case (n=4) study design in Western region states (n=6)



HEAL MAPPS™

Healthy Eating Active Living

Mapping Attributes using Participatory Photographic Surveys



HEAL MAPPS™ is a mechanism to Mobilize rural people and Assess perceptions of resources and readiness to change the context of rural place to prevent overweight and obesity among children and families using community-engaged participatory research methods.

HEAL MAPPS™ Outputs

Table 1. HEAL MAPPS™ Mobilization and Assessments to Date

State	Communities (n)	Participants (n)	Mapped Routes (n)	Photographed Attributes (n)	Disseminated Reports (n)
OR	6	228	54	690	6
WA	4	149	49	625	4
NV	4	118	44	460	4
NM	1	13	13	87	1
CO	1	19	8	80	1
ID	*	*	*	*	*

Since the project began, more than 16 HEAL MAPPS™ programs have resulted in significant community mobilization and assessment outputs (Table 1). Project specific HEAL MAPPS™ events sparked non-project specific ancillary collaborations and leveraged additional funding this year, totaling over \$124,000, to increase local availability and improve access to healthy food and activity environmental resources. Additional project specific and ancillary HEAL MAPPS™ programs are scheduled in 2014 (Table 2).

Table 2. HEAL MAPPS™ Completed & Planned Trainings & Mapping Events

State	Trainings	HEAL MAPPS™ 2012-2014	HEAL MAPPS™ 2014-2015
Oregon	Aug, 2012	6	TBD*
Washington	Nov, 2012	6	2
Nevada	Nov, 2012	4	-
New Mexico	Nov, 2013	1	3
Idaho	April, 2014	*	3
Colorado	Nov, 2013	1	3

*TBD = To Be Determined. Each state partner is required to complete the HEAL MAPPS process in a minimum of two rural communities by project end. Oregon will repeat HEAL MAPPS beginning in 2015 to meet Aim 2 environmental assessment protocol.

Plan for HEAL MAPPS™ Data Analysis

Observational, survey, and narrative data collected during HEAL MAPPS assessments from all six states (OR, WA, NV, NM, ID, CO) will be analyzed using a constant comparative method at each conceptual level of influence and triangulated across multiple data sources.

AIM TWO

COMMUNITY LEVEL

Research Design

Six rural (population < 10,000) communities in three Oregon counties were randomized within county to condition.

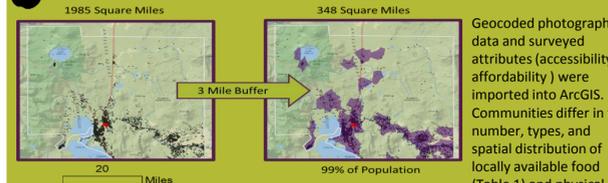


Assessments and Results

Rural Community Food and Physical Activity Environment Audit using GIS

- Beginning summer 2013, communities began using the R-CFPA Environmental Audit tool to assess the actual (vs. perceived) rural community food & physical activity resources.
- Audit is ground-truthed using camera-enabled GPS to quantify and qualify elements of resource availability and accessibility. Data will be used to influence and document changes over time.
- Surveys of the locally available food and physical activity resources were conducted by community-based researchers and residents trained to use GPS cameras.

Network Buffer Example



Local availability was defined as the "network buffer" encompassing 95% of the households spatially distributed in and around the community geographic center. Geocoded photographic data and surveyed attributes (accessibility, affordability) were imported into ArcGIS. Communities differ in the number, types, and spatial distribution of locally available food (Table 1) and physical activity (Table 2) resources. The most noteworthy variability in the rural food environment was the number and location of fast food and convenience store resources. The most remote communities (Bonanza, Chiloquin) had the fewest food resources. Most had seasonal only access to local produce and all but one had some type of food assistance.

Table 1. Local Food Resources

Community	Fast Food	Convenience Stores	Grocery	Local Food & Agriculture*	Food Assistance*	Cafe/Deli/Restaurant	SNAP Retailers
Bonanza	0	2	1	6	2	3	2
Chiloquin	0	7	3	2	2	4	1
Clatskanie	2	4	1	9	1	11	3
Estacada	5	5	3	10	3	15	2
Molalla	13	10	2	13	0	15	10
Rainier	3	3	1	8	1	11	2

*Local Food and Agriculture includes farmers markets, farm stands or U-pick operations, home based retailers selling things like eggs and veggies *Food assistance includes food banks and pantries, community meals, and summer or free lunch programs.

Table 2. Local Physical Activity Resources

Community	City or Neighborhood Parks	County/State Parks	Playgrounds (Includes @ Schools)	Other Physical Activity*	School Physical Activity	Total Physical Activity Resources	% Indoor	% W/Fee
Bonanza	1	0	3	13	2	19	0	11
Chiloquin	1	8	5	13	4	31	6	13
Clatskanie	2	2	6	20	9	37	5	11
Estacada	1	3	8	16	7	28	7	18
Molalla	6	3	10	19	7	35	17	37
Rainier	1	3	5	15	6	25	8	16

*Other PA includes things like, trails on private forest land, beaches or waterways, recreation and exercise centers etc.

AIM TWO

SCHOOL LEVEL

Research Design

One elementary school from each participating rural community (N=6 schools) serves as the focal point for school-level assessments and intervention activities. Data are collected annually to assess changes.

Assessments and Results

School Environmental Assessments

The School Physical Activity and Nutrition Environment Tool (SPAN-ET) was used to quantify the quality of school Physical Activity (PA) and Nutrition contexts in 27 Areas of Interest (AOI) across three environmental categories: Physical, Situational, and Policy. AOI criteria were measured as met or not to calculate practice ratings. The practice score is expressed as the percentage of measurement criteria that were observed as met.

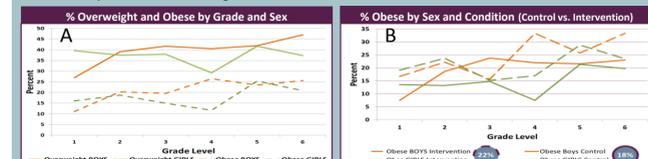
SPAN-ET Scoring Scale

Practice Rating	Criteria Met (%)	Criteria Met (n)
Poor Practice	≤ 25%	0
Fair Practice	26% ≤ 50%	3
Good Practice	51% ≤ 75%	3
Best Practice	76% ≤ 100%	0

- GROW team members and school stakeholders did assessments together, to ensure the process is sustainable when the grant ends.
- In 2013, SPAN-ET overall scores reflected Fair (n=3) to Good Practice (n=3) among GROW schools. Each school received a report outlining strengths and opportunities for improvement, and a resource guide with suggested strategies to achieve best practice.
- SPAN-ET was repeated in January – March, 2014; change will be evaluated over time.

Height and Weight Assessments

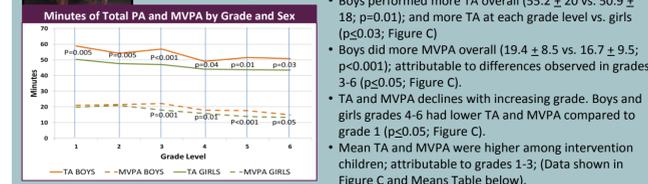
We measured 1870 K-6 grade elementary students from participating GROW schools during the 2013-2014 school year. Grades 1 through 6 are shown.



- Combined prevalence of overweight & obesity (Figure A) was similar for boys and girls (p>0.05).
- 4th grade girls had lower obesity (11% vs. 26%; p=0.002) and overweight (29% vs. 40%; p=0.05) compared to 4th grade boys (Figure A).
- Prevalence of overweight and obesity among girls was more stable while boys had higher rates as grade level increased compared to 1st graders (p<0.03) (Figure B).
- Overall, children in our intervention schools had higher prevalence of obesity (22% vs. 18%; p=0.02). Closer inspection of the data revealed this effect was attributable to differences observed among 4th graders only (P=0.05) (Figure B).

Physical Activity Assessments

Physical activity (PA) data were collected in all six schools on 1,555 children. Children wore Walk4Life MVP pedometers on 4 consecutive school days from first to last bell. Data were averaged across the 4-days to examine Total Activity (TA; total minutes of light, moderate and vigorous PA) and MVPA (total minutes above 120 steps/minute).



Comparison of Mean TA and MVPA by Condition

Condition	Mean Moderate and Vigorous Activity (MVPA; minutes (sd))	Total Physical Activity (TA; minutes (sd))
SNAP-Ed (Control) Schools	17.1 (11.7)	77.1 (17.7)
GROW (Intervention) Schools	22.2 (12.2)	82.2 (18.2)

*Other PA includes things like, trails on private forest land, beaches or waterways, recreation and exercise centers etc.

AIM TWO

FAMILY LEVEL

Research Design

The focal point for family recruitment efforts is the school setting. To date, 239 children and 165 families have enrolled in the study.

To enroll families must sign up at least one but not more than two parents or guardians, and at least 1 child in grades K-6 per family.

GROW HKC Family and Child Enrollment Data

Enrollment Counts	Children	Families
County 1	95	62
Control	52	38
Intervention	43	24
County 2	129	93
Control	64	46
Intervention	65	47
County 3	15	10
Control	9	1
Intervention	12	9
Study Totals		
Overall	239	165
Control Communities	119	85
Intervention Communities	120	80

Assessments and Results

Family Nutrition and Physical Activity Practices, Rules, and Readiness

All enrolled families complete the Family Nutrition and Physical Activity Screening Tool (FNPA) and the Family Stage of Change (FSOC) readiness assessments. The FNPA measures family and child rules and habitual practices shown to predict child BMI.

FNPA: Item scores range from 1-4 and measure family-level nutrition and activity practices that predict child BMI. Higher scores reflect healthier habits. Comparative analyses were conducted on mean domain scores (FNPA Table below).

Comparison of Mean FNPA Domain Scores at Baseline by Condition

FNPA Variables	SNAP-Ed (Control)	GROW (Intervention)	P-Value
Total Summary Score (20 items)	57.0 (22.3)	60.2 (20.3)	NA
Total Mean Score	3.28 (0.39)	3.35 (0.31)	0.18
Nutrition Domain Summary Score (10 items)	33.0 (3.87)	33.8 (2.90)	NA
Nutrition Domain Mean Score	3.30 (0.39)	3.38 (0.30)	0.13
Physical Activity Domain Summary Score (5 items)	16.0 (3.20)	16.2 (3.34)	NA
Physical Activity Domain Mean Score	3.21 (0.65)	3.24 (0.67)	0.74
Screen Time Domain Summary Score (3 items)	9.1 (2.39)	9.29 (1.92)	NA
Screen Time Domain Mean Score	3.03 (0.80)	3.11 (0.64)	0.57
Sleep Domain Summary Score (2 items)	7.4 (0.90)	7.62 (0.84)	NA
Sleep Domain Mean Score	3.7 (0.45)	3.81 (0.44)	0.10

- In general, item scores ranged between 3-4 indicating that families are reporting home environments that support obesity-preventing practices and policies. Items scoring lowest include:
 - "My child drinks low-fat milk at meals or snacks" (2.67 ± 1.1)
 - "My child spends <2 hours on TV/games/computers each day" (2.81 ± 1.1)
 - "My child is enrolled in sports or activities with a coach or leader" (2.63 ± 1.3)

FSOC: The FSOC measures, at the unit of family, readiness to change family practices and policies related to child obesity risk. Scores align with the Transtheoretical Model Stages of Change: 1=precontemplation; 2=contemplation; 3=preparation; 4=action; 5=maintenance. Comparative analyses were conducted on mean stage of change domain scores (FSOC Table below).

Comparison of Mean FSOC Domain Scores at Baseline by Condition

FSOC Variables	SNAP-Ed (Control)	GROW (Intervention)	P-Value
Total Summary Score (12 items)	47.1 (8.5)	49.0 (7.8)	NA
Total Mean Score	4.0 (0.64)	4.2 (0.54)	0.15
Nutrition Domain Summary Score (6 items)	22.4 (5.1)	23.9 (4.6)	NA
Nutrition Domain Mean Score	3.81 (0.72)	4.01 (0.64)	0.04*
Physical Activity Domain Summary Score (3 items)	12.8 (2.76)	13.03 (2.81)	NA
Physical Activity Domain Mean Score	4.34 (0.89)	4.39 (0.90)	0.79
Screen Time Domain Summary Score (3 items)	7.48 (2.68)	7.48 (2.58)	NA
Screen Time Domain Mean Score	3.78 (1.34)	3.88 (1.25)	0.68
Sleep Domain Summary Score (3 items)	4.78 (0.83)	4.87 (0.50)	NA
Sleep Domain Mean Score	4.78 (0.83)	4.87 (0.50)	0.52

- Control families have a lower stage of readiness compared intervention families relative to the FSOC Nutrition Domain. Follow-up item by item comparisons reveal the use of microwaveable foods (p=0.05) and using candy as a reward (p=0.01) are behaviors control families are more challenged to habitually do in a way that supports obesity-prevention.

SUMMARY to DATE

- Family-level data suggest rural families may benefit from intervention strategies directed toward low-fat milk consumption, decreasing screen time, and environmental actions that enable greater participation in organized sports or physical activities.
- Child BMI and PA data suggest that the prevalence of overweight and obesity is high among rural children and that children spend less than 5% of their school day engaged in physical activity of sufficient intensity to positively impact health.

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