

Lung cancer in the commonwealth A far too common disease

by Claudia Hopenhayn-Rich, M.P.H., Ph.D., Michelle L. Stump, M.S.P.H., and Joe Petrik, M.Sc., M.A.

Lung cancer is a devastating disease. Not only is it the most common cancer in the United States and in Kentucky, it also claims more lives than any other cancer. But it is also among the most preventable, since its main risk factor – tobacco use – has been identified clearly. Smoking causes as many as 90% of all lung cancers, and one in 10 smokers can expect to be diagnosed with the disease. The American Cancer Society estimated that in the year 2000 lung cancer accounted for 14% of all newly diagnosed cancers and 28% of all cancer deaths, killing more than 150,000 people. In Kentucky alone more than 3,000 people die from lung cancer every year.

Keeping records

To keep track of lung and other cancers in the commonwealth, the Kentucky General Assembly in April 1990 passed a law establishing the Kentucky Cancer Registry. The KCR, with the cooperation of Kentucky's 109 acute-care hospitals and other free-standing cancer treatment centers, collects data on all new cancer cases diagnosed in residents of Kentucky. In the years since it was established, the KCR has improved its ability to document

all newly diagnosed cancers. By 1994 the KCR was capturing about 95% of all new cases.

For data to be meaningful they must be comparable with data from national and regional sources. The Surveillance, Epidemiology, and End Results (SEER) Program was started in 1973 by the National Cancer Institute and is the most comprehensive source of nationwide information on diagnosed cancers and survival

rates in the United States. SEER compiles data on cancers from 14% of the population, and these data are thought to approximate cancer rates in the nation as a whole.

Data on mortality rates come from the National Center for Health Statistics at the Centers for Disease Control and Prevention. These data are believed to be essentially complete and all-inclusive.

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FROM THE GOVERNANCE BOARD

Lung cancer has long been recognized as a major public health issue in Kentucky – and for good reason. Kentucky's lung cancer mortality rate is the highest of all states in the nation. A wide range of education, clinical, and basic research issues need to be addressed as the commonwealth seeks to reduce the incidence of and mortality from this deadly disease. As the General Assembly, in collaboration with Gov. Paul Patton, focused on the problem of lung cancer in Kentucky, the decision was made to invest in a 20-year initiative on lung cancer prevention and control research. To guide these research efforts, the General Assembly, through Kentucky Legislative Statute 164.476, established the Lung Cancer Research Project.

The research project is a consortium enterprise between the University of Kentucky and the University of Louisville. A nine-member Governance Board was established to oversee the project. The Board's membership consists of two members each from the University of Kentucky, the University of Louisville, and the Kentucky Council on Postsecondary Education, and three members representing the commonwealth at large, one of whom is appointed as chair by the Governor.

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Lung cancer incidence and mortality rates

Incidence and mortality rates are commonly used to describe the occurrence and impact of disease. Rates are generally defined as the number of events that occur per 1,000 or 100,000 people in a population. Here the events of interest are new lung cancer cases per 100,000 people (the lung cancer *incidence* rate) and lung cancer deaths per 100,000 people (the lung cancer *mortality* rate). Incidence and mortality rates can be specified for a given population during a given period, usually a year or a group of years.

Often both incidence and mortality rates are adjusted for age. This involves a statistical technique that takes into account the age distribution of the population being considered. Researchers adjust for age because most cancers occur more frequently in the old than in the young, and different populations may have different age compositions. Florida, for example, has an older average population than the United States as a whole since it is a retirement state for many people, whereas Alaska has a younger average population since it

attracts young people. Adjustment for such differences in age compositions allows researchers to make valid comparisons across different geographical regions, populations and periods.

Kentucky is No. 1

Kentucky has the unfortunate distinction of having the highest lung cancer incidence and mortality rates in the nation. The 1997 overall lung cancer incidence rate in Kentucky was 53% higher than that of the United States — 85.3 cases per 100,000 individuals, compared with the estimated national rate of 55.6 cases per 100,000 from SEER. Given the high fatality rate of lung cancer, the mortality rate follows a similar pattern. From 1993 to 1997, Kentucky had the highest lung cancer mortality rate in the nation, with the rate in 1997 being 43% higher than the U.S. average. Not surprisingly, reducing lung cancer incidence and mortality are major public health priorities in the commonwealth.

Sex- and race-specific rates

For decades researchers have seen that lung cancers across the nation occur more frequently in men than

in women. The same pattern is observed in Kentucky, where incidence rates for 1997 were 120.4 cases per 100,000 men and 59.2 cases per 100,000 women, with the SEER rates being 69.1 and 43.1 respectively. Similar differences are observed for mortality rates in Kentucky, with 99.7 lung cancer deaths per 100,000 men and 46.1 per 100,000 women. These differences have been attributed mainly to the traditionally higher smoking rates among men than women, although this trend has been reversing in recent years.

Across the country, lung cancer rates are also higher in African Americans than in whites. Again, the same trend is seen in Kentucky, where incidence rates in 1997 were 92 per 100,000 African Americans and 81.7 per 100,000 whites, with the SEER rates being 68.4 and 54.7 respectively. The percentage of lung cancers in Kentucky among men and women, for both African Americans and whites, is shown in Fig. 1.

Trends over time and geography

Lung cancer mortality rates generally follow the prevalence of smoking in a population. Overall, lung cancer deaths had increased steadily over the last few decades with the increase in smoking. Fortunately, the more recent decrease in smoking in the nation and in Kentucky has started to lower the mortality rate of this disease. Similarly, areas with lower smoking rates have substantially lower lung cancer mortality rates than those areas with higher rates. The contrast in lung cancer mortality rates between states with low smoking rates (such as Utah and California) and those with high smoking rates (such as Kentucky and West Virginia) is as obvious as it is dramatic (Fig. 2).

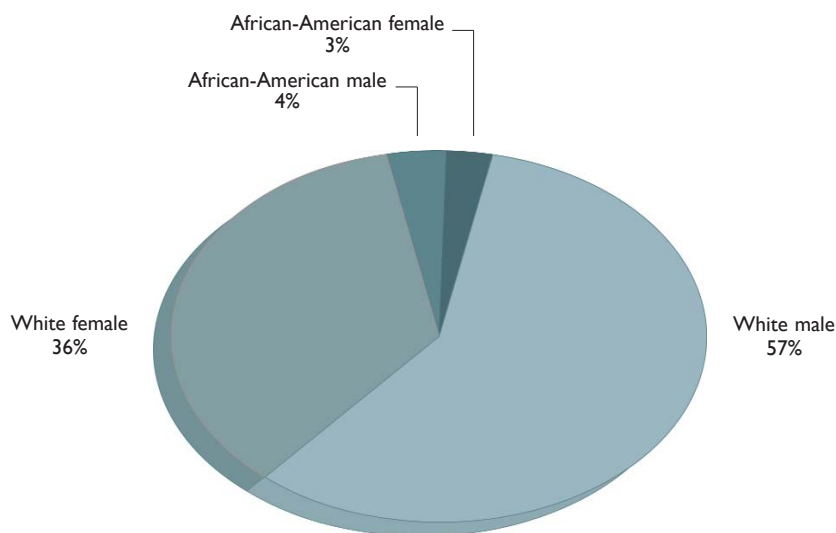


Fig. 1. Lung cancer cases in Kentucky (1994–98), percent by race and sex.

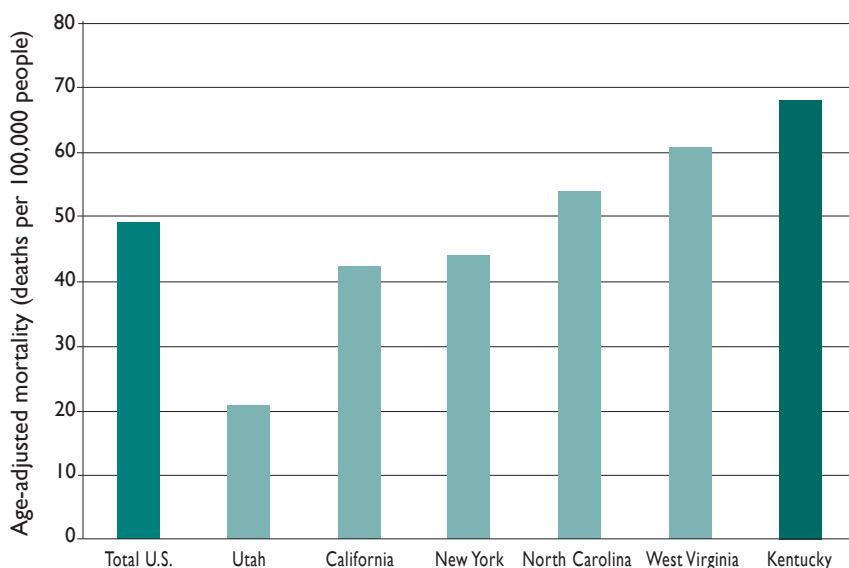


Fig. 2. Age-adjusted lung cancer mortality rates in the United States and in selected states (SEER lung cancer data, 1993–97).

Lung cancer survival patterns

The overall survival rate for lung cancers that are detected *before* the disease has spread (a localized tumor) reaches almost 50%. But because only 15% of cases are detected that early, the overall five-year survival rate for lung cancer patients is only 14%. This is why lung cancer is such a highly fatal disease: the symptoms often do not appear until late in the development of the disease and we lack widespread methods for early detection such as those for breast and colorectal cancer.

The five-year survival rate for individuals whose lung cancer has spread but is still confined to the chest cavity (a regional tumor) is only 20%. In contrast, the five-year survival rate at the same stage for breast cancer is 77% and for colorectal cancer is 65%.

More alarming still are the lung cancers that are diagnosed when the disease has spread to other organs (the distant stage). Almost half of all cases are diagnosed this late but, unfortunately, the five-year survival rate is only 2% (Fig. 3.)

Clearly, development and implementation of early detection methods can have a tremendous impact on the treatment of and survival from lung cancer.

Conclusion

These data illustrate the seriousness and magnitude of the lung cancer problem in Kentucky. It is a devastating disease — both physically and emotionally — affecting a disproportionately large number of residents of the

commonwealth. Frequently, lung cancer develops as an undetected tumor, and by the time it becomes symptomatic and diagnosed, it is usually too late for successful treatment. The result is a short survival period and, ultimately, the death of some 85% of all patients diagnosed with this disease.

But it's not all bad news. Compared with other cancers, lung cancer is one of the most preventable, since most cases are attributable to a single cause: cigarette smoking. Unfortunately, for years Kentucky has ranked No. 1 in the nation in smoking prevalence. Of special concern is the state's smoking prevalence among the younger, adolescent population.

Despite this grim picture, clear concrete steps can be taken to lower the burden of lung cancer significantly in the commonwealth. This is key to the mission of the Lung Cancer Research Project. These steps include characterizing the problem across all of Kentucky and among different segments of the population, by region, age,

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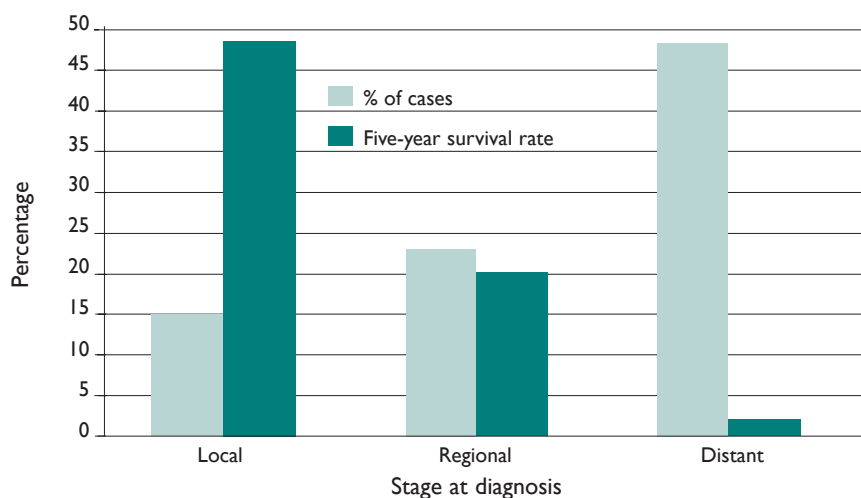


Fig. 3. Proportion of lung and bronchus cancers by stage at diagnosis and corresponding five-year survival rates (SEER lung cancer data, 1989–96).

gender, socioeconomic standing, as well as other groupings. This will aid in implementing successful programs for prevention, primarily through reducing current smoking rates. It also will be of utmost priority to identify, develop and implement medical procedures that can increase early detection through screening. Similarly, it is paramount to develop and implement new treatments that can affect the survival and quality of life significantly for the many individuals for whom prevention is too late.

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Written by Dr. Claudia Hopenhayn-Rich and Michelle L. Stump, and edited by Joe Petrik, Kentucky Prevention Research Center, Markey Cancer Control Program, University of Kentucky, Markey Cancer Center.

Joe Petrik can be reached by e-mail at jpetrik@prc.uky.edu.

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The Governance Board is challenged to establish an aggressive research program that will enable the University of Kentucky and the University of Louisville to become nationally recognized leaders in the epidemiology, diagnosis and treatment of lung cancer. The impact of these research efforts should be the reduction of lung cancer incidence and mortality rates among Kentuckians.

Initial steps

In the fall of 2000 the Board Chair established a subcommittee that was charged with developing a draft strategic plan for review by the full Governance Board. The strategic plan was approved in February 2001 by the Governance Board. The Board will provide routine updates on implementation through a series of quarterly policy briefs, in conjunction with the Kentucky Prevention Research Center, with this issue being the initial effort. This and future issues also will be used as an avenue to disseminate data on lung cancer incidence, mortality and survival in Kentucky, as well as associated information on risk factors of this deadly disease.

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c/o Kentucky Prevention Research Center
2365 Harrodsburg Road, Suite B100
Lexington, KY
40504

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