

## PROJECT BRIEF

### 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 pilot study to determine if there is non-random geographic distribution of ADHD in Milwaukee County, Wisconsin.

#### Design

- Cross section study
- Children ages 5-17
- Continuity care at three academic family medicine clinics in Milwaukee County
- Presenting 8/16/04 - 8/15/06
  - With ADHD (N = 80)
  - Without ADHD (N = 1,144)

#### 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 < 0.02)
- 75% ADHD cases were male
- No apparent relationship to parks, freeway, toxic waste sites, and waterways
- Multivariate Analysis

- Zip code of residence and gender were significant risk factors (p values = 0.000)
- Race/ethnicity no longer significant

#### Observation

- ADHD cases overrepresented in south and western suburban school districts, compared to city of Milwaukee
- Cases were 7-fold above expected in zip code adjacent to major airport

#### Synthesis

- ADHD cases are non-randomly distributed in this Milwaukee County sample
- Certain suburban school districts may be more aggressive/efficient in referring children for ADHD diagnosis
- Could environmental features such as airport noise corridors play a role?

#### Limitations

- Sample size
- Single geographic location
- Interviews not conducted

#### Conclusion

Further studies are needed to confirm these very preliminary findings.

#### Project Investigators

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The Center for Urban Population Health is a partnership among the University of Wisconsin School of Medicine and Public Health, the University of Wisconsin-Milwaukee, and Aurora Health Care, Inc. Our mission is advancing population health research and education to improve the health of urban communities.