

State of Lung Cancer
2021 Report

Introduction

About every two and a half minutes, someone in the U.S. is diagnosed with lung cancer, and every day, lung cancer takes the lives more than 382 of our friends, neighbors and loved ones. But now there's hope, more Americans than ever are surviving lung cancer. While the disease remains the leading cause of cancer deaths among both women and men, over the past five years, the survival rate has increased by 14.5% nationally to 23.7% yet remains significantly lower among communities of color at 20% and Black Americans at 18%.

For the second consecutive year, the “State of Lung Cancer” report explores the lung cancer burden among racial and ethnic minority groups at the national and state levels. In addition to lower survival rates, people of color who are diagnosed with lung cancer face worse outcomes compared to whites, including: less likely to be diagnosed early, less likely to receive surgical treatment and more likely not to receive any treatment.

This year's report also examines the lifesaving potential of lung cancer screening, which can detect the disease at an earlier stage when it's more curable, and the importance of advancements in lung cancer research which holds the promise for better treatment options.

A strategic imperative of the American Lung Association is to defeat lung cancer, and to do so, we use a variety of tactics and stakeholders to address the disease and its risk factors, including public policy efforts and public health protections, awareness of lung cancer screening and more.

The “State of Lung Cancer” report provides a state-specific understanding of the burden of lung cancer and opportunities to address this deadly disease.

It does not reflect the potential impact of the COVID-19 pandemic on cancer diagnosis, treatment, or survival as the data in the report preceded the emergence of the novel coronavirus.

Based on new research, in March of 2021, the United States Preventive Services Task Force expanded its recommendation for screening to include a larger age range and more current and former smokers. This will dramatically increase the number of women and Black Americans who are considered at high risk for lung cancer. Screening rates in this report are from before the guidelines were updated and do not yet reflect screening among those newly eligible.

Nationally, screening rates have increased every year since it was first recommended. However, the national rate did not change from 2019 to 2020, likely due to COVID-19 lockdowns limiting access to healthcare resources and the public's reticence to enter medical facilities during the pandemic.

The report also serves as both a guidepost and rallying call, providing policymakers, researchers, healthcare practitioners, as well as patients, caregivers and others committed to ending lung cancer by identifying where their state can best focus its resources to decrease the toll of lung cancer.



The State-by-State Toll of Lung Cancer

While the field of lung cancer has seen advances in personalized treatment thanks to innovations in targeted and immunotherapy treatments, as well as the introduction of lifesaving lung cancer screening, the burden of lung cancer is not the same everywhere. Treatment rates, levels of exposure to risk factors, and uptake and coverage of screening vary from state to state. To save more lives, it's critical to prevent lung cancer when possible and diagnose the disease as early as possible. Additionally, everyone should have access to therapies that may extend or improve the quality of their life.

By better understanding the impact of lung cancer at the state level, we can encourage interventions to save and extend lives. This report considers the following measures of lung cancer burden by state: new cases, survival, early diagnosis, surgical treatment, lack of treatment, screening and prevention, racial disparities and Medicaid fee-for-service program coverage of screening and identifies where each state ranks on each of these measures.

Our policymakers must do more to protect and expand quality and affordable healthcare coverage and improve access to lung cancer screening and treatment.





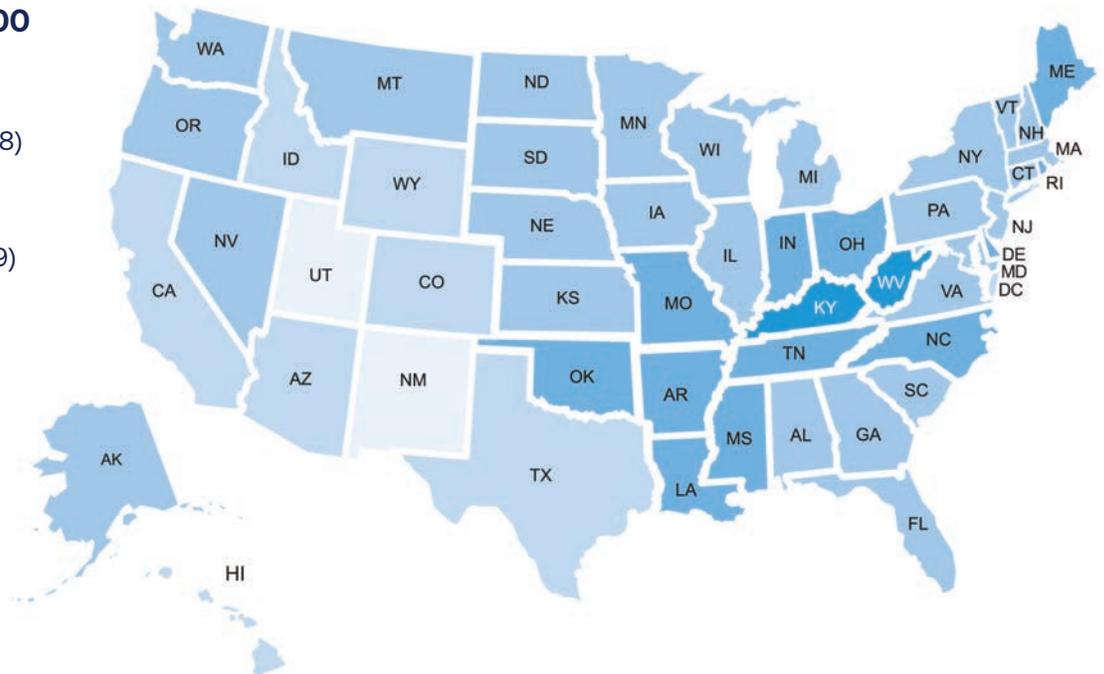
New Cases

Close to 236,000 people will be diagnosed with lung cancer this year, with the rate of new cases varying by state. The report finds that Utah has the nation's best lung cancer rate while Kentucky has the worst at almost 2.5 times the incidence rate of Utah. Over the last five years, the rate of new cases decreased **10%** nationally.

There are a variety of risk factors associated with lung cancer, including smoking, exposure to radon gas, air pollution and secondhand smoke. Radon testing and mitigation, healthy air protections, and reducing the smoking rate through tobacco tax increases, smokefree air laws and access to comprehensive quit smoking services are all ways to help prevent new lung cancer cases.

Tiers, by rate per 100,000

- Top (26.4-37.2)
- Above Average (37.3-50.8)
- Average (50.9-65.7)
- Below Average (65.8-81.9)
- Bottom (82.0-89.4)



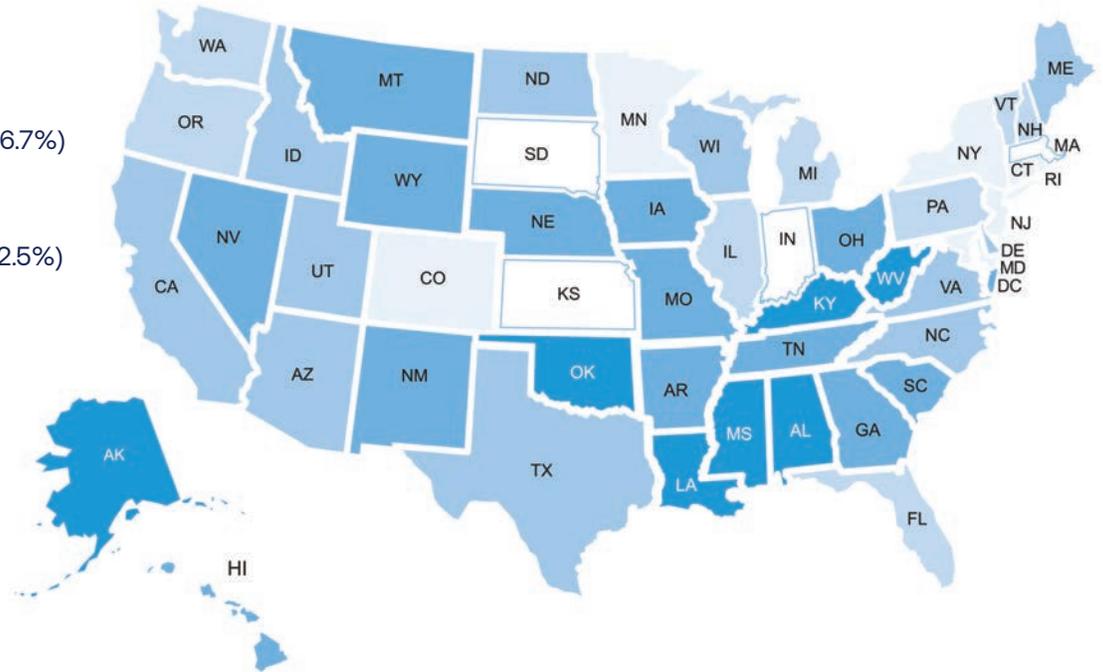


Survival Rate

Lung cancer has one of the lowest five-year survival rates of all cancers because cases are often diagnosed at later stages, when the disease is less likely to be curable. The national average of people alive five years after a lung cancer diagnosis is **23.7%**, which is a **14.5%** improvement over the last five years. Connecticut ranked best at **28.8%**, while Alabama ranked worst at **18.4%**.

Tiers

- Top (26.8%-28.8%)
- Above Average (24.7%-26.7%)
- Average (22.6%-24.6%)
- Below Average (20.5%-22.5%)
- Bottom (18.4%-20.4%)
- Data Not Available





Early Diagnosis

Nationally, **only 24%** of cases are diagnosed at an early stage when the five-year survival rate is much higher (60%). Unfortunately, **46%** of cases are not caught until a late stage when the survival rate is only **6%**. Early diagnosis rates increased **36%** over the last five years nationally and were best in Massachusetts (**30%**) and worst in Hawaii (**19%**).

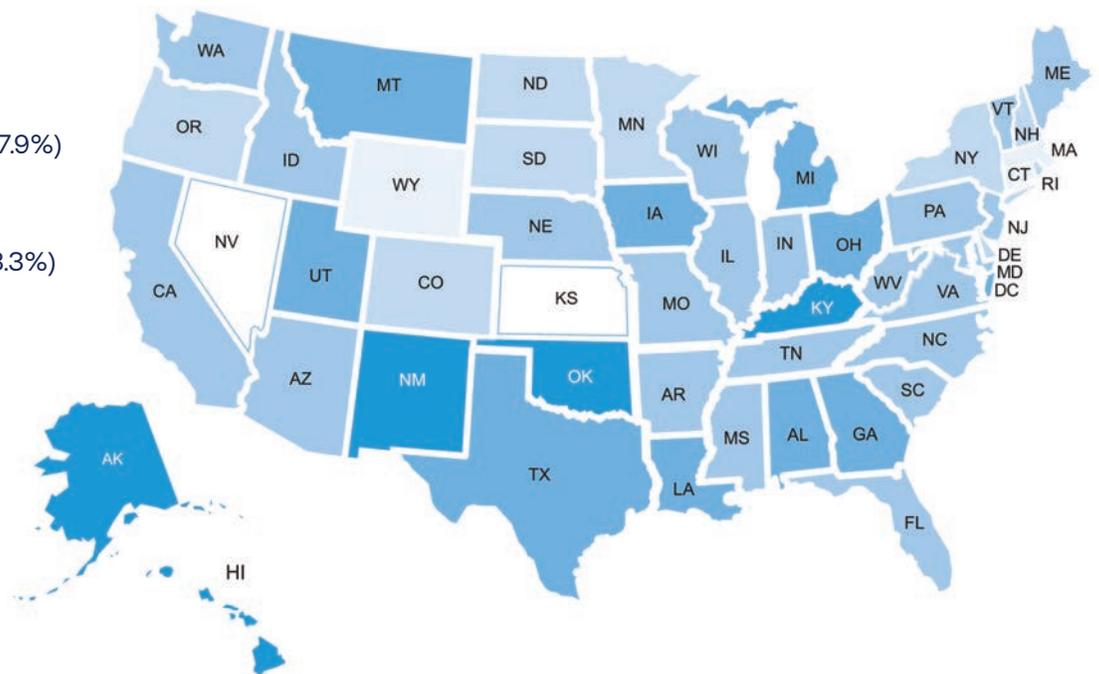
Stage at Diagnosis and 5-Year Survival Rate



- Early (localized - confined to primary site)
- Regional (spread to regional lymph nodes)
- Distant (cancer has metastasized)
- Unstaged tumors

Tiers

- Top (28.0%-30.3%)
- Above Average (25.6%-27.9%)
- Average (23.4%-25.5%)
- Below Average (21.2%-23.3%)
- Bottom (19.0%-21.1%)
- Data Not Available





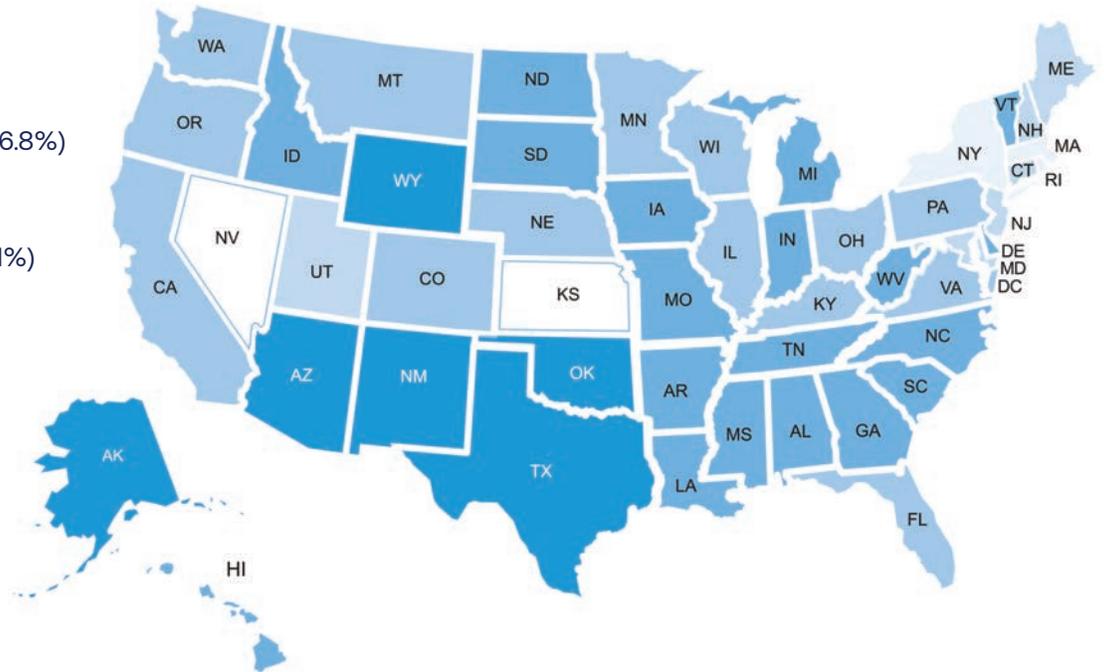
Surgical Treatment

Lung cancer can often be treated with surgery if it is diagnosed at an early stage and has not spread. Nationally, **20.7%** of cases underwent surgery, which was a **3%** improvement over the last five years. Rates ranged from best at **30.9%** in Massachusetts to worst at **13.1%** in New Mexico.

Patients who are not healthy enough to undergo the procedure or whose cancer has spread too widely may not be candidates for surgery. Other treatments may be recommended instead of or in addition to surgery, such as chemotherapy, radiation, targeted therapy or immunotherapy. This report focuses on surgical treatment because it is more likely to be curative.

Tiers

- Top (26.9%-30.9%)
- Above Average (22.7%-26.8%)
- Average (19.2%-22.6%)
- Below Average (16.1%-19.1%)
- Bottom (13.1%-16.0%)
- Data Not Available





Screening and Prevention

Lung cancer screening gives us hope in the fight to defeat lung cancer and represents an opportunity to save lives. Screening with annual low-dose CT scans can reduce the lung cancer death rate by up to 20% by detecting tumors at early stages when the cancer is more likely to be curable.

Based on new research, in March of 2021, the United States Preventive Services Task Force expanded its recommendation for screening to include a larger age range and more current and former smokers. This dramatically increased the number of women and Black Americans who are considered at high risk for lung cancer.

High risk is defined as:

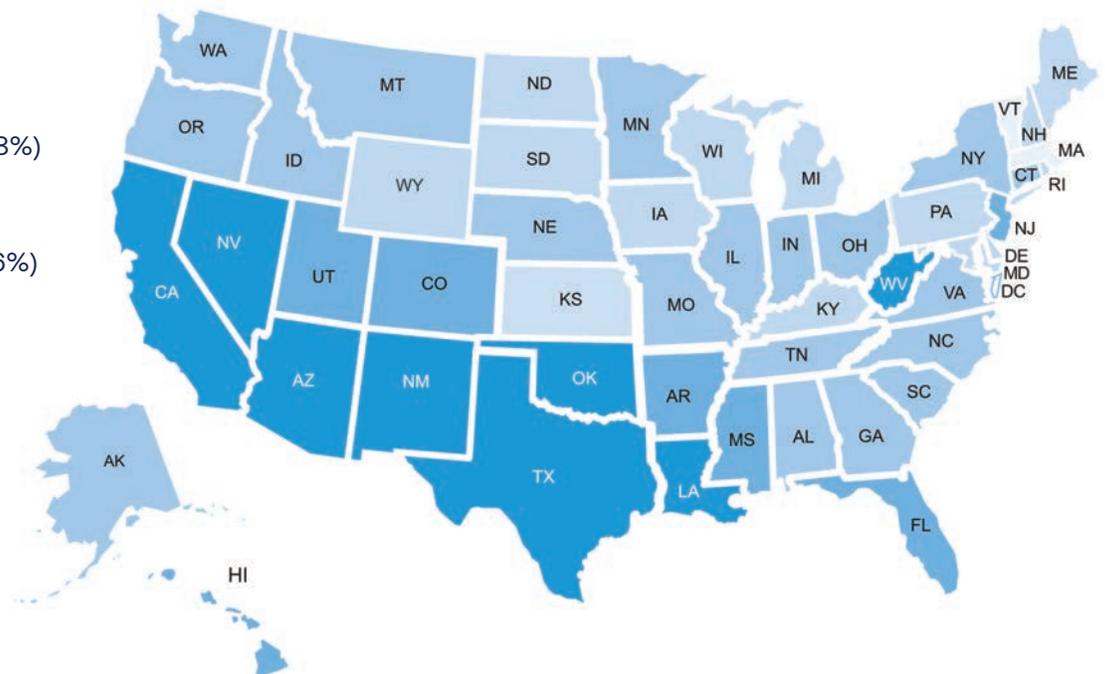
	USPSTF Guidelines 2013-2021	USPSTF Guidelines 2021
Age	55-80 years	50-80 years
Smoking History	30 or more pack years (this means 1 pack a day for 30 years, 2 packs a day for 15 years, etc.)	20 or more pack years (this means 1 pack a day for 20 years, 2 packs a day for 10 years, etc.)
Smoking Status	Current smoker or quit within the last 15 years	

Screening rates in this report were collected before the guidelines were updated and do not yet reflect screening among those newly eligible.

For screening to be most effective, more of the high-risk population should be screened annually—currently screening rates are very low among those at high risk. Nationally, only **5.7%** of those at high risk were screened. Massachusetts has the best screening rate at **17.8%**, while California and Wyoming have the worst at **1.0%**.

Tiers

- Top (12.9%-17.8%)
- Above Average (8.1%-12.8%)
- Average (4.7%-8.0%)
- Below Average (2.9%-4.6%)
- Bottom (1.0%-2.8%)
- Data Not Available

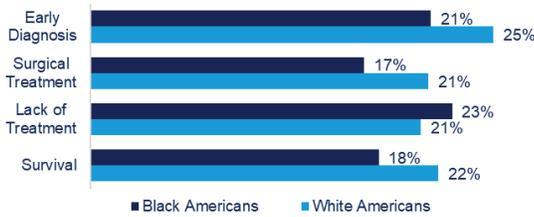




Racial Disparities

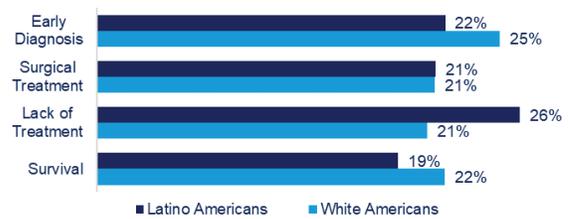
The American Lung Association believes that everyone deserves the opportunity to lead a full and healthy life. Sadly, many systemic issues have contributed to health disparities, including for those facing lung cancer. The “State of Lung Cancer” 2021 found that people of color who are diagnosed with lung cancer face worse outcomes compared to white Americans as they are less likely to be diagnosed early, less likely to receive surgical treatment, more likely to receive no treatment, and have lower survival rates. More than half of the 29 million uninsured Americans are people of color, and research is clear that having health coverage impacts people’s medical care and ultimately their health outcomes. Addressing racial disparities in healthcare coverage will therefore be critical to addressing racial disparities in lung cancer care.

Black Americans



- Early Diagnosis**
18% worse than white Americans
- Surgical Treatment**
23% worse than white Americans
- Lack of Treatment**
9% worse than white Americans
- Survival**
21% worse than white Americans

Latinos



- Early Diagnosis**
16% worse than white Americans
- Surgical Treatment**
Same as white Americans
- Lack of Treatment**
26% worse than white Americans
- Survival**
16% worse than white Americans

Asian Americans or Pacific Islanders



- Early Diagnosis**
18% worse than white Americans
- Surgical Treatment**
17% better than white Americans
- Lack of Treatment**
5% worse than white Americans
- Survival**
9% better than white Americans

Indigenous Peoples (American Indians/Alaska Natives)



- Early Diagnosis**
17% worse than white Americans
- Surgical Treatment**
25% worse than white Americans
- Lack of Treatment**
11% worse than white Americans
- Survival**
13% worse than white Americans





Prevention

Keys to prevention include limiting exposure to tobacco use, radon, air pollution and secondhand smoke, all of which are known to cause lung cancer. Despite having a good understanding of these risk factors, it is not always possible to identify the cause of an individual patient's lung cancer. If you have concerns about your risk because of your exposures or your family history, it is important to share this with your doctor.

This report contains information and data on exposures to these risk factors on the state level:

- **Tobacco use** is the leading risk factor for lung cancer, accounting for 80 to 90% of cases. While we have seen historic decreases in the national smoking rate, not all Americans or regions of the country have benefited equally.
- **Secondhand smoke** has also been shown to cause lung cancer. There is no safe level of exposure to secondhand smoke. The “State of Lung Cancer” report highlights that making homes, workplaces and public spaces smokefree air zones, with no smoking allowed, can reduce the risk of exposure. This report’s sister, “State of Tobacco Control,” grades states for efforts to protect public spaces from secondhand smoke.
- **Radon**, a naturally occurring radioactive gas, is the second leading cause of lung cancer and the leading cause among nonsmokers. Radon is a colorless and odorless gas that can seep into homes and buildings. Some geographical areas have naturally higher radon rates than others, but any home can have elevated levels. The U.S. Environmental Protective Agency (EPA) has set an action level of 4 pCi/L (picocuries per liter of air). At or above this level of radon, the EPA recommends you take corrective measures to reduce your exposure to radon gas. The report highlights counties and their predicted average indoor radon level.
- **Exposure to year-round particle pollution** in the air has been shown to cause lung cancer. Each year the American Lung Association releases the “State of the Air” report. The 2021 “State of the Air” report found that more than 20.7 million people lived in counties that had unhealthy levels of air pollution in all categories from 2017 to 2019.





Discussion

- The five-year lung cancer survival rate increased **14.5%** nationally to **23.7%** yet remains significantly lower among communities of color at **20.0%** and Black Americans at **18.0%**.
- In addition to lower survival rates, people of color who are diagnosed with lung cancer face worse outcomes compared to whites, including: less likely to be diagnosed early, less likely to receive surgical treatment and more likely to receive no treatment.
- Nationally, only **24%** of cases are diagnosed at an early stage when the five-year survival rate is much higher (**60%**).
- Lung cancer screening with low-dose CT scans has been recommended for those at high risk since 2013, but only **5.7%** of those eligible were screened in 2020.
- The analysis in the “State of Lung Cancer” serves as a baseline against which future data can be compared, which may be especially beneficial as progress is made on the implementation of lung cancer screening.



Conclusion

As the American Lung Association works toward defeating lung cancer, the goal of the “State of Lung Cancer” report is to empower the public to learn more about lung cancer in their state and take action to improve lung cancer patients’ access to quality and affordable healthcare.

The report looks at key lung cancer measures to highlight the burden and examine opportunities to better address lung cancer at the state level. The report found that lung cancer rates for every measure vary significantly by state, and that every state can do more to defeat lung cancer, such as increasing the rate of screening among those at high risk, addressing racial disparities that impact lung cancer outcomes, decreasing exposure to radon and secondhand smoke, and eliminating tobacco use.

This report provides unique information for federal and state officials, policymakers, researchers and those affected by lung cancer and emphasizes the need for resources and action to decrease the toll of lung cancer across the country.





Methodology and Data Sources

The report includes state-specific measures of lung cancer incidence, adult smoking prevalence, estimated percent of radon tests at or above the U.S. EPA action level, five-year survival, early diagnosis, surgery as part of the first course of treatment, lack of treatment, and screening among those at high risk.

Lung cancer incidence, staging, surgical treatment, and lack of treatment data are for years 2014-2018 and includes malignant lung and bronchus tumors. This data is based on the North American Association of Central Cancer Registries (NAACCR) December 2020 data submission. In the U.S., registries also participate in the National Cancer Institute's (NCI) Surveillance, Epidemiology, and End Results (SEER) Program or the Centers for Disease Control and Prevention's (CDC) National Program of Cancer Registries (NPCR) or both. Support for cancer registries is provided by the state, province or territory in which the registry is located.

Incidence data for Kansas and Nevada are for 2014-2018 and from CDC's WONDER Online Database United States Cancer Statistics as data from these states were not included in the NAACCR data submission.

Cases diagnosed at an early stage correspond with local stage from SEER summary staging and are generally equivalent to stage I. Cases diagnosed at a late stage correspond with distant stage from SEER summary staging and are generally equivalent to stage IV.

State survival rates are the age-standardized percent of cases still alive five years after diagnosis for cases diagnosed in years 2011-2017. These data are from Cancer in North America: 2014-2018 Volume Four: Cancer Survival in the United States and Canada 2011-2017 from NAACCR. Survival data was not available for four states and the District of Columbia. National survival rates by race and ethnicity are from NCI's SEER program.

Lack of treatment is the percent of lung cancer diagnoses that did not receive any medical treatment generally associated with lung or other cancers, including the following: removal, biopsy or aspiration of regional lymph node; surgical removal of distant lymph nodes or other tissue(s)/organ(s) beyond the primary site; surgery for lung cancer; radiation; chemotherapy; systemic hormonal agents; immunotherapy; other, including experimental, double-blind, and unproven; and transplant or endocrine surgery or radiation.

Screening rates were determined by dividing the number of screening exams meeting United States Preventative Task Force (USPSTF) criteria by the estimated number of people at high risk for lung cancer and recommended for annual screening with low dose computed tomography.





Methodology and Data Sources

Data on the number of screening exams meeting USPSTF criteria came from the American College of Radiology's (ACR) Lung Cancer Screening Registry State Level Comparison for 2020. We believe this registry represents most lung cancer screenings as it is the only approved registry at this time, and screening facilities are required to submit data on all lung cancer screenings to it in order to meet Medicare eligibility requirements.

This research was supported by the ACR's National Radiology Data Registry (NRDR). The views expressed in this report represent those of the authors, and do not necessarily represent the official views of the NRDR or the ACR. The authors wish to thank the Lung Cancer Screening Registry steering committee and ACR staff for the use of registry data.

The number of people at high risk for lung cancer was based on USPSTF criteria from 2013 to March of 2021, which defined high risk as ages 55-80 years of age; 30 or more pack-year history of smoking (one pack a day for 30 years, two packs a day for 15 years, etc.); and are a current smoker, or have quit within the last 15 years. Based on new research, in March of 2021, the United States Preventive Services Task Force expanded its recommendation for screening to include a lower age range of 50 years and pack-year history of 20. Screening rates in this report are from before the guidelines were updated and do not yet reflect screening among those newly eligible.

To assess current coverage of lung cancer screening in state Medicaid fee-for-service programs, the Lung Association surveyed state Medicaid programs to obtain information on coverage of low dose CT scans for individuals at high risk for lung cancer and reviewed publicly available coverage policies.

Smoking rates include the percent of adults who have ever smoked 100 or more cigarettes and currently smoke on some days or all days using data from the 2019 BRFSS.

Radon estimates for each state are primarily based on the latest percent of county-level pre-mitigation radon tests from occupied interior spaces at or above the U.S. Environmental Protection Agency action level of 4 pCi/L (picoCuries per liter of air) from CDC's National Environmental Public Health Tracking for 2008-2017, weighted by U.S. Census Bureau 2019 estimates of county populations.

Additional methodological information is available in the online version of this report at [Lung.org/solc](https://www.lung.org/solc).





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