Attention Deficit/Hyperactivity Disorder:
Available Information on Impact and Gaps/Variations in Care

Impact of Topic

Prevalence:

- In a study by Visser et al, researchers found that in 2007, the estimated prevalence of parent-reported ADHD (ever) among children aged 4--17 years was 9.5%, representing 5.4 million children. Of those with a history of ADHD, 78% (4.1 million, or 7.2% of all children aged 4--17 years) were reported to currently have the condition. Of those with current ADHD, nearly half (46.7%) had mild ADHD, with the remainder having moderate (39.5%) or severe (13.8%) ADHD. ADHD (ever) was more than twice as common among boys as girls (13.2% versus 5.6%). High rates of ADHD (ever) were noted among multiracial children (14.2%) and children covered by Medicaid (13.6%) (Visser, et al).

- Nearly one in 10 children aged 4--17 years diagnosed with ADHD by 2007. The overall estimate for the prevalence of children with a history of ADHD diagnosis in 2007 was higher than a recent estimate (8.4% of children aged 6--17 years) based on annual data from the 2004--2006 National Health Interview Survey (NHIS) (*2*). The NHIS report documented an average annual increase in diagnosed ADHD (ever) of 3% from 1997 to 2006; this present report documents a greater average annual increase (5.5%) over a slightly later period (2003--2007) (Visser, et al).

- A study by Rowland et al estimated the prevalence of medication treatment for attention deficit–hyperactivity disorder (ADHD) among elementary school children in a North Carolina county. The method was Parents of 7333 children in grades 1 through 5 in 17 public elementary schools were asked whether their child had ever been given a diagnosis of ADHD by a psychologist or physician and whether their child was currently taking medication to treat ADHD. Parents of 6099 children (83%) responded. Observations from this study suggest that the prevalence of medication treatment for ADHD is higher among boys than among girls and higher among whites than among African Americans (Rowland, et al)

Morbidity:

- ADHD has a multidimensional effect on an individual's daily life functioning, and can culminate in significant costs attributable to greater health-care needs, more frequent unintentional injury, co-occurring psychiatric conditions and productivity losses. ADHD medications can reduce symptoms, but might be associated with side effects and symptoms effecting morbidity (Visser, et al).

Costs:

- Each child with ADHD costs $1954 per year, and there are potential medical and work-time cost savings achievable by eliminating disparities, which would equal $660 million in savings per year (Scheffler, et al).

- Reductions in reading and math test scores for children with ADHD can lead to an increase in the probability of dropping out of high school. This would in turn have an effect on wages impacting the entire direct cost of ADHD. Mental health problems are 1 of the leading causes of days lost in the workplace. Therefore, mental health problems beginning in childhood may have a significant effect on productivity in society (Currie, et al).

Medication Use:

- In 2000, a survey conducted among school nurses in Maryland reported that 3.7% of all public elementary school children took ADHD medication at school. (Rowland, et al)

Disparities:

- In the aforementioned study by Visser, et al comparing ADHD prevalence data between 2003 and 2007, rates of increase were highest among older teens, multiracial and Hispanic children, in addition to children with a primary language other than English. A notable correlation was identified for age and survey year, with the rate of ADHD diagnosis increasing more for the oldest age group, namely 15-17 years (Visser, et al).

Gaps/Variations in Care

Disparities:

- A parent survey by Rowland et al evaluated the prevalence of ADHD medication treatment in a population of children grades 1-5 in 17 public elementary schools in a North Carolina county. Parents were asked if their child had ever been given a diagnosis of ADHD by a psychologist or physician and whether their child was currently taking medication to treat ADHD. Parents of 6099 children (83%) responded to the survey. Results showed that Hispanic children were the least likely to have been given an ADHD diagnosis or to be receiving medication treatment for ADHD (Rowland, et al). This was true also for African American children, compared to white children with ADHD who were receiving medication treatment. This suggests barriers to care for specific populations, including less access to medical providers, less health insurance coverage, and less ability to pay for medication. Language and cultural differences may also impact treatment decisions (Rowland, et al).

Prescribing habits:

- The use of stimulant medications in the United States has risen and as a result there is concern over the potential for over diagnosis of ADHD and the potential for overuse of medications. A study by Sheffler et al reveal that the United States is the world's largest consumer of ADHD medications. Factors which may influence this finding are direct to consumer advertising and the number of U.S. medical specialists who are able to diagnose and treat ADHD. Notably, little difference exists in the rates of ADHD between the United States and other countries. However, the rates of "diagnostic prevalence" (namely, cases actually diagnosed by clinicians) fall behind true prevalence outside the United States (Scheffler, et al).

Physician opinion on treating ADHD:

- A study by Stein, et al aims to evaluate physician opinion on identifying and/or treating children with mental illness. The results showed that pediatricians are least likely to agree on identifying and treating learning problems. Of the physicians surveyed, 66% think pediatricians should treat or manage ADHD. In practice few usually inquire about conditions surveyed except for ADHD. Few report they usually treat, except ADHD 54%. Lastly and notably, more recently trained physicians were not more likely to treat mental health conditions (Stein, et al).

Variations in Care:

- A cross sectional survey by Froehlich et al evaluates a nationally representative sample of the US population from 2001 to 2004. The participants more specifically included 8 to 15-year-old children in the National Health and Nutrition Examination Survey. The Diagnostic Interview Schedule for Children was used to measure the presence of ADHD in the past year based on DSM-IV criteria. The results showed that **those lacking DSM-IV ADHD data were significantly more likely to be younger (mean age, 9.9 years vs 12.1 years), poorer (lowest income quintile, 24.9% vs 18.9%), and African American (17.0% vs 14.7%).** Additionally, less than half of children who met DSM-IV criteria for ADHD had reportedly had their conditions diagnosed or been treated with ADHD medications. Thus, it seems the case that even when children are diagnosed with ADHD there is not always the appropriate follow up of treatment. Lastly, the researchers noted a lower likelihood of consistent medication use in the poorest children, suggesting inequity across ADHD diagnosis and treatment (Froehlich, et al).

- A study by Hoagwood et al examines knowledge on treatment services for children and adolescents with ADHD between 1989 to 1996. The researchers found that increases in stimulant prescriptions have taken place since 1989. Particularly, prescriptions now represent three fourths of all visits to physicians by children with ADHD. Between 1989 and 1996, services including health counseling grew 10-fold, and diagnostic services grew 3-fold. By contrast, psychotherapy decreased from 40% of pediatric visits to 25%. Notably, follow-up care diminished from more than 90% of visits to 75%. Family practitioners were more likely than either pediatricians or psychiatrists to prescribe stimulants and less likely to utilize diagnostic services, engage in follow-up care and mental health counseling (Hoagwood, et al).

- About 50% of children with ADHD seen in practice settings obtain care that matches guidelines of the American Academy of Child and Adolescent Psychiatry. Physicians identify critical barriers to service provision for these children, namely lack of pediatric specialists, insurance coverage, and waiting lists. The aforementioned trends in treatment and physician variations in service delivery suggest there may be major gaps between the research base and clinical practice (Hoagwood, et al).

- A study by Gardner, et al suggests that children treated for ADHD require additional follow-up visits to measure the impact of medication and support ongoing treatment. The survey included families of children 4 to 15 years of age who had been diagnosed with ADHD. In the initial office visit, parents and clinicians completed questionnaires, and six months after the initial visit, parents completed a second questionnaire. Children identified with ADHD, including those prescribed medication, had a median of only one

follow-up visit with a health specialist. Researchers noted that this is too few visits to allow for medication adjustment or promote adherence to treatment (Gardner, et al).

- The MTA or Multimodal Treatment Study of Children With ADHD looks at the longer term outcomes for ADHD treatment of 579 children from age 7-9.9. years. The aforementioned children had a diagnosis of ADHD and for the purpose of the trial were randomly assigned to one of four intervention groups: intensive multicomponent behavior therapy (Beh), intensive medication management (MedMgt), the combination (Comb), and routine community care (CC).
- Results were recorded over several years. According to Jensen, et al, at 24 months, the primary (intent to treat) analyses illustrated modest improvements, and after 36 months there was little difference in comorbid conditions and rates of diagnosis. However, at 36 months 71% of Comb and MedMgt participants were using medication at high levels compared to 62% and 45% of CC and Beh participants, respectively.
- Jensen, et al also point out that both medication and educational services for 24 and 36 months were indicators of poorer outcome at 36 months. This poses the question of whether those who are doing poorly get more treatment yet still do not improve compared to the patients for whom treatment is necessary (Jensen, et al).

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