

Household Income Disparities in Childhood Acute Lymphoblastic Leukemia Incidence and Mortality: A US Population-Based Analysis between 2000 and 2020

Inas Ruhban, MD; Susan Szpunar, MPH, PhD; Premchand Anne, MD
Department of Pediatrics, Ascension St. John Hospital, Detroit, Michigan

Introduction: Acute Lymphoblastic Leukemia (ALL) is the most common childhood cancer with an annual incidence of 3.7-4.9 cases per 100,000. There are no recent reports of the effect of socioeconomic status on pediatric ALL incidence and mortality class. Objective: Assess the association between ALL incidence and mortality and the socioeconomic status in children ages 21 years and younger.

Methods: Retrospective analysis was conducted of the Surveillance, Epidemiology and End Results (SEER) database, which represents up to 48% of the general US population. We included patients with ALL up to 21 years of age during 2000-2020. Patients were categorized based on annual household income into three groups: low-income: < \$50,000; middle-income: \$50,000-\$75,000; high-income: >\$75,000. Incidence and mortality rates were expressed per 100,000 person-years. Annual Percentage Changes (APCs) were defined as the average year-over-year rate change. Student's t test was used to determine if APCs were significantly different from zero with a significance level of 0.05.

Results: We reviewed 30,852 cases, of which 9%, 54%, and 37% belonged to low-, middle-, or high-income families, respectively, and with incidence rates of 3.2, 3.4, and 3.1 per 100,000 person-years, respectively. Incidence in low-income children showed a statistically significant average increase of 1.1% ($p = 0.003$) per year during 2000-2020, while it showed a significant increased followed by stable rates since 2007 and 2010 in middle- and high-income children, respectively. ALL mortality was 0.5, 0.4, and 0.4 per 100,000 person-years, in low-, middle-, and high-income children, respectively. Mortality in low-income children has increased 2000-2007 (APC= 25.2%, $p = 0.011$); it did not significantly change after that.

Conclusions: ALL incidence in low-income children has been increasing and remained the highest while mortality improved in middle-income children. Differences in healthcare access may be associated with the findings; further studies are needed to delineate this further.