# Anemia in children in foster care connected to other diagnoses, researchers find

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Children in or adopted from the Pennsylvania foster care system with anemia may have greater odds of certain developmental and behavioral diagnoses according to a newly published study from Penn State

researchers. This study, published in *PLOS ONE*, is the first to examine such a relationship among children in U.S. foster care.

The researchers, with lead author Amrita Arcot, graduate student in nutritional sciences, and in partnership with the Penn State Evidence-to-Impact Collaboration's Data Accelerator, analyzed administrative records for more than 50,000 youth ages 6 months to 10 years in or adopted from the Pennsylvania foster care system between 2010 and 2015.

The researchers found that youth suffering from anemia were more likely to be diagnosed with delayed milestones, developmental delays, irritability and adjustment disorders than youth without anemia. The team originally hypothesized that the sample population would have a higher anemia diagnosis rate than other children, but their data revealed that 2.7% of their sample were diagnosed with anemia—a rate that aligns closely with national figures ranging from 2.0% to 3.4% for children in the studied age range.

"Children in foster care, or those who were recently adopted, often undergo frequent medical check-ups," Arcot said. "Hence, the detection rate of conditions such as anemia might be higher for this group."

While the rates of anemia diagnosis are not higher in this population, Arcot said that past research indicates the rate of iron deficiency is higher than anemia in children. Iron deficiency precedes anemia and is frequently left undiagnosed until it progresses to overt anemia. As such, the authors said they suspect that children in foster care, or children recently adopted, have a rate of iron deficiency that exceed the rate of anemia, but more research is needed to test this hypothesis.

"This research underscores the nuanced challenges these children face," said Xueyi Xing, EIC assistant research professor. "Our results indicate

that anemia can have a lasting impact, especially during crucial growth periods, like the neonatal and early childhood phases. This can influence developmental outcomes in the long run only detectable through the use of large longitudinal administrative data sets."

In this study, the researchers identified a strong association between anemia and certain developmental and behavioral diagnoses. Children diagnosed with anemia from 2 to 4 years of age and 5 to 10 years of age were nearly three times more likely to be diagnosed with specific delays in development, when compared to children not diagnosed with anemia between 6 months to 2 years of age. Specific delays in development broadly encompass diagnoses like difficulty with reading, math, speech and/or coordination development.

"Children with iron deficiency may be at risk of poor cognitive, behavioral and/or developmental outcomes when compared to children without iron deficiency; however, such issues may not be identified until entry into school," Arcot said. "This underpins the urgency of research focused on the interplay between environment and health."

The study not only highlights the importance of screening practices for these children but also stresses the need for further investigation to examine rates of anemia and other health concerns among children in foster care, according to Arcot.

"Secondary data analysis is a viable option, especially given the inherent difficulty in recruiting children in the welfare system," Arcot said. "This study serves as a crucial foundation for future investigations. Moreover, it emphasizes the need for proactive health care interventions, considering the unique challenges and vulnerabilities faced by children in foster care."

**More information:** Amrita Arcot et al, Iron status, development, and

behavior in young children in the Pennsylvania foster care system, *PLOS ONE* (2023). DOI: 10.1371/journal.pone.0289951