Impact of Household Income and Urbanicity on School Services

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Background
Access to an appropriate educational setting is a priority for families of children with autism spectrum disorder (ASD).

Objectives
(1) To determine how school placement, special services, and suspension rates for children with ASD are associated with household income and urbanicity (as determined by surrounding population density).
(2) To determine whether emotional, academic, and special needs of children with ASD are being met in the school system by household income and urbanicity.

Methods
Parent participants in the Interactive Autism Network (IAN)—a large, validated and verified internet-mediated parent-report research registry—completed the School Services Questionnaire (SSQ) on their child with ASD. The SSQ asks questions regarding special services, school placement, completed the School Services Questionnaire (SSQ) on their child with ASD.

Results
Parents of 1774 children with ASD completed the survey

- Median Age (Interquartile Range): 11.4 years (6)
- Gender: 79.9% male
- Race & Ethnicity: 83.4% white; 88.4% non-Hispanic

Variables
- Urbanicity: urban ($1 million; at least 250,000 inhabitants in principal city of that county), suburban ($1 million; less than 250,000 inhabitants in principal city), small-medium metro (50,000-999,999), rural (<50,000)
- Household Income: divided into quartiles: (1) ≤ $45,000; (2) $45,001-75,000; (3) $75,001-135,000; (4) > $135,000
- School Placement: homeschool, public, private (with regular education classes), specialized private or non-public (for children with special needs), specialized public (for children with special needs)
- Special Services: modified education plan, special education teachers/aides, speech therapy, behavior therapy, occupational/physical therapy, counseling, assistive technology, ABA, social skills groups
- Suspension Rates
- Parent Satisfaction: emotional, academic, & special needs

Results (Continued)
- Urbanicity was significantly related to use of certain special services, with each of the following being more common in suburban, small-medium metro, and rural settings:
  - Behavior therapy ($^2(3)=9.12, p=0.028$)
  - Assistive technology ($^2(3)=13.68, p=0.003$)
  - Applied behavior analysis ($^2(3)=14.34, p=0.002$)
- Social skills training groups ($^2(3)=13.37, p=0.004$)
- Household income was significantly related to social skills groups ($^2(3)=9.85, p=0.02$); Families in the 3rd and 4th quartiles were more likely to receive social skills training/groups.
- Higher suspension rates were significantly associated with smaller urbanicity settings ($^2(3)=13.286, p=0.004$)
- Parent satisfaction with the school’s ability to meet their child’s emotional, academic, and special needs significantly differed by household income, with higher quartiles generally having higher rates of satisfaction

Conclusions
- Children in rural settings had a less varied distribution of school placement, and greater rates of suspension.
- Children in suburban settings, as well as the top two income quartiles, were more likely to receive certain special services compared to the other urbanicity settings and lower income quartiles.
- The proportion of children in public school was relatively equal across all household income quartiles, but there were significant differences by income as to where the rest of the children attended school.
- Parents from the top two income quartiles were more likely to indicate satisfaction with school’s ability to meet their child’s needs.
- These findings point to the need for better educational access for children with ASD who are in lower income quartiles and non-suburban settings

Acknowledgements:
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References:
- Lower rates of suspension were significantly associated with suburban and rural settings.
- Children in suburban settings had a less varied distribution of school placement, and greater rates of suspension.
- Children in suburban settings, as well as the top two income quartiles, were more likely to receive certain special services compared to the other urbanicity settings and lower income quartiles.
- The proportion of children in public school was relatively equal across all household income quartiles, but there were significant differences by income as to where the rest of the children attended school.
- Parents from the top two income quartiles were more likely to indicate satisfaction with school’s ability to meet their child’s needs.
- These findings point to the need for better educational access for children with ASD who are in lower income quartiles and non-suburban settings.

Table 1: School placement by urbanicity, p<0.001

<table>
<thead>
<tr>
<th>Urbanicity</th>
<th>Total</th>
<th>1st Quartile</th>
<th>2nd Quartile</th>
<th>3rd Quartile</th>
<th>4th Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeschool</td>
<td>123 (7.3)</td>
<td>32 (6.6)</td>
<td>46 (9.2)</td>
<td>31 (6.4)</td>
<td>14 (6.9)</td>
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<tr>
<td>Public</td>
<td>1152 (68.8)</td>
<td>285 (63.8)</td>
<td>395 (76.9)</td>
<td>361 (72.2)</td>
<td>116 (75.3)</td>
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<tr>
<td>Private</td>
<td>67 (4.0)</td>
<td>27 (6.2)</td>
<td>17 (3.2)</td>
<td>18 (3.6)</td>
<td>5 (3.2)</td>
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<tr>
<td>Specialized</td>
<td>176 (10.5)</td>
<td>60 (13.7)</td>
<td>73 (13.5)</td>
<td>38 (7.6)</td>
<td>5 (3.2)</td>
</tr>
<tr>
<td>Private/Non-Public</td>
<td>157 (9.4)</td>
<td>43 (9.8)</td>
<td>59 (10.1)</td>
<td>47 (9.4)</td>
<td>8 (5.2)</td>
</tr>
</tbody>
</table>

Table 2: School placement by income quartiles, p<0.001

<table>
<thead>
<tr>
<th>Income Quartile</th>
<th>Total</th>
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<th>2nd Quartile</th>
<th>3rd Quartile</th>
<th>4th Quartile</th>
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</thead>
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<tr>
<td>Homeschool</td>
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<td>56 (12.3)</td>
<td>22 (6.7)</td>
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<td>361 (70.1)</td>
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<tr>
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<td>60 (3.9)</td>
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<td>11 (3.3)</td>
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<tr>
<td>Specialized</td>
<td>154 (10.1)</td>
<td>27 (5.9)</td>
<td>35 (10.6)</td>
<td>53 (10.3)</td>
<td>39 (17.0)</td>
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<tr>
<td>Private/Non-Public</td>
<td>144 (9.4)</td>
<td>54 (11.8)</td>
<td>28 (8.5)</td>
<td>47 (9.1)</td>
<td>15 (6.6)</td>
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