



# Discussion Roadmap

- Obesity as a public health problem
- Factors influencing overweight and obesity among children and adults
- Community-based research to gather practice-based evidence
- GROW HKC: a multi-level model of obesity prevention



# Session Objectives

- Participants will be able to:
  - **Identify** multi-level factors that contribute to obesity and impede progress in obesity prevention
  - **Communicate** the importance of coordinated, multi-faceted approaches to obesity prevention
  - **Learn** about a regional multi-level project to prevent obesity among rural children and families



# OBESITY: COMPLEX BUT CONQUERABLE

THE UNITED STATES FACES AN ALARMING OBESITY PROBLEM. WE ARE QUICK TO BLAME INDIVIDUALS FOR EATING TOO MUCH OR EXERCISING TOO LITTLE, BUT IN TRUTH, THE CAUSES ARE MORE COMPLEX AND INVOLVE MANY FACTORS.

## THE Vicious Cycle

1 OUT OF 3 CHILDREN ARE OVERWEIGHT OR OBESE.



2 OUT OF 3 ADULTS ARE OVERWEIGHT.



More than the U.S. Department of Defense's total budget in 2013...

37% OF ADULTS ARE PREDIABETIC.

8% OF ADULTS HAVE TYPE 2 DIABETES.

3% OF ADULTS THAT HAVE TYPE 2 DIABETES ARE UNDIAGNOSED



OTHER HEALTH PROBLEMS:

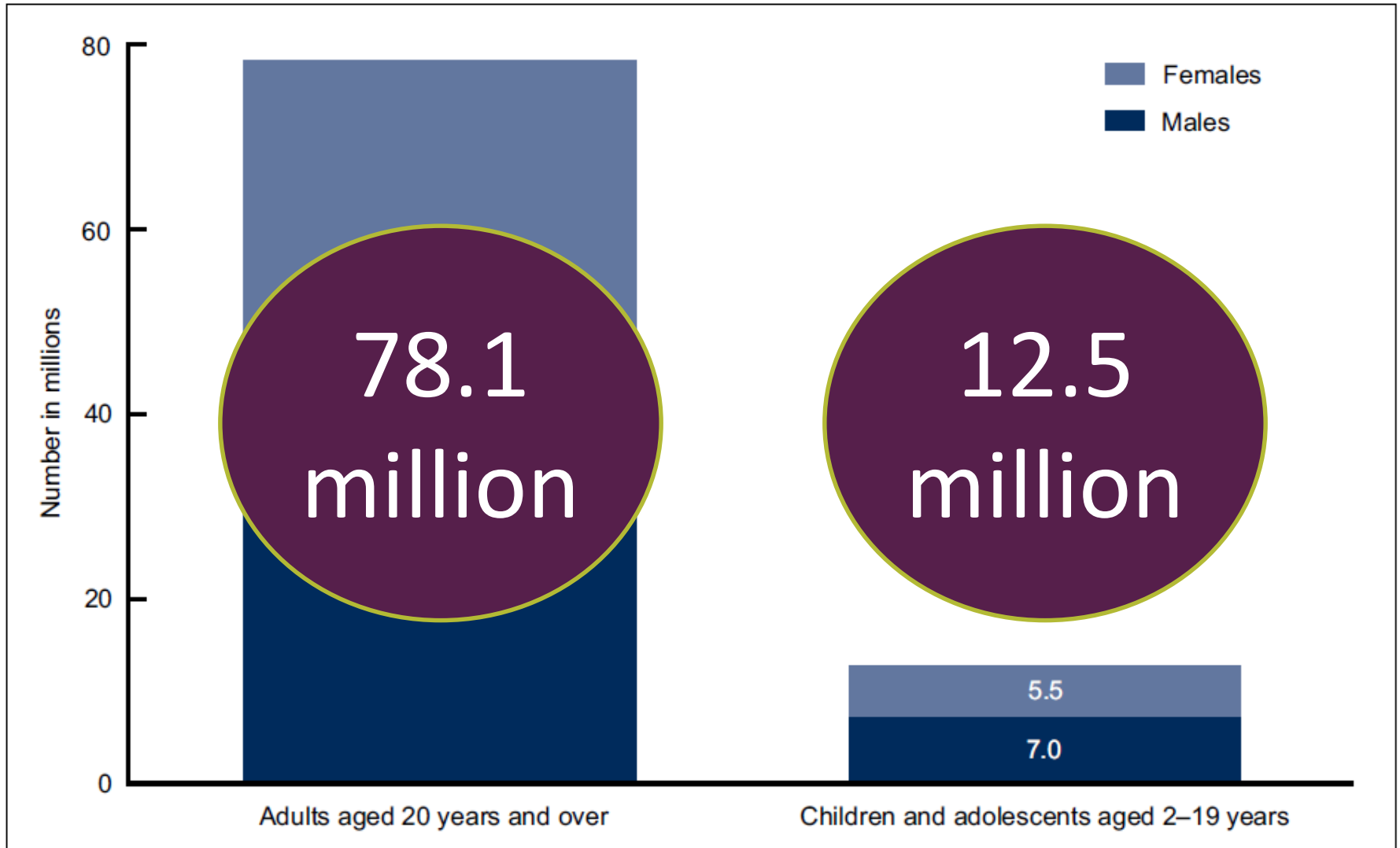
HEART DISEASE  
CORONARY ARTERY DISEASE  
TYPE 2 DIABETES  
HIGH BLOOD PRESSURE  
SLEEP APNEA  
DEPRESSION



# Overweight and Obesity Definitions

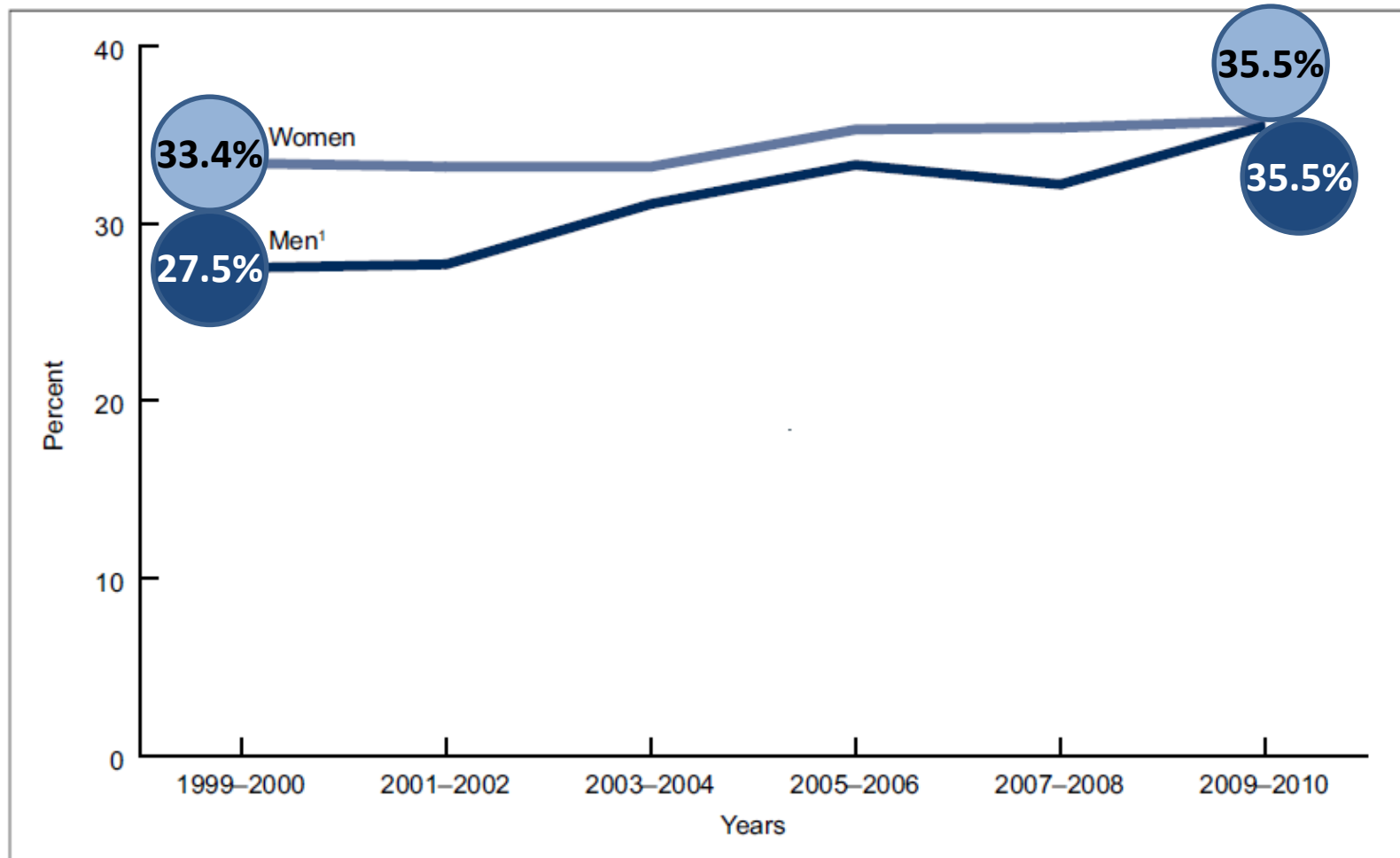
- Adults, 20 years and older
  - Overweight = Body Mass Index (BMI) 25-29.9 kg/m<sup>2</sup>
  - Obese (Grade 1) = BMI  $\geq$  30 kg/m<sup>2</sup> < 35 kg/m<sup>2</sup>
  - Obese (Grade 2) = BMI  $\geq$  35 kg/m<sup>2</sup> < 40 kg/m<sup>2</sup>
  - Obese (Grade 3) = BMI  $\geq$  40 kg/m<sup>2</sup>
- Children and adolescents, 2-19 years
  - Overweight = BMI- for-age  $\geq$  85<sup>th</sup> < 95<sup>th</sup> percentile
  - Obese = BMI- for-age  $\geq$  95<sup>th</sup> percentile

# Latest Numbers of Obese Americans



# Latest Adult Obesity Trend Data

## *Ages 20 and over*

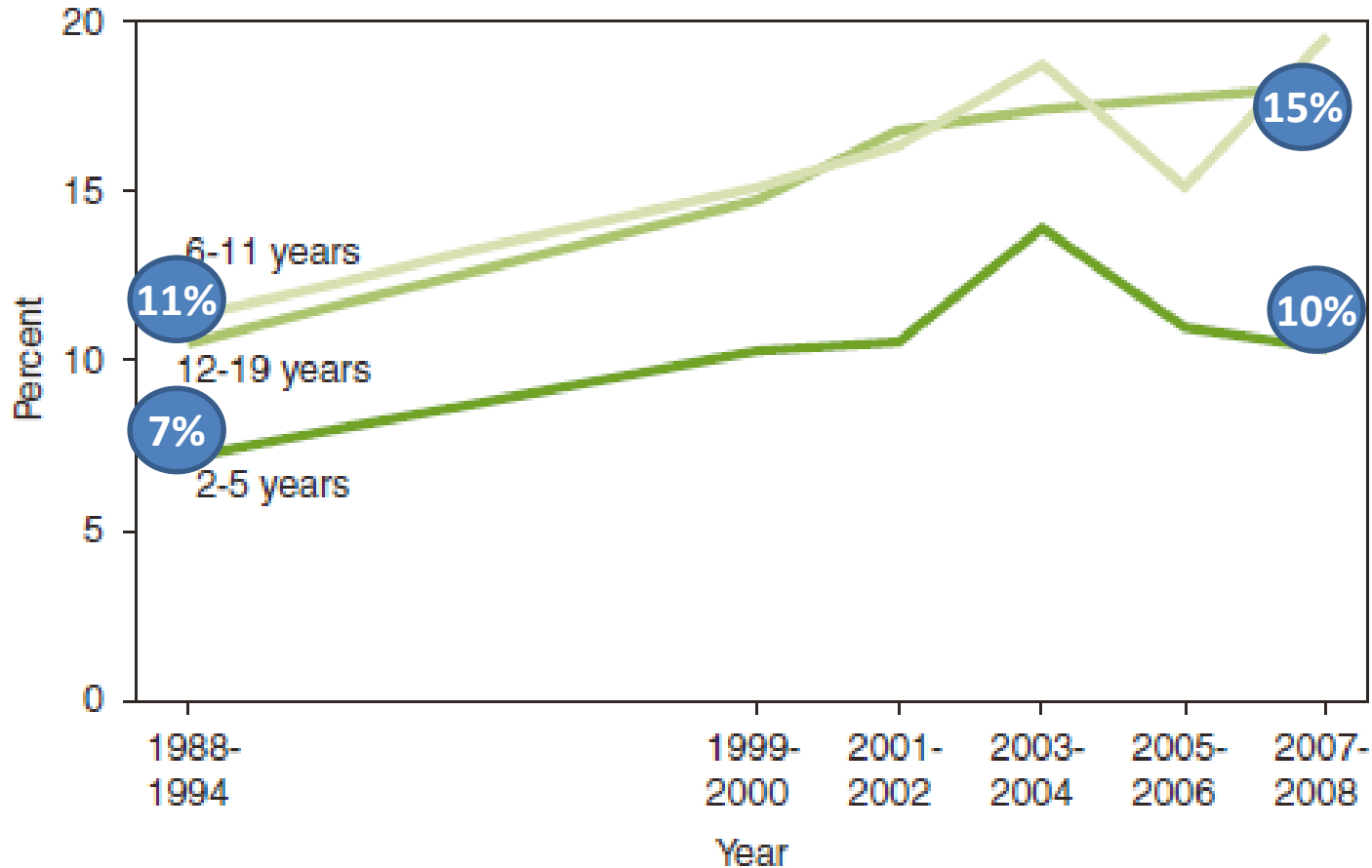


<sup>1</sup>Significant increasing linear trend 1999-2000 to 2009-2010 ( $p < 0.0001$ ).

NOTE: Estimates were age adjusted by the direct method to the 2000 U.S. Census population using the age groups 20-39, 40-59, and 60 and over.

SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009-2010.

# Obesity Trends Among U.S. Children



**FIGURE 2-2** Obesity among U.S. children and adolescents by age, 1988-1994 through 2007-2008. SOURCE: NCHS, 2011.



# Factors Influencing Obesity Prevalence

International Factors

National/Regional Factors

Community Factors

Local Environment Factors

Individual Factors

Population Weight

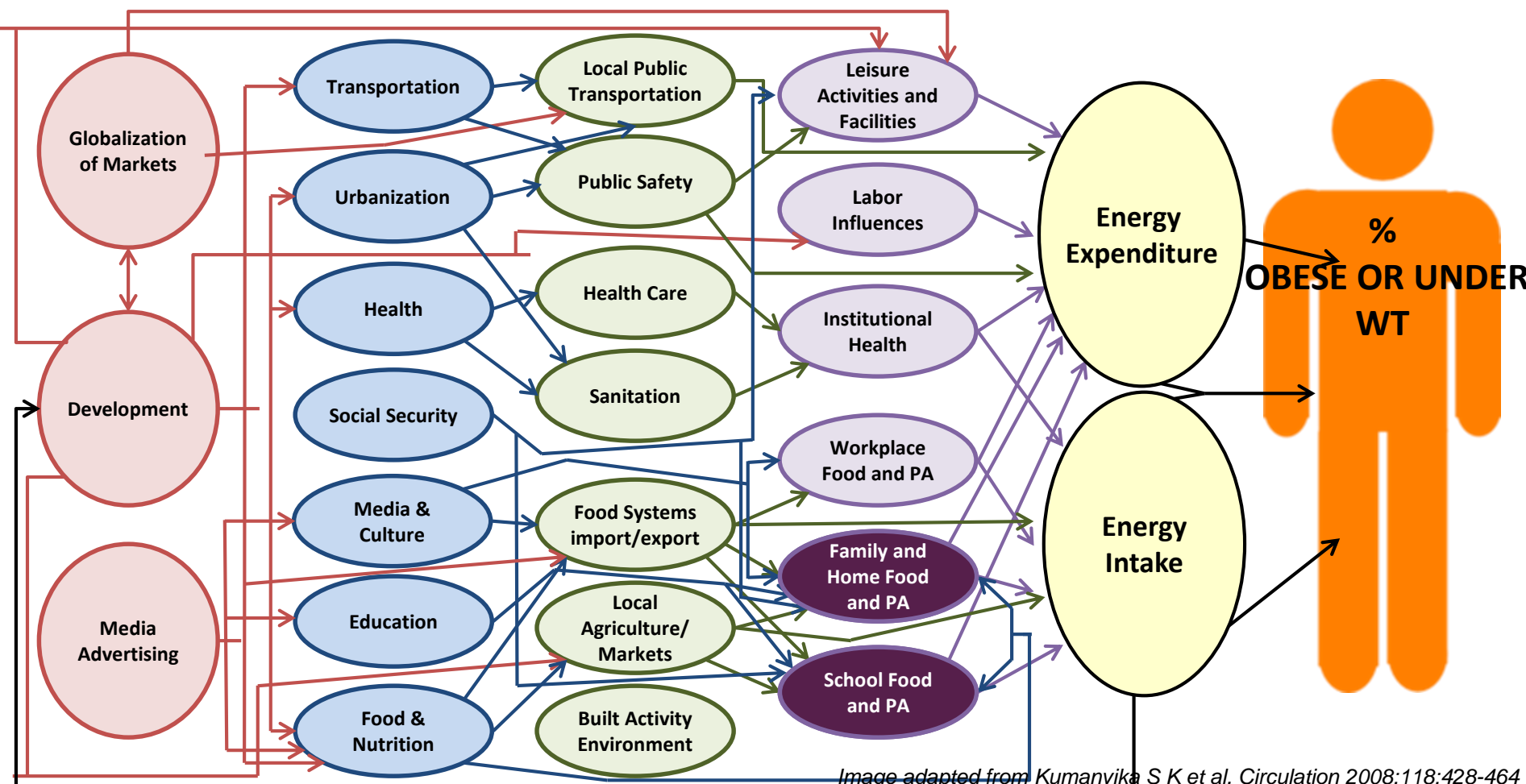


Image adapted from Kumanyika S K et al. Circulation 2008;118:428-464

# 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.

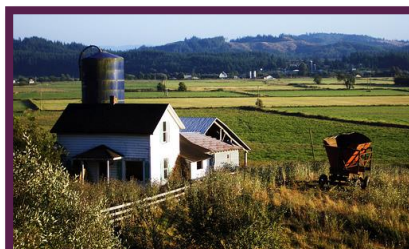


# Relevance of generating rural options for weight healthy kids...

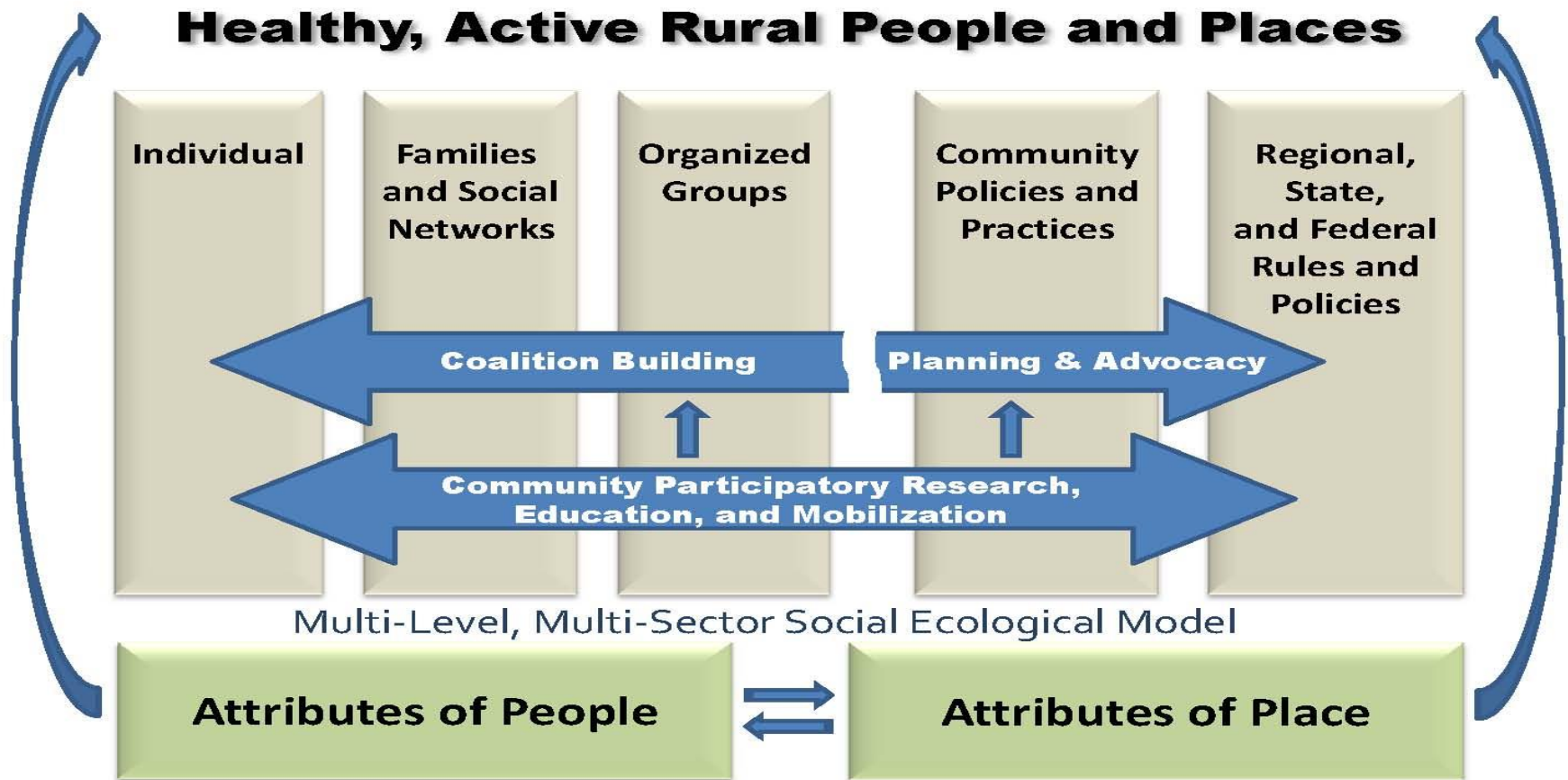
- The prevalence of childhood overweight and obesity is higher among children living in rural areas (36% vs. 30%)
- Most evidence-based practice and obesity preventing programs were developed and tested in more urban environments

# Relevance of generating rural options for weight healthy communities...

- Rural 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 Theoretical Framework



Adapted from Maibach et al, APHA Annual Meeting 2007

# GROW HKC Specific Aims

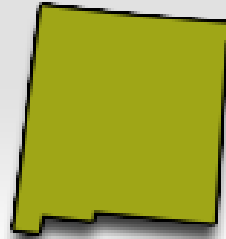
Arizona



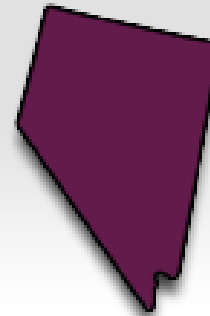
Colorado



New Mexico



Nevada



Washington



- Our **first aim** is to understand the rural obesogenic environment.
- OSU is partnering with Extension Services in six Western States to engage rural people in community-based participatory research

Oregon





# Community-Level Data

- Resident driven understanding of the attributes of the community relative to HE and PA
  - HEAL MAPPS
- Community Readiness
  - HEAL MAPPS
- Objective measure of existing resources
  - Community Audit



Healthy Eating Active Living  
Mapping Attributes using Participatory Photographic Surveys

# HEAL MAPPS TOOLS

COMMUNITY  
ENGAGED  
ACTION  
RESEARCH

MAPPS  
RESULTS  
CONSENSUS  
REPORT

COMMUNITY  
PARTICIPATORY  
PHOTO  
MAPPING

COMMUNITY  
MOTIVATIONAL  
CONVERSATION

FOCUSED  
GROUP  
DECISION-MAKING



# HEAL MAPPS mobilizes local residents to...

- Assess environmental features  
of the rural community that make easier or harder eating healthfully and being physically active
- Address people's different perceptions  
of their local community features as supports or barriers to healthy behaviors
- Identify environmental factors  
that affect rural residents', particularly children and families, ability to meet guidelines for healthy nutrition and physical activity behaviors
- Present findings and plan actions



# Mapping Attributes using Camera Enabled GPS Units



Community members are provided MAPPS equipment and trained to use tools to map features of their community



On their own or with a partner, they photograph (and map) their direct experiences with the food and physical activity environment in the community



They record their experiences of the community features along their route on their route journal.

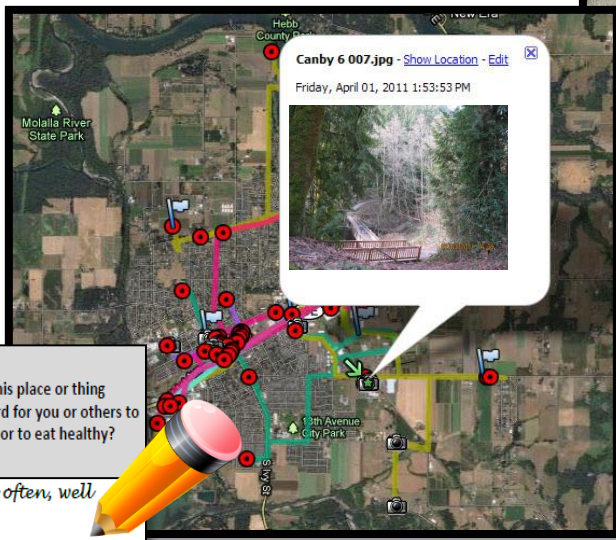
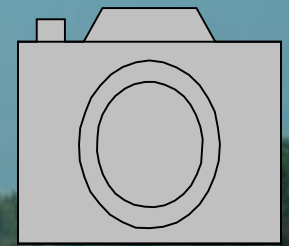


Photo #	Picture of?	This is a photo of a place or thing that makes it... (check all that apply):				Why do you think this place or thing makes it easy or hard for you or others to be physically active or to eat healthy?
		Easy for you or others to be physically active	Hard for you or others to be physically active	Easy for you or others to eat healthy	Hard for you or others to eat healthy	
2.	Trail	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>I use this trail often, well maintained.</i>

A lot of kids have long bus rides to school...when they arrive they sit in the class all day



# HEAL MAPPS Routes

...tell a story of how people intersect with the food and physical activity features of their rural place



Route Key

Red = Walk

Green = Bike

Orange = Auto

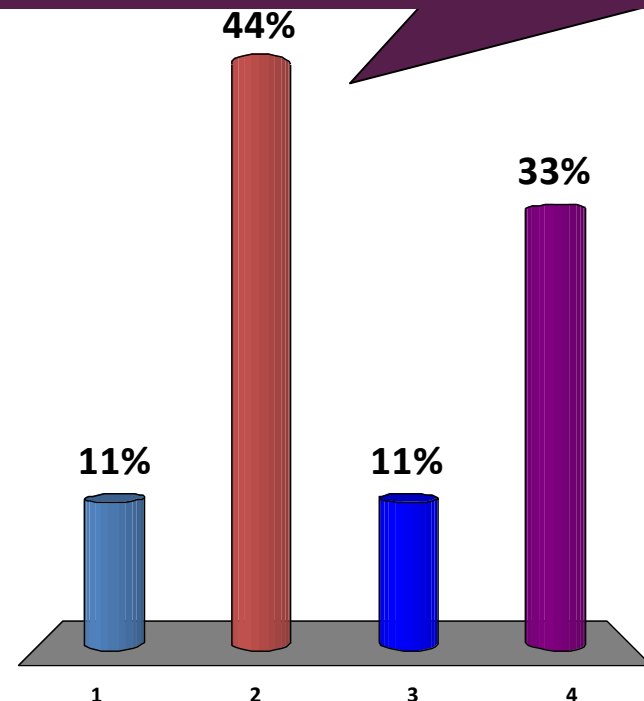
# Community Conversation:

How knowledgeable are the people in your community about the link between the community environment and obesity?



Most kids have a 30-40 minute commute then right into the classroom; rural schools and shortened school days make it harder for kids and families to promote healthy lifestyles; I wish my kids could bike to school and home; by the time the kids get home, my youngest is starving with lunch at 10:45

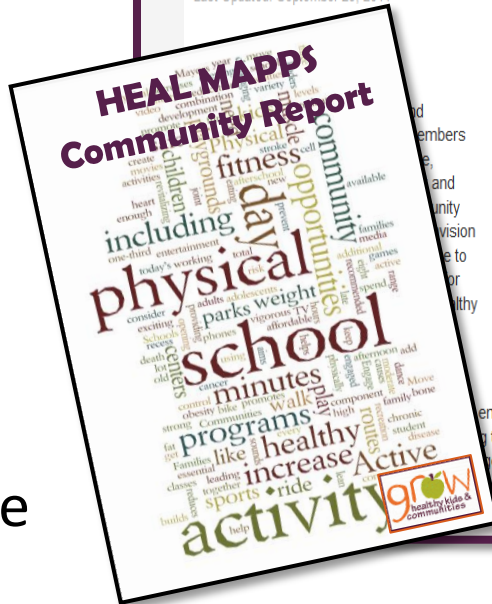
- 1) Easy for you or others to be **physically active**
- 2) Hard for you or others to be **physically active**
- 3) Easy for you or others to **eat healthy**
- 4) Hard for you or others to **eat healthy**



# HEAL MAPPS

## Data and Reports...

- Data analyzed at local level are provided to participating communities as HEAL MAPPS Community Report
- Community data are aggregated at the state-level and analyzed to inform a model of rural obesity prevention



The screenshot shows the Oregon State University extension website. The header includes the OSU logo and the text 'Local Extension offices near you Learn more about this institution'. Below the header is a navigation menu with links for Home, About, Resource Areas, News, Articles, Answers, Calendar, and Learning Lessons. The main content area is titled 'About Creating Healthy Communities' and includes a 'Have a question?' section, a 'Print' button, and a 'Share / Save' button. A sidebar on the right contains a 'Resource Area Feeds' section and an 'In This Resource Area' section. The bottom of the page features a logo for 'Creating Healthy Communities' and a paragraph of text.

*HEAL MAPPS helps us help communities to Generate Rural Options for Weight-HEALTHY KIDS!*

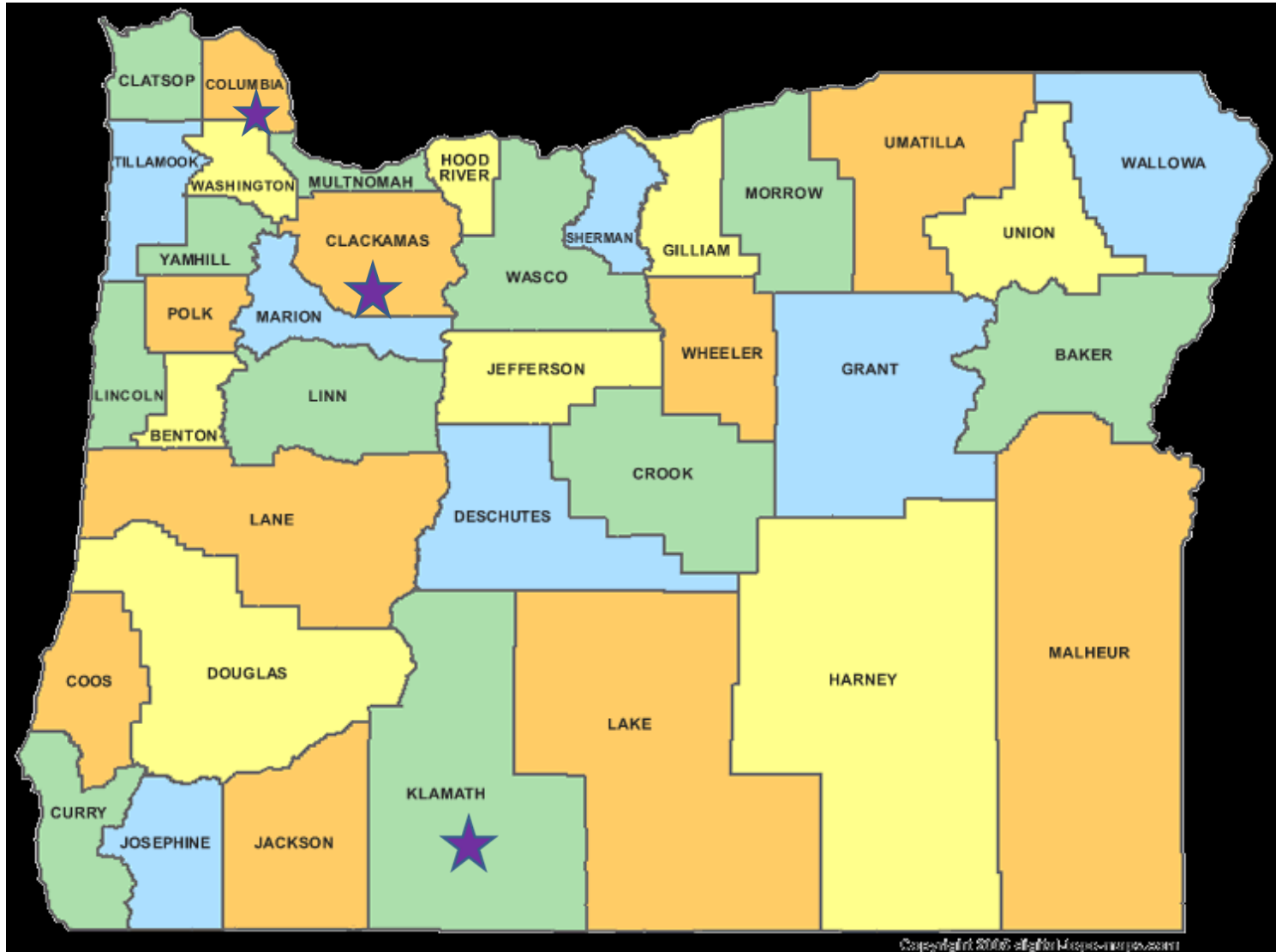


# GROW HKC Specific Aims



- Our **second aim** is to plan, implement, and evaluate a multi-level intervention targeting rural home, school, and community behavioral settings to promote HE and increase PA, and thus improve weight status among rural children.

# GROW HKC Oregon Counties





# Intervention Design

Condition

Columbia

Clackamas

Klamath

Control

R





Intervention



- 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

# It takes a village to change behavior....

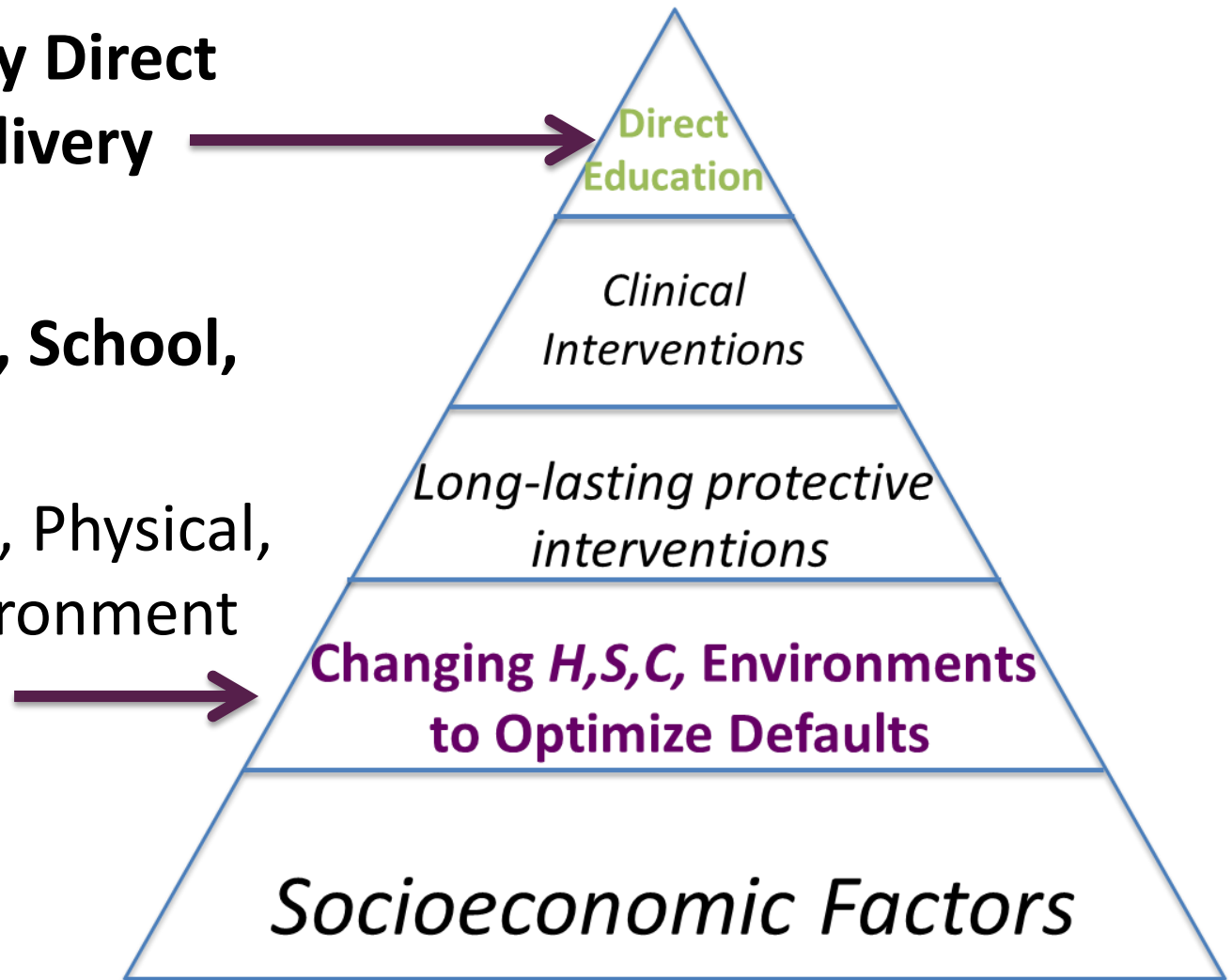


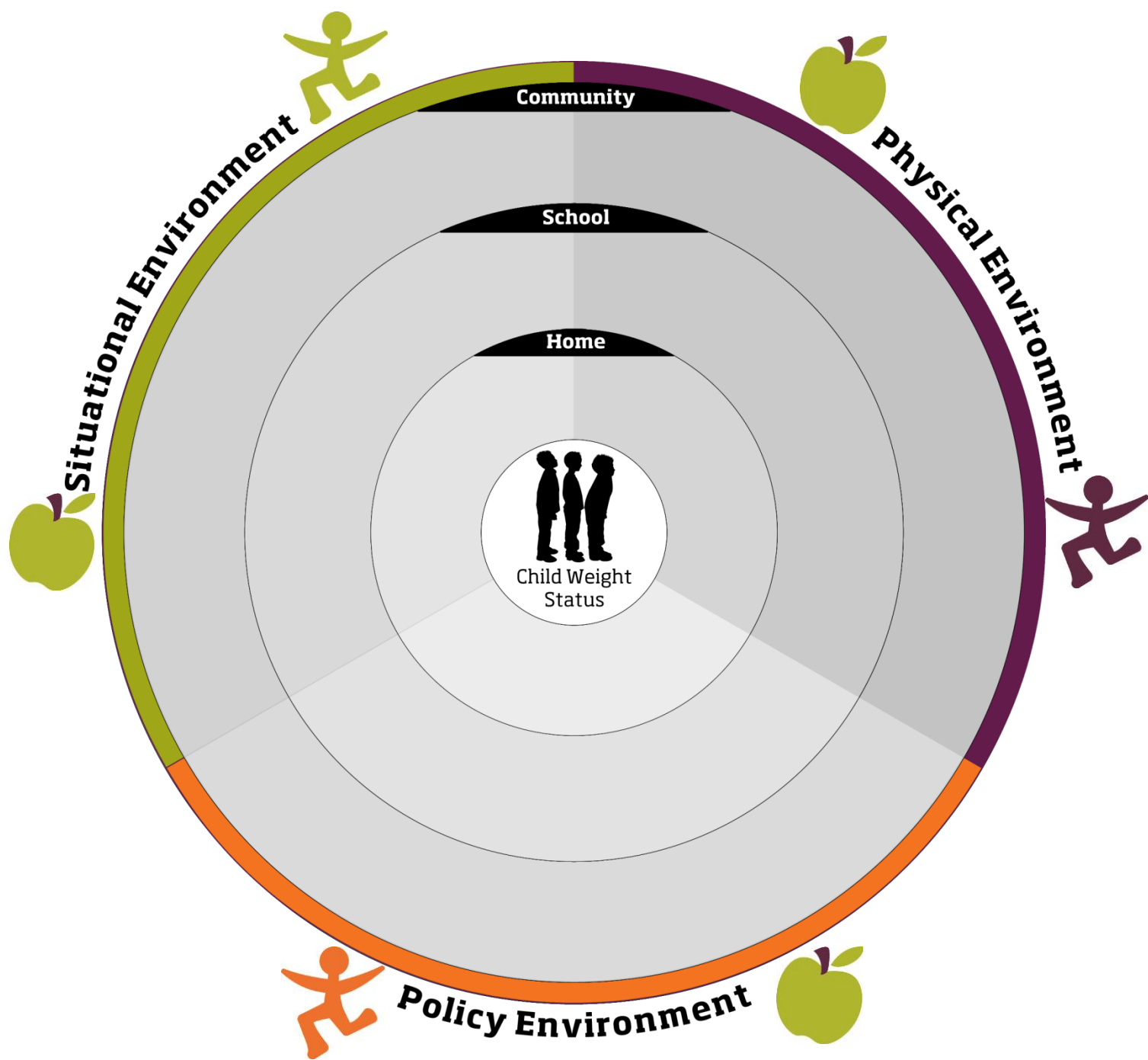
- **Promoting PA** 
- **Promoting HE** 
- **Sectors of Influence**
  - Community
    - Private
    - Public
  - Schools
  - Family Homes

Positive efforts in one environment (e.g. schools) can be undone if other environments (home) do not **promote opportunities** for PA or HE or **demonstrate value** toward PA and HE.

# Framework for Intervention Action: Health Impact Pyramid

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





# Family Home

- Family Nutrition and Physical Activity Assessment (FNPA)
- Home PA Environmental Audit
- Family Stage of Change
- Family PA
  - Accelerometers
- Family Diet
  - Recall



**FAMILY STAGE of CHANGE (FSOC) Survey**

Please fill out the FSOC Survey questions while considering your usual FAMILY habits.

**Instructions:**

- For each statement below, check the box in the first row to mark your answer .
- If you check a **purple box** in the first row, answer the rest of the questions that appear in **purple** (see Example A). If you check a **green box** in the first row, answer the rest of the questions that appear in **green** (see Example B).
- Answer ALL **blue** questions. See Examples A and B below.

**Example A**

Statement 1: We eat meals as a family together.

Never <input type="checkbox"/>	Rarely <input checked="" type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>
--------------------------------	--	------------------------------------	--	---------------------------------

• 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

• Have you been eating/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

**Example B**

Statement 1: We eat meals as a family together.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input checked="" type="checkbox"/>	Always <input type="checkbox"/>
--------------------------------	---------------------------------	------------------------------------	---	---------------------------------

• 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

• Have you been eating/Has your family been eating most or all meals together as a family for at least 6 months?  
Yes  No

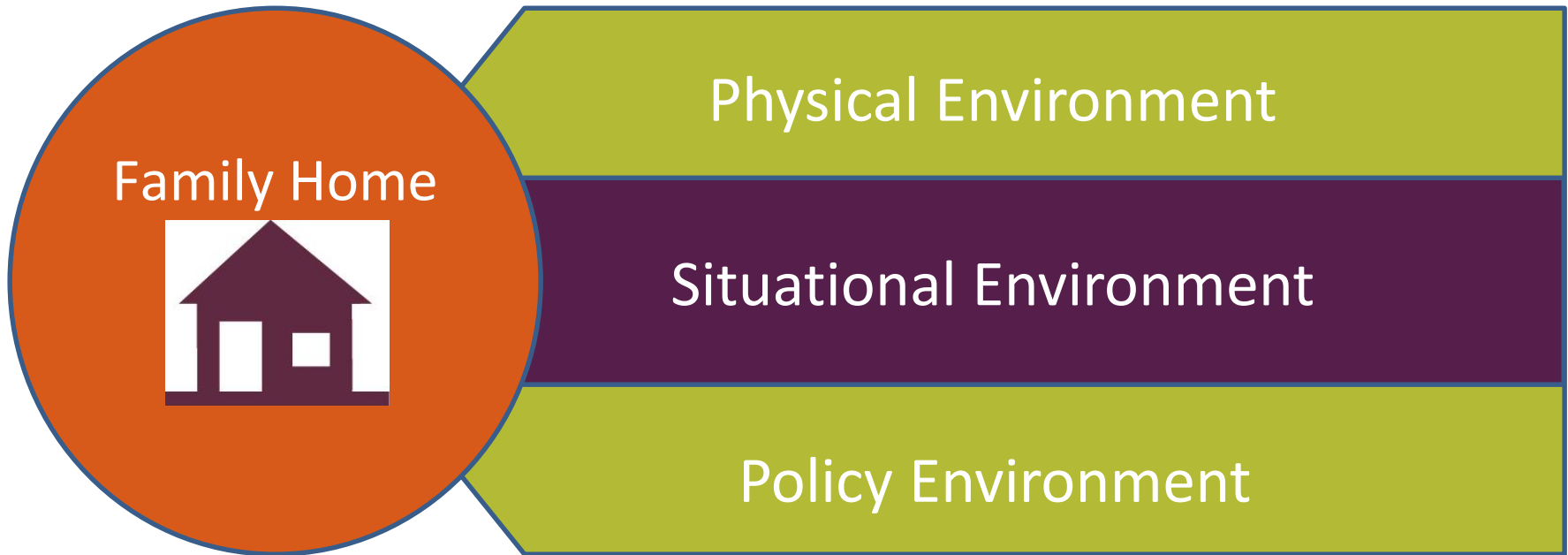
• Check how many meals you eat together in an average week.

Does your family home have adequate outdoor space for child and family active play?

Do you have play items that support active play (e.g. bicycles, balls, hula hoops)

Does your family use candy or sweets as a reward for good behavior?

Does your family find ways to be physically active together?



Does your family limit the amount of TV/electronic media your child watches?

Does your family limit the eating of chips, cookies, and candy?

# Family Stage of Change (FSOC)

- The FSOC is a tool to help us target our intervention strategies so they have the greatest potential for positive impact!

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

Never  Rarely  Sometimes  Almost always  Always

• 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

# School Environment

- School Nutrition and Physical Activity Assessment of the Environment (SNPA)
- Whole School BMI
  - Grade
  - Sex





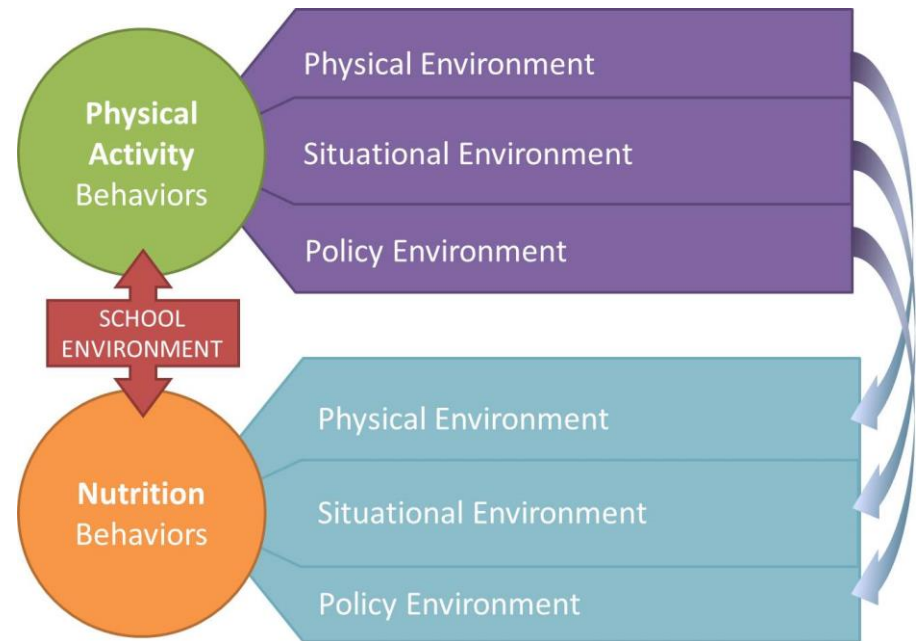
# School Environment: SNPA

- **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.

SNPA School Report can be used to:

- Measure change as a result of intervention activities
  - secure grant funding
- document school-level changes resulting from national, state, and/or district policies
- evaluate school wellness, health and performance factors & practices



## School Nutrition and Physical Activity Environment Assessment

### SAMPLE Elementary School Report

This report provides a review of [Insert School Name] Elementary School's school wellness environment as determined by the Oregon State University (OSU) GROW Healthy Kids and Communities research team. The successes and opportunities identified in this report are based on current best practices for school wellness, specifically related to nutrition and physical activity. We applaud the great number of successful wellness practices and policies currently happening at [Insert School Name]. Any of the suggested opportunities for growth may be used as starting points to initiate positive change within the school environment and further promote the health and well-being of [Insert School Name] students and staff.

#### 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

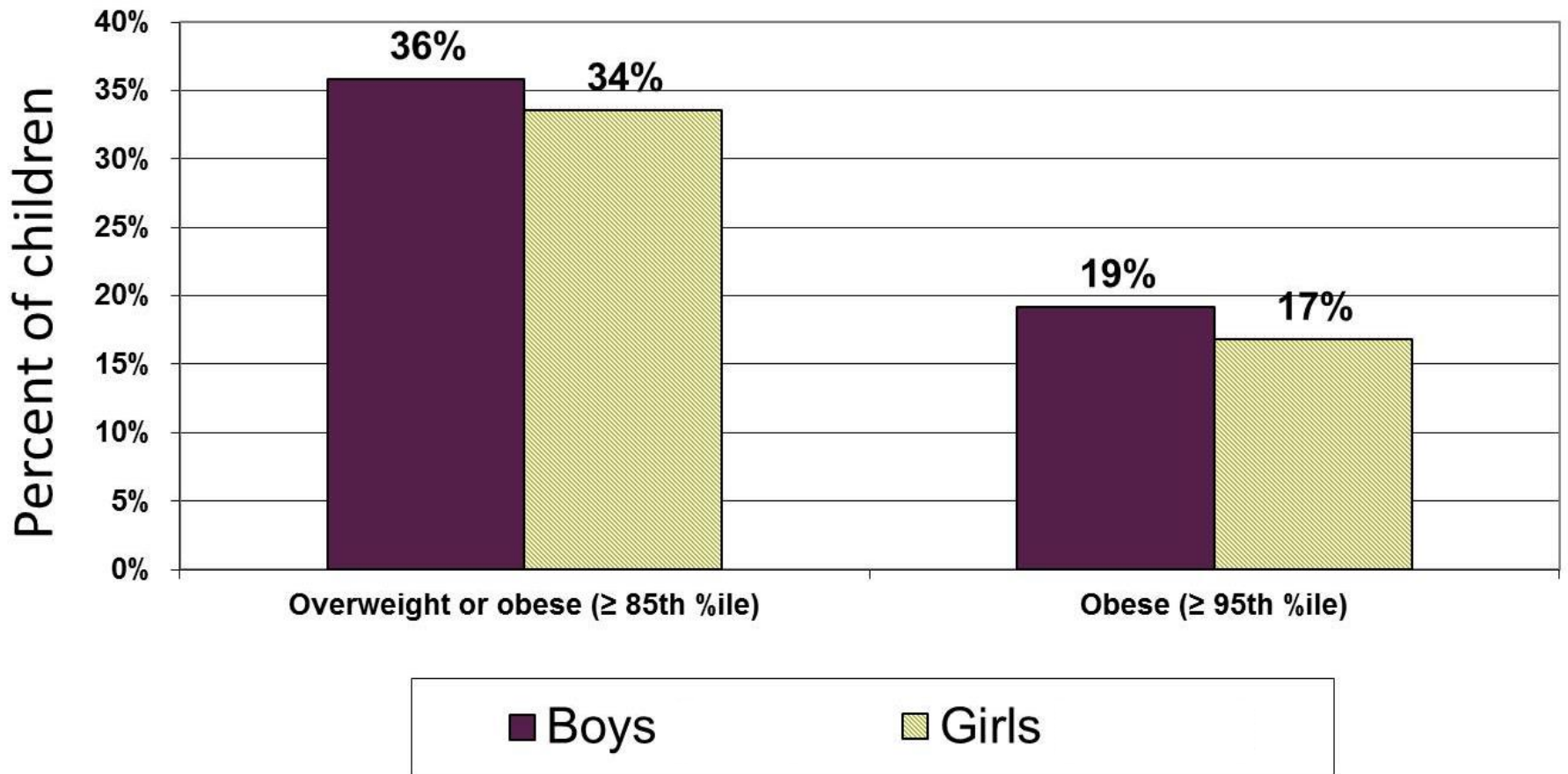
##### Physical Activity

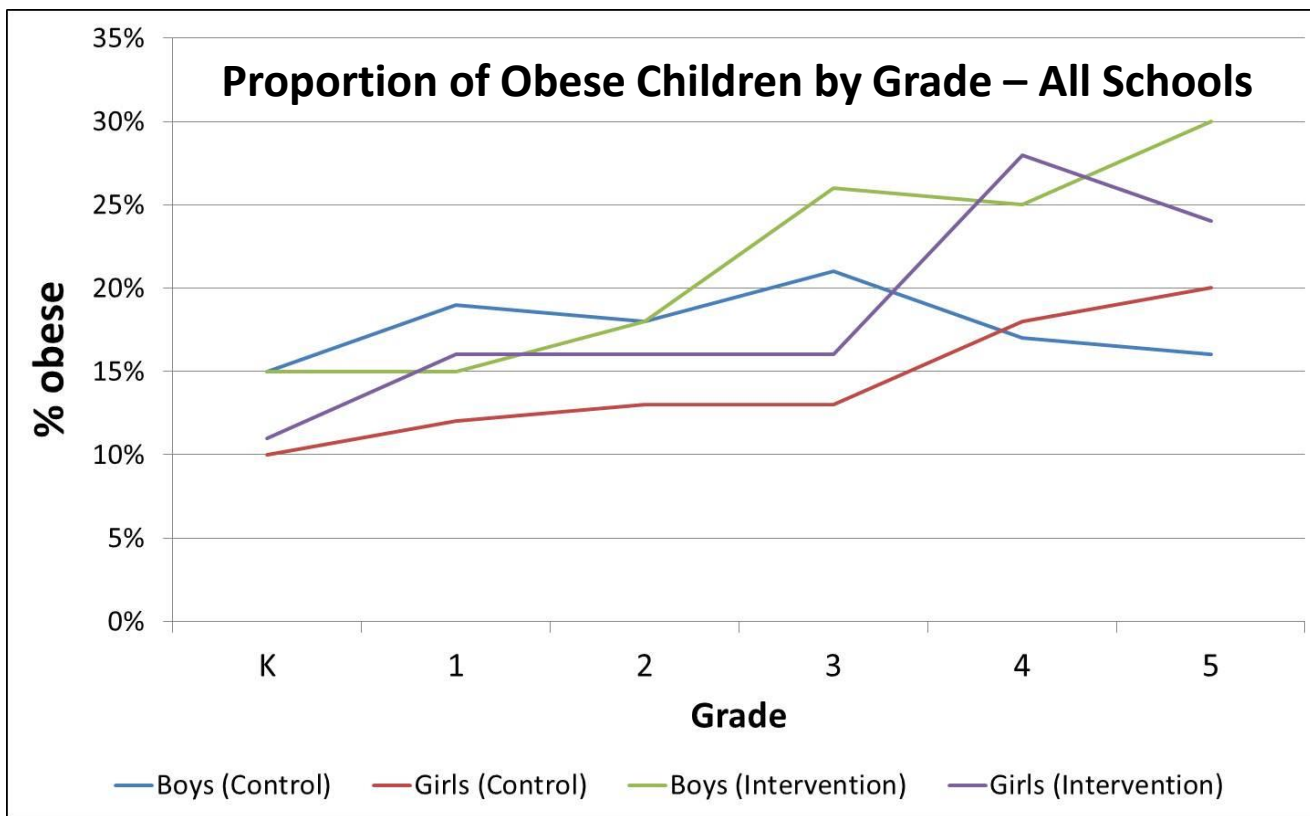
- ✓ Physical Environment
  - Investigate options for dividing the cafeteria during lunch time so that any unused space can be utilized for recess/physical activity.
- ✓ Situational Environment
  - Provide opportunities to participate in physical activity breaks in addition to recess on a daily basis.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

##### Nutrition

- ✓ Physical Environment
  - Enhance the cafeteria with decorative elements or objects that add visual and/or auditory interest and appeal.
- ✓ Situational Environment
  - Ensure all classrooms consistently arrive at the cafeteria in time for students to enjoy the full 20 minute lunch period.
- ✓ Policy Environment
  - Create a policy on using food as a reward, reinforcement, or punishment for students.

# Baseline Prevalence of Overweight and Obesity by Gender (n=1737)





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

<sup>1</sup> All p-values were calculated using Kindergarten as the reference group.

# Grow HKC Research Team

- Principal Researchers
  - Deborah John, PhD
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- Research Assistants
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- State and County Partners





Thank You!

Questions??

