Applying the Neighborhood Environment-Wide Association Study (NE-WAS) Approach to Contextual Influences on Physical Activity among Older Adults

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Background

- We piloted an ‘Neighborhood Environment-Wide Association Study (NE-WAS)’ approach to studying neighborhood influences on health, analogous to a Genome Wide Association Study (GWAS) approach.

Genetic Study

- Candidate gene approach
- GWAS

Neighborhood Study

- Conventional neighborhood effects analysis
- NE-WAS

Methods

NYC NAMES-II was a telephone survey of 3,497 adult residents of New York City aged 65-75.

Please Note: New York City is not only Manhattan

The Bronx

Brooklyn

Queens

Using regression and machine learning, we identified the neighborhood measures most predictive of:

1) Total physical activity (PASE score)
2) Gardening (ever/never)
3) Walking (ever/never)
4) Housework (ever/never, as a negative control)

Neighborhood measures were compiled from:
- US Census (e.g. extreme poverty -- % of population living below half the poverty line)
- Street View Audit (e.g. neighborhood disorder)
- Administrative records (e.g. pedestrian injury rates)

All Neighborhood measures

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Measures</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics and Housing</td>
<td>121</td>
<td>Population density</td>
</tr>
<tr>
<td>Education, Employment, and Income</td>
<td>102</td>
<td>% college grad, % in labor force</td>
</tr>
<tr>
<td>Urban Form</td>
<td>50</td>
<td>% walk to work, bus stop density</td>
</tr>
<tr>
<td>Crime and Disorder</td>
<td>35</td>
<td>% of streets rated as filthy</td>
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<tr>
<td>Parks</td>
<td>5</td>
<td>% of land area dedicated to large parks</td>
</tr>
<tr>
<td>Pedestrian Safety</td>
<td>24</td>
<td>Pedestrian injury count from 2000-2009</td>
</tr>
<tr>
<td>Total</td>
<td>337</td>
<td></td>
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</tbody>
</table>

Conclusions

- The systematic approach to comparing neighborhood measures to activity measures revealed patterns in the domains of neighborhood measures associated with activity.

- The NE-WAS appears to hold promise for hypothesis generation

Contact and Acknowledgments

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