Assessing the built, social, and nutrition environment of Wisconsin communities: the WASABE and ANEWC studies

Kelli Blackmore, Madeline Duffy, Sarah Moen, Navnit Sekhon, & Jessica Warrens
Agenda

- Background
- Methods
  - WASABE
  - ANEWC
- Our Field Experience
- Results
- Discussion
- Conclusion
Background
Obesity in Wisconsin

- Rates of obesity are rising in the United States
  - Wisconsin, 2010
    - 27% of adults obese
    - 37% of adults overweight

- Obesity and its associated chronic diseases put economic burden on society
  - US spent roughly $139 billion dollars on obesity-related health care in 2008
  - Wisconsin alone spent nearly $2 billion
What is SHOW?

- The Survey of the Health of Wisconsin, 2008-present
  - Series of independent, annual household surveys
  - Representative sample of Wisconsin adult residents (n=800 to 1,000 annually)
  - Creates comprehensive statewide picture of health

- Data from:
  - Individual interviews
  - Physical exam
  - Follow-up phone interview

- Goal: collect social and built environment data for each participant, with 1.8 participants per household
Schematic

SHOW

ANEWC

NEMS-S

NEMS-R

WASABE

WASABE Audit Tool
Obesity and the built environment

- **Built environment:** structures and spaces created or modified by people
- Characteristics believed to encourage physical activity
- Inconclusive research
What is WASABE?

- Wisconsin Assessment of the Social and Built Environment (WASABE), 2010-present
  - Extension of SHOW
  - Data on physical and social attributes in neighborhoods of SHOW participants
  - Emphasis on determinants of physical activity in one's built environment
  - Direct observation, audit tool
WASABE Aims

Primary Aim
- To examine the association between built and social neighborhood attributes and levels of physical activity in Wisconsin adults

Secondary Aims
- To identify differences in built and social neighborhood attributes by race/ethnicity, SES, and urbanicity
- To analyze the roles of the built and social environment on physical activity-related health disparities
- To examine relationships between observation data & extant data from GIS with data from individuals' perceptions of the neighborhood
Obesity and the nutrition environment

**Nutrition environment:** places in a community where people buy or eat food

- **Restaurants**
  - More of the food dollar going to restaurant meals
  - Increased caloric density of restaurant meals with decreased nutrient value
  - Presence of fast-food restaurants positively associated with obesity

- **Food Stores**
  - Presence of supermarkets inversely related to obesity rates
  - Supermarkets offer access to fresh fruits and vegetables, better quality diets
What is ANEWC?

- Assessing the Nutrition Environment of Wisconsin Communities (ANEWC), 2010-present
  - Ancillary study to SHOW
  - Data gathered on nutrition environment
    - Restaurants
    - Food Stores
  - Focus on determinants of healthy eating
  - Standardized observational survey
ANEWC Aims

Primary Aims

- To document strengths and weaknesses of the food environment in Wisconsin
- To examine the association between the food environment and diet quality and weight among Wisconsin adults
- To develop and test a pilot intervention to improve the food environment in Wisconsin communities
Methods: WASABE
Methods: The WASABE Audit Tool

- Direct observational audit tool developed by WASABE team based on theory, literature review and consultation with content experts in the field

- The tool covers the following domains:
  - Predominant land use
  - Availability of public recreational facilities
  - Number and type of non-residential destinations
  - Pedestrian safety from traffic and crime
  - Aesthetics
  - Social climate
Methods:
The WASABE Audit Tool

8. Please answer the following questions regarding bicycling conditions and follow the skip patterns:

<table>
<thead>
<tr>
<th>Bicycle Transportation/Commuting</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-Road Biking Conditions</td>
</tr>
<tr>
<td>Yes, both sides</td>
</tr>
<tr>
<td>a. Is there an on-street, paved, marked bike lane?</td>
</tr>
<tr>
<td>i. If Yes [for Q.8(a.):] Are there any obstructions in the marked bike lane (e.g., drainage gates, parked cars, etc.)? Continue on to Q.8(b.)</td>
</tr>
<tr>
<td>ii. If Yes [for Q.8(a.):] Are there any parts of the bike lanes that are missing or worn off? If Yes: Skip to Q.9</td>
</tr>
<tr>
<td>iii. If No [for Q.8(a.):] Is the outermost lane wide enough (~15 ft.) that it would reasonably fit a motorized vehicle and a cyclist side by side? If No: Skip to Q.9</td>
</tr>
<tr>
<td>iv. If Yes [for Q.8(a.):] Are there obstructions in the outermost part of the lane (e.g., drainage gates, parked cars, etc.)?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neighborhood Characteristics (2/2)</th>
<th>0</th>
<th>1-2</th>
<th>3+</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>f. Liter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Careless/Harmless</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii. Hazardous</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii. Cigarette Butts* (see manual)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Broken/boarded up windows</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Are any of the following publicly available amenities present within the segment?

<table>
<thead>
<tr>
<th>Publicly Available Amenities</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Public trash cans (nonresidential)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Seating/benches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Bike rack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Public art (e.g., murals, sculptures, urban furniture, neighborhood kiosks, public fountain, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Public attractive natural features (e.g., notable public landscaping, gardens, parks or green spaces, pond)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. Are the following signs visible in the segment?

<table>
<thead>
<tr>
<th>Neighborhood Signs</th>
<th>0</th>
<th>1-2 sm</th>
<th>1+ lg or 3+ sm</th>
</tr>
</thead>
</table>
Methods: ANEW C
Methods: ANEWC

GIS Mapping

- Drivable distance from household:
  - 2 miles for urban/suburban areas
  - 5 miles for rural areas

- Enumerating, mapping, and assessing food stores and restaurants within buffer area

Data
- Collected at outlet level
- Aggregated and analyzed at buffer level
Methods: ANEWCC

Outlet Selection

- Esri Business Analyst
  - Extension of ArcGIS
  - Restaurants and food stores in WI in 2008

- In-Field Observation
  - Teams of 2-4, given maps and tracking forms
  - Outlets added or removed, classifications modified, based on what observers saw in the field

Audit Tool

- Nutrition Environment Measures Survey (NEMS)
  - As developed by: Glanz, Frank, Saelens, & Sallis
NEMS-R
NEMS for Restaurants
Methods: NEMS-R

Nutrition Environment

- Restaurants
  - Fast Food
  - Sit Down
  - Fast Casual
  - Drinks and Food
    - Unique to ANEWC project
**Methods: NEMS-R**

<table>
<thead>
<tr>
<th>Menu Review</th>
<th>Select One</th>
<th>Choices (#)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>16) <strong>Main Dishes/Entrees:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Total # Main Dishes/Entrees</td>
<td>☐ yes</td>
<td>☐ □ □ □</td>
<td></td>
</tr>
<tr>
<td>b. Healthy Options</td>
<td>☐ yes</td>
<td>☐ □ □</td>
<td></td>
</tr>
<tr>
<td>17) Main dish salads:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Total # Main dish salads</td>
<td>☐ yes</td>
<td>☐ □ □</td>
<td></td>
</tr>
<tr>
<td>b. Healthy Options</td>
<td>☐ yes</td>
<td>☐ □ □</td>
<td></td>
</tr>
<tr>
<td>c. Low-fat or fat free salad dressings</td>
<td>☐ yes</td>
<td>☐ □ □</td>
<td></td>
</tr>
<tr>
<td>18) <strong>Fruit (w/out sugar)</strong></td>
<td>☐ yes</td>
<td>☐ □ □</td>
<td></td>
</tr>
<tr>
<td>19) Non-fried vegetables (w/out sauce)</td>
<td>☐ yes</td>
<td>☐ □ □</td>
<td></td>
</tr>
<tr>
<td>20) Diet soda</td>
<td>☐ yes</td>
<td>☐ □ □</td>
<td></td>
</tr>
<tr>
<td>21) Other healthy or low calorie beverage?</td>
<td>☐ yes</td>
<td>☐ □ □</td>
<td></td>
</tr>
</tbody>
</table>
Methods: NEMS-R

Variables measured

- Facilitators of healthy eating
- Barriers to healthy eating
- Availability of healthy options
- Pricing comparisons
- Kids' menu
  - Availability
  - Healthy options
NEMS-S
NEMS for Stores
Methods: NEMS-S

Nutrition Environment

- Food Store Categories
  - Supermarkets
  - Grocery stores
  - Ethnic outlets
  - Convenience stores
  - Gas stations
  - Pharmacies
  - Discount stores
  - Dollar stores
Methods: NEMS-S

<table>
<thead>
<tr>
<th>Item</th>
<th>Available</th>
<th>Price/lb.</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthier Option: Lean ground beef, 90% lean, 10% fat (Ground Sirloin)</td>
<td>Yes, No</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Alternate Items: Lean ground beef (&lt;10% fat)</td>
<td>Yes, No, NA</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>3. Ground Turkey (&lt;10% fat)</td>
<td>Yes, No</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>4. # of varieties of lean ground beef (&lt;10% fat)</td>
<td>0, 1, 2, 3, 4, 5, 6+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Methods: NEMS-S

Variables Measured

- 10 food categories that contribute the most fat and calories to the American diet and those that are most recommended for healthful eating (Glanz et al., 2007)
  - Fruit
  - Vegetables
  - Milk
  - Ground beef
  - Hot dogs
  - Frozen dinners
  - Beverages
  - Baked goods
  - Bread
  - Snack Chips
Methods: NEMS-S

Availability
- Are the items carried?
- If carried, are they available?
- How many options are available?

Quality
- Is the item appealing to the customer?
- Is it of good quality or spoiled?

Price
- Prices of healthy foods compared to unhealthy ones
Methods: Data Dissemination
Data Dissemination

- Step 1: County Selection
- Step 2: Engage with Local Stakeholders
Brown County

- Home of the Green Bay Packers
- Data collected in mostly suburban areas
- Director Brown County Health Department
  - Judy Friederichs
Dane County

- Madison
- Data collected in both rural and urban areas
- Public Health Supervisor
  - Judy Howard
Jefferson County

- Watertown and Jefferson
- Data collected in mostly rural areas
- Public Health Officers from Jefferson and Dodge Counties
  - Carol Quest
  - Gail Scott
  - Jody Langfeldt
  - Alex Lichtenstein
Milwaukee County

- Milwaukee
- Data collected in both urban and suburban areas
- Greenfield Health Officer
  - Darren Rausch
- Wauwatosa Health Department
  - Nancy Kreuser
Waukesha County

- Waukesha
- Data collected in mostly suburban and rural areas
- Wellness Coordinator for Waukesha County Technical College
  - Kathryn DeRemer
Data Dissemination

- Step 3: Prepare and Share Report
Our Group Field Experience
Goals

- Experience public health in non-academic setting
- Develop leadership and team-building skills
- Develop understanding of study design, management, methods and field implementation
- Develop and improve quality control and quality assurance skills
- Develop understanding of variation in social, built and nutrition environments of Wisconsin communities and potential influence on health
Unique Aspects of Group Fieldwork Placement

- Weekly meetings with Capstone Committee members
- Group capstone paper
- Present to communities
- Develop 4-page reports for county health briefs  
  - Serves as template for future data dissemination
Traveling the State

- Team of 18 undergraduate and graduate students
- Evaluated built, social, and nutrition environments using assessment tools
- Conversed with citizens curious about WASABE and store owners curious about ANEWC
Working in the Office

- Creating WASABE maps using ArcGIS software for teams to use when conducting assessment in the field
- Performing quality assurance & quality control
- Organizing weekly meetings
Results
Preliminary Results: WASABE

- Sidewalk Availability
- Mixed-Land Use
- Recreational Facilities

Percent

- Waukesha Co
- Milwaukee Co
- Jefferson Co
- Dane Co
- Brown Co
Preliminary Results: NEMS-R

- Smaller costs less
- Healthy costs less
- Healthy meals IDed
- Nutrition info posted
- Reduced size portions
- Fast Food

Percent
Preliminary Results: NEMS-S

- Cheaper WW bread
  - Waukesha Co
  - Milwaukee Co
  - Jefferson Co
  - Dane Co
  - Brown Co

- Cheaper skim milk
  - Waukesha Co
  - Milwaukee Co
  - Jefferson Co
  - Dane Co
  - Brown Co

- Offer carrots
  - Waukesha Co
  - Milwaukee Co
  - Jefferson Co
  - Dane Co
  - Brown Co

- Offer bananas
  - Waukesha Co
  - Milwaukee Co
  - Jefferson Co
  - Dane Co
  - Brown Co

- Supermarket/Grocery
  - Waukesha Co
  - Milwaukee Co
  - Jefferson Co
  - Dane Co
  - Brown Co
Qualitative Observations

**WASABE**
- Fewer sidewalks in high SES areas
- Mixed land use often paired w/ high traffic flow

**ANEWCC**
- Prices in inner city food stores greater than food stores in suburban areas
- Minimal availability of food options in rural areas
- Restaurant owners found there was not enough demand for fresh, healthy food to justify offering it
- Restaurants that provided healthy options were proud of their selection
Discussion
Discussion

- Implications of reports to counties:
  - Health assessments
  - Inform future interventions, funding opportunities
  - Stimulate community awareness
  - Establish relationships
Discussion

Strengths

- Utility of assessment tool for public health decision making
  - Data extensive, of good quality
  - Snapshot of neighborhoods
  - Provides baseline data
  - Data can support future policy making

- Potential for ongoing data collection
Discussion

Limitations

- Data representative of state as a whole is difficult to use to craft interventions at a county or city level.
- Cannot control for neighborhood selection bias.
- Subjectivity of assessment tools.
Acknowledgements

- We thank all of the members of the SHOW, WASABE, and ANEWC teams for providing us with both the data and support for this project.

- We personally thank our capstone committee members: Barbara Duerst, MS, RN; Janice Liebhart, MS; Kristen Malecki, PhD, MPH; Ana Martinez-Donate, PhD; and Sara Soka, MS.
Conclusion

Thank you.

Questions?

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