

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:
 - 1997-1999, 2000-2002, 2003-2005, 2006-2008



Results– Overall Prevalence

Disability	Prevalence
Any DD	13.9 ←
ADHD	6.7
Autism	0.5
Blind/unable to see at all	0.1
Cerebral palsy	0.4
Moderate to profound hearing loss	0.5
Learning disability	7.0
Intellectual disability	0.7
Seizures	0.7
Stammering/stuttering	1.6
Other developmental delay	3.7

Male/Female Ratio

Any DD	1.9*
ADD/ADHD	2.5*
Autism	3.8*
Blindness	1.6
Cerebral palsy	1.0
Hearing loss	1.5
Learning disability	1.8*
Intellectual disability	1.2
Seizures	1.2
Stutter or stammer	2.5*
Other DD	1.8*

* P>0.05

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

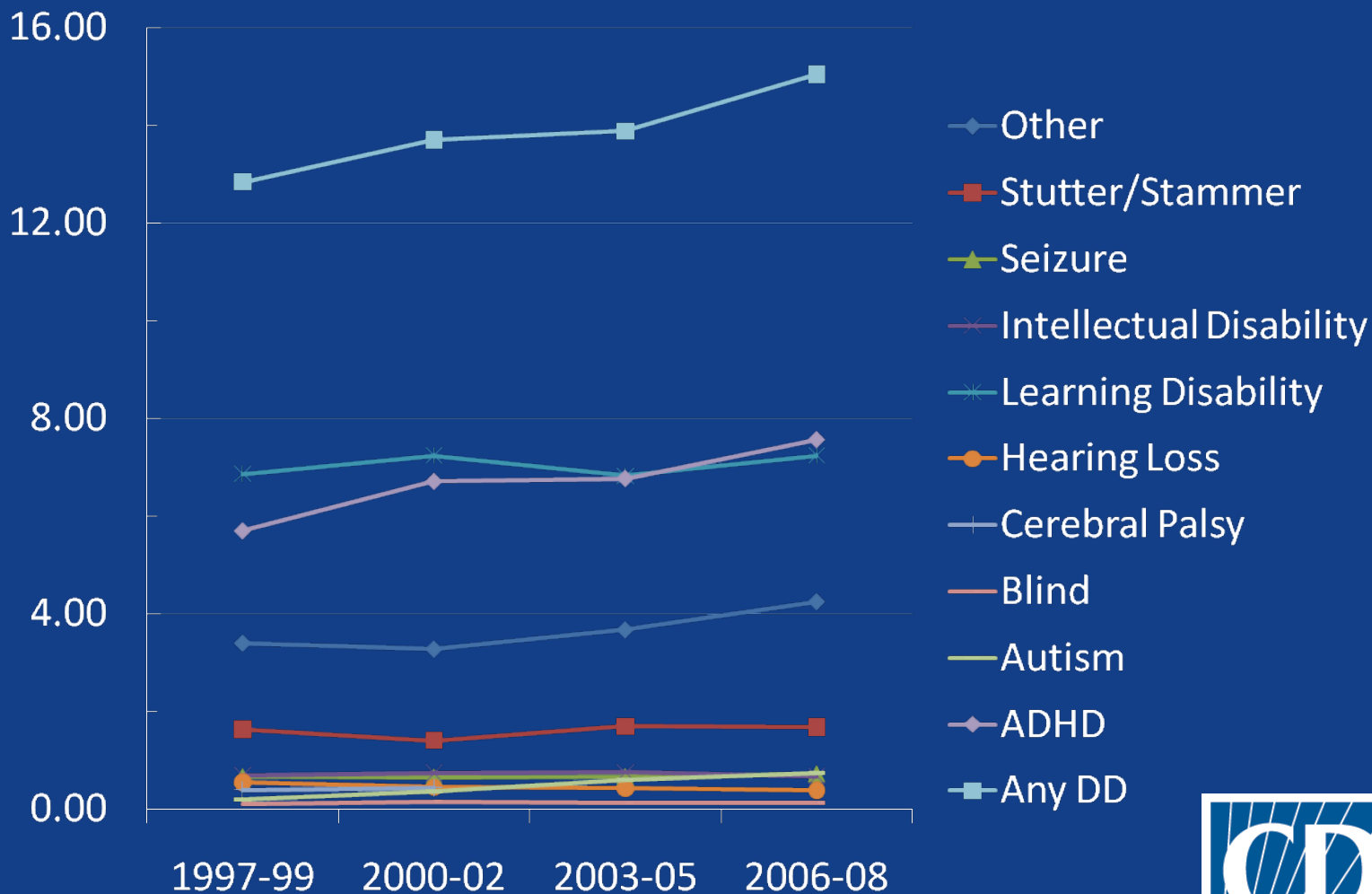
- Maternal education, poverty and public insurance status:
 - Higher prevalence of ‘any DD’
 - ADHD, learning disabilities, intellectual disabilities, seizures, stuttering/stammering, other developmental delays
 - Health insurance status most pervasive risk factor

*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

	1997-1999	2006-2008	Percent change *
Any DD	12.8	15.0	17
Autism	0.2	0.7	289
ADHD	5.7	7.6	33
Other dev. delay	3.4	4.2	25
Hearing loss	0.6	0.4	-31

* 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
 - CDC ADDM (2008), HRSA Nat'l Survey of Children's Hlth (2007)
- 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

Strengths

- National picture
- Same set of questions
- Exemplary response rate

Challenges

- Parent reporting
- Chronicity of the disorder



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

