

# Brain Cancer

## *What is the brain?*

The brain is a soft, spongy mass of tissue that is protected by the bones of the skull and three thin membranes called meninges. Watery fluid called cerebrospinal fluid cushions the brain. A network of nerves carries messages back and forth between the brain and the rest of the body. There are three major parts of the brain: (1) cerebrum, (2) cerebellum and (3) brain stem.

## *What is brain cancer?*

Brain tumors can be either benign or malignant. Benign tumors do not contain cancer cells and rarely become malignant. Malignant brain tumors are generally more serious and often are life threatening, grow rapidly and very rarely break away from a primary tumor and spread to other parts of the brain, spinal cord or body. Tumors that begin in the brain tissue are known as primary tumors.

## *What are the risk factors?*

There are only a few well-established risk factors for brain tumors. These include radiotherapy to the head in childhood, certain rare genetic disorders, and a variety of environmental exposures.

## *What are the signs and symptoms?*

Symptoms of brain cancer depend upon the size, type and location of the tumor. They

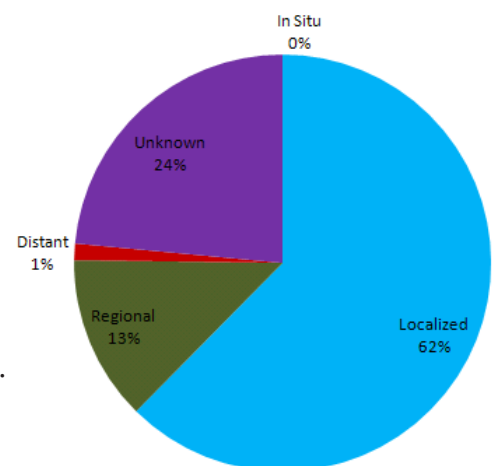
may be caused by brain swelling, fluid buildup within the skull, or when a tumor presses on a nerve, or damages an area of the brain. The most common symptoms of brain tumors include headache; nausea or vomiting; changes in speech, vision or hearing; problems balancing or walking; changes in mood, personality or ability to concentrate; memory problems; muscle jerking or twitching; or numbness or tingling in the arms or legs.

## *How is it diagnosed?*

A medical checkup, neurological examination, biopsy, CAT scan, MRI or other tests will help to diagnose brain cancer.

## *Diagnosis*

In the 2003-2007 time period, 62 percent were diagnosed at the localized stage, 13 percent at regional stage, 1 percent at distant stage and 24 percent were of unknown stage of progression.



### *What are the common treatments?*

Treatment options include: surgery, radiation therapy, chemotherapy and/or pain control.

### *What are the survival outcomes?*

Using 1999-2007 SEER data, the national 5-year relative survival rate estimate is 33 percent. When diagnosed at localized stage, the 5-year relative survival rate is 36 percent. For regional and distant stages, the 5-year relative survival rates are 22 percent and 37 percent respectively. The survival rate when the stage of diagnosis could not be determined was estimated at 30 percent.

### *What can you tell me about this cancer in North Dakota?*

Summary Statistics 2003-2007	ND	WNC	US
INCIDENCE			
Annual age-adjusted incidence rates*	6.8	6.8	6.7
Average number of new cases	45	1,397	20,362
Percent of all new cancers	1.34	1.4	1.4
MORTALITY			
Annual age-adjusted mortality rates*	4.9	4.8	4.3
Average number of deaths each year	33	997	13,000
Percent of all cancer deaths	2.52	2.52	2.33
* Rates per 100,000 and standardized to U.S. year 2000 population.	WNC and US data source: <a href="http://apps.nccd.cdc.gov/uscs">http://apps.nccd.cdc.gov/uscs</a>		

☞ The West North Central (WNC) regions include the following states: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota.

## INCIDENCE:

### *Incidence Rates by Gender, North Dakota 2003-2007*

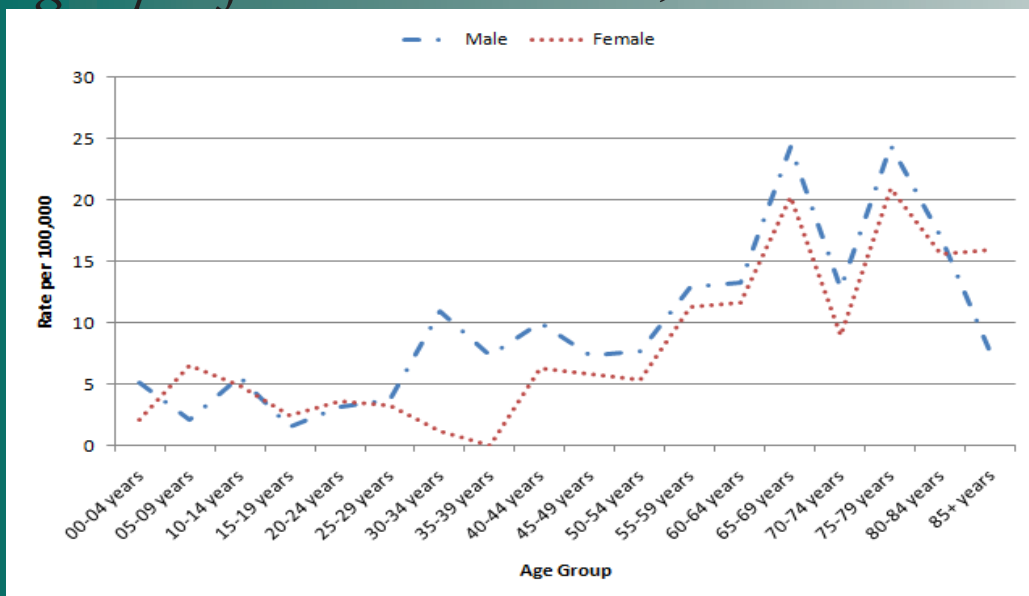


☞ An average of 45 new cases of brain cancer are diagnosed each year in North Dakota, which is about 1 percent of all cancers diagnosed in the state.

☞ The incidence of brain cancer is higher among men than women.

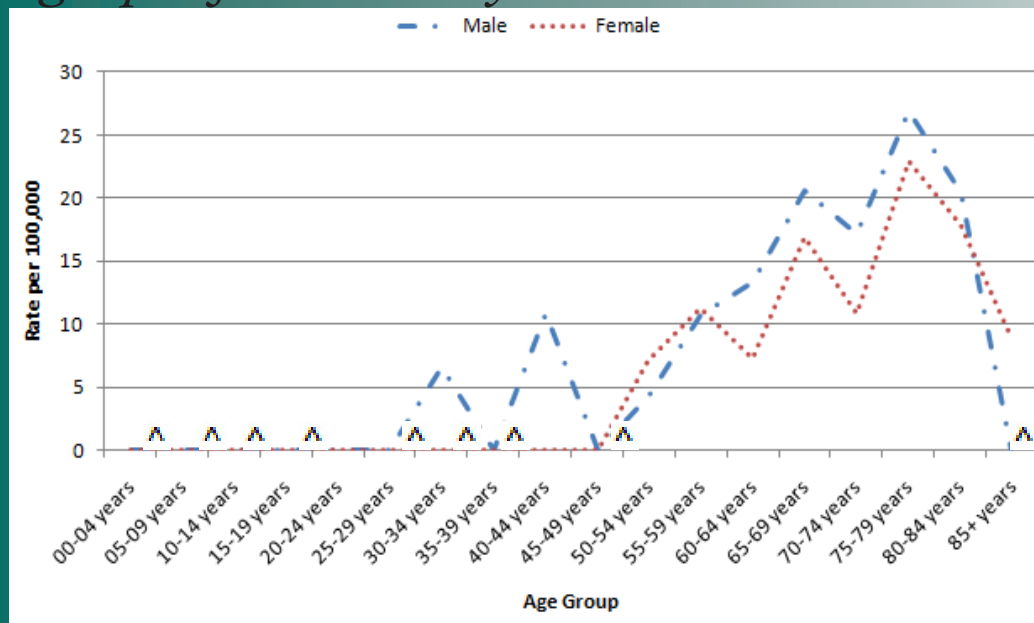
☞ The average annual incidence rate for men is 8.1 per 100,000 men and the average annual incidence rate for women is 6 per 100,000 women.

### *Age-Specific Incidence Rates, North Dakota 2003-2007*



☞ The annual incidence rate increases with age.

## Age-specific Mortality Rates, North Dakota 2003-2007



☞ An average of 33 deaths due to brain cancer occur each year in North Dakota, which is about 3 percent of all cancer deaths in the state.

☞ The average annual death rate for men is 5.9 per 100,000 men, and for women it is 4 per 100,000 women.

☞ Death rate increases with age.

^ Statistic not displayed due to fewer than five cases.

## Glossary of Cancer Terminology

- ☞ **Age-adjusted rate:** Since cancer rates tend to vary with age, and since populations vary with respect to their age-distribution, incidence and mortality rates are age-adjusted to allow comparison of rates between different populations (i.e. county or regional boundaries).
- ☞ **Age-specific rate:** The number of new cases diagnosed per 100,000 individuals over a specified time period for a specified age-group.
- ☞ **Incidence:** The number of new cases of a given type of cancer diagnosed during the year.
- ☞ **Mortality:** The number of deaths attributed to the particular type of cancer that occurred during the year. Includes deaths of patients diagnosed in earlier years, individuals newly diagnosed during the year, and patients for whom a diagnosis of cancer is made only after death.
- ☞ **Risk factor:** Anything that increases a person's chance of getting a disease.
- ☞ **Stage at diagnosis:** How far a cancer has spread from its site of origin when it is diagnosed. There are several different systems for the staging of cancers. This report uses the general summary stage system. The stages, in order of increasing spread, are in situ, localized, regional and distant. Cancers diagnosed at the localized, regional or distant stage are referred to as invasive.



For more information, visit  
[www.ndhealth.gov/cancerregistry/](http://www.ndhealth.gov/cancerregistry/)  
 or call 701.328.2306

