

## Prevalence and Incidence of AD/HD

by Sam Goldstein, PhD

**THE QUESTION OF EPIDEMIOLOGY,** or incidence and prevalence, is among the most frequently debated issues regarding AD/HD. There are particular implications for the use of the terms incidence and prevalence. Incidence refers to the number of individuals in a specified population in whom the condition begins within a specified time period, such as five years. Prevalence refers to the number of individuals in a specified population who have the condition at a specified time, such as on a particular day, regardless of when the condition began. Incidence and prevalence are equally important yet often misunderstood issues when discussing the history and nature of AD/HD. Each may be more or less useful depending upon aspects of the condition studied.

Incidence is particularly important to appreciate the pattern of increasing diagnosis and treatment for AD/HD over the past twenty years. Prevalence is equally important to helping us understand the true numbers of individuals with AD/HD across the lifespan. Incidence is much easier to measure than prevalence. For conditions such as AD/HD, prevalence may vary as the clinical and psychiatric descriptions of the condition vary. Thus, it is not surprising that over the last twenty-five years the prevalence of AD/HD has been suggested as between 2 percent and 15 percent, with a steadily increasing incidence every year, while the incidence has steadily increased every year. The recent articles summarized here addressed the issues of prevalence and incidence in AD/HD.

► **Barbaresi, W.J., Katusic, S.K., Colligan, R.C., Pankratz, V.S., Weaver, A.L., Weber, K.J., Mrazek, D.A., & Jacobsen, S.J. (2002). How common is attention-deficit/hyperactivity disorder? Incidence in a population-based birth cohort in Rochester, Minnesota. *Archives Pediatric Adolescent Medicine, 156(3), 209-210.***

These authors sought to determine the “cumulative incidence” (prevalence) of AD/HD in a population-based birth cohort and to estimate the prevalence of pharmacologic treatment for children who fulfill research criteria for AD/HD. All children born between 1976 and 1982 in Rochester, Minnesota, remaining in the community after five years of age (over 5,000 subjects) had their medical and school records reviewed for clinical diagnoses of AD/HD and supporting documentation. The highest estimate of the cumulative incidence at age nineteen was 16 percent. The lowest estimate was 7.4 percent. Prevalence of treatment with stimulant medication was 86.5 percent for those with definite AD/HD, 40 percent for those with probable AD/HD. The authors suggest their results provide insight into the apparent discrepancies in estimates of the occurrence of AD/HD with less stringent criteria resulting in higher cumulative incidence. Children who met the most stringent criteria for AD/HD were most likely to receive medication treatment.

► **Barkley, R., Fischer, M., Smallish, L., & Fletcher, K. (2002). The persistence of ADHD into young adulthood as a function of reporting source and definition of disorder. *Journal of Abnormal Child Psychology, 111(2), 279-289.***

The question of accuracy in self-report for AD/HD symptoms was the basis of this study, part of a longitudinal follow-up of children with AD/HD into their adult years. Based upon self-report, the incidence of AD/HD was only 5 percent. However, the incidence was considerably higher when based on parental reports, nearly 50 percent. When a developmental criterion of two standard deviations above the control mean was used to determine presence of disorder in adulthood, presence increased to 12 percent based upon self-report and 66 percent based upon parent report. Parent reports were found to be more strongly associated with major life outcome than were self-reports. The authors concluded that previous follow-up studies relying on self-report alone might have substantially underestimated the persistence of AD/HD into adulthood. They note further that higher rates of the disorder can be measured using a developmental standard rather than the DSM criteria for the disorder.

► **Castle, L., Aubert, R.E., Verbrugge, R.R., Khalid, M., & Epstein, R.S. (2007). Trends in medication treatment for ADHD. *Journal of Attention Disorders, 10(4), 335-342.***

These authors examined demographic trends in the use of medication to treat AD/HD in adult and pediatric populations. They used pharmacy claims data for a large population of commercially insured Americans. They evaluated prevalence of drug use from 2000 to 2005 to treat AD/HD. In 2005, 4.4 percent of children up to the age of 19 and 0.8 percent of adults twenty and older used AD/HD medications. Treatment rates were higher in boys (6.1 percent) than girls (2.6 percent) but the rates for men and women were approximately equal (0.8 percent).

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During the period of this study, incidence of treatment increased rapidly (11.8 percent per year) for the population as a whole. Treatment rates grew more rapidly for adults than for children, more rapidly for women than for men and more rapidly for girls than for boys.

► **Cuffe, S.P., McKeown, R.E., Jackson, K.L., et al. (2001). Prevalence of ADHD in a community sample of older adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 40(9), 1037-1044.***

Between 1986 and 1988, nearly 3,500 middle school students were screened based upon symptom severity with the schedule for affective disorders and schizophrenia in school-age children. This study utilized DSM III diagnostic criteria. The authors report the incidence of AD/HD as 2.62 percent in males and 0.54 percent in females. The authors also reported that AD/HD was comorbid with affective disorders. Of interest in this study was that nearly 2 percent of the general population additionally met symptom criteria for AD/HD but lacked the age of onset criterion. Based upon these data, the authors suggest that clinicians should consider correcting for the decline in symptoms of AD/HD during development, carefully evaluate the age of onset of symptoms, even if significant impairment was not reported and con-

## What Have We Learned?

- › Incidence and prevalence yield different, equally important statistics concerning AD/HD.
- › Varying the stringency of the criteria used for a diagnosis of AD/HD varies the incidence, with less stringent criteria yielding a higher level of incidence.
- › As diagnostic criteria change the prevalence of AD/HD varies, complicating accurate measurement across the lifespan.
- › The majority of children being treated for AD/HD present with a full set of symptoms meeting the diagnosis. Less than half of children with a probable set of symptoms appear to be receiving medication treatment. Finally, a very small number (below 10 percent) are being treated with medication with a questionable diagnosis or less.
- › Self-report measures may underestimate the prevalence and incidence of AD/HD.
- › The development of AD/HD symptoms appears to be a common outcome for children with histories of traumatic brain injury, raising the question concerning etiology, or cause, as a diagnostic criteria for AD/HD.
- › Approximately 4 percent to 5 percent of the childhood population is currently being treated for AD/HD. There has been a steady increase in incidence and treatment for AD/HD every year for at least the last ten years.
- › It appears that in residential settings for adults with serious psychiatric problems the incidence of AD/HD may be low for reasons that have yet to be identified.

sider the high comorbidity rates present in populations of youth with AD/HD.

► **Havey, J.M., Olson, J.M., McCormick, C., & Cates, G.L. (2005). Teachers' perceptions of the incidence and management of attention-deficit hyperactivity disorder. *Applied Neuropsychology, 12(2), 120-127.***

This study examined teacher perceptions on the causes, incidence and appropriate treatment methods of AD/HD. Results demonstrated that teachers were likely

to identify children as having AD/HD at rates higher than the expected prevalence rates specified in DSM-IV. Out of 121 rating scales analyzed, nearly 24 percent of students were identified by teachers as meeting criteria for one of three types of AD/HD. Males had significantly higher scores than females. Hispanics had higher scores than other groups. Class size was also associated with the likelihood that teachers would identify more than 5 percent of their students as having AD/HD. The authors suggest that despite increasing

evidence of a connection between biological factors and AD/HD, environmental factors such as class size and culture appeared to also influence teachers' perceptions about which students have the disorder.

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► **Kenemer, K., & Goldstein, S. (2005). Incidence of ADHD in adults with severe mental health problems. *Applied Neuropsychology, 12(2), 77-82.***

These authors sought to determine the incidence rates of AD/HD and comorbid disorders in an adult inpatient psychiatric setting. Patient charts were reviewed from a state hospital in the western United States. Of the 292 persons served in 2002, only six received a diagnosis of AD/HD. Of these patients, two received additional diagnoses for major depression, one for generalized anxiety and one for bipolar disorder. Five of the six participants had a history of substance abuse and four were diagnosed with personality disorders. None of the six diagnosed with AD/HD received a diagnosis of learning disability. A variety of non-stimulant medications were utilized to treat these patients. Prevalence, comorbidity, implications for future research regarding adult AD/HD in this population are discussed.

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► **Max, J.E., Schachar, R.J., Levin, H.S., Ewing-Cobbs, L., Chapman, S.B., Dennis, M., Saunders, A., & Landis, J. (2005). Predictors of secondary attention-deficit/hyperactivity disorder in children and adolescents 6 to 24 months after traumatic brain injury. *Journal of the American Academic of Child and Adolescent Psychiatry, 44(10), 1041-9.***

Over the last ten years, these authors have followed groups of children with traumatic brain injury assessing for the incidence and onset of AD/HD. In this sample of 143 consecutive admissions to five trauma centers, children from five to fourteen years of age without a pre-injury history of AD/HD were observed prospectively following a traumatic brain injury for a twenty-four month period. Secondary AD/HD occurred in 15 of 103 participants between six and twelve months after injury and 17 of 82 participants in the second year after injury. Secondary AD/HD was significantly comorbid with personality change due to traumatic brain injury and new onset disruptive behavior disorders. Pre-injury adaptive functioning was a consistent predictor of secondary AD/HD. Regression analyses revealed that pre-injury psychosocial adversity was an independent predictor of secondary AD/HD in the second year following injury. Neither severity of injury nor lesion location predicted secondary AD/HD through the twenty-four month study period.

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► **Cho, S.C., Kim, B.N., Kim, J.W., Rohde, L.A., Hwang, J.W., Chung, D.S., Shin, M.S., Lyoo, I.K., Go, B.J., Lee, S.E., Kim, H.W. (2008). Full syndrome and subthreshold attention-deficit/hyperactivity disorder in a Korean community sample: comorbidity and temperament findings. *European Child and Adolescent Psychiatry, 18(7), 447-457.***

This study sought to investigate comorbid disorders and profiles of temperament in children with full syndrome and subthreshold AD/HD. A sample of nearly 3,000 children was randomly selected from six representative elementary schools in Seoul, Korea. Prevalence rates of full syndrome and subthreshold AD/HD were respectively 5.9 percent and 9 percent. Subthreshold AD/HD cases did not differ from full syndrome AD/HD in their juvenile temperament and general character. All showed high novelty seeking and low persistence combined with low self-directedness versus controls. Subthreshold children with AD/HD also showed increased risk for externalizing disorders and higher scores on a variety of symptom profiles (e.g., anxiety, depression, social problems, etc.). The authors suggest their results support the clinical relevance of subthreshold AD/HD in the Asian culture. 📍