

Geographic Clustering of ADHD in Children

Background

Attention Deficit Hyperactivity Disorder (ADHD) is a prevalent neurodevelopment disorder that typically manifests in early childhood and persists through adulthood. A diagnosis of ADHD is characterized by inattention, hyperactivity, and impulsivity. ADHD is generally diagnosed following concern by a parent, teacher or school official. The exact etiology of ADHD is unknown, but the following factors can contribute to the likelihood of a diagnosis: genetic factors, male gender, environmental factors such as preterm birth and maternal smoking. In addition, biopsychosocial risks such as low income, family dysfunction, and urban residence have also been suggested.

Objective

A study to determine if there is non-random geographic distribution of ADHD diagnosis.

Design

- Cross sectional study
- Children ages 5-17
- Continuity care at primary care clinics in a large integrated medical system
- Eastern Wisconsin
- Presenting 8/16/04 - 8/15/06
 - With ADHD (N = 6,833, 13.5%)
 - Without ADHD (N = 43,630)

Analysis

- Street addresses and demographic data geocoded with Map Marker Plus
- Mapped using ARC-GIS
- CrimeStat III used for spatial modeling, including mapping of ratio of case/control densities
- Univariate analysis: chi-square or Mann-Whitney U test
- Multivariate: binary logistic regression

Results

- All non-white ethnicities less frequently diagnosed with ADHD (p values < 0.01)
- 74% ADHD cases were male
- No apparent relationship to freeways and waterways

Observation

- Statewide, age-adjusted ratio of cases:controls was higher upstate (more rural); in Milwaukee County, ADHD cases overrepresented in south and western suburban school districts, compared to city of Milwaukee
- Statewide, male gender, white race, lower population density and greater distance to nearest park were most predictive of ADHD

Synthesis

- ADHD cases are non-randomly distributed in this Eastern Wisconsin sample.
- Certain suburban school districts may be more aggressive/efficient in referring children for ADHD diagnosis.

PROJECT BRIEF

Limitations

- Single geographic location
- Interviews/records review not conducted

Conclusion

Further studies are needed to confirm these very preliminary findings.

Next Steps

- Linking to state lead screen data
- Linking to Census block data
- Conducting similar analysis in Dane County, WI (currently starting with David Simmons, UWSMPH)

Project Investigators

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Publications/Presentations

Baumgardner, D., Schreiber, A. (2009).
Geographic Analysis of Attention-Deficit/Hyperactivity Disorder in Children: Eastern Wisconsin, USA.
Poster abstract accepted for the Public Health Partners Wisconsin Public Health Association Conference.

Baumgardner, D., Schreiber, A. (2008).
Geographic Analysis of Attention-Deficit/Hyperactivity Disorder in Children: Eastern Wisconsin, USA. Paper presentation at the North American Primary Care Research Group, Rio Grande, Puerto Rico.

Baumgardner, D.J. & Schreiber, A.L. (2008).
Geographic Analysis of ADHD in

Children: Eastern Wisconsin. Rieselbach Distinguished Paper presented at *Aurora Scientific Day*, Milwaukee WI (May).

Baumgardner, D.J., Schreiber, A. (2008).
Geographic Analysis of Attention-Deficit/Hyperactivity Disorder in Children: Eastern Wisconsin, USA.
Presented at the Wisconsin Research and Education Network Forum, Wisconsin Dells, WI.

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