Every three and a half minutes someone in the United States will die from lung cancer, accounting for about one in four cancer deaths. Yet, 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 ten years the survival rate has dramatically increased. The “State of Lung Cancer” report examines this promising trend, including what is driving the change and what still needs to be done to save more lives.

The five-year survival rate – the rate of people who are still alive five years after being diagnosed – is now 21.7%, as reported in the 2019 “State of Lung Cancer” report, up from 17.2% a decade ago. This is a dramatic 26% improvement over the past 10 years. This year’s report supports both the lifesaving potential of lung cancer screening, which finds the disease at an early 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 need an approach that engages a variety of tactics and stakeholders to address the disease, its risk factors, 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 and opportunities to address lung cancer.

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 we have seen advancements in personalized treatment thanks to biomarker testing, targeted and immunotherapies, as well as a method of early detection, the burden of lung cancer is not the same everywhere. Treatment, exposure to risk factors, and use of screening vary from state to state. To save lives, it’s critical to prevent lung cancer when possible and diagnose the disease as early as possible.

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

More than 228,000 people will be diagnosed with lung cancer this year, and the rate of new cases varies greatly by state. The report finds the lung cancer incidence rate was 59.6 per 100,000 people nationally, ranging from 27.1 in Utah to 92.6 in Kentucky. 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 (27.1 - 40.1)
- Above Average (40.1 - 53.1)
- Average (53.1 - 66.2)
- Below Average (66.3 - 79.5)
- Bottom (79.5 - 92.6)
Survival Rates

The survival rate of lung cancer varies by state. Lung cancer has one of the lowest five-year survival rates among leading cancers because it is often not caught at an early stage when it is more likely to be curable. The five-year lung cancer survival rate was 21.7 percent nationally, ranging from 26.4 percent in Connecticut to 16.8 percent in Alabama.

Tiers

- **Top (24.5% - 26.4%)**
- **Above Average (22.6% - 24.4%)**
- **Average (20.7% - 22.5%)**
- **Below Average (18.7% - 20.6%)**
- **Bottom (16.8% - 18.6%)**
- **Data Not Available**
Early Diagnosis

Nationally, only 21.5 percent of cases are caught early when the five-year survival rate is much higher (57.7 percent). Unfortunately, most cases (48.5 percent) are not caught until a late stage when the cancer has spread to other organs, treatment options are less likely to be curative, and the survival rate is only 6.0 percent.

Stage at Diagnosis and 5-Year Survival Rate

The stage at which someone is diagnosed with lung cancer varies significantly by state. The early diagnosis rate was **highest for Wyoming at 28.1 percent** and **lowest for Alaska at 16.6 percent**.

**Tiers**

- **Top (25.5% - 28.1%)**
- **Above Average (22.8% - 25.4%)**
- **Average (20.5% - 22.7%)**
- **Below Average (18.6% - 20.4%)**
- **Bottom (16.6% - 18.5%)**
- **Data Not Available**
Surgical Treatment

Lung cancer is more likely to be curable if the tumor can be removed through surgery, and surgery is more likely to be an option if the diagnosis is made at an early stage before the cancer has widely spread. Nationally, 20.6 percent of cases underwent surgery as part of the first course of treatment, ranging from 30.5 percent in Massachusetts to 13.5 percent in New Mexico.

Patients who are not healthy enough to undergo the procedure or whose cancer has spread too far 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 (26.6% - 30.5%)
- Above Average (22.6% - 26.5%)
- Average (19.2% - 22.5%)
- Below Average (16.4% - 19.1%)
- Bottom (13.5% - 16.3%)
- Data Not Available
Lack of Treatment

Not every patient receives treatment after being diagnosed with lung cancer. This can happen for multiple reasons, such as the tumor having spread too far, poor health, or refusal of treatment. Some of these reasons may be unavoidable, but no one should go untreated because of lack of provider or patient knowledge, stigma associated with lung cancer, fatalism after diagnosis, or cost of treatment. Dismantling these and other barriers is important to reducing the percent of untreated patients.

The percent of patients who receive no treatment is 15.4 percent nationally, ranging from 8.0 percent in North Dakota to 30.4 percent in Arizona.
Screening

If everyone currently eligible were screened, close to 48,000 lives could be saved. For those ages 55-80 with a 30 pack year history who still smoke or have quit within the last 15 years, screening with annual low-dose CT scans can reduce the lung cancer death rate by up to 20 percent by detecting tumors at early stages when the cancer is more likely to be curable.

For screening to be most effective, more of the high-risk population should be screened – currently screening rates are very low among those at high risk. This may be because of a lack of access or low awareness and knowledge among patients and providers. As rates vary tremendously between states, it is clear that more can be done to increase screening rates. Screening rates among those at high risk were 4.2 percent nationally, ranging from 12.3 percent in Massachusetts to 0.5 percent in Nevada.

Tiers

- Top (9.0% - 12.3%)
- Above Average (5.8% - 8.9%)
- Average (3.4% - 5.7%)
- Below Average (2.0% - 3.3%)
- Bottom (0.5% - 1.9%)
- Data Not Available
Medicaid Coverage of Screening

Medicaid beneficiaries are disproportionately affected by lung cancer, yet standard Medicaid programs are one of the only healthcare payers not required to cover lung cancer screening. If screening is covered, Medicaid programs may use different eligibility criteria, require prior authorization or charge individuals for their scans.

As of January 2019, **31 state Medicaid fee-for-service programs covered lung cancer screening for those at high risk, 12 did not**, and seven had no information available. In states where fee-for-service Medicaid plans covered screening, 4.8 percent of those at high risk had been screened, compared to 2.6 percent in states that did not cover screening. Coverage may also vary between fee-for-service and managed care plans within a state's Medicaid program.

The Lung Association urges all state Medicaid programs to cover lung cancer screening based on evidence-based guidelines across all fee-for-service and managed care plans and to remove any financial or administrative barriers that limit access to this lifesaving service.

### Coverage

- **Covered**
- **Not Covered**
- **No Information Available**
- **No Fee-for-Service Program**
Prevention

Keys to prevention include raising awareness about tobacco use, exposure to radon gas, air pollution, and secondhand smoke, all of which are known to cause lung cancer. Despite understanding of these risk factors, for some patients the cause of lung cancer is not clear. If you have concerns about your risk, such as if others in your family have or ever had lung cancer, it is important to mention this to 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 percent of cases. While we have seen historic decreases in the national smoking rate, not all Americans or regions of the country have benefitted equally.

- **Secondhand smoke** has also been shown to cause lung cancer. There is no safe level of exposure to secondhand smoke. The report highlights that making homes, work places and public spaces smokefree air zones, with no smoking allowed, can reduce the risk of exposure. This report’s sister “State of Tobacco Control” report 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 puts out the “State of the Air” report. The 2019 report grades U.S. counties on harmful particle and ozone pollution recorded over a three-year period and details trends for metropolitan areas over the past two decades. The report also ranks both the cleanest and most polluted areas in the country.
Discussion

Over the last decade, the rate of new lung cancer cases has decreased 19 percent, but it still remains the leading cause of cancer death in the United States.

Over the same period, the five-year survival rate has increased 26 percent, but remains one of the lowest among leading cancers.

Only 21.5 percent of lung cancer cases are diagnosed early, when survival rates are five times greater.

Lung cancer screening with low-dose CT scans has been recommended for those at high risk since 2013, but only 4.2 percent of those eligible were screened in 2018.

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 with the knowledge and information to appeal to state officials and raise awareness of this deadly disease. The report takes a look 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 disparities in receipt of treatment, decreasing exposure to radon and secondhand smoke, and eliminating tobacco use. This report provides unique information for 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, radon zones, 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 is for years 2012-2016 and includes malignant lung and bronchus tumors. These data are based on the North American Association of Central Cancer Registries (NAACCR) December 2018 data submission. In the U.S., registries also participate in the National Cancer Institute’s 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 the District of Columbia, Kansas, and Nevada are for 2011-2015 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.

Survival rates are the age-standardized percent of cases still alive five years after diagnosis for cases diagnosed in years 2009-2015. These data are from Cancer in North America: 2012-2016 Volume Four: Cancer Survival in the United States and Canada 2009-2015 from NAACCR. Survival data was not available for five states and the District of Columbia.

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 2018. 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.

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The number of people at high risk for lung cancer was based on USPSTF criteria, which defines 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. Data from CDC's 2015 National Health Interview Survey and 2017 Behavioral Risk Factor Surveillance System (BRFSS) were used to estimate the number of people at high risk for lung cancer.

Smoking rates are 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 2017 BRFSS.

The number of counties in each state by radon zone comes from the Environmental Protection Agency’s Map of Radon Zones.

Additional methodological information is available in the online version of this report at Lung.org/solc.