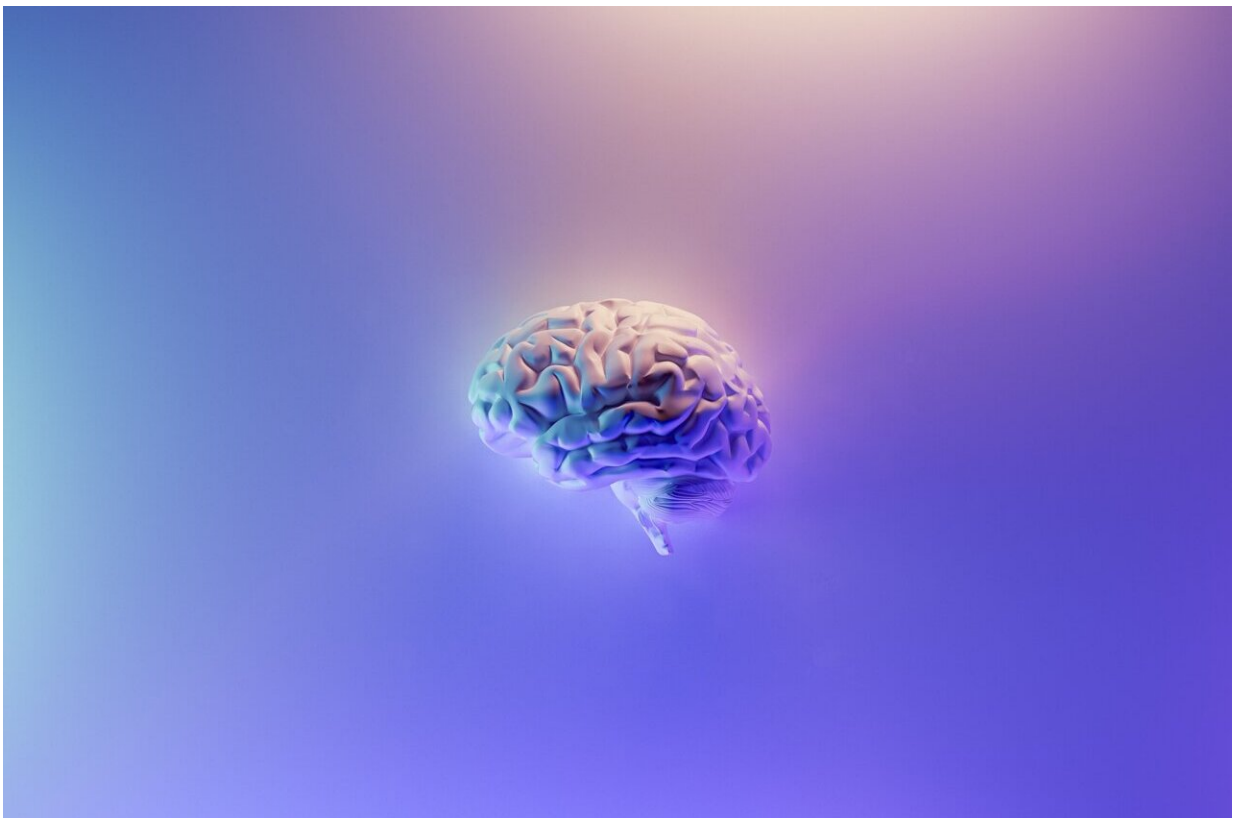


# Nationwide study of 295,000 brain cancer patients examines differences due to age and sex

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Findings from a national study by researchers at Translational Genomics Research Institute (TGen), an affiliate of City of Hope, and external

collaborators suggest that sex and age are crucial factors in the care and survival of patients with malignant brain tumors and other central nervous system (CNS) cancers.

In the first study to present findings at this scale, an examination of nearly 295,000 individuals with malignant tumors originating in the brain discovered that the overall incidence of gliomas (a tumor of the non-neuron, support cells in the brain) was higher among males, and that difference increased with age, while females had longer survival at almost every age, except among children aged 0-9 years.

The study results published recently in the journal *Neuro-oncology*.

"These results contribute to the growing understanding and impact that sex and age have on [cancer incidence](#) and survival," said Michael Berens, Ph.D., Professor and Director of TGen's Cancer and Cell Biology Division, and one of the study's authors.

"Identifying disadvantaged sex and age groups is critical in designing clinical trials, and in developing individual care plans for patients with these lethal tumors," said Dr. Berens, who also is Head of TGen's Glioma Research Lab.

The study drew from 18 years of incidence data (2000-2017) from the Central Brain Tumor Registry of the United States (CBTRUS), provided by the U.S. Centers for Disease Control and Prevention's National Program of Cancer Registries (NPCR), and the National Cancer Institute's Survival Epidemiology and End Results (SEER) Program. The survival data (2001-2016) was provided by NPCR. CBTRUS is the nation's largest population-based registry focused exclusively on primary brain and CNS tumors. Only [malignant tumors](#) were included in this analysis.

Among the study's findings:

- Of those patients studied: 44.1% were female; 55.9% were male.
- Glioblastoma brain cancer was the most common diagnosis, representing 55% of all cases.
- Of those with glioblastoma, 53% were female; 56% were male.
- The group with the highest age-adjusted incidence rate were patients aged 70-79, followed by those aged 60-69, and then those 80 years and older.
- The incidence of glioma in all age groups was highest in males.
- Overall, male-to-female incidence ratio was lowest in children and increased over time, with the biggest difference observed for patients aged 50-59.
- Male-to-female survival ratio varied with age, with females having a survival disadvantage in children under 9, but an advantage in almost all other age categories.
- Males had the highest survival disadvantage in ages 20-29, but this male-to-female survival difference decreased over time, with no statistically significant survival difference in patients aged over 70.

"While differences in survival and incidence based on sex and age have been studied individually, there have been no studies looking at the intersection of these two key variables and their combined effect on the incidence and survival for gliomas," said Jill Barnholtz-Sloan, Ph.D., senior author and Senior Investigator, Division of Cancer Epidemiology and Genetics, and Associate Director for the Informatics and Data Science Program, National Cancer Institute (NCI), which is part of the National Institutes of Health. Dr. Barnholtz-Sloan conducted the study prior to joining NCI.

**More information:** Gi-Ming Wang et al, Importance of the intersection of age and sex to understand variation in incidence and

survival for primary malignant gliomas, *Neuro-Oncology* (2021). [DOI: 10.1093/neuonc/noab199](https://doi.org/10.1093/neuonc/noab199)

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