Why does the worldwide prevalence of childhood attention deficit hyperactivity disorder matter?

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Why Does the Worldwide Prevalence of Childhood Attention Deficit Hyperactivity Disorder Matter?

How many children around the world have attention deficit hyperactivity disorder (ADHD)? Is ADHD a creation of permissive Western culture rarely seen outside North America? Do world regions with elevated ADHD rates hold the key to causation? Childhood ADHD is diagnosed when a child exhibits a persistent syndrome of inattention, hyperactivity, and impulsivity that impairs functioning both at home and at school before the child is 7 years old. The worldwide prevalence of this disorder is 5.2%, as uncovered in this issue by a Brazilian research team led by Polanczyk and Rohde. Their elegant research synthesized studies of ADHD from around the world in the most comprehensive literature search undertaken to date. A method called meta-analysis was applied to the resulting database to investigate why studies in some world regions report estimates that deviate from the worldwide rate.

At stake is ADHD's identity as a bona fide mental disorder (as opposed to a social construction). When initial reports of ADHD prevalence emerged, higher prevalence in North American than European samples was remarked upon. This observation spawned a 10-year debate, exemplified by articles with titles such as, "Is Childhood Hyperactivity the Product of Western Culture?" (1) and, more recently, "ADHD Is Best Understood As a Cultural Construct" (2). Having an explanation for inconsistencies in the cross-national prevalence of ADHD is important because such inconsistencies fuel assertions that ADHD is a fraud propagated by the "profit-dependent pharmaceutical industry and a high-status profession [psychiatry] looking for new roles" (2).

Also at stake is the potential for scientists to exploit geographic variation in ADHD's prevalence to yield new information concerning its causes, which currently remain frustratingly unknown. Geographic comparisons are a powerful tool for investigating the etiology of disorders. In the first epidemiological study ever conducted, John Snow compared rates of cholera across areas of London during the 1854 cholera epidemic. Going against the then-prevalent "miasma" theory, which stipulated that diseases are carried by foul air, Snow surveyed residents about their source of drinking water and, using simple statistics, discovered that cholera cases were clustered around one particular water pump. This discovery lead to the closing of the infected pump and prevented new cases. Moreover, although Snow was unable to identify the water-borne particles that cause cholera, his finding advanced the germ theory of disease (3). Contemporary examples show that when populations vary on their exposure to risk factors, geographic comparisons of disorder rates can generate new hypotheses about etiology. High rates of asthma and allergy in developed Western countries, compared to developing countries, generated new hypotheses about the etiology of respiratory disorders (e.g., childhood exposure to antibiotics, exposure to dust mite allergens, overly hygienic life styles) (4). In psychiatry, geographic comparisons reveal that the prevalence of schizophrenia in urban locations is more than double that in rural locations (5). This observation generated new hypotheses now subject to intense research (e.g., urban social isolation, infectious exposure exacerbated by urban crowding). In child psychiatry, geographic comparisons discredited the hypothesis that well-baby immunizations cause autism; countries with versus without the vaccine have the same prevalence of autism (6). Considering ADHD, high-prevalence countries could offer clues to etiology, whereas

low-prevalence countries could share protective factors that reduce the prevalence of ADHD. However, before looking for geographic clues to causation, it is necessary to rule out the alternative explanation for geographic differences in prevalence: methodological artifacts. As highlighted by Polanczyk et al. (this issue), studies around the world often use different methods, making it difficult to determine whether disease rates truly vary between countries.

The meta-regression carried out by Polanczyk's team approached the question of ADHD's geography in three steps. The first step ascertained the central tendency of prevalence rates reported from research samples over the past 25 years: 5.2%. This overall rate was derived from an impressive 102 studies comprising 171,756 children sampled from schools, communities, or birth registers. Such nonreferred samples are essential for estimating the population prevalence of ADHD because they avoid the obvious biases that would result from counting only the subset of children brought to medical attention.

The second step evaluated the expectation that North America's prevalence would exceed those of all other regions. The regions represented were Africa (4 studies), Asia (15), Europe (32), the Middle East (4), North America (32), Oceania (6), and South America (9 nine). The main finding was that the variation in prevalence associated with the samples' geographic origin did not fit a pattern consistent with the notion that ADHD is a byproduct of American culture. The North American rate (6.2%) only slightly exceeded the European rate (4.6%). The highest rates emerged from Africa (8.5%) and South America (11.8%). Corroboration comes from a dimensional ADHD scale used in

21 countries. Japanese and Finnish children scored lowest, Jamaican and Thai children scored highest, and American children scored about average (7).

The last step tested whether the different prevalence rates across studies could be accounted for by different methodologies. Methodological features were coded for each study, including sample size, response rate, information source (e.g., parents, teachers, children), and whether diagnosis followed the ICD (8) or the DSM. The main finding was that the difference in ADHD prevalence between North America and Europe was explained by methodology. Most important, all North American researchers had followed the DSM, whereas many European researchers had preferred the ICD. What's the difference? The ICD-10 strictly requires that a child must show symptoms in all three dimensions (inattention, hyperactivity, and impulsivity) and must meet all criteria at home and at school. The ICD-10 also excludes children with co-occurring disorders. DSM-IV is more lenient. It is possible to diagnose a child who shows symptoms in only one dimension (inattention). Some impairing symptoms—but not all—must be shown at home and at school. DSM-IV allows diagnosing ADHD alongside co-occurring disorders. Polanczyk et al. (this issue) concluded that geographic variation in the reported prevalence of ADHD is mainly explained by methodological foibles such as these diagnostic rules. Supporting this conclusion, a multisite trial study reported that using a uniform diagnostic protocol yields ADHD patients who are highly similar across clinics in Africa, Australia, Europe, and North America (9).

The finding of Polanczyk and colleagues of a uniform prevalence rate worldwide attests that ADHD is probably not caused by the avarice of the American psychiatric profession or by permissive Western culture and that reducing our avarice and

permissiveness will not make ADHD disappear (1). A uniform prevalence rate worldwide also suggests, disappointingly, that geographical variation will not provide fresh clues to the causation of ADHD. Because there is no causal biomarker with which to diagnose ADHD, the diagnosis remains syndromebased. Thus, becoming an identified ADHD patient is partly a function of the gap between a child's behavior and the expectations of the adults in his or her world about how children ought to behave (2). This gap is encoded differently in DSM-IV, which identifies more children with ADHD, versus ICD-10, which identifies fewer. The question is whether DSM-IV overidentifies ADHD or ICD-10 underidentifies ADHD. The answer matters. Excess medical costs per ADHD patient, relative to same-age children, have been estimated at near $1,000 per child per year for hospitalization, primary care office visits, outpatient mental health visits, and medications (10). Thus, even a small shift in the population prevalence of diagnosed ADHD could have important fiscal implications for institutions involved in the treatment of ADHD. Nosologists are working toward a more unified approach between DSM-V and ICD-11; there is much good work to be done.

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