Nearly a quarter of a million American will be diagnosed with lung cancer this year, or one every two and a half minutes. It is the leading cancer killer in the United States, accounting for about one in four cancer deaths. The five-year survival rate for lung cancer is less than one in five (18.1 percent), much lower than those for many other common cancers. Less than half of those diagnosed with lung cancer will still be alive a year later. Lung cancer can be prevented, and new research has shown that screening can catch more cases earlier and save lives.

However, the burden of lung cancer is not the same everywhere. Some states have much higher rates of new cases than others, or much lower survival rates. Treatment, exposure to risk factors, and access to screening facilities also varies from state to state.

This report summarizes the available data on state-specific lung cancer burden. It provides policy makers, researchers, health care practitioners, and anyone committed to ending lung cancer with a one-stop resource for identifying where their state can best focus its resources to decrease the burden of lung cancer.

Tobaccouse is the leading risk factor for lung cancer, accounting for 80 to 90 percent of cases. Smoking and second-hand smoke have both been shown to cause lung cancer. Radon, a naturally occurring radioactive gas, is the second leading cause of lung cancer and the leading cause among non-smokers.

The lung cancer incidence rate, or number of new cases diagnosed each year, was 63.0 per 100,000 for the United States overall in 2009-2013. Utah had the lowest rate at 29.1, and Kentucky had the highest at 96.8. This report shows that, on average, each one point increase in the smoking rate for a state equals an increase of 2.4 points in the lung cancer incidence rate. Decreasing the smoking rate through smoking prevention and cessation is the single best way to prevent lung cancer.

For those ages 55-80 with a heavy smoking 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% by detecting tumors at early stages when it is more curable. For screening to be most effective, patients must be able to access high-quality centers offering the service, such as those accredited by the American College of Radiology.

Nationally, there are 4.8 accredited lung cancer screening centers per million people. Utah had the fewest centers per million people at 0.7, while Delaware had the most at 21.1. In comparison, 20.3 centers per million people have earned the American College of Radiology’s designation as Breast Imaging Centers of Excellence.

The percent of people still alive five years after being diagnosed with lung cancer (the survival rate) was 20.0 percent nationally, ranging from 15.9 in Louisiana to 24.0 percent in New York. Analysis in this report showed that states with more accredited screening centers per capita have higher survival rates, with each additional center per million people being associated with a 0.3 point increase in the lung cancer survival rate.

One of the reasons overall lung cancer survival rates are so low is because most cases (49.8 percent) are not diagnosed until later stages when the cancer has spread to other organs, treatment is less likely to be curative, and survival is very low (4.5 percent). Only 18.9 percent of cases nationally are diagnosed at an early, local stage when survival is a much higher 55.3 percent.

Wyoming had the highest portion of cases diagnosed at an early stage at 23.3 percent and Hawaii had the lowest at 15.0 percent. Arizona had the lowest portion of cases diagnosed at a late stage at 41.1 percent and Iowa had the highest at 56.2 percent.

Similar to survival, states with more screening centers per capita had a higher portion of cases diagnosed at an early stage, with each additional center per million people being associated with a 0.2 point increase in the percent of cases diagnosed early.

Lung cancer can often be treated with surgery as part of the first course of treatment if it is at an early stage and has not spread outside of the lung and lymph nodes close to the lung. While surgery may not be an option for every patient, those who receive it as part of their initial treatment have higher survival rates than those who do not. 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 or in addition to surgery, such as chemotherapy, radiation, targeted therapy, or immunotherapy.

Nationally, 21.0 percent of patients underwent surgery as part of the first course of treatment, ranging from 30.1 percent in Massachusetts to 14.3 percent in Oklahoma. States with the most screening centers per capita had a higher portion of patients undergoing surgery as part of the first course of treatment, with each additional center per million people being associated with a 0.4 point increase in the percent of patients undergoing surgery.

The relationships between screening centers per capita and survival, early stage at diagnosis, and undergoing surgery are intriguing, but do not prove that more screening centers per capita lead to improvements in these three outcomes. The data on stage at diagnosis and undergoing surgery used in this report were from 2009 through 2013, while lung cancer screening was first recommended in 2013, and not covered by insurance or Medicare without cost-sharing until 2015, meaning most of the cases were diagnosed before screening was available, and all before it was covered without cost-sharing. This is even more true for survival, which has an additional five-year data lag that is required to track cases after diagnosis. Given these data limitations, the observed relationships suggest that one or more additional factors are driving both the number of screening centers per capita and survival, stage at diagnosis, and undergoing surgery. For example, states with a higher average quality of healthcare could be expected to have better lung cancer outcome measures and be more likely to add accredited screening centers.

This analysis shows how states compare on the burden of lung cancer both overall and in specific areas, which can help inform where resources are required to address disparities. The data and results also serve as a baseline against which future research can be compared, which may be especially beneficial as the data progresses to cover the years after lung cancer screening was recommended. Future studies could also include additional factors, such as healthcare quality, to see how they relate to lung cancer screening and burden.