Lung and Bronchus Cancer in Minnesota

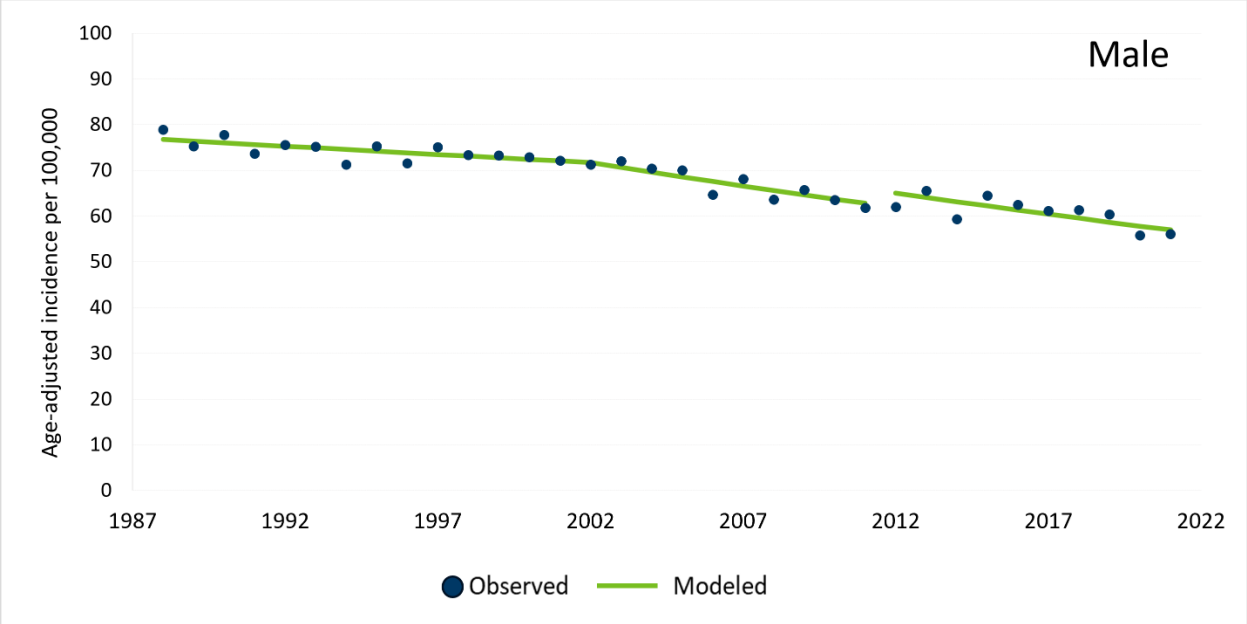
FACTS AND FIGURES—INCIDENCE AND MORTALITY

Cancers diagnosed in the lungs and bronchus are called lung cancer. Lung cancers typically start in the cells lining the bronchi and parts of the lung such as the bronchioles or alveoli [1]. Most lung cancers are diagnosed in adults. In 2021, lung cancer was the second most common newly diagnosed cancer and the leading cause of cancer death in both males and females in Minnesota. Notably, long term trends have differed between males and females.

Trends in lung cancer incidence differ between males and females.

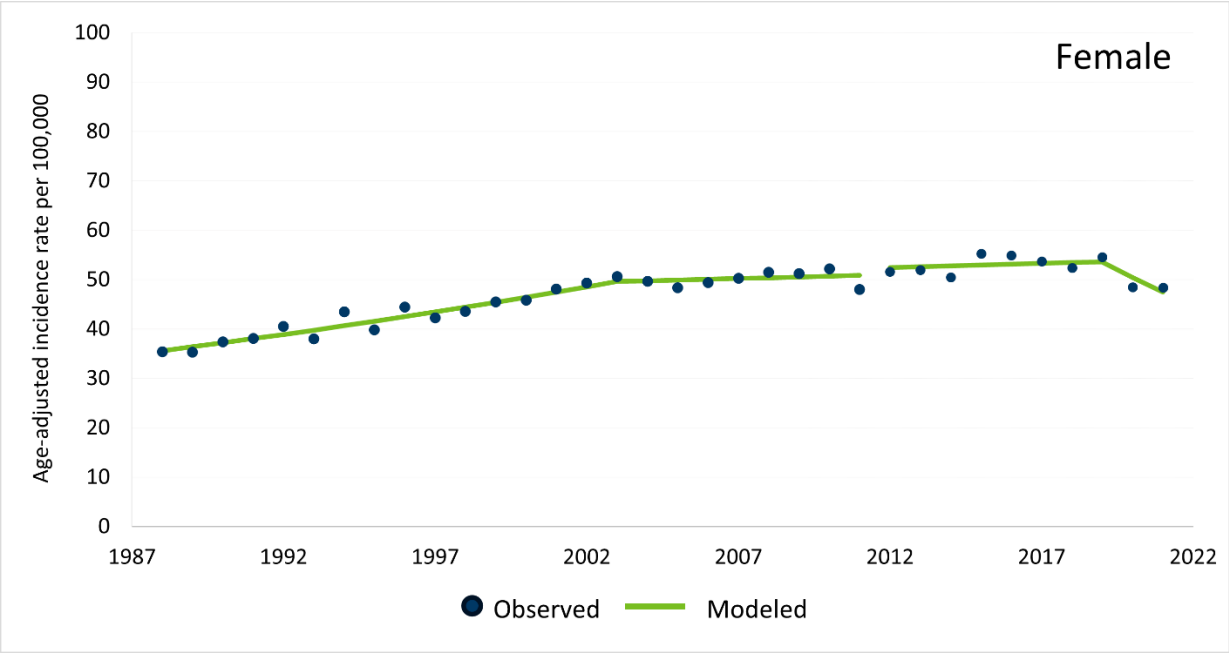
Between 1988 and 2021, the rate of new lung cancer diagnoses in Minnesota was stable for both sexes combined. However, as shown in the trendlines below, when broken down by sex the trends for males and females are notably different. The average annual percent change in the rate of new lung cancer diagnoses in men decreased by 1.1% each year between 1988 and 2021. In contrast, the average annual percent change in the rate of new lung cancer diagnoses in females increased by 0.8% each year during the same period. Prior to 2012, all new cancers reported to the Minnesota Cancer Reporting System (MCRS) had to have tissue confirmation. Beginning in 2012, the reporting rules expanded to include new cancers diagnosed without tissue confirmation. This means that prior to 2012, lung cancer incidence may have been underestimated.

Among males, lung cancer incidence has decreased over the past 23 years.



From 1988 to 2002, the male lung cancer incidence rate in Minnesota decreased significantly by 0.5% per year, and then declined significantly by 1.5% per year from 2002 to 2021.

Among females, lung cancer incidence increased until 2003 and then remained stable.

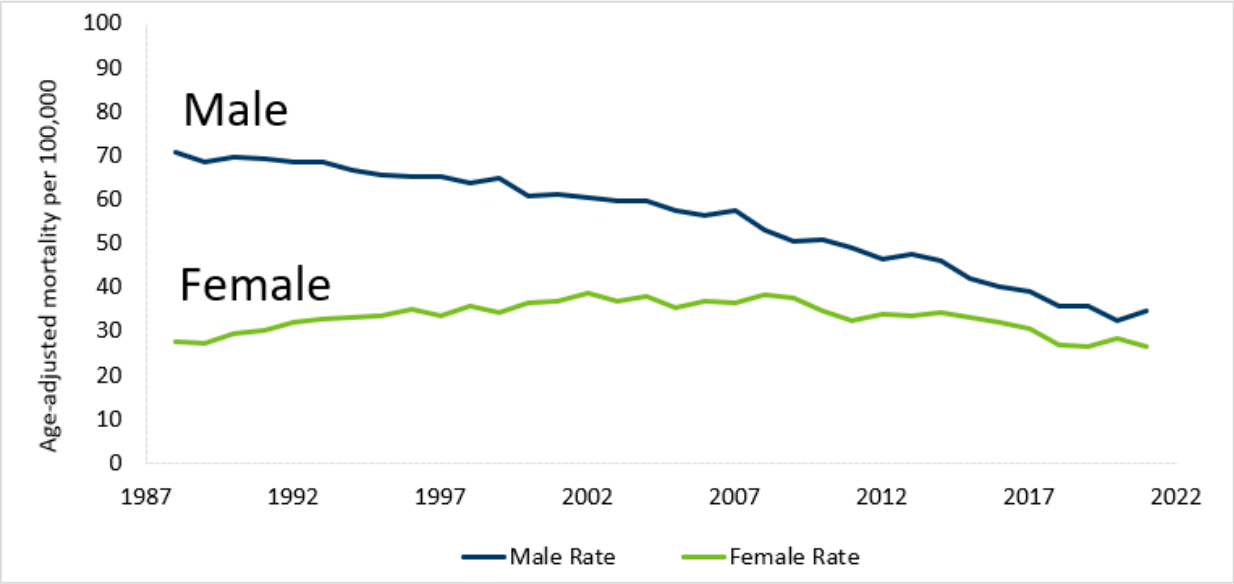


From 1988 to 2003, the female lung cancer incidence rate in Minnesota increased significantly by 2.2% per year, and then increased by 0.3% per year from 2003 to 2019, before decreasing by 5.9% per year from 2019 to 2021.

Trends in lung cancer mortality differ among males and females.

Since 1988, mortality rates for males have consistently decreased through 2020. Additional data in the future will help us determine if the increase in 2021 is a true increase in lung cancer mortality. Although there is a slight fluctuation in mortality rates for females, since 2007 there appears to be a downward trend.

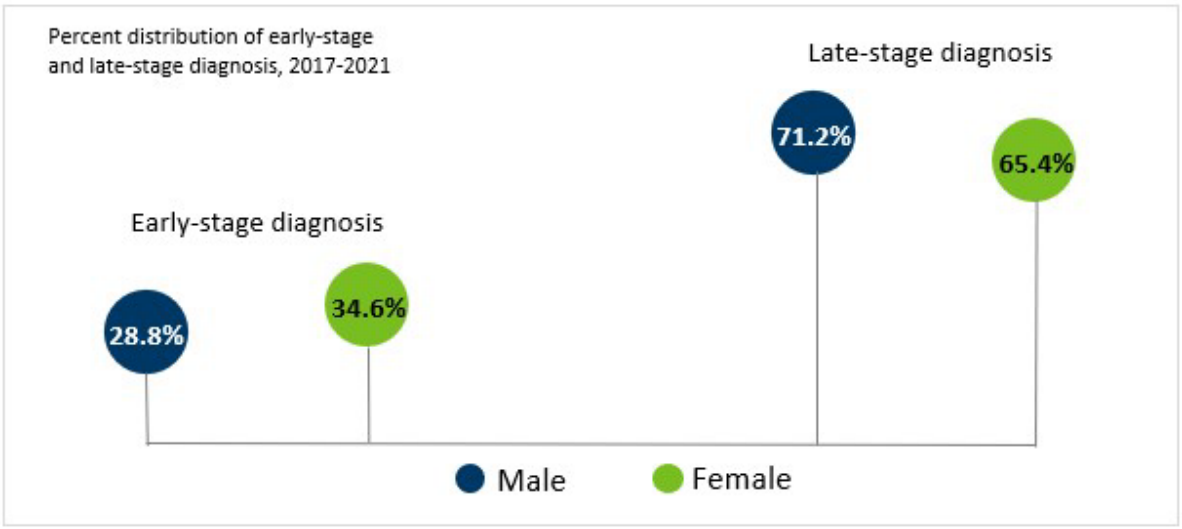
Since 1988, lung cancer mortality (death) rates have decreased for males and fluctuated for females.



Lung cancer burden, 2017-2021

Between 2017 and 2021, there were 19,413 lung cancer diagnoses and 11,004 deaths from lung cancer in Minnesota. Ninety-eight percent of these occurred in Minnesotans aged 50 or more years. The age-adjusted rates per 100,000 were 54.5 for incidence and 31.1 for mortality. Approximately two-thirds were diagnosed at a late stage. Late-stage diagnoses include cancers diagnosed at a regional or distant stage.

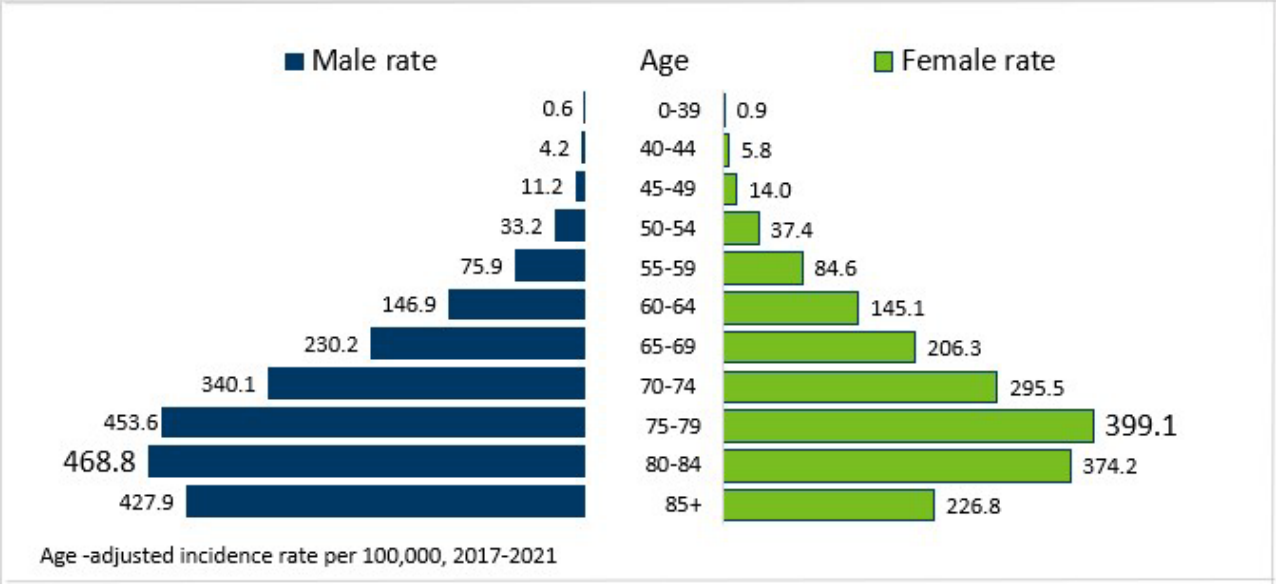
Females tend to be diagnosed at an earlier stage of lung cancer than males.



The rate of newly diagnosed lung cancers increases with age and is highest for males.

Among males and females between the ages of 0 and 39 years the rate of lung cancer incidence and mortality is extremely low. Rates increase with age until late in life.

Males aged 55 and older had higher lung cancer incidence rates than females.

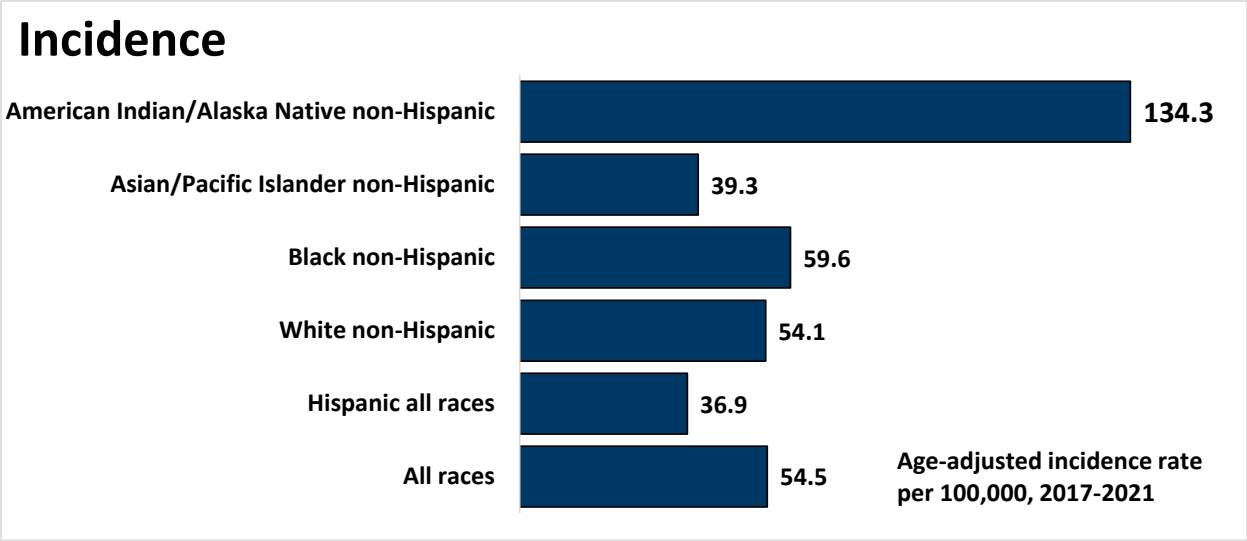


Lung cancer incidence rates in females under age 50 are higher than rates in males under age 50 in Minnesota and nationally. The reasons for this are not entirely clear and may be due to a combination of factors including genetic predisposition, types of exposures, health care access and higher medical care service utilization.

Incidence varies by race and ethnicity.

Between 2017 and 2021, rates of new lung cancer diagnoses and deaths were highest among Minnesotans who are American Indian and were lowest among Minnesotan of any race who are Hispanic.

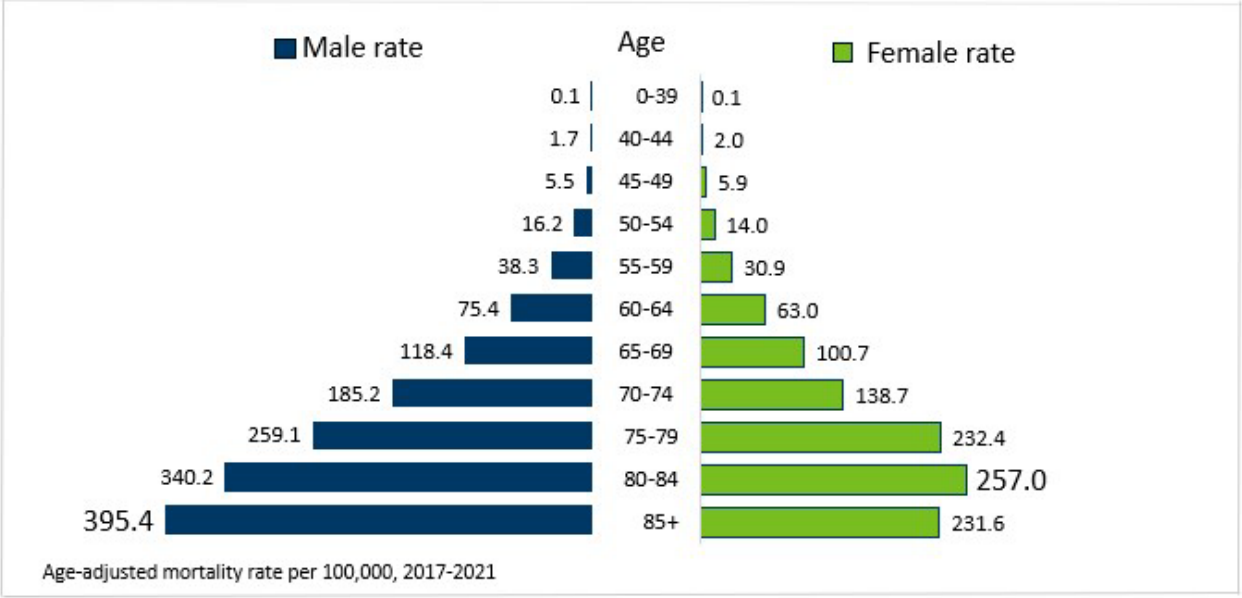
Minnesotans who are American Indian/Alaska Native had the highest lung cancer incidence rate.



The incidence rate for people who are American Indian/Alaska Native non-Hispanic was more than twice as high as the incidence rate for people of all races combined.

Lung cancer mortality (deaths) differ by age and sex, and by race and ethnicity.

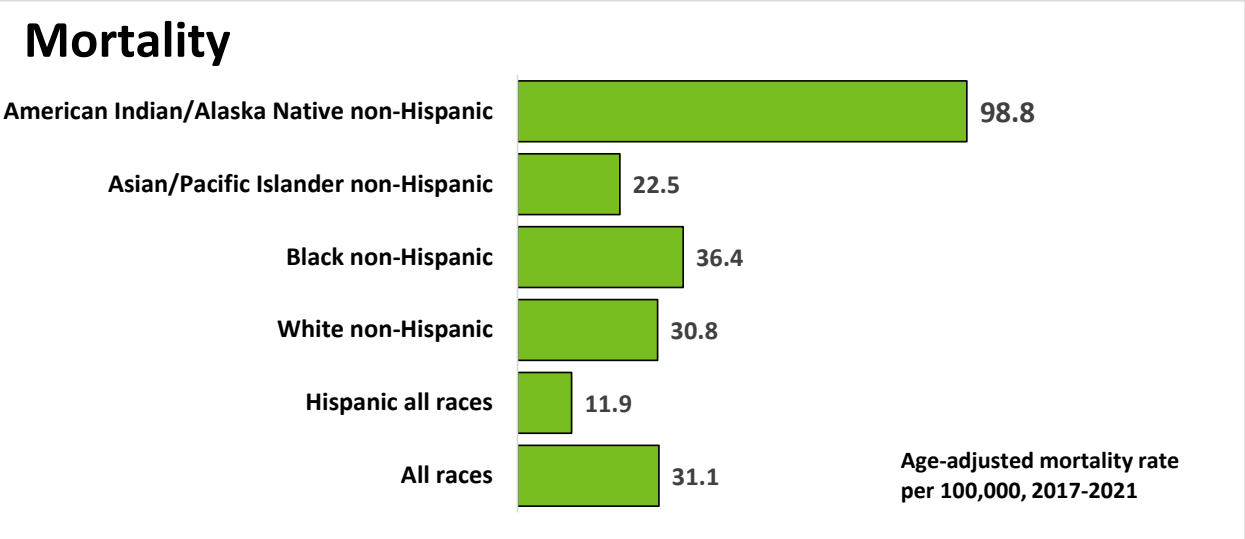
Males aged 55 and older had higher lung cancer mortality rates than females.



The mortality rate peaks for males 85 or more years of age, whereas the rate peaks for females 80-84 years of age.

Mortality varies by race and ethnicity.

Minnesotans who are American Indian/Alaska Native had the highest lung cancer mortality rate.

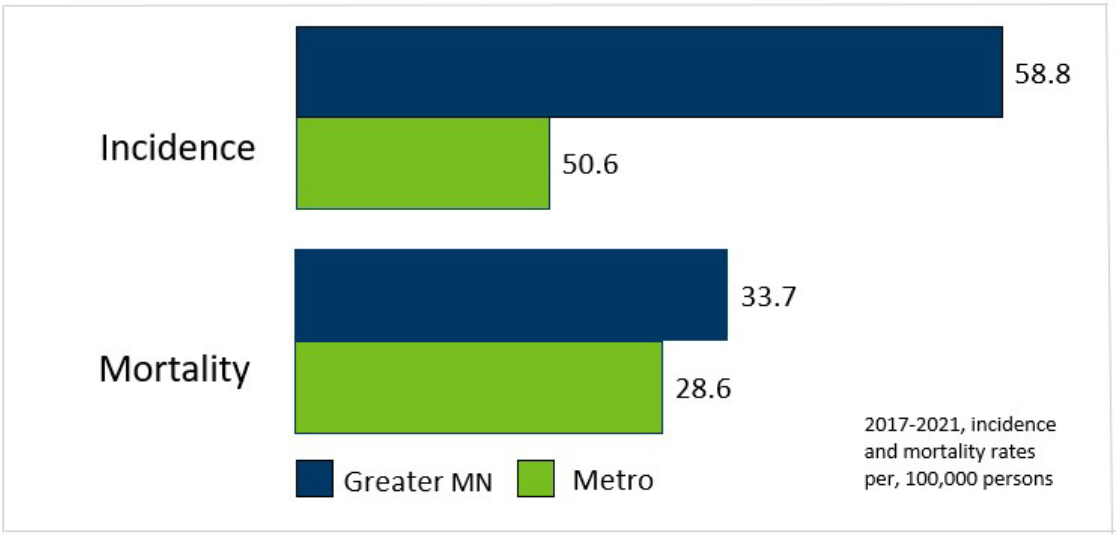


The mortality rate for people who are American Indian/Alaska Native non-Hispanic was more than three times higher than the mortality rate for people of all races combined.

Lung cancer incidence and mortality rates vary across Minnesota.

Rates of new lung cancer cases and deaths were different by geographic location within Minnesota. Between 2017 and 2021, the rate of new lung cancer cases in Greater Minnesota was 58.8 per 100,000 and the rate of new lung cancer deaths was 33.7 per 100,000.

The highest rates of new lung cancer cases and deaths occurred in Greater Minnesota.



Signs and symptoms of lung cancer [3, 4]

- A cough that doesn't go away or gets worse
- Coughing up any amount of blood or rust colored sputum (spit or phlegm)
- Chest pain
- Hoarseness
- Unexplainable weight loss
- Loss of appetite
- Shortness of breath
- Feeling weak or tired
- Lung infections that don't go away or keep returning
- Wheezing
- Bone pain
- Headache

Risk and protective factors for lung cancer

In the United States, cigarette smoking is linked to about 80% to 90% of lung cancer deaths. [5] The biggest modifiable risk factor for lung cancer is cigarette smoking.

- **Tobacco**[3,4]– Cigarette smoking is the number one risk factor for lung cancer.
- **Secondhand smoke** [3,4] – Breathing in other people's tobacco also causes lung cancer.
- **Radon**[3,4,6] – Radon exposure is the second leading risk factor of lung cancer among smokers and the leading cause for nonsmokers. The average radon level in Minnesota is more than three times higher than the U.S. radon level. In Minnesota, more than two in five homes have radon levels that pose a significant public health risk.
- **Work-place exposures**[4] – Exposures to substances such as asbestos, arsenic, beryllium, cadmium, vinyl chloride, silica, nickel compounds, chromium compounds, coal products, mustard gas, chloromethyl ethers, and diesel exhaust found in some workplaces increase the risk of developing lung cancer. The risk increases for smokers. The government and industry have worked to help protect workers from these exposures.
- **Personal or family history of lung cancer**[4] – Lung cancer survivors are at risk of developing another lung cancer, especially if they smoke. Having a parent, sibling or child with lung cancer slightly increases the risk of developing lung cancer. Whether this is due to shared genes or shared household exposures is unclear.
- **Certain dietary supplements**[4] – Two large studies that looked at the possible role of vitamin supplements in reducing lung cancer risk found that people who smoked and took beta carotene supplements had an increased risk of lung cancer. People who smoke should avoid taking beta carotene supplements.
- **Arsenic in drinking water**[4] – Studies suggest that people exposed to levels of arsenic in drinking water have an increased of lung cancer. For most Americans on public water systems, drinking water is not a major source of arsenic.
- **Previous radiation to the lungs**[4] – Radiation therapy to the chest for other cancers increases the risk of lung cancer, particularly for people who smoke. Females who have radiation therapy to the breast after a lumpectomy do not appear to have an increased risk of lung cancer.
- **Air pollution**[4] – The risk of developing lung cancer appears to be slightly increased by exposure to air pollution, especially near heavily trafficked roads in cities.
- **Age**[7,1] – Advanced age is an important risk factor for cancer overall and for lung cancer. Nationally, the median age of diagnosis for lung cancer is 71 years.

Resources

1. American Cancer Society. What is lung cancer? (https://www.cancer.org/cancer/lung-cancer/about/what-is.html) Accessed Nov. 15, 2024.
2. American Cancer Society. Can lung cancer be found early? (https://www.cancer.org/cancer/lung-cancer/about/what-is.html) Accessed Nov. 15, 2024.
3. Mayo Clinic. Lung cancer symptoms and causes (https://www.mayoclinic.org/diseases-conditions/lung-cancer/symptoms-causes/syc-20374620). Accessed Nov. 15, 2024.
4. American Cancer Society. Lung cancer risk factors (https:/www.cancer.org/cancer/lung-cancer/causes-risks-prevention/risk-factors.html). Accessed Nov. 15, 2024.
5. Centers for Disease Control (CDC). What are the risk factors for lung cancer? (https://www.cdc.gov/lung-cancer/risk-factors/). Accessed Nov. 15, 2024.
6. Minnesota Department of Health (MDH). Radon in homes (https://www.health.state.mn.us/communities/environment/air/radon/index.html). Accessed Nov. 15, 2024.
7. National Cancer Institute (NCI). Age and cancer risk (https:/www.cancer.gov/about-cancer/causes-prevention/risk/age). Accessed Nov. 15, 2024.
8. Fu Y, Liu J, Chen Y, Liu Z, Xia H, Xu H. Gender disparities in lung cancer incidence in the United States during 2001-2019. Sci Rep. 2023 Aug 3;13(1):12581. doi: 10.1038/s41598-023-39440-8. PMID: 37537259; PMCID: PMC10400573.

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