



BACKGROUND

Despite advances in cancer diagnosis and clinical care, survival for many primary brain and other central nervous system (CNS) tumors remain poor. This study evaluates survival over time for primary brain and other CNS tumors, from 2004-2017, using the most complete and up-to-date overall survival data from the Center for Disease Control's National Program of Cancer Registries (NPCR).

METHODS

Survival differences were determined utilizing the National Program of Cancer Registries Survival Analytic file for primary brain and CNS tumors. Overall survival and survival of the 5 most common histologies, within specific age groups (ages 0-14, 15-39, and 40+), were determined. Overall survival was compared for three time periods: 2004-2007, 2008-2012, and 2013-2017.

Survival differences were evaluated using Kaplan-Meier and multivariable Cox proportional hazards models. Models were adjusted for sex, race/ethnicity, and treatment. Malignant and non-malignant brain tumors were assessed separately.

RESULTS

Aside from hemangioma and mesenchymal tumors in individuals over 40 years old, no notable changes in survival were observed across the time periods for non-malignant tumors.

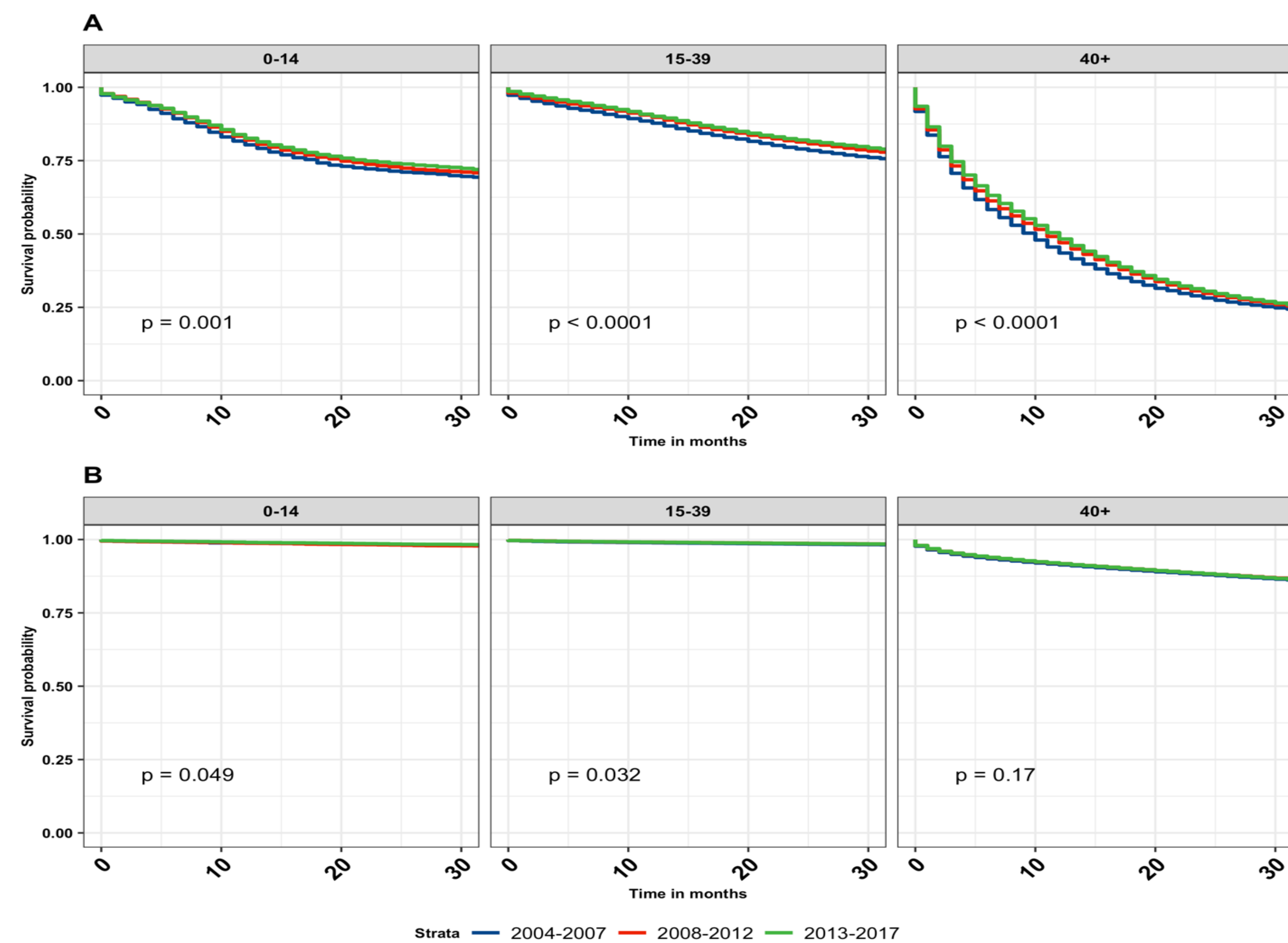
Significant survival improvements were observed in children (0-14 years) with embryonal tumors and in adolescents and young adults (ages 15-39 years, AYA) with anaplastic astrocytoma. In older adults (40+ years), significant improvement was observed in the top five histologies except oligodendroglioma.

Adjusted for sex, race/ethnicity, and treatment, there were improvements in survival in 2008-2012 and 2013-2017, when compared to 2004-2007, in children and AYA with malignant tumors.

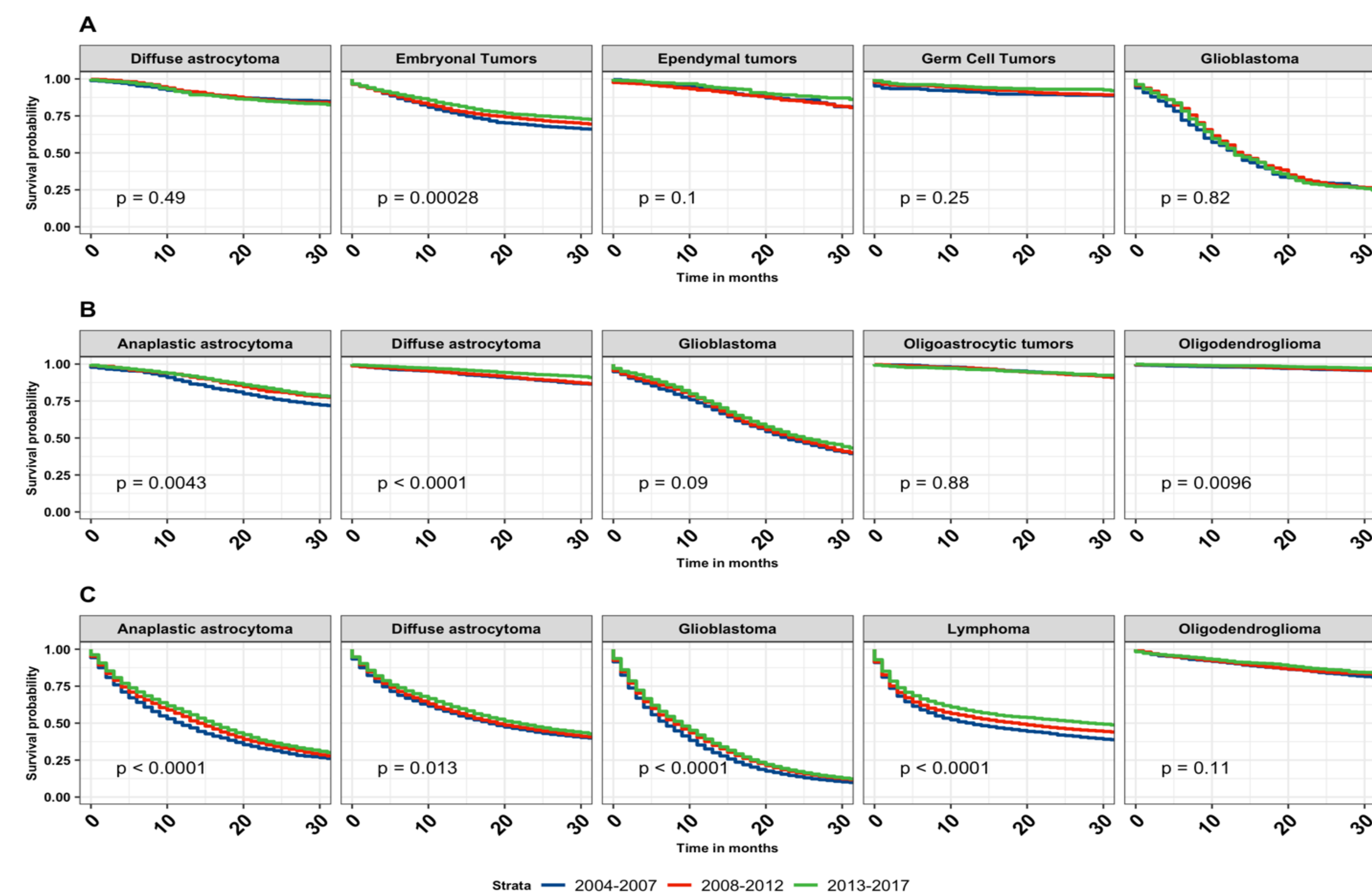
Changes in Survival Over Time for Primary Brain and Other CNS Tumors in the United States

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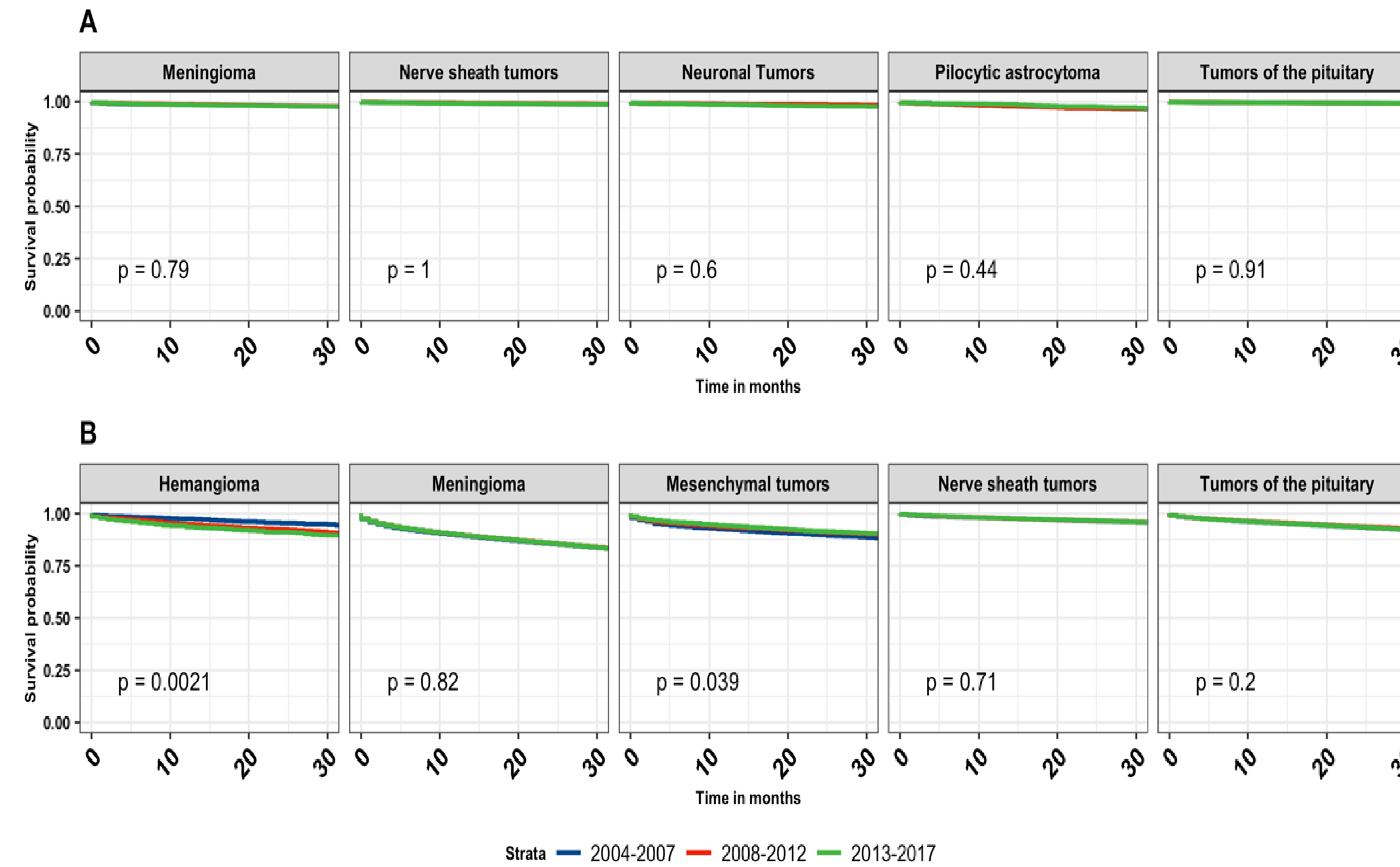
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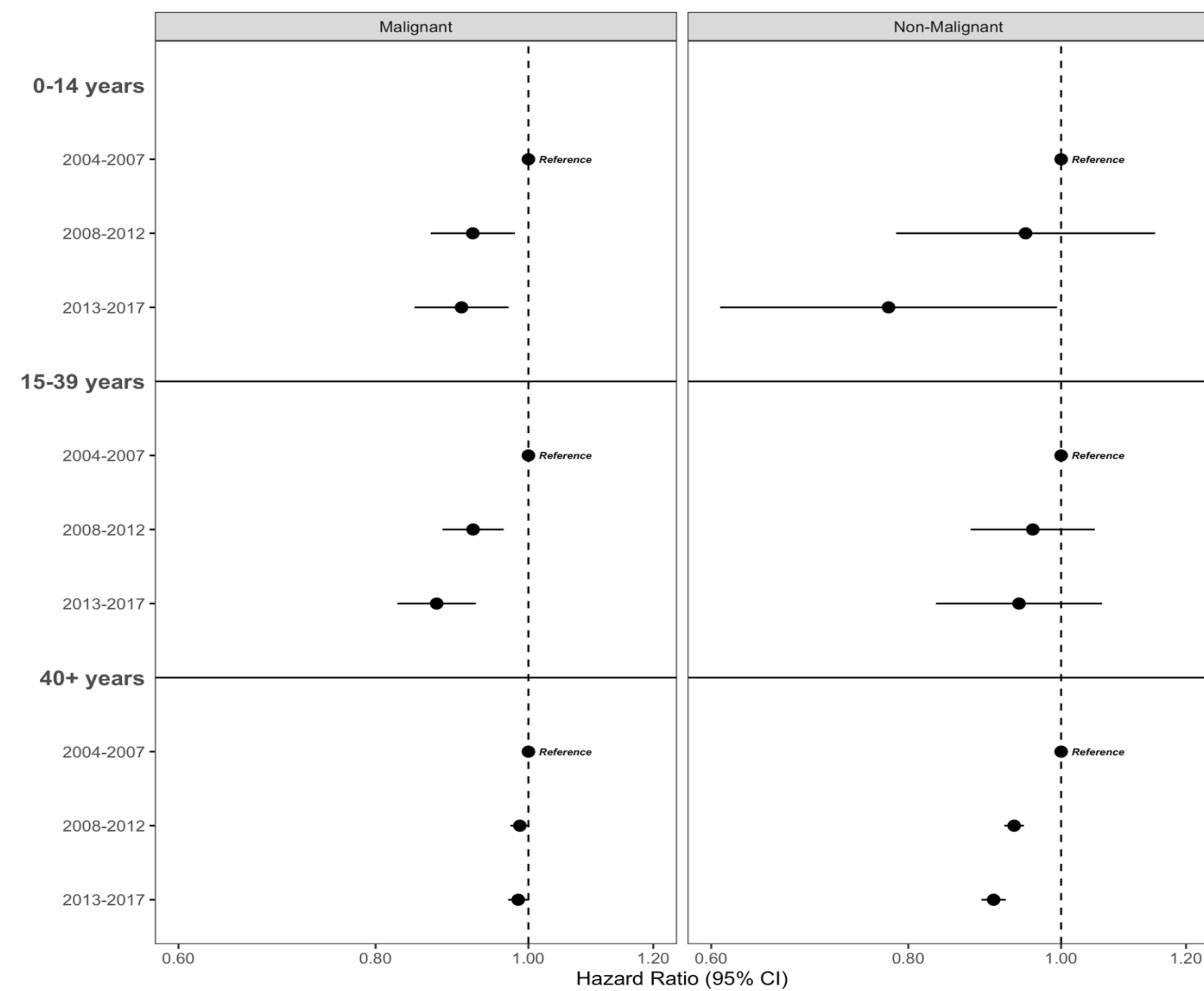
Overall Kaplan-Meier survival curves stratified by age group (0-14 years, 15-39 years, 40+ years) and year of diagnosis (2004-2007, 2008-2012, 2013-2017) for all primary brain and other CNS tumors by malignant (A) and non-malignant (B) behavior. P-values are determined by a log-rank test. (NPCR Survival Data: Data provided by CDC's National Program of Cancer Registries SEER*Stat Database: NPCR Survival Analytic file, 2004–2017)



Kaplan-Meier overall survival curves for malignant brain and other CNS tumors stratified by year of diagnosis for the five most common histologies stratified by age group (children ages 0-14 years (A), AYA ages 15-39 years (B), Older adults ages 40+ years (C)) and year of diagnosis (2004-2007, 2008-2012, 2013-2017). P-values are determined by a log-rank test. (NPCR Survival Data: Data provided by CDC's National Program of Cancer Registries SEER*Stat Database: NPCR Survival Analytic file, 2004–2017)



Kaplan-Meier overall survival curves for non-malignant brain and other CNS tumors stratified by year of diagnosis for the five most common pathologies stratified by age group (AYA ages 15-39 years (A), older adults ages 40+ years (B)) and year of diagnosis (2004-2007, 2008-2012, 2013-2017). P-values are determined by a log-rank test. (NPCR Survival Data: Data provided by CDC's National Program of Cancer Registries SEER*Stat Database: NPCR Survival Analytic file, 2004–2017)



Multivariable Cox proportional hazards forest plots comparing overall survival by year of diagnosis for primary brain and other CNS tumors stratified by behavior and age group. All models adjusted for sex, race/ethnicity, treatment pattern. (NPCR Survival Data: Data provided by CDC's National Program of Cancer Registries SEER*Stat Database: NPCR Survival Analytic file, 2004–2017)



CONCLUSION

Overall survival for malignant brain and other CNS tumors improved slightly in 2013-2017 for all age groups, as compared to 2004-2007.

No significant changes were observed for non-malignant brain and other CNS tumors.

Continued monitoring of changes in survival over time are important for adding to our understanding of advances in diagnosis and treatment of individuals with primary brain and other CNS tumors.

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