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Brief Communication

The association of Medicaid expansion and pediatric cancer overall survival

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Abstract

Medicaid eligibility expansion, though not directly applicable to children, has been associated with improved access to care in children with cancer, but associations with overall survival are unknown. Data for children ages 0 to 14 years diagnosed with cancer from 2011 to 2018 were queried from central cancer registries data covering cancer diagnoses from 40 states as part of the Centers for Disease Control and Prevention's National Program of Cancer Registries. Difference-in-differences analyses were used to compare changes in 2-year survival from 2011-2013 to 2015-2018 in Medicaid expansion relative to nonexpansion states. In adjusted analyses, there was a 1.50 percentage point (95% confidence interval = 0.37 to 2.64) increase in 2-year overall survival after 2014 in expansion relative to nonexpansion states, particularly for those living in the lowest county income quartile (difference-in-differences = 5.12 percentage point, 95% confidence interval = 2.59 to 7.65). Medicaid expansion may improve cancer outcomes for children with cancer.

The Patient Protection and Affordable Care Act (ACA), passed in 2010 and largely enacted in 2014, included expanding Medicaid eligibility to adults with incomes of no more than 138% of the federal poverty level (1). As of July 2022, 39 states (including Washington, DC) adopted Medicaid expansion, and 12 did not (2). Although not directed specifically at increasing Medicaid coverage in children, expansion is associated with increased Medicaid uptake and slightly decreased uninsured rates in children, including those with cancer (3,4). These findings may be at least partially attributed to "welcome mat" effects, where eligible but previously uninsured children become enrolled in Medicaid or the Children's Health Insurance Program because of gains in parental coverage eligibility or other ACA-mediated factors (3,4).

Medicaid expansion has positively affected cancer survival and mortality in adults (5-9); however, its effect on childhood cancer survival has not been reported. Our objective was to examine whether there is early evidence for an expansion-associated impact on childhood cancer survival.

Data for children ages 0 to 14 years diagnosed with cancer from 2011 to 2018 were queried from data covering cancer diagnoses from 40 states as part of the Centers for Disease Control and Prevention's National Program of Cancer Registries (Supplementary Table 1, available online) (10). The primary outcome was 2-year overall survival, which was integrated into our analyses via the pseudo-observation method (11). The 2-year endpoint was selected to be similar to the median follow-up time (21 months for individuals diagnosed post-ACA). Other oncologic endpoints were not available. We used difference-in-differences (DID) analyses to compare changes in 2-year survival from 2011-2013 to 2015-2018 between children residing in states expanding Medicaid by 2014 vs states not expanding Medicaid within the study period (Supplementary Methods, available online) (12). The year 2014 was excluded as a washout and phase-in period. States expanding Medicaid from 2015 to 2018 were excluded from our main analyses but were included in a sensitivity analysis (Supplementary Table 1, available online). Analyses were adjusted for state and year fixed effects and covariates including age, race, ethnicity, sex, metropolitan residence, and cancer type, which were selected a priori because of associations with healthcare access and cancer outcomes. Individuals missing covariate information were excluded from the analyses. Because several states had limited Medicaid expansions from 2010 to 2011 (13), we conducted a sensitivity analysis adjusting for early Medicaid expansion status, including 2009 to 2018 data. Because the expansions could lead to earlier diagnosis resulting in improved prognosis (6,14), stage at diagnosis was not included as a

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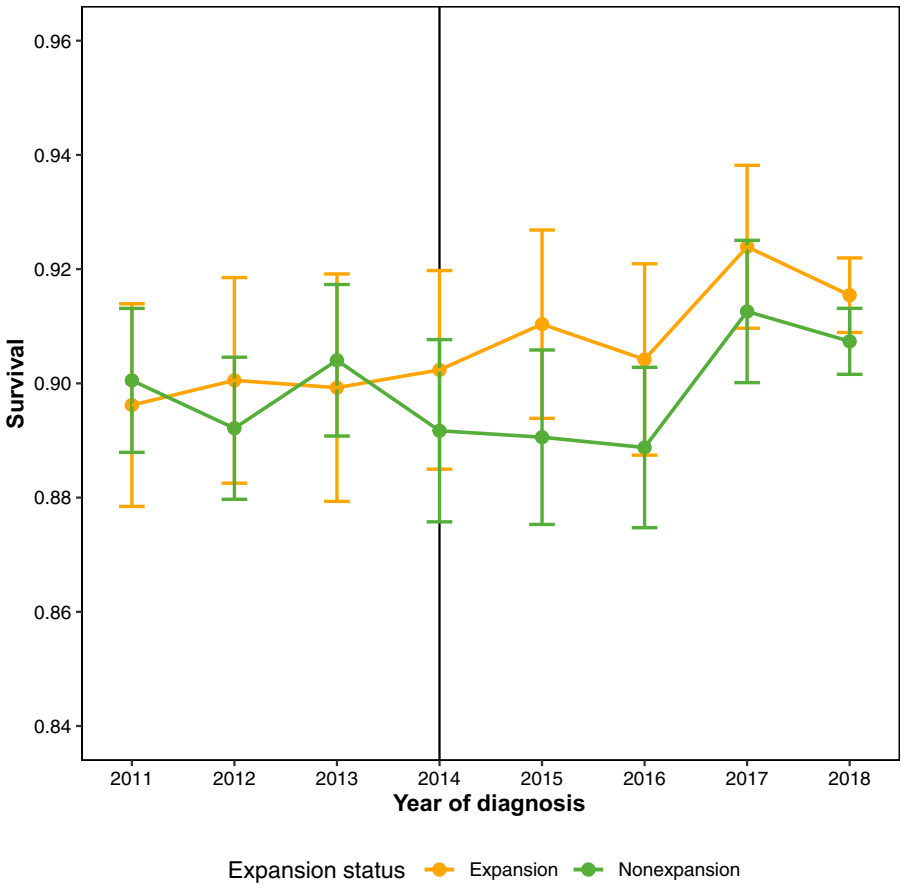

Figure 1. Temporal trends in 2-year overall survival by state Medicaid expansion status (Central Brain Tumor Registry of the United States: data provided by the Center for Disease Control and Prevention's National Program of Cancer Registries, 2011-2018).

covariate in our main analyses but was included in a sensitivity analysis. Analyses were conducted overall and by sociodemographic subgroups and cancer type. We hypothesized that historically socioeconomically disadvantaged subgroups and those with tumors more amenable to early detection and/or treatment would be most affected by the expansions (15). The parallel trends assumption for DID analyses was assessed by visually assessing temporal trends and by testing for differential changes in survival between expansion and nonexpansion states over the pre-expansion period (Supplementary Methods, available online) (12). The trends were satisfactorily similar for all analyses unless noted (Supplementary Table 2, available online).

A total of 46 850 children diagnosed between 2011 and 2018 were included (Supplementary Table 3, Supplementary Figure 1, available online). For all cancers combined, there was a statistically significant increase in 2-year overall survival from pre- to post-expansion in expansion (89.9%-91.3%) vs nonexpansion (89.9%-89.9%) states (DID = 1.50 percentage points, 95% confidence interval [CI] = 0.37 to 2.64). The most notable expansion-associated increases in overall survival were in those living in the lowest quartile of county income (DID = 5.12%, 95% CI = 2.59 to 7.65) and with malignant bone tumors (DID = 5.91 percentage points, 95% CI = 0.09 to 11.73). Statistically non-significant expansion-associated increases in overall survival were also observed in non-Hispanic Black children (DID = 3.63 percentage points, 95% CI = -0.19 to 7.45) (Figures 1 and 2; Supplementary Table 4, Supplementary Figures 2 and 3, available online). Sensitivity analyses produced similar results (Supplementary Results, Supplementary Table 5, available online).

In summary, we found evidence for an expansion-associated increase in overall survival for children with cancer in expansion relative to nonexpansion states, particularly for those living in lower income areas and with bone tumors. Although the relative increase was small, it translates to an additional 200 children alive at 2 years following their cancer diagnosis.

These results may be explained in part by "welcome mat" effects, where Medicaid-eligible children became enrolled from an increased awareness by their guardian(s), perhaps because of greater outreach in expansion states and reductions in application burden (3). The observations that lower socioeconomic status groups, including residents of low-income counties and possibly non-Hispanic Black children, had expansion-related survival improvements are plausible given that expansion policies targeted low-income populations.

Our prior results showed expansion-associated increases in Medicaid and/or Children's Health Insurance Program coverage and reductions in privately insured and uninsured childhood cancer patients in association with expansion (4). The ACA has been associated with reductions in out-of-pocket expenses for medical care in families (16), which may result in increases in access to care that could ultimately affect outcomes (17). Given similar results in a sensitivity analysis adjusting for stage at diagnosis, stage changes are likely not an important contributor to the changes in survival.

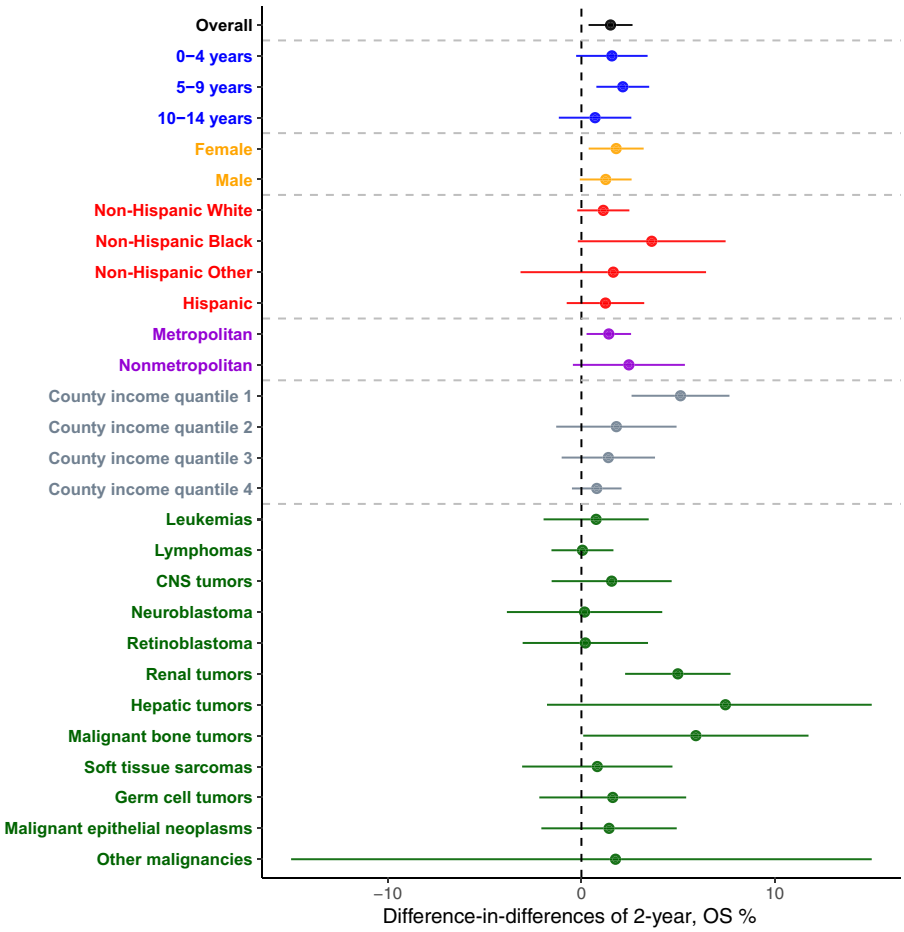

Figure 2. Difference-in-differences estimates of the expansion-associated change in 2-year overall survival (CBTRUS: data provided by the Center for Disease Control and Prevention's National Program of Cancer Registries, 2011-2018). Point estimates and 95% confidence intervals reflect the adjusted difference-in-differences estimates of expansion-associated changes in 2-year overall survival for the overall cohort or given subgroup. Positive (>0) values reflect increased 2-year overall survival associated with Medicaid expansion. CNS = central nervous system; OS = overall survival.

A key strength of these data is the large size. However, only two years of follow-up may be insufficient to fully capture policy effects on disease outcomes. Additionally, not all states were included, earlier detection could result in lead-time bias, power may be insufficient for some cancer types, and we lacked information on potential Medicaid expansion–associated changes in treatment patterns. Furthermore, it is unclear whether changing sample composition, such as an increase in children of lower socioeconomic status, contributed to the present findings. Finally, DID analyses assume parallel trends in the outcome in the absence of expansion and common shocks between the state groups (12). Although changes in survival were similar between state groups over time in the pre-ACA period, it is impossible to directly test these assumptions; hence, factors beyond Medicaid expansion could also contribute to our findings, precluding causal inference.

In conclusion, in an early analysis of Medicaid expansion, we found evidence for improvements in overall survival in children with cancer.

Data availability

No new data were analyzed in support of this research. The data analyzed included data from the Central Brain Tumor Registry of the United States (CBTRUS), which were provided through an agreement with the Centers for Disease Control's National Program of Cancer Registries. In addition, CBTRUS used data from the research data files of the National Cancer Institute's Surveillance, Epidemiology, and End Results Program.

Author contributions

Jill S. Barnholtz-Sloan, PhD (Data curation; Writing—review & editing), Quinn T. Ostrom, PhD, MPH (Conceptualization; Methodology; Supervision; Writing—review & editing), Kimberly J. Johnson, PhD, MPH (Conceptualization; Methodology; Supervision; Visualization; Writing—original draft; Writing—review & editing), Carol Kruckko, BA (Data curation; Writing—review & editing), Justin Michael Barnes, MD, MS (Conceptualization; Formal analysis; Methodology; Visualization; Writing—original draft; Writing—review & editing), Corey Neff, MPH (Data curation; Formal analysis; Methodology; Writing—review & editing), and Xuesong Han, PhD (Methodology; Writing—review & editing)

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Conflicts of interest

The authors have no conflicts of interest to disclose.

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