



[For Medical Professionals](#) › [Tools for Your Practice](#) › [Connect with Nationwide Children's](#) ›

# Lower Socioeconomic Status Is Associated With Worse Childhood Arterial Ischemic Stroke Outcomes

*Very low income patients had 3x the risk for worse 1-year outcomes compared with high income children.*

**Columbus, OH – September 2018**

A recent international, multicenter study has found that low household income is associated with poorer arterial ischemic stroke (AIS) outcomes in pediatric patients. This trend held true even when children from lower- and middle-income countries were excluded from the analysis.

Senior author Warren Lo, MD ([/find-a-doctor/profiles/warren-d-lo](#)), a member of the Division of Neurology at Nationwide Children's Hospital ([/specialties/neurology](#)), collaborated on the study with colleagues at the Hospital for Sick Children in Toronto and the University of California San Francisco.

“Good evidence exists that lower socioeconomic status and poverty are associated with a greater incidence, frequency, and severity of stroke and worse outcomes in adults,” says Dr. Lo. “So, it seemed obvious that we should ask this question in children.”

As the largest study of AIS in children to date, it included 355 children (age 29 days - 18 years) at 37 international centers in 9 countries between 2010 and 2014. Annual family income was associated with worse patient outcome, and very low income patients (<\$10,000) had more than 3 times the risk for worse 1-year outcomes compared with high income children (>\$100,000).

Income did not correlate with the receipt of rehabilitation services, although the quality and frequency of services received was not assessed. Further, low income and decreased consciousness at presentation were highly correlated so that decreased consciousness was excluded from the analysis. This association, however, suggests that children from very low income families may have been far sicker at the time of presentation. The authors hypothesize that because stroke symptoms are sometimes difficult to recognize in children, more severe/noticeable symptoms may occur before very low-income families seek medical help.

Because stroke in children is uncommon, occurring in just 2 to 4 children per 100,000, Dr. Lo suggests that the parents of children who have a heightened risk for stroke, such as those with congenital heart disease or sickle cell, could be trained in the adult system for recognizing and seeking medical attention for stroke, FAST (Face, Arms, Speech, Time to call the emergency squad).

While the authors were not able to identify the cause for worse outcome after stroke in very low income children, they suggest that examination of unmeasured variables such as nutritional status could help clarify this relationship and warrant further investigation. Moreover, Dr. Lo speculates that children who are extremely poor may have less access to high-quality healthcare, preventative healthcare, and/or adequate vaccination. Additionally, after a stroke, their parents may not have the resources or time to take off from work to commit to chronic rehabilitation if necessary.

Previous studies found that children who were under-vaccinated were at a higher risk for developing stroke than children who were fully-vaccinated. Herpes viruses, including the common childhood virus chicken pox, can infect the linings of blood vessels causing inflammation and potentially AIS in both children and adults. Dr. Lo emphasized that children need to be adequately vaccinated, especially against chicken pox.

The new publication was part of the larger, NIH-funded Vascular effects of Infection in Pediatric Stroke (VIPS) project for which Dr. Lo was a site investigator, responsible for recruiting patients and implementing protocols. The VIPS project was a large multi-national, prospective observational study that sought to address whether infection predisposes a child to the development of stroke and the development of any abnormalities of blood circulation.

**Reference:**

Jordan LC, Hills NK, Fox CK, Ichord RN, Pergami P, deVeber GA, Fullerton HJ, Lo W, For the VIPS Investigators. Socioeconomic determinants of outcome after childhood arterial ischemic stroke. (<https://www.ncbi.nlm.nih.gov/pubmed/29980641>) *Neurology* . 2018 Aug 7; 91(6):\_e509-e516.

**Nationwide Children’s Hospital**

700 Childrens Drive  
Columbus, OH 43205

(614) 722-2000 (tel:16147222000)

(/newsroom/news-releases/2014/12/nationwide-childrens-hospital-re-designated-with-american-nurses-credentialing-center-magnet) (<https://health.usnews.com/health-news/best-childrens-hospitals/articles/best-childrens-hospitals-honor-roll-and-overview>)

© 2018 Nationwide Children’s Hospital