Determining environmental assets in six Oregon communities to explain the rural obesogenic context

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

WHAT: Integrated research, education, and Extension program aimed to address the childhood obesity prevention challenge

WHY: Many risk factors have been associated with childhood obesity, including rural residency

- Childhood overweight and obesity prevalence is higher among children living in rural (36%) compared to urban (30%) areas
- Rural communities face unique environmental challenges that can have an impact on healthy eating and physical activity patterns different from those found in urban places
- Weight health and habits carry over into adulthood
- Environmental strategies to prevent obesity have focused on more urban areas

HOW: Mobilize rural residents and decision-makers to identify and address the rural obesogenic context
Describe a new survey tool for measuring the rural food and activity environment and evaluating obesogenic disparities.

Describe a model for spatially defining and analyzing where rural people live with respect to available food and activity resources.
Research Methods

• Assess the food and physical activity resources in six Oregon communities using participatory research approach, multiple case study (n=6) design using mixed methods

Assess = Photomap every resource for food and physical activity that is available
Study Sites

Three Counties
Two Communities

Columbia Co.
Clatskanie & Rainier

Clackamas Co.
Estacada & Molalla

Klamath Co.
Chiloquin & Bonanza

Population <10,000
Urban Proximity
Geographic Location
Low Income Schools
Defining Community Boundaries

Where Do People Live?

- **School District Boundary**
  - Too large an area to effectively sample >700 mi²
- **City Limits**
  - Too small an area to capture a significant portion of the population
- **Goal**
  - Capture > 85% of the population & minimize study area
  - Capture resources spatially relevant to the majority of population

Network buffers ranging from 2 to 5 miles out from population weighted centers, capture >90% of the population and reduce area surveyed by 30 to 80%
Community members are provided a Garmin OR 550 (camera-enabled GPS unit) and trained to map features of their community. On their own or with a partner, they photograph (and map) the food and/or physical activity resources in their assigned sectors of the community. They record details about the resources on the sheets of the audit tool, which are then used to create maps for the community.
Community Audit...yields attributes that can be associated with resource photos and tracks

GROW HKC
Community Food Environment Audit

Please use the provided Garmin (GPS) unit, in conjunction with this survey, to map, photograph, and log information about all the food environment and resources in your community. If you do not have access to a Garmin unit, you may use any other GPS mapping device, such as a Garmin or GPS app on your smartphone, along with a camera. For each photograph that you take, please take care not to include people in your photographs.

Specifically, you will map, photograph and log information about all possible food resources in your community. Once you complete the audit of your sector, please check off all of the food resource categories that you encountered in your sector.

- A. Grocery Stores
- B. Convenience Stores
- C. Roadside or Dealerside Retailers
- D. Restaurants
- E. Vending Machines (in public spaces)
- F. Food Banks and Food Pantries
  Food Assistance Programs, including:
  - G. Meals on Wheels
  - H. Gleneagles
  - I. Free Meal Sites
  - J. Summer Meal Service Programs
- K. Farm Fresh/ U-Pick Operations
- L. Farmers Markets
- M. Community Gardens
- N. Hunting, Fishing and Foraging Supports
- O. Home-Based Food Retailers
- P. Other Community Food Resources

A. Grocery Stores

Name of Store:

Photographs and Logos: Please photograph and log (with the Garmin unit) each grocery store you come across in your sector.

Take a photo of the front of the grocery store. Take a single photo, if you can capture the entire store and the sign with the store’s name in a single shot. If you need to take more than one photo to capture the entire store and the sign, take the shot looking straight ahead, and as needed, 1-2 shots looking to the left and to the right. Record your photo code(s), below.

- Looking straight ahead:
  - DSC ——— PG
  - DSC ——— PG

- Looking to the left (as needed):
  - DSC ——— PG
  - DSC ——— PG

- Looking to the right (as needed):
  - DSC ——— PG
  - DSC ——— PG

Take additional photographs that describe the access to this store. Examples of photographs to take are listed below. For each feature that is present, please take no more than one photo.

- Bike rack at the store
  - DSC ——— PG
- Bus stop adjacent to the store
  - DSC ——— PG
- Parking at the store. Also, note the type of parking below.
  - DSC ——— PG
  - Street side
  - Parking lot
- Handicapped parking spaces at the store
  - DSC ——— PG
- Ramps/curb cuts that promote handicap accessibility
  - DSC ——— PG
- Evidence of walking access to the store
  - Sidewalk leading to store
    - DSC ——— PG
  - Crosswalks
    - DSC ——— PG
  - Sign or poster that states the store hours
    - DSC ——— PG
  - Sign or poster that states that the store takes SNAP, EBT or Oregon Trail
    - DSC ——— PG
  - Sign or poster that states that the retailer is a WIC-authorized vendor
    - DSC ——— PG
  - Other access feature (Describe): ________________________________

Food Retailer Description: Please categorize this food retailer, by answering the questions below to the best of your knowledge.

Is a membership required to shop in this store (e.g., Bi-Mart, Costco, Sam’s Club)?
- Yes
- No
- I don’t know

Can you purchase products in bulk at this store?
- Yes
- No
- I don’t know

Is this store a national or locally-owned (franchise or non-franchise)?
- National chain
- Locally-owned
- Locally-owned, not franchise
- I don’t know

Is this store considered an outlet store (also known as a “bargain store”)?
- Yes
- No
- I don’t know

Descriptions or definitions of concepts or features are provided in boxes to provide guidance for your understanding and decision-making.
Transferring Data from the Field to OSU

Plug units into computer

Send data to OSU

Data attributed and symbolized in ArcMap 10.1 using data from community audit sheets
Results

Distribution of Adult BMI

BMI data calculated from DMV data (2005-2012)
Courtesy of Oregon Environmental Public Health Tracking Program
DMV record derived BMI data

- DMV estimates significantly correlated to BRFSS estimates
  - Men $r=0.518$ ($p<0.001$)
  - Women $r=0.699$ ($p<0.001$)

- Data useful for describing the spatial and temporal patterns of BMI distribution

- 10000x Greater resolution than survey data

[Graph showing mean BMI comparison between DMV and BRFSS data for men and women over years 2003 to 2010]

Oregon Environmental Public Health Tracking: DMV records for obesity tracking
### Results

#### Distribution of Adult BMI

<table>
<thead>
<tr>
<th>Community</th>
<th>Healthy 18-24.9</th>
<th>Overweight 25-29.9</th>
<th>Obese &gt; 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estacada</td>
<td>12</td>
<td>88</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Molalla</td>
<td>3</td>
<td>96</td>
<td>1</td>
</tr>
<tr>
<td>Clatskanie</td>
<td>11</td>
<td>82</td>
<td>7</td>
</tr>
<tr>
<td>Rainier</td>
<td>7</td>
<td>84</td>
<td>9</td>
</tr>
<tr>
<td>Bonanza</td>
<td>25</td>
<td>67</td>
<td>8</td>
</tr>
<tr>
<td>Chiloquin</td>
<td>10</td>
<td>72</td>
<td>18</td>
</tr>
</tbody>
</table>

**Body Mass Index kg/m²**

- | 18 - 24.9 |
- | 25 - 30   |
- | > 30      |
Results

Distribution of Food Resources

Food Resource Categories
- Food Assistance
  - Community Meals
  - Food Banks
  - Summer Lunch
- Local Agriculture
  - Farm Stands/U-picks
  - Farmers Markets
  - Home-based Retailers
  - Gleaning/Hunting/Fishing
  - Community Gardens
- Fast Food/Restaurants etc.
  - Drive through Coffee hut
  - Fast Food
  - Concession Stand
  - All you can eat buffet
  - Restaurant w/ wait staff
  - Deli/Sandwich shops
  - Café/Bakery
  - Convenience Stores
  - Vending machines
Results

Distribution of Food Resources

- Clatskanie
- Molalla
- Rainier
- Estacada
- Chiloquin
- Bonanza
Results

Distribution of Physical Activity Resources

- Low/No Cost
  - Public parks and Playgrounds
  - Community/Recreation Centers
  - Trails
  - Beaches/Waterways
  - Community Swimming Pools
  - Skate parks
  - Sports playing fields/Courts
  - Community Gardens

- Fee-Based
  - Golf Courses
  - Equestrian centers
  - Exercise/Fitness Center
  - Dance Studios
Results

Distribution of Physical Activity Resources

Clatskanie
Molalla
Estacada
Rainier
Bonanza
Chiloquin
Results

Access to Resources

Analyzed via a ¼ mile network buffer – approximately a 5-10 minute walk

- Low/No cost resources
  - Community Centers
  - Public lands/Parks & Playgrounds
  - Sports Fields/Courts

- Fee-Based Resources
  - Golf Courses
  - Equestrian centers
  - Exercise/Fitness centers

- Local Agriculture
  - Farm stands/U-picks
  - Farmer’s markets
  - Home-based sales (Eggs, Milk, Veggies)
  - Hunting/Fishing/Gleaning Supports

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Proportion of Chiloquin Population Within 1/4 mile of Food and Physical Activity Resources

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low/No Cost Outdoor PA</td>
<td>50</td>
</tr>
<tr>
<td>Low/No Cost Indoor PA</td>
<td>10</td>
</tr>
<tr>
<td>Fee-Based Outdoor PA</td>
<td>10</td>
</tr>
<tr>
<td>Fee-Based Indoor PA</td>
<td>20</td>
</tr>
<tr>
<td>Locally Ag, Grocery Stores, &amp; Food Assistance</td>
<td>10</td>
</tr>
<tr>
<td>Convenience Stores Fast Food and Restaurants</td>
<td>20</td>
</tr>
</tbody>
</table>
Discussion & Conclusion

In rural communities, a lack of available resources and accessibility to existing resources may make developing and maintaining healthy dietary and activity habits difficult.

- **Resources available but spread out** – Supports need to be affordable and accessible from where people live and work
  - Most importantly: year round, indoor and outdoor, safe low/no cost physical activity, and access to affordable, healthy food

- **Communities can use results from the audit tool as evidence of the need for adding or improving:**
  - Access to healthy food options
  - Free/low cost, safe, indoor and year round physical activity options

- **Rural communities have unique and diverse characteristics**
  - One size will not fit all - opportunities for optimizing local, community, and/or regional food and physical activity systems to reduce obesity risk and improve rural health
Putting Research into Action

- Food Assistance
- Grocery Stores
- Local Agriculture
- Restaurants/Fast Food
- Convenience Stores