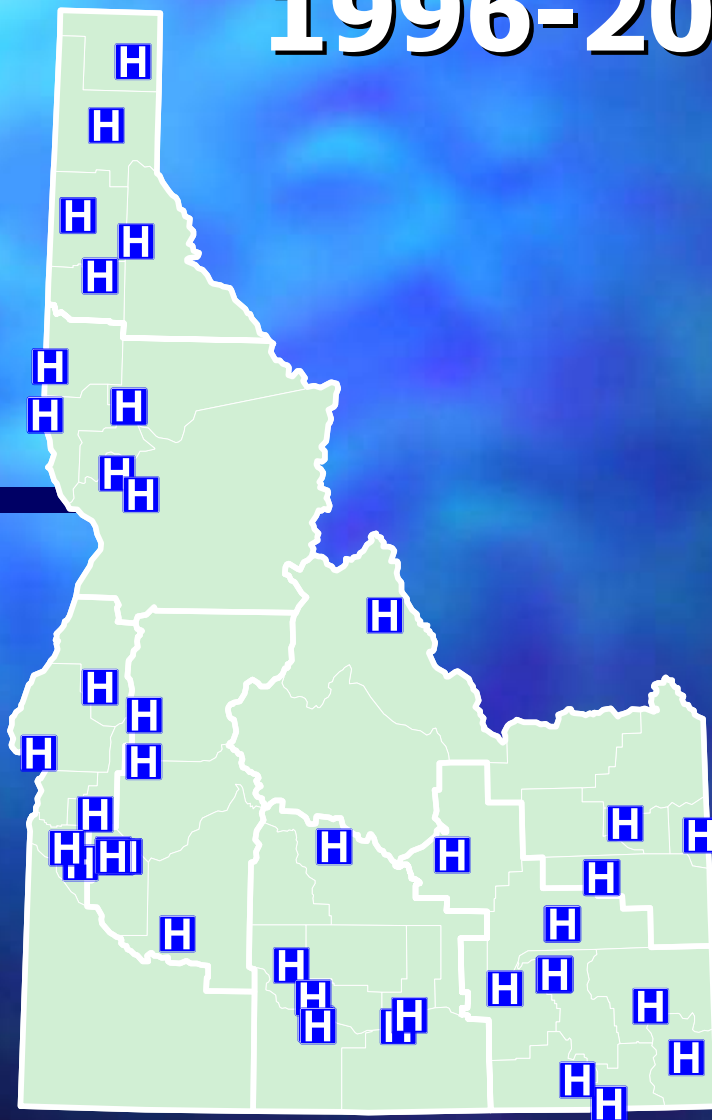


BRAIN CANCER IN IDAHO 1996-2000



Legend



Health Districts



Idaho County Boundaries

■ This PowerPoint presentation was created by the Cancer Data Registry of Idaho, a program of the Idaho Hospital Association. It includes information on brain cancer:

- Incidence
- Histology
- Behavior/Grade
- Treatment
- Survival
- Mortality

DEFINITIONS

Age-adjustment: a technique which permits comparison of incidence or mortality rates after removing the effect of differing age distributions among the compared population groups. An age-adjusted rate is the hypothetical rate that would be observed in a population group if the age distribution of the group were the same as the age distribution of the standard population. Age-adjusted rates presented used the 2000 U.S. standard, and are not comparable to rates age-adjusted to the 1970 U.S. standard.

Cancer: a term that includes more than 100 different diseases, each characterized by the uncontrolled growth and spread of abnormal cells.

Incidence Rate: the number of new cancer cases divided by the population of risk.

Mortality Rate: the number of cancer deaths divided by the population at risk.

DEFINITIONS (CONTINUED)

Person-years: a measure of the size of a population over time, used as the denominator in cancer incidence and mortality rates. Person-years are calculated as the product of the number of persons in the population at risk and the number of years over which cases/deaths are counted.

SEER: part of the National Cancer Institute, the Surveillance, Epidemiology, and End Results (SEER) program consists of several population-based cancer registries throughout the U.S. SEER cancer statistics are designed to be representative of the U.S.

BRAIN CANCER INCIDENCE

Brain and Other Nervous System Cancer, 1996-2000, Invasive Cases Numbers of Cases, Age-Adjusted and Crude Rates

Geography	Rates		Cases	Population
	Adjusted	Crude		
Health District 1	7.4	7.5	64	849,762
Health District 2	8.3	8.5	42	492,320
Health District 3	7.7	7.5	68	901,204
Health District 4	8.5	7.5	119	1,582,082
Health District 5	6.9	6.7	53	789,100
Health District 6	8.1	7.4	58	780,704
Health District 7	9.8	8.7	68	779,748
State of Idaho	8.1	7.7	473	6,174,920
SEER Whites 97-99	7.1	7.0	6,036	86,594,723
SEER All Races 97-99	6.5	6.1	6,895	112,158,844

Rates are per 100,000 person-years.

Age-adjusted rates use the 2000 U.S. (5-year groups) standard.

BRAIN CANCER INCIDENCE

- *United States Cancer Statistics 1999 Incidence* showed brain and other nervous system (ONS) cancer to be the 10th most common cancer site among males in Idaho, and the 14th most common among females. In Idaho, brain and ONS cancer accounted for 473 of 24,809 invasive cases from 1996-2000.
- Age-adjusted incidence rates (2000 U.S. standard) differed by health district, ranging from 6.9 cases per 100,000 females in Health District 5 to 9.8 cases per 100,000 females in Health District 7.
- From *United States Cancer Statistics 1999 Incidence*, Idaho had the highest rate of brain cancer among males in the nation. The reason for this unknown, as the causes for brain cancer are not well understood. Suspected risk factors include exposure to vinyl chloride, radiation, and agricultural chemicals.
- Compared to SEER data, brain cancer incidence was significantly higher in Idaho from 1996-2000.

BRAIN CANCER INCIDENCE

Brain and Other Nervous System Cancer in Idaho, 1996-2000, Invasive Cases
Age-Specific Rates

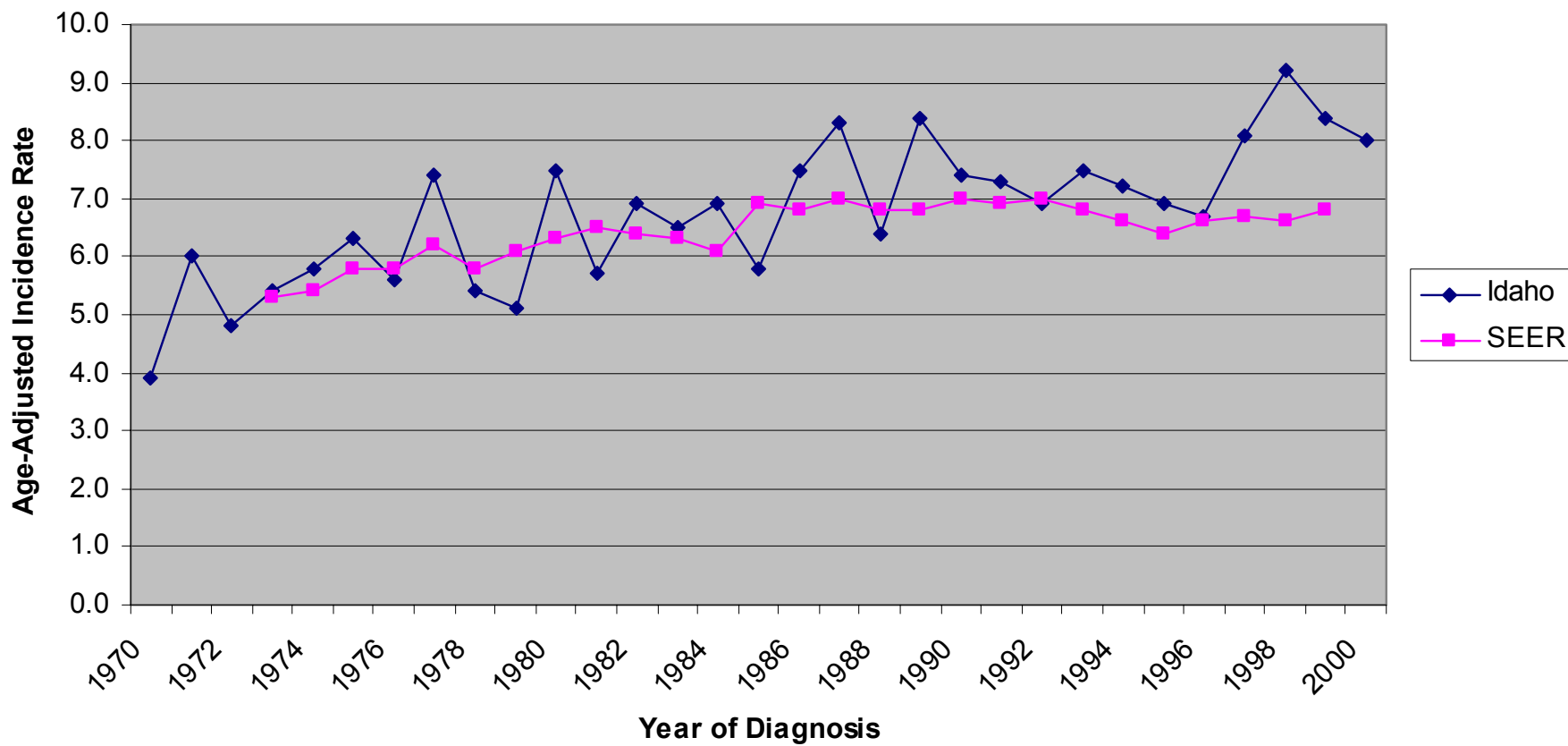
Age Group	Idaho, 1996-2000			SEER, 1997-1999		
	Rate	Cases	Population	Rate	Cases	Population
00-04	4.3	20	464,476	3.7	302	8,214,892
05-09	3.2	15	473,029	3.1	260	8,369,676
10-14	2.4	12	502,876	2.5	198	7,846,119
15-19	2.0	11	552,706	1.7	133	8,047,370
20-24	2.6	12	464,499	1.9	145	7,692,060
25-29	4.9	19	389,164	2.9	239	8,266,195
30-34	5.2	20	386,246	3.4	303	8,995,339
35-39	5.6	26	461,699	3.8	371	9,716,327
40-44	8.6	41	477,199	4.4	408	9,288,988
45-49	9.0	39	431,205	5.3	421	7,879,295
50-54	10.2	36	351,579	8.4	535	6,347,468
55-59	7.8	22	282,442	10.5	501	4,773,071
60-64	16.1	38	236,680	14.3	548	3,839,265
65-69	23.7	46	194,444	17.3	624	3,616,180
70-74	23.7	41	173,172	20.0	652	3,257,299
75-79	25.3	37	146,494	23.5	634	2,700,118
80-84	19.5	20	102,338	21.8	385	1,769,701
85+	21.3	18	84,672	15.3	236	1,539,481

BRAIN CANCER INCIDENCE

- Brain cancer incidence rates increase with age. A 75 year old person's risk of developing brain cancer is about 10 times higher than that of a teenager.
- Age-specific brain cancer rates in Idaho, 1996-2000, were higher than SEER rates, 1997-1999, for most age groups.

BRAIN CANCER INCIDENCE

Trends in Brain and ONS Cancer Incidence, 1970-2000



BRAIN CANCER INCIDENCE

- From 1970-2000, brain cancer incidence increased about 48% in Idaho, an average increase of 1.4% per year. For SEER regions, the incidence trend is quite similar to Idaho's for the years 1973-1996; Idaho's rates are higher for years later than 1996.

BRAIN CANCER HISTOLOGY

Brain and Other Nervous System Tumor Histology
Modified CBTRUS 1998 Revision Groupings, Invasive Cases Only

Histology	Idaho, 1996-2000						SEER Whites, 1997-1999					
	Male and Female		Male		Female		Male and Female		Male		Female	
	Cases	Percent	Cases	Percent	Cases	Percent	Cases	Percent	Cases	Percent	Cases	Percent
Tumors of Neuroepithelial Tissue	438	93.2%	261	94.2%	177	91.7%	4,156	93.6%	2,344	94.8%	1,812	92.0%
Diffuse astrocytoma	7	1.5%	5	1.8%	2	1.0%	84	1.9%	42	1.7%	42	2.1%
Anaplastic astrocytoma	39	8.3%	20	7.2%	19	9.8%	294	6.6%	168	6.8%	126	6.4%
Glioblastoma	224	47.7%	139	50.2%	85	44.0%	2,111	47.5%	1,201	48.6%	910	46.2%
Pilocytic astrocytoma	27	5.7%	11	4.0%	16	8.3%	181	4.1%	98	4.0%	83	4.2%
Unique astrocytoma variants	0	0.0%	0	0.0%	0	0.0%	12	0.3%	5	0.2%	7	0.4%
Oligodendroglioma	24	5.1%	15	5.4%	9	4.7%	329	7.4%	190	7.7%	139	7.1%
Anaplastic oligodendroglioma	10	2.1%	4	1.4%	6	3.1%	115	2.6%	65	2.6%	50	2.5%
Ependymoma/anaplastic ependymoma	12	2.6%	8	2.9%	4	2.1%	144	3.2%	83	3.4%	61	3.1%
Ependymoma variants	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mixed glioma	13	2.8%	6	2.2%	7	3.6%	116	2.6%	60	2.4%	56	2.8%
Astrocytoma, NOS	39	8.3%	21	7.6%	18	9.3%	329	7.4%	184	7.4%	145	7.4%
Glioma malignant, NOS	25	5.3%	16	5.8%	9	4.7%	236	5.3%	125	5.1%	111	5.6%
Choroid plexus	0	0.0%	0	0.0%	0	0.0%	7	0.2%	6	0.2%	1	0.1%
Neuroepithelial	0	0.0%	0	0.0%	0	0.0%	10	0.2%	7	0.3%	3	0.2%
Neuronal/glial, neuronal & mixed	2	0.4%	2	0.7%	0	0.0%	15	0.3%	9	0.4%	6	0.3%
Embryonal/primitive/medulloblastoma	16	3.4%	14	5.1%	2	1.0%	173	3.9%	101	4.1%	72	3.7%
Tumors of Cranial and Spinal Nerves	1	0.2%	0	0.0%	1	0.5%	6	0.1%	2	0.1%	4	0.2%
Tumors of the Meninges	8	1.7%	3	1.1%	5	2.6%	81	1.8%	35	1.4%	46	2.3%
Germ Cell Tumors and Cysts	1	0.2%	1	0.4%	0	0.0%	19	0.4%	12	0.5%	7	0.4%
Local Extensions from Regional Tumors	0	0.0%	0	0.0%	0	0.0%	8	0.2%	4	0.2%	4	0.2%
Unclassified Tumors	22	4.7%	12	4.3%	10	5.2%	172	3.9%	75	3.0%	97	4.9%

BRAIN CANCER HISTOLOGY

- By histology grouping, Idaho's pattern of brain and ONS cancers is quite similar to the pattern in SEER regions, for both sexes combined and separately for males and females.

BRAIN CANCER BEHAVIOR

**Brain and Other Nervous System Cancer, 1996-2000, Benign & Invasive Cases
Numbers of Cases, Age-Adjusted Rates by Site and Behavior**

Geography/ Behavior	Brain and ONS		Brain		Other Nervous System	
	Rate	Cases	Rate	Cases	Rate	Cases
Idaho 96-00 Benign	5.9	338	0.7	39	5.2	299
Idaho 96-00 Malignant	8.1	473	7.5	438	0.6	35
SEER 97-99 Malignant	7.1	6,036	6.8	5,721	0.4	315

Rates are per 100,000 person-years.

Age-adjusted rates use the 2000 U.S. (5-year groups) standard.

SEER does not collect benign Brain & ONS cases.

BRAIN CANCER BEHAVIOR

- Broken out separately, Idaho has higher incidence rates than SEER regions for both brain and other nervous system cancers.
- Not all central cancer registries collect data on benign brain tumors. The reporting of information about these tumors is mandated by Idaho Code. SEER registries do not report on benign brain tumors.
- There were 39 cases of benign brain tumors diagnosed among Idahoans from 1996-2000, and 299 cases of other benign nervous system tumors.

BRAIN CANCER GRADE

Brain and Other Nervous System Cancer Grade of Tumor, Invasive Cases

Grade	Idaho, 1996-2000			SEER Whites, 97-99		
	Cases	Percent	% Known	Cases	Percent	% Known
Well differentiated; grade I	27	5.7%	7.9%	170	3.8%	7.2%
Moderately differentiated; grade II	48	10.1%	14.1%	374	8.4%	15.9%
Poorly differentiated; grade III	19	4.0%	5.6%	251	5.6%	10.7%
Undifferentiated; grade IV	247	52.2%	72.4%	1,550	34.9%	66.1%
Unknown	132	27.9%	-	2,101	47.3%	-

BRAIN CANCER GRADE

- Both Idaho and SEER regions had large numbers of brain and ONS tumors with unknown grade, although the percentage of unknown grade was almost twice as high in SEER regions.
- Among tumors with known grade, Idaho had a lower percentage of Grade III and a higher percentage of Grade IV tumors than SEER regions.

BRAIN CANCER TREATMENT

Brain and Other Nervous System Cancer Treatment Regimen, Idaho Cases, 1996-2000

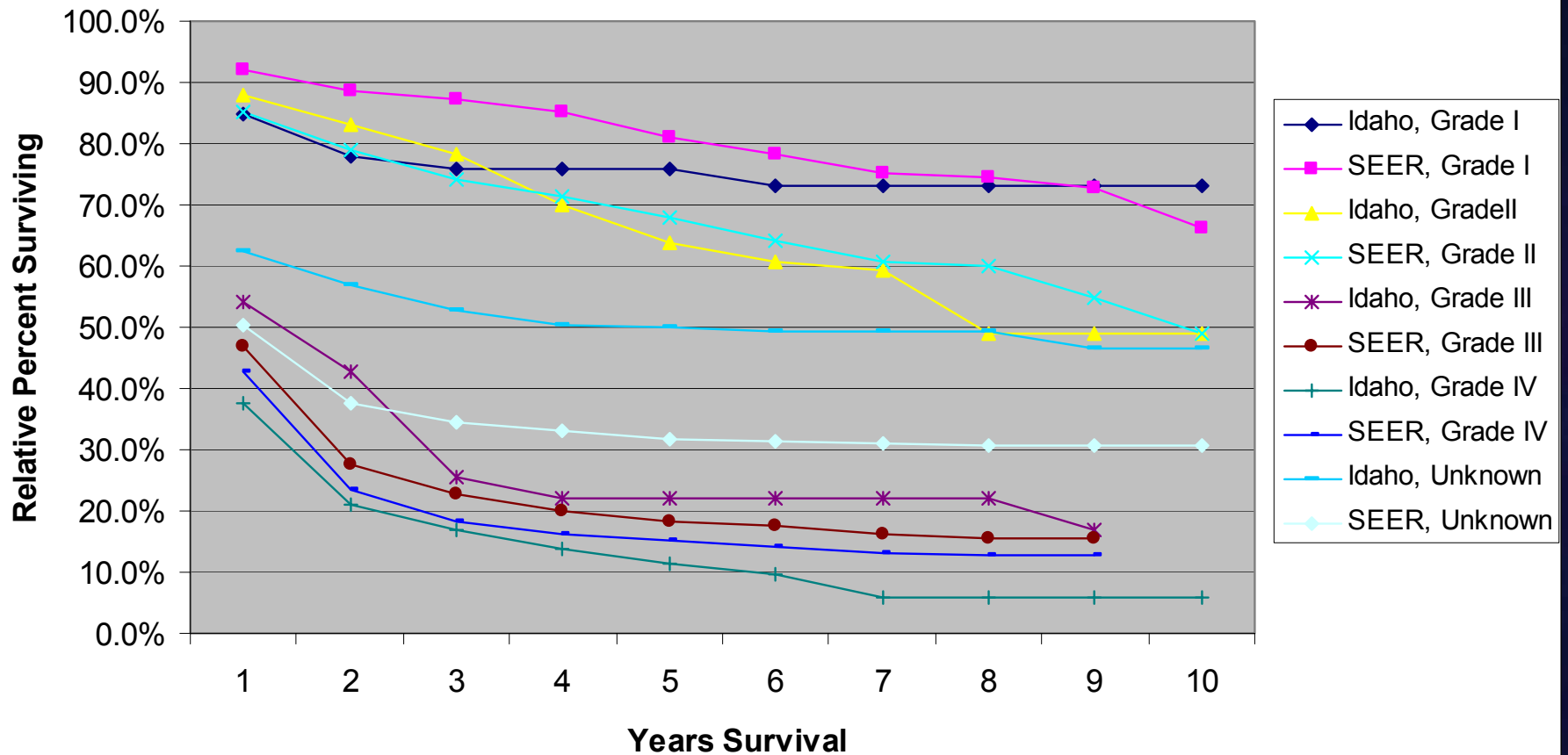
Treatment	Cases
Surgery, Radiation, Chemotherapy	88
Surgery, Radiation	111
Surgery, Chemotherapy	15
Surgery Alone	99
Radiation, Chemotherapy	20
Radiation Alone	43
Chemotherapy Alone	7
Other/None/Unknown	90

BRAIN CANCER TREATMENT

- Treatment for brain cancer may include a combination of surgery, radiation, and chemotherapy.
- The most common treatment for Idaho resident cases diagnosed from 1996-2000 was surgery in combination with radiation. About two-thirds of cases were treated with some type of surgery.
- ***Note: CDRI chemotherapy statistics are likely under-estimates due to reporting limitations.***

BRAIN CANCER SURVIVAL

Brain and ONS Survival, 1990-2000 Cases

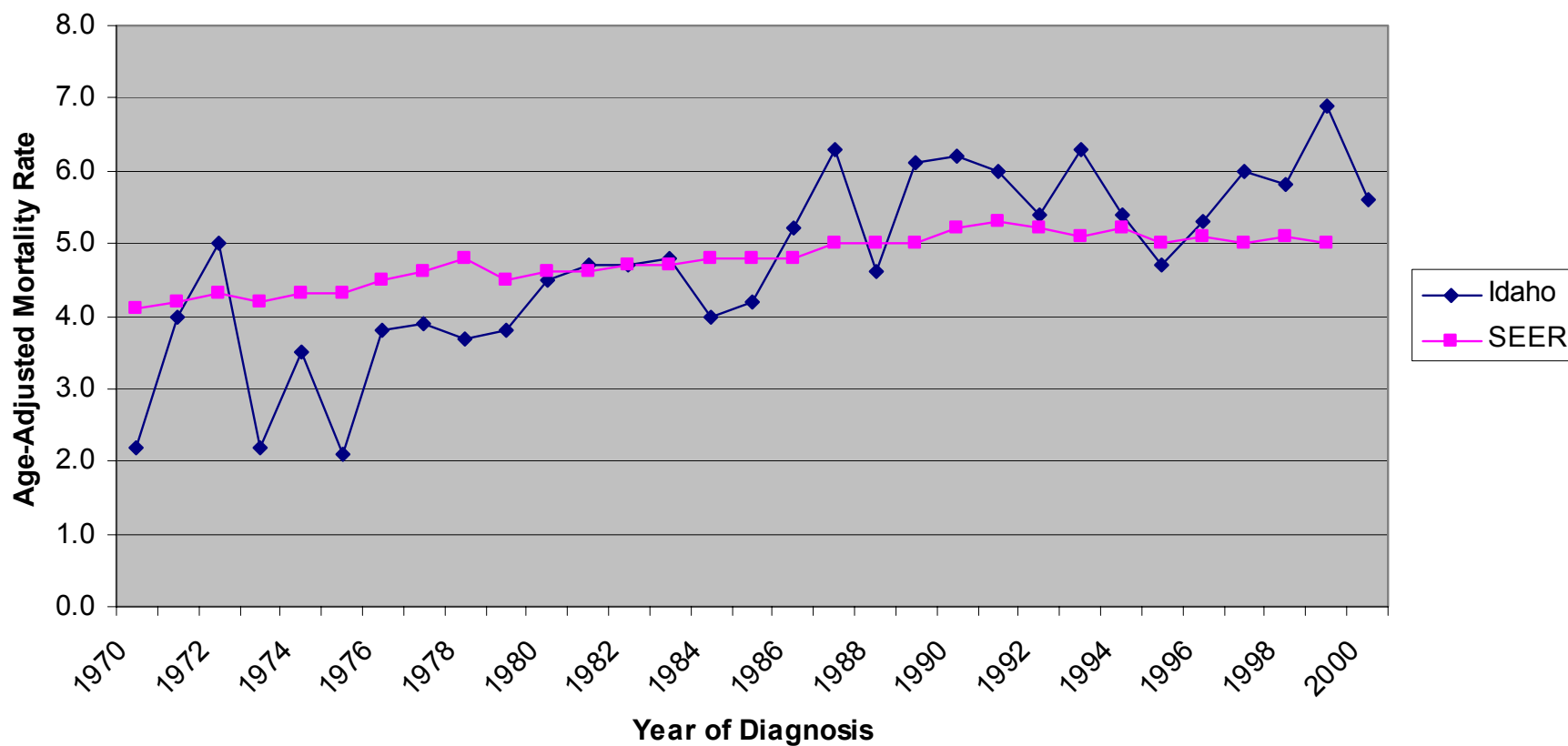


BRAIN CANCER SURVIVAL

- Survival rates from all causes of death were estimated using the life table method. For survival analyses, death certificate only cases, autopsy only cases, and persons with other primary cancers were excluded. Relative survival statistics show the probability of surviving, compared with a general group of persons from the U.S. with the same sex and ages as the cases at time of diagnosis.
- Survival rates differed significantly by grade of tumor. Five-year relative survival rates for Idaho residents diagnosed with brain cancer were 75.9% for Grade I tumors, 63.8% for Grade II tumors, 22.2% for Grade III tumors, and 11.5% for Grade IV tumors. Grade-specific survival rates were often lower for Idaho cases than for SEER cases, except for Grade III cases. However, the large proportion of cases with unknown Grade, particularly among SEER cases, coupled with the much lower survival among SEER cases with unknown grade, make these statistics difficult to interpret.

BRAIN CANCER MORTALITY

Trends in Brain and ONS Cancer Mortality, 1970-2000



BRAIN CANCER MORTALITY

- From 1996-2000, there were 343 brain and ONS cancer deaths among Idahoans. Among the leading cancer deaths, brain cancer ranks 8th, accounting for about 3% of all cancer deaths in Idaho, 1996-2000.
- From 1970-2000, brain cancer mortality doubled in Idaho, increasing at an average rate of about 2.2% per year. Compared with SEER regions, Idaho's brain cancer mortality rates were lower in earlier years, and higher in later years.

Population Description

The population of the state of Idaho in 2000 was 1,293,953 (648,660 males and 645,293 females). Population figures were obtained from the U.S. Bureau of the Census.⁷ Idaho is comprised of 44 counties grouped into seven health districts. The composition of the health districts, as well as their population estimates by gender as used in this report, are shown below:

<u>Health District</u>	<u>Counties</u>	<u>Male</u>	<u>Female</u>
District 1	Benewah, Bonner, Boundary, Kootenai, Shoshone	88,773	89,560
District 2	Clearwater, Latah, Lewis, Idaho, Nez Perce	51,019	49,514
District 3	Adams, Canyon, Gem, Owyhee, Payette, Washington	95,257	96,040
District 4	Ada, Boise, Elmore, Valley	174,327	170,028
District 5	Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, Twin Falls	81,469	80,928
District 6	Bannock, Bear Lake, Bingham, Butte, Caribou, Franklin, Oneida, Power	78,011	78,895
District 7	Bonneville, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, Teton	79,804	80,328

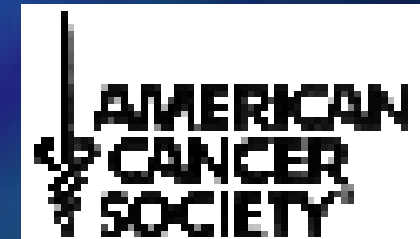
For information on Idaho-specific brain cancer incidence, staging, treatment, and survival, contact:

Cancer Data Registry of Idaho
PO Box 1278
Boise, ID 83701-1278
Phone: 208.338.5100 x213
Fax: 208.338.7800
Web: www.idcancer.org



For general cancer information, contact:

American Cancer Society
2676 S. Vista Ave.
Boise, ID 83705
Phone: 1-800-ACS-2345
Fax: 208.343.9922
Web: www.cancer.org



For information about cancer clinical trials, contact:

National Cancer Institute
Phone: 1-800-4-CANCER
Web: cancer.trials.nci.nih.gov