

Childhood infections may have lasting effects on school performance

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Severe infections leading to hospitalizations during childhood are associated with lower school achievement in adolescence, reports a study in the July issue of *The Pediatric Infectious Disease Journal (PIDJ)*.

In the nationwide study of nearly 600,000 Danish children, higher numbers of hospitalizations for infections were associated with a reduced probability of completing ninth grade, as well as with lower test scores, according to the new research by Ole Köhler-Fosberg, MD, of Aarhus University Hospital and colleagues. An expert commentary discusses the role of vaccination in the relationship between investment in [health](#) and protecting and improving "human capital."

Largest Study of the Link Between Childhood Infections and School Achievement

The study included nationwide data of 598,553 children born in Denmark between 1987 and 1997. The researchers looked at two measures of childhood infections: hospital admission for infections, an indicator of moderate to severe infections; and prescriptions for anti-infective drugs (such as antibiotics) in primary care, reflecting less-severe infections.

These [infection](#) measures were analyzed for their association with two measures of later [school achievement](#): completing ninth grade and average scores on the final ninth-grade [school](#) examinations. Overall,

91.5 percent of the children completed ninth grade. The associations were adjusted for other factors linked to school [achievement](#), such as birthweight, mental and physical health, and parents' education and mental health.

Any hospital contact for infections was associated with an 18 percent reduction in the odds of completing ninth grade (the last year before secondary school in Denmark). The more hospitalizations for infections, the lower the odds of reaching this educational milestone—children with five or more infections requiring hospitalization had a 38 percent reduction in the odds of completing ninth grade.

Among children who completed ninth grade, hospitalization for infections was associated with a small but significant reduction in final exam scores. This relationship was affected by the timing as well as the number of infections, with the greatest impact on children hospitalized within the past year.

Primary care treatment with anti-infective drugs—indicating the presence of common, less-severe infections—was unrelated to the chances of completing ninth grade. In general, the study found that less-severe infections not requiring hospitalization did not affect the children's cognitive ability.

The study adds to a growing body of research linking poorer school achievement to an increased risk of adverse health and socioeconomic outcomes later in life. Aside from brain damage caused by serious infections like rubella or encephalitis, "there is growing awareness that a wider range of infections may have a more subtle and/or delayed impact on brain function," the researchers write. The study is the largest to date to analyze infections as a predictor of school achievement; it provides no evidence on any outcomes beyond school.

"Our findings extend our understanding regarding the association between particularly severe infections during childhood and adolescence and cognitive achievement," Dr. Köhler-Fosberg and coauthors conclude. They note that their findings might be explained by missed school days or socioeconomic factors associated with the susceptibility of acquiring infections.

The study is an "interesting and valuable" contribution to research into the interplay between health and education, write David E. Bloom Ph.D., and Andrew Stawasz, BSILR, in a commentary accompanying the new study. They discuss the association between health and human capital—an economic concept referring to "the skills and capacities embodied in people that have productive value."

The study adds to previous evidence that "vaccination can impact human capital through improving educational attainment and performance," Dr. Bloom and Mr. Stawasz write. These studies "suggest that the health generated by high vaccination rates is not just a consequence—but also a cause—of high income."

More information: Ole Köhler-Forsberg et al. Childhood Infections and Subsequent School Achievement Among 598,553 Danish Children, *The Pediatric Infectious Disease Journal* (2017). [DOI: 10.1097/INF.0000000000001869](https://doi.org/10.1097/INF.0000000000001869)

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