Association of Food Deserts and Pediatric Hospitalization Rates

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Association of Food Deserts and Pediatric Hospitalization Rates
Laura M. Plencner, MD, Matthew Hall, PhD, Molly Krager, MD, Henry T. Puls, MD, Jessica L. Markham, MD, MSc, Ellen Kerns and Jessica L. Bettenhausen, MD

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Background
- Nearly 40 million United States residents live in areas with limited access to affordable and nutritious foods (i.e. food deserts)
- Data evaluating the association of food deserts and health is limited in children

Objectives
- Describe differences in hospitalization rates for children based upon their residence within a food desert and describe any differences among reasons for hospitalization

Methods
- Retrospective cross-sectional study
- United States Department of Agriculture’s Food Access Research Atlas used to determine food deserts at the census tract level
- Included children ≤18 years old in the Kansas City metropolitan area in 2016 in census tracts where ≥80% of children hospitalized were at the children’s hospital
- Hospital data and American Community Survey was used to determine hospitalization rates for each census tract
- Overall and service line analyses were adjusted for poverty rate

Results
- 460 census tracts were included (13.7% food deserts, 86.3% non-food deserts) with 482,623 children and 6,638 hospitalizations
- In unadjusted analyses, pediatric hospitalization rates were higher in food deserts compared to non-food deserts
- When adjusted for poverty differences resolved
- Poverty adjusted hospitalization rates stratified by service line did not differ based upon food desert status except for cardiac hospitalizations

Discussion
- Our results suggest that residing in food deserts may not affect children’s hospitalization rates and any differences may instead be a result of poverty
- Efforts in alleviating poverty may be more effective in improving child health than directly addressing food deserts
- Limitations:
  - Hospitalizations may be too distal a measure for adverse health outcomes and food deserts may be associated with other sequelae such as malnourishment or obesity
  - Food access as measured by the USDA food desert definition may not significantly affect child health

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<table>
<thead>
<tr>
<th>Census Tract Characteristics</th>
<th>Overall</th>
<th>Non-Food Desert</th>
<th>Food Desert</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Census Tracts</td>
<td>460</td>
<td>397 (86.3)</td>
<td>63 (13.7)</td>
<td>0.04</td>
</tr>
<tr>
<td>Urban Census Tract</td>
<td>332 (83)</td>
<td>324 (81.6)</td>
<td>8 (2.1)</td>
<td>0.04</td>
</tr>
<tr>
<td>Low vehicle access</td>
<td>101 (22)</td>
<td>71 (17.9)</td>
<td>30 (47.6)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Poverty Rate</td>
<td>10.4 [5.1, 18.9]</td>
<td>8.6 [4.3, 16]</td>
<td>21.5 [14.6, 30.7]</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>55429.5 [40896, 75852]</td>
<td>58966 [43173, 80300]</td>
<td>41250 [34786, 50685]</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Child population</td>
<td>944 [618.5, 1367.5]</td>
<td>948 [629, 1373]</td>
<td>902 [602, 1204]</td>
<td>0.27</td>
</tr>
<tr>
<td>Median Age of Children</td>
<td>9.5 [8.8, 10.3]</td>
<td>9.7 [8.8, 10.4]</td>
<td>9 [8.7, 9.6]</td>
<td>0.003</td>
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<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Non-Hispanic White</td>
<td>81.2 [65.2, 88.9]</td>
<td>81.5 [67.3, 88.9]</td>
<td>75.6 [47.7, 88.7]</td>
<td>0.15</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>5.7 [2, 13.4]</td>
<td>5.6 [1.9, 12.2]</td>
<td>8.7 [3.3, 30]</td>
<td>0.009</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5.3 [2.6, 8.9]</td>
<td>5.2 [2.6, 8.8]</td>
<td>5.6 [2.5, 9.6]</td>
<td>0.7</td>
</tr>
<tr>
<td>Other</td>
<td>4.6 [2.7, 7.1]</td>
<td>4.7 [2.8, 7.2]</td>
<td>3.7 [2.1, 6.7]</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Overall Hospitalization Rate

Unadjusted Hospitalization Rate

Adjusted Hospitalization Rate

Rate per 1,000 Children

Food Desert  Non-Food Desert  p ≤ 0.05