

Children who start school a year early more likely to be diagnosed with ADHD, study shows

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Children with ADHD find it more difficult to focus and to complete their schoolwork. Credit: public domain image

Could a child's birthday put them at risk for an ADHD misdiagnosis? The answer appears to be yes, at least among children born in August

who start school in states with a Sept. 1 cutoff enrollment date, according to a new study led by Harvard Medical School researchers.

The findings, published Nov. 28 in *The New England Journal of Medicine*, show that children born in August in those states are 30 percent more likely to receive an ADHD diagnosis, compared with their slightly older peers enrolled in the same grade.

The rate of ADHD diagnoses among children has risen dramatically over the past 20 years. In 2016 alone, more than 5 percent of U.S. children were being actively treated with medication for ADHD. Experts believe the rise is fueled by a combination of factors, including a greater recognition of the disorder, a true rise in the incidence of the condition and, in some cases, improper diagnosis.

The results of the new study underscore the notion that at least in a subset of elementary school students, the diagnosis may be a factor of earlier school enrollment, the research team said.

"Our findings suggest the possibility that large numbers of kids are being over-diagnosed and overtreated for ADHD because they happen to be relatively immature compared to their older classmates in the early years of elementary school," said study lead author Timothy Layton, assistant professor of health care policy in the Blavatnik Institute at Harvard Medical School.

Most states have arbitrary cutoff birth dates that determine which grade a child will be placed in and when they can start school. In states with a Sept. 1 cutoff, a child born on Aug. 31 will be nearly a full year younger on the first day of school than a classmate born on Sept. 1. At this age, Layton noted, the younger child might have a harder time sitting still and concentrating for long periods of time in class. That extra fidgeting may lead to a medical referral, Layton said, followed by diagnosis and

treatment for ADHD.

For example, the researchers said, what may be normal behavior in a boisterous 6-year-old could seem relatively abnormal relative to the behavior of older peers in the same classroom.

This dynamic may be particularly true among younger children given that an 11- or 12-month difference in age could lead to significant differences in behavior, the researchers added.

"As children grow older, small differences in age equalize and dissipate over time, but behaviorally speaking, the difference between a 6-year-old and a 7-year-old could be quite pronounced," said study senior author Anupam Jena, the Ruth L. Newhouse Associate Professor of Health Care Policy in the Blavatnik Institute at Harvard Medical School and an internal medicine physician at Massachusetts General Hospital. "A normal behavior may appear anomalous relative to the child's peer group."

Using the records of a large insurance database, the investigators compared the difference in ADHD diagnosis by birth month—August versus September—among more than 407,000 elementary school children born between 2007 and 2009, and who were followed until the end of 2015.

In states that use Sept. 1 as a cutoff date for school enrollment, children born in August had a 30 percent greater chance of an ADHD diagnosis than children born in September, the analysis showed. No such differences were observed between children born in August and September in states with cutoff dates other than Sept. 1 for school enrollment.

For example, 85 out of 100,000 students born in August were either

diagnosed with or treated for ADHD, compared with 64 students per 100,000 born in September. When investigators looked at ADHD treatment only, the difference was also large—53 of 100,000 students born in August received ADHD medication, compared with 40 of 100,000 for those born in September.

Jena points to a similar phenomenon described in Malcolm Gladwell's book *Outliers*. Canadian professional hockey players are much more likely to have been born early in the year, according to research cited in Gladwell's book. Canadian youth hockey leagues use Jan. 1 as a cutoff date for age groups. In the formative early years of youth hockey, players born in the first few months of the year were older and more mature, and therefore more likely to be tracked into elite leagues, with better coaching, more time on the ice and a more talented cohort of teammates. Over the years this cumulative advantage gives the relatively older players an edge over their younger competitors.

Similarly, Jena noted, a 2017 working paper from the National Bureau of Economic Research suggests that children born just after the cutoff date for starting [school](#) tend to have better long-term educational performance than their relatively younger peers born later in the year.

"In all of those scenarios, timing and age appear to be potent influencers of outcome," Jena said.

Research has shown wide variations in ADHD diagnosis and treatment across different regions in the United States. ADHD diagnosis and treatment rates have also climbed dramatically over the last 20 years. In 2016 alone, more than 5 percent of all [children](#) in the United States were taking medication for ADHD, the authors note. All of these factors have fueled concerns over ADHD overdiagnosis and overtreatment.

The reasons for the rise in ADHD incidence are complex and

multifactorial, Jena said. Arbitrary cutoff dates are likely just one of many variables driving this phenomenon, he added. In recent years, many states have adopted measures that hold schools accountable for identifying ADHD and give educators incentives to refer any child with symptoms suggesting ADHD for medical evaluation.

"The diagnosis of this condition is not just related to the symptoms, it's related to the context," Jena said. "The relative age of the kids in class, laws and regulations, and other circumstances all come together."

It is important to look at all of these factors before making a diagnosis and prescribing treatment, Jena said.

"A child's age relative to his or her peers in the same grade should be taken into consideration and the reasons for referral carefully examined."

Provided by Harvard Medical School

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