Assessing Neighborhood Environments to Improve Physical Activity & Health

Weighing In Quarterly Meeting
June 1, 2017
Presentation Outline

• Neighborhood built environment and health
• Measuring the neighborhood built environment
• Measurement resources
• Selecting and adapting measures
• Measurement support
• Measurement in action
Figure 2: Ecological Model of Active Living
The Role of Neighborhoods in Physical Activity

Kids in walkable neighborhoods:
- Twice as much walking
- 15% less time in a vehicle

12-16 year olds
N = 574
Carlson et al. 2016, Pediatrics
Carlson et al. 2015, Health & Place

1.9 to 2.1 time more likely to engage in MVPA

Proportion of time spent in MVPA

<table>
<thead>
<tr>
<th>Location</th>
<th>Proportion of Time (MVPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>At school</td>
<td>4.8%</td>
</tr>
<tr>
<td>At home</td>
<td>5.5%</td>
</tr>
<tr>
<td>In neighborhood</td>
<td>10.3%</td>
</tr>
</tbody>
</table>

Overall MVPA min/day

- 39 min/day
- 23% of total

MVPA from walking trips + MVPA from other sources

12-16 year olds
N = 574
Community Design and Physical Activity

Residential density

Mixed land use

Street connectivity

High Walkable

Low Walkable
6-11 year olds
N = 730

PAE = physical activity environment
• Residential density (↑)
• Mixed land use (↑)
• Street connectivity (↑)
• Parks (↑)

NE = nutrition environment
• Supermarkets (↑)
• Fast-food outlets (↓)

Saelens et al. 2012
Am J Prev Med
Streetscape Features and Physical Activity

- Street segment features
  - Sidewalk presence and condition
  - Aesthetics/condition of properties
  - Speed limit

- Crossing/intersection features
  - Safe crossings
  - Curb ramps

6-16 year olds
N = 1655
Cain et al. 2014
Soc Sci & Med
Why Measure the Built Environment in KC?

• To identify features related to physical activity and health
  • Which improvements will have the greatest impacts on health?

• To educate or engage community members and decision makers
  • Can engagement result in environmental improvements?

• To identify and prioritize specific environmental improvements
  • Which areas and features are in greatest need of improvement?

• To track/evaluate progress over time or due to an intervention
  • At what pace are we heading in the right direction?
Measures Selection Resources
National Collaborative for Childhood Obesity Research (NCCOR)
NCCOR Measures Registry

http://www.nccor.org/nccor-tools/measures/
# Measures Covered in NCCOR Registry

<table>
<thead>
<tr>
<th>SETTING</th>
<th>METHOD OF ASSESSMENT</th>
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<tbody>
<tr>
<td></td>
<td>GIS</td>
</tr>
<tr>
<td>Community design</td>
<td>X</td>
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<tr>
<td>Transportation system</td>
<td></td>
</tr>
<tr>
<td>Streetscapes</td>
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<td>Trails</td>
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<td>Parks</td>
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<tr>
<td>Recreation</td>
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<tr>
<td>Schools and child care</td>
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<tr>
<td>Homes</td>
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<tr>
<td>Workplaces</td>
<td></td>
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<tr>
<td>Other buildings</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td></td>
</tr>
</tbody>
</table>
NCCOR Measures Registry

Filter options

- Search
  - Contains
- Domain
  - Individual Dietary Behavior (21)
  - Food Environment (9)
  - Individual Physical Activity Behavior (22)
  - Physical activity Environment (3)
- Measure Type
  - GIS (2)
  - 24-hour dietary recall or food frequency (1)
  - Electronic monitor (91)
  - Environmental observation (9)
  - Questionnaire (165)
  - Record or log (36)
  - Other (49)
- Age
  - 2 - 5 Years (76)
  - 6 - 11 Years (201)
  - 12 - 18 Years (177)
  - Adults (23)
- Context
  - Metro/Urban (108)
  - Small Town/Rural (20)
Active Living Research

http://activelivingresearch.org/
Considerations in Selecting Measures

• Project purpose
  • To educate or engage community members? –resident audit
  • To inform environmental improvement projects or priorities? –detailed audit
  • To evaluate if a project resulted in environmental changes? –case studies or surveillance system

• Burden to respondents and/or investigators
  • Will response rates be low if the tool is too long/burdensome?
  • Will important information be missed if tool is too brief?

• Comprehensiveness, specificity (breadth or depth)
  • Cover multiple constructs, or a specific construct in detail?

• Evidence of reliability and/or validity
Reliability and Validity

• Identifying if a measure is reliable
  • Survey/questionnaire: Have the same people complete the questionnaire twice over a two-week period, responses should be similar.
  • Audit tool: Have two raters audit the same feature, responses should be similar.

• Identifying is a measure if valid
  • Compare to a criterion measure if available; for measuring attitudes/perceptions and for environmental audits, reliability is often sufficient.
Measurement Support

• Consulting on measure selection and data collection
• Collecting and managing data
• Analyzing and interpreting data
Measurement in Action