Trends in the Prevalence of Developmental Disabilities in US Children, 1997–2008

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The Problem

- There was a paucity of national data on developmental disabilities (DDs) in US children
- Recent data with focused samples suggest higher and growing prevalence for some DDs
  - Autism and attention-deficit/hyperactivity disorder
- National data on trends in the prevalence of other DDs were 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
  - Increases in maternal age ↑
- Increases in awareness, improved diagnosis ↑↓

Objectives

- To examine the overall prevalence of DD and specific DDs in US children, ages 3-17 years
- To examine trends in prevalence over a 12-year period (1997-2008)
- To examine how the prevalence and trends vary by key demographic characteristics

National Health Interview Survey

- Fielded continuously since 1957 to:
  - Collect data on the health status of the US population
  - Address specific issues of current public health concern
  - Provide estimates for monitoring trends
- Target is the US noninstitutionalized civilian population
- In-person interviews conducted by Census Bureau
- Oversample of black and Hispanic households
- High response rates
  - Average 88.3% for household interview
  - Average 91.2% for sample child interview

NHIS Structure

- Household Core
  - Demographic info on all household members
- Family Core
  - General info on all family members
- Sample Adult Core
  - One randomly selected adult
- Sample Child Core
  - One randomly selected child
  - Respondent is parent or other knowledgeable person

Sources for demographics, general health status, and insurance coverage

Source for health conditions, limitations, health care access and utilization, and mental health

Specific Developmental Disabilities

- Attention-deficit/hyperactivity disorder
- Autism
- Blind, unable to see at all
- Cerebral palsy
- Mental retardation (intellectual disability)
- Learning disability
- Moderate to profound hearing loss (without aids)
- Seizures
- Stammering/stuttering
- Other developmental delay

Developmental Disability Definitions and Time Frames

- For most disabilities, affirmative response to:
  - "Has a doctor or other health care provider ever told you that [*child's name*] has [*specific DD*]?"
- For seizures and stammering/stuttering:
  - "During the past 12 months, has [*child's name*] had [*specific DD*]?"
- For blindness and hearing loss:
  - "Is [*child's name*] blind or unable to see at all?"
  - "Which statement best describes [*child's name*]'s hearing without a hearing aid? Excellent, good, a little trouble hearing, moderate trouble, a lot of trouble, or deaf?"

Analysis Plan

- Estimates produced for children aged 3-17 years
  - Total sample size for 1997-2008: 119,367
  - Approximately 11,000 children per year
  - Weighted to represent the US population of children
  - Standard errors adjusted to account for sample design
- Examined prevalence for 12-year time period
- Temporal trends evaluated by considering four time periods:
  - 1997-1999; 2000-2002; 2003-2005; 2006-2008

Overall Prevalence

for Noninstitutionalized US Children 3-17 Years

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

Male/Female Ratio

Disability	*Ratio*
Any developmental disability	*** 1.9 ***
ADHD	*** 2.5 ***
Autism	*** 3.9 ***
Blind, unable to see	1.6
Cerebral palsy	1.0
Intellectual disability	1.2
Learning disability	*** 1.8 ***
M-p hearing loss	1.5
Seizures	1.2
Stammering/stuttering	*** 2.5 ***
Other developmental delay	*** 1.8 ***

May Be Due To:

Biologic/genetic cause: X-linked

Cultural incentive for greater case findings in boys vs. girls

Sex-specific presentation: ADHD

Race/Ethnicity Ratios

Relative to Non-Hispanic White Children

Disability	*NH Black*	*Hispanic*
Any disability	1.0	*** 0.7 ***
ADHD	0.8	*** 0.5 ***
Autism	0.8	0.6
Blind, unable to see	1.1	1.3
Cerebral palsy	0.9	0.8
Intellectual disability	1.7	1.1
Learning disability	1.0	*** 0.7 ***
M-p hearing loss	0.8	0.6
Seizures	1.4	0.9
Stammering/stuttering	*** 2.1 ***	1.5
Other delay	0.9	*** 0.7 ***

May Be Due To:

Access to care

Insurance coverage

Language barriers

Maternal Education and Income Ratios

Relative to College Graduates and Higher Incomes

Disability	*Less than HS*	*Poor or Near Poor*
Any disability	*** 1.3 ***	*** 1.3 ***
ADHD	1.0	1.1
Autism	0.4	0.9
Blind, unable to see	2.3	1.5
Cerebral palsy	0.8	1.2
Intellectual disability	1.9	*** 2.1 ***
Learning disability	*** 1.7 ***	*** 1.4 ***
M-p hearing loss	2.0	2.0
Seizures	1.6	1.8
Stammering/stuttering	*** 2.7 ***	*** 2.2 ***
Other delay	1.0	*** 1.4 ***

May Be Due To:

Access to care

Insurance coverage

Health Insurance Ratios

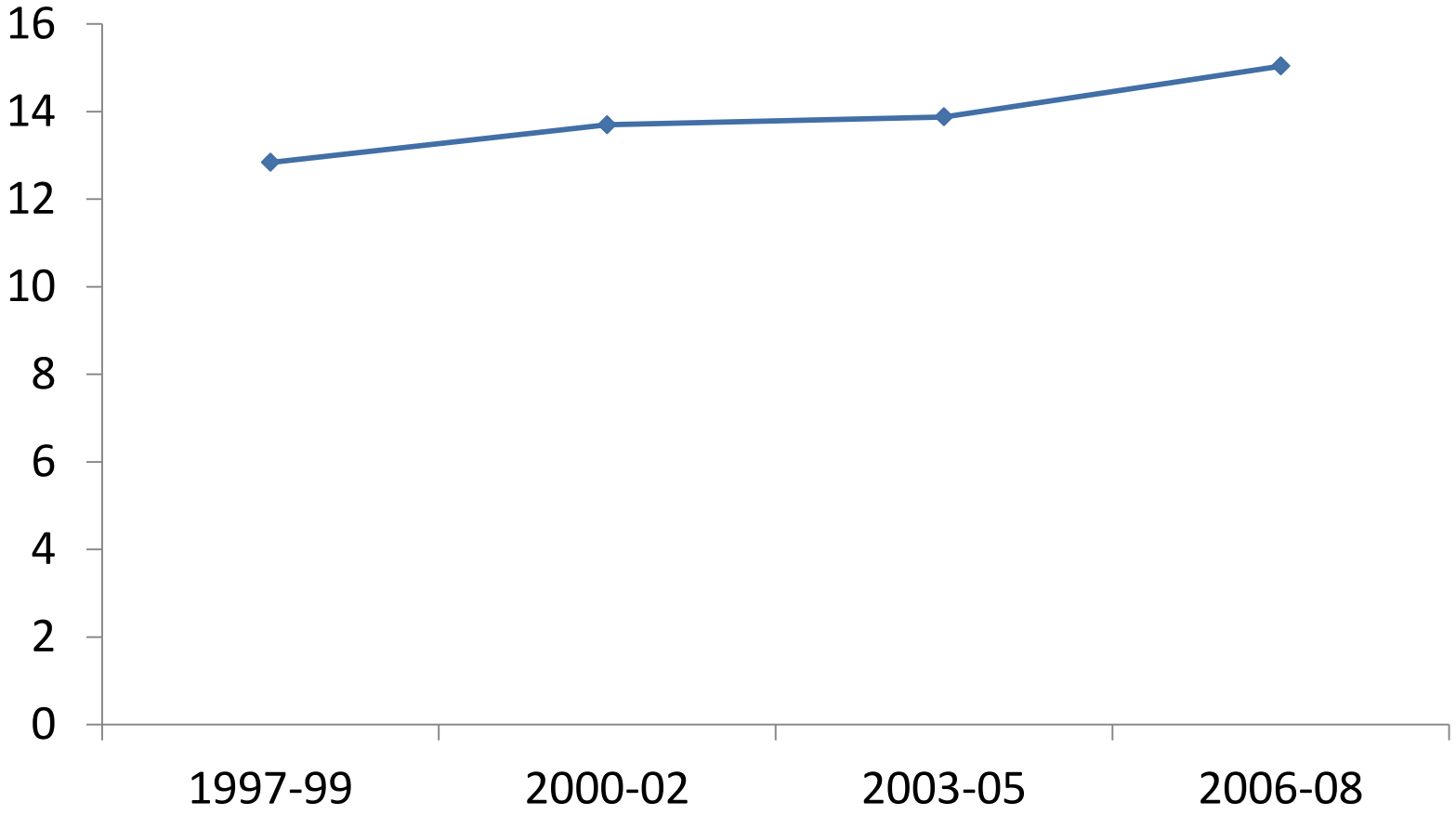
Relative to Privately Insured Children

Disability	*Medicaid or CHIP*	*Not Insured*
Any disability	*** 1.7 ***	1.0
ADHD	*** 1.6 ***	0.8
Autism	1.5	0.4
Blind, unable to see	1.7	1.7
Cerebral palsy	1.0	0.5
Intellectual disability	*** 3.8 ***	0.9
Learning disability	*** 1.8 ***	1.0
M-p hearing loss	2.3	1.3
Seizures	*** 2.7 ***	0.9
Stammering/stuttering	*** 2.9 ***	1.5
Other delay	*** 2.0 ***	0.8

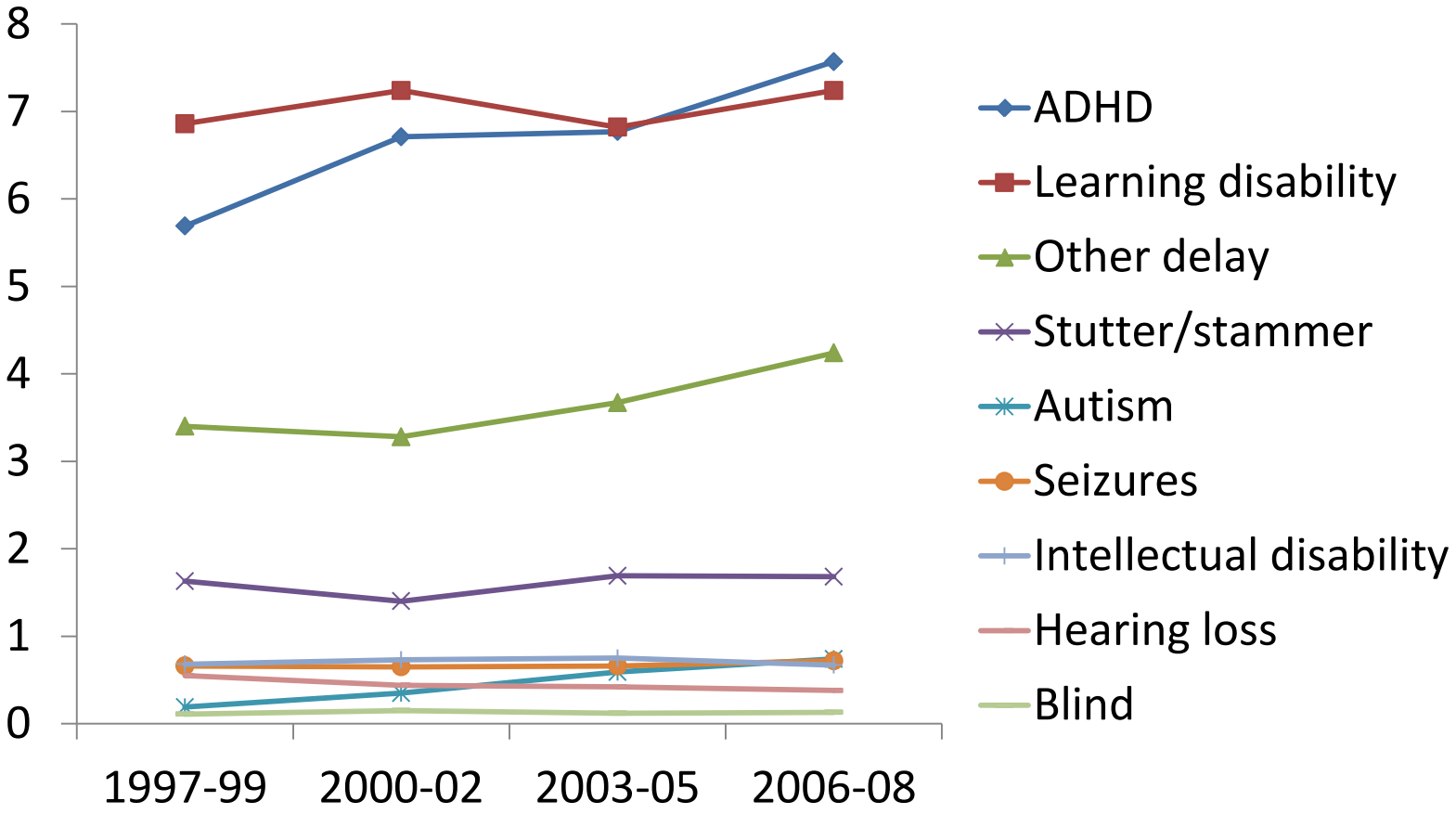
May Be Due To:

Eligibility for Medicaid for children with disabilities

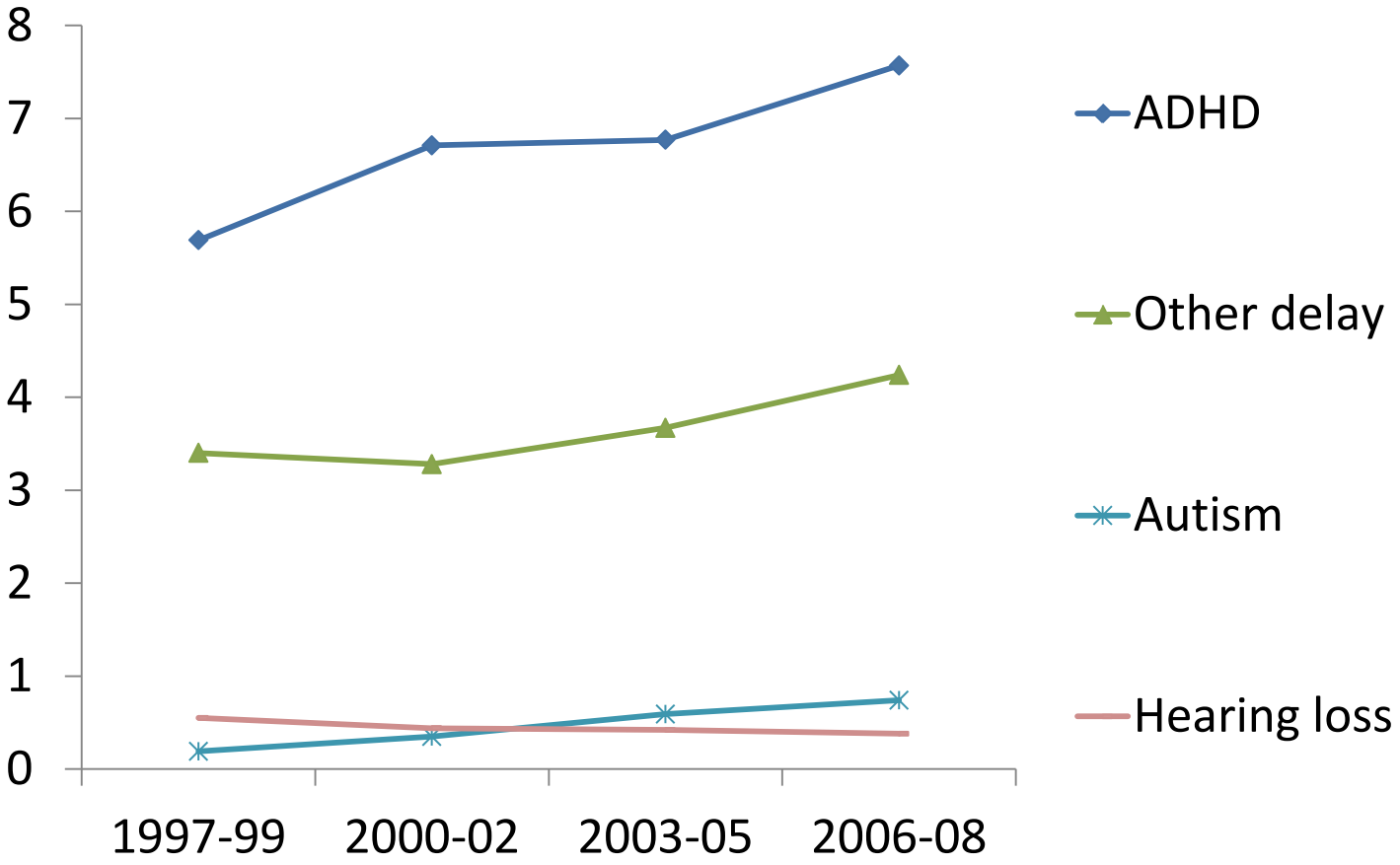
Trends in Prevalence of Any Developmental Disability



Trends in Prevalence of Specific Developmental Disabilities



Statistically Significant Trends



Major Conclusions

- Nearly 10 million children in US were reported to have a DD in 2006-2008
- 17% increase over the 12-year time period
  - 1.8 million more children with DDs relative to a decade earlier
  - Due largely to changes in autism, ADHD, and other developmental delays

Why Increases in ADHD and Autism?

- Corroborated trends in other systems
  - Autism: ADDM, NSCH
  - ADHD: Office-based visits and education data
- Known efficacy of interventions
  - Early identification and intervention for autism
  - Medications and behavioral interventions for ADHD
- Increase in prevalence of prenatal and other risk factors
- Societal shift in acceptance and de-stigmatization

Why Changes in Hearing Loss and Other Developmental Delay?

- Hearing loss – no previous data
  - Slight modification to hearing loss categories
- Other developmental delay
  - Education change in 1997 allowed use of the delay category for children up to age 9 years

Strengths and Challenges

Strengths

- National picture
- Same questions over time
- High response rate

Challenges

- Errors due to parent reporting of conditions
- Chronicity of the disabilities

Implications

- Increases in developmental disabilities can impact:
  - Need for health, education, and social services
  - Need for specialized mental health services
  - Burden on families and caregivers

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