

# Babies born too early likely to face educational and lifelong behavioral setbacks

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Babies who are born early are likely to face adverse neurocognitive and behavioral outcomes as they go from kindergarten through high school, according to new Stanford research.

A full-term [birth](#) is typically between 37 and 42 weeks of pregnancy, but births between 32 and 36 weeks are considered moderate to late preterm births. And those seemingly short few weeks may result in serious education lags and lifelong behavioral impacts.

"Late [preterm birth](#)—previously considered unimportant beyond infancy—may be an important neurocognitive risk factor," said Lee M. Sanders, a pediatrician, core faculty member at Stanford Health Policy and chief of the division of general pediatrics at Stanford Medicine. "So, this warrants special screening and intervention from medical providers, early childcare providers, early intervention programs—and schools."

Findings from the study by Lee and his Stanford colleagues were recently published in the *Journal of Pediatrics*. They found that after adjusting for socioeconomic status and compared with full-term births, moderate and late preterm births are associated with increased risk of low performance in mathematics and English language arts, as well as chronic absenteeism and suspension from [school](#).

"In a sort of negative cascade, these outcomes are associated with a host of further reduced opportunities later in life, including lower engagement in school, reduced access to college, and higher unemployment," said co-author Carrie Townley Flores, a doctoral student at the Stanford Graduate School of Education (GSE). "Each of these negative outcomes indicate that the system that is in place is not supporting the child fully. As schools become aware of the risks associated with preterm birth, they may pay closer attention to it as a potential risk factor."

Amy Gerstein, executive director of the GSE's John W. Gardner Center for Youth and Their Communities, and Ciaran Phibbs, associate professor of pediatrics, were the other co-authors of the study.

Late and moderate preterm births account for up to 8.5% of all births in the United States. Those numbers had been rising since 1990, then declined slightly from 2007 through 2014, but then began rising again in 2015.

Most research done on long-term neurocognitive and educational outcomes of preterm birth has focused on very early premature births at less than 32 weeks. But little is known about the long-term risks of moderate and late preterm birth for educational outcomes through 12th grade.

## **A Novel Dataset**

The Stanford researchers used a novel dataset matching hospital birth data with individual school records in a high-risk school district. They constructed a "virtual birth cohort" using statistics from the Office of Statewide Health Planning and Development, which links birth certificates to the maternal and infant hospital discharge data for all California in-hospital deliveries. Their sample consisted of 72,316 students born between 1998 and 2012 in a California school district.

They then analyzed risks for four educational outcomes for children from K-12: proficiency in English language arts and [literacy skills](#), proficiency in mathematics, chronic absenteeism and suspensions. The strongest associations of poorer skills were found in grades three to five, when students born moderate or late preterm demonstrated a 6-10% increased risk for below-proficiency skills, a 28% increased risk for chronic absenteeism and a 23% increased risk for suspensions. Then moving to children in grades six through eight, students born prematurely demonstrated a 2-7% increased risk for below-proficiency skills in math and English language and literacy skills; in grades nine through 12, they found a 7% risk for suspensions.

Several hypotheses may explain these associations, the authors wrote. Infants who have been born prematurely are at risk of developing lower executive function and are at increased risk of inflammatory chronic conditions such as asthma, which may explain school absences.

"Moderate and late preterm students are also at risk for having attention deficits, which predict school suspension rates and may explain the link between prematurity and suspension through high school," they wrote.

Studies have shown that poor academic performance and chronic absenteeism in elementary school predicts that some of those students may not complete [high school](#), which in turn can lead to unemployment and poor health once into adulthood. Overall, the findings suggest that the adverse educational outcomes related to premature birth can have long-term consequences.

"Long-term behavioral implications include increased risks for common mental health disorders, such as anxiety and depression and oppositional disorders, as well as risky health behaviors, such as substance-use disorders," Sanders said.

## **What Can Be Done?**

Sanders said one potential solution is to improve communication and data sharing between the medical and educational communities. Pediatric providers take child advocacy as a central part of their medical responsibility, and many are former educators themselves.

"This is an opportunity to break down traditional silos as a means of identifying and supporting those children most at risk of challenging outcomes," Sanders said. "When educators consider a student's potential need, understanding birth outcomes as a risk factor could provide another window into a child's whole-life experience."

With family permission, he said, health systems can inform early childcare and school systems about individual children who may be at risk because of an adverse birth outcome, such as late preterm birth. Education systems can inform health-care providers if students are beginning to exhibit concerning educational outcomes, such as absenteeism or suspension.

Further, schools can collect information on birth outcomes at enrollment. Asking a question on an intake form as to whether a child experienced premature birth can signal to educators that a student may benefit from additional supports.

To reduce the risks of adverse birth outcomes, prior studies have demonstrated the effectiveness of improved prenatal medical care and supplemental nutrition programs, such as WIC, as well as building social support and mental health supports for pregnant mothers.

The Stanford study suggests opportunities to examine the effectiveness of other efforts to lower adverse birth outcomes. These efforts include early-intervention programs that provide parent coaching and developmental supports during early childhood, supplemental nutrition programs, integrated behavioral health in community health centers, as well as policy reforms to help parents support their child's well-being, such as supplemental income for families with young children and paid family leave. The Stanford Population Health in Schools (PHIS) Lab is working on ways to help develop a regional network of education-health collaboratives to implement and test the effectiveness of such programs.

**More information:** Carrie Townley Flores et al. Short-Term and Long-Term Educational Outcomes of Infants Born Moderately and Late Preterm, *The Journal of Pediatrics* (2021). [DOI: 10.1016/j.jpeds.2020.12.070](https://doi.org/10.1016/j.jpeds.2020.12.070)

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