Prevalence of Developmental Disabilities in the United States, 1997-2004

CA Boyle, S Boulet, L Schieve, RA Cohen S SJ Blumberg, M Yeargin-Allsopp, S Visser, MD Kogan

Centers for Disease Control and Prevention

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the CDC or HRSA
The Problem

- There is a paucity of national data on developmental disabilities (DDs) in U.S. children
- Previous studies
  - 1988 – 17%; 3-17 years
  - 1997-2005 – 13%; 3-17 years
- More recent data suggest higher prevalence for some DDs
  - autism and attention deficit-hyperactivity disorder
- National data on trends in the prevalence of other DDs are lacking
Factors Influencing Trends

- Improved survival
  - preterm, birth defects and genetic disorders
- Medical practice and prevention changes
  - Improved prenatal diagnosis, new infant vaccines, expansion of newborn screening
- Shifts in population risk factors
  - Increase in maternal age
- Increases in awareness/improved diagnosis
Objectives

• To examine the overall prevalence of DD and specific DDs in U.S. children, ages 3-17 years

• To examine trends in prevalence over a 12 year time period (1997-2008)

• To examine how the prevalence and trends varies by key demographic characteristics
Methods -- General

- NCHS’s National Health Interview Survey Data – Child Survey component
- 1997 – 2008; 12 years
- age 3-17 years
- Sample size of 119,367; approximately 11,000 children/yr
- Information obtained from in-person interviews with parent or other knowledgeable person
- Response rate: 88.1% / 91.2%
Specific Developmental Disabilities

- Attention deficit-hyperactivity disorder
- Autism
- Blindness
- Cerebral palsy
- Moderate to profound hearing loss (without aids)
- Learning disability
- Mental retardation (intellectual disability)
- Seizures
- Stammering/stuttering
- Other developmental delay
Methods – DD Definitions

• Affirmative response to Q:
  • “Has a doctor or other health-care provider ever told that [child’s name] has [DD]?”

• Time frame:
  • “ever” --- for the majority of the disorders
  • “past 12 months” – seizures and stammering/stuttering
  • “currently” --- blindness and m-p hearing loss
Methods – Covariates

- Child age, sex and race/ethnicity, mother’s education, total family income, health insurance status
Methods -- Analysis

- Prevalence and SEs weighted to reflect the U.S. population
- SEs adjusted to account for sampling design
- Examined prevalence for 12 year time period combined
- Temporal trends for 4 time periods:
### Results—Overall Prevalence

<table>
<thead>
<tr>
<th>Disability</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any DD</td>
<td>13.9</td>
</tr>
<tr>
<td>ADHD</td>
<td>6.7</td>
</tr>
<tr>
<td>Autism</td>
<td>0.5</td>
</tr>
<tr>
<td>Blind/unable to see at all</td>
<td>0.1</td>
</tr>
<tr>
<td>Cerebral palsy</td>
<td>0.4</td>
</tr>
<tr>
<td>Moderate to profound hearing loss</td>
<td>0.5</td>
</tr>
<tr>
<td>Learning disability</td>
<td>7.0</td>
</tr>
<tr>
<td>Intellectual disability</td>
<td>0.7</td>
</tr>
<tr>
<td>Seizures</td>
<td>0.7</td>
</tr>
<tr>
<td>Stammering/stuttering</td>
<td>1.6</td>
</tr>
<tr>
<td>Other developmental delay</td>
<td>3.7</td>
</tr>
</tbody>
</table>
### Male/Female Ratio

<table>
<thead>
<tr>
<th>Disability</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any DD</td>
<td>1.9*</td>
</tr>
<tr>
<td>ADD/ADHD</td>
<td>2.5*</td>
</tr>
<tr>
<td>Autism</td>
<td>3.8*</td>
</tr>
<tr>
<td>Blindness</td>
<td>1.6</td>
</tr>
<tr>
<td>Cerebral palsy</td>
<td>1.0</td>
</tr>
<tr>
<td>Hearing loss</td>
<td>1.5</td>
</tr>
<tr>
<td>Learning disability</td>
<td>1.8*</td>
</tr>
<tr>
<td>Intellectual disability</td>
<td>1.2</td>
</tr>
<tr>
<td>Seizures</td>
<td>1.2</td>
</tr>
<tr>
<td>Stutter or stammer</td>
<td>2.5*</td>
</tr>
<tr>
<td>Other DD</td>
<td>1.8*</td>
</tr>
</tbody>
</table>

* P > 0.05

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**Why?**

- **Biologic/genetic:** X-linked
- **Cultural incentive for greater case finding in boys vs. girls**
- **Sex-specific presentation:** ADHD example
Race/ethnicity

- Hispanics: lower prevalence of several disorders including ADHD, learning disabilities, and other developmental delay

*May reflect access to care, insurance coverage, language barriers*
Socioeconomic Factors

• Maternal education, poverty and public insurance status:
  • Higher prevalence of ‘any DD’
  • ADHD, learning disabilities, intellectual disabilities, seizures, stuttering/stammering, other developmental delays
  • Health insurance status most pervasive risk factor

May reflect eligibility for Medicaid for children with disabilities
Table 3. Trends in Prevalence of Specific Developmental Disabilities in Children Ages 3-17 Years
National Health Interview Survey 1997-2008
## Changes in DD Prevalence

<table>
<thead>
<tr>
<th>Condition</th>
<th>1997-1999</th>
<th>2006-2008</th>
<th>Percent change *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any DD</td>
<td>12.8</td>
<td>15.0</td>
<td>17</td>
</tr>
<tr>
<td>Autism</td>
<td>0.2</td>
<td>0.7</td>
<td>289</td>
</tr>
<tr>
<td>ADHD</td>
<td>5.7</td>
<td>7.6</td>
<td>33</td>
</tr>
<tr>
<td>Other dev. delay</td>
<td>3.4</td>
<td>4.2</td>
<td>25</td>
</tr>
<tr>
<td>Hearing loss</td>
<td>0.6</td>
<td>0.4</td>
<td>-31</td>
</tr>
</tbody>
</table>

* p-value (test of trend) <0.05
Major Conclusions

- Nearly 10 million children in U.S. were reported to have a DD in the most recent time period
- 17% increase over the 12 year time period
- 1.8 million more children with DDs relative to a decade earlier
- Due to changes in autism, ADD/ADHD, other developmental delays
DD Specific Trends

- Autism – corroborated trends in other systems
- ADHD -- limited data
  - Office-based visits and education data (‘other hlth impaired’) – also showed increases
- Hearing loss – no previous data
  - Slight modification to hearing loss categories
- Other developmental delay – education change in 1997
  - Allowed the use of the dd category for children up to age 9 years
Why Increases in ADHD and Autism?

- Advantages of early intervention for autism
- Improvements in clinical, parent, and societal recognition
- Efficacy of medications and behavior interventions for ADHD
- Increase in the prevalence of prenatal and other risk factors (e.g., parental age)
- Societal shift in the acceptance and de-stigmatization
## Strengths and Challenges

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Challenges</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>National picture</td>
<td>Parent reporting</td>
</tr>
<tr>
<td>Same set of questions</td>
<td>Chronicity of the disorder</td>
</tr>
<tr>
<td>Exemplary response rate</td>
<td></td>
</tr>
</tbody>
</table>
Implications

- Direct bearing on the need for health, education and social services including impact on caregivers
- Continued monitoring of risk factor shifts, changes in acceptance and benefits of early services