



## Does Severe Malaria Impact Academic Achievement?

March 2, 2023

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**Article type:** [Pediatrics Blog](#)

**Topics:** [Cognition/Language/Learning Disorders](#), [Infectious Diseases](#), [Public Health](#)

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In a recently released issue of *Pediatrics*, Ann Jacqueline Nakitende of the College of Health Sciences, Makerere University, Kampala, Uganda, in collaboration with local and US colleagues, examine the impact of severe malaria on childhood academic achievement among Ugandan children ages 5-12 years ([10.1542/peds.2022-058310](https://doi.org/10.1542/peds.2022-058310)). Specifically, the authors compared school achievement between those children who had experienced severe malaria and control children without severe malaria who were enrolled from the same household or neighborhood and within 1 year of a child with severe malaria. Severe malaria includes children with cerebral malaria, defined as coma with *Plasmodium falciparum* on blood smear and no other cause for the coma, or with severe malarial anemia, defined as *Plasmodium falciparum* on blood smear and hemoglobin  $\leq 5$  mg/dL. Children in this study were enrolled from a larger study (n=718) that evaluated them for cognitive outcomes over 2 years of follow-up; this present study included a smaller (randomly selected) cohort of those at least 5 years of age, of whom 73 had cerebral malaria, 56 had severe malarial anemia and 100 were community control children. At an average follow up of 67.1 months (range 19-101 months), children were assessed with the Wide Range Achievement Test, Fourth Edition, adapted and translated for Luganda language speakers, which has subtests for math computation, spelling, reading, and sentence comprehension.

Malaria is not common or endemic in the US, but it is a huge burden worldwide, with 247 million cases and 619,000 deaths in 2021, of which 95% and 96%, respectively, occurred in the African region; 80% of all deaths were in children under 5 years.<sup>1</sup> The authors note that episodes of uncomplicated malaria are not only common, with children experiencing 1.6-5.4 episodes annually, but frequent after an episode of severe

malaria. The authors cite evidence that repeated episodes of uncomplicated malaria can impact academic outcomes,<sup>2</sup> likely mainly due to associated school absenteeism, but the longer term impact of severe malaria, which may cause neurocognitive and neurologic deficits, on academic achievement has not been studied. In this research, children with severe malaria (either cerebral malaria or severe malarial anemia) had worse reading scores 2-9 years after their episode of severe malaria, as compared to children from the same household or neighborhood who did not experience severe malaria. The authors were able to show that repeated episodes of uncomplicated malaria accounted for essentially a third of this difference. I encourage you to read this great article to understand better how the authors were able to arrive at their main conclusions.

Reduced academic achievement for any child may lead to social consequences such as bullying, grade retention, and school failure, which may impact adult well-being. The profound differences between those with and without severe malaria, and the striking impact of severe malaria on academic performance, emphasize the burden of malaria on global and African childhood health and wellbeing. Of note, those enrolled in this study received optimized malarial prevention with insecticide-treated bed nets and malaria education, so results may be even more concerning among those without this access. The authors propose downstream interventions, including targeted school remediation and post-malarial chemoprevention to reduce the number of repeated episodes. What can you and I do with the knowledge gained from this article? Becoming informed is a first step, and becoming engaged in global health advocacy is another step. Where? The [AAP's Global Health Section](#) and iCATCH (International Community Access to Child Health) Program offer a place to start.

#### **References:**

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2. Fernando D, Wickremasinghe R, Mendis KN, Wickremasinghe R. Cognitive performance at school entry of children living in malaria-endemic areas of Sri Lanka. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 2003;97:161-165