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CBTRUS Statistical Report: Primary Brain and Central Nervous System Tumors Diagnosed in the United States in 2007–2011

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Introduction

The objective of the *CBTRUS Statistical Report: Primary Brain and Central Nervous System Tumors Diagnosed in the United States in 2007–2011* is to provide a comprehensive summary of the current descriptive epidemiology of primary brain and central nervous system (CNS) tumors in the United States population. CBTRUS obtained the latest available data on all newly diagnosed primary brain and CNS tumors from the CDC, National Program of Cancer Registries (NPCR), and the NCI, SEER program for diagnosis years 2007–2011. Incidence counts and rates of primary malignant and non-malignant brain and CNS tumors are documented by histology, gender, age, race, and Hispanic ethnicity. Mortality and relative survival rates for selected malignant histologies calculated using SEER data for the period 1995–2011 are also presented.

Background

CBTRUS is a unique professional research organization that focuses exclusively on providing quality statistical data on the population-based incidence of primary brain and CNS tumors in the United States (for more information on CBTRUS see: http://www.cbtrus.org/aboutus.html). CBTRUS was incorporated as a nonprofit 501(c)(3) in 1992 following a study conducted by the American Brain Tumor Association (ABTA) to determine the feasibility of a central registry focused on primary brain and CNS tumors in the United States.

CBTRUS is currently the only population-based site-specific registry in the United States that works in partnership with a public cancer surveillance organization, the CDC's NPCR, from which data are directly received under a special agreement. This agreement permits transfer of data through the National Program of Central Registries Cancer Surveillance System (NPCR-CSS) Submission Specifications mechanism,[1] the system utilized for collection of central (state) cancer data as mandated in 1992 by Public Law 102–515, the Cancer Registries Amendment Act.[2] This mandate was expanded to include non-malignant brain tumors in 2002, with the passage of Public Law 107–260.[3] CBTRUS researchers combine the NPCR data with data from the SEER program[4] of the NCI, which was established for national cancer surveillance in the early 1970s. All data from NPCR and SEER originate from tumor registrars who adhere to the Uniform Data Standards (UDS) for malignant and non-malignant brain and CNS tumors as directed by the North American Association of Cancer Registries (NAACCR) (http://www.naaccr.org). Along with the UDS, there are quality control checks and a system for rating each central registry to further insure that these data are reported as accurately and completely as possible. As a surveillance partner, CBTRUS can, therefore, report high quality data on brain and CNS tumors with histological specificity useful to the communities it serves. Its database contains the largest aggregation of population-based data on the incidence of all primary brain and CNS tumors in the United States.

This seventeenth statistical report, and third report published as a supplement to *Neuro-Oncology*, the official journal of the Society for Neuro-Oncology (http://www.soc-neuro-onc.org), continues the past efforts of CBTRUS to provide the most up-to-date population-based incidence rates for all primary brain and CNS tumors by histology, age, gender, race, and Hispanic ethnicity. These data have been organized by clinically relevant histology groupings and reflect the *2007 WHO Classification of Tumours of the Central Nervous System*.[5,6] These data provide important information for allocation and planning of specialty healthcare services, in the planning of disease prevention and control programs, and in research activities, and may lead to clues that will stimulate research into the causes of this terrible group of disease.

Technical Notes

Data Collection

CBTRUS does not collect data directly from patients' medical records. As noted, data for CBTRUS analyses come from the NPCR and SEER programs. By law, brain tumors (malignant and non-malignant) are reportable diseases. Hence, tumor registrars in treatment centers collect these data and send this information to central cancer registries in their states where they are collated and de-identified and sent to NPCR and SEER. Brain and CNS tumors are reported using the site definition described in Public Law 107–260.[3] On an annual basis, NPCR secures permission from the central cancer registries to release their data on brain and CNS tumors to CBTRUS. Central cancer registries play an essential role in the collection process, diagrammatically presented in Figure 1. These data are population-based and, therefore, by definition, represent a comprehensive documentation of all cancers diagnosed within a geographic region over a period of time.

CBTRUS obtained incidence data from 51 cancer registries (46 NPCR and 5 SEER) that include cases of malignant and non-malignant (benign and uncertain) primary brain and CNS tumors. The 51 population-based cancer registries include 50 state registries and the District of Columbia. **Data were requested for all newly-diagnosed primary malignant and non-malignant tumors from 2007 to 2011 at any of the following anatomic sites: brain, meninges, spinal cord, cranial nerves, and other parts of the central nervous system, pituitary and pineal glands, and olfactory tumors of the nasal cavity** (Table 1).[7]

NPCR provided data on 338,197 primary brain and CNS tumors diagnosed from 2007 to 2011. An additional 13,674 primary brain and CNS tumor case records for the time period were obtained from SEER. These data were combined into a single data set for analyses. A total of 8,696 records (2.5%) were deleted from the final analytic data set for one or more of the following reasons: invalid site/histology combination, duplicate records that included a less accurate reporting source than microscopic confirmation (e.g. radiographic versus microscopic confirmation), duplicate records for bilateral vestibular schwannoma or meningioma, duplicate record for recurrent disease, and errors in time sequence of diagnosis. The final analytic data set included 343,175 records from 51 population-based central cancer registries, including 50 state registries and the District of Columbia.

Age-adjusted incidence rates per 100,000 for the entire U.S. for selected other cancers were obtained from the United States Cancer Statistics (USCS),[8] produced by the CDC and the NCI, via CDC Wide-ranging Online Data for Epidemiologic Research (WONDER), for the purpose of comparison with brain and CNS tumor incidence rates. This database includes both NPCR and SEER data, and represents 100% of the U.S. population. Note that the 2014 CBTRUS Statistical Report does not include USCS data from 2011, as these data were not available at time of publication.

Survival data for malignant brain and CNS tumors were obtained from 18 SEER registries for the years 1995 to 2011. This dataset provides population-based information for about 26% of the United States population,[9] and is a subset of the data used for the incidence calculations presented in this report. Survival information derived from active patient follow-up is not available in the data that CBTRUS receives from NPCR registries, so the SEER data are used for the generation of these Tables.

Mortality data used in this report are from the National Center for Health Statistics and include deaths where primary brain or CNS tumor was listed as cause of death on the death certificate for all 50 states and the District of Columbia.

Definitions

Measures in Surveillance Epidemiology

This report presents the following population-based measures: incidence rates, mortality rates, and relative survival rates (for more information on definitions of terms and measures used see: http://www.cbtrus.org/glossary/glossary1.html).

Comparing incidence rates between statistical reports from different reporting agencies is not recommended due to differences in case definition, data collection, and rate calculation.

Classification by Behavior and Histology

This report uses the most recent 2012 CBTRUS histology grouping scheme (Table 2a). The classification scheme utilizes ICD-O-3 codes[7] and may include morphology codes that were not previously reported to CBTRUS.[10] Tables 2b and 2c list malignant only and non-malignant only histologies, respectively. In this report, incidence rates are provided by major histology grouping and detailed histology.

Gliomas are tumors that arise from glial or precursor cells and include astrocytoma, glioblastoma, oligodendroglioma, ependymoma, mixed glioma, malignant glioma, not otherwise specified (NOS), and a few rare histologies. Because there is no standard definition for gliomas, CBTRUS defines glioma as ICD-O-3 histology codes 9380–9384, 9391–9460, and 9480 as starred in Tables 2a, 2b, and 2c. It is also important to note that the statistics for lymphomas and hematopoietic neoplasms contained in this report refer only to those lymphomas and hematopoietic neoplasms that arise in the brain and CNS.

This report also utilizes the International Classification of Childhood Cancer (ICCC) grouping system for pediatric cancers. ICCC categories for this report were generated using the SEER Site/Histology ICCC-3 Recode[11] based on the ICCC, Third edition[12] and 2008 WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues (Please see the CBTRUS website for additional information on this classification scheme: http://www.cbtrus.org). The ICCC was developed in 1996 with subsequent changes made to correlate with revisions to ICD-O in order to provide a standard classification of childhood tumors for comparing incidence and survival across regions and time periods. As shown, the Table 16 age group category total, 0–19 age group count, and age-specific and age-adjusted rates are equivalent to those presented throughout this report, even though the histology grouping scheme differs from that used by CBTRUS, which is specific to brain and CNS tumors and correlates with *WHO Classification of Tumours of the Central Nervous System.*

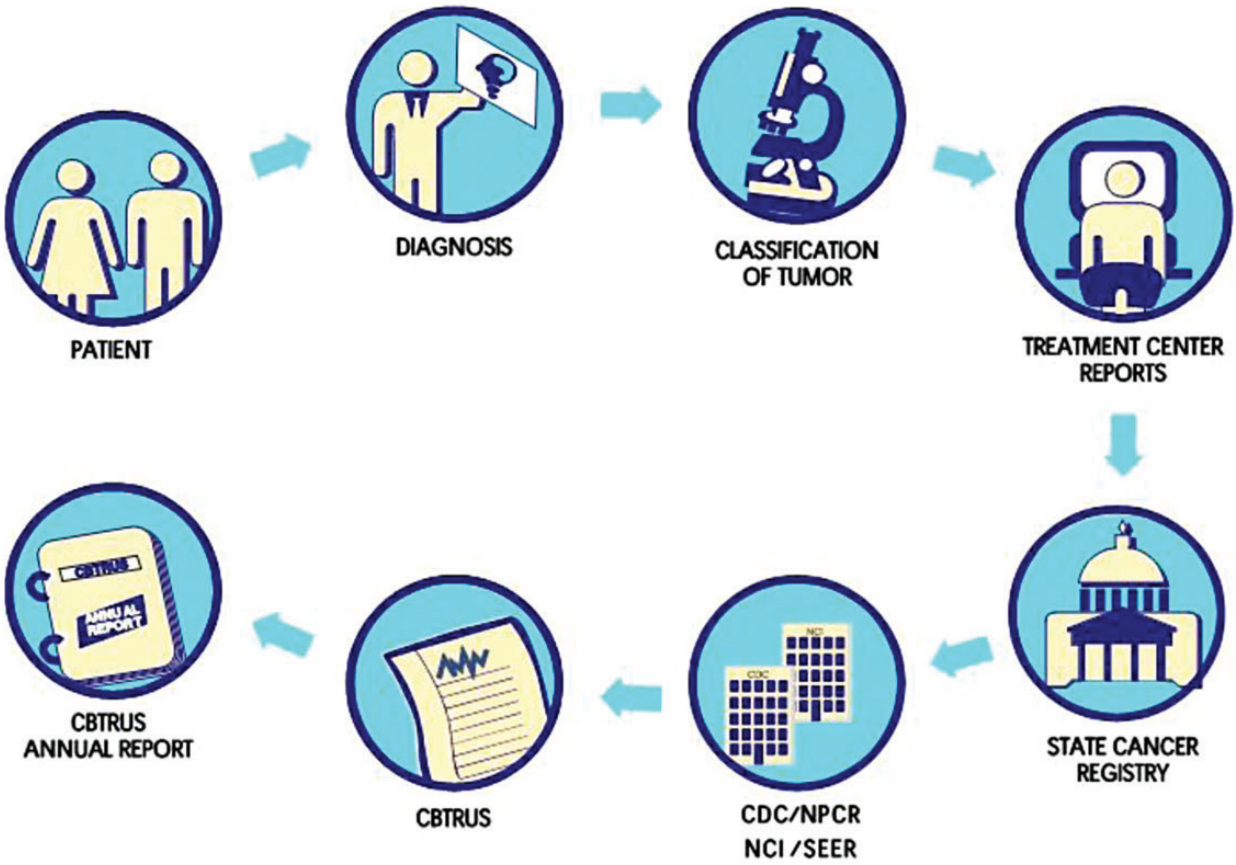


Fig. 1. Schematic of Cancer Registration Process for CBTRUS Reporting.

Anatomic Location of Tumor Sites

Various terms are used to describe the regions of the brain and central nervous system. The specific sites used in this report are broadly based on the categories and site codes defined in the SEER Site/Histology Validation List.[13] See Table 1 for an overview of CBTRUS primary site groupings. The CBTRUS Site/Validation List can be found on the CBTRUS website (http://www.cbtrus.org).

Measurement Methods

Counts, means, rates, ratios, proportions, and other relevant statistics were calculated using R 3.1.1 statistical software[14] and/or SEER*Stat 8.1.5.[15] Statistics are suppressed when counts are fewer than 16 within a cell. However, the data in the suppressed cells are included in the counts and rates for the totals. Note that reported percentages may not add up to 100% due to rounding.

Population data for each geographic region were obtained from the SEER program website[16] for the purpose of rate calculation.

Age-adjusted incidence rates and 95% confidence intervals[17] for malignant and non-malignant tumors and for selected histology groupings by gender, race, Hispanic ethnicity, and pediatric, young adult, and adult age groups were estimated. Age-adjustment was based on one-year age groupings and standardized to the 2000 U.S. standard population. The age distribution of the 2000 U.S. standard population is shown in Appendix A. Combined populations for the regions included in this report are shown in Appendix B and Appendix C.

CBTRUS presents statistics on the pediatric and adolescent age group 0–19 years in order to include and describe specific brain and CNS tumor patterns in age groups 0–4, 5–9, 10–14, and 15–19 years. However, the 0–14 year age group is a standard age category for childhood cancer used by other cancer surveillance organizations and has been included in this report for consistency and comparison purposes. Race categories in this report are all races, white, black, American Indian/Alaskan Native (AIAN), and Asian/Pacific Islander (API). Other race, unspecified, and unknown race are included in statistics that are not race-specific. Hispanic ethnicity was defined using the NAACCR Hispanic Identification Algorithm, version 2, data element, which utilizes a combination of cancer registry data fields (Spanish/Hispanic Origin data element, birthplace, race, and surnames) to directly and indirectly classify cases as Hispanic or non-Hispanic.[18] The NAACCR regional scheme (http://faststats.naaccr.org/usregions.php) was used for statistics reported by region of the United States.

Brain Tumor Definition Differences

It should be noted that NPCR, SEER, and NAACCR report brain tumors differently from CBTRUS. The definition of brain and CNS tumors used by these organizations in their published incidence

and mortality statistics includes tumors located in the following sites with their ICD-O-3 site codes in parentheses: brain, meninges, and other central nervous system tumors (C70.0–9, C71.0–9, and C72.0–9), but *excludes* lymphoma and leukemia histologies (9590–9989) from all brain and CNS sites.[6]

In contrast, CBTRUS reports data on all tumor morphologies located within the Consensus Conference site definition including lymphoma and other hematopoietic histologies (9590–9989), as well as olfactory tumors of the nasal cavity [C30.0 (9522–9523)].[10] Additionally, CBTRUS reports data on all brain and CNS tumors irrespective of behavior, whereas many reporting organizations may only publish rates for malignant brain and CNS tumors. **It is important to understand these differences in definition, as they influence the direct comparison of published rates.**

In the United States, cancer registries and surveillance groups only collect data on primary brain tumors (meaning tumors that originate within the brain) and do not collect data on tumors that metastasize to the brain from other primary sites. As a result, **only primary brain and CNS tumors are included in this report.**

Estimation of Expected Numbers of Brain and CNS Tumors in 2014 and 2015

Estimated numbers of expected malignant and non-malignant brain and CNS tumors were calculated for 2014 and 2015. To project 2014 and 2015 estimates of all primary brain and CNS tumors, age-adjusted brain tumor incidence rates for a state were multiplied by the projected population for that state. Projected population estimates for 2014 and 2015 were obtained from the interim projections from 2000–2030 based on the 2000 Census.[16]

Estimation of Mortality Rates for Brain and CNS Tumors

Age-adjusted mortality rates for deaths resulting from all malignant brain and CNS tumors were calculated using the mortality data available in the CDC WONDER Online Database provided by National Center for Health Statistics (NCHS).[19] In addition to total age-adjusted rate for the United States, age-adjusted rates are presented by gender and state.

Estimation of Survival Rates

SEER*Stat 8.1.5 statistical software was used to estimate one-, two-, three-, four-, five-, and ten-year relative survival rates for primary malignant brain tumor cases diagnosed between 1995–2011 in eighteen SEER areas.[15,20] This software utilizes life-table (actuarial) methods to compute survival estimates and accounts for current follow-up. Survival was estimated for brain (C71.0-C71.9), meninges (C70.0-C70.9), spinal cord, cranial nerves, and other parts of the central nervous system (C72.0-C72.9), pituitary and pineal glands (C75.1-C75.3), and olfactory tumors of the nasal cavity [C30.0 (9522–9523)]. Second or later primary tumors, cases diagnosed at autopsy, cases in which race or sex is coded as other or unknown, and cases known to be alive but for whom follow-up time could not be calculated, were excluded from the SEER survival data analyses. Survival was not calculated for non-malignant tumors as collection of these cases has only been mandated since 2004, and therefore, not enough time has elapsed to accurately calculate relative survival.

Data Interpretation

The CBTRUS works diligently to support the broader surveillance efforts aimed at improving the collection and reporting of primary brain and CNS tumors. The central cancer registry data provided to NPCR and SEER and, subsequently, to CBTRUS vary from year-to-year due to ongoing updates in collection and data refinement aimed to improve completeness and accuracy. **Therefore, it is important to note that data from previous CBTRUS Reports cannot be compared to data in *CBTRUS Statistical Report: Primary Brain and Central Nervous System Tumors Diagnosed in the United States in 2007–2011*. The latest report supersedes all previous reports in terms of coverage of the United States population with the most up-to-date information.**

Random fluctuations in average annual rates are common, especially for rates based on small incidence counts. The CBTRUS policy to suppress data presentation for cells with counts of fewer than 16 is consistent with the NPCR policy.

As noted in the *Annual Report to the Nation on the Status of Cancer, 1975–2010, Featuring Prevalence of Comorbidity and Impact on Survival Among Persons With Lung, Colorectal, Breast, or Prostate Cancer* and in the *2013 CBTRUS Statistical Report*, the policy change enacted in 2007 guiding the Veterans Health Administration (VHA) had resulted in underreporting of cancer data—especially for men—to central cancer registries. The ongoing process to clarify this policy indicates that underreporting for VHA facilities has diminished over time.[21]

Delays in reporting and late ascertainment are a reality and a known issue influencing registry completeness and, consequently, rate underestimations occur, especially for the most recent years.[22] CBTRUS also recognizes that the problem may be even more likely to occur in the reporting of non-malignant brain and CNS tumors, where reporting often comes from non-hospital based sources and mandated collection is relatively recent (2004).

CBTRUS editing practices conducted yearly, aimed at refining the data for accuracy and clinical relevance should also be recognized in interpreting these report data. Exclusion of site and histology combinations considered to be invalid by the consulting neuropathologists, who revised the CBTRUS site/histology validation list in 2012, may have the impact of underestimating the incidence of brain and CNS tumors. Editing changes, such as reconsidering paired sites as multiple tumors rather than a single bilateral tumor beginning in 2004, also incorporate updates to the cancer registration coding rules that influence case ascertainment and data collection.[6]

Population estimates used for denominators affect incidence rates. CBTRUS has utilized population data estimates based on the 2000 U.S. Census in this report.

Results

Primary Brain and CNS Tumors in Comparison to Other Common Neoplasms in the United States

Average annual age-adjusted incidence rates for primary brain and CNS tumors (2007–2011) and a selection of common cancers (2007–2010) in the United States are presented by age in Figures 2a (ages 0–19) and 2b (ages 20+) (Note: the 2014

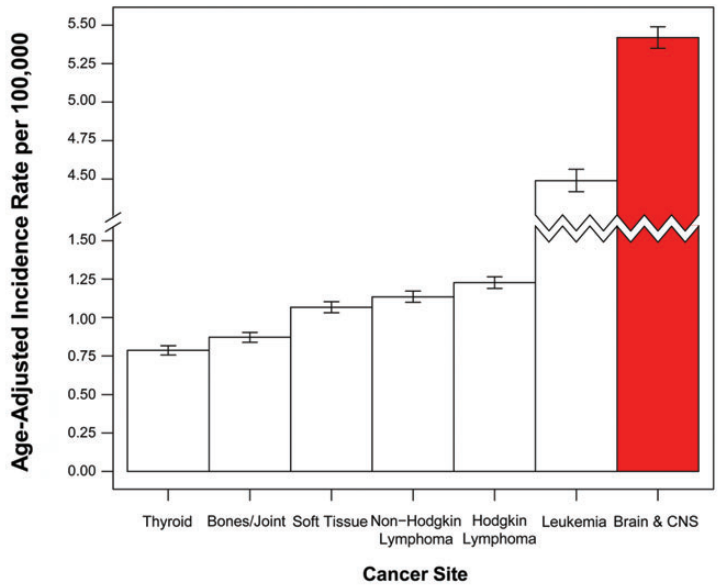


Fig. 2a. Average Annual Age-Adjusted Incidence Rates[a] of All Primary Brain and CNS Tumors in Comparison to Other Common Cancers in Children and Adolescents (Ages 0–19), CBTRUS Statistical Report: NPCR and SEER 2007–2011, USCS 2007–2010[b].

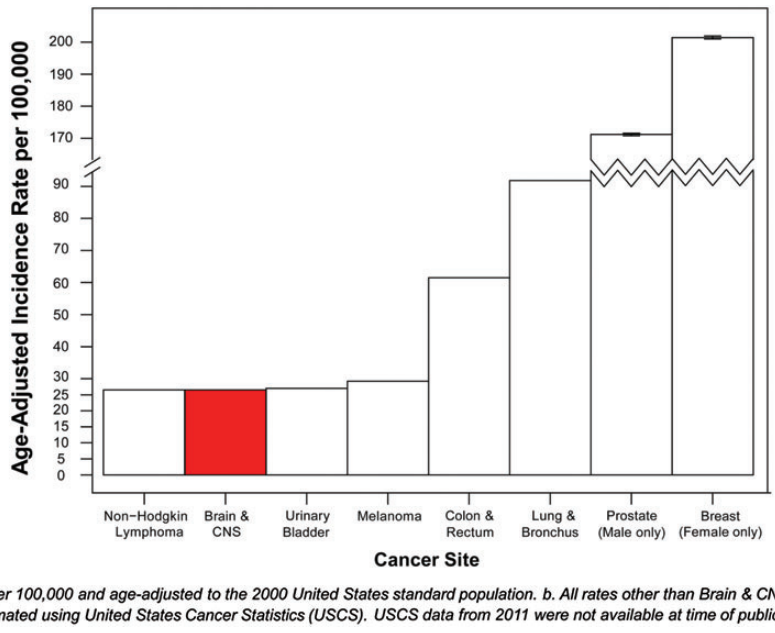


Fig. 2b. Average Annual Age-Adjusted Incidence Rates[a] of All Primary Brain and CNS Tumors in Comparison to Other Cancers in Adults (Ages 20 +), CBTRUS Statistical Report: NPCR and SEER 2007–2011, USCS 2007–2010[b].

CBTRUS Statistical Report does not include USCS data from 2011 as these data were not available at time of publication).

- Brain and CNS tumors are the most common neoplasm among those 0–19 years old, with an average annual age-adjusted incidence rate of 5.42 per 100,000.
- The second most common cancer is leukemia, with an average annual age-adjusted incidence rate of 4.49 per 100,000.
- Prostate and breast cancer are the most common cancers among those 20+ years in the United States, with average annual age-adjusted incidence rates of 201.40 per 100,000 and 171.20 per 100,000, respectively.
- Brain and CNS tumors (27.86 per 100,000) are approximately as common as non-Hodgkin lymphoma (26.50 per 100,000), melanoma (27.00 per 100,000), and urinary bladder (29.20 per 100,000).

Primary Brain and CNS Tumors: Distributions and Incidence by Gender, Age, Year, Behavior, and Cancer Registry

Counts of the 343,175 incident brain tumors (115,799 malignant; 227,376 non-malignant) reported during 2007–2011 by histology and demographic characteristics for all ages are presented in Tables 3–6. The predominant tumor categories by behavior are presented in Figure 3.

Incidence Rates by Gender and Behavior

- Overall, approximately 42% of all tumors occurred in males (144,963 tumors) and 58% in females (198,212 tumors).
- 55% of the malignant tumors occurred in males (63,832 tumors) and 45% in females (51,967 tumors).
- 36% of the non-malignant tumors occurred in males (81,131 tumors) and 64% in females (146,245 tumors).

Incidence Rates by Age

The overall average annual age-adjusted incidence rate for 2007–2011 for all primary brain and CNS tumors was 21.42 per 100,000 (Table 3). The overall incidence rate was 5.42 per 100,000 for children and adolescents 0–19 years of age (5.26 per 100,000 for children 0–14 years, Table 24), and 27.85 per 100,000 for adults 20+ years (Table 7). The overall incidence rates of tumors by behavior and age group (0–19 years and 20+ years) are shown in Figure 4 and Table 7.

Incidence Rates by Year and Behavior

Figure 5 presents the overall annual age-adjusted incidence rates of all primary brain and CNS tumors by year from 2007 through 2011 and behavior. The incidence rates of all primary brain and CNS tumors for 2007–2011 did not differ significantly by year, both overall and by behavior.

Incidence Rates by Central Cancer Registry, Age, and Behavior

The overall number of reported tumors is listed by central cancer registry in Table 6. The average annual combined 2007–2011 population of 306,602,148 represents approximately 99.8% of the U.S. population for those years.

- Approximately 66% of tumors were non-malignant, but there was substantial variation by cancer registry (range: 54.1–73.1%).
- About 62.1% of all tumors had a histologically confirmed diagnosis, with substantial regional variation (range: 52.5–95.5%).

The overall average annual age-adjusted incidence rates by central cancer registry, age group, and behavior are presented in Table 7, Figure 6a–c.

- There is less variation by region for malignant tumor incidence rates as compared to incidence rates for non-malignant tumors. The central cancer registry and regional variations likely reflect differences in reporting and case ascertainment practices.
- Many non-malignant brain and CNS tumors are not histologically confirmed.
- The overall average annual age-adjusted incidence rates of all tumors (malignant and non-malignant) for each individual central cancer registry ranged from 15.58 to 27.50 per 100,000.
- Average annual age-adjusted incidence rates of all primary malignant tumors ranged from 4.75 to 8.62 per 100,000, and average annual age-adjusted incidence rates of all primary non-malignant tumors ranged from 8.67 to 19.51 per 100,000.
- Among adults 20 years of age and older, the central cancer registry-specific incidence rates ranged from 5.55 to 11.18 per 100,000 for malignant tumors and from 11.63 to 26.39 per 100,000 for non-malignant tumors.

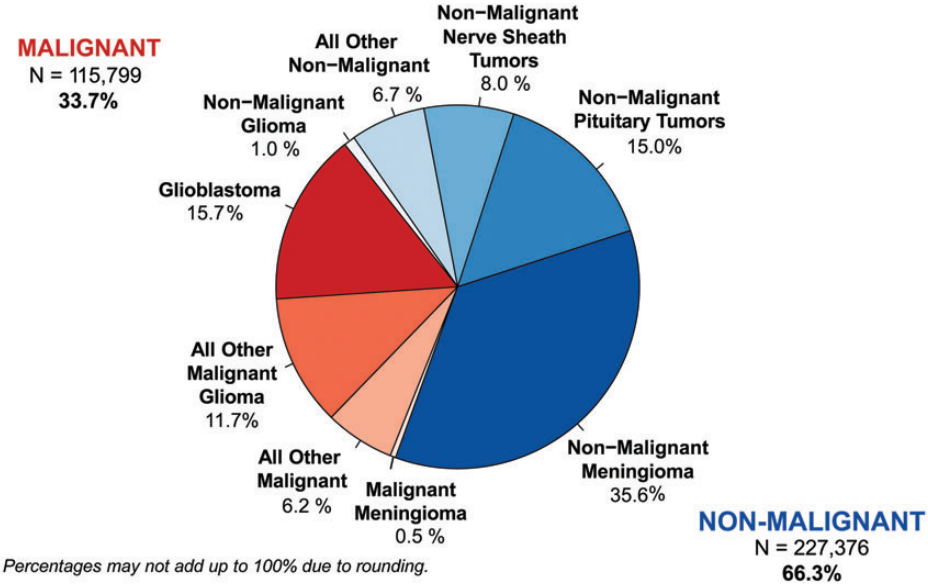
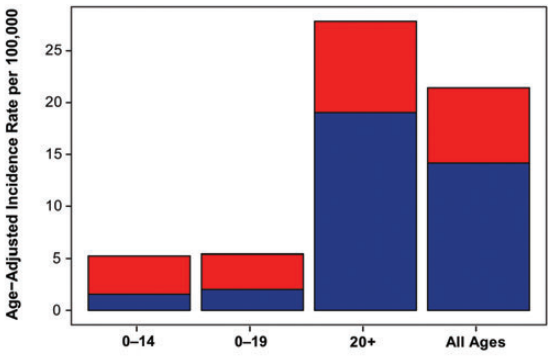


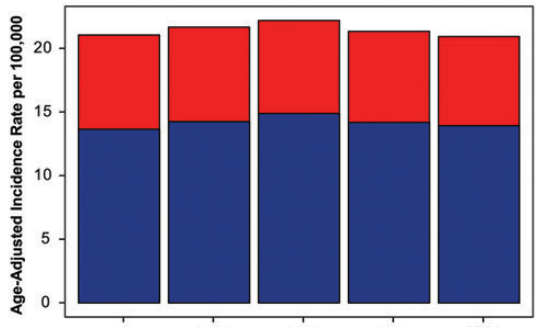
Fig. 3. Distribution[a] of Primary Brain and CNS Tumors by Behavior (N = 343,175), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.



	0–14	0–19	20+	All Ages
Non-Malignant	1.56	2.03	19.05	14.17
Malignant	3.70	3.39	8.80	7.25
Total	5.26	5.42	27.85	21.42

a. Rates per 100,000 and age-adjusted to the 2000 United States standard population.

Fig. 4. Average Annual Age-Adjusted Incidence Rates[a] of Primary Brain and CNS Tumors by Age and Behavior, CBTRUS Statistical Report: NPCR and SEER, 2007–2011.



	2007	2008	2009	2010	2011
Non-Malignant	13.65	14.24	14.88	14.18	13.92
Malignant	7.39	7.42	7.31	7.15	7.01
Total	21.04	21.66	22.19	21.33	20.93

a. Rates per 100,000 and age-adjusted to the 2000 United States standard population.

Fig. 5. Annual Age-Adjusted Incidence Rates[a] of Primary Brain and CNS Tumors by Year and Behavior, CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

- In those less than 20 years of age, incidence rates listed ranged from 2.19 to 4.39 per 100,000 for malignant tumors and from 0.61 to 3.73 per 100,000 for non-malignant tumors.

Primary Brain and CNS Tumors: Incidence by Site, Histology, Gender, Race, Hispanic Ethnicity, and Age

Distribution of Tumors by Site and Histology

The distribution of brain and CNS tumors by site is shown in Figures 7a–c.

- Overall, frontal (8.6%), temporal (6.4%), parietal (4.0%), and occipital lobes (1.1%) account for 20.1% of all tumors.
- For malignant tumors, frontal (23.2%), temporal (17.0%), parietal (10.9%), and occipital (2.9%) account for 54.0% of tumors.
- Overall, the most common tumor site is the meninges, representing 36.1% of all tumors.
- For non-malignant tumors, 53.5% of all tumors occur in the meninges.
- Cerebrum, ventricle, cerebellum, and brain stem tumors account for 7.1% of all tumors.
- The cranial nerves and the spinal cord/cauda equina account for 9.6% of all tumors.
- The pituitary and craniopharyngeal duct and pineal glands account for 16.7% of all tumors.

The distribution by brain and CNS histology is shown in Figure 8a.

- The most frequently reported histology overall is meningioma (36.1%), followed by glioblastoma (15.4%).
- Tumors of the pituitary and nerve sheath tumors combined account for about one-fourth of all tumors, the vast majority of which are non-malignant.

The distribution of malignant and non-malignant brain and CNS tumors by histology are shown in Figures 8b and 8c, respectively, as well as in Table 9.

- The most common malignant tumor is glioblastoma (45.6%).
- The most common non-malignant tumor is meningioma (53.7%).
- Vestibular schwannomas (defined by histology code 9560, also formerly called acoustic neuromas) account for 94.1% of all non-malignant nerve sheath tumors (based on multiple sites in the brain and CNS).

The broad category glioma represents approximately 28% of all tumors (Figure 8a) and 80% of malignant tumors (Figure 8b). The distribution of gliomas by site and histology are shown in Figures 9 and 10, respectively.

- Only a very small proportion of gliomas occur outside the brain. The majority of these tumors occur in the frontal, temporal, parietal, and occipital lobes combined (60.9%).
- Glioblastoma accounts for the majority of gliomas, while other astrocytomas and glioblastoma combined account for about three-fourths of all gliomas.

Incidence of Spinal Cord Tumors

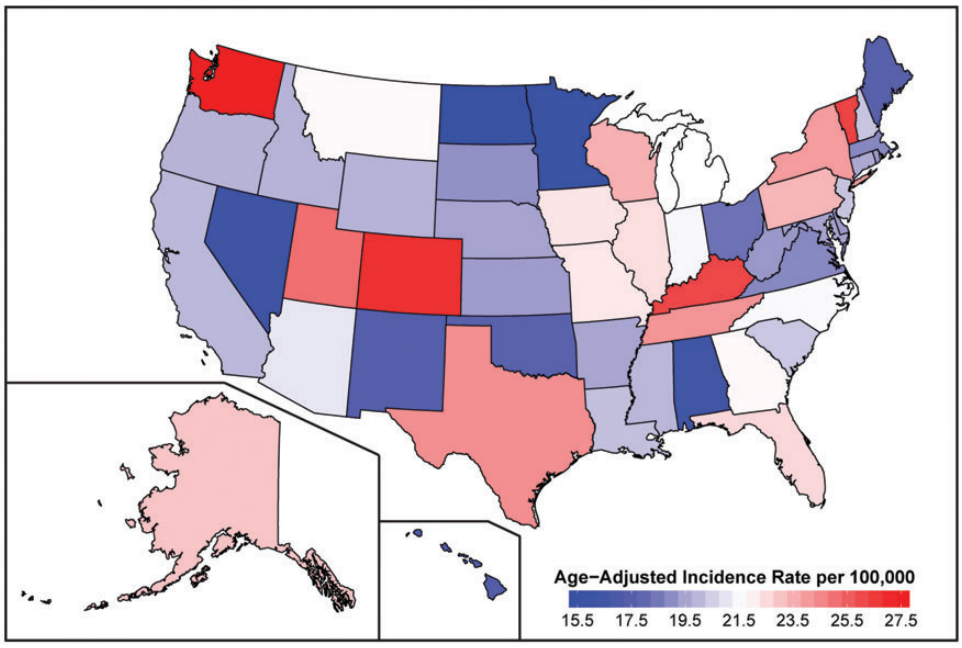
Although spinal cord tumors account for a relatively small percentage of all brain and CNS tumors, they result in significant morbidity. The most prevalent histologies found in the spinal cord, spinal meninges, and cauda equina are presented in Figures 11a and 11b for both children and adolescents (0–19 years) and adults (20+ years), respectively.

- The predominant histology for those 0–19 years is ependymal tumors followed by other astrocytomas, including glioblastoma.
- Tumors of meninges account for the largest proportion of spinal cord tumors among those ages 20 years and older.

Incidence Rates by Site and Gender

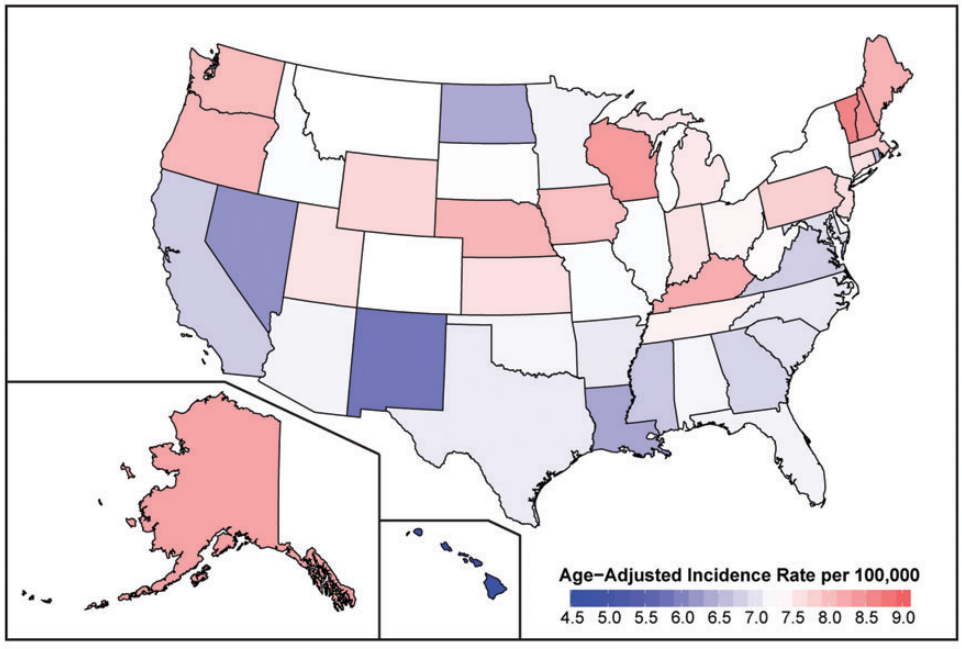
Incidence counts and average annual age-adjusted rates for brain and CNS tumors by site and gender are provided in Table 8.

- Incidence rates were highest for tumors located in the meninges (7.61 per 100,000).



a. Rates per 100,000 and age-adjusted to the 2000 United States standard population. b. Data only available from 2007-2010 for Nevada.

Fig. 6a. Average Annual Age-Adjusted Incidence Rates[a] of All Primary Brain and CNS Tumors by Central Cancer Registry, CBTRUS Statistical Report: NPCR and SEER, 2007–2011[b].



a. Rates per 100,000 and age-adjusted to the 2000 United States standard population. b. Data only available from 2007-2010 for Nevada.

Fig. 6b. Average Annual Age-Adjusted Incidence Rates[a] of Malignant Primary Brain and CNS Tumors by Central Cancer Registry, CBTRUS Statistical Report: NPCR and SEER, 2007–2011[b].

- Incidence rates were lowest for olfactory tumors of the nasal cavity (0.04 per 100,000).
- Incidence rates were higher in females than in males for tumors located in the meninges, pituitary, and cranial nerves.
- Males had higher incidence rates of tumors located in the four lobes of the brain, cerebrum, ventricle, cerebellum, brain stem, other brain, spinal cord and cauda equina, other nervous system, pineal, and olfactory tumors of the nasal cavity compared to females.

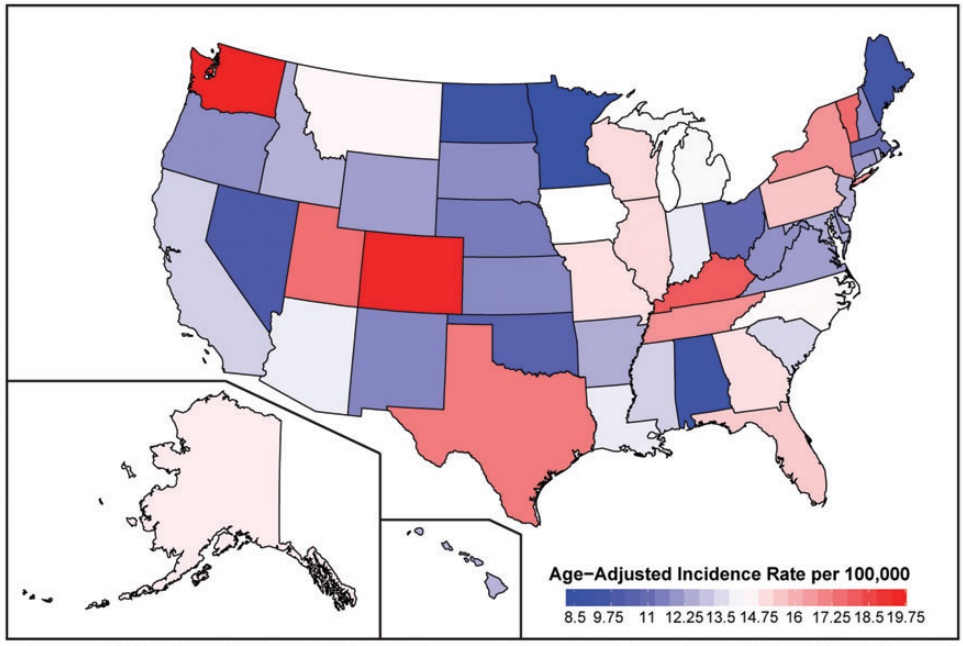


Fig. 6c. Average Annual Age-Adjusted Incidence Rates[a] of Non-Malignant Primary Brain and CNS Tumors by Central Cancer Registry, CBTRUS Statistical Report: NPCR and SEER, 2007–2011[b].

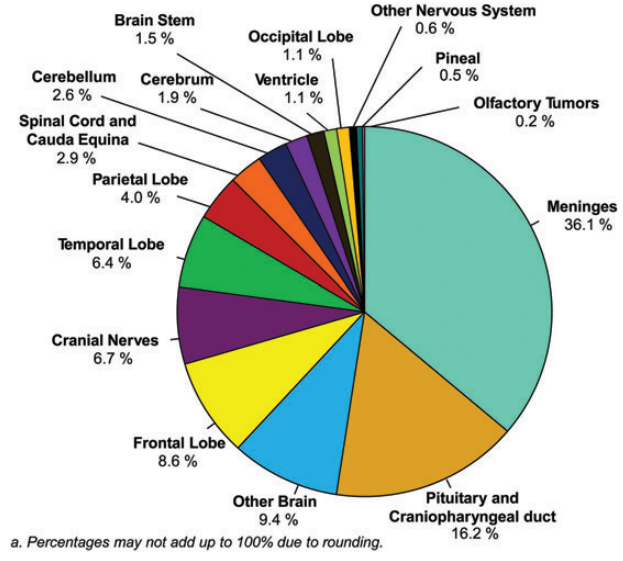


Fig. 7a. Distribution[a] of All Primary Brain and CNS Tumors by Site (N = 343,175), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

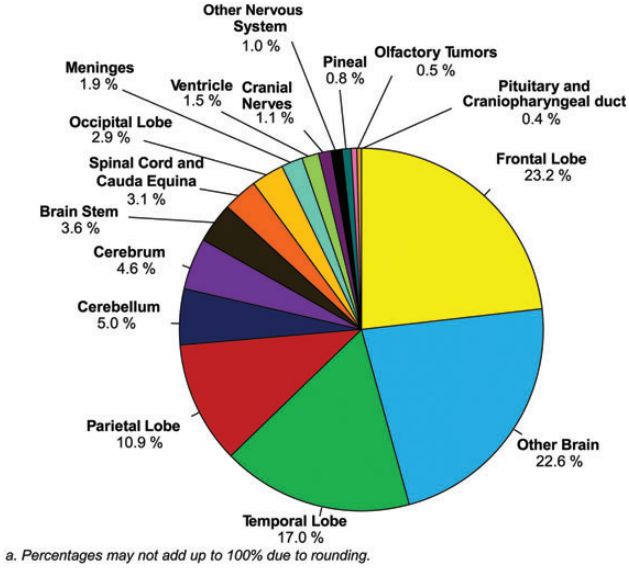


Fig. 7b. Distribution[a] of Malignant Primary Brain and CNS Tumors by Site (N = 115,799), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

Incidence Rates by Major Histology Groupings and Specific Histologies

Incidence rates by major histology groupings and specific histologies are provided in Table 3.

- Among CBTRUS major histology groupings, incidence rates were highest for tumors of the meninges (7.88 per 100,000), followed by tumors of the neuroepithelial tissue (6.61 per 100,000), tumors of the sellar region (3.47 per 100,000), and tumors of the cranial and spinal nerves (1.70 per 100,000).
- Incidence rates were highest for meningiomas (7.61 per 100,000), glioblastomas (3.19 per 100,000), tumors of the pituitary (3.29 per 100,000), and nerve sheath tumors (1.70 per 100,000).

Incidence Rates by Behavior and Histology

Brain and CNS tumor incidence rates by behavior (malignant and non-malignant) are presented in Table 9.

- For malignant tumors, the incidence rate was highest for glioblastoma (3.19 per 100,000), followed by diffuse astrocytoma (0.55 per 100,000) and lymphoma (0.44 per 100,000).
- For non-malignant tumors, meningioma (7.50 per 100,000), tumors of the pituitary (3.28 per 100,000), and nerve sheath (1.69 per 100,000) had the highest incidence rates.

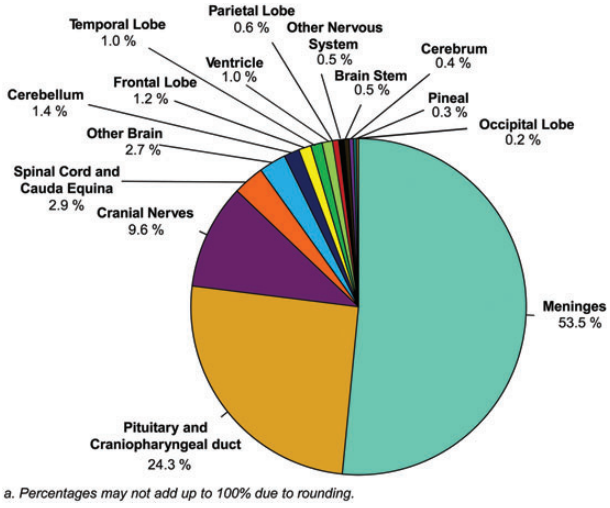


Fig. 7c. Distribution[a] of Non-Malignant Primary Brain and CNS Tumors by Site (N = 227,376), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

Incidence Rates by Gender and Histology

Incidence rates by histology and gender are presented in Table 3. Incidence rates for all primary brain and CNS tumors combined are higher among females (23.26 per 100,000) than males (19.42 per 100,000).

- The incidence rate of tumors of neuroepithelial tissue is higher in males (7.77 per 100,000) than in females (5.61 per 100,000).
- The incidence rate of tumors of meninges is higher in females (10.51 per 100,000) than in males (4.85 per 100,000).

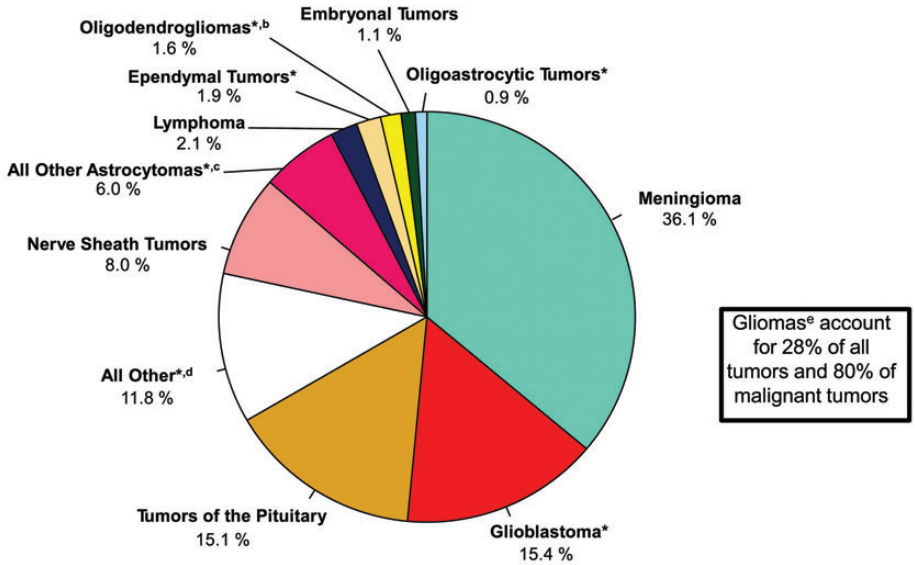
Incidence rate ratios (male:female) for selected histologies and groupings are shown in Figure 12.

- Incidence was higher in males for many histologies, such as germ cell tumors, most glial tumors, lymphomas, and embryonal tumors.
- In addition to meningiomas, tumors of the pituitary were also more common in females than in males.

Incidence Rates by Race and Histology

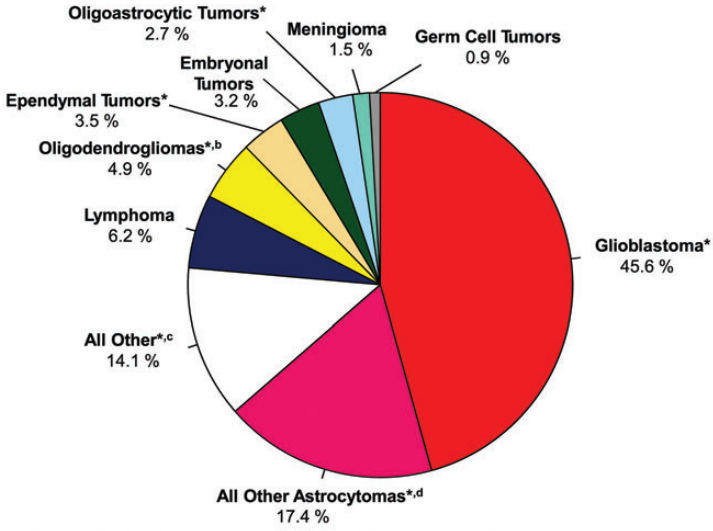
Incidence rates by histology and race are shown in Table 4.

- Incidence rates for all primary brain and CNS tumors combined are lower for race groups AIAN (13.02 per 100,000) as compared to whites (21.51 per 100,000), blacks (21.23 per 100,000), and API (20.42 per 100,000).
- Incidence rates of meningioma, tumors of the pituitary, and craniopharyngioma for blacks exceed those observed for white, AIAN, and API races.



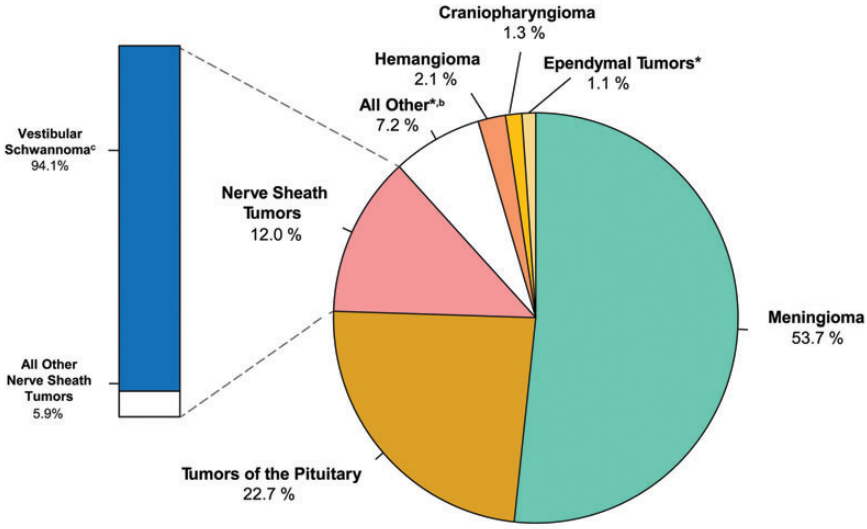
** All or some of this histology is included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a).*
a. Percentages may not add up to 100% due to rounding. b. Includes oligodendroglioma and anaplastic oligodendroglioma (Table 2a). c. Includes pilocytic astrocytoma, diffuse astrocytoma, anaplastic astrocytoma, and unique astrocytoma variants (Table 2a). d. Includes glioma malignant, NOS, choroid plexus tumors, other neuroepithelial tumors, neuronal and mixed neuronal-glial tumors, tumors of the pineal region, other tumors of cranial and spinal nerves, mesenchymal tumors, primary melanocytic lesions, other neoplasms related to the meninges, other hematopoietic neoplasms, hemangioma, neoplasm, unspecified, and all other (Table 2a). e. ICD-O-3 histology codes: 9380- 9384, 9391-9460,9480 .

Fig. 8a. Distribution[a] of All Primary Brain and CNS Tumors by CBTRUS Histology Groupings and Histology (N = 343,175), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.



** All or some of this histology is included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2b).*
a. Percentages may not add up to 100% due to rounding. b. Includes oligodendroglioma and anaplastic oligodendroglioma (Table 2b). c. Includes glioma malignant, NOS, choroid plexus tumors, other neuroepithelial tumors, neuronal and mixed neuronal-glial tumors, tumors of the pineal region, nerve sheath tumors, other tumors of cranial and spinal nerves, mesenchymal tumors, primary melanocytic lesions, other neoplasms related to the meninges, other hematopoietic neoplasms, hemangioma, neoplasm, unspecified, and all other (Table 2b). d. Includes pilocytic astrocytoma, diffuse astrocytoma, anaplastic astrocytoma, and unique astrocytoma variants (Table 2b).

Fig. 8b. Distribution[a] of Malignant Primary Brain and CNS Tumors by CBTRUS Histology Groupings and Histology (N = 115,799), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.



** All or some of this histology is included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 Table 2c).*
a. Percentages may not add up to 100% due to rounding. b. Includes pilocytic astrocytoma, diffuse astrocytoma, anaplastic astrocytoma, unique astrocytoma variants, glioblastoma, oligodendroglioma, anaplastic oligodendroglioma, oligoastrocytic tumors, glioma malignant, NOS, choroid plexus tumors, other neuroepithelial tumors, neuronal and mixed neuronal- glial tumors, tumors of the pineal region, embryonal tumors, other tumors of cranial and spinal nerves, mesenchymal tumors, primary melanocytic lesions, other neoplasms related to the meninges, other hematopoietic neoplasms, germ cell tumors, neoplasm, unspecified, and all other (Table 2c). c. ICD-O-3 histology code 9560.

Fig. 8c. Distribution[a] of Non-Malignant Primary Brain and CNS Tumors by CBTRUS Histology Groupings and Histology (N = 227,376), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

- The average annual incidence rate for tumors of the cranial and spinal nerves in the API group is highest for all racial groups.

Incidence rate ratios (white:black) for selected histologies are shown in Figure 13.

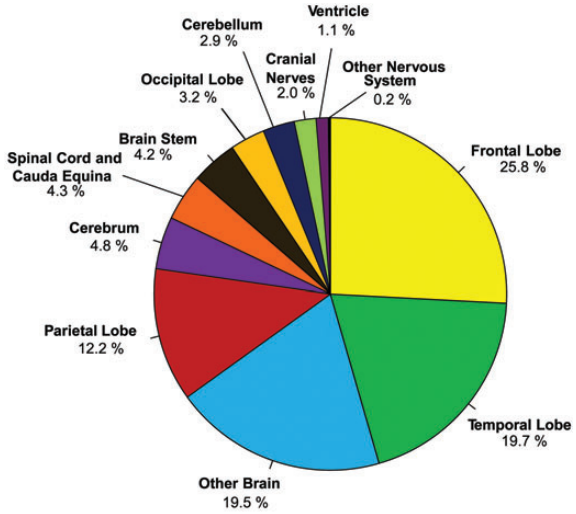
- Incidence rates for glioblastoma, all other astrocytoma, oligodendroglioma, oligoastrocytic tumors, and nerve sheath tumors are approximately 2 times greater in whites than in blacks.
- Incidence rates for pilocytic astrocytoma, ependymal tumors, embryonal tumors, lymphoma, and germ cell tumors are also higher among whites than blacks.

- Incidence rates for meningioma and tumors of the pituitary are higher among blacks than whites.

Incidence Rates by Hispanic Ethnicity and Histology

Incidence rates by Hispanic ethnicity and histology are shown in Table 5.

- The overall incidence rate for primary brain and CNS tumors is 20.02 per 100,000 among Hispanics and 21.72 per 100,000 among non-Hispanics.
- Tumors of the pituitary are the only histology that is higher in Hispanics than in non-Hispanics.



a. Percentages may not add up to 100% due to rounding.
b. ICD-O-3 codes = 9380-9384,9391-9460,9480 (Table 2a).

Fig. 9. Distribution[a] of Primary Brain and CNS Gliomas[b] by Site (N = 96,448), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

Incidence Rates by Age and Histology

The age-adjusted incidence rates by histology and age at diagnosis are presented in Table 10 and Figure 14 (for ages 20+) and Figure 15 (For ages 0–19).

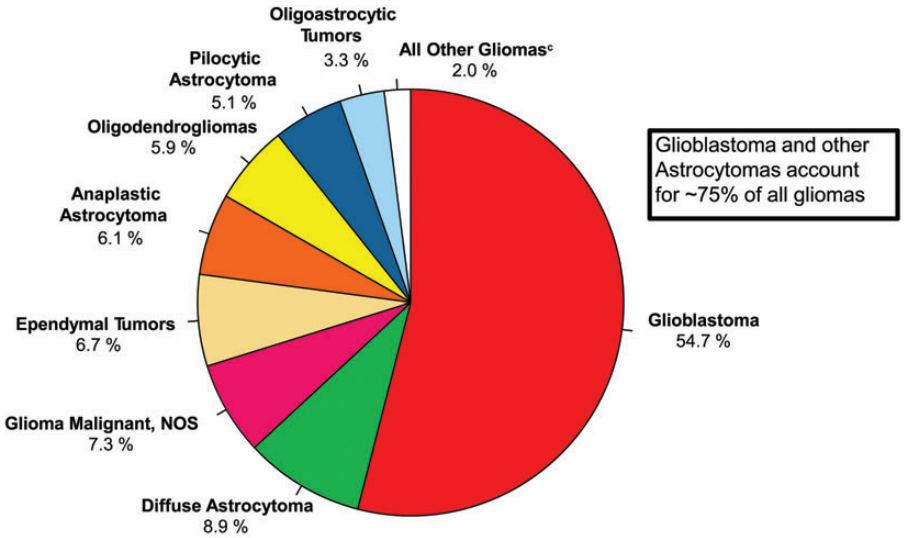
- The incidence rate for all brain and CNS tumors is highest among the 85+ year olds (81.16 per 100,000) and lowest among children ages 0–14 years (5.26 per 100,000).
- Incidence rates of pilocytic astrocytoma, germ cell tumors, and embryonal tumors are higher in the younger age groups and decrease with advancing age.
- Incidence rate of meningioma increases progressively with age.
- There are declines in incidence rates between age groups for those 0–19, particularly for the gliomas and embryonal tumor types (primitive neuroectodermal tumor (PNET) and medulloblastoma).
- Incidence rates of pilocytic astrocytoma decline substantially from the 10–14 years age group to the 15–19 years age group.
- There is a substantial increase in incidence of tumors of the pituitary between 10–14 and 15–19.
- The incidence rate of PNET is highest in the 0–4 age group, and incidence of medulloblastoma is highest in those 9 years old and younger.

The distribution patterns of histologies within age groups differ substantially as is apparent in Table 11, which shows the four most common brain and CNS tumor histologies by age at occurrence.

Median Age at Diagnosis

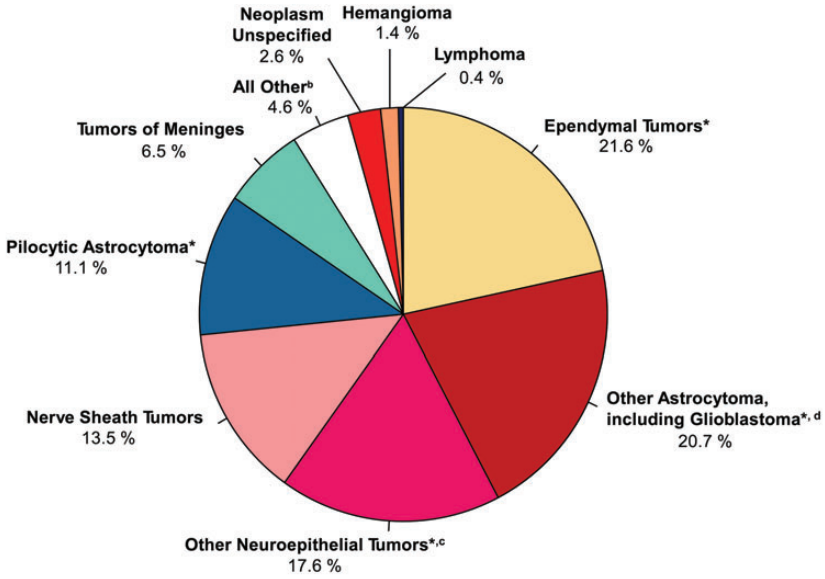
The median age at diagnosis for all primary brain and CNS tumors is 59 years (Table 9).

- The histology-specific median ages range from 9 (embryonal tumors) to 70 (neoplasm, unspecified) years.



a. Percentages may not add up to 100% due to rounding. b. ICD-O-3 codes = 9380-9384,9391-9460,9480.(Table 2a). c. Includes histologies from unique astrocytoma variants, other neuroepithelial tumors, and neuronal and mixed neuronal-glial tumors (Table 2a).

Fig. 10. Distribution[a] of Primary Brain and CNS Gliomas[b] by Histology Subtypes (N = 96,448), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.



** All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a).*
a. Percentages may not add up to 100% due to rounding. b. Includes embryonal tumors, other tumors of cranial and spinal nerves, other hematopoietic neoplasms, germ cell tumors, neoplasm unspecified, and all other (Table 2a). c. Includes oligodendroglioma, anaplastic oligodendroglioma, oligoastrocytic tumors, glioma malignant, NOS, choroid plexus tumors, other neuroepithelial tumors, and neuronal and mixed neuronal-glial tumors (Table 2a). d. Includes diffuse astrocytoma, anaplastic astrocytoma, unique astrocytoma variants (Table 2a).

Fig. 11a. Distribution[a] of Spinal Cord, Spinal Meninges, and Cauda Equina Tumors in Children and Adolescents (Ages 0–19), CBTRUS Histology Groupings, and Histology (N = 1,238), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

- Pilocytic astrocytoma, choroid plexus tumors, neuronal and mixed neuronal-glial tumors, tumors of the pineal region, embryonal tumors, and germ cell tumors and cysts are histologies with younger median ages at diagnosis.
- Meningioma and glioblastoma are primarily diagnosed at older ages (median age of 65 and 64, respectively).

Childhood and Adolescence: Primary Brain and CNS Tumors: Incidence and Distribution by Site, Histology, Gender, and Age

Distribution of Tumors by Site and Histology in Children and Adolescents (Ages 0–19)

Brain and CNS tumors are the most common form of solid tumors in children.[23] About 7% of the reported brain and CNS tumors during 2007–2011 occurred in children and adolescents ages 0–19 years, and approximately 5% of reported tumors occurred in children 0–14. The distribution of brain and CNS tumors for children and adolescents ages 0–19 years by site is shown in Figure 16a.

- The largest percentages of tumors in childhood and adolescence (17.3%) are located within the frontal, temporal, parietal, and occipital lobes of the brain combined.
- Cerebrum, ventricle, cerebellum, and brain stem tumors account for 5.4%, 5.7%, 15.9%, and 10.2% of all brain and CNS tumors in childhood and adolescence, respectively.
- Tumors of the meninges represent 2.8% of all tumors in childhood and adolescence.
- The cranial nerves and the spinal cord and cauda equina account for 6.1% and 4.5% of all brain and CNS tumors in childhood and adolescence, respectively.
- Tumors located in the pituitary and pineal glands together account for about 16.6% of all brain and CNS tumors in childhood and adolescence.

Figure 16b presents the most common brain and CNS histologies in children and adolescents ages 0–19 years.

- For children and adolescents ages 0–19 years, pilocytic astrocytomas, embryonal tumors, and glioma malignant, NOS account for 15.4%, 12.0%, and 11.7%, respectively (Figure 16).
- Gliomas account for approximately 47.9% of tumors in children and adolescents ages 0–19 years.

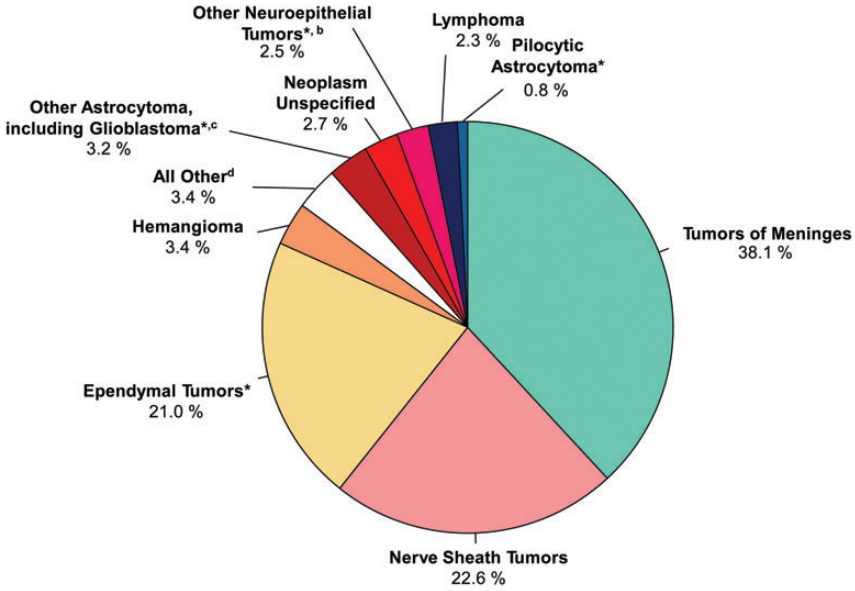
Distribution of Tumors by Site and Histology in Children (Ages 0–14)

The distribution of brain and CNS tumors for children ages 0–14 years by site is shown in Figure 17a.

- Tumors of the cerebellum comprised the largest proportion of tumors (18.7%), followed by other brain (15.2%) and brain stem (12.4%).

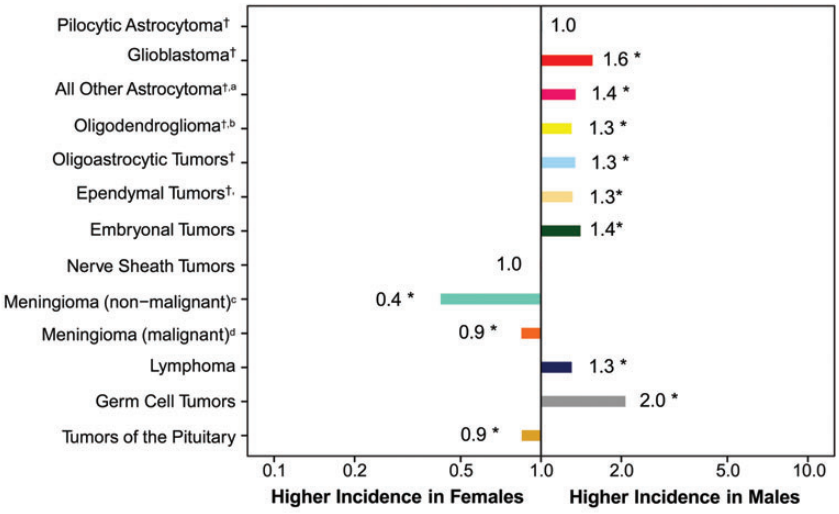
Figure 17b presents the most common brain and CNS histologies in children ages 0–14 years.

- For children ages 0–14 years, pilocytic astrocytomas, embryonal tumors, and glioma malignant, NOS account for 17.6%, 15.0%, and 14.5%, respectively.
- Gliomas account for approximately 53% of tumors in children ages 0–14 years.



*All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a).
a. Percentages may not add up to 100% due to rounding. b. Includes oligodendroglioma, anaplastic oligodendroglioma, oligoastrocytic tumors, glioma malignant, NOS, choroid plexus tumors, other neuroepithelial tumors, and neuronal and mixed neuronal-glial tumors (Table 2a). c. Includes diffuse astrocytoma, anaplastic astrocytoma, unique astrocytoma variants (Table 2a). d. Includes embryonal tumors, other tumors of cranial and spinal nerves, other hematopoietic neoplasms, germ cell tumors, neoplasm unspecified, and all other (Table 2a).

Fig. 11b. Distribution[a] of Spinal Cord, Spinal Meninges, and Cauda Equina Tumors in Adults (Ages 20+), CBTRUS Histology Groupings, and Histology (N = 14,822), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.



* Incidence Rate is significantly different in males and females.
† All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480.
a. ICD-O-3 Histology Codes: 9381, 9384, 9424, 9400, 9401, 9410, 9411, 9420. b. ICD-O-3 Histology Codes: 9450, 9451, 9460.
c. ICD-O-3 Histology Codes: 9530/0,9530/1, 9531/0, 9532/0, 9533/0, 9534/0, 9537/0, 9538/1, 9539/1. d. ICD-O-3 Histology Codes: 9530/3, 9538/3, 9539/3.

Fig. 12. Incidence Rate Ratios by Gender (Males:Females) for Selected CBTRUS Histology Groupings and Histology, CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

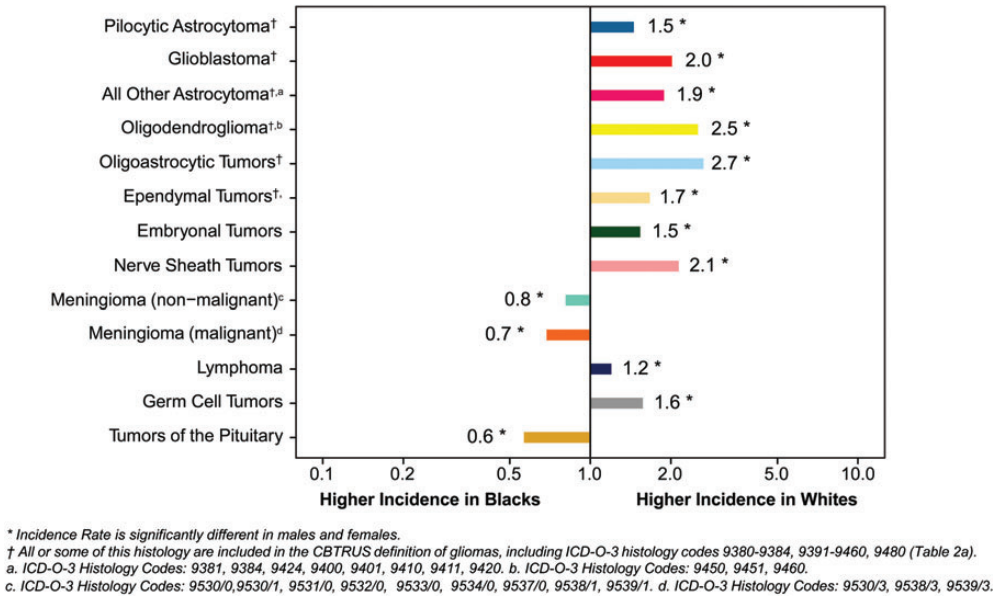
- Of embryonal tumors, medulloblastomas, atypical teratoid/rhabdoid tumors and primitive neuroectodermal tumors account for 61.7%, 15.0%, and 15.0%, respectively.

Distribution of Tumors by Site and Histology in Adolescents (Ages 15–19)

About 1.9% of all brain and CNS tumors occurred in adolescents 15–19 years old. 6,491 total tumors were diagnosed in persons 15–19 between 2007 and 2011 (Table 15). The distribution of these tumors by site is presented in Figure 18a.

- Approximately 29.8% of these tumors were diagnosed in the pituitary, which includes the craniopharyngeal duct.
- The frontal lobe, temporal lobe, occipital lobe, and parietal lobe accounted for 21.0% of total.

The distribution of brain and CNS tumors in those 15–19 years old by histology is presented in Figure 18b.



** Incidence Rate is significantly different in males and females.*
† All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a).
a. ICD-O-3 Histology Codes: 9381, 9384, 9424, 9400, 9401, 9410, 9411, 9420. b. ICD-O-3 Histology Codes: 9450, 9451, 9460.
c. ICD-O-3 Histology Codes: 9530/0,9530/1, 9531/0, 9532/0, 9533/0, 9534/0, 9537/0, 9538/1, 9539/1. d. ICD-O-3 Histology Codes: 9530/3, 9538/3, 9539/3.

Fig. 13. Incidence Rate Ratios by Race (Whites:Blacks) for Selected CBTRUS Histology Groupings and Histologies, CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

- The most common histologies in adolescents ages 15–19 years include tumors of the pituitary (25.4%) and pilocytic astrocytoma (10.1%).
- Gliomas accounts for approximately 35% of tumors in adolescents ages 15–19 years.

Childhood Incidence Rates by Histology and Gender

The incidence rates of the most common childhood tumors by gender for children and adolescents 0–19 are shown in Table 12. Among major histology groupings,

- Average annual incidence rates are highest for tumors of neuroepithelial tissue (3.66 per 100,000). Among these tumors, the most common histologies are pilocytic astrocytoma (0.84 per 100,000), embryonal tumors (0.65 per 100,000), and glioma malignant, NOS (0.64 per 100,000).
- There are notable differences in incidence rates between males and females for ependymal tumors, embryonal tumors, germ cell tumors, and tumors of the pituitary.

Childhood and Adolescent Incidence Rates by Histology and Race

Table 13 shows incidence rates by histology and race for children and adolescents ages 0–19 years.

- Incidence rates are highest among API (6.18 per 100,000) as compared to white (5.64 per 100,000), black (4.23 per 100,000), and AIAN (2.87 per 100,000).

Childhood and Adolescent Incidence Rates by Histology and Hispanic Ethnicity

Incidence rates for children and adolescents ages 0–19 years by Hispanic ethnicity are shown in Table 14.

- Incidence rates for non-Hispanics (5.68 per 100,000) are higher than those for Hispanics (4.51 per 100,000).
- The largest differences between non-Hispanics and Hispanics are in incidence rates of tumors of neuroepithelial tissue and tumors of cranial and spinal nerves.

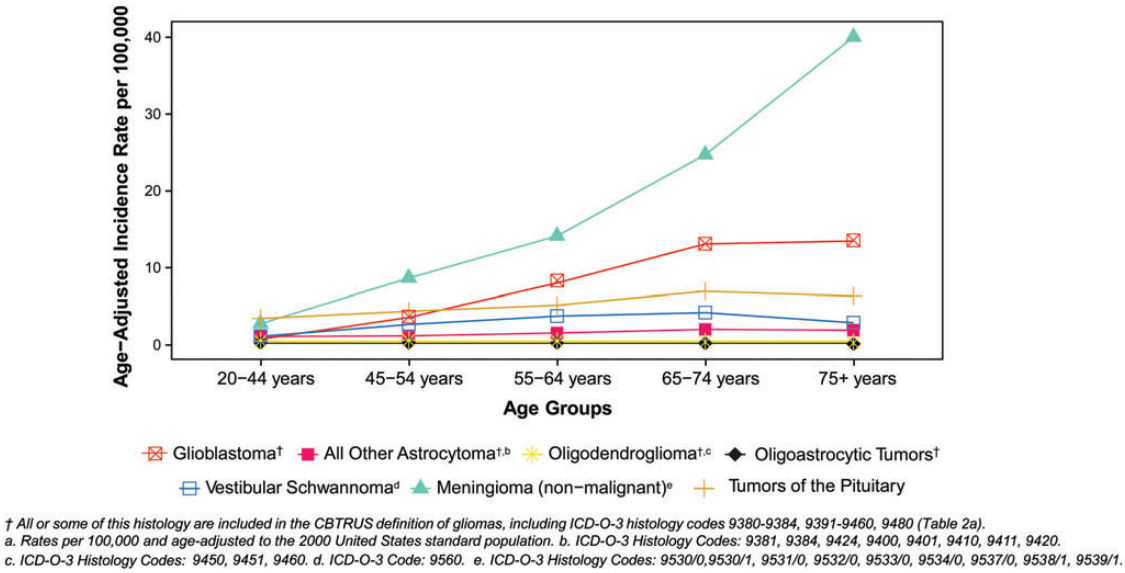
Childhood and Adolescent Incidence Rates by Age and Histology

The detailed age-adjusted incidence rates by histology for childhood age groups 0–14 years, childhood and adolescence 0–19 years, 0–4 years, 5–9 years, 10–14 years, and 15–19 years are shown in Table 15.

- Overall incidence rates for age groups 0–4 years (5.80 per 100,000) and 15–19 years (5.91 per 100,000) significantly exceed those observed in age groups 5–9 years (5.00 per 100,000) and 10–14 years (5.00 per 100,000).
- Individual histology distributions vary substantially within these age groups.
- Incidence rates of pilocytic astrocytoma, glioma malignant, NOS, ependymal tumors; choroid plexus tumors, and embryonal tumors decrease with increasing age.

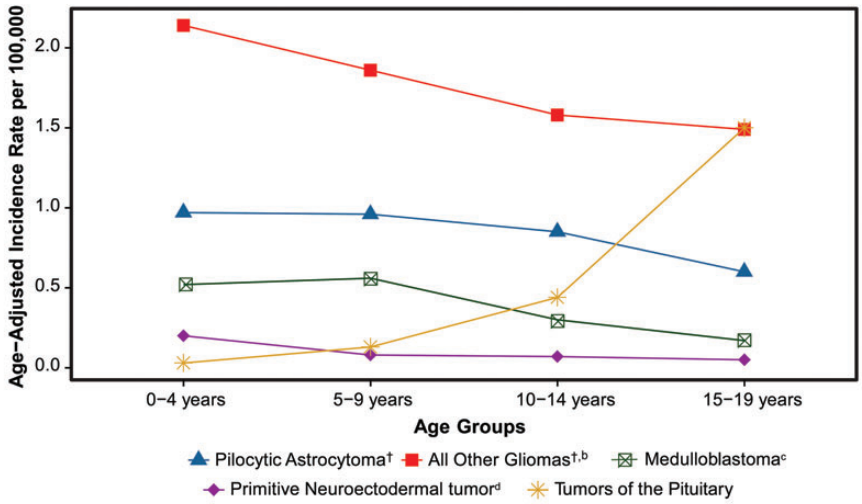
Childhood and Adolescent Incidence Rates by Histology Defined by ICCC

Table 16 presents the CBTRUS childhood and adolescent brain and CNS tumor data used for this report according to the International Classification of Childhood Cancer (ICCC) grouping system for pediatric cancers (Please see the CBTRUS website for additional information on this classification scheme: http://www.cbtrus.org).[12]



† All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a).
a. Rates per 100,000 and age-adjusted to the 2000 United States standard population. b. ICD-O-3 Histology Codes: 9381, 9384, 9424, 9400, 9401, 9410, 9411, 9420.
c. ICD-O-3 Histology Codes: 9450, 9451, 9460. d. ICD-O-3 Code: 9560. e. ICD-O-3 Histology Codes: 9530/0,9530/1, 9531/0, 9532/0, 9533/0, 9534/0, 9537/0, 9538/1, 9539/1.

Fig. 14. Age-Adjusted Incidence Rates[a] of Brain and CNS Tumors by Selected Histologies and Age Groups (Ages 20+), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.



† All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a).
a. Rates per 100,000 and age-adjusted to the 2000 United States standard population. b. ICD-O-3 Histology Codes: 9380-9384, 9391-9420, 9422-9460, 9480.
c. ICD-O-3 histology codes: 9470/3, 9471/3, 9472/3,9474/3. d. § ICD-O-3 Histology Code: 9473/3.

Fig. 15. Age-Adjusted Incidence Rates[a] in Children and Adolescents of Brain and CNS Tumors by Selected Histologies and Age Groups (Ages 0–19), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

Primary Brain and CNS Tumors: Estimated Numbers of Expected Cases, Mortality Rates, and Relative Survival

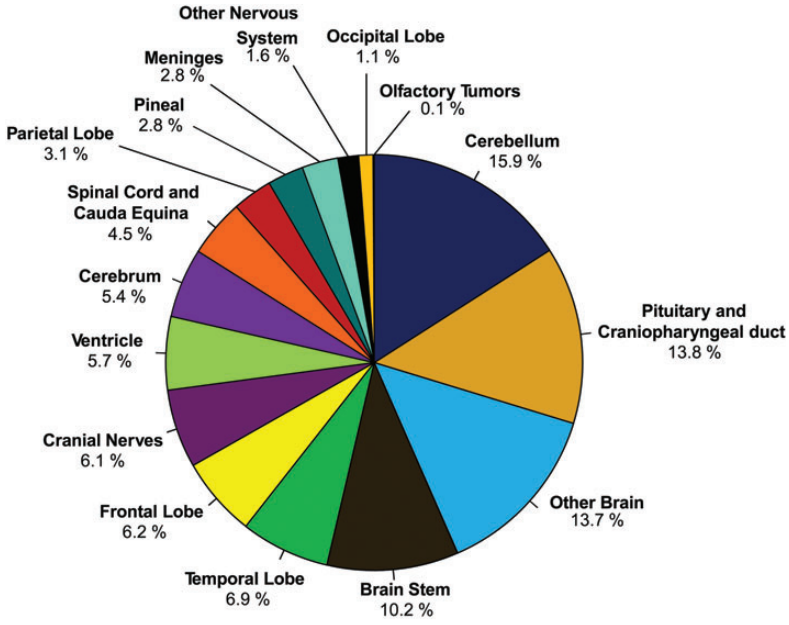
Estimated Numbers of Expected Cases of All Primary Brain and CNS Tumors by State

The estimated numbers of cases of all primary brain and CNS tumors for 2014 and 2015 by state are shown in Table 17. The estimated numbers of cases of malignant and non-malignant tumors by state were calculated by multiplying the CBTRUS age-adjusted incidence rates (2007–2011) by the 2014 and 2015 population projections for each state and the District of Columbia.

- The total number of new cases of primary brain and CNS tumors for all 50 states and the District of Columbia in 2014 is estimated to be 67,900 with 22,980 being malignant and 44,910 being non-malignant.
- For 2015, the estimate is 68,470 primary brain and CNS cases of which 23,180 and 45,300 are expected to be malignant and non-malignant, respectively.

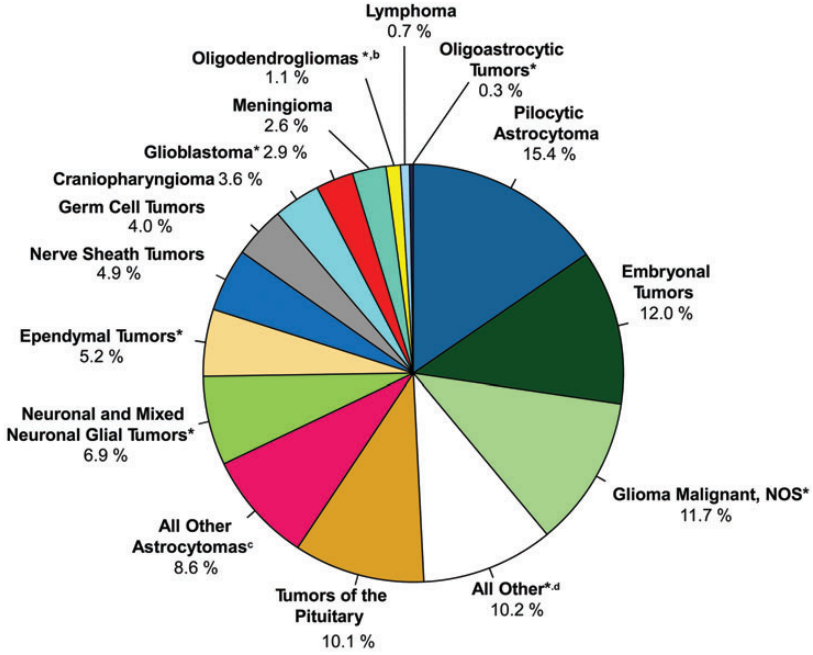
Estimated Numbers of Expected Cases of All Primary Brain and CNS Tumors by Histology and Age

The estimated number of cases of all primary brain and CNS tumors for 2014 and 2015 by histology are shown in Table 18.



a. Percentages may not add up to 100% due to rounding.

Fig. 16a. Distribution[a] in Children and Adolescents (Ages 0–19) of Primary Brain and CNS Tumors by Site (N = 22,535), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.



** All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a). a. Percentages may not add up to 100% due to rounding. b. ncludes oligodendrogliomas and anaplastic oligodendrogliomas (Table 2a). c. Includes diffuse astrocytoma, anaplastic astrocytoma, unique astrocytoma variants (Table 2a). d. Includes choroid plexus tumors, other neuroepithelial tumors, tumors of the pineal region, other tumors of cranial and spinal nerves, mesenchymal tumors, primary melanocytic lesions, other neoplasms related to the meninges, other hematopoietic neoplasms, hemangioma, neoplasm unspecified, all other (Table 2a).*

Fig. 16b. Distribution[a] in Children and Adolescents (Ages 0–19) of Primary Brain and CNS Tumors by CBTRUS Histology Groupings and Histology (N = 22,535), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

- Meningiomas have the highest number of estimated new cases, with 24,980 cases in 2014 and 25,190 in 2015. Tumors of the pituitary have the second highest number of estimated cases, with 10,430 cases in 2014 and 10,520 in 2015.

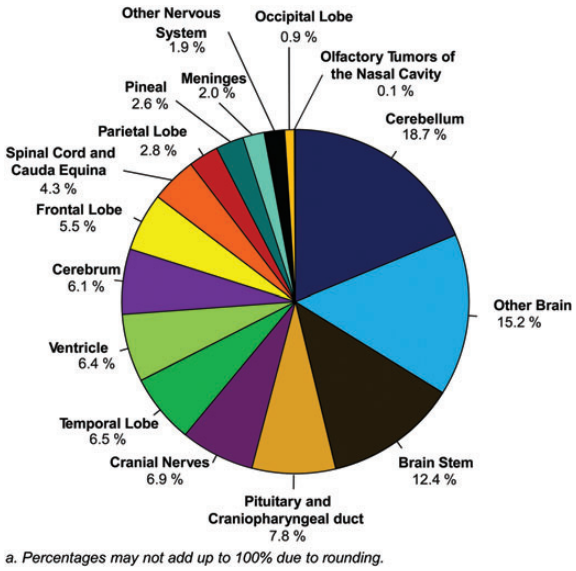


Fig. 17a. Distribution[a] in Children (Ages 0–14) of Primary Brain and CNS Tumors by Site (N = 16,044), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

- Glioblastoma has the highest number of cases of all malignant tumors, with 10,110 cases predicted in 2014 and 10,200 in 2015.

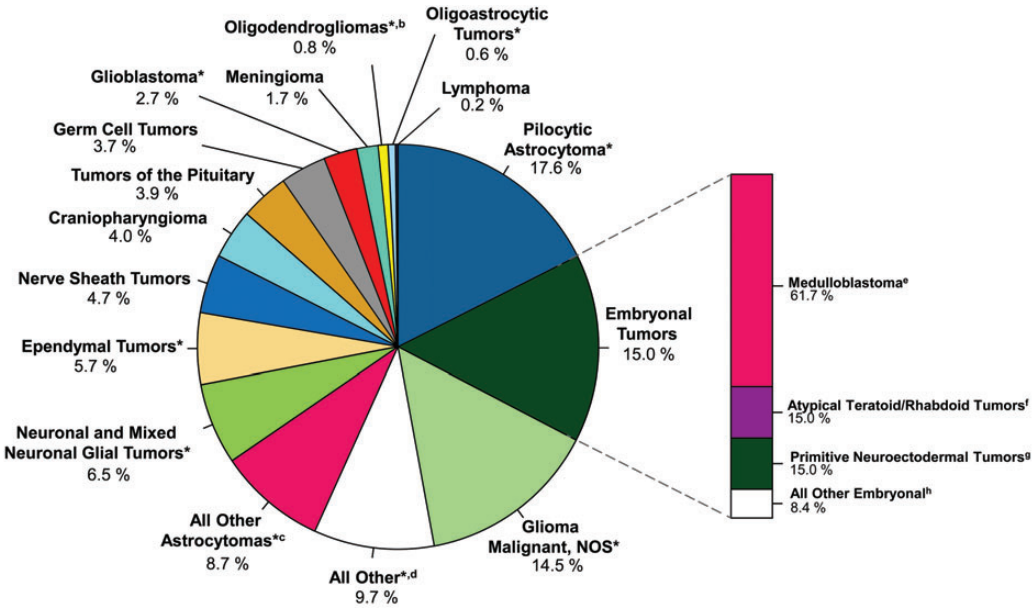
The estimated numbers of cases for 2014 and 2015 by age are presented in Table 19.

- For 2014, the highest number of cases is predicted in those 75+, with 15,280 cases. In 2015, the highest number of cases is estimated to be in those 65–74, with 15,630 cases.
- For 2014, children and adolescents 0–19 years old are estimated to have 4,590 new primary brain and CNS tumors. In 2015, children and adolescents 0–19 years old are estimated to have 4,620 new primary brain and CNS tumors.

Estimated Mortality Rates from Malignant Brain and CNS Tumors by State and Gender

Table 20 and Figure 19 show average annual age-adjusted mortality rates for primary malignant brain and CNS tumors in the United States during 2007–2011 by state and gender.

- The aggregate total number of observed deaths is 69,789, for an average annual age-adjusted mortality rate of 4.26 per 100,000.
- There is considerable variation by individual state, which ranges from a low of 2.32 deaths per 100,000 to a high of 5.57 deaths per 100,000.
- Males have higher mortality rates from brain and CNS tumors than females in the United States population, with 5.21 per 100,000 as compared to 3.48 per 100,000.



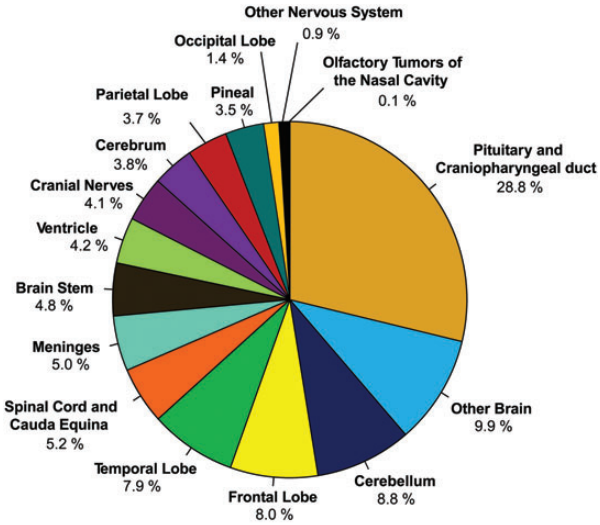
** All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a).*
a. Percentages may not add up to 100% due to rounding. b. Includes oligodendrogliomas and anaplastic oligodendrogliomas (Table 2a). c. Includes diffuse astrocytoma, anaplastic astrocytoma, unique astrocytoma variants (Table 2a). d. Includes choroid plexus tumors, other neuroepithelial tumors, tumors of the pineal region, other tumors of cranial and spinal nerves, mesenchymal tumors, primary melanocytic lesions, other neoplasms related to the meninges, other hematopoietic neoplasms, hemangioma, neoplasm unspecified, all other (Table 2a). e. ICD-O-3 histology codes: 9470/3, 9471/3, 9472/3,9474/3. f. ICD-O-3 histology code: 9508/3. g. ICD-O-3 histology code: 9473/3. h. ICD-O-3 histology codes: 8963/3, 9364/3, 9490/0 , 9490/3, 9500/3, 9501/3, 9502/3.

Fig. 17b. Distribution[a] in Children (Ages 0–14) of Primary Brain and CNS Tumors by CBTRUS Histology Groupings and Histology (N = 16,044), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

Relative Survival Rates for Malignant Brain and CNS Tumors by Site

Relative survival estimates by site are presented in Table 21.

- The highest ten-year survival is for tumors occurring in the cranial nerves (90.9%).
- The lowest ten-year survival was for tumors of the parietal lobe (14.0%).



a. Percentages may not add up to 100% due to rounding.

Fig. 18a. Distribution[a] in Adolescents (Ages 15–19) of Primary Brain and CNS Tumors by Site (N = 6,491), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

Survival Rates for Malignant Brain and CNS Tumors by Histology and Age

Survival estimates for malignant brain tumors by histology and age at diagnosis are presented in Tables 22 and 23. The one- through ten-year relative survival rates by histology are shown in Table 23.

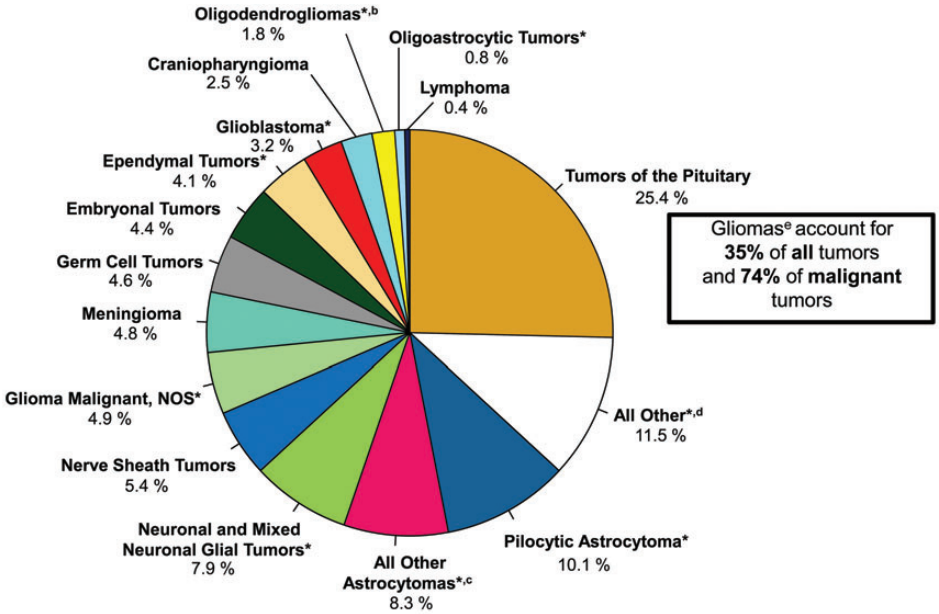
- The estimated five- and ten-year relative survival rates for malignant brain and CNS tumors are 34.2% and 28.5%, respectively.
- There is a large variation in survival estimates depending upon tumor histology; five-year survival rates are 94.1% for pilocytic astrocytoma but are 5.0% for glioblastoma.
- Survival generally decreases with older age at diagnosis; children and young adults generally have better survival outcomes for most histologies.

Descriptive Summary of Meningioma, Glioblastoma, and Embryonal Tumors

The data in the CBTRUS Statistical Report 2007–2011 are synthesized to describe the three most common histologic types: meningioma, glioblastoma, and embryonal tumors.

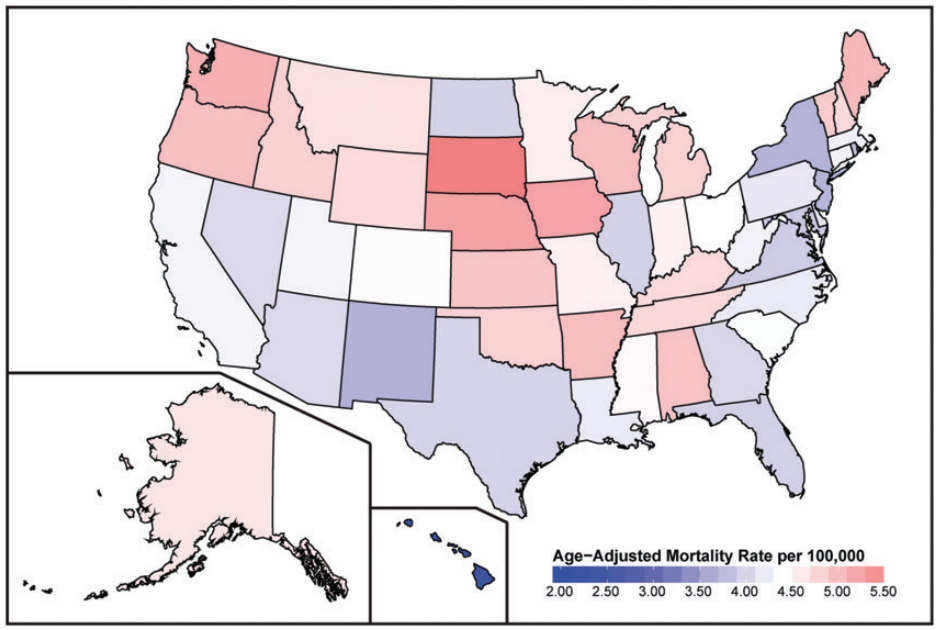
Meningioma

- Meningiomas are the most frequently reported tumors, accounting for 36.1% of tumors overall (Figure 8a).



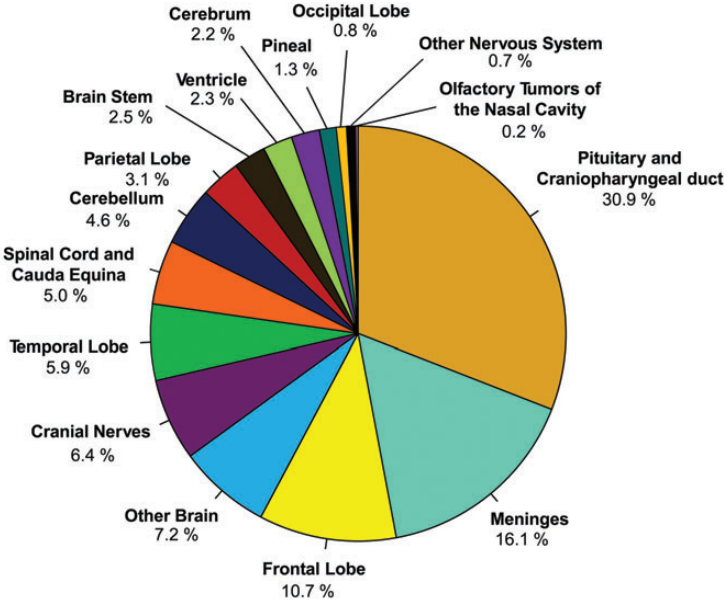
** All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a).*
a. Percentages may not add up to 100% due to rounding. b. Includes oligodendrogliomas and anaplastic oligodendrogliomas (Table 2a). c. Includes diffuse astrocytoma, anaplastic astrocytoma, unique astrocytoma variants (Table 2a). d. Includes choroid plexus tumors, other neuroepithelial tumors, tumors of the pineal region, other tumors of cranial and spinal nerves, mesenchymal tumors, primary melanocytic lesions, other neoplasms related to the meninges, other hematopoietic neoplasms, hemangioma, neoplasm unspecified, all other (Table 2a). e. ICD-O-3 histology codes: 9380- 9384, 9391-9460,9480.

Fig. 18b. Distribution[a] in Adolescents (Ages 15–19) of Primary Brain and CNS Tumors by Histology (N = 6,491), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.



a. Rates per 100,000 and age-adjusted to the 2000 United States standard population.

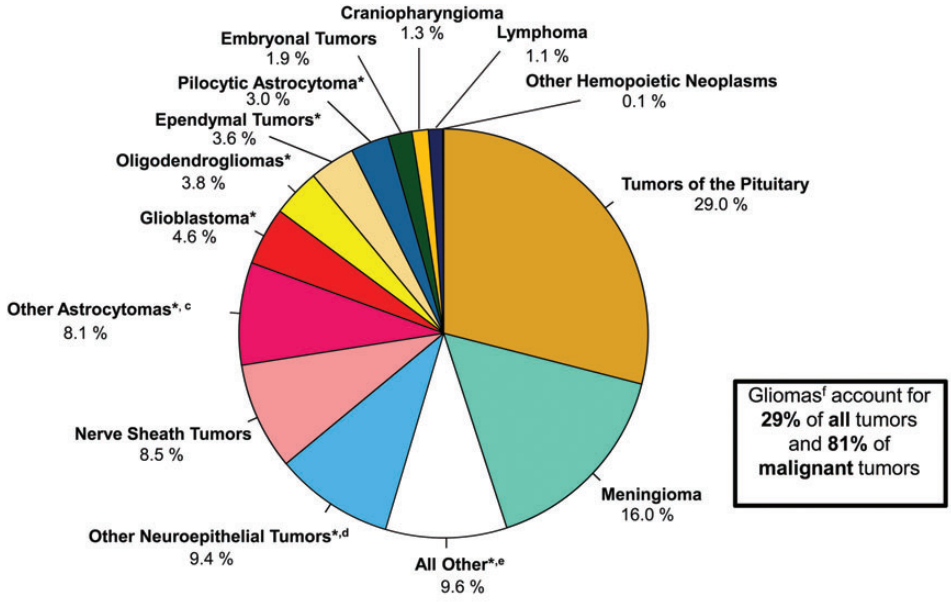
Fig. 19. Average Annual Age-Adjusted Mortality Rates for Malignant Primary Brain and CNS Tumors by Central Cancer Registry, CBTRUS Statistical Report: NCHS, 2007–2011.



a. Percentages may not add up to 100% due to rounding.
b. Adolescents and Young Adults (AYA), as defined by the National Cancer Institute, see: http://www.cancer.gov/researchandfunding/snapshots/adolescent-young-adult.

Fig. 20a. Distribution[a] in Adolescents and Young Adults[b] (Ages 15–39) of Primary Brain and CNS Tumors by Site (N = 51,118), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

- Non-malignant meningiomas with behavior codes /0 (benign) or /1 (uncertain) account for 98.5% of meningiomas reported to CBTRUS (Table 9).
- Meningiomas are most common in older adults and least common in children (Table 10).
- Incidence of meningiomas increases with age, with a dramatic increase after age 65. Even among the population aged 85 years and older, these rates continue to be high (Table 10).
- Non-malignant meningiomas are 2.3 times more common in females as compared to males (Figure 12).



** All or some of this histology are included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380-9384, 9391-9460, 9480 (Table 2a).*
a. Percentages may not add up to 100% due to rounding. b. Adolescents and Young Adults (AYA), as defined by the National Cancer Institute, see: http://www.cancer.gov/researchandfunding/snapshots/adolescent-young-adult. c. Includes diffuse astrocytoma, anaplastic astrocytoma, unique astrocytoma variants (Table 2a). d. Includes other tumors of cranial and spinal nerves, mesenchymal tumors, primary melanocytic lesions, other neoplasms related to the meninges, hemangioma, neoplasm unspecified, all other (Table 2a). e. Includes oligoastrocytic tumors, glioma malignant, NOS, choroid plexus tumors, other neuroepithelial tumors, neuronal and mixed neuronal-glial tumors, tumors of the pineal region (Table 2a). f. ICD-O-3 histology codes: 9380- 9384, 9391-9460,9480.

Fig. 20b. Distribution[a] in Adolescents and Young Adults[b] (Ages 15–39) of Primary Brain and CNS Tumors by Histology (N = 51,118), CBTRUS Statistical Report: NPCR and SEER, 2007–2011.

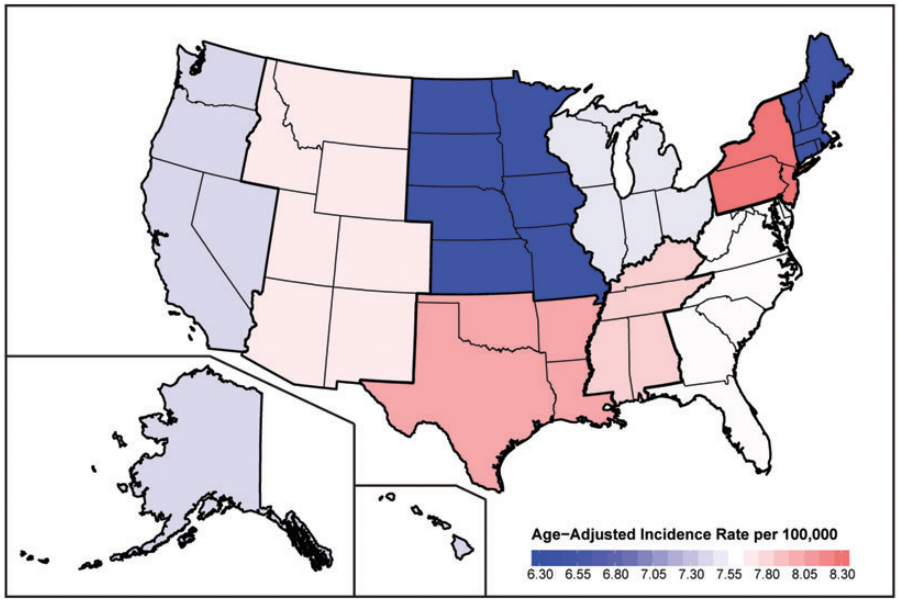
- Incidence of meningioma is significantly higher in blacks than in whites (Figure 13).
- Ten-year relative survival for malignant meningioma is 57.2% (Table 22).
- Age had a large effect on relative survival after diagnosis with malignant meningioma: 10-year survival was 84.4% for ages 24–44, and 33.5% for 75+ (Table 23).
- Incidence of meningioma varies significantly among regions of the United States (Figure 21). The highest incidence is found in the Middle Atlantic, while the lowest is in the West North Central region.

Glioblastoma

- Glioblastoma is the second most frequently reported histology and the most common malignant tumor (Tables 3 and 9).
- Glioblastoma accounts for 15.4% of all primary brain tumors (Figure 8a) and 45.6% of primary malignant brain tumors (Figure 8b).
- Glioblastoma is more common in older adults (Table 11) and is less common in children; these tumors comprise approximately 3% of all brain and CNS tumors reported among 0–19 year olds (Table 12).
- Incidence of glioblastoma increases with age, with rates highest in the 75 to 84 years (Table 10).
- Glioblastoma is 1.6 times more common in males (Figure 12).
- Glioblastoma is about 2 times higher among whites as compared to blacks (Figure 13).
- Relative survival estimates for glioblastoma are quite low; 5.0% of patients survived five years post diagnosis (Table 22). These survival estimates are somewhat higher for the small number of patients who are diagnosed under age 20 (Table 23).
- Incidence of glioblastoma varies significantly between regions of the United States (Figure 22). The highest incidence is in New England, while the lowest is in the West South Central region.

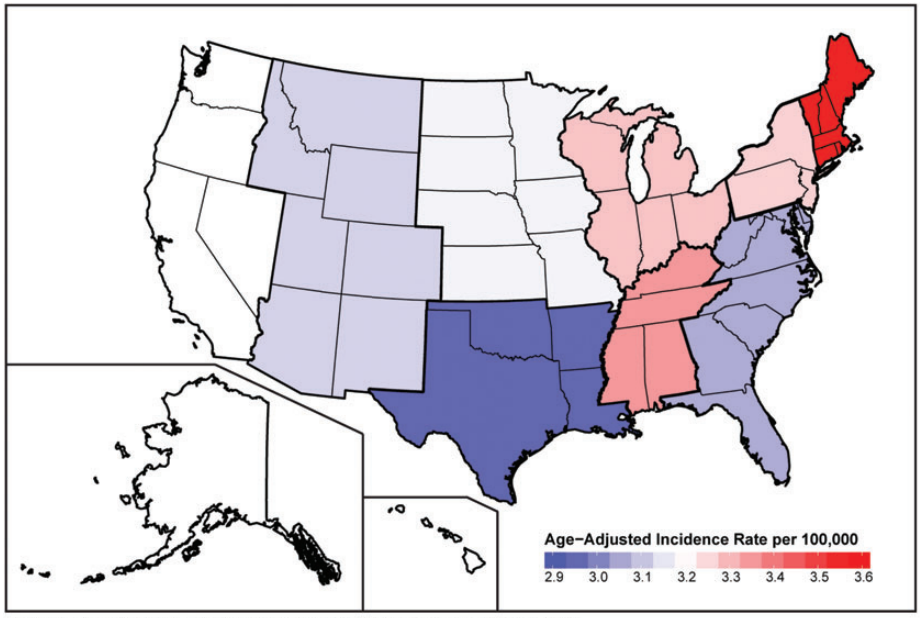
Embryonal Tumors

- Embryonal tumors are the most frequently reported tumor type in children ages 0–4, and the second most common tumor type overall in children and adolescents ages 0–19 (Tables 11 and 12).
- Embryonal tumors account for 15.0% of all primary brain tumors in children ages 0–14 (Figure 16) and 1.1% of tumors diagnosed overall (Figure 8a).
- Embryonal tumors are not commonly grouped together in clinical practice as they are within the CBTRUS histologic grouping scheme, as there is significant variation between the different histologies within this category. This category includes primitive neuroectodermal tumor (PNET) (ICD-O-3 histology code 9473), medulloblastoma (ICD-O-3 histology codes 9470–9472), atypical teratoid/rhabdoid tumor (ATRT) (ICD-O-3 histology code 9508), and several other histologies.
- Incidence of medulloblastoma decreases with age. Incidence was 0.52 per 100,000, 0.56 per 100,000, 0.30 per 100,000, and 0.17 per 100,000 in children ages 0–4, 5–9, 10–14, and adolescents 15–19, respectively (Table 15).
- Incidence of PNET was 0.20 per 100,000, 0.08 per 100,000, 0.07 per 100,000, and 0.05 per 100,000 in children ages 0–4, 5–9, 10–14, and adolescents 15–19, respectively (Table 15).



a. Rates per 100,000 and age-adjusted to the 2000 United States standard population.
b. Defined using the NAACCR regional scheme -- http://faststats.naaccr.org/usregions.php. c. Data only available from 2007-2010 for Nevada.

Fig. 21. Average Annual Age-Adjusted Incidence Rates[a] of Meningioma by Region[b], CBTRUS Statistical Report: NPCR and SEER, 2007–2011[c].



a. Rates per 100,000 and age-adjusted to the 2000 United States standard population.
b. Defined using the NAACCR regional scheme -- http://faststats.naaccr.org/usregions.php. c. Data only available from 2007-2010 for Nevada.

Fig. 22. Average Annual Age-Adjusted Incidence Rates[a] of Glioblastoma by Region[b], CBTRUS Statistical Report: NPCR and SEER, 2007–2011[c].

- Incidence of ATRT was 0.33 per 100,000 and 0.02 per 100,000 in children 0–4 and 5–9, respectively. There are too few of these cases in older age groups to report (Table 15).
- Relative survival estimates for embryonal tumors are low but vary significantly by histology. 10-year survival is 63.3% for medulloblastoma, 42.6% for PNET, and 25.9% for ATRT (Table 22).

Descriptive Summary of Adolescent and Young Adult Primary Brain and CNS Tumors

Brain and CNS tumors are less common in adolescents and young adults (AYA; ages 15–39)[24] as compared to older adults (Table 24). While brain tumors have a higher incidence rate in AYA as opposed to children (Table 24), they are not as common in comparison to other types of cancer.

- About 15% of all brain and CNS tumors occurred in AYA, ages 15–39 years.
- 51,118 total tumors were diagnosed in persons 15–39 between 2007–2011 (Figure 20a–b).
- The overall incidence rate in this age group was 10.08 per 100,000 (Table 24).
- Tumors of neuroepithelial tissue had the highest incidence (3.41 per 100,000), followed by tumors of the sellar region (3.04 per 100,000) (Table 24).
- The most common histology in AYA was tumors of the pituitary (2.90 per 100,000), followed by meningioma (1.68 per 100,000) and nerve sheath tumors (0.88 per 100,000) (Table 11).
- The majority of AYA brain and CNS tumors occurred in the pituitary and craniopharyngeal duct (30.9%), followed by the meninges (16.1%) (Figure 20a).
- Approximately 20.5% of tumors diagnosed in AYA are located within the frontal, temporal, parietal, and occipital lobes of the brain combined (Figure 20a).
- Cerebrum, ventricle, cerebellum, and brain stem tumors combined account for about 11.6% of all AYA tumors (Figure 20a).
- The predominately non-malignant tumors of the pituitary (29.0%), meningioma (16.0%), and nerve sheath (8.5%) represent over half of tumors diagnosed in those 15–39. (Figure 20b).
- Glioma accounts for approximately 29% of all brain and CNS tumors in AYA, and about 81% of malignant tumors. (Figure 20b).
- AYA are estimated to have 10,800 new primary brain and CNS tumors for 2014 and are estimated to have 10,850 new primary brain and CNS tumors for 2015 (Table 24).
- AYA have higher rates of relative survival than adults greater than 40 years old for all histologic types. Though 1-year relative survival for most tumor types is higher for AYA than children, 10-year survival is usually higher for children as compared to AYA (Table 25).

Concluding Comment

The *CBTRUS Statistical Report: Primary Brain and Central Nervous System Tumors Diagnosed in the United States in 2007–2011* comprehensively describes the current population-based incidence of primary malignant and non-malignant brain and CNS tumors collected and reported by central cancer registries covering approximately 99.8% of the United States population (for 2011 only, data was available for 50 out of 51 registries). This report aims to serve as a useful resource for researchers, clinicians, patients, and families. In keeping with its mission, CBTRUS continually revises its reports to reflect the current collection and reporting practices of the broader surveillance community in which it works, while integrating the input it receives from the clinical and research community, especially from neuropathologists, when possible. In this way, the CBTRUS facilitates communication between the cancer surveillance and the brain tumor research and clinical communities and contributes meaningful insight into the descriptive epidemiology of all primary brain and CNS tumors in the United States.

Abbreviations

AIAN – American Indian/Alaskan Native
API – Asian/Pacific Islander
AYA – Adolescents and Young Adults
ATRT – Atypical Teratoid/Rhabdoid Tumor
CBTRUS – Central Brain Tumor Registry of the United States
CDC – Centers for Disease Control and Prevention
CSS – Cancer Surveillance System
CI – Confidence interval
CNS – Central nervous system
ICD-O-3 – International Classification of Diseases for Oncology, Third Edition
ICCC – International Classification of Childhood Cancer
NAACCR – North American Association of Central Cancer Registries
NCDB – National Cancer Data Base
NCHS – National Center for Health Statistics
NCI – National Cancer Institute
NOS – Not otherwise specified
NPCR – National Program of Cancer Registries
PNET – Primitive Neuroectodermal Tumor
SEER – Surveillance, Epidemiology and End Results
USCS – United States Cancer Statistics
VHA – Veteran's Health Administration
WHO – World Health Organization

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Table 1. Central Brain Tumor Registry of the United States (CBTRUS), Brain and Central Nervous System Tumor Site Groupings

Site	ICD-O-3[a] Site Code
Frontal lobe of brain	C71.1
Temporal lobe of brain	C71.2
Parietal lobe of brain	C71.3
Occipital lobe of brain	C71.4
Cerebrum	C71.0
Ventricle	C71.5
Cerebellum	C71.6
Brain stem	C71.7
Other brain	C71.8-C71.9
Spinal cord and cauda equina	C72.0-C72.1
Cranial nerves	C72.2-C72.5
Other nervous system	C72.8-C72.9
Meninges (cerebral & spinal)	C70.0-C70.9
Pituitary and craniopharyngeal duct	C75.1-C75.2
Pineal	C75.3
Olfactory tumors of the nasal cavity[b]	C30.0

[a]International Classification of Diseases for Oncology, 3rd Edition, 2000. World Health Organization, Geneva, Switzerland.
[b]ICD-O-3 histology codes 9522–9523 only.

Table 2a. Central Brain Tumor Registry of the United States (CBTRUS), Brain and Central Nervous System Tumor Histology Groupings

Histology	ICD-O-3[a] Histology Code[b]
Tumors of Neuroepithelial Tissue	
Pilocytic astrocytoma*	9421
Diffuse astrocytoma*	9400, 9410, 9411, 9420
Anaplastic astrocytoma*	9401
Unique astrocytoma variants*	9381, 9384, 9424
Glioblastoma*	9440, 9441, 9442/3[c]
Oligodendroglioma*	9450
Anaplastic oligodendroglioma*	9451, 9460
Oligoastrocytic tumors*	9382
Ependymal tumors*	9383, 9391, 9392, 9393, 9394
Glioma malignant, NOS*	9380
Choroid plexus tumors	9390
Other neuroepithelial tumors*	9363, 9423, 9430, 9444
Neuronal and mixed neuronal-glial tumors*	8680, 8681, 8690, 8693, 9412, 9413, 9442/1[d], 9492 (excluding site C75.1), 9493, 9505, 9506, 9522, 9523
Tumors of the pineal region	9360, 9361, 9362
Embryonal tumors	8963, 9364, 9470, 9471, 9472, 9473, 9474, 9490, 9500, 9501, 9502, 9508
Tumors of Cranial and Spinal Nerves	
Nerve sheath tumors	9540, 9541, 9550, 9560, 9561, 9570, 9571
Other tumors of cranial and spinal nerves	9562
Tumors of Meninges	
Meningioma	9530, 9531, 9532, 9533, 9534, 9537, 9538, 9539
Mesenchymal tumors	8324, 8800, 8801, 8802, 8803, 8804, 8805, 8806, 8810, 8815, 8824, 8830, 8831, 8835, 8836, 8850, 8851, 8852, 8853, 8854, 8857, 8861, 8870 , 8880, 8890, 8897, 8900, 8901, 8902, 8910, 8912, 8920, 8921, 8935, 8990, 9040, 9136, 9150, 9170, 9180, 9210, 9241, 9260, 9373, 9480
Primary melanocytic lesions	8720, 8728, 8770, 8771
Other neoplasms related to the meninges	9161, 9220, 9231, 9240, 9243, 9370, 9371, 9372, 9535
Lymphomas and Hematopoietic Neoplasms	
Lymphoma	9590, 9591, 9596, 9650, 9651, 9652, 9653, 9654, 9655, 9659, 9661, 9662, 9663, 9664, 9665, 9667, 9670, 9671, 9673, 9675, 9680, 9684, 9687, 9690, 9691, 9695, 9698, 9699, 9701, 9702, 9705, 9714, 9719, 9728, 9729
Other hematopoietic neoplasms	9727, 9731, 9733, 9734, 9740, 9741, 9750, 9751, 9752, 9753, 9754, 9755, 9756, 9757, 9758, 9760, 9766, 9823, 9826, 9827, 9832, 9837, 9860, 9861, 9866, 9930, 9970
Germ Cell Tumors and Cysts	
Germ cell tumors, cysts and heterotopias	8020, 8440, 9060, 9061, 9064, 9065, 9070, 9071, 9072, 9080, 9081, 9082, 9083, 9084, 9085, 9100, 9101
Tumors of Sellar Region	
Tumors of the pituitary	8040, 8140, 8146, 8246, 8260, 8270, 8271, 8272, 8280, 8281, 8290, 8300, 8310, 8323, 9492 (Site C75.1 only), 9582
Craniopharyngioma	9350, 9351, 9352
Unclassified Tumors	
Hemangioma	9120, 9121, 9122, 9123, 9125, 9130, 9131, 9133, 9140
Neoplasm, unspecified	8000, 8001, 8002, 8003, 8004, 8005, 8010, 8021
All other	8320, 8452, 8710, 8711, 8713, 8811, 8840, 8896, 8980, 9173, 9503, 9580

[a]International Classification of Diseases for Oncology, 3rd Edition, 2000. World Health Organization, Geneva, Switzerland.
[b]See the CBTRUS website for additional information about the specific histology codes included in each group: http://www.cbtrus.org
[c]Morphology 9442/3 only.
[d]Morphology 9442/1 only.
*All or some of this histology is included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380–9384, 9391–9460, 9480.
Abbreviations NOS, not otherwise specified.

Table 2b. Central Brain Tumor Registry of the United States (CBTRUS), Brain and Central Nervous System Tumor Malignant Histologies[a]

Histology	ICD-O-3[b] Histology Code[c]
Tumors of Neuroepithelial Tissue	
Pilocytic astrocytoma*	9421/1 [Included with malignant tumors]
Diffuse astrocytoma*	9400/3, 9410/3, 9411/3, 9420/3
Anaplastic astrocytoma*	9401/3
Unique astrocytoma variants*	9381/3, 9424/3
Glioblastoma*	9440/3, 9441/3, 9442/3
Oligodendroglioma*	9450/3
Anaplastic oligodendroglioma*	9451/3, 9460/3
Oligoastrocytic tumors*	9382/3
Ependymal tumors*	9391/3, 9392/3, 9393/3
Glioma malignant, NOS*	9380/3
Choroid plexus tumors	9390/3
Other neuroepithelial tumors*	9423/3, 9430/3
Neuronal and mixed neuronal-glial tumors*	8680/3, 8693/3, 9505/3, 9522/3, 9523/3
Tumors of the pineal region	9362/3
Embryonal tumors	8963/3, 9364/3, 9470/3, 9471/3, 9472/3,9473/3, 9474/3, 9490/3, 9500/3, 9501/3, 9502/3, 9508/3
Tumors of Cranial and Spinal Nerves	
Nerve sheath tumors	9540/3, 9560/3, 9561/3, 9571/3
Tumors of Meninges	
Meningioma	9530/3, 9538/3, 9539/3
Mesenchymal tumors	8800/3, 8801/3, 8802/3, 8803/3, 8804/3, 8805/3, 8806/3, 8810/3, 8815/3, 8830/3, 8850/3, 8851/3, 8852/3, 8853/3, 8854/3, 8857/3, 8890/3, 8900/3, 8901/3, 8902/3, 8910/3, 8912/3, 8920/3, 8921/3, 8990/3, 9040/3, 9150/3, 9170/3, 9180/3, 9260/3, 9480/3
Primary melanocytic lesions	8720/3, 8728/3, 8770/3, 8771/3
Other neoplasms related to the meninges	9220/3, 9231/3, 9240/3, 9243/3, 9370/3, 9371/3, 9372/3
Lymphomas and Hematopoietic Neoplasms	
Lymphoma	9590/3, 9591/3, 9596/3, 9650/3, 9651/3, 9652/3, 9653/3, 9654/3, 9655/3, 9659/3, 9661/3, 9662/3, 9663/3, 9664/3, 9665/3, 9667/3, 9670/3, 9671/3, 9673/3, 9675/3, 9680/3, 9684/3, 9687/3, 9690/3, 9691/3, 9695/3, 9698/3, 9699/3, 9701/3, 9702/3, 9705/3, 9714/3, 9719/3, 9728/3, 9729/3
Other hematopoietic neoplasms	9727/3, 9731/3, 9733/3, 9734/3, 9740/3, 9741/3, 9750/3, 9754/3, 9755/3, 9756/3, 9757/3, 9758/3, 9760/3, 9823/3, 9826/3, 9827/3, 9832/3, 9837/3, 9860/3, 9861/3, 9866/3, 9930/3
Germ Cell Tumors and Cysts	
Germ cell tumors, cysts and heterotopias	8020/3, 8440/3, 9060/3, 9061/3, 9064/3, 9065/3, 9070/3, 9071/3, 9072/3, 9080/3, 9081/3, 9082/3, 9083/3, 9084/3, 9085/3, 9100/3, 9101/3
Tumors of Sellar Region	
Tumors of the pituitary	8140/3, 8246/3, 8260/3, 8270/3, 8272/3, 8280/3, 8281/3, 8290/3, 8300/3, 8310/3, 8323/3
Unclassified Tumors	
Hemangioma	9120/3, 9130/3, 9133/3, 9140/3
Neoplasm, unspecified	8000/3, 8001/3, 8002/3, 8003/3, 8004/3, 8005/3, 8010/3, 8021/3
All other	8320/3, 8710/3, 8711/3, 8811/3, 8840/3, 8896/3, 8980/3, 9503/3, 9580/3

[a]Includes all the histologies listed in the standard definition of reportable brain tumors from the Consensus Conference on Brain Tumor Definition.
[b]International Classification of Diseases for Oncology, 3rd Edition, 2000. World Health Organization, Geneva, Switzerland.
[c]See the CBTRUS website for additional information about the specific histology codes included in each group: http://www.cbtrus.org.
*All or some of this histology is included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380–9384, 9391–9460, 9480.
Abbreviations: NOS, not otherwise specified.

Table 2c. Central Brain Tumor Registry of the United States (CBTRUS), Brain and Central Nervous System Tumor Non-Malignant Histologies[a]

Histology	ICD-O-3[b] Histology Code[c]
Tumors of Neuroepithelial Tissue	
Pilocytic astrocytoma*	9421/1 [Included with malignant tumors]
Unique astrocytoma variants*	9384/1
Ependymal tumors*	9383/1; 9394/1
Choroid plexus	9390/0,1
Other neuroepithelial tumors	9363/0; 9444/1
Neuronal and mixed neuronal-glial tumors*	8680/0,1; 8681/1; 8690/1; 8693/1; 9412/1; 9413/0; 9442/1; 9492/0 (excluding site C75.1); 9493/0; 9505/1; 9506/1
Tumors of the pineal region	9360/1; 9361/1
Embryonal tumors	9490/0
Tumors of Cranial and Spinal Nerves	
Nerve sheath tumors	9540/0,1; 9541/0, 9550/0; 9560/0,1; 9570/0; 9571/0
Other tumors of cranial and spinal nerves	9562/0
Tumors of Meninges	
Meningioma	9530/0,1; 9531/0; 9532/0; 9533/0; 9534/0; 9537/0; 9538/1; 9539/1
Mesenchymal tumors	8324/0; 8800/0; 8810/0; 8815/0; 8824/0,1; 8830/0,1; 8831/0; 8835/1; 8836/1; 8850/0,1; 8851/0; 8852/0, 8854/0; 8857/0; 8861/0; 8870/0; 8880/0, 8890/0,1; 8897/1; 8900/0; 8920/1; 8935/0,1; 8990/0,1; 9040/0; 9136/1, 9150/0,1; 9170/0; 9180/0; 9210/0; 9241/0; 9373/0
Primary melanocytic lesions	8728/0,1; 8770/0; 8771/0
Other neoplasms related to the meninges	9161/1; 9220/0,1; 9535/0
Lymphomas and Hematopoietic Neoplasms	
Other hematopoietic neoplasms	9740/1; 9751/1; 9752/1; 9753/1; 9766/1; 9970/1
Germ Cell Tumors and Cysts	
Germ cell tumors, cysts and heterotopias	8440/0; 9080/0,1; 9084/0
Tumors of Sellar Region	
Tumors of the pituitary	8040/0,1; 8140/0,1; 8146/0; 8260/0; 8270/0; 8271/0; 8272/0; 8280/0; 8281/0; 8290/0; 8300/0; 8310/0; 8323/0; 9492/0 (site C75.1 only); 9582/0
Craniopharyngioma	9350/1; 9351/1; 9352/1
Unclassified Tumors	
Hemangioma	9120/0; 9121/0; 9122/0; 9123/0; 9125/0; 9130/0,1; 9131/0; 9133/1
Neoplasm, unspecified	8000/0,1; 8001/0,1; 8005/0; 8010/0
All other	8452/1; 8711/0; 8713/0; 8811/0; 8840/0; 9173/0; 9580/0

[a]Includes all the histologies listed in the standard definition of reportable brain tumors from the Consensus Conference on Brain Tumor Definition.
[b]International Classification of Diseases for Oncology, 3rd Edition, 2000. World Health Organization, Geneva, Switzerland.
[c]See the CBTRUS website for additional information about the specific histology codes included in each group: http://www.cbtrus.org.
*All or some of this histology is included in the CBTRUS definition of gliomas, including ICD-O-3 histology codes 9380–9384, 9391–9460, 9480.
Abbreviations: NOS, not otherwise specified.

Table 3. Average Annual Age-Adjusted Incidence Rates[a] for Brain and Central Nervous System Tumors by Major Histology Groupings, Histology, and Gender, CBTRUS Statistical Report: NPCR and SEER, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

Histology	Total			Male			Female		
	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
Tumors of Neuroepithelial Tissue	**105,147**	**6.61**	**(6.57–6.65)**	**58,633**	**7.77**	**(7.71–7.83)**	**46,514**	**5.61**	**(5.56–5.66)**
Pilocytic astrocytoma	4,954	0.34	(0.33–0.35)	2,524	0.34	(0.33–0.35)	2,430	0.34	(0.32–0.35)
Diffuse astrocytoma	8,629	0.55	(0.54–0.57)	4,845	0.65	(0.63–0.66)	3,784	0.47	(0.46–0.49)
Anaplastic astrocytoma	5,861	0.37	(0.36–0.38)	3,265	0.43	(0.42–0.45)	2,596	0.31	(0.30–0.33)
Unique astrocytoma variants	998	0.07	(0.06–0.07)	540	0.07	(0.07–0.08)	458	0.06	(0.06–0.07)
Glioblastoma	52,751	3.19	(3.16–3.22)	30,230	3.98	(3.93–4.02)	22,521	2.52	(2.49–2.56)
Oligodendroglioma	4,012	0.26	(0.25–0.27)	2,240	0.30	(0.29–0.31)	1,772	0.23	(0.22–0.24)
Anaplastic oligodendroglioma	1,650	0.11	(0.10–0.11)	910	0.12	(0.11–0.13)	740	0.09	(0.09–0.10)
Oligoastrocytic tumors	3,169	0.21	(0.20–0.21)	1,791	0.24	(0.23–0.25)	1,378	0.18	(0.17–0.19)
Ependymal tumors	6,507	0.42	(0.41–0.43)	3,646	0.48	(0.46–0.49)	2,861	0.36	(0.35–0.38)
Glioma malignant, NOS	7,033	0.46	(0.45–0.47)	3,518	0.48	(0.47–0.50)	3,515	0.45	(0.43–0.46)
Choroid plexus tumors	809	0.05	(0.05–0.06)	374	0.05	(0.04–0.05)	435	0.06	(0.05–0.06)
Other neuroepithelial tumors	98	0.01	(0.01–0.01)	38	0.01	(0.00–0.01)	60	0.01	(0.01–0.01)
Neuronal and mixed neuronal-glial tumors	4,197	0.28	(0.27–0.29)	2,201	0.29	(0.28–0.30)	1,996	0.26	(0.25–0.27)
Tumors of the pineal region	641	0.04	(0.04–0.05)	247	0.03	(0.03–0.04)	394	0.05	(0.05–0.06)
Embryonal tumors	3,838	0.26	(0.25–0.27)	2,264	0.31	(0.29–0.32)	1,574	0.22	(0.21–0.23)
Tumors of Cranial and Spinal Nerves	**27,626**	**1.70**	**(1.68–1.73)**	**13,190**	**1.70**	**(1.67–1.73)**	**14,436**	**1.71**	**(1.68–1.74)**
Nerve sheath tumors	27,606	1.70	(1.68–1.72)	13,180	1.70	(1.67–1.73)	14,426	1.71	(1.68–1.74)
Other tumors of cranial and spinal nerves	20	0.00	(0.00–0.00)	–	–	–	–	–	–
Tumors of Meninges	**128,051**	**7.88**	**(7.84–7.93)**	**35,149**	**4.85**	**(4.80–4.90)**	**92,902**	**10.51**	**(10.44–10.58)**
Meningioma	123,776	7.61	(7.57–7.66)	32,860	4.55	(4.50–4.60)	90,916	10.26	(10.20–10.33)
Mesenchymal tumors	1,285	0.08	(0.08–0.09)	632	0.08	(0.08–0.09)	653	0.08	(0.07–0.09)
Primary melanocytic lesions	134	0.01	(0.01–0.01)	81	0.01	(0.01–0.01)	53	0.01	(0.00–0.01)
Other neoplasms related to the meninges	2,856	0.18	(0.17–0.19)	1,576	0.21	(0.20–0.22)	1,280	0.16	(0.15–0.17)
Lymphomas and Hematopoietic Neoplasms	**7,339**	**0.46**	**(0.45–0.47)**	**3,858**	**0.52**	**(0.50–0.54)**	**3,481**	**0.40**	**(0.39–0.41)**
Lymphoma	7,125	0.44	(0.43–0.45)	3,745	0.51	(0.49–0.52)	3,380	0.39	(0.37–0.40)
Other hematopoietic neoplasms	214	0.01	(0.01–0.02)	113	0.01	(0.01–0.02)	101	0.01	(0.01–0.01)
Germ Cell Tumors and Cysts	**1,502**	**0.10**	**(0.10–0.11)**	**1,018**	**0.14**	**(0.13–0.14)**	**484**	**0.07**	**(0.06–0.07)**
Germ cell tumors, cysts and heterotopias	1,502	0.10	(0.10–0.11)	1,018	0.14	(0.13–0.14)	484	0.07	(0.06–0.07)
Tumors of Sellar Region	**54,546**	**3.47**	**(3.44–3.50)**	**24,658**	**3.25**	**(3.21–3.30)**	**29,888**	**3.76**	**(3.72–3.81)**
Tumors of the pituitary	51,700	3.29	(3.26–3.32)	23,312	3.08	(3.04–3.12)	28,388	3.57	(3.53–3.61)
Craniopharyngioma	2,846	0.18	(0.18–0.19)	1,346	0.18	(0.17–0.19)	1,500	0.19	(0.18–0.20)
Unclassified Tumors	**18,964**	**1.19**	**(1.17–1.21)**	**8,457**	**1.19**	**(1.16–1.21)**	**10,507**	**1.20**	**(1.18–1.22)**
Hemangioma	4,723	0.30	(0.29–0.31)	2,051	0.27	(0.26–0.28)	2,672	0.33	(0.32–0.34)
Neoplasm, unspecified	14,160	0.88	(0.87–0.90)	6,369	0.91	(0.89–0.93)	7,791	0.87	(0.85–0.88)
All other	81	0.00	(0.00–0.01)	37	0.01	(0.00–0.01)	44	0.01	(0.00–0.01)
TOTAL[b]	**343,175**	**21.42**	**(21.35–21.49)**	**144,963**	**19.42**	**(19.32–19.52)**	**198,212**	**23.26**	**(23.15–23.36)**

[a]Rates are per 100,000 and are age-adjusted to the 2000 US standard population.
[b]Refers to all brain tumors including histologies not presented in this table.
– Counts are not presented when fewer than 16 cases were reported for the specific histology category. Suppressed cases are included in the total count.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 4. Average Annual Age-Adjusted Incidence Rates[a] for Brain and Central Nervous System Tumors by Major Histology Groupings, Histology, and Race[b], CBTRUS Statistical Report: NPCR and SEER, 2007–2011

Histology	White			Black			AIAN			API		
	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
Tumors of Neuroepithelial Tissue	**93,229**	**7.13**	**(7.09–7.18)**	**7,499**	**3.87**	**(3.78–3.96)**	**558**	**3.19**	**(2.91–3.50)**	**3,209**	**4.14**	**(3.99–4.29)**
Pilocytic astrocytoma	4,079	0.36	(0.35–0.37)	567	0.25	(0.23–0.27)	33	0.14	(0.09–0.19)	241	0.29	(0.26–0.33)
Diffuse astrocytoma	7,606	0.60	(0.59–0.62)	618	0.31	(0.29–0.34)	61	0.34	(0.25–0.44)	281	0.36	(0.31–0.40)
Anaplastic astrocytoma	5,244	0.40	(0.39–0.42)	358	0.19	(0.17–0.21)	36	0.19	(0.13–0.26)	173	0.22	(0.19–0.26)
Unique astrocytoma variants	795	0.07	(0.06–0.07)	133	0.06	(0.05–0.07)	–	–	–	48	0.06	(0.04–0.08)
Glioblastoma	48,164	3.45	(3.42–3.48)	2,995	1.70	(1.64–1.77)	200	1.43	(1.22–1.66)	1,117	1.57	(1.47–1.66)
Oligodendroglioma	3,595	0.30	(0.29–0.31)	228	0.12	(0.10–0.13)	26	0.14	(0.09–0.21)	139	0.16	(0.14–0.19)
Anaplastic oligodendroglioma	1,474	0.12	(0.11–0.12)	91	0.05	(0.04–0.06)	–	–	–	65	0.08	(0.06–0.10)
Oligoastrocytic tumors	2,838	0.23	(0.22–0.24)	172	0.09	(0.07–0.10)	22	0.11	(0.07–0.17)	112	0.13	(0.11–0.16)
Ependymal tumors	5,603	0.45	(0.44–0.46)	555	0.27	(0.25–0.29)	46	0.22	(0.16–0.29)	270	0.32	(0.28–0.36)
Glioma malignant, NOS	5,890	0.48	(0.47–0.49)	744	0.37	(0.34–0.40)	37	0.20	(0.13–0.28)	314	0.41	(0.37–0.46)
Choroid plexus tumors	692	0.06	(0.05–0.06)	67	0.03	(0.02–0.04)	–	–	–	39	0.05	(0.03–0.07)
Other neuroepithelial tumors	82	0.01	(0.01–0.01)	–	–	–	–	–	–	–	–	–
Neuronal and mixed neuronal-glial tumors	3,499	0.29	(0.28–0.30)	429	0.20	(0.18–0.22)	33	0.15	(0.10–0.22)	208	0.25	(0.21–0.28)
Tumors of the pineal region	491	0.04	(0.04–0.04)	107	0.05	(0.04–0.06)	–	–	–	25	0.03	(0.02–0.04)
Embryonal tumors	3,177	0.28	(0.27–0.29)	424	0.18	(0.17–0.20)	28	0.11	(0.08–0.17)	173	0.21	(0.18–0.24)
Tumors of Cranial and Spinal Nerves	**23,843**	**1.79**	**(1.76–1.81)**	**1,604**	**0.84**	**(0.80–0.88)**	**156**	**0.91**	**(0.77–1.08)**	**1,810**	**2.29**	**(2.18–2.40)**
Nerve sheath tumors	23,827	1.79	(1.76–1.81)	1,603	0.84	(0.80–0.88)	156	0.91	(0.77–1.08)	1,808	2.29	(2.18–2.40)
Other tumors of cranial and spinal nerves	16	0.00	(0.00–0.00)	–	–	–	–	–	–	–	–	–
Tumors of Meninges	**105,321**	**7.68**	**(7.63–7.73)**	**15,670**	**9.35**	**(9.19–9.50)**	**665**	**4.95**	**(4.55–5.38)**	**5,780**	**8.28**	**(8.06–8.51)**
Meningioma	101,748	7.40	(7.35–7.45)	15,270	9.14	(8.99–9.29)	633	4.78	(4.38–5.21)	5,537	7.99	(7.77–8.21)
Mesenchymal tumors	1,067	0.08	(0.08–0.09)	121	0.06	(0.05–0.08)	–	–	–	72	0.09	(0.07–0.11)
Primary melanocytic lesions	120	0.01	(0.01–0.01)	–	–	–	–	–	–	–	–	–
Other neoplasms related to the meninges	2,386	0.19	(0.18–0.19)	271	0.14	(0.12–0.16)	18	0.09	(0.05–0.14)	167	0.20	(0.17–0.24)
Lymphomas and Hematopoietic Neoplasms	**6,202**	**0.45**	**(0.44–0.47)**	**691**	**0.38**	**(0.35–0.41)**	**47**	**0.32**	**(0.23–0.44)**	**339**	**0.49**	**(0.43–0.54)**
Lymphoma	6,028	0.44	(0.43–0.45)	665	0.36	(0.33–0.39)	45	0.31	(0.22–0.43)	330	0.47	(0.42–0.53)
Other hematopoietic neoplasms	174	0.01	(0.01–0.02)	26	0.01	(0.01–0.02)	–	–	–	–	–	–
Germ Cell Tumors and Cysts	**1,183**	**0.10**	**(0.10–0.11)**	**151**	**0.07**	**(0.06–0.08)**	**–**	**–**	**–**	**157**	**0.19**	**(0.16–0.23)**
Germ cell tumors, cysts and heterotopias	1,183	0.10	(0.10–0.11)	151	0.07	(0.06–0.08)	–	–	–	157	0.19	(0.16–0.23)
Tumors of Sellar Region	**40,300**	**3.16**	**(3.12–3.19)**	**10,299**	**5.60**	**(5.49–5.71)**	**460**	**2.67**	**(2.41–2.94)**	**3,140**	**3.94**	**(3.80–4.09)**
Tumors of the pituitary	38,138	2.98	(2.95–3.01)	9,794	5.35	(5.24–5.46)	446	2.58	(2.33–2.86)	2,992	3.76	(3.62–3.90)
Craniopharyngioma	2,162	0.18	(0.17–0.18)	505	0.25	(0.23–0.27)				148	0.18	(0.16–0.22)
Unclassified Tumors	**16,053**	**1.20**	**(1.18–1.22)**	**1,932**	**1.13**	**(1.08–1.19)**	**126**	**0.96**	**(0.78–1.16)**	**779**	**1.10**	**(1.02–1.18)**
Hemangioma	4,024	0.32	(0.31–0.33)	394	0.20	(0.18–0.22)	35	0.19	(0.13–0.27)	253	0.31	(0.27–0.35)
Neoplasm, unspecified	11,965	0.88	(0.86–0.90)	1,527	0.92	(0.88–0.97)	91	0.76	(0.60–0.95)	520	0.78	(0.71–0.85)
All other	64	0.00	(0.00–0.01)	–	–	–	–	–	–	–	–	–
TOTAL[c]	**286,131**	**21.51**	**(21.43–21.59)**	**37,846**	**21.23**	**(21.01–21.45)**	**2,017**	**13.02**	**(12.40–13.66)**	**15,214**	**20.42**	**(20.09–20.76)**

[a]Rates are per 100,000 and are age-adjusted to the 2000 US standard population.
[b]Individuals with unknown race were excluded (N = 1,967).
[c]Refers to all brain tumors including histologies not presented in this table.
– Counts and rates are not presented when fewer than 16 cases were reported for the specific histology category. The suppressed cases are included in the counts and rates for totals.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified; AIAN, American Indian/Alaskan Native; API, Asian/Pacific Islander.

Table 5. Average Annual Age-Adjusted Incidence Rates[a] for Brain and Central Nervous System Tumor by Major Histology Groupings, Histology, and Hispanic Ethnicity[b], CBTRUS Statistical Report: NPCR and SEER, 2007–2011

Histology	Hispanic			Non-Hispanic		
	N	Rate	95% CI	N	Rate	95% CI
Tumors of Neuroepithelial Tissue	**9,913**	**5.10**	**(4.99–5.21)**	**95,234**	**6.85**	**(6.81–6.90)**
Pilocytic astrocytoma	705	0.23	(0.21–0.25)	4,249	0.37	(0.35–0.38)
Diffuse astrocytoma	850	0.42	(0.39–0.45)	7,779	0.58	(0.57–0.59)
Anaplastic astrocytoma	515	0.27	(0.24–0.29)	5,346	0.39	(0.38–0.40)
Unique astrocytoma variants	137	0.05	(0.04–0.06)	861	0.07	(0.06–0.07)
Glioblastoma	3,608	2.43	(2.35–2.52)	49,143	3.26	(3.23–3.29)
Oligodendroglioma	407	0.19	(0.17–0.21)	3,605	0.28	(0.27–0.29)
Anaplastic oligodendroglioma	176	0.09	(0.08–0.10)	1,474	0.11	(0.10–0.11)
Oligoastrocytic tumors	306	0.14	(0.12–0.16)	2,863	0.22	(0.21–0.23)
Ependymal tumors	814	0.36	(0.33–0.38)	5,693	0.43	(0.42–0.44)
Glioma malignant, NOS	844	0.38	(0.35–0.41)	6,189	0.48	(0.47–0.50)
Choroid plexus tumors	142	0.05	(0.04–0.06)	667	0.05	(0.05–0.06)
Other neuroepithelial tumors	–	–	–	85	0.01	(0.01–0.01)
Neuronal and mixed neuronal-glial tumors	498	0.19	(0.17–0.20)	3,699	0.30	(0.29–0.31)
Tumors of the pineal region	94	0.04	(0.03–0.04)	547	0.04	(0.04–0.05)
Embryonal tumors	804	0.27	(0.25–0.29)	3,034	0.26	(0.25–0.27)
Tumors of Cranial and Spinal Nerves	**2,259**	**1.23**	**(1.18–1.29)**	**25,367**	**1.77**	**(1.75–1.80)**
Nerve sheath tumors	2,256	1.23	(1.18–1.28)	25,350	1.77	(1.75–1.80)
Other tumors of cranial and spinal nerves	–	–	–	17	0.00	(0.00–0.00)
Tumors of Meninges	**11,066**	**7.70**	**(7.55–7.86)**	**116,985**	**7.95**	**(7.90–7.99)**
Meningioma	10,554	7.46	(7.30–7.61)	113,222	7.67	(7.62–7.72)
Mesenchymal tumors	131	0.06	(0.05–0.07)	1,154	0.09	(0.08–0.09)
Primary melanocytic lesions	–	–	–	119	0.01	(0.01–0.01)
Other neoplasms related to the meninges	366	0.18	(0.16–0.20)	2,490	0.18	(0.18–0.19)
Lymphomas and Hematopoietic Neoplasms	**763**	**0.48**	**(0.45–0.52)**	**6,576**	**0.45**	**(0.44–0.46)**
Lymphoma	729	0.47	(0.43–0.51)	6,396	0.44	(0.43–0.45)
Other hemopoietic neoplasms	34	0.02	(0.01–0.02)	180	0.01	(0.01–0.02)
Germ Cell Tumors and Cysts	**278**	**0.10**	**(0.09–0.11)**	**1,224**	**0.10**	**(0.10–0.11)**
Germ cell tumors, cysts and heterotopias	278	0.10	(0.09–0.11)	1,224	0.10	(0.10–0.11)
Tumors of Sellar Region	**8,003**	**4.15**	**(4.05–4.25)**	**46,543**	**3.40**	**(3.37–3.43)**
Tumors of the pituitary	7,528	3.95	(3.85–4.05)	44,172	3.22	(3.19–3.25)
Craniopharyngioma	475	0.20	(0.18–0.22)	2,371	0.18	(0.17–0.19)
Unclassified Tumors	**2,034**	**1.25**	**(1.19–1.31)**	**16,930**	**1.19**	**(1.17–1.21)**
Hemangioma	559	0.28	(0.25–0.30)	4,164	0.31	(0.30–0.32)
Neoplasm, unspecified	1,463	0.96	(0.91–1.02)	12,697	0.88	(0.86–0.89)
All other	–	–	–	69	0.00	(0.00–0.01)
TOTAL[c]	**34,316**	**20.02**	**(19.79–20.25)**	**308,859**	**21.72**	**(21.64–21.79)**

[a]Rates are per 100,000 and age-adjusted to the 2000 US standard population.
[b]Hispanic ethnicity is not mutually exclusive of race; Classified using the North American Association of Central Cancer Registries Hispanic Identification Algorithm, version 2 (NHIA v2).
[c]Refers to all brain tumors including histologies not presented in this table.
– Counts and rates are not presented when fewer than 16 cases were reported for the specific histology category. The suppressed cases are included in the counts and rates for totals.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 6. Characteristics of Brain and Central Nervous System Tumors by Central Cancer Registry, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

State	No. of Newly Diagnosed Tumors	Percent Non-Malignant Tumors	Total		Malignant		Non-Malignant		Average Annual 2007–2011 Population[a]
			Histologically Confirmed	Radio-graphically Confirmed	Histologically Confirmed	Radio-graphically Confirmed	Histologically Confirmed	Radio-graphically Confirmed	
Alabama	4,220	56.6%	72.8%	23.1%	87.7%	7.2%	61.3%	36.5%	4,747,487
Alaska	718	63.8%	59.2%	37.6%	86.5%	13.5%	43.7%	53.1%	700,911
Arizona	6,948	65.9%	61.0%	33.2%	83.5%	8.6%	49.3%	46.1%	6,333,864
Arkansas	3,025	63.7%	59.9%	35.6%	81.4%	15.6%	47.7%	48.4%	2,896,276
California	36,409	66.2%	66.4%	30.0%	86.7%	8.2%	56.0%	40.8%	36,966,844
Colorado	6,510	72.4%	53.0%	43.9%	84.3%	10.4%	41.0%	56.4%	4,966,113
Connecticut	3,845	61.6%	69.7%	28.1%	84.9%	12.8%	60.3%	37.9%	3,559,598
Delaware	929	62.4%	66.8%	29.6%	83.4%	11.5%	56.9%	40.9%	891,063
District of Columbia	605	67.3%	63.5%	31.1%	83.8%	6.9%	53.6%	42.5%	594,175
Florida	24,735	69.0%	59.5%	37.6%	86.7%	9.1%	47.3%	50.2%	18,695,204
Georgia	10,038	68.5%	59.1%	37.4%	84.3%	11.7%	47.5%	49.0%	9,600,577
Hawaii	1,272	73.1%	59.1%	36.6%	85.4%	8.0%	49.5%	46.0%	1,347,402
Idaho	1,528	62.9%	66.6%	29.3%	83.4%	10.8%	56.6%	40.4%	1,549,678
Illinois	14,744	67.7%	59.9%	37.8%	87.4%	9.5%	46.9%	51.4%	12,787,979
Indiana	7,213	64.6%	56.4%	41.1%	85.1%	16.1%	40.6%	57.2%	6,453,988
Iowa	3,707	64.5%	62.4%	35.4%	85.1%	13.9%	50.1%	47.9%	3,032,647
Kansas	2,859	60.7%	62.7%	33.3%	83.5%	14.0%	49.3%	48.0%	2,830,758
Kentucky	5,991	68.8%	52.5%	43.0%	82.3%	14.0%	39.1%	57.0%	4,315,419
Louisiana	4,621	68.5%	64.7%	32.1%	86.9%	8.3%	54.6%	42.4%	4,484,341
Maine	1,357	54.1%	73.2%	23.3%	87.0%	12.4%	61.6%	35.4%	1,328,654
Maryland	5,803	64.6%	67.1%	27.4%	85.5%	7.1%	57.1%	38.4%	5,739,266
Massachusetts	6,728	59.0%	73.4%	23.3%	88.2%	7.8%	63.4%	34.4%	6,517,680
Michigan	11,568	65.0%	61.9%	34.2%	85.1%	9.8%	49.7%	47.4%	9,920,847
Minnesota	4,355	55.0%	95.5%	00.0%	96.3%	0.0%	94.9%	0.0%	5,278,692
Mississippi	3,029	66.1%	62.9%	33.1%	84.6%	10.3%	51.7%	44.7%	2,956,305
Missouri	7,105	67.2%	58.6%	37.5%	85.7%	9.9%	45.5%	51.2%	5,955,538
Montana	1,204	66.1%	60.7%	36.1%	87.7%	10.5%	46.9%	49.7%	982,701
Nebraska	1,849	58.8%	65.7%	30.6%	82.5%	15.0%	54.0%	43.8%	1,812,886
Nevada	1,727	61.4%	71.6%	23.2%	87.3%	5.0%	61.8%	34.6%	2,672,631
New Hampshire	1,461	59.5%	74.0%	23.1%	89.0%	7.0%	64.2%	34.4%	1,315,840
New Jersey	9,557	62.9%	66.4%	29.1%	85.7%	11.2%	55.1%	40.0%	8,756,548
New Mexico	1,859	66.4%	70.4%	24.2%	86.1%	6.2%	62.5%	32.6%	2,036,195
New York	24,720	69.9%	59.3%	37.9%	86.3%	10.6%	47.8%	49.1%	19,310,539

North Carolina	10,580	67.2%	66.2%	30.4%	87.1%	8.3%	56.1%	40.6%	9,417,441
North Dakota	566	58.8%	60.1%	34.6%	80.7%	19.7%	45.6%	49.8%	666,892
Ohio	11,489	59.7%	65.9%	27.7%	78.1%	10.0%	57.7%	40.7%	11,524,810
Oklahoma	3,456	59.3%	59.8%	36.1%	78.7%	19.3%	46.9%	51.8%	3,712,908
Oregon	4,095	59.6%	72.1%	25.5%	87.3%	9.5%	61.9%	36.9%	3,801,241
Pennsylvania	16,802	66.9%	59.5%	35.5%	83.0%	10.6%	48.0%	48.0%	12,659,667
Rhode Island	1,123	65.8%	70.3%	27.9%	92.7%	3.2%	58.6%	40.5%	1,053,876
South Carolina	4,952	65.5%	60.1%	33.9%	84.2%	9.8%	47.4%	47.1%	4,574,432
South Dakota	832	61.9%	61.4%	33.2%	83.3%	10.5%	48.0%	48.5%	807,526
Tennessee	8,061	69.1%	57.0%	40.2%	85.8%	9.6%	44.1%	54.0%	6,297,123
Texas	28,119	70.3%	54.5%	39.4%	81.6%	12.4%	43.0%	50.7%	24,763,449
Utah	2,922	68.4%	67.6%	31.5%	87.2%	9.3%	58.6%	40.6%	2,714,727
Vermont	922	66.7%	60.2%	38.5%	90.6%	7.9%	45.0%	54.1%	624,991
Virginia	7,760	64.4%	67.1%	29.8%	86.4%	7.1%	56.6%	42.3%	7,927,984
Washington	9,477	71.0%	55.7%	41.0%	84.0%	10.7%	44.4%	53.1%	6,651,629
West Virginia	2,076	62.2%	61.2%	36.0%	85.7%	12.9%	46.4%	51.9%	1,846,213
Wisconsin	7,125	64.2%	58.7%	37.4%	83.5%	12.2%	44.9%	52.8%	5,664,094
Wyoming	579	61.7%	69.9%	29.4%	84.7%	14.7%	60.8%	38.7%	554,499
TOTAL	**343,175**	**66.0%**	**62.1%**	**34.0%**	**85.2%**	**9.9%**	**50.4%**	**46.3%**	**306,602,148**

[a]Population estimates were obtained from the United States Bureau of the Census available on the SEER program website.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; CNS, central nervous system; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program.

Table 7. Brain and Central Nervous System Tumor Average Annual Age-Adjusted Incidence Rates[a] by Age, Behavior, and Central Cancer Registry, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

State	0–19 Years				20+ Years				All Ages					
	Malignant		Non-Malignant		Malignant		Non-Malignant		Malignant		Non-Malignant		All Tumors	
	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
Alabama	2.90	(2.50–3.35)	0.96	(0.73–1.23)	8.91	(8.47–9.35)	12.70	(12.18–13.23)	7.18	(6.85–7.52)	9.33	(8.95–9.72)	16.51	(16.01–17.02)
Alaska	3.55	(2.50–4.89)	3.28	(2.28–4.57)	10.17	(8.78–11.72)	19.28	(17.33–21.38)	8.27	(7.23–9.42)	14.69	(13.27–16.22)	22.96	(21.18–24.84)
Arizona	3.20	(2.84–3.59)	2.07	(1.79–2.39)	8.77	(8.39–9.16)	18.65	(18.09–19.21)	7.17	(6.88–7.47)	13.89	(13.49–14.31)	21.06	(20.56–21.57)
Arkansas	3.47	(2.91–4.10)	3.46	(2.91–4.09)	8.50	(7.97–9.07)	16.13	(15.38–16.91)	7.06	(6.64–7.50)	12.50	(11.94–13.08)	19.56	(18.86–20.28)
California	2.95	(2.80–3.10)	1.65	(1.55–1.77)	8.28	(8.12–8.44)	17.93	(17.70–18.17)	6.75	(6.63–6.87)	13.26	(13.09–13.43)	20.01	(19.80–20.22)
Colorado	3.07	(2.67–3.51)	1.87	(1.55–2.22)	9.01	(8.57–9.48)	26.39	(25.62–27.18)	7.31	(6.97–7.66)	19.36	(18.80–19.93)	26.67	(26.01–27.33)
Connecticut	3.66	(3.13–4.27)	1.57	(1.23–1.97)	9.22	(8.72–9.75)	16.25	(15.58–16.95)	7.63	(7.24–8.04)	12.04	(11.55–12.55)	19.67	(19.04–20.31)
Delaware	4.39	(3.27–5.77)	2.87	(1.98–4.04)	8.57	(7.61–9.62)	15.58	(14.28–16.96)	7.37	(6.60–8.20)	11.93	(10.96–12.96)	19.30	(18.06–20.61)
District of Columbia	4.07	(2.59–6.09)	3.73	(2.32–5.67)	8.10	(6.91–9.42)	17.78	(16.01–19.69)	6.94	(5.98–8.01)	13.75	(12.41–15.19)	20.69	(19.03–22.46)
Florida	3.55	(3.31–3.81)	2.13	(1.94–2.32)	8.62	(8.41–8.83)	20.73	(20.41–21.05)	7.16	(7.00–7.33)	15.39	(15.16–15.63)	22.55	(22.27–22.85)
Georgia	3.43	(3.13–3.75)	1.81	(1.59–2.05)	8.23	(7.91–8.55)	20.24	(19.74–20.74)	6.85	(6.61–7.10)	14.95	(14.59–15.31)	21.80	(21.37–22.24)
Hawaii	2.78	(2.04–3.69)	1.18	(0.72–1.82)	5.55	(4.92–6.23)	17.33	(16.20–18.52)	4.75	(4.25–5.30)	12.69	(11.88–13.56)	17.45	(16.48–18.45)
Idaho	2.49	(1.89–3.21)	1.63	(1.16–2.24)	9.21	(8.42–10.07)	17.03	(15.93–18.19)	7.28	(6.69–7.92)	12.61	(11.82–13.45)	19.90	(18.90–20.94)
Illinois	3.02	(2.77–3.29)	2.24	(2.02–2.47)	8.96	(8.69–9.24)	20.30	(19.90–20.72)	7.26	(7.05–7.47)	15.12	(14.82–15.42)	22.38	(22.01–22.75)
Indiana	4.07	(3.67–4.51)	2.19	(1.90–2.52)	9.00	(8.63–9.39)	18.51	(17.96–19.07)	7.59	(7.29–7.89)	13.83	(13.43–14.24)	21.42	(20.92–21.93)
Iowa	3.62	(3.06–4.25)	2.13	(1.71–2.62)	9.70	(9.14–10.29)	19.17	(18.38–19.99)	7.96	(7.52–8.41)	14.28	(13.70–14.88)	22.24	(21.51–22.98)
Kansas	3.14	(2.62–3.74)	1.96	(1.55–2.44)	9.42	(8.83–10.03)	15.68	(14.92–16.47)	7.62	(7.17–8.08)	11.75	(11.19–12.32)	19.36	(18.65–20.10)
Kentucky	3.97	(3.47–4.53)	2.46	(2.07–2.90)	9.83	(9.35–10.32)	24.22	(23.46–25.00)	8.15	(7.78–8.53)	17.98	(17.42–18.54)	26.12	(25.46–26.80)
Louisiana	3.27	(2.84–3.76)	1.96	(1.63–2.34)	7.59	(7.16–8.03)	18.62	(17.95–19.30)	6.35	(6.02–6.69)	13.84	(13.35–14.34)	20.19	(19.60–20.79)
Maine	4.09	(3.14–5.23)	1.16	(0.70–1.83)	9.70	(8.89–10.56)	12.95	(11.99–13.97)	8.09	(7.44–8.78)	9.57	(8.87–10.31)	17.66	(16.70–18.66)
Maryland	3.30	(2.90–3.73)	1.71	(1.43–2.03)	8.45	(8.06–8.85)	16.91	(16.36–17.48)	6.97	(6.67–7.28)	12.55	(12.15–12.97)	19.52	(19.02–20.04)
Massachusetts	3.83	(3.41–4.29)	1.95	(1.66–2.27)	9.43	(9.06–9.82)	14.80	(14.33–15.28)	7.83	(7.53–8.13)	11.11	(10.77–11.47)	18.94	(18.48–19.41)
Michigan	3.60	(3.28–3.94)	1.87	(1.65–2.11)	9.11	(8.80–9.42)	19.03	(18.59–19.48)	7.53	(7.29–7.77)	14.11	(13.79–14.44)	21.64	(21.24–22.04)
Minnesota	3.10	(2.71–3.54)	1.31	(1.05–1.60)	8.80	(8.38–9.23)	11.63	(11.15–12.13)	7.16	(6.85–7.49)	8.67	(8.32–9.03)	15.83	(15.36–16.32)
Mississippi	2.99	(2.49–3.56)	1.99	(1.59–2.46)	8.21	(7.68–8.78)	17.81	(17.01–18.64)	6.72	(6.31–7.14)	13.27	(12.69–13.88)	19.99	(19.27–20.72)
Missouri	3.41	(3.02–3.84)	1.43	(1.19–1.72)	8.81	(8.43–9.20)	20.36	(19.77–20.97)	7.26	(6.96–7.57)	14.93	(14.51–15.37)	22.19	(21.67–22.72)
Montana	2.74	(1.90–3.83)	1.52	(0.93–2.36)	9.14	(8.21–10.14)	19.70	(18.29–21.19)	7.30	(6.59–8.07)	14.49	(13.47–15.56)	21.79	(20.54–23.10)
Nebraska	4.08	(3.34–4.94)	3.08	(2.43–3.84)	9.66	(8.92–10.44)	14.80	(13.88–15.76)	8.06	(7.49–8.66)	11.44	(10.76–12.15)	19.50	(18.60–20.42)
Nevada	2.19	(1.69–2.80)	0.61	(0.36–0.97)	7.76	(7.14–8.42)	13.83	(12.99–14.72)	6.16	(5.70–6.66)	10.04	(9.43–10.68)	16.21	(15.44–17.00)
New Hampshire	4.36	(3.39–5.52)	2.46	(1.78–3.32)	10.03	(9.17–10.95)	15.70	(14.62–16.84)	8.40	(7.72–9.13)	11.90	(11.11–12.74)	20.31	(19.25–21.40)
New Jersey	3.69	(3.35–4.06)	2.01	(1.76–2.28)	9.23	(8.91–9.57)	16.95	(16.51–17.40)	7.64	(7.39–7.90)	12.66	(12.34–12.99)	20.31	(19.90–20.72)
New Mexico	2.50	(1.96–3.15)	1.78	(1.32–2.34)	7.21	(6.61–7.85)	15.63	(14.73–16.57)	5.86	(5.40–6.34)	11.66	(11.00–12.34)	17.51	(16.71–18.34)

New York	3.60	(3.36–3.84)	2.60	(2.40–2.81)	8.81	(8.59–9.03)	22.27	(21.93–22.62)	7.31	(7.14–7.48)	16.63	(16.38–16.88)	23.94	(23.64–24.25)
North Carolina	3.26	(2.96–3.59)	1.90	(1.67–2.16)	8.59	(8.29–8.91)	19.49	(19.02–19.96)	7.07	(6.83–7.31)	14.44	(14.11–14.79)	21.51	(21.10–21.93)
North Dakota	2.93	(1.87–4.35)	–	–	7.78	(6.74–8.94)	12.56	(11.19–14.05)	6.39	(5.58–7.29)	9.19	(8.20–10.27)	15.58	(14.29–16.96)
Ohio	3.33	(3.05–3.63)	2.19	(1.97–2.44)	9.05	(8.77–9.34)	14.51	(14.16–14.88)	7.41	(7.20–7.63)	10.98	(10.72–11.25)	18.39	(18.05–18.74)
Oklahoma	2.71	(2.28–3.20)	1.88	(1.52–2.29)	8.98	(8.48–9.49)	14.01	(13.39–14.66)	7.18	(6.81–7.57)	10.53	(10.07–11.00)	17.71	(17.12–18.32)
Oregon	3.80	(3.27–4.39)	2.09	(1.70–2.53)	9.76	(9.26–10.29)	15.78	(15.14–16.45)	8.05	(7.66–8.46)	11.85	(11.38–12.34)	19.91	(19.29–20.54)
Pennsylvania	3.72	(3.42–4.03)	2.03	(1.82–2.26)	9.43	(9.16–9.70)	20.94	(20.54–21.34)	7.79	(7.58–8.00)	15.51	(15.22–15.81)	23.30	(22.94–23.67)
Rhode Island	2.66	(1.84–3.72)	2.45	(1.68–3.45)	8.29	(7.43–9.23)	16.74	(15.50–18.06)	6.68	(6.01–7.40)	12.64	(11.73–13.61)	19.32	(18.18–20.51)
South Carolina	3.04	(2.61–3.51)	1.66	(1.35–2.01)	8.59	(8.15–9.04)	18.12	(17.48–18.78)	7.00	(6.66–7.34)	13.40	(12.93–13.87)	20.39	(19.82–20.98)
South Dakota	2.75	(1.86–3.90)	1.61	(0.95–2.55)	9.16	(8.11–10.32)	15.93	(14.52–17.43)	7.32	(6.52–8.19)	11.82	(10.80–12.91)	19.14	(17.83–20.52)
Tennessee	3.58	(3.19–4.01)	2.49	(2.16–2.85)	8.99	(8.61–9.38)	22.40	(21.80–23.02)	7.44	(7.14–7.74)	16.69	(16.25–17.14)	24.12	(23.59–24.67)
Texas	3.67	(3.48–3.87)	2.51	(2.35–2.68)	8.45	(8.25–8.66)	23.10	(22.77–23.44)	7.08	(6.93–7.24)	17.19	(16.95–17.44)	24.27	(23.99–24.56)
Utah	3.90	(3.36–4.50)	2.05	(1.66–2.52)	9.07	(8.41–9.76)	23.66	(22.59–24.77)	7.59	(7.09–8.11)	17.46	(16.69–18.26)	25.05	(24.13–26.00)
Vermont	2.26	(1.33–3.60)	3.06	(1.97–4.55)	11.18	(9.89–12.59)	23.42	(21.51–25.46)	8.62	(7.65–9.68)	17.58	(16.17–19.08)	26.20	(24.48–28.01)
Virginia	3.25	(2.91–3.62)	1.48	(1.25–1.73)	8.19	(7.86–8.53)	16.48	(16.01–16.96)	6.77	(6.52–7.04)	12.17	(11.83–12.52)	18.95	(18.52–19.38)
Washington	3.83	(3.43–4.26)	2.95	(2.60–3.33)	9.66	(9.27–10.06)	26.17	(25.52–26.83)	7.99	(7.69–8.30)	19.51	(19.04–19.99)	27.50	(26.93–28.07)
West Virginia	3.56	(2.81–4.46)	1.87	(1.35–2.53)	8.88	(8.22–9.58)	15.98	(15.08–16.92)	7.35	(6.83–7.90)	11.93	(11.27–12.62)	19.28	(18.44–20.16)
Wisconsin	3.84	(3.41–4.31)	2.00	(1.70–2.35)	10.18	(9.76–10.62)	20.33	(19.73–20.95)	8.36	(8.04–8.70)	15.08	(14.63–15.53)	23.44	(22.89–24.00)
Wyoming	2.93	(1.84–4.45)	–	–	9.65	(8.32–11.13)	16.31	(14.59–18.18)	7.72	(6.72–8.84)	12.16	(10.90–13.53)	19.89	(18.26–21.62)
TOTAL	**3.39**	**(3.34–3.45)**	**2.03**	**(1.99–2.07)**	**8.80**	**(8.75–8.86)**	**19.05**	**(18.97–19.13)**	**7.25**	**(7.21–7.29)**	**14.17**	**(14.11–14.23)**	**21.42**	**(21.35–21.49)**

[a]Rates are per 100,000 and are age-adjusted to the 2000 United States standard population.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval.

Table 8. Brain and Central Nervous System Tumor Average Annual Age-Adjusted Incidence Rates[a] by Site[b] and Gender, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

ICD-O-3 Code	Site	Total			Male			Female		
		N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
C71.1-C71.4	Frontal, temporal, parietal, and occipital lobes of the brain	69,415	4.31	(4.28–4.34)	38,458	5.10	(5.05–5.15)	30,957	3.63	(3.59–3.67)
C71.0	Cerebrum	6,356	0.40	(0.39–0.41)	3,315	0.44	(0.43–0.46)	3,041	0.37	(0.36–0.38)
C71.5	Ventricle	3,941	0.26	(0.25–0.27)	2,153	0.29	(0.27–0.30)	1,788	0.23	(0.22–0.24)
C71.6	Cerebellum	9,038	0.60	(0.58–0.61)	4,875	0.65	(0.64–0.67)	4,163	0.54	(0.52–0.56)
C71.7	Brain stem	5,318	0.35	(0.34–0.36)	2,829	0.38	(0.37–0.39)	2,489	0.33	(0.32–0.34)
C71.8-C71.9	Other brain	32,238	2.01	(1.98–2.03)	16,813	2.28	(2.24–2.31)	15,425	1.78	(1.75–1.80)
C72.0-C72.1	Spinal cord and cauda equina	10,051	0.64	(0.62–0.65)	5,159	0.68	(0.66–0.70)	4,892	0.60	(0.58–0.62)
C72.2-C72.5	Cranial nerves	23,064	1.42	(1.40–1.44)	10,807	1.39	(1.37–1.42)	12,257	1.46	(1.43–1.48)
C72.8-C72.9	Other nervous system	2,199	0.14	(0.13–0.15)	1,176	0.16	(0.15–0.17)	1,023	0.12	(0.12–0.13)
C70.0-C70.9	Meninges (cerebral & spinal)	123,770	7.61	(7.57–7.66)	33,068	4.57	(4.52–4.62)	90,702	10.24	(10.17–10.31)
C75.1-C75.2	Pituitary and craniopharyngeal duct	55,639	3.54	(3.51–3.57)	25,079	3.31	(3.27–3.36)	30,560	3.85	(3.80–3.89)
C75.3	Pineal	1,559	0.10	(0.10–0.11)	889	0.12	(0.11–0.13)	670	0.09	(0.08–0.09)
C30.0[c]	Olfactory tumors of the nasal cavity	587	0.04	(0.03–0.04)	342	0.04	(0.04–0.05)	245	0.03	(0.03–0.03)
TOTAL		**343,175**	**21.42**	**(21.35–21.49)**	**144,963**	**19.42**	**(19.32–19.52)**	**198,212**	**23.26**	**(23.15–23.36)**

[a]Rates are per 100,000 and are age adjusted to the 2000 US standard population.
[b]The sites referred to in this table are loosely based on the categories and site codes defined in the SEER site/histology validation list.
[c]ICD-O-3 histology codes 9522–9523 only.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval.

Table 9. Distribution and Average Annual Age-Adjusted Incidence Rates[a] of Brain and Central Nervous System Tumors by Major Histology Groupings, Histology, and Behavior, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

Histology	Total					Malignant			Non-Malignant		
	N	% of All Tumors	Median Age	Rate	(95% CI)	N	Rate	(95% CI)	N	Rate	(95% CI)
Tumors of Neuroepithelial Tissue	**105,147**	**30.6**	**56.0**	**6.61**	**(6.57–6.65)**	**97,884**	**6.14**	**(6.10–6.17)**	**7,263**	**0.48**	**(0.47–0.49)**
Pilocytic astrocytoma	4,954	1.4	13.0	0.34	(0.33–0.35)	4,954	0.34	(0.33–0.35)	–	–	–
Diffuse astrocytoma	8,629	2.5	48.0	0.55	(0.54–0.57)	8,628	0.55	(0.54–0.57)	–	–	–
Anaplastic astrocytoma	5,861	1.7	53.0	0.37	(0.36–0.38)	5,861	0.37	(0.36–0.38)	–	–	–
Unique astrocytoma variants	998	0.3	23.0	0.07	(0.06–0.07)	668	0.04	(0.04–0.05)	330	0.02	(0.02–0.03)
Glioblastoma	52,751	15.4	64.0	3.19	(3.16–3.22)	52,751	3.19	(3.16–3.22)	–	–	–
Oligodendroglioma	4,012	1.2	43.0	0.26	(0.25–0.27)	4,012	0.26	(0.25–0.27)	–	–	–
Anaplastic oligodendroglioma	1,650	0.5	49.0	0.11	(0.10–0.11)	1,649	0.10	(0.10–0.11)	–	–	–
Oligoastrocytic tumors	3,169	0.9	42.0	0.21	(0.20–0.21)	3,167	0.21	(0.20–0.21)	–	–	–
Ependymal tumors	6,507	1.9	44.0	0.42	(0.41–0.43)	4,094	0.26	(0.26–0.27)	2,413	0.15	(0.15–0.16)
Glioma malignant, NOS	7,033	2.0	37.0	0.46	(0.45–0.47)	7,033	0.46	(0.45–0.47)	–	–	–
Choroid plexus tumors	809	0.2	19.0	0.05	(0.05–0.06)	117	0.01	(0.01–0.01)	692	0.05	(0.04–0.05)
Other neuroepithelial tumors	98	0.0	31.5	0.01	(0.01–0.01)	64	0.00	(0.00–0.01)	34	0.00	(0.00–0.00)
Neuronal and mixed neuronal-glial tumors	4,197	1.2	27.0	0.28	(0.27–0.29)	800	0.05	(0.05–0.05)	3,397	0.23	(0.22–0.23)
Tumors of the pineal region	641	0.2	33.0	0.04	(0.04–0.05)	352	0.02	(0.02–0.03)	289	0.02	(0.02–0.02)
Embryonal tumors	3,838	1.1	9.0	0.26	(0.25–0.27)	3,734	0.26	(0.25–0.26)	104	0.01	(0.01–0.01)
Tumors of Cranial and Spinal Nerves	**27,626**	**8.1**	**55.0**	**1.70**	**(1.68–1.73)**	**239**	**0.02**	**(0.01–0.02)**	**27,387**	**1.69**	**(1.67–1.71)**
Nerve sheath tumors	27,606	8.0	55.0	1.70	(1.68–1.72)	239	0.02	(0.01–0.02)	27,367	1.69	(1.67–1.71)
Other tumors of cranial and spinal nerves	20	0.0	56.5	0.00	(0.00–0.00)	–	–	–	20	0.00	(0.00–0.00)
Tumors of Meninges	**128,051**	**37.3**	**65.0**	**7.88**	**(7.84–7.93)**	**2,540**	**0.16**	**(0.15–0.16)**	**125,511**	**7.73**	**(7.68–7.77)**
Meningioma	123,776	36.1	65.0	7.61	(7.57–7.66)	1,772	0.11	(0.10–0.11)	122,004	7.50	(7.46–7.55)
Mesenchymal tumors	1,285	0.4	48.0	0.08	(0.08–0.09)	418	0.03	(0.02–0.03)	867	0.06	(0.05–0.06)
Primary melanocytic lesions	134	0.0	57.5	0.01	(0.01–0.01)	88	0.01	(0.00–0.01)	46	0.00	(0.00–0.00)
Other neoplasms related to the meninges	2,856	0.8	49.0	0.18	(0.17–0.19)	262	0.02	(0.01–0.02)	2,594	0.16	(0.16–0.17)
Lymphomas and Hematopoietic Neoplasms	**7,339**	**2.1**	**65.0**	**0.46**	**(0.45–0.47)**	**7,308**	**0.45**	**(0.44–0.46)**	**31**	**0.00**	**(0.00–0.00)**
Lymphoma	7,125	2.1	65.0	0.44	(0.43–0.45)	7,125	0.44	(0.43–0.45)	–	–	–
Other hematopoietic neoplasms	214	0.1	51.0	0.01	(0.01–0.02)	183	0.01	(0.01–0.01)	31	0.00	(0.00–0.00)
Germ Cell Tumors and Cysts	**1,502**	**0.4**	**17.0**	**0.10**	**(0.10–0.11)**	**1,026**	**0.07**	**(0.07–0.07)**	**476**	**0.03**	**(0.03–0.03)**
Germ cell tumors, cysts and heterotopias	1,502	0.4	17.0	0.10	(0.10–0.11)	1,026	0.07	(0.07–0.07)	476	0.03	(0.03–0.03)
Tumors of Sellar Region	**54,546**	**15.9**	**50.0**	**3.47**	**(3.44–3.50)**	**124**	**0.01**	**(0.01–0.01)**	**54,422**	**3.46**	**(3.44–3.49)**
Tumors of the pituitary	51,700	15.1	51.0	3.29	(3.26–3.32)	119	0.01	(0.01–0.01)	51,581	3.28	(3.25–3.31)
Craniopharyngioma	2,846	0.8	42.0	0.18	(0.18–0.19)	–	–	–	2,841	0.18	(0.18–0.19)

Continued

Table 9. *Continued*

Histology	Total					Malignant			Non-Malignant		
	N	% of All Tumors	Median Age	Rate	(95% CI)	N	Rate	(95% CI)	N	Rate	(95% CI)
Unclassified Tumors	**18,964**	**5.5**	**63.0**	**1.19**	**(1.17–1.21)**	**6,678**	**0.41**	**(0.40–0.42)**	**12,286**	**0.78**	**(0.76–0.79)**
Hemangioma	4,723	1.4	49.0	0.30	(0.29–0.31)	25	0.00	(0.00–0.00)	4,698	0.30	(0.29–0.31)
Neoplasm, unspecified	14,160	4.1	70.0	0.88	(0.87–0.90)	6,633	0.41	(0.40–0.42)	7,527	0.47	(0.46–0.49)
All other	81	0.0	60.0	0.00	(0.00–0.01)	20	0.00	(0.00–0.00)	61	0.00	(0.00–0.00)
TOTAL[b]	**343,175**	**100.0**	**59.0**	**21.42**	**(21.35–21.49)**	**115,799**	**7.25**	**(7.21–7.29)**	**227,376**	**14.17**	**(14.11–14.23)**

[a]Rates are per 100,000 and are age-adjusted to the 2000 US standard population.
[b]Refers to all brain tumors including histologies not presented in this table.
– Counts are not presented when fewer than 16 cases were reported for the specific histology category. The suppressed cases are included in the counts for totals.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 10. Average Annual Age-Adjusted and Age-Specific Incidence Rates[a] by Major Histology Groupings, Histology, and Age at Diagnosis, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

Histology	Age at Diagnosis															
	0–19		20–34		35–44		45–54		55–64		65–74		75–84		85+	
	Rate	(95% CI)	Rate	(95% CI)	Rate	(95% CI)	Rate	(95% CI)	Rate	(95% CI)	Rate	(95% CI)	Rate	(95% CI)	Rate	(95% CI)
Tumors of Neuroepithelial Tissue	**3.66**	**(3.61–3.72)**	**3.38**	**(3.31–3.44)**	**4.47**	**(4.38–4.57)**	**6.94**	**(6.83–7.05)**	**11.70**	**(11.51–11.83)**	**17.17**	**(16.91–17.42)**	**19.53**	**(19.19–19.87)**	**12.21**	**(11.80–12.64)**
Pilocytic astrocytoma	0.84	(0.81–0.87)	0.24	(0.23–0.26)	0.12	(0.11–0.14)	0.09	(0.08–0.10)	0.09	(0.07–0.10)	0.06	(0.05–0.08)	0.06	(0.04–0.08)	–	–
Diffuse astrocytoma	0.27	(0.26–0.29)	0.50	(0.48–0.53)	0.58	(0.55–0.61)	0.61	(0.57–0.64)	0.79	(0.75–0.83)	1.02	(0.96–1.08)	1.14	(1.06–1.23)	0.68	(0.59–0.79)
Anaplastic astrocytoma	0.09	(0.08–0.10)	0.28	(0.26–0.30)	0.39	(0.36–0.41)	0.46	(0.43–0.48)	0.65	(0.61–0.69)	0.90	(0.85–0.96)	0.92	(0.85–0.99)	0.39	(0.32–0.47)
Unique astrocytoma variants	0.10	(0.09–0.11)	0.06	(0.06–0.07)	0.04	(0.03–0.05)	0.04	(0.03–0.05)	0.05	(0.04–0.06)	0.05	(0.03–0.06)	0.07	(0.05–0.10)	0.06	(0.04–0.10)
Glioblastoma	0.15	(0.14–0.17)	0.41	(0.39–0.43)	1.23	(1.18–1.28)	3.59	(3.51–3.67)	8.03	(7.90–8.16)	13.09	(12.87–13.31)	15.03	(14.74–15.34)	8.95	(8.60–9.32)
Oligodendroglioma	0.05	(0.05–0.06)	0.31	(0.29–0.33)	0.47	(0.44–0.50)	0.42	(0.39–0.44)	0.32	(0.29–0.34)	0.22	(0.20–0.26)	0.20	(0.17–0.24)	0.10	(0.07–0.15)
Anaplastic oligodendroglioma	0.01	(0.01–0.01)	0.09	(0.08–0.10)	0.17	(0.16–0.19)	0.18	(0.16–0.20)	0.20	(0.18–0.22)	0.16	(0.13–0.18)	0.10	(0.08–0.13)	–	–
Oligoastrocytic tumors	0.04	(0.03–0.04)	0.29	(0.27–0.31)	0.33	(0.31–0.36)	0.29	(0.27–0.31)	0.26	(0.24–0.29)	0.21	(0.19–0.24)	0.16	(0.13–0.20)	–	–
Ependymal tumors	0.28	(0.27–0.30)	0.36	(0.34–0.39)	0.48	(0.45–0.51)	0.60	(0.57–0.63)	0.56	(0.52–0.60)	0.56	(0.51–0.61)	0.40	(0.36–0.46)	0.16	(0.12–0.22)
Glioma malignant, NOS	0.64	(0.62–0.67)	0.25	(0.23–0.26)	0.25	(0.23–0.27)	0.28	(0.26–0.30)	0.37	(0.35–0.40)	0.59	(0.55–0.64)	1.16	(1.08–1.25)	1.61	(1.46–1.77)
Choroid plexus tumors	0.10	(0.09–0.11)	0.03	(0.03–0.04)	0.04	(0.03–0.04)	0.04	(0.03–0.05)	0.04	(0.03–0.05)	0.03	(0.02–0.04)	0.05	(0.03–0.07)	–	–
Other neuroepithelial tumors	0.01	(0.01–0.01)	0.01	(0.00–0.01)	–	–	–	–	–	–	–	–	–	–	–	–

Neuronal and mixed neuronal-glial tumors	0.37	(0.35–0.39)	0.32	(0.30–0.34)	0.23	(0.21–0.25)	0.22	(0.20–0.24)	0.22	(0.20–0.24)	0.19	(0.16–0.21)	0.15	(0.12–0.18)	0.07	(0.04–0.11)
Tumors of the pineal region	0.04	(0.04–0.05)	0.05	(0.04–0.05)	0.04	(0.03–0.05)	0.05	(0.04–0.06)	0.04	(0.03–0.05)	0.03	(0.02–0.04)	–	–	–	–
Embryonal tumors	0.65	(0.63–0.68)	0.18	(0.16–0.19)	0.11	(0.09–0.12)	0.09	(0.07–0.10)	0.05	(0.04–0.06)	0.04	(0.03–0.06)	0.04	(0.03–0.06)	–	–
Tumors of Cranial and Spinal Nerves	**0.27**	**(0.25–0.28)**	**0.80**	**(0.77–0.84)**	**1.75**	**(1.69–1.81)**	**2.78**	**(2.71–2.85)**	**3.88**	**(3.78–3.97)**	**4.35**	**(4.23–4.48)**	**3.41**	**(3.27–3.56)**	**1.83**	**(1.67–2.00)**
Nerve sheath tumors	0.27	(0.25–0.28)	0.80	(0.77–0.84)	1.75	(1.69–1.80)	2.78	(2.71–2.85)	3.87	(3.78–3.97)	4.35	(4.23–4.48)	3.41	(3.27–3.56)	1.82	(1.66–1.99)
Other tumors of cranial and spinal nerves	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tumors of Meninges	**0.22**	**(0.20–0.23)**	**1.60**	**(1.55–1.64)**	**4.99**	**(4.90–5.09)**	**9.16**	**(9.03–9.29)**	**14.80**	**(14.63–14.99)**	**25.58**	**(25.27–25.89)**	**37.91**	**(37.44–38.39)**	**49.66**	**(48.82–50.51)**
Meningioma	0.14	(0.13–0.15)	1.36	(1.32–1.40)	4.66	(4.56–4.75)	8.79	(8.66–8.91)	14.40	(14.17–14.53)	25.08	(24.78–25.39)	37.49	(37.02–37.96)	49.48	(48.64–50.32)
Mesenchymal tumors	0.04	(0.03–0.05)	0.06	(0.05–0.07)	0.10	(0.09–0.12)	0.10	(0.09–0.11)	0.14	(0.12–0.16)	0.15	(0.12–0.17)	0.12	(0.10–0.15)	–	–
Primary melanocytic lesions	**–**	**–**	–	–	–	–	0.01	(0.01–0.01)	0.02	(0.01–0.02)	0.02	(0.01–0.03)	0.03	(0.02–0.05)	–	–
Other neoplasms related to the meninges	0.04	(0.03–0.04)	0.18	(0.16–0.19)	0.23	(0.21–0.25)	0.27	(0.24–0.29)	0.30	(0.28–0.33)	0.33	(0.29–0.37)	0.27	(0.23–0.31)	0.12	(0.08–0.16)
Lymphomas and Hematopoietic Neoplasms	**0.03**	**(0.02–0.03)**	**0.11**	**(0.10–0.12)**	**0.27**	**(0.25–0.30)**	**0.45**	**(0.42–0.48)**	**0.89**	**(0.85–0.93)**	**1.85**	**(1.77–1.94)**	**2.29**	**(2.17–2.41)**	**1.19**	**(1.07–1.33)**
Lymphoma	0.01	(0.01–0.02)	0.10	(0.09–0.12)	0.26	(0.24–0.29)	0.44	(0.41–0.46)	0.86	(0.82–0.91)	1.82	(1.74–1.91)	2.27	(2.16–2.39)	1.18	(1.05–1.32)
Other hematopoietic neoplasms	0.01	(0.01–0.02)	0.01	(0.00–0.01)	0.01	(0.00–0.01)	0.01	(0.01–0.02)	0.03	(0.02–0.04)	0.03	(0.02–0.05)	–	–	–	–
Germ Cell Tumors and Cysts	**0.21**	**(0.20–0.23)**	**0.11**	**(0.10–0.12)**	**0.05**	**(0.04–0.06)**	**0.03**	**(0.02–0.04)**	**0.02**	**(0.02–0.03)**	**0.03**	**(0.02–0.04)**	**0.03**	**(0.02–0.05)**	–	–
Germ cell tumors, cysts and heterotopias	0.21	(0.20–0.23)	0.11	(0.10–0.12)	0.05	(0.04–0.06)	0.03	(0.02–0.04)	0.02	(0.02–0.03)	0.03	(0.02–0.04)	0.03	(0.02–0.05)	–	–
Tumors of Sellar Region	**0.73**	**(0.70–0.75)**	**3.09**	**(3.03–3.15)**	**4.19**	**(4.10–4.28)**	**4.59**	**(4.50–4.68)**	**5.40**	**(5.29–5.51)**	**7.21**	**(7.04–7.37)**	**7.12**	**(6.92–7.33)**	**4.75**	**(4.49–5.01)**
Tumors of the pituitary	0.53	(0.51–0.55)	2.97	(2.91–3.03)	4.03	(3.94–4.11)	4.38	(4.30–4.47)	5.16	(5.05–5.27)	6.95	(6.79–7.12)	6.91	(6.71–7.12)	4.63	(4.38–4.90)
Craniopharyngioma	0.20	(0.19–0.21)	0.12	(0.11–0.13)	0.16	(0.15–0.18)	0.21	(0.19–0.23)	0.24	(0.22–0.26)	0.25	(0.22–0.28)	0.21	(0.18–0.25)	0.11	(0.08–0.16)
Unclassified Tumors	**0.30**	**(0.29–0.32)**	**0.56**	**(0.54–0.59)**	**0.82**	**(0.79–0.86)**	**1.06**	**(1.02–1.10)**	**1.53**	**(1.48–1.59)**	**2.55**	**(2.45–2.65)**	**5.15**	**(4.98–5.32)**	**11.48**	**(11.08–11.89)**
Hemangioma	0.10	(0.09–0.11)	0.26	(0.24–0.27)	0.36	(0.33–0.38)	0.42	(0.40–0.45)	0.49	(0.46–0.53)	0.47	(0.43–0.52)	0.51	(0.46–0.57)	0.42	(0.35–0.51)
Neoplasm, unspecified	0.20	(0.18–0.21)	0.30	(0.29–0.32)	0.46	(0.44–0.49)	0.63	(0.60–0.67)	1.03	(0.98–1.08)	2.07	(1.98–2.16)	4.62	(4.46–4.79)	11.03	(10.63–11.43)
All other	**–**	**–**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL[c]	**5.42**	**(5.35–5.49)**	**9.65**	**(9.54–9.76)**	**16.55**	**(16.38–16.73)**	**25.00**	**(24.80–25.21)**	**38.21**	**(37.92–38.49)**	**58.74**	**(58.27–59.21)**	**75.44**	**(74.78–76.11)**	**81.16**	**(80.09–82.25)**

[a]Rates are per 100,000 and age-adjusted to the 2000 US. standard population.
[b]Adolescents and Young Adults (AYA), as defined by the National Cancer Institute, see: http://www.cancer.gov/cancertopics/aya.
[c]Refers to all brain tumors including histologies not presented in this table.
– Counts and rates are not presented when fewer than 16 cases were reported for the specific histology category. The suppressed cases are included in the counts and rates for totals.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 11. Most Common Primary Brain and CNS Tumors[a] by Age, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

Age (years)	Most Common Histology			Second Most Common Histology			Third Most Common Histology			Fourth Most Common Histology		
	Histology	Rate[b]	(95% CI)	Histology	Rate	(95% CI)	Histology	Rate	(95% CI)	Histology	Rate	(95% CI)
0–4	Embryonal Tumors	1.23	(1.16–1.30)	Pilocytic Astrocytoma	0.97	(0.91–1.03)	Glioma Malignant, NOS	0.92	(0.86–0.98)	Ependymal Tumors	0.47	(0.43–0.52)
5–9	Pilocytic Astrocytoma	0.96	(0.90–1.02)	Glioma Malignant, NOS	0.89	(0.83–0.95)	Embryonal Tumors	0.74	(0.68–0.79)	Neuronal and Mixed Neuronal Glial Tumors	0.30	(0.27–0.34)
10–14	Pilocytic Astrocytoma	0.85	(0.80–0.91)	Glioma Malignant, NOS	0.49	(0.45–0.53)	Neuronal and Mixed Neuronal Glial Tumors	0.46	(0.42–0.51)	Tumors of the Pituitary	0.44	(0.40–0.48)
15–19	Tumors of the Pituitary	1.50	(1.42–1.57)	Pilocytic Astrocytoma	0.60	(0.55–0.64)	Neuronal and Mixed Neuronal Glial Tumors	0.47	(0.43–0.51)	Nerve Sheath Tumors	0.32	(0.28–0.35)
15–39[c]	Tumors of the Pituitary	2.90	(2.86–2.95)	Meningioma	1.68	(1.64–1.72)	Nerve Sheath Tumors	0.88	(0.85–0.90)	Diffuse Astrocytoma	0.47	(0.45–0.49)
20–34	Tumors of the Pituitary	2.97	(2.91, 3.03)	Meningioma	1.36	(1.32–1.40)	Nerve Sheath Tumors	0.80	(0.77–0.84)	Diffuse Astrocytoma	0.50	(0.48–0.53)
35–44	Meningioma	4.66	(4.56–4.75)	Tumors of the Pituitary	4.03	(3.94–4.11)	Nerve Sheath Tumors	1.75	(1.69–1.80)	Glioblastoma	1.23	(1.18–1.28)
45–54	Meningioma	8.79	(8.66–8.91)	Tumors of the Pituitary	4.38	(4.30–4.47)	Glioblastoma	3.59	(3.51–3.67)	Nerve Sheath Tumors	2.78	(2.71–2.85)
55–64	Meningioma	14.35	(14.17–14.53)	Glioblastoma	8.03	(7.90–8.16)	Tumors of the Pituitary	5.16	(5.05–5.27)	Nerve Sheath Tumors	3.87	(3.78–3.97)
65–74	Meningioma	25.08	(24.78–25.39)	Glioblastoma	13.09	(12.87–13.31)	Tumors of the Pituitary	6.95	(6.79–7.12)	Nerve Sheath Tumors	4.35	(4.23–4.48)
75–84	Meningioma	37.49	(37.02–37.96)	Glioblastoma	15.03	(14.74–15.34)	Tumors of the Pituitary	6.91	(6.71–7.12)	Nerve Sheath Tumors	3.41	(3.27–3.56)
85+	Meningioma	49.48	(48.64–50.32)	Glioblastoma	8.95	(8.60–9.32)	Tumors of the Pituitary	4.63	(4.38–4.90)	Nerve Sheath Tumors	1.82	(1.66–1.99)
OVERALL	**Meningioma**	**7.61**	**(7.57–7.66)**	**Tumors of the Pituitary**	**3.29**	**(3.26–3.32)**	**Glioblastoma**	**3.19**	**(3.16–3.22)**	**Nerve Sheath Tumors**	**1.70**	**(1.68–1.72)**

[a]Excludes ICD-0–3 Codes 8000–8005, 8010 and 8021.
[b]Rates are per 100,000 and age-adjusted to the 2000 US. standard population.
[c]Adolescents and Young Adults (AYA), as defined by the National Cancer Institute, see: http://www.cancer.gov/cancertopics/aya.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 12. Average Annual Age-Adjusted Incidence Rates[a] for Children and Adolescents (Ages 0–19), Brain and Central Nervous System Tumors by Major Histology Groupings, Histology, and Gender, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

Histology	Total			Male			Female		
	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
Tumors of Neuroepithelial Tissue	**15,154**	**3.66**	**(3.61–3.72)**	**8,149**	**3.85**	**(3.77–3.94)**	**7,005**	**3.47**	**(3.39–3.55)**
Pilocytic astrocytoma	3,475	0.84	(0.81–0.87)	1,791	0.85	(0.81–0.89)	1,684	0.84	(0.80–0.88)
Diffuse astrocytoma	1,139	0.27	(0.26–0.29)	621	0.29	(0.27–0.32)	518	0.26	(0.23–0.28)
Anaplastic astrocytoma	370	0.09	(0.08–0.10)	202	0.10	(0.08–0.11)	168	0.08	(0.07–0.10)
Unique astrocytoma variants	431	0.10	(0.09–0.11)	229	0.11	(0.09–0.12)	202	0.10	(0.09–0.11)
Glioblastoma	643	0.15	(0.14–0.17)	362	0.17	(0.15–0.19)	281	0.14	(0.12–0.16)
Oligodendroglioma	221	0.05	(0.05–0.06)	118	0.05	(0.05–0.07)	103	0.05	(0.04–0.06)
Anaplastic oligodendroglioma	32	0.01	(0.01–0.01)	18	0.01	(0.00–0.01)	–	–	–
Oligoastrocytic tumors	147	0.04	(0.03–0.04)	64	0.03	(0.02–0.04)	83	0.04	(0.03–0.05)
Ependymal tumors	1,172	0.28	(0.27–0.30)	683	0.32	(0.30–0.35)	489	0.24	(0.22–0.26)
Glioma malignant, NOS	2,644	0.64	(0.62–0.67)	1,278	0.61	(0.58–0.64)	1,366	0.68	(0.65–0.72)
Choroid plexus tumors	412	0.10	(0.09–0.11)	224	0.11	(0.09–0.12)	188	0.09	(0.08–0.11)
Other neuroepithelial tumors	34	0.01	(0.01–0.01)	–	–	–	27	0.01	(0.01–0.02)
Neuronal and mixed neuronal-glial tumors	1,550	0.37	(0.35–0.39)	856	0.40	(0.38–0.43)	694	0.34	(0.32–0.37)
Tumors of the pineal region	186	0.04	(0.04–0.05)	88	0.04	(0.03–0.05)	98	0.05	(0.04–0.06)
Embryonal tumors	2,698	0.65	(0.63–0.68)	1,608	0.76	(0.73–0.80)	1,090	0.54	(0.51–0.57)
Medulloblastoma[b]	*1,694*	*0.41*	*(0.39–0.42)*	*1,053*	*0.32*	*(0.30–0.35)*	*641*	*0.32*	*(0.30–0.35)*
Primitive neuroectodermal tumor[c]	*420*	*0.10*	*(0.09–0.11)*	*241*	*0.09*	*(0.08–0.10)*	*179*	*0.09*	*(0.08–0.10)*
Atypical teratoid/rhabdoid tumor[d]	*370*	*0.09*	*(0.08–0.10)*	*201*	*0.08*	*(0.07–0.10)*	*169*	*0.08*	*(0.07–0.10)*
Other embryonal histologies[e]	*220*	*0.05*	*(0.05–0.06)*	*118*	*0.05*	*(0.04–0.06)*	*102*	*0.05*	*(0.04–0.06)*
Tumors of Cranial and Spinal Nerves	**1,107**	**0.27**	**(0.25–0.28)**	**574**	**0.27**	**(0.25–0.29)**	**533**	**0.26**	**(0.24–0.29)**
Nerve sheath tumors	1,106	0.27	(0.25–0.28)	574	0.27	(0.25–0.29)	532	0.26	(0.24–0.28)
Other tumors of cranial and spinal nerves	–	–	–	–	–	–	–	–	–
Tumors of Meninges	**922**	**0.22**	**(0.20–0.23)**	**459**	**0.21**	**(0.19–0.23)**	**463**	**0.22**	**(0.20–0.25)**
Meningioma	582	0.14	(0.13–0.15)	285	0.13	(0.12–0.15)	297	0.14	(0.13–0.16)
Mesenchymal tumors	167	0.04	(0.03–0.05)	75	0.04	(0.03–0.04)	92	0.05	(0.04–0.06)
Primary melanocytic lesions	–	–	–	–	–	–	–	–	–
Other neoplasms related to the meninges	160	0.04	(0.03–0.04)	92	0.04	(0.03–0.05)	68	0.03	(0.03–0.04)
Lymphomas and Hematopoietic Neoplasms	**108**	**0.03**	**(0.02–0.03)**	**72**	**0.03**	**(0.03–0.04)**	**36**	**0.02**	**(0.01–0.02)**
Lymphoma	57	0.01	(0.01–0.02)	38	0.02	(0.01–0.02)	19	0.01	(0.01–0.01)
Other hematopoietic neoplasms	51	0.01	(0.01–0.02)	34	0.02	(0.01–0.02)	17	0.01	(0.00–0.01)
Germ Cell Tumors and Cysts	**891**	**0.21**	**(0.20–0.23)**	**611**	**0.29**	**(0.26–0.31)**	**280**	**0.14**	**(0.12–0.16)**
Germ cell tumors, cysts and heterotopias	891	0.21	(0.20–0.23)	611	0.29	(0.26–0.31)	280	0.14	(0.12–0.16)
Tumors of Sellar Region	**3,084**	**0.73**	**(0.70–0.75)**	**1,019**	**0.48**	**(0.45–0.51)**	**2,065**	**0.99**	**(0.95–1.04)**
Tumors of the pituitary	2,271	0.53	(0.51–0.55)	622	0.29	(0.26–0.31)	1,649	0.79	(0.75–0.83)

Continued

Table 12. *Continued*

Histology	Total			Male			Female		
	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
Craniopharyngioma	813	0.20	(0.19–0.21)	397	0.19	(0.17–0.21)	416	0.21	(0.19–0.23)
Unclassified Tumors	**1,269**	**0.30**	**(0.29–0.32)**	**660**	**0.31**	**(0.29–0.33)**	**609**	**0.30**	**(0.27–0.32)**
Hemangioma	435	0.10	(0.09–0.11)	233	0.11	(0.10–0.12)	202	0.10	(0.09–0.11)
Neoplasm, unspecified	820	0.20	(0.18–0.21)	421	0.20	(0.18–0.22)	399	0.20	(0.18–0.22)
All other	–	–	–	–	–	–	–	–	–
TOTAL[f]	**22,535**	**5.42**	**(5.35–5.49)**	**11,544**	**5.44**	**(5.34–5.54)**	**10,991**	**5.40**	**(5.30–5.51)**

[a]Rates are per 100,000 and are age-adjusted to the 2000 US standard population.
[b]ICD-O-3 histology codes: 9470/3, 9471/3, 9472/3,9474/3.
[c]ICD-O-3 histology code: 9473/3.
[d]ICD-O-3 histology code: 9508/3.
[e]ICD-O-3 histology codes: 8963/3, 9364/3, 9490/0 , 9490/3, 9500/3, 9501/3, 9502/3.
[f]Refers to all brain tumors including histologies not presented in this table.
– Counts and rates are not presented when fewer than 16 cases were reported for the specific histology category. Suppressed cases are included in the total counts and rates.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 13. Average Annual Age-Adjusted Incidence Rates[a] for Children and Adolescents (Ages 0–19), Brain and Central Nervous System Tumors by Major Histology Groupings and Race[b], CBTRUS Statistical Report: NPCR and SEER, 2007–2011

	White			Black			AIAN			API		
	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
Tumors of Neuroepithelial Tissue	**12,156**	**3.86**	**(3.79–3.93)**	**1,939**	**2.83**	**(2.71–2.96)**	**132**	**1.79**	**(1.50–2.12)**	**814**	**3.59**	**(3.35–3.85)**
Pilocytic astrocytoma	2,821	0.90	(0.86–0.93)	426	0.62	(0.57–0.69)	23	0.31	(0.20–0.47)	178	0.79	(0.68–0.91)
Diffuse astrocytoma	913	0.29	(0.27–0.31)	147	0.21	(0.18–0.25)	–	–	–	62	0.28	(0.21–0.35)
Anaplastic astrocytoma	306	0.10	(0.09–0.11)	46	0.07	(0.05–0.09)	–	–	–	–	–	–
Unique astrocytoma variants	324	0.10	(0.09–0.11)	76	0.11	(0.09–0.14)	–	–	–	24	0.11	(0.07–0.16)
Glioblastoma	483	0.15	(0.14–0.17)	100	0.15	(0.12–0.18)	–	–	–	48	0.21	(0.16–0.28)
Oligodendroglioma	184	0.06	(0.05–0.07)	23	0.03	(0.02–0.05)	–	–	–	–	–	–
Anaplastic oligodendroglioma	25	0.01	(0.00–0.01)	–	–	–	–	–	–	–	–	–
Oligoastrocytic tumors	124	0.04	(0.03–0.05)	17	0.03	(0.01–0.04)	–	–	–	–	–	–
Ependymal tumors	937	0.30	(0.28–0.31)	149	0.22	(0.18–0.25)	17	0.23	(0.13–0.36)	62	0.27	(0.21–0.35)
Glioma malignant, NOS	2,105	0.67	(0.64–0.70)	352	0.52	(0.47–0.58)	19	0.26	(0.16–0.41)	152	0.67	(0.57–0.79)
Choroid plexus tumors	340	0.11	(0.10–0.12)	38	0.05	(0.04–0.07)	–	–	–	27	0.11	(0.08–0.17)
Other neuroepithelial tumors	24	0.01	(0.00–0.01)	–	–	–	–	–	–	–	–	–
Neuronal and mixed neuronal-glial tumors	1,264	0.40	(0.38–0.42)	174	0.25	(0.21–0.29)	16	0.22	(0.12–0.35)	87	0.39	(0.31–0.48)
Tumors of the pineal region	120	0.04	(0.03–0.05)	54	0.08	(0.06–0.10)	–	–	–	–	–	–

Embryonal tumors	2,186	0.70	(0.67–0.73)	324	0.47	(0.42–0.53)	23	0.31	(0.20–0.46)	136	0.59	(0.50–0.70)
Medulloblastoma[c]	*1,394*	*0.45*	*(0.42–0.47)*	*181*	*0.27*	*(0.23–0.31)*	*16*	*0.22*	*(0.12–0.35)*	*83*	*0.36*	*(0.29–0.45)*
Primitive neuroectodermal tumor[d]	*334*	*0.11*	*(0.09–0.12)*	*62*	*0.09*	*(0.07–0.11)*	-	-	-	*17*	*0.08*	*(0.04–0.12)*
Atypical teratoid/rhabdoid tumor[e]	*295*	*0.09*	*(0.08–0.10)*	*43*	*0.06*	*(0.04–0.08)*	-	-	-	*27*	*0.11*	*(0.07–0.16)*
Other embryonal histologies[f]	*168*	*0.05*	*(0.05–0.06)*	*33*	*0.06*	*(0.04–0.08)*	-	-	-	-	-	-
Tumors of Cranial and Spinal Nerves	**842**	**0.27**	**(0.25–0.28)**	**147**	**0.21**	**(0.18–0.25)**	**–**	**–**	**–**	**93**	**0.41**	**(0.33–0.50)**
Nerve sheath tumors	841	0.26	(0.25–0.28)	147	0.21	(0.18–0.25)	–	–	–	93	0.41	(0.33–0.50)
Other tumors of cranial and spinal nerves	–	–	–	–	–	–	–	–	–	–	–	–
Tumors of Meninges	**723**	**0.22**	**(0.21–0.24)**	**118**	**0.17**	**(0.14–0.20)**	**–**	**–**	**–**	**63**	**0.28**	**(0.21–0.36)**
Meningioma	446	0.14	(0.13–0.15)	84	0.12	(0.09–0.15)	–	–	–	37	0.16	(0.11–0.23)
Mesenchymal tumors	139	0.04	(0.04–0.05)	–	–	–	–	–	–	–	–	–
Primary melanocytic lesions	–	–	–	–	–	–	–	–	–	–	–	–
Other neoplasms related to the meninges	127	0.04	(0.03–0.05)	20	0.03	(0.02–0.04)	–	–	–	–	–	–
Lymphomas and Hematopoietic Neoplasms	**82**	**0.03**	**(0.02–0.03)**	**16**	**0.02**	**(0.01–0.04)**	**–**	**–**	**–**	**–**	**–**	**–**
Lymphoma	39	0.01	(0.01–0.02)	–	–	–	–	–	–	–	–	–
Other hematopoietic neoplasms	43	0.01	(0.01–0.02)	–	–	–	–	–	–	–	–	–
Germ Cell Tumors and Cysts	**674**	**0.21**	**(0.20–0.23)**	**98**	**0.14**	**(0.11–0.17)**	**–**	**–**	**–**	**112**	**0.51**	**(0.42–0.61)**
Germ cell tumors, cysts and heterotopias	674	0.21	(0.20–0.23)	98	0.14	(0.11–0.17)	–	–	–	112	0.51	(0.42–0.61)
Tumors of Sellar Region	**2,343**	**0.73**	**(0.70–0.76)**	**468**	**0.66**	**(0.60–0.72)**	**40**	**0.54**	**(0.38–0.73)**	**212**	**0.95**	**(0.82–1.08)**
Tumors of the pituitary	1,724	0.53	(0.50–0.55)	341	0.47	(0.42–0.52)	35	0.47	(0.32–0.65)	156	0.70	(0.59–0.82)
Craniopharyngioma	619	0.20	(0.18–0.21)	127	0.19	(0.16–0.22)	–	–	–	56	0.25	(0.19–0.32)
Unclassified Tumors	**1,020**	**0.32**	**(0.30–0.34)**	**139**	**0.20**	**(0.17–0.24)**	**–**	**–**	**–**	**93**	**0.41**	**(0.33–0.51)**
Hemangioma	369	0.12	(0.10–0.13)	36	0.05	(0.04–0.07)	–	–	–	26	0.12	(0.08–0.17)
Neoplasm, unspecified	639	0.20	(0.19–0.22)	103	0.15	(0.12–0.18)	–	–	–	65	0.29	(0.22–0.37)
All other	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL[g]	**17,840**	**5.64**	**(5.55–5.72)**	**2,925**	**4.23**	**(4.08–4.39)**	**213**	**2.87**	**(2.50–3.29)**	**1,395**	**6.18**	**(5.86–6.52)**

[a]Rates are per 100,000 and are age-adjusted to the 2000 US standard population.
[b]Individuals with unknown race were excluded (N = 162).
[c]ICD-O-3 histology codes: 9470/3, 9471/3, 9472/3,9474/3.
[d]ICD-O-3 histology code: 9473/3.
[e]ICD-O-3 histology code: 9508/3.
[f]ICD-O-3 histology codes: 8963/3, 9364/3, 9490/0 , 9490/3, 9500/3, 9501/3, 9502/3.
[g]Refers to all brain tumors including histologies not presented in this table.
– Counts and rates are not presented when fewer than 16 cases were reported for the specific histology category. Suppressed cases are included in the total counts and rates.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified; AIAN,American Indian/Alaskan Native; API, Asian/Pacific Islander.

Table 14. Average Annual Age-Adjusted Incidence Rates[a] for Children and Adolescents (Ages 0–19), Brain and Central Nervous System Tumors by Major Histology Groupings, Histology, and Hispanic Ethnicity[b], CBTRUS Statistical Report: NPCR and SEER, 2007–2011

Histology	Hispanic			Non-Hispanic		
	N	Rate	95% CI	N	Rate	95% CI
Tumors of Neuroepithelial Tissue	**2,671**	**2.83**	**(2.73–2.94)**	**12,483**	**3.90**	**(3.83–3.97)**
Pilocytic astrocytoma	545	0.58	(0.53–0.63)	2,930	0.92	(0.88–0.95)
Diffuse astrocytoma	175	0.19	(0.16–0.22)	964	0.30	(0.28–0.32)
Anaplastic astrocytoma	72	0.08	(0.06–0.10)	298	0.09	(0.08–0.10)
Unique astrocytoma variants	80	0.09	(0.07–0.11)	351	0.11	(0.10–0.12)
Glioblastoma	133	0.15	(0.12–0.17)	510	0.16	(0.14–0.17)
Oligodendroglioma	32	0.04	(0.02–0.05)	189	0.06	(0.05–0.07)
Anaplastic oligodendroglioma	–	–	–	25	0.01	(0.00–0.01)
Oligoastrocytic tumors	21	0.02	(0.01–0.03)	126	0.04	(0.03–0.05)
Ependymal tumors	251	0.26	(0.23–0.30)	921	0.29	(0.27–0.31)
Glioma malignant, NOS	436	0.46	(0.42–0.50)	2,208	0.70	(0.67–0.73)
Choroid plexus tumors	87	0.09	(0.07–0.11)	325	0.10	(0.09–0.11)
Other neuroepithelial tumors	–	–	–	30	0.01	(0.01–0.01)
Neuronal and mixed neuronal-glial tumors	239	0.26	(0.23–0.30)	1,311	0.40	(0.38–0.43)
Tumors of the pineal region	37	0.04	(0.03–0.05)	149	0.05	(0.04–0.05)
Embryonal tumors	552	0.57	(0.52–0.62)	2,146	0.68	(0.65–0.71)
Medulloblastoma[c]	*338*	*0.36*	*(0.32–0.40)*	*1,356*	*0.43*	*(0.41–0.45)*
Primitive neuroectodermal tumor[d]	*76*	*0.08*	*(0.06–0.10)*	*344*	*0.11*	*(0.10–0.12)*
Atypical teratoid/rhabdoid tumor[e]	*98*	*0.09*	*(0.08–0.11)*	*272*	*0.09*	*(0.08–0.10)*
Other embryonal histologies[f]	*40*	*0.04*	*(0.03–0.06)*	*180*	*0.06*	*(0.05–0.07)*
Tumors of Cranial and Spinal Nerves	**179**	**0.19**	**(0.17–0.23)**	**928**	**0.29**	**(0.27–0.31)**
Nerve sheath tumors	179	0.19	(0.17–0.23)	927	0.29	(0.27–0.30)
Other tumors of cranial and spinal nerves	–	–	–	–	–	–
Tumors of Meninges	**150**	**0.17**	**(0.14–0.20)**	**772**	**0.23**	**(0.22–0.25)**
Meningioma	74	0.08	(0.07–0.11)	508	0.15	(0.14–0.17)
Mesenchymal tumors	29	0.03	(0.02–0.04)	138	0.04	(0.04–0.05)
Primary melanocytic lesions	–	–	–	–	–	–
Other neoplasms related to the meninges	44	0.05	(0.04–0.07)	116	0.03	(0.03–0.04)
Lymphomas and Hematopoietic Neoplasms	**24**	**0.03**	**(0.02–0.04)**	**84**	**0.03**	**(0.02–0.03)**
Lymphoma	–	–	–	44	0.01	(0.01–0.02)
Other hematopoietic neoplasms	–	–	–	40	0.01	(0.01–0.02)
Germ Cell Tumors and Cysts	**175**	**0.19**	**(0.17–0.23)**	**716**	**0.22**	**(0.21–0.24)**
Germ cell tumors, cysts and heterotopias	175	0.19	(0.17–0.23)	716	0.22	(0.21–0.24)
Tumors of Sellar Region	**696**	**0.79**	**(0.73–0.85)**	**2,388**	**0.71**	**(0.68–0.74)**

Tumors of the pituitary	503	0.58	(0.53–0.63)	1,768	0.52	(0.49–0.54)
Craniopharyngioma	193	0.21	(0.18–0.24)	620	0.19	(0.18–0.21)
Unclassified Tumors	**283**	**0.31**	**(0.28–0.35)**	**986**	**0.30**	**(0.28–0.32)**
Hemangioma	93	0.10	(0.08–0.13)	342	0.10	(0.09–0.12)
Neoplasm, unspecified	187	0.21	(0.18–0.24)	633	0.19	(0.18–0.21)
All other	–	–	–	–	–	–
TOTAL[g]	**4,178**	**4.51**	**(4.38–4.65)**	**18,357**	**5.68**	**(5.60–5.76)**

[a]Rates are per 100,000 and are age-adjusted to the 2000 US standard population.
[b]Hispanic ethnicity is not mutually exclusive of race; Classified using the North American Association of Central Cancer Registries Hispanic Identification Algorithm, version 2 (NHIA v2).
[c]ICD-O-3 histology codes: 9470/3, 9471/3, 9472/3,9474/3.
[d]ICD-O-3 histology code: 9473/3.
[e]ICD-O-3 histology code: 9508/3.
[f]ICD-O-3 histology codes: 8963/3, 9364/3, 9490/0 , 9490/3, 9500/3, 9501/3, 9502/3.
[g]Refers to all brain tumors including histologies not presented in this table.
– Counts and rates are not presented when fewer than 16 cases were reported for the specific histology category. The suppressed cases are included in the counts and rates for totals.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 15. Average Annual Age-Adjusted Incidence Rates[a] for Children and Adolescents (Ages 0–19), Brain and Central Nervous System Tumors by Major Histology Groupings, Histology, and Age at Diagnosis, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

	Age At Diagnosis																	
	0–14[‡]			0–19[‡]			0–4			5–9			10–14			15–19		
	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
Tumors of Neuroepithelial Tissue	**12,103**	**3.96**	**(3.89–4.03)**	**15,154**	**3.66**	**(3.61–3.72)**	**4,862**	**4.82**	**(4.69–4.96)**	**3,870**	**3.85**	**(3.73–3.97)**	**3,371**	**3.26**	**(3.15–3.37)**	**3,051**	**2.78**	**(2.68–2.88)**
Pilocytic astrocytoma	2,821	0.93	(0.89–0.96)	3,475	0.84	(0.81–0.87)	973	0.97	(0.91–1.03)	968	0.96	(0.90–1.02)	880	0.85	(0.80–0.91)	654	0.60	(0.55–0.64)
Diffuse astrocytoma	846	0.28	(0.26–0.30)	1,139	0.27	(0.26–0.29)	351	0.35	(0.31–0.39)	235	0.23	(0.21–0.27)	260	0.25	(0.22–0.28)	293	0.27	(0.24–0.30)
Anaplastic astrocytoma	260	0.09	(0.08–0.10)	370	0.09	(0.08–0.10)	65	0.06	(0.05–0.08)	99	0.10	(0.08–0.12)	96	0.09	(0.08–0.11)	110	0.10	(0.08–0.12)
Unique astrocytoma variants	296	0.10	(0.09–0.11)	431	0.10	(0.09–0.11)	72	0.07	(0.06–0.09)	102	0.10	(0.08–0.12)	122	0.12	(0.10–0.14)	135	0.12	(0.10–0.15)
Glioblastoma	434	0.14	(0.13–0.16)	643	0.15	(0.14–0.17)	105	0.10	(0.09–0.13)	147	0.15	(0.12–0.17)	182	0.18	(0.15–0.20)	209	0.19	(0.17–0.22)
Oligodendroglioma	123	0.04	(0.03–0.05)	221	0.05	(0.05–0.06)	25	0.02	(0.02–0.04)	42	0.04	(0.03–0.06)	56	0.05	(0.04–0.07)	98	0.09	(0.07–0.11)
Anaplastic oligodendroglioma	–	–	–	32	0.01	(0.01–0.01)	–	–	–	–	–	–	–	–	–	20	0.02	(0.01–0.03)
Oligoastrocytic tumors	92	0.03	(0.02–0.04)	147	0.04	(0.03–0.04)	31	0.03	(0.02–0.04)	26	0.03	(0.02–0.04)	35	0.03	(0.02–0.05)	55	0.05	(0.04–0.07)
Ependymal tumors	908	0.29	(0.28–0.31)	1,172	0.28	(0.27–0.30)	476	0.47	(0.43–0.52)	218	0.22	(0.19–0.25)	214	0.21	(0.18–0.24)	264	0.24	(0.21–0.27)
Glioma malignant, NOS	2,328	0.76	(0.73–0.80)	2,644	0.64	(0.62–0.67)	929	0.92	(0.86–0.98)	895	0.89	(0.83–0.95)	504	0.49	(0.45–0.53)	316	0.29	(0.26–0.32)
Choroid plexus tumors	362	0.12	(0.10–0.13)	412	0.10	(0.09–0.11)	271	0.27	(0.24–0.30)	50	0.05	(0.04–0.07)	41	0.04	(0.03–0.05)	50	0.05	(0.03–0.06)
Other neuroepithelial tumors	29	0.01	(0.01–0.01)	34	0.01	(0.01–0.01)	–	–	–	–	–	–	18	0.02	(0.01–0.03)	–	–	–
Neuronal and mixed neuronal-glial tumors	1039	0.34	(0.32–0.36)	1,550	0.37	(0.35–0.39)	258	0.26	(0.23–0.29)	302	0.30	(0.27–0.34)	479	0.46	(0.42–0.51)	511	0.47	(0.43–0.51)
Tumors of the pineal region	140	0.05	(0.04–0.05)	186	0.04	(0.04–0.05)	58	0.06	(0.04–0.07)	38	0.04	(0.03–0.05)	44	0.04	(0.03–0.06)	46	0.04	(0.03–0.06)

Continued

Table 15. *Continued*

	Age At Diagnosis																	
	0–14[‡]			0–19[‡]			0–4			5–9			10–14			15–19		
	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
Embryonal tumors	2,413	0.79	(0.76–0.82)	2,698	0.65	(0.63–0.68)	1,241	1.23	(1.16–1.30)	741	0.74	(0.68–0.79)	431	0.42	(0.38–0.46)	285	0.26	(0.23–0.29)
Medulloblastoma	*1,494*	*0.49*	*(0.47–0.52)*	*1,694*	*0.41*	*(0.39–0.43)*	*569*	*0.56*	*(0.52–0.61)*	*596*	*0.59*	*(0.55–0.64)*	*329*	*0.32*	*(0.29–0.36)*	*200*	*0.18*	*(0.16–0.21)*
Primitive neuroectodermal tumor	*360*	*0.12*	*(0.10–0.13)*	*420*	*0.10*	*(0.09–0.11)*	*202*	*0.20*	*(0.17–0.23)*	*86*	*0.09*	*(0.07–0.11)*	*72*	*0.07*	*(0.05–0.09)*	*60*	*0.05*	*(0.04–0.07)*
Atypical teratoid/rhabdoid tumor	*363*	*0.12*	*(0.10–0.13)*	*370*	*0.09*	*(0.08–0.10)*	*330*	*0.33*	*(0.29–0.36)*	*23*	*0.02*	*(0.01–0.03)*	-	-	-	-	-	-
Other embryonal histologies	*202*	*0.07*	*(0.06–0.07)*	*220*	*0.05*	*(0.05–0.06)*	*141*	*0.14*	*(0.12–0.16)*	*40*	*0.04*	*(0.03–0.05)*	*21*	*0.02*	*(0.01–0.03)*	*18*	*0.02*	*(0.01–0.03)*
Tumors of Cranial and Spinal Nerves	**758**	**0.25**	**(0.23–0.27)**	**1,107**	**0.27**	**(0.25–0.28)**	**278**	**0.28**	**(0.24–0.31)**	**230**	**0.23**	**(0.20–0.26)**	**250**	**0.24**	**(0.21–0.27)**	**349**	**0.32**	**(0.29–0.35)**
Nerve sheath tumors	758	0.25	(0.23–0.27)	1,106	0.27	(0.25–0.28)	278	0.28	(0.24–0.31)	230	0.23	(0.20–0.26)	250	0.24	(0.21–0.27)	348	0.32	(0.28–0.35)
Other tumors of cranial and spinal nerves	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tumors of Meninges	**458**	**0.15**	**(0.14–0.16)**	**922**	**0.22**	**(0.20–0.23)**	**130**	**0.13**	**(0.11–0.15)**	**105**	**0.10**	**(0.09–0.13)**	**223**	**0.21**	**(0.19–0.24)**	**464**	**0.42**	**(0.38–0.46)**
Meningioma	272	0.09	(0.08–0.10)	582	0.14	(0.13–0.15)	61	0.06	(0.05–0.08)	57	0.06	(0.04–0.07)	154	0.15	(0.13–0.17)	310	0.28	(0.25–0.32)
Mesenchymal tumors	125	0.04	(0.03–0.05)	167	0.04	(0.03–0.05)	58	0.06	(0.04–0.07)	38	0.04	(0.03–0.05)	29	0.03	(0.02–0.04)	42	0.04	(0.03–0.05)
Primary melanocytic lesions	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Other neoplasms related to the meninges	52	0.02	(0.01–0.02)	160	0.04	(0.03–0.04)	–	–	–	–	–	–	39	0.04	(0.03–0.05)	108	0.10	(0.08–0.12)
Lymphomas and Hematopoietic Neoplasms	**70**	**0.02**	**(0.02–0.03)**	**108**	**0.03**	**(0.02–0.03)**	**20**	**0.02**	**(0.01–0.03)**	**28**	**0.03**	**(0.02–0.04)**	**22**	**0.02**	**(0.01–0.03)**	**38**	**0.03**	**(0.02–0.05)**
Lymphoma	30	0.01	(0.01–0.01)	57	0.01	(0.01–0.02)	–	–	–	–	–	–	–	–	–	27	0.02	(0.02–0.04)
Other hematopoietic neoplasms	40	0.01	(0.01–0.02)	51	0.01	(0.01–0.02)	16	0.02	(0.01–0.03)	–	–	–	–	–	–	–	–	–
Germ Cell Tumors and Cysts	**590**	**0.19**	**(0.18–0.21)**	**891**	**0.21**	**(0.20–0.23)**	**133**	**0.13**	**(0.11–0.16)**	**165**	**0.17**	**(0.14–0.19)**	**292**	**0.28**	**(0.25–0.32)**	**301**	**0.27**	**(0.24–0.31)**
Germ cell tumors, cysts and heterotopias	590	0.19	(0.18–0.21)	891	0.21	(0.20–0.23)	133	0.13	(0.11–0.16)	165	0.17	(0.14–0.19)	292	0.28	(0.25–0.32)	301	0.27	(0.24–0.31)
Tumors of Sellar Region	**1,273**	**0.42**	**(0.40–0.44)**	**3,084**	**0.73**	**(0.70–0.75)**	**173**	**0.17**	**(0.15–0.20)**	**417**	**0.42**	**(0.38–0.46)**	**683**	**0.66**	**(0.61–0.71)**	**1,811**	**1.65**	**(1.57–1.72)**
Tumors of the pituitary	625	0.20	(0.19–0.22)	2,271	0.53	(0.51–0.55)	34	0.03	(0.02–0.05)	129	0.13	(0.11–0.15)	462	0.44	(0.40–0.48)	1,646	1.50	(1.42–1.57)
Craniopharyngioma	648	0.21	(0.20–0.23)	813	0.20	(0.19–0.21)	139	0.14	(0.12–0.16)	288	0.29	(0.26–0.32)	221	0.21	(0.19–0.24)	165	0.15	(0.13–0.18)
Unclassified Tumors	**792**	**0.26**	**(0.24–0.28)**	**1,269**	**0.30**	**(0.29–0.32)**	**251**	**0.25**	**(0.22–0.28)**	**206**	**0.21**	**(0.18–0.24)**	**335**	**0.32**	**(0.29–0.36)**	**477**	**0.43**	**(0.40–0.47)**
Hemangioma	235	0.08	(0.07–0.09)	435	0.10	(0.09–0.11)	66	0.07	(0.05–0.08)	65	0.07	(0.05–0.08)	104	0.10	(0.08–0.12)	200	0.18	(0.16–0.21)
Neoplasm, unspecified	547	0.18	(0.16–0.20)	820	0.20	(0.18–0.21)	181	0.18	(0.15–0.21)	139	0.14	(0.12–0.17)	227	0.22	(0.19–0.25)	273	0.25	(0.22–0.28)
All other	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL[f]	**16,044**	**5.26**	**(5.18–5.34)**	**22,535**	**5.42**	**(5.35–5.49)**	**5,847**	**5.80**	**(5.65–5.95)**	**5,021**	**5.00**	**(4.86–5.14)**	**5,176**	**5.00**	**(4.87–5.14)**	**6,491**	**5.91**	**(5.76–6.05)**

[a]Rates are per 100,000 and are age-adjusted to the 2000 US standard population.
[b]ICD-O-3 histology codes: 9470/3, 9471/3, 9472/3,9474/3.
[c]ICD-O-3 histology code: 9473/3.
[d]ICD-O-3 histology code: 9508/3.
[e]ICD-O-3 histology codes: 8963/3, 9364/3, 9490/0 , 9490/3, 9500/3, 9501/3, 9502/3.
[f]Refers to all brain tumors including histologies not presented in this table.
– Counts and rates are not presented when fewer than 16 cases were reported for the specific histology category. The suppressed cases are included in the counts and rates for totals.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 16. Age-Adjusted and Age-Specific Incidence Rates[a] for Children and Adolescents (Ages 0–19), Brain and Central Nervous System Tumors: Malignant and Non-Malignant by International Classification of Childhood Cancer (ICCC),[b] CBTRUS Statistical Report: NPCR and SEER, 2007–2011

ICCC Category	0–14[c] years			0–19[c] years			< 1 year		1–4 years		5–9 years		10–14 years		15–19 years	
	N	Rate	95% CI	N	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI	Rate	95% CI
II Lymphomas and reticuloendothelial neoplasms	56	0.02	(0.01–0.02)	90	0.02	(0.02–0.03)	–	–	–	–	0.02	(0.01–0.03)	0.02	(0.01–0.03)	0.03	(0.02–0.04)
III CNS and misc. intracranial and intraspinal neoplasms	13,917	4.56	(4.48–4.64)	19,164	4.61	(4.55–4.68)	4.93	(4.63–5.25)	5.14	(4.98–5.29)	4.40	(4.27–4.53)	4.21	(4.09–4.34)	4.77	(4.65–4.91)
III(a) Ependymomas and choroid plexus tumor	1,270	0.41	(0.39–0.43)	1,584	0.38	(0.36–0.40)	0.95	(0.82–1.09)	0.69	(0.63–0.75)	0.27	(0.23–0.30)	0.25	(0.22–0.28)	0.29	(0.25–0.32)
III(b) Astrocytomas	5,351	1.75	(1.71–1.80)	6,789	1.64	(1.60–1.68)	1.43	(1.27–1.60)	2.09	(1.99–2.20)	1.75	(1.67–1.84)	1.56	(1.49–1.64)	1.31	(1.24–1.38)
III(c) Intracranial and intraspinal embryonal tumors	2,229	0.73	(0.70–0.76)	2,500	0.61	(0.58–0.63)	1.21	(1.06–1.37)	1.07	(1.00–1.14)	0.70	(0.65–0.76)	0.40	(0.37–0.44)	0.25	(0.22–0.28)
III(d) Other gliomas	1,893	0.62	(0.60–0.65)	2,350	0.57	(0.55–0.59)	0.36	(0.28–0.45)	0.64	(0.58–0.69)	0.75	(0.70–0.81)	0.53	(0.49–0.58)	0.42	(0.38–0.46)
III(e) Other specified intracranial and intraspinal neoplasms	2,627	0.86	(0.83–0.90)	5,121	1.22	(1.18–1.25)	0.64	(0.54–0.77)	0.51	(0.46–0.56)	0.79	(0.73–0.84)	1.25	(1.18–1.32)	2.27	(2.18–2.36)
III(f) Unspecified intracranial and intraspinal neoplasms	547	0.18	(0.16–0.20)	820	0.20	(0.18–0.21)	0.35	(0.27–0.44)	0.14	(0.11–0.17)	0.14	(0.12–0.17)	0.22	(0.19–0.25)	0.25	(0.22–0.28)
IV Neuroblastoma and other peripheral nervous cell tumors	142	0.05	(0.04–0.05)	158	0.04	(0.03–0.04)	0.29	(0.22–0.37)	0.07	(0.05–0.09)	0.02	(0.01–0.03)	–	–	0.01	(0.01–0.02)
IX Soft tissue and other extraosseous sarcomas	65	0.02	(0.02–0.03)	88	0.02	(0.02–0.03)	–	–	–	–	0.02	(0.01–0.03)	0.02	(0.01–0.03)	0.02	(0.01–0.03)
X(a) Intracranial & intraspinal germ cell tumors	590	0.19	(0.18–0.21)	891	0.21	(0.20–0.23)	0.33	(0.26–0.42)	0.08	(0.06–0.10)	0.17	(0.14–0.19)	0.28	(0.25–0.32)	0.27	(0.24–0.31)
All other categories	–	–	–	23	0.01	(0.00–0.01)	–	–	–	–	–	–	–	–	–	–
Not classified by ICCC	1,261	0.41	(0.39–0.44)	2,121	0.51	(0.48–0.53)	0.62	(0.52–0.74)	0.37	(0.33–0.42)	0.37	(0.33–0.41)	0.45	(0.41–0.49)	0.78	(0.73–0.84)
TOTAL[c]	**16,044**	**5.26**	**(5.18–5.34)**	**22,535**	**5.42**	**(5.35–5.49)**	**6.22**	**(5.88–6.58)**	**5.69**	**(5.53–5.86)**	**5.00**	**(4.86–5.14)**	**5.00**	**(4.87–5.14)**	**5.91**	**(5.76–6.05)**

[a]Rates are per 100,000
[b]See the CBTRUS website for additional information on this classification scheme: http://www.cbtrus.org.
[c]Rates are age adjusted to the 2000 U.S. standard population.
[d]Refers to all brain tumors including histologies not presented in this table.
– Counts and rates are not presented when fewer than 16 cases were reported for the specific ICCC category. The suppressed cases are included in the counts and rates for totals.
Abbreviations: ICCC, International Classification of Childhood Cancer; CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval.

Table 17. Estimated Number of Cases[a,b] of Brain and Central Nervous System Tumors Overall and by Behavior by State, 2014, 2015

STATE	2014 Estimated New Cases			2015 Estimated New Cases		
	All	Malignant	Non-Malignant	All	Malignant	Non-Malignant
Alabama	770	330	430	770	330	430
Alaska	160	60	110	170	60	110
Arizona	1,500	510	990	1,540	520	1,020
Arkansas	570	210	370	580	210	370
California	7,860	2,650	5,210	7,950	2,680	5,260
Colorado	1,320	360	960	1,330	370	970
Connecticut	710	280	440	710	280	440
Delaware	180	70	110	180	70	110
District of Columbia	110	–	70	110	–	70
Florida	4,690	1,490	3,200	4,780	1,520	3,260
Georgia	2,200	690	1,510	2,230	700	1,530
Hawaii	240	70	170	240	70	180
Idaho	320	120	200	320	120	210
Illinois	2,920	950	1,980	2,930	950	1,980
Indiana	1,390	490	900	1,400	490	900
Iowa	670	240	430	670	240	430
Kansas	550	220	330	550	220	340
Kentucky	1,130	350	780	1,140	350	780
Louisiana	940	300	650	940	300	650
Maine	240	110	130	250	110	130
Maryland	1,200	430	770	1,210	430	780
Massachusetts	1,280	530	750	1,280	530	750
Michigan	2,290	800	1,490	2,290	800	1,500
Minnesota	890	400	490	900	410	490
Mississippi	600	200	400	600	200	400
Missouri	1,340	440	900	1,350	440	910
Montana	220	70	140	220	70	140
Nebraska	350	140	200	350	140	200
Nevada	480	180	300	500	190	310
New Hampshire	290	120	170	300	120	170
New Jersey	1,870	700	1,170	1,880	710	1,170
New Mexico	360	120	240	360	120	240
New York	4,680	1,430	3,250	4,680	1,430	3,250
North Carolina	2,120	700	1,430	2,150	710	1,450
North Dakota	100	–	60	100	–	60
Ohio	2,140	860	1,280	2,140	860	1,280

Oklahoma	650	260	380	650	260	390
Oregon	790	320	470	800	320	480
Pennsylvania	2,960	990	1,970	2,960	990	1,970
Rhode Island	220	80	140	220	80	140
South Carolina	940	320	620	950	320	620
South Dakota	150	60	90	150	60	90
Tennessee	1,560	480	1,080	1,570	480	1,090
Texas	6,360	1,850	4,500	6,450	1,880	4,570
Utah	690	210	480	700	210	490
Vermont	180	60	120	180	60	120
Virginia	1,590	570	1,020	1,600	570	1,030
Washington	1,890	550	1,340	1,910	560	1,360
West Virginia	350	130	220	350	130	220
Wisconsin	1,370	490	880	1,380	490	890
Wyoming	100	–	60	110	–	60
United States	**67,900**	**22,980**	**44,910**	**68,470**	**23,180**	**45,300**

[a]Source: Estimation based on CBTRUS NPCR and SEER 2007–2011 data.
[b]Rounded to the nearest 10.
– Estimated number is less than 50 and may affect totals.

Table 18. Estimated Number of Cases[a,b] of Brain and Central Nervous System Tumors Overall and by Behavior by Major Histology Groupings and Histology, 2014, 2015

Histology	2014 Estimated New Cases			2015 Estimated New Cases		
	All	Malignant	Non-Malignant	All	Malignant	Non-Malignant
Tumors of Neuroepithelial Tissue	**20,950**	**19,460**	**1,520**	**21,130**	**19,630**	**1,530**
Pilocytic astrocytoma	1,080	1,080	–	1,090	1,090	–
Diffuse astrocytoma	1,740	1,740	–	1,760	1,760	–
Anaplastic astrocytoma	1,170	1,170	–	1,180	1,180	–
Unique astrocytoma variants	220	130	60	220	130	60
Glioblastoma	10,110	10,110	–	10,200	10,200	–
Oligodendroglioma	820	820	–	830	830	–
Anaplastic oligodendroglioma	350	320	–	350	320	–
Oligoastrocytic tumors	670	670	–	670	670	–
Ependymal tumors	1,330	820	480	1,340	830	480
Glioma malignant, NOS	1,460	1,460	–	1,470	1,470	–
Choroid plexus tumors	160	–	160	160	–	160
Other neuroepithelial tumors	–	–	–	–	–	–
Neuronal and mixed neuronal-glial tumors	890	160	730	900	160	740

Continued

Table 18. *Continued*

Histology	2014 Estimated New Cases			2015 Estimated New Cases		
	All	Malignant	Non-Malignant	All	Malignant	Non-Malignant
Tumors of the pineal region	130	60	60	130	60	60
Embryonal tumors	820	820	–	830	830	–
Tumors of Cranial and Spinal Nerves	**5,390**	**60**	**5,360**	**5,430**	**60**	**5,400**
Nerve sheath tumors	5,390	60	5,360	5,430	60	5,400
Other tumors of cranial and spinal nerves	–	–	–	–	–	–
Tumors of Meninges	**24,980**	**510**	**24,500**	**25,190**	**510**	**24,710**
Meningioma	24,120	350	23,770	24,330	350	23,980
Mesenchymal tumors	250	100	190	260	100	190
Primary melanocytic lesions	–	–	–	–	–	–
Other neoplasms related to the meninges	570	60	510	580	60	510
Lymphomas and Hematopoietic Neoplasms	**1,460**	**1,430**	**–**	**1,470**	**1,440**	**–**
Lymphoma	1,390	1,390	–	1,410	1,410	–
Other hematopoietic neoplasms	–	–	–	–	–	–
Germ Cell Tumors and Cysts	**320**	**220**	**100**	**320**	**220**	**100**
Germ cell tumors, cysts and heterotopias	320	220	100	320	220	100
Tumors of Sellar Region	**11,000**	**–**	**10,970**	**11,090**	**–**	**11,060**
Tumors of the pituitary	10,430	–	10,400	10,520	–	10,490
Craniopharyngioma	570	–	570	580	–	580
Unclassified Tumors	**3,770**	**1,300**	**2,470**	**3,800**	**1,310**	**2,490**
Hemangioma	950	–	950	960	–	960
Neoplasm, unspecified	2,790	1,300	1,490	2,810	1,310	1,500
All other	–	–	–	–	–	–
TOTAL‡	**67,900**	**22,980**	**44,910**	**68,470**	**23,180**	**45,300**

[a]Source: Estimation based on CBTRUS NPCR and SEER 2007–2011 data, and US Census population estimates.
[b]Rounded to the nearest 10. Numbers may not add up due to rounding.
– Estimated number is less than 50 and may affect totals.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 19. Estimated Number of Cases[a,b] of Brain and Central Nervous System Tumors by Age, Major Histology Groupings, and Histology, 2014, 2015

Histology	2014 Estimated New Cases							2015 Estimated New Cases						
	0–19	20–34	35–44	45–54	55–64	65–74	75+	0–19	20–34	35–44	45–54	55–64	65–74	75+
Tumors of Neuroepithelial Tissue	**3,100**	**2,220**	**1,820**	**3,020**	**4,620**	**4,370**	**3,510**	**3,120**	**2,230**	**1,820**	**3,010**	**4,720**	**4,570**	**3,560**
Pilocytic astrocytoma	710	160	50	–	–	–	–	720	160	50	–	–	–	–
Diffuse astrocytoma	230	330	240	270	310	260	200	230	330	240	260	320	270	210
Anaplastic astrocytoma	80	180	160	200	260	230	150	80	180	160	200	260	240	160
Unique astrocytoma variants	80	–	–	–	–	–	–	90	–	–	–	–	–	–
Glioblastoma	130	270	500	1,560	3,180	3,330	2,680	130	270	500	1,550	3,240	3,480	2,720
Oligodendroglioma	–	200	190	180	130	60	–	–	200	190	180	130	60	–
Anaplastic oligodendroglioma	–	60	70	80	80	–	–	–	60	70	80	80	–	–
Oligoastrocytic tumors	–	190	130	130	100	50	–	–	190	130	130	110	60	–
Ependymal tumors	240	240	200	260	220	140	70	240	240	200	260	230	150	70
Glioma malignant, NOS	540	160	100	120	150	150	250	550	160	100	120	150	160	260
Choroid plexus tumors	80	–	–	–	–	–	–	90	–	–	–	–	–	–
Other neuroepithelial tumors	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Neuronal and mixed neuronal-glial tumors	310	210	90	100	90	50	–	320	210	90	100	90	50	–
Tumors of the pineal region	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Embryonal tumors	550	120	–	–	–	–	–	550	120	–	–	–	–	–
Tumors of Cranial and Spinal Nerves	**230**	**530**	**710**	**1,210**	**1,540**	**1,110**	**600**	**230**	**530**	**710**	**1,200**	**1,570**	**1,160**	**610**
Nerve sheath tumors	230	530	710	1,210	1,530	1,110	600	230	530	710	1,200	1,560	1,160	610
Other tumors of cranial and spinal nerves	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tumors of Meninges	**190**	**1,050**	**2,030**	**3,990**	**5,860**	**6,520**	**8,130**	**190**	**1,050**	**2,040**	**3,970**	**5,980**	**6,810**	**8,260**
Meningioma	120	890	1,900	3,830	5,680	6,390	8,060	120	900	1,900	3,810	5,800	6,670	8,190
Mesenchymal tumors	–	–	–	–	60	–	–	–	–	–	–	60	–	–
Primary melanocytic lesions	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Other neoplasms related to the meninges	–	120	90	120	120	80	50	–	120	90	120	120	90	50
Lymphomas and Hematopoietic Neoplasms	**–**	**70**	**110**	**200**	**350**	**470**	**400**	**–**	**70**	**110**	**190**	**360**	**490**	**410**
Lymphoma	–	70	110	190	340	460	400	–	70	110	190	350	480	400
Other hematopoietic neoplasms	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Germ Cell Tumors and Cysts	**180**	**70**	**–**	**–**	**–**	**–**	**–**	**180**	**70**	**–**	**–**	**–**	**–**	**–**
Germ cell tumors, cysts and heterotopias	180	70	–	–	–	–	–	180	70	–	–	–	–	–
Tumors of Sellar Region	**620**	**2,030**	**1,710**	**2,000**	**2,140**	**1,840**	**1,290**	**620**	**2,040**	**1,710**	**1,990**	**2,180**	**1,920**	**1,310**
Tumors of the pituitary	450	1,950	1,640	1,910	2,040	1,770	1,260	450	1,960	1,640	1,900	2,090	1,850	1,280
Craniopharyngioma	170	80	70	90	100	60	–	170	80	70	90	100	70	–
Unclassified Tumors	**250**	**370**	**330**	**460**	**610**	**650**	**1,350**	**260**	**370**	**330**	**460**	**620**	**680**	**1,370**
Hemangioma	80	170	150	180	190	120	100	90	170	150	180	200	130	100

Continued

Table 19. *Continued*

Histology	2014 Estimated New Cases							2015 Estimated New Cases						
	0–19	20–34	35–44	45–54	55–64	65–74	75+	0–19	20–34	35–44	45–54	55–64	65–74	75+
Neoplasm, unspecified	170	200	190	270	410	530	1,250	170	200	190	270	420	550	1,270
All other	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL[‡]	**4,590**	**6,350**	**6,750**	**10,890**	**15,130**	**14,960**	**15,280**	**4,620**	**6,360**	**6,750**	**10,830**	**15,440**	**15,630**	**15,520**

[a]Source: Estimation based on CBTRUS NPCR and SEER 2007–2011 data, and US Census population estimates.
[b]Rounded to the nearest 10. Numbers may not add up due to rounding.
– Estimated number is less than 50 and may affect totals.
Abbreviations: CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 20. Average Annual Age-Adjusted Mortality Rates[a] for Malignant Brain and Central Nervous System Cancer Overall and by State and Gender, United States, 2007–2011[b]

State	TOTAL			Males			Females		
	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
Alabama	1,294	4.94	(4.66–5.21)	710	5.95	(5.51–6.40)	584	4.05	(3.72–4.38)
Alaska	134	4.64	(3.79–5.50)	80	5.69	(4.35–7.30)	54	3.74	(2.76–4.96)
Arizona	1,358	4.05	(3.83–4.26)	756	4.78	(4.44–5.12)	602	3.36	(3.09–3.64)
Arkansas	809	4.99	(4.64–5.34)	459	6.25	(5.67–6.83)	350	3.91	(3.50–4.33)
California	7,710	4.26	(4.16–4.36)	4,319	5.17	(5.01–5.33)	3,391	3.46	(3.34–3.58)
Colorado	1,071	4.45	(4.18–4.72)	618	5.49	(5.05–5.94)	453	3.56	(3.23–3.89)
Connecticut	859	4.25	(3.96–4.54)	482	5.32	(4.84–5.81)	377	3.36	(3.01–3.70)
Delaware	202	4.13	(3.55–4.70)	110	4.99	(4.04–5.94)	92	3.45	(2.77–4.25)
District of Columbia	98	3.48	(2.81–4.25)	52	4.29	(3.19–5.66)	46	2.91	(2.12–3.90)
Florida	4,621	3.97	(3.86–4.09)	2,637	4.95	(4.76–5.14)	1,984	3.17	(3.03–3.32)
Georgia	1,818	4.04	(3.85–4.23)	1,002	4.95	(4.63–5.27)	816	3.35	(3.12–3.58)
Hawaii	179	2.32	(1.97–2.67)	106	2.95	(2.38–3.52)	73	1.75	(1.37–2.20)
Idaho	374	4.82	(4.32–5.31)	225	6.03	(5.23–6.83)	149	3.72	(3.12–4.32)
Illinois	2,663	3.98	(3.83–4.13)	1,459	4.80	(4.55–5.05)	1,204	3.31	(3.12–3.49)
Indiana	1,561	4.54	(4.31–4.77)	859	5.45	(5.08–5.83)	702	3.76	(3.48–4.04)
Iowa	892	5.23	(4.88–5.58)	512	6.50	(5.93–7.07)	380	4.13	(3.70–4.56)

Kansas	741	4.91	(4.55–5.27)	431	6.26	(5.66–6.86)	310	3.74	(3.32–4.16)
Kentucky	1,117	4.74	(4.46–5.02)	607	5.56	(5.11–6.02)	510	4.01	(3.66–4.36)
Louisiana	978	4.19	(3.93–4.46)	539	5.08	(4.64–5.52)	439	3.44	(3.11–3.76)
Maine	412	5.02	(4.52–5.51)	235	6.15	(5.34–6.96)	177	4.04	(3.43–4.65)
Maryland	1,181	3.91	(3.69–4.14)	644	4.74	(4.37–5.12)	537	3.26	(2.98–3.54)
Massachusetts	1,549	4.24	(4.03–4.46)	851	5.21	(4.86–5.57)	698	3.43	(3.17–3.69)
Michigan	2,645	4.81	(4.62–5.00)	1,480	5.91	(5.60–6.22)	1,165	3.95	(3.72–4.18)
Minnesota	1,284	4.57	(4.32–4.82)	711	5.39	(4.99–5.79)	573	3.85	(3.53–4.17)
Mississippi	697	4.49	(4.15–4.82)	363	5.33	(4.77–5.90)	334	3.89	(3.47–4.32)
Missouri	1,496	4.55	(4.32–4.78)	829	5.46	(5.08–5.84)	667	3.72	(3.43–4.01)
Montana	268	4.67	(4.10–5.24)	149	5.45	(4.56–6.35)	119	4.00	(3.27–4.74)
Nebraska	509	5.25	(4.79–5.72)	276	6.18	(5.44–6.92)	233	4.40	(3.83–4.98)
Nevada	541	4.05	(3.70–4.40)	343	5.33	(4.74–5.91)	198	2.88	(2.47–3.29)
New Hampshire	354	4.74	(4.24–5.24)	212	6.17	(5.31–7.02)	142	3.59	(2.99–4.19)
New Jersey	1,789	3.74	(3.57–3.92)	1,003	4.66	(4.37–4.95)	786	2.96	(2.75–3.17)
New Mexico	404	3.69	(3.32–4.05)	233	4.53	(3.94–5.13)	171	2.93	(2.48–3.37)
New York	3,914	3.72	(3.60–3.83)	2,157	4.61	(4.41–4.81)	1,757	3.01	(2.87–3.16)
North Carolina	2,088	4.20	(4.02–4.38)	1,183	5.32	(5.00–5.63)	905	3.32	(3.11–3.54)
North Dakota	147	3.98	(3.33–4.64)	77	4.44	(3.49–5.58)	70	3.52	(2.72–4.48)
Ohio	2,859	4.42	(4.26–4.59)	1,550	5.25	(4.98–5.51)	1,309	3.69	(3.49–3.90)
Oklahoma	961	4.81	(4.50–5.11)	520	5.58	(5.09–6.07)	441	4.06	(3.68–4.45)
Oregon	1,061	4.98	(4.68–5.29)	630	6.27	(5.77–6.77)	431	3.83	(3.46–4.20)
Pennsylvania	3,134	4.16	(4.02–4.31)	1,731	5.09	(4.84–5.33)	1,403	3.39	(3.21–3.57)
Rhode Island	229	3.80	(3.30–4.29)	128	4.74	(3.91–5.57)	101	3.03	(2.43–3.63)
South Carolina	1,089	4.37	(4.11–4.64)	624	5.59	(5.14–6.05)	465	3.39	(3.08–3.70)
South Dakota	247	5.57	(4.86–6.28)	131	6.24	(5.16–7.33)	116	5.03	(4.09–5.97)
Tennessee	1,621	4.75	(4.52–4.98)	879	5.68	(5.29–6.06)	742	4.00	(3.71–4.29)
Texas	4,563	4.00	(3.88–4.12)	2,488	4.71	(4.52–4.90)	2,075	3.38	(3.23–3.53)
Utah	476	4.26	(3.87–4.65)	282	5.25	(4.62–5.88)	194	3.36	(2.88–3.84)
Vermont	181	4.86	(4.14–5.58)	108	6.13	(4.94–7.31)	73	3.68	(2.87–4.65)
Virginia	1,631	3.92	(3.72–4.11)	912	4.79	(4.47–5.11)	719	3.22	(2.98–3.45)
Washington	1,787	5.11	(4.87–5.35)	1,033	6.28	(5.88–6.67)	754	4.08	(3.78–4.37)
West Virginia	490	4.25	(3.86–4.63)	254	4.72	(4.12–5.32)	236	3.81	(3.31–4.31)
Wisconsin	1,564	4.99	(4.74–5.24)	906	6.24	(5.83–6.65)	658	3.95	(3.64–4.25)
Wyoming	139	4.74	(3.94–5.54)	79	5.50	(4.32–6.89)	60	3.92	(2.98–5.07)
United States	**69,789**	**4.26**	**(4.23–4.29)**	**38,964**	**5.21**	**(5.15–5.26)**	**30,825**	**3.48**	**(3.44–3.52)**

[a]Rates are per 100,000 and are age-adjusted to the 2000 US standard population.
[b]Estimated by CBTRUS using Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999–2011 on CDC WONDER Online Database, released 2014. Data are from the Multiple Cause of Death Files, 1999–2011, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at http://wonder.cdc.gov/ucd-icd10.html.
– Counts and rates are not presented when fewer than 20 cases were reported for the specific category. The suppressed cases are included in the counts and rates for totals.
Abbreviations: NCHS, National Center for Health Statistics; CI, confidence interval.

Table 21. One-, Two-, Five-, and Ten-Year Relative Survival Rates[a] for Malignant Brain and Central Nervous System Tumors by Site[b], SEER 18 Registries, 1995–2011[c]

ICD-O-3 CODE	SITE[b]	N	1-Year		2-Year		5-Year		10-Year	
			%	95% CI	%	95% CI	%	95% CI	%	95% CI
C71.1	Frontal lobe of the brain	16,298	60.3	(59.5–61.1)	45.9	(45.0–46.7)	34.6	(33.8–35.4)	26.1	(25.2–27.0)
C71.2	Temporal lobe of the brain	11,640	55.1	(54.2–56.0)	34.5	(33.6–35.4)	22.6	(21.8–23.5)	17.1	(16.2–18.1)
C71.3	Parietal lobe of the brain	7,800	48.1	(47.0–49.3)	29.7	(28.6–30.8)	19.5	(18.5–20.5)	14.0	(13.0–15.0)
C71.4	Occipital lobe of the brain	1,959	50.4	(48.1–52.7)	31.1	(28.9–33.3)	21.3	(19.3–23.4)	17.8	(15.6–20.0)
C71.0	Cerebrum	3,518	49.0	(47.3–50.7)	35.3	(33.6–36.9)	26.6	(25.0–28.2)	23.0	(21.3–24.7)
C71.5	Ventricle	1,300	74.6	(72.1–77.0)	67.5	(64.8–70.1)	61.5	(58.5–64.4)	57.1	(53.7–60.3)
C71.6	Cerebellum	3,983	84.6	(83.4–85.7)	78.5	(77.1–79.8)	71.0	(69.4–72.6)	66.2	(64.4–68.0)
C71.7	Brain stem	3,230	69.3	(67.6–70.9)	56.5	(54.6–58.2)	48.0	(46.1–49.9)	42.9	(40.7–44.9)
C71.8-C71.9	Other brain	15,777	42.4	(41.6–43.2)	30.3	(29.6–31.1)	21.8	(21.0–22.5)	17.2	(16.5–18.0)
C72.0-C72.1	Spinal cord and cauda equina	2,420	88.9	(87.5–90.1)	84.4	(82.7–85.9)	79.5	(77.5–81.3)	75.6	(73.0–78.0)
C72.2-C72.5	Cranial nerves	758	96.4	(94.6–97.5)	94.5	(92.5–96.0)	92.3	(89.7–94.2)	90.9	(87.7–93.3)
C72.8-C72.9	Other nervous system	678	60.8	(56.8–64.5)	51.3	(47.2–55.3)	43.8	(39.4–48.0)	39.9	(35.0–44.7)
C70.0-C70.9	Meninges (cerebral and spinal)	1,349	82.5	(80.2–84.6)	75.6	(72.8–78.0)	64.6	(61.3–67.7)	57.0	(52.8–60.9)
C75.1-C75.2	Pituitary and craniopharyngeal duct	275	85.1	(80.0–88.9)	81.4	(75.9–85.8)	72.2	(65.5–77.8)	65.5	(57.5–72.4)
C75.3	Pineal	734	88.0	(85.3–90.2)	81.5	(78.3–84.3)	74.7	(71.0–78.0)	68.5	(63.8–72.7)
C30.0[d]	Olfactory tumors of the nasal cavity	392	90.7	(87.0–93.3)	84.1	(79.7–87.7)	77.6	(72.1–82.1)	64.1	(55.9–71.2)
All Codes	**All Sites**	**72,111**	**57.7**	**(57.4–58.1)**	**43.8**	**(43.4–44.2)**	**34.2**	**(33.8–34.6)**	**28.5**	**(28.1–28.9)**

[a]The cohort analysis of survival rates was utilized for calculating the survival estimates presented in this table. Long-term cohort-based survival estimates reflect the survival experience of individuals diagnosed over the time period, and they may not necessarily reflect the long-term survival outlook of newly diagnosed cases.
[b]The sites referred to in this table are loosely based on the categories and site codes defined in the SEER Site/Histology Validation List.
[c]Estimated by CBTRUS using Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 18 Regs Research Data + Hurricane
[d]ICD-O-3 histology codes 9522–9523 only.
Katrina Impacted Louisiana Cases, Nov 2013 Sub (1973–2011 varying) - Linked To County Attributes - Total U.S., 1969–2012 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2014, based on the November 2013 submission.
Abbreviation: SEER, Survival, Epidemiology and End Results; CI, confidence interval.

Table 22. One-, Two-, Three-, Four-, Five-, and Ten-Year Relative Survival Rates[a,b] for Selected Malignant Brain and Central Nervous System Tumors by Histology, SEER 18 Registries, 1995–2011[c]

Histology	N	1-Year		2-Year		3-Year		4-Year		5-Year		10-Year	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Pilocytic astrocytoma	3,556	98.0	(97.4–98.4)	96.6	(95.9–97.2)	95.6	(94.8–96.3)	94.7	(93.7–95.4)	94.1	(93.1–94.9)	91.9	(90.5–93.0)
Diffuse astrocytoma	6,267	71.9	(70.7–73.0)	61.1	(59.9–62.4)	54.9	(53.6–56.2)	50.7	(49.3–52.0)	47.4	(46.0–48.8)	37.0	(35.4–38.6)
Anaplastic astrocytoma	3,780	61.3	(59.7–62.9)	43.3	(41.6–45.0)	35.0	(33.4–36.7)	30.6	(28.9–32.2)	27.3	(25.6–28.9)	19.0	(17.3–20.7)
Glioblastoma	30,611	36.5	(36.0–37.1)	14.8	(14.3–15.2)	8.7	(8.3–9.0)	6.3	(6.0–6.6)	5.0	(4.8–5.4)	2.6	(2.3–2.9)
Oligodendroglioma	3,406	94.0	(93.1–94.8)	89.6	(88.5–90.7)	86.0	(84.7–87.3)	82.7	(81.2–84.1)	79.5	(77.9–81.0)	62.8	(60.5–65.1)
Anaplastic oligodendroglioma	1,340	81.3	(79.1–83.4)	68.6	(65.9–71.2)	61.8	(58.9–64.6)	56.7	(53.7–59.6)	52.2	(49.1–55.1)	39.3	(35.7–42.8)
Ependymal tumors	2,734	93.7	(92.6–94.6)	89.7	(88.4–90.9)	86.8	(85.2–88.1)	84.7	(83.0–86.2)	83.3	(81.6–84.9)	79.2	(76.8–81.3)
Oligoastrocytic tumors	1,986	87.3	(85.7–88.7)	77.2	(75.1–79.1)	70.6	(68.4–72.8)	65.3	(62.9–67.6)	61.1	(58.6–63.6)	46.9	(43.7–50.1)
Glioma malignant, NOS	4,364	62.6	(61.0–64.0)	51.7	(50.2–53.3)	48.3	(46.7–49.9)	46.5	(44.8–48.1)	45.1	(43.4–46.7)	40.3	(38.5–42.2)
Neuronal and mixed neuronal-glial tumors	500	91.1	(88.0–93.4)	84.0	(80.1–87.2)	80.2	(75.9–83.8)	77.0	(72.4–81.0)	76.7	(71.9–80.8)	62.8	(55.6–69.3)
Embryonal tumors	2,855	81.6	(80.1–83.0)	71.7	(69.9–73.4)	66.8	(64.9–68.6)	63.7	(61.8–65.6)	61.2	(59.3–63.2)	54.2	(51.9–56.4)
Medulloblastoma[d]	1,690	88.5	(86.9–90.0)	82.0	(80.0–83.9)	77.4	(75.1–79.4)	74.2	(71.9–76.4)	71.7	(69.2–74.0)	63.3	(60.3–66.1)
Primitive neuroectodermal tumor[e]	679	75.8	(72.4–78.9)	60.5	(56.6–64.2)	54.7	(50.7–58.5)	51.4	(47.3–55.2)	49.1	(45.1–53.0)	42.6	(38.3–46.7)
Atypical teratoid/rhabdoid tumor[f]	203	49.6	(42.4–56.4)	33.8	(26.9–40.8)	29.4	(22.7–36.4)	28.5	(21.9–35.5)	27.4	(20.7–34.5)	25.9	(19.0–33.3)
Other embryonal histologies[g]	283	76.9	(71.4–81.5)	64.4	(58.2–69.9)	59.9	(53.5–65.7)	56.9	(50.3–62.8)	53.4	(46.7–59.6)	50.2	(43.1–57.0)
Meningioma	1,180	83.2	(80.7–85.4)	76.0	(73.1–78.7)	71.4	(68.2–74.3)	68.9	(65.6–72.0)	65.4	(61.8–68.7)	57.2	(52.6–61.5)
Lymphoma	4,832	48.2	(46.7–49.6)	39.4	(37.9–40.9)	34.8	(33.3–36.3)	31.5	(30.1–33.0)	29.3	(27.8–30.8)	21.6	(19.9–23.3)
TOTAL: All Brain and Other Nervous System[h]	**72,111**	**57.7**	**(57.4–58.1)**	**43.8**	**(43.4–44.2)**	**38.7**	**(38.4–39.1)**	**36.0**	**(35.6–36.4)**	**34.2**	**(33.8–34.6)**	**28.5**	**(28.1–28.9)**

[a]The cohort analysis of survival rates was utilized for calculating the survival estimates presented in this table. Long-term cohort-based survival estimates reflect the survival experience of individuals diagnosed over the time period, and they may not necessarily reflect the long-term survival outlook of newly diagnosed cases.
[b]Rates are an estimate of the percentage of patients alive at one, two, three, four, five, and ten year, respectively.
[c]Estimated by CBTRUS using Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 18 Regs Research Data + Hurricane Katrina Impacted Louisiana Cases, Nov 2013 Sub (1973–2011 varying) - Linked To County Attributes - Total U.S., 1969–2012 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2014, based on the November 2013 submission.
[d]ICD-O-3 histology codes: 9470/3, 9471/3, 9472/3,9474/3.
[e]ICD-O-3 histology code: 9473/3.
[f]ICD-O-3 histology code: 9508/3.
[g]ICD-O-3 histology codes: 8963/3, 9364/3, 9490/0 , 9490/3, 9500/3, 9501/3, 9502/3.
[h]Includes histologies not listed in this table.
Abbreviation: SEER, Survival, Epidemiology and End Results; CI, confidence interval; NOS, not otherwise specified.

Table 23. One-, Two-, Five-, and Ten-Year Relative Survival Rates[a,b] for Selected Malignant Brain and Central Nervous System Tumors by Age Groups, SEER 18 Registries, 1995–2011[c]

Histology	Age Group (years)	N	1-Year		2-Year		5-Year		10-Year	
			%	95% CI	%	95% CI	%	95% CI	%	95% CI
Pilocytic astrocytoma	0–19	2,562	98.6	(98.1–99.0)	98.3	(97.7–98.8)	96.7	(95.8–97.4)	95.8	(94.6–96.7)
	20–44	738	96.8	(95.2–97.9)	94.8	(92.7–96.2)	90.7	(88.0–92.8)	85.9	(82.1–88.9)
	45–54	134	94.2	(88.2–97.2)	86.0	(78.2–91.2)	78.1	(68.6–85.1)	74.2	(63.0–82.4)
	55–64	74	98.0	(86.4–99.7)	89.1	(77.2–95.0)	81.7	(67.7–90.1)	67.7	(48.2–81.1)
	65–74	32	84.9	(64.2–94.2)	71.0	(48.1–85.2)	55.3	(32.7–73.1)	55.3	(32.7–73.1)
	75+	–	–	–	–	–	–	–	–	–
Diffuse astrocytoma	0–19	932	92.5	(90.6–94.1)	87.0	(84.6–89.1)	82.6	(79.8–85.1)	80.5	(77.4–83.2)
	20–44	2,225	92.1	(90.9–93.2)	85.0	(83.4–86.5)	65.1	(62.9–67.3)	46.2	(43.3–49.0)
	45–54	991	74.0	(71.1–76.7)	59.3	(56.0–62.5)	42.3	(38.8–45.7)	30.8	(26.8–34.8)
	55–64	875	54.6	(51.2–57.9)	34.4	(31.0–37.8)	21.3	(18.3–24.6)	12.9	(9.5–16.8)
	65–74	669	36.9	(33.1–40.6)	22.9	(19.6–26.3)	12.7	(9.9–15.9)	8.5	(5.5–12.5)
	75+	575	21.0	(17.7–24.6)	10.4	(7.8–13.4)	4.8	(2.8–7.7)	–	–
Anaplastic astrocytoma	0–19	294	64.7	(58.8–69.9)	43.5	(37.5–49.3)	31.9	(26.2–37.8)	27.8	(22.0–33.9)
	20–44	1,234	87.2	(85.1–89.0)	72.8	(70.1–75.4)	50.4	(47.1–53.6)	35.7	(32.0–39.3)
	45–54	678	71.0	(67.3–74.3)	48.3	(44.3–52.3)	29.4	(25.5–33.4)	18.3	(14.2–22.7)
	55–64	648	49.7	(45.6–53.6)	25.7	(22.2–29.4)	10.6	(7.9–13.7)	5.6	(3.1–9.2)
	65–74	527	33.2	(29.0–37.3)	14.8	(11.7–18.3)	5.9	(3.7–8.8)	–	–
	75+	399	16.8	(13.2–20.8)	7.2	(4.7–10.3)	0.5	(0.0–2.4)	–	–
Glioblastoma	0–19	393	56.0	(50.8–60.9)	32.6	(27.7–37.5)	18.2	(14.1–22.8)	12.6	(8.6–17.4)
	20–44	2,953	67.2	(65.4–68.9)	36.8	(35.0–38.6)	17.6	(16.1–19.2)	10.0	(8.6–11.6)
	45–54	5,448	54.1	(52.8–55.5)	22.2	(21.0–23.4)	6.5	(5.7–7.3)	3.1	(2.4–4.0)
	55–64	8,004	42.3	(41.2–43.4)	15.1	(14.3–16.0)	4.1	(3.6–4.7)	1.5	(1.0–2.2)
	65–74	7,495	25.3	(24.3–26.3)	8.3	(7.6–9.0)	2.0	(1.6–2.5)	0.8	(0.4–1.4)
	75+	6,318	10.6	(9.80–11.4)	3.1	(2.7–3.7)	0.9	(0.6–1.3)	–	–
Oligodendroglioma	0–19	260	96.9	(93.9–98.5)	94.5	(90.8–96.7)	92.3	(88.1–95.1)	90.6	(85.6–93.9)
	20–44	1,734	98.1	(97.3–98.7)	95.4	(94.2–96.4)	85.6	(83.6–87.3)	67.1	(64.0–70.0)
	45–54	751	94.3	(92.3–95.8)	89.3	(86.7–91.5)	79.0	(75.4–82.2)	60.5	(55.1–65.5)
	55–64	403	87.8	(83.9–90.8)	78.6	(73.9–82.7)	65.3	(59.3–70.6)	46.5	(38.9–53.8)
	65–74	166	77.5	(69.9–83.4)	68.7	(60.2–75.7)	49.6	(40.0–58.4)	34.4	(22.9–46.3)
	75+	92	60.0	(48.1–70.0)	48.5	(36.3–59.7)	35.0	(21.7–48.6)	–	–
Anaplastic oligodendroglioma	0–19	–	–	–	–	–	–	–	–	–
	20–44	543	93.5	(90.9–95.3)	83.5	(79.9–86.5)	67.2	(62.6–71.4)	50.0	(44.1–55.6)
	45–54	314	85.3	(80.7–88.9)	72.9	(67.3–77.7)	56.9	(50.5–62.8)	44.3	(36.9–51.5)
	55–64	267	74.8	(68.9–79.8)	60.1	(53.5–66.1)	40.8	(33.7–47.6)	29.6	(21.7–37.9)
	65–74	131	50.9	(41.7–59.4)	34.3	(25.7–43.0)	16.4	(9.7–24.6)	–	–
	75+	50	35.4	(21.9–49.1)	15.0	(6.1–27.5)	–	–	–	–
Ependymal tumors	0–19	782	93.7	(91.7–95.3)	87.3	(84.6–89.6)	75.1	(71.5–78.4)	66.0	(61.5–70.1)
	20–44	869	96.7	(95.2–97.7)	94.8	(93.0–96.2)	91.3	(88.9–93.3)	89.7	(86.7–92.1)
	45–54	490	93.8	(91.0–95.7)	91.1	(87.9–93.5)	86.4	(82.2–89.6)	85.3	(80.8–88.8)
	55–64	344	92.9	(89.3–95.3)	89.3	(85.0–92.5)	86.1	(80.5–90.2)	86.1	(80.5–90.2)
	65–74	161	88.4	(81.5–92.8)	79.3	(71.0–85.5)	76.2	(67.2–83.1)	70.5	(57.6–80.1)
	75+	88	74.9	(62.7–83.6)	70.7	(57.0–80.8)	58.3	(40.6–72.4)	28.1	(10.6–48.8)
Oligoastrocytic tumors	0–19	133	93.0	(87.0–96.3)	87.1	(79.7–91.9)	81.8	(73.2–87.9)	75.7	(65.1–83.5)
	20–44	1052	96.1	(94.7–97.2)	89.6	(87.5–91.4)	71.5	(68.2–74.5)	55.0	(50.5–59.2)
	45–54	400	86.6	(82.7–89.7)	75.1	(70.2–79.4)	60.6	(54.7–65.9)	41.1	(32.9–49.1)
	55–64	225	72.5	(65.9–78.1)	49.6	(42.2–56.6)	29.3	(22.0–36.9)	22.2	(14.3–31.1)
	65–74	121	61.4	(51.8–69.7)	40.9	(31.3–50.2)	26.2	(17.1–36.3)	–	–
	75+	–	–	–	–	–	–	–	–	–

Continued

Table 23. *Continued*

Histology	Age Group (years)	N	1-Year		2-Year		5-Year		10-Year	
			%	95% CI	%	95% CI	%	95% CI	%	95% CI
Glioma malignant, NOS	0–19	1,614	76.2	(74.0–78.3)	63.8	(61.3–66.2)	59.9	(57.3–62.4)	58.6	(55.9–61.2)
	20–44	849	87.2	(84.6–89.3)	77.6	(74.5–80.4)	65.2	(61.4–68.7)	50.5	(45.7–55.1)
	45–54	437	71.7	(67.0–75.8)	57.3	(52.3–62.1)	47.7	(42.3–52.8)	39.9	(33.7–46.0)
	55–64	370	50.0	(44.7–55.1)	36.8	(31.6–42.0)	27.3	(22.2–32.7)	25.2	(19.4–31.5)
	65–74	381	34.1	(29.3–39.0)	21.8	(17.6–26.3)	15.5	(11.5–20.0)	12.8	(8.5–18.0)
	75+	713	16.4	(13.7–19.4)	11.9	(9.4–14.8)	8.0	(5.4–11.3)	7.5	(3.9–12.8)
Neuronal and mixed neuronal-glial tumors	0–19	65	96.9	(87.7–99.2)	88.0	(76.3–94.1)	86.0	(73.7–92.8)	78.1	(54.4–90.5)
	20–44	142	95.0	(89.7–97.7)	91.9	(85.6–95.5)	80.8	(71.9–87.1)	62.3	(48.6–73.4)
	45–54	124	92.9	(86.4–96.4)	89.7	(82.3–94.2)	79.2	(69.4–86.2)	72.6	(59.1–82.3)
	55–64	90	89.3	(80.1–94.4)	72.5	(61.1–81.1)	60.9	(48.1–71.5)	46.1	(30.0–60.7)
	65–74	45	81.0	(64.9–90.3)	77.5	(59.9–88.1)	76.3	(57.4–87.7)	50.1	(22.9–72.4)
	75+	34	73.6	(52.3–86.5)	59.0	(36.9–75.7)	59.0	(36.9–75.7)	47.9	(11.6–77.8)
Embryonal tumors	0–19	2,100	81.0	(79.2–82.6)	71.0	(68.9–72.9)	61.9	(59.6–64.1)	56.2	(53.6–58.6)
	20–44	591	86.8	(83.7–89.4)	79.1	(75.5–82.3)	65.1	(60.6–69.2)	54.9	(49.7–59.8)
	45–54	82	78.4	(67.3–86.1)	66.9	(54.8–76.5)	52.7	(39.3–64.5)	35.6	(20.1–51.5)
	55–64	–	–	–	–	–	–	–	–	–
	65–74	–	–	–	–	–	–	–	–	–
	75+	–	–	–	–	–	–	–	–	–
Meningioma	0–19	–	–	–	–	–	–	–	–	–
	20–44	158	96.9	(92.4–98.8)	96.4	(91.5–98.5)	89.9	(83.0–94.0)	84.4	(76.0–90.1)
	45–54	192	92.9	(87.9–95.8)	86.9	(80.8–91.2)	77.9	(70.3–83.7)	70.5	(61.3–77.9)
	55–64	273	88.3	(83.6–91.8)	79.6	(73.8–84.3)	68.2	(61.2–74.2)	52.4	(43.1–60.9)
	65–74	249	83.2	(77.4–87.6)	73.5	(66.8–79.1)	55.8	(47.7–63.2)	52.3	(43.5–60.4)
	75+	295	63.9	(57.4–69.7)	55.1	(48.0–61.7)	47.0	(37.9–55.5)	33.5	(21.2–46.2)
Lymphoma	0–19	69	83.7	(72.5–90.7)	79.0	(67.0–87.0)	73.6	(60.8–82.8)	66.8	(51.1–78.5)
	20–44	1,100	41.4	(38.5–44.4)	35.5	(32.6–38.4)	29.8	(26.9–32.7)	23.9	(20.9–27.1)
	45–54	770	56.6	(52.9–60.0)	48.2	(44.5–51.8)	37.9	(34.2–41.7)	27.5	(23.3–31.9)
	55–64	944	59.7	(56.4–62.9)	49.4	(46.0–52.7)	36.7	(33.2–40.3)	26.6	(22.6–30.8)
	65–74	1058	48.0	(44.8–51.0)	38.2	(35.0–41.3)	23.6	(20.6–26.8)	14.0	(10.6–18.0)
	75+	891	33.9	(30.6–37.2)	23.3	(20.2–26.5)	13.9	(10.9–17.2)	10.6	(7.5–14.2)
TOTAL: All Brain and Other Nervous System[e]	0–19	10,435	86.6	(85.9–87.2)	79.4	(78.5–80.2)	73.3	(72.4–74.2)	69.5	(68.5–70.6)
	20–44	15,074	83.7	(83.1–84.3)	72.6	(71.8–73.3)	58.5	(57.6–59.4)	46.5	(45.5–47.6)
	45–54	11,225	66.5	(65.6–67.4)	45.6	(44.6–46.6)	32.1	(31.1–33.1)	25.1	(24.0–26.1)
	55–64	12,962	51.1	(50.2–52.0)	29.0	(28.1–29.8)	17.7	(16.9–18.5)	13.0	(12.2–13.9)
	65–74	11,542	33.3	(32.4–34.2)	18.3	(17.5–19.0)	10.5	(9.8–11.2)	7.5	(6.7–8.3)
	75+	10,873	16.9	(16.2–17.7)	9.6	(9.0–10.3)	5.9	(5.3–6.5)	3.9	(3.2–4.7)

[a]The cohort analysis of survival rates was utilized for calculating the survival estimates presented in this table. Long-term cohort-based survival estimates reflect the survival experience of individuals diagnosed over the time period, and they may not necessarily reflect the long-term survival outlook of newly diagnosed cases.

[b]Rates are an estimate of the percentage of patients alive at one, two, five, and ten year, respectively. Rates were not presented for categories with 50 or less cases and were suppressed for rates where less than 16 cases were surviving within a category.

[c]Estimated by CBTRUS using Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 18 Regs Research Data + Hurricane Katrina Impacted Louisiana Cases, Nov 2013 Sub (1973–2011 varying) - Linked To County Attributes - Total U.S., 1969–2012 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2014, based on the November 2013 submission.

[d]Adolescents and Young Adults (AYA), as defined by the National Cancer Institute, see: http://www.cancer.gov/cancertopics/aya

[e]Includes histologies not listed in this table.

Table 24. Average Annual Age-Adjusted Incidence Rates and Estimated Number of Cases[a,b] of Brain and Central Nervous System Tumors by Major Histology Groupings, Histology, and NCI Age Groups, CBTRUS Statistical Report: NPCR and SEER, 2007–2011

Age at Diagnosis												
Histology	Children[b] (0–14)				AYA[c] (15–39)				Adults (40+)			
	Rate	(95% CI)	Estimated New Cases		Rate	(95% CI)	Estimated New Cases		Rate	(95% CI)	Estimated New Cases	
			2014	2015			2014	2015			2014	2015
Tumors of Neuroepithelial Tissue	**3.96**	**(3.89–4.03)**	**2,550**	**2,570**	**3.41**	**(3.36–3.46)**	**3,670**	**3,690**	**10.58**	**(10.5–10.65)**	**15,780**	**15,950**
Pilocytic astrocytoma	0.93	(0.89–0.96)	600	600	0.29	(0.27–0.30)	320	320	0.09	(0.08–0.09)	130	140
Diffuse astrocytoma	0.28	(0.26–0.30)	180	180	0.47	(0.45–0.49)	520	520	0.76	(0.74–0.78)	1,130	1,150
Anaplastic astrocytoma	0.09	(0.08–0.10)	60	60	0.26	(0.25–0.28)	300	300	0.60	(0.58–0.62)	900	900
Unique astrocytoma variants	0.10	(0.09–0.11)	60	60	0.07	(0.06–0.08)	80	90	0.05	(0.04–0.05)	70	80
Glioblastoma	0.14	(0.13–0.16)	90	90	0.47	(0.45–0.49)	520	520	6.95	(6.89–7.01)	10,370	10,480
Oligodendroglioma	0.04	(0.03–0.05)	*	*	0.30	(0.28–0.31)	330	330	0.34	(0.33–0.36)	510	510
Anaplastic oligodendroglioma	–	–	*	*	0.09	(0.08–0.10)	110	110	0.17	(0.16–0.18)	250	260
Oligoastrocytic tumors	0.03	(0.02–0.04)	20	20	0.25	(0.24–0.27)	290	290	0.26	(0.24–0.27)	390	390
Ependymal tumors	0.29	(0.28–0.31)	190	190	0.36	(0.34–0.37)	390	390	0.53	(0.51–0.55)	790	800
Glioma malignant, NOS	0.76	(0.73–0.80)	490	490	0.25	(0.24–0.27)	290	290	0.48	(0.47–0.50)	720	720
Choroid plexus tumors	0.12	(0.10–0.13)	80	80	0.04	(0.03–0.04)	*	*	0.04	(0.03–0.04)	60	60
Other neuroepithelial tumors	0.01	(0.01–0.01)	*	*	0.01	(0.00–0.01)	*	*	0.01	(0.00–0.01)	*	*
Neuronal and mixed neuronal-glial tumors	0.34	(0.32–0.36)	220	220	0.33	(0.32–0.35)	370	370	0.20	(0.19–0.21)	300	300
Tumors of the pineal region	0.05	(0.04–0.05)	*	*	0.05	(0.04–0.05)	50	50	0.04	(0.03–0.04)	60	60
Embryonal tumors	0.79	(0.76–0.82)	510	510	0.18	(0.17–0.19)	200	200	0.07	(0.06–0.08)	100	110
Tumors of Cranial and Spinal Nerves	**0.25**	**(0.23–0.27)**	**160**	**160**	**0.88**	**(0.85–0.90)**	**960**	**960**	**3.11**	**(3.07–3.16)**	**4,640**	**4,690**
Nerve sheath tumors	0.25	(0.23–0.27)	160	160	0.88	(0.85–0.90)	960	960	3.11	(3.07–3.15)	4,640	4,690
Other tumors of cranial and spinal nerves	–	–	*	*	–	–	*	*	0.00	(0.00–0.00)	*	*
Tumors of Meninges	**0.15**	**(0.14–0.16)**	**100**	**100**	**1.92**	**(1.88–1.96)**	**2,080**	**2,090**	**16.66**	**(16.57–16.76)**	**24,850**	**25,120**
Meningioma	0.09	(0.08–0.10)	60	60	1.68	(1.64–1.72)	1,830	1,830	16.26	(16.16–16.35)	24,260	24,510
Mesenchymal tumors	0.04	(0.03–0.05)	*	*	0.06	(0.06–0.07)	70	70	0.12	(0.11–0.12)	180	180
Primary melanocytic lesions	–	–	*	*	0.00	(0.00–0.01)	*	*	0.01	(0.01–0.02)	*	*
Other neoplasms related to the meninges	0.02	(0.01–0.02)	*	*	0.17	(0.16–0.18)	190	190	0.27	(0.26–0.28)	400	410
Lymphomas and Hematopoietic Neoplasms	**0.02**	**(0.02–0.03)**	*****	*****	**0.13**	**(0.12–0.14)**	**150**	**150**	**0.94**	**(0.92–0.97)**	**1,400**	**1,420**
Lymphoma	0.01	(0.01–0.01)	*	*	0.12	(0.11–0.13)	140	140	0.93	(0.90–0.95)	1390	1400
Other hematopoietic neoplasms	0.01	(0.01–0.02)	*	*	0.01	(0.01–0.01)	*	*	0.02	(0.02–0.02)	*	*
Germ Cell Tumors and Cysts	**0.19**	**(0.18–0.21)**	**120**	**120**	**0.13**	**(0.12–0.14)**	**150**	**150**	**0.03**	**(0.03–0.04)**	*****	**50**

Germ cell tumors, cysts and heterotopias	0.19	(0.18–0.21)	120	120	0.13	(0.12–0.14)	150	150	0.03	(0.03–0.04)	*	50
Tumors of Sellar Region	**0.42**	**(0.40–0.44)**	**270**	**270**	**3.04**	**(2.99–3.09)**	**3,280**	**3,300**	**5.36**	**(5.30–5.41)**	**8,000**	**8,080**
Tumors of the pituitary	0.20	(0.19–0.22)	130	130	2.90	(2.86–2.95)	3,130	3,150	5.14	(5.09–5.20)	7,670	7,750
Craniopharyngioma	0.21	(0.20–0.23)	140	140	0.13	(0.12–0.14)	150	150	0.21	(0.20–0.22)	310	320
Unclassified Tumors	**0.26**	**(0.24–0.28)**	**170**	**170**	**0.58**	**(0.56–0.60)**	**640**	**640**	**2.15**	**(2.12–2.19)**	**3,210**	**3,240**
Hemangioma	0.08	(0.07–0.09)	50	50	0.26	(0.25–0.27)	290	290	0.44	(0.43–0.46)	660	660
Neoplasm, unspecified	0.18	(0.16–0.20)	120	120	0.32	(0.30–0.33)	350	350	1.70	(1.67–1.73)	2,540	2,560
All other	–	–	*	*	–	–	*	*	0.01	(0.01–0.01)	*	*
TOTAL[d]	**5.26**	**(5.18–5.34)**	**3,380**	**3,420**	**10.08**	**(9.99–10.17)**	**10,800**	**10,850**	**38.84**	**(38.69–38.99)**	**57,940**	**58,550**

[a]Rates are per 100,000 and age-adjusted to the 2000 US. standard population.
[b]Children as defined by the National Cancer Institute, see: http://www.cancer.gov/researchandfunding/snapshots/pediatric.
[c]Adolescents and Young Adults (AYA), as defined by the National Cancer Institute, see: http://www.cancer.gov/researchandfunding/snapshots/adolescent-young-adult.
[d]Refers to all brain tumors including histologies not presented in this table.
– Counts and rates are not presented when fewer than 16 cases were reported for the specific histology category. The suppressed cases are included in the counts and rates for totals.
*Estimated number is less than 50 and may affect totals.
Abbreviations: AYA, Adolescents and Young Adults, CBTRUS, Central Brain Tumor Registry of the United States; NPCR, National Program of Cancer Registries; SEER, Surveillance, Epidemiology and End Results program; CI, confidence interval; NOS, not otherwise specified.

Table 25. One-, Two-, Five-, and Ten-Year Relative Survival Rates[a,b] for Selected Malignant Brain and Central Nervous System Tumors by NCI Age Groups, SEER 18 Registries, 1995–2011[c]

Histology	Age Group (years)	N	1-Year		2-Year		5-Year		10-Year	
			%	95% CI	%	95% CI	%	95% CI	%	95% CI
Pilocytic astrocytoma	Children[d] (0–14)	2,131	98.8	(98.2–99.2)	98.5	(97.9–99.0)	97.1	(96.1–97.8)	95.9	(94.6–96.9)
	AYA[e] (15–39)	1066	97.2	(96.0–98.1)	95.8	(94.3–96.9)	92.7	(90.7–94.3)	90.2	(87.6–92.3)
	Adults (40+)	359	95.3	(92.1–97.2)	87.9	(83.5–91.2)	79.9	(74.1–84.5)	72.4	(64.7–78.7)
Diffuse astrocytoma	Children[d] (0–14)	729	91.4	(89.1–93.3)	86.7	(83.9–89.1)	82.5	(79.3–85.3)	80.7	(77.3–83.7)
	AYA[e] (15–39)	1,931	93.2	(92.0–94.3)	86.6	(84.9–88.1)	68.9	(66.4–71.1)	51.2	(48.2–54.2)
	Adults (40+)	3,607	56.4	(54.7–58.1)	42.1	(40.4–43.8)	28.5	(26.8–30.2)	19.6	(17.8–21.5)
Anaplastic astrocytoma	Children[d] (0–14)	216	60.1	(53.2–66.4)	40.2	(33.4–46.9)	29.3	(22.9–36.0)	25.2	(18.9–32.0)
	AYA[e] (15–39)	1,012	87.7	(85.5–89.6)	73.5	(70.4–76.2)	49.8	(46.1–53.3)	35.9	(31.8–40.0)
	Adults (40+)	2,552	50.9	(48.9–52.9)	31.6	(29.7–33.6)	18.1	(16.4–19.9)	11.5	(9.8–13.3)
Glioblastoma	Children[d] (0–14)	270	49.9	(43.6–55.7)	28.8	(23.2–34.6)	20.8	(15.7–26.5)	14.9	(9.9–20.8)
	AYA[e] (15–39)	1,754	71.7	(69.5–73.8)	44.4	(42.0–46.9)	22.3	(20.1–24.6)	13.2	(11.1–15.6)
	Adults (40+)	28,587	34.2	(33.7–34.8)	12.7	(12.3–13.2)	3.7	(3.5–4.0)	1.6	(1.4–1.9)
Oligodendroglioma	Children[d] (0–14)	152	96.0	(91.2–98.2)	95.3	(90.3–97.7)	93.0	(87.3–96.2)	90.9	(84.0–95.0)
	AYA[e] (15–39)	1,397	98.6	(97.8–99.2)	96.2	(94.9–97.1)	87.2	(85.1–89.0)	69.7	(66.4–72.9)
	Adults (40+)	1,857	90.3	(88.8–91.7)	84.1	(82.2–85.8)	72.3	(69.8–74.6)	54.6	(51.2–57.9)
Anaplastic oligodendroglioma	Children[d] (0–14)	–	–	–	–	–	–	–	–	–
	AYA[e] (15–39)	379	93.0	(89.8–95.2)	82.4	(77.9–86.0)	66.0	(60.3–71.1)	48.5	(41.6–55.0)
	Adults (40+)	947	76.6	(73.6–79.2)	63.2	(59.8–66.3)	46.8	(43.1–50.3)	35.6	(31.4–39.9)
Ependymal tumors	Children[d] (0–14)	656	93.3	(91.0–95.0)	86.3	(83.3–88.9)	72.8	(68.7–76.4)	63.9	(58.9–68.4)
	AYA[e] (15–39)	783	96.4	(94.7–97.5)	94.1	(92.1–95.6)	90.3	(87.7–92.4)	86.8	(83.3–89.6)
	Adults (40+)	1,295	92.2	(90.5–93.7)	88.7	(86.6–90.5)	84.6	(81.8–86.9)	82.7	(78.8–85.9)
Oligoastrocytic tumors	Children[d] (0–14)	80	94.9	(86.8–98.1)	87.7	(77.6–93.5)	80.3	(68.0–88.3)	74.5	(59.7–84.5)
	AYA[e] (15–39)	859	96.8	(95.3–97.8)	90.6	(88.2–92.4)	74.2	(70.6–77.4)	56.7	(51.8–61.4)
	Adults (40+)	1,047	78.9	(76.2–81.3)	65.3	(62.1–68.3)	48.7	(45.1–52.2)	36.2	(31.7–40.7)
Glioma malignant, NOS	Children[d] (0–14)	1,458	74.8	(72.5–77.0)	61.9	(59.2–64.4)	58.5	(55.8–61.2)	57.2	(54.3–60.0)
	AYA[e] (15–39)	791	88.6	(86.1–90.7)	81.1	(78.0–83.8)	68.3	(64.5–71.9)	55.5	(50.5–60.1)
	Adults (40+)	2,115	44.2	(41.9–46.3)	33.5	(31.4–35.7)	26.7	(24.6–28.9)	22.8	(20.3–25.3)
Neuronal and mixed neuronal-glial tumors	Children[d] (0–14)	42	97.5	(83.1–99.7)	91.8	(76.4–97.3)	88.6	(72.1–95.6)	88.6	(72.1–95.6)
	AYA[e] (15–39)	129	96.1	(90.8–98.4)	91.0	(84.1–95.0)	81.4	(72.2–87.9)	68.4	(53.1–79.6)
	Adults (40+)	329	88.3	(83.9–91.5)	80.2	(74.9–84.5)	73.3	(66.9–78.6)	57.7	(48.6–65.7)
Embryonal tumors	Children[d] (0–14)	1,907	80.0	(78.1–81.8)	70.3	(68.1–72.4)	62.0	(59.6–64.4)	55.9	(53.2–58.5)
	AYA[e] (15–39)	725	88.5	(85.9–90.7)	79.6	(76.3–82.5)	64.3	(60.3–68.1)	55.9	(51.3–60.2)
	Adults (40+)	223	72.4	(65.8–78.0)	58.1	(50.9–64.6)	44.2	(36.6–51.5)	32.7	(24.6–40.9)
Meningioma	Children[d] (0–14)	–	–	–	–	–	–	–	–	–
	AYA[e] (15–39)	98	98.0	(91.6–99.5)	98.0	(91.6–99.5)	91.1	(82.1–95.7)	88.3	(77.9–94.0)
	Adults (40+)	1,073	81.9	(79.3–84.3)	74.0	(70.9–76.9)	62.9	(59.1–66.4)	54.0	(49.1–58.7)
Lymphoma	Children[d] (0–14)	41	87.8	(73.2–94.7)	85.3	(70.0–93.1)	79.3	(62.6–89.2)	73.6	(53.1–86.2)
	AYA[e] (15–39)	796	41.1	(37.6–44.5)	35.2	(31.8–38.6)	30.3	(26.9–33.6)	24.5	(21.0–28.2)
	Adults (40+)	3,995	49.2	(47.6–50.8)	39.7	(38.1–41.3)	28.4	(26.8–30.1)	20.2	(18.3–22.1)
TOTAL: All Brain and Other Nervous System[f]	Children[d] (0–14)	8,535	85.4	(84.7–86.2)	78.2	(77.3–79.1)	72.6	(71.5–73.6)	68.7	(67.5–69.9)
	AYA[e] (15–39)	12,783	86.9	(86.3–87.5)	78.1	(77.3–78.8)	64.9	(64.0–65.8)	53.5	(52.3–54.6)
	Adults (40+)	50,793	45.6	(45.2–46.1)	29.1	(28.7–29.5)	19.5	(19.2–20.0)	14.9	(14.4–15.3)

[a]The cohort analysis of survival rates was utilized for calculating the survival estimates presented in this table. Long-term cohort-based survival estimates reflect the survival experience of individuals diagnosed over the time period, and they may not necessarily reflect the long-term survival outlook of newly diagnosed cases.

[b]Rates are an estimate of the percentage of patients alive at one, two, five, and ten year, respectively. Rates were not presented for categories with 50 or less cases and were suppressed for rates where less than 16 cases were surviving within a category.

[c]Estimated by CBTRUS using Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 18 Regs Research Data + Hurricane Katrina Impacted Louisiana Cases, Nov 2013 Sub (1973–2011 varying) - Linked To County Attributes - Total U.S., 1969–2012 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2014, based on the November 2013 submission.

[d]Children as defined by the National Cancer Institute, see: http://www.cancer.gov/researchandfunding/snapshots/pediatric.

[e]Adolescents and Young Adults (AYA), as defined by the National Cancer Institute, see: http://www.cancer.gov/researchandfunding/snapshots/adolescent-young-adult.

[f]Includes histologies not listed in this table.

Abbreviation: SEER, Survival, Epidemiology and End Results; CI, confidence interval; NOS, not otherwise specified.

Appendix A. 2000 U.S. Standard Population

Age Group	2000 U.S.	Age Group	2000 U.S.	Age Group	2000 U.S.
0–4	18,986,520	45–49	19,805,793	**Total**	**274,633,642**
5–9	19,919,840	50–54	17,224,359		
10–14	20,056,779	55–59	13,307,234		
15–19	19,819,518	60–64	10,654,272		
20–24	18,257,225	65–69	9,409,940		
25–29	17,722,067	70–74	8,725,574		
30–34	19,511,370	75–79	7,414,559		
35–39	22,179,956	80–84	4,900,234		
40–44	22,479,229	85+	4,259,173		

Appendix B. Average Annual Populations[a] for 2007–2011 by Age, Gender, and Race

Male

Age Group	White	Black	AIAN	API	Total
0–4	7,810,954	1,707,101	189,019	589,906	10,296,980
5–9	7,849,153	1,655,085	180,670	562,182	10,247,090
10–14	8,107,511	1,744,870	183,262	547,649	10,583,292
15–19	8,600,616	1,902,951	197,749	585,511	11,286,827
20–24	8,473,356	1,660,641	185,769	652,420	10,972,187
25–29	8,251,179	1,443,967	168,617	687,149	10,550,912
30–34	7,739,718	1,312,730	151,915	669,571	9,873,933
35–39	8,012,798	1,312,241	143,222	674,891	10,143,153
40–44	8,447,573	1,342,919	138,451	599,962	10,528,905
45–49	9,099,426	1,379,780	135,519	553,132	11,167,857
50–54	8,851,948	1,271,224	118,226	491,248	10,732,646
55–59	7,822,283	1,017,922	91,426	411,082	9,342,713
60–64	6,626,503	740,343	67,656	318,232	7,752,734
65–69	4,862,275	503,979	44,076	226,913	5,637,243
70–74	3,610,303	359,065	28,799	165,837	4,164,004
75–79	2,807,908	242,070	17,827	110,677	3,178,481
80–84	2,045,489	148,757	10,381	69,306	2,273,933
85+	1,569,318	106,484	6,881	52,364	1,735,047
TOTAL	**120,588,309**	**19,852,129**	**2,059,467**	**7,968,032**	**150,467,937**

Female

Age Group	White	Black	AIAN	API	Total
0–4	7,455,098	1,650,728	183,711	568,230	9,857,768
5–9	7,478,677	1,601,608	175,695	559,237	9,815,218
10–14	7,701,865	1,684,402	179,050	534,779	10,100,096
15–19	8,112,425	1,840,757	187,109	557,309	10,697,601
20–24	8,001,553	1,682,611	168,586	638,144	10,490,894
25–29	7,932,319	1,566,650	156,618	744,945	10,400,532
30–34	7,473,988	1,464,487	145,322	744,165	9,827,962
35–39	7,845,788	1,479,074	140,031	747,556	10,212,449
40–44	8,346,594	1,505,889	137,375	668,525	10,658,383
45–49	9,139,011	1,552,187	138,724	620,658	11,450,580
50–54	9,030,333	1,448,290	124,734	567,925	11,171,282
55–59	8,148,587	1,204,169	98,077	493,560	9,944,393
60–64	7,037,809	909,935	72,373	384,370	8,404,488
65–69	5,372,409	659,029	48,928	269,555	6,349,921
70–74	4,220,261	505,819	34,510	202,799	4,963,388
75–79	3,594,847	388,012	23,922	152,646	4,159,427
80–84	3,050,905	282,474	15,696	106,361	3,455,437
85+	3,253,198	274,758	13,510	88,923	3,630,388
TOTAL	**123,195,668**	**21,700,880**	**2,043,972**	**8,649,686**	**155,590,206**

[a]Population data source for 51 population-based geographic regions: Estimates from the United States. Bureau of the Census http://seer.cancer.gov/popdata/index.html.
Abbreviations: AIAN, American Indian Alaskan Native; API, Asian Pacific Islander.

Appendix C. Average Annual Populations[a] for 2007–2011 by Age, Gender, and Hispanic Ethnicity

Male			
Age Group	Hispanic	Non-Hispanic	Total
0–4	2,574,459	7,722,521	10,296,980
5–9	2,344,101	7,902,989	10,247,090
10–14	2,252,269	8,331,023	10,583,292
15–19	2,273,286	9,013,541	11,286,827
20–24	2,253,741	8,718,446	10,972,187
25–29	2,254,121	8,296,791	10,550,912
30–34	2,103,441	7,770,493	9,873,933
35–39	1,931,538	8,211,615	10,143,153
40–44	1,718,320	8,810,585	10,528,905
45–49	1,469,898	9,697,959	11,167,857
50–54	1,155,054	9,577,592	10,732,646
55–59	852,367	8,490,346	9,342,713
60–64	609,138	7,143,595	7,752,734
65–69	411,576	5,225,666	5,637,243
70–74	294,519	3,869,485	4,164,004
75–79	207,449	2,971,033	3,178,481
80–84	133,194	2,140,739	2,273,933
85+	89,921	1,645,126	1,735,047
TOTAL	**24,928,391**	**125,539,545**	**150,467,937**

Female			
Age Group	Hispanic	Non-Hispanic	Total
0–4	2,472,435	7,385,333	9,857,768
5–9	2,249,680	7,565,538	9,815,218
10–14	2,157,132	7,942,964	10,100,096
15–19	2,108,141	8,589,460	10,697,601
20–24	1,962,620	8,528,274	10,490,894
25–29	1,992,594	8,407,938	10,400,532
30–34	1,934,752	7,893,211	9,827,962
35–39	1,834,393	8,378,056	10,212,449
40–44	1,639,270	9,019,113	10,658,383
45–49	1,439,704	10,010,876	11,450,580
50–54	1,175,738	9,995,544	11,171,282
55–59	913,516	9,030,877	9,944,393
60–64	687,971	7,716,517	8,404,488
65–69	498,017	5,851,904	6,349,921
70–74	381,327	4,582,062	4,963,388
75–79	290,187	3,869,240	4,159,427
80–84	203,889	3,251,548	3,455,437
85+	168,881	3,461,507	3,630,388
TOTAL	**24,110,244**	**131,479,962**	**155,590,206**

[a]Population data source for 51 population-based geographic regions: Estimates from the U.S. Census Bureau http://seer.cancer.gov/popdata/index.html